

# Step by Step: The Reconstruction of Waterlogged Leather Shoes

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## Introduction

In 2023/24, previously waterlogged shoes recovered from the *HL Hunley* Submarine were treated at the Warren Lasch Conservation Center labs. This poster presents the devised method for their reconstruction and preparation for display and storage, highlighting a particularly challenging case study.

### Treatment Materials

- Lascaux 360 HV & Lascaux 498 HV
- Japanese Paper
- Acrylic paints
- Ethafoam
- Cotton stocking
- Black Polyester
- Earth magnets



Fig. 3. Earth magnet covered in toned paper and used to hold leather to the support.



Fig. 4. Custom made polyester cover for Ethafoam support.

## Methodology

### Gather Reference Material

Archaeological data is combined with historic research to form the most accurate stylistic interpretation of the shoe to inform reconstruction.

### Carve Internal Support

Internal measurements of the shoe are taken and used in carving a support from Ethafoam. This support is divided where needed to facilitate insertion and removal from the shoe (Fig. 2).

### Shape and Tone Paper Fills

Where support or stylistic interpretation is required, Kitakata Japanese paper is cut or torn into the appropriate shapes, slightly wetted and then molded around the carved support. Once dried into the desired form the paper fill is toned using acrylic paints to be aesthetically sympathetic to the overall appearance of the shoe.

### Application of Paper Fills

Colored fills are adhered in position using a combination of Lascaux 360 HV and Lascaux 498 HV with the aid of clamps and magnets.

### Cover Internal Support

Ethafoam is covered in fabric to improve surface quality and aesthetics (Fig. 4).



Fig. 1. The author making final adjustments to the shoe support cover.



Fig. 2. Custom made support carved from Ethafoam to meet shoe's specifications.

## Case Study: Wicks' Brogan Style Shoes

A particularly interesting treatment case was the reconstruction of the brogan style shoes belonging to crewmember James A. Wicks. Wicks' brogans were of a higher quality than was typical for the time and region, with metal eyelets included in their design. After excavation, a large fragment of the right shoe was left encased in concretions (Fig. 5). The fragment was deemed too fragile to be separated. Further, while encased it served as an effective tool in educating viewers about the conditions in which some of the artefacts of the Hunley were found. However, the interpretation of the shoes was significantly impacted by the loss of such a large fragment. It was therefore deemed that a replica should be made (Fig. 6) and attached in position (Fig. 7).



Fig. 5. Large fragment of the upper portion of Wick's right shoe showing four metal eyelets and a fragment of shoelace through the top eyelet (all encased in concretions).

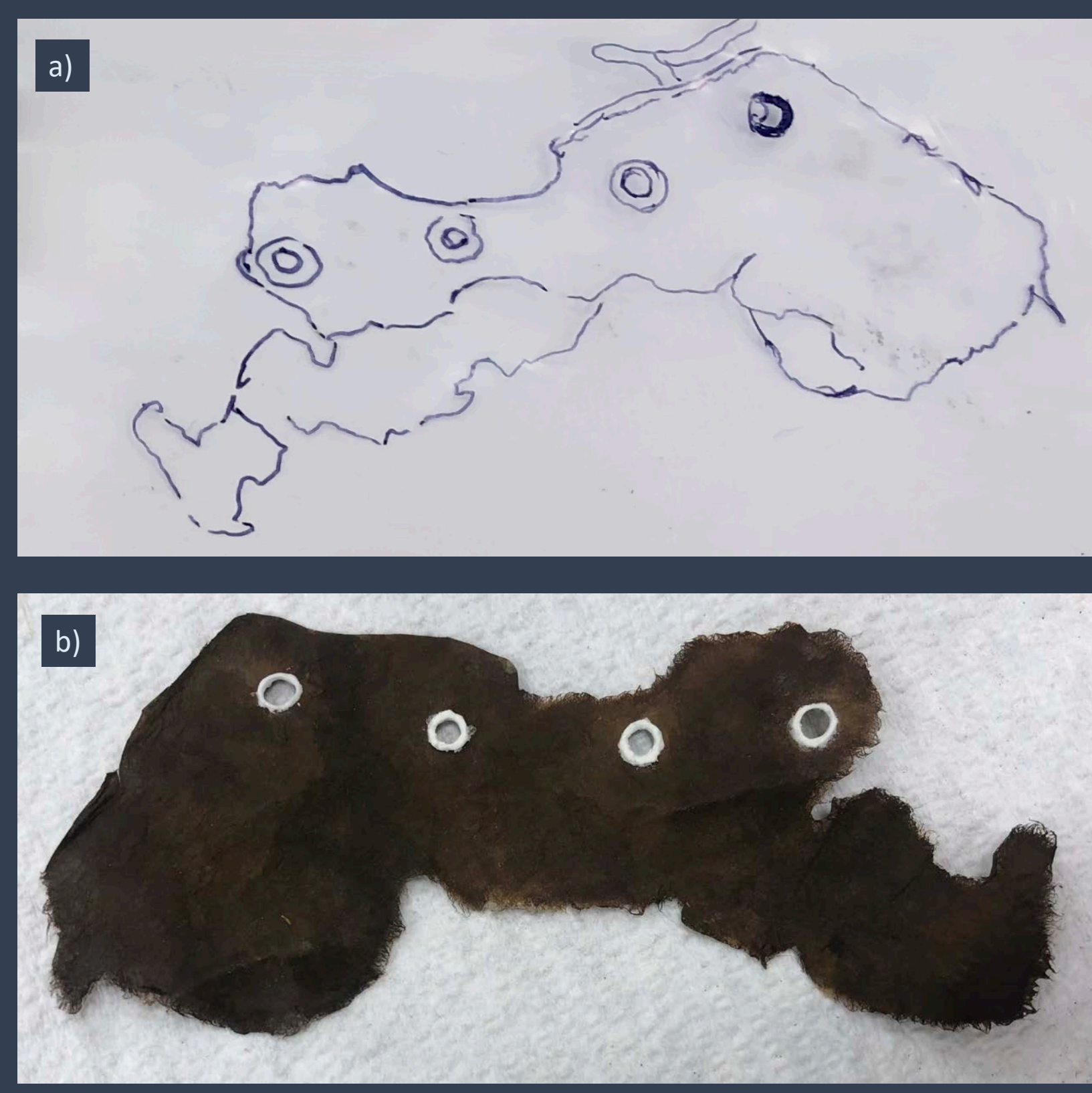


Fig. 6. Images of the replicated fragment being traced (a) and made from paper (b) toned with acrylics and with B-72 bulked with micro balloons to replicate eyelets.



Fig. 7. Image of the majority of Wick's right shoe reconstructed and fully supported with floating replicated fragment temporarily pinned into position. Conservators debated the merits of leaving this replicated fragment as a removable piece, as pictured above. However, ultimately the fragment was attached to an additional paper support that was attached to the shoe itself to create a more cohesive visual rendering of the shoe (Fig. 9).

## Results & Discussion

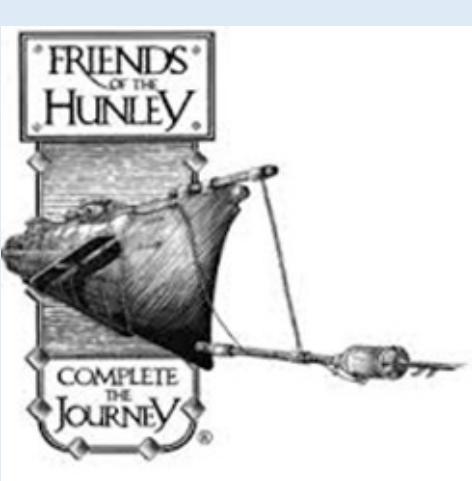
At the end of their reconstruction, the crewmembers' shoes will be ready for display alongside many of the other artifacts from the *HL Hunley* submarine. Their display will contribute both to a better understanding of the historic vessel and the conservation efforts involved in presenting it to the public. Ongoing challenges include finding a more efficient method of making custom internal supports including supporting fragments of leather that has the tendency to lean away from that support. The use of earth magnets covered in toned paper (Fig. 3) is being explored to address the latter issue.



Fig. 8. After treatment image of the inside of Wicks' brogan style shoe.



Fig. 9. After treatment image of the outside of Wicks' brogan style shoe.



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