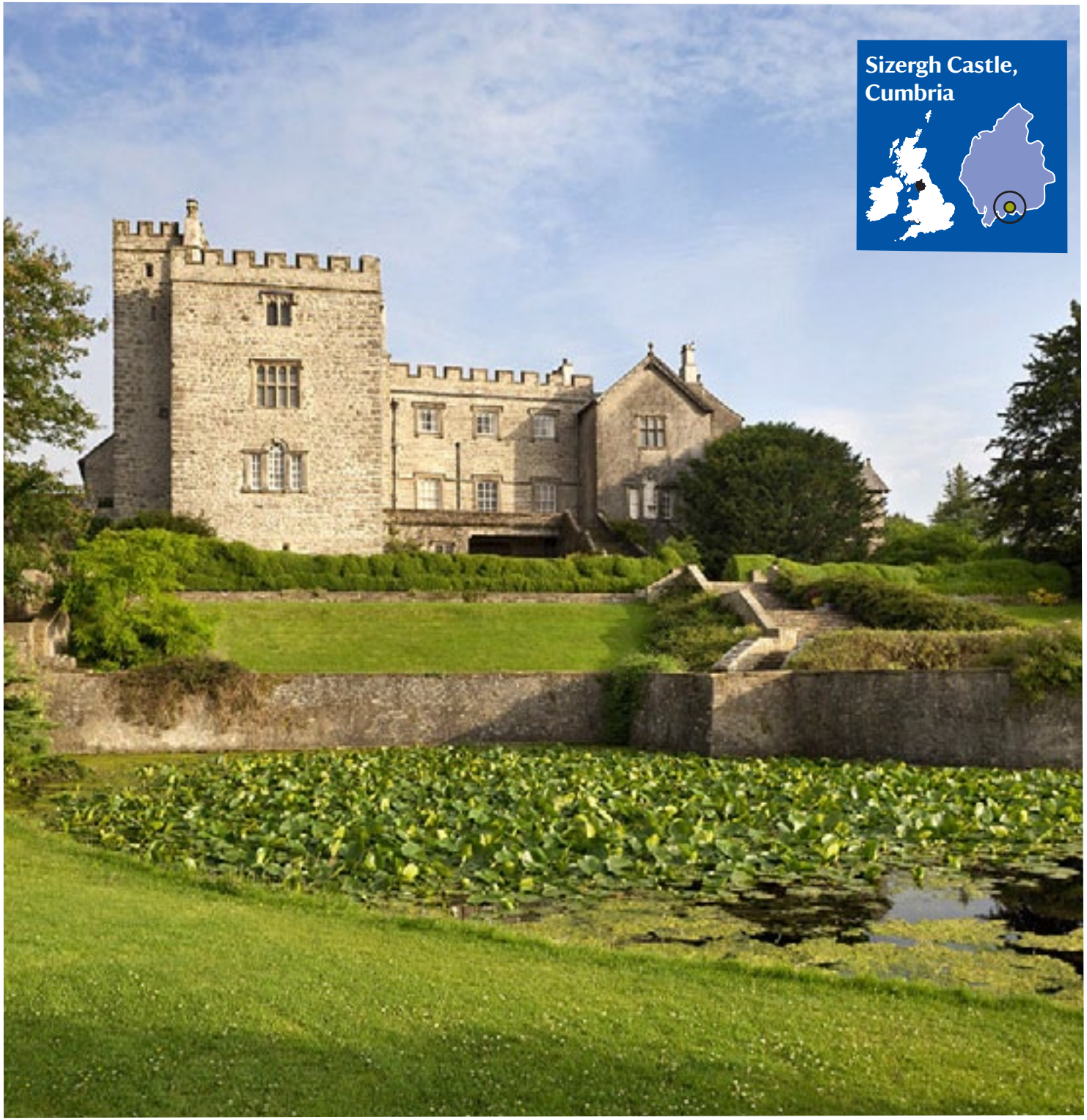
National Trust

Case Study

Sizergh Castle

Heavy summer rain flooded multiple areas of the estate

April 2014



Background

During a storm in June 2012 comprising of thunder, lightning, and heavy rain, the Entrance Hall and Visitor Services centre at Sizergh Castle flooded. The flooding occurred around 1.30pm on a Thursday afternoon, after which the property was evacuated and closed for the rest of the day. Luckily Sizergh is regularly closed on Fridays and Saturdays so those days were used for conservators to come in and assess the damage. Sizergh resumed normal opening times on Sunday.

The central structure of the Castle (predominantly 1300s complete with solar tower) is where the Entrance Hall is located. The two wings on the north and south of the central structure were added in the 1500s. This forms a U-shape and within it a gravelled courtyard. The courtyard is the east front and is the current visitor's entrance. The original entrance of the Castle (though not the visitor's entrance) is on the west front. The west entrance of the Castle has a terrace which leads to a grassy bank and a mirror pond further below. During the heavy summer rains in June, the flash flood flowed from a sloped hill opposite the Castle's east front, through the Castle's east entrance doors and out of the west entrance doors and onto the terrace.

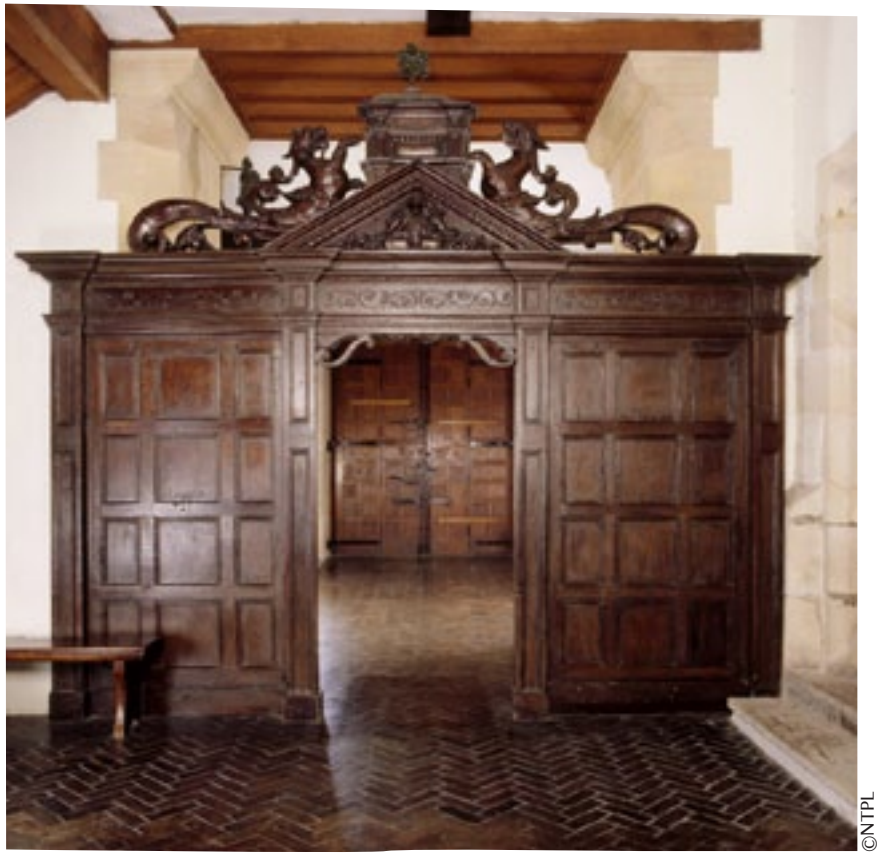
Emergency salvage procedures had been implemented quickly, and not many items were lost in the flood. The wooden block floor in the Entrance Hall received the most damage and needed to be completely removed on Thursday afternoon for salvaging. Complete restoration of the wooden floor blocks and all other items was accomplished within 3 months after the initial flooding.

Impact

Only the Entrance Hall of the castle flooded; the water was about one foot deep. On the first floor Upper Hall (directly above the Entrance Hall), water had collected on the flat roof outside the window, also about one foot deep. Only minimal amounts of water entered the Upper Hall through this window.

The greatest damage in the castle occurred to the oak wood block floors in the Entrance Hall. A few of the blocks were displaced in the flood and were discovered floating in the floodwater. All of the floor blocks were removed to be salvaged, but not all could be recovered. All of the original adhesive on the wood oak blocks was also lost due to the flood and salvaging process.

The Visitor Services building, located south west of the Castle, also flooded. The flood occurred as a result of leaks in the roof and overflowing gutters. The building also lost power. Luckily the Visitors Services building did not require much restoration work but shop stock was damaged with a loss of £476 worth of items.



Above **The Entrance Hall at Sizergh Castle**

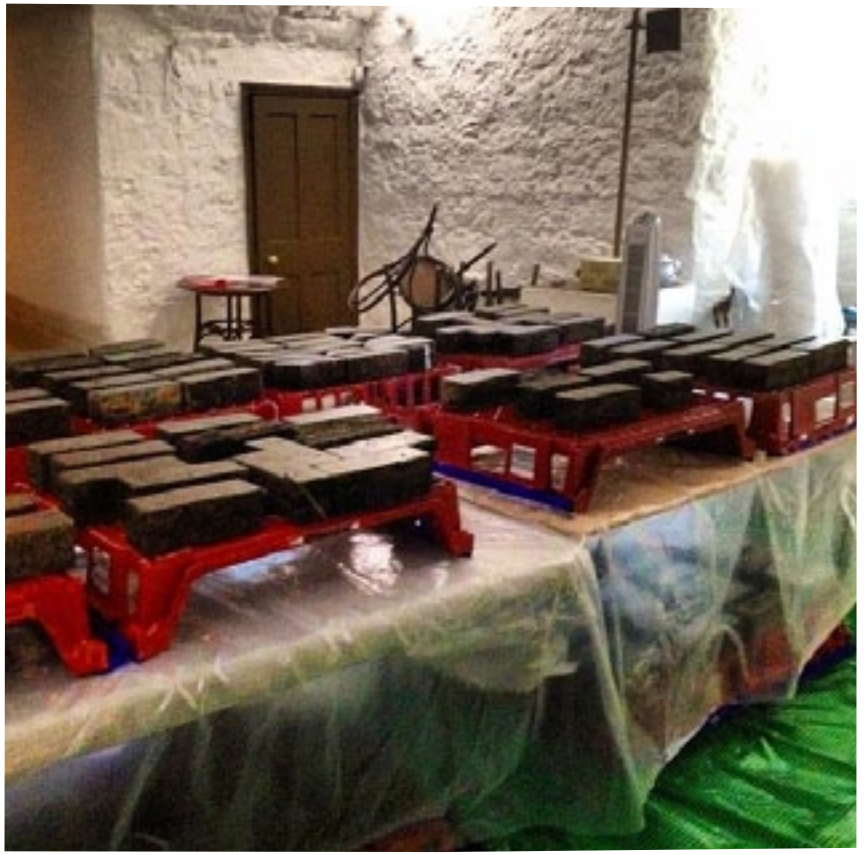
Left **Part of the Entrance Hall wooden floor, damaged**

Response

Emergency salvage procedures were immediately implemented by the House Steward at the time, Emma Burnell. Firstly the visitors in the Castle were made to evacuate. Fire services were also contacted for help - they assessed all risks and discovered that the flat roof above the Entrance Hall had about a foot of water pooling. They immediately pumped the water out before it could flood other floors of the house; only a very small amount of water leaked in from the window into the Upper Hall. The emergency call out procedure was also activated (where all those on the emergency call out list held by a monitoring company were contacted) and within 3 hours more staff had arrived on site to aid in the salvage procedures.

Many of Sizergh's already on-site staff had been occupied during the flood evacuating the Visitor Services building. The remainder swept the water within the Entrance Hall from the east entrance (where it had entered) with mops, out the doors of the west entrance and out onto the terrace. Once more staff arrived on site they began unblocking drains and setting up a salvage room where a wind tunnel was created. The salvage room was an empty room set up with multiple fans in the Tower Basement of the castle.

Staff then began to salvage the items from the Entrance Hall. Each wooden block was labelled to preserve its original location and removed from the floor on Thursday afternoon. Every single oak block removed (over 2000 in total) was then placed in the wind tunnel in the salvage room. All of the heavy furniture in the Entrance Hall was raised off the ground and placed on standing blocks. The items which hung on the walls such as the aboriginal speers and shields as well as chairs and taxidermy cases were repositioned in the Queen's Room and Dining Room on the first floor. No other items needed any additional conservation work.



Cost

Conservation costs:
- Replacement of rotten threshold board (specialist external furniture restoration company): £2,403.07 excl VAT
- Restoration and relaying of floor blocks (specialist external furniture restoration company): £19,000 excl VAT
- Interpretation, in-house: £75
- Shop stock written off (retail price): £476

Excess payments:
- Buildings damage: £1,000
- Contents loss: £250
- Income loss: £250
- Future repair costs (to east door): £4,000
- FloodSax for future prevention: £280

Total: £27,734.07

Funding:
Insurance and operational budget

Top left **Wooden floor blocks drying out in the salvage room**

Bottom left **Oak blocks are labelled to recognize their original positions**

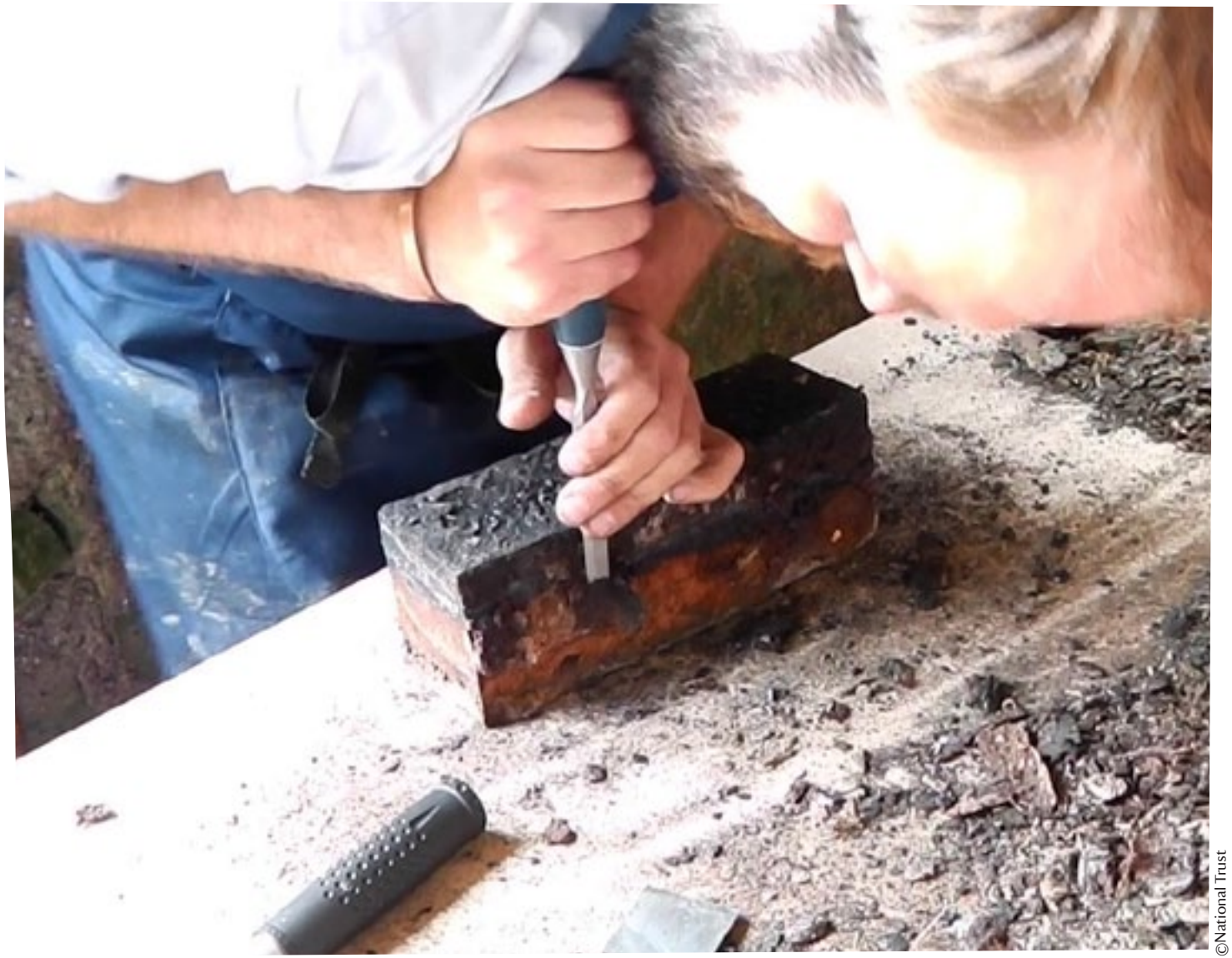
Review

Lessons learnt

The main lesson learnt was that the same evacuation procedures should be used for floods as are used for fires. It was difficult for Sizergh staff to encourage people to evacuate the Castle as well as the Visitor Services building. Thus if such an incident occurred again, the staff would sound the fire alarms starting the tried and tested fire evacuation procedure. As rain, thunder and lightning were present outside the visitors' main instinct was to seek shelter inside.

The emergency procedures are also currently being reviewed and re-written at Sizergh Castle. Improvements need to be made in the clarity of roles and responsibilities; they need simplification. Nonetheless the staff at Sizergh now feels confident they can deal with any emergency situation that should arise in the future. Keeping people trained and ready for action is important.

It is also extremely important and beneficial for staff to attend emergency salvage training and for the property to hold regular practices. It was clearly evident how effective Emma Burnell's recent emergency salvage course had been and how it had prepared her to manage this flooding incident at Sizergh.



Right **Oak blocks being cleaned before relaying**

Review

Associated works

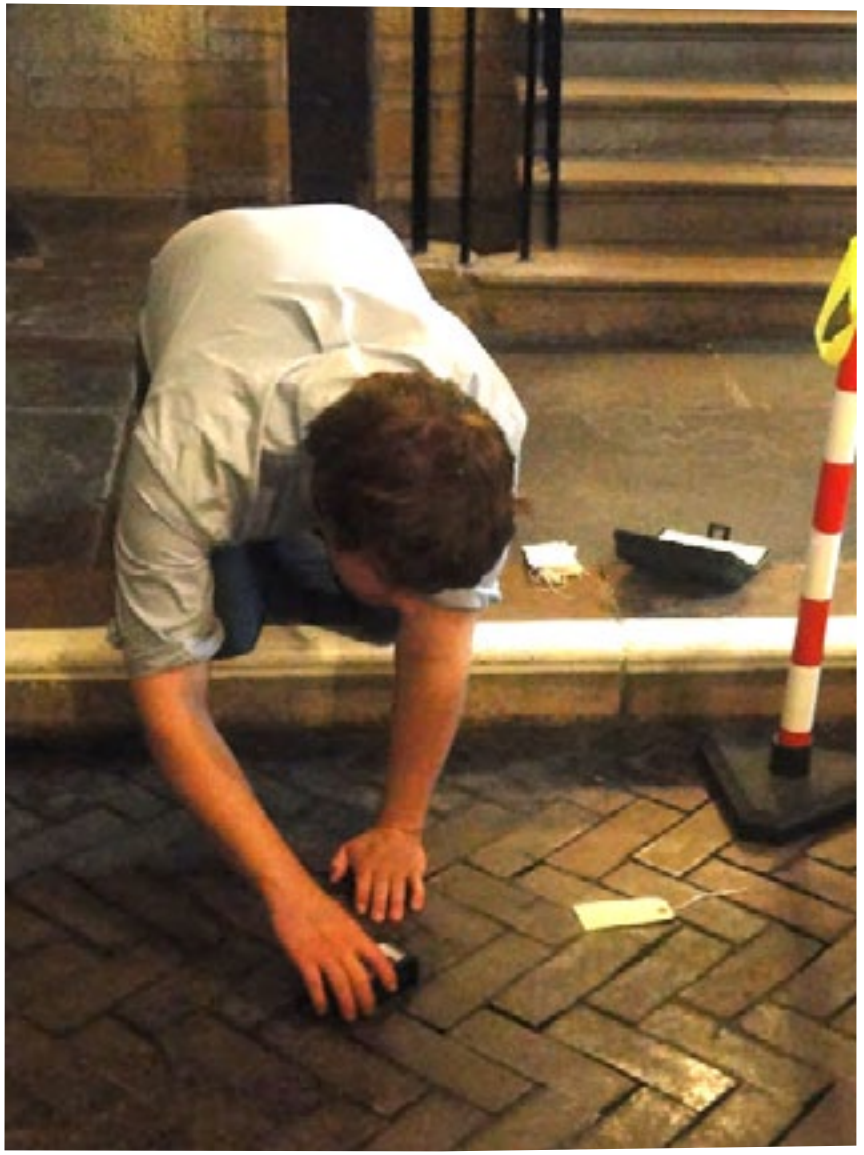
The following day National Trust Conservator Julie Vint and Furniture Conservator (Peter Hall & Sons) John Wynn Griffiths came to assist the salvage and assess the damage to the floor. Peter Hall & Sons visited again many times over the coming weeks. The wooden floor blocks were dried in the wind tunnel in the basement of the castle, during which the humidity levels were constantly measured and maintained.

Drying couldn't occur too quickly to prevent further damage to the oak blocks. With this technique the wooden blocks needed 4 – 5 weeks to dry completely. Afterwards the floor blocks were all cleaned; old fill and bitumen was completely removed from the bottom and sides of the blocks.

A few of the oak blocks had been too damaged to restore and some new oak wooden floor blocks were made in their place. All of the wooden blocks needed new adhesive and a modern version needed to be implemented because a replica of the old bitumen adhesive was not setting. Once the new adhesive was added the wooden blocks were placed back in the Entrance Hall floor according to their identification labels.

Fans had also been set up in the Entrance Hall during restoration works to dry out the concrete floor beneath the wooden floor. The concrete took longer to dry than the wooden blocks.

During the restoration floor protection was set up in the Entrance Hall and works continued to be carried out during visitor hours. Interpretation panels were set up to inform the visitors of the ongoing conservation work.



Recommendations

The immediate response of the Sizergh team sweeping away the water, setting up the salvage room and removing the wooden blocks was critical in reducing the amount of restoration work afterwards. Emma Burnell had recently attended an emergency salvage course and was fortunately very well informed as per what to immediately do in this type of situation.

The regional salvage trailer actually lives on site at Sizergh and sped up the process of implementing emergency procedures. However, the supplies in the trailer were depleted and it was unorganized after its last use and thus was not as useful as it should have been. Since the flood the property has invested in their own supply of FloodSax to lay quickly to prevent flooding in the building. The Sizergh team have also established a regular gutter cleaning routine to prevent future water build-up.

Left **Replacing the wooden floor blocks after drying and cleaning**

Further information

Emergency salvage course information and salvage guidance - http://intranet/intranet/pages/i-cns-emergency_salvage.htm

Contact

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Building surveyor, former: Chris Shepherd
House steward: Emma Pullen
Conservators: Caroline Cotgrove, Julie Vint (retired)
John Wynn Griffiths – Furniture Conservator (external – Peter Hall & Sons)

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Case study information

This case study was compiled by Natasha Rozanski with assistance from Caroline Cotgrove and Georgina Gates.

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Above **Installing the temporary floor**