SCAPE

Scottish Coastal Archaeology and the Problem of Erosion

University of St Andrews

Coastal Zone Assessment Survey

Loch Ryan Report

Sarah Boyd, Joanna Hambly

The SCAPE Trust and University of St Andrews
December 2023

Supported by

HISTORIC ENVIRONMENT SCOTLAND | ÀRAINNEACHD EACHDRAIDHEIL ALBA

Contents

Key Findings

The August 2023 survey of the Loch Ryan coastline, Dumfries and Galloway, focused on areas of vulnerable soft coastline between Kirkholm in the west and Leffnoll Point in the east.

The coastline is generally sheltered, but we observed notable erosion along stretches where the coast edge is made up of very soft raised marine deposits between McCulloch's Point and Kirkholm. East of Stranraer from Innermessan to Leffnoll Point is very low lying and historic concrete embankments and coastal defences to protect the Cairnryan Military railway and other World War2 infrastructure are failing in many places.

Twenty-five archaeological and built heritage sites were visited and documented by SCAPE officers and volunteers. Ten of these were not previously recorded in heritage records. The Loch Ryan area also contains thirty-three sites related to RAF Wig Bay, which were previously surveyed by SCAPE in 2015. Six of the RAF Wig Bay sites located on the coast were visited and updated as part of the August 2023 survey.

The largest categories of site types were WW2 military sites, representing 32% (8) of total sites visited, followed by domestic settlement sites, representing 20% (5) of total sites visited.

Three of the surveyed sites have been prioritised for monitoring and further action due to a combination of their vulnerability to coastal erosion and structural deterioration, and their archaeological, social, and historical significance. These are:

- Two intertidal slipways [SCAPE ID 12372 and 12377] located in Wig Bay used during and immediately after WW2 to haul flying boats out of the loch for maintenance and servicing. The condition of these has deteriorated since the previous survey in 2015 and periodic monitoring is recommended.

- Innermessan Camp [SCAPE ID 15815], a World War 1 ship construction yard and World War 2 ship and locomotive service yard, which has been assigned a priority 2 status in recognition of the rare survival of infrastructure from both World Wars in Loch Ryan. Innermessan would benefit from a detailed survey and on-site interpretation.

In addition, two recent finds of mammoth bones from McCulloch's Point and the mouth of the Corsewall Burn raise general awareness of the potential of further discoveries of this kind to be made along parts of the west coast of Loch Ryan where raised beach and marine deposits are eroding.

1. Introduction

This report presents the results of a Community Coastal Zone Assessment Survey (CCZAS) of Loch Ryan. The survey was conducted over two days by SCAPE officers and volunteers and covered sections of vulnerable soft coast between Kirkholm and Leffnoll Point (Figure 1).

The coastline of Loch Ryan had not previously been covered by a CCZAS, however in 2015, SCAPE conducted a condition survey of the surviving elements of RAF Wig Bay (SCAPE, 2015).

The aim of the CCZAS was to characterise and assess the condition and vulnerability of the coastal archaeological resource along stretches of coastline identified as being at moderate to high risk of erosion by 2030. The surveys greatly benefited from information from volunteers about local heritage and recent coastline change.

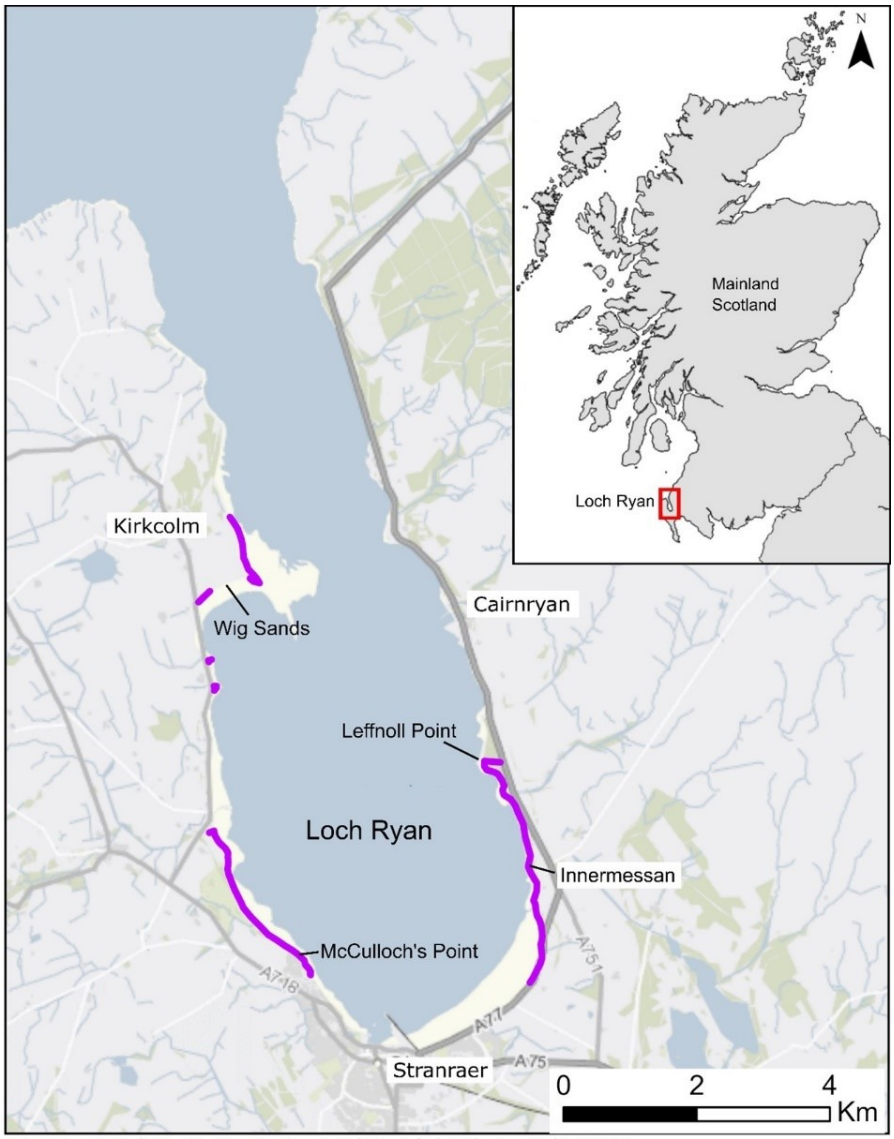

Figure 1. Surveyed coastline highlighted in purple and main locations mentioned in text.

2. Project aims and objectives

The overarching aim of the survey was to identify and characterise archaeological sites and areas that are likely to be impacted by coastal erosion and other threats in the short to medium term.

Survey objectives were to:

- Identify the most vulnerable sections of coastline through desk-based assessment to target fieldwork to coastlines experiencing erosion,
- Involve volunteers from local communities and societies in the field surveys,
- Locate and record archaeological sites at the coast edge and intertidal zone,
- Assess the condition and vulnerability of the sites,
- Assess the field evidence for coastline change during the walkover survey,
- Share results with Dumfries and Galloway Council and Historic Environment Scotland.

3. Methodology

3.1. Prioritisation of field walkover survey areas

In advance of the walkover surveys, desk-based analysis of models of national coastal susceptibility and national coastal change were undertaken to understand the vulnerability of the coastline and target areas for walkover survey. Two models were combined; a coastal erosion susceptibility model (Fitton et al. 2016) and a model of projected coastal erosion rates by 2030 (Dynamic Coast, Hurst et al. 2021). The coastline was divided into 0.5 km x 0.5 km grid cells and each cell assigned a score based on the combined results from each model. Grid cells coloured yellow, orange, and red contain coast which will experience erosion by 2030, with red cells having the highest vulnerability to, or highest predicted rate of, erosion according to the underlying models (Figure 2). The methodology used to combine the models is outlined in a short methodology report, available on the SCAPE website.

The resolution of 0.5 km grid cells was chosen to give a broad overview of the nature of the coastline for walkover planning purposes. Within a red or orange grid cell there may be areas of accretion or no erosion, however the cell will also contain coastline with moderate to high susceptibility of erosion by 2030.

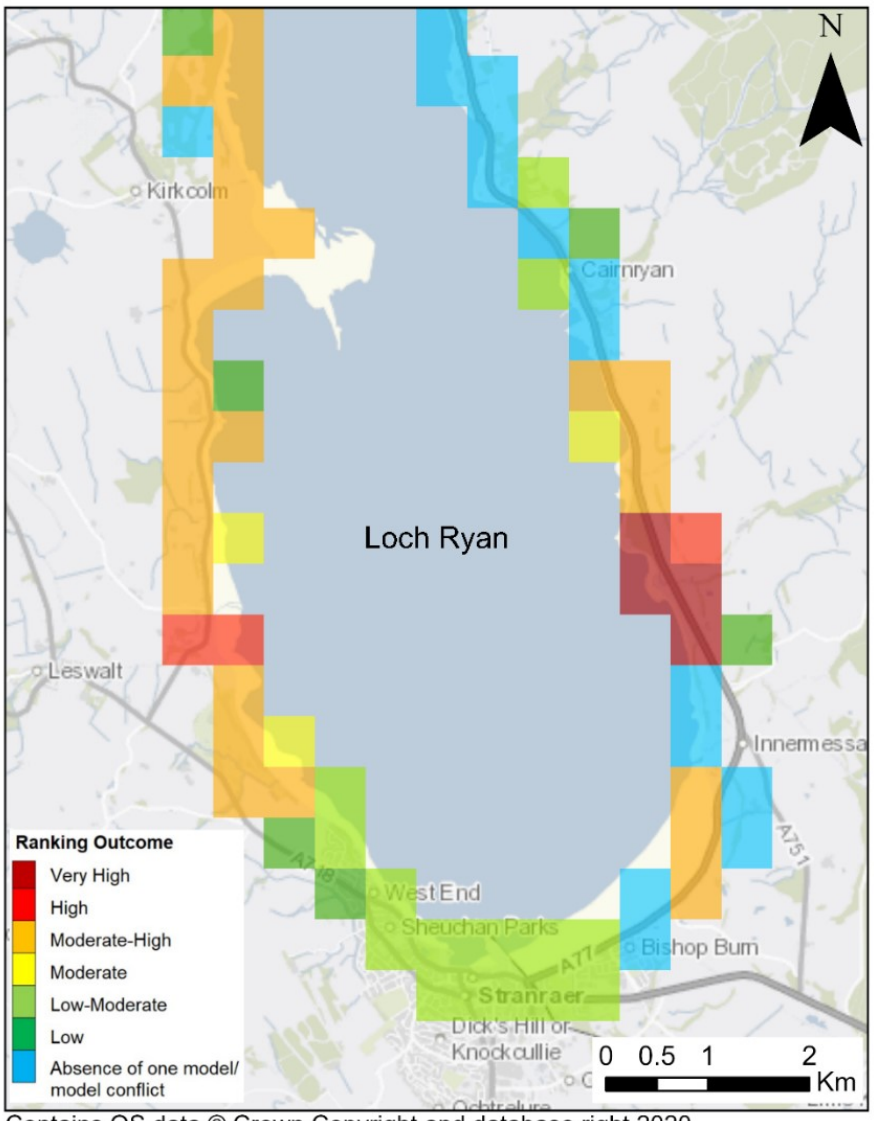

Figure 2. Modelled vulnerability of the Loch Ryan coastline. Red, orange, and yellow cells denote coast which is experiencing erosion and therefore targeted during the 2023 CCZAS survey. Green cells denote coast that is not experiencing erosion and blue cells denote areas where there is a conflict between the models, or which are only included by one model.

3.2. Preparation of coastal heritage baseline

Historic Environment Scotland and Dumfries and Galloway council provided information and point data of all existing known heritage sites around Loch Ryan, in a zone extending 500m seaward of the mean high-water springs line and 100m inland or extended further inland if DC2 modelling suggests the area could face erosion greater than 100m by 2100. This data was imported into ArcGIS 10.7. The selected sites were then refined to screen out sites not relevant to the surveys. Table 1 presents information on main categories of sites removed from the coastal heritage baseline.

Site Category	Reasoning

Shipwrecks and other poorly located sites	Site records with only approximate coordinates (e.g. bottom left corner of a km grid square) were removed from the database due to the inability to accurately locate during fieldwork. Shipwreck records are often poorly located with multiple wrecks plotted in the same grid square corner. When wrecks were noted on our surveys, these were checked against the shipwreck database and linked to the correct record where identifiable.
Urban records	Records which are not at threat from coastal processes in urban coastal areas. This includes listed buildings, market squares, plaques, and memorials.
Findspots and relocated heritage	Site records where finds were discovered and are no longer there or sites recording the original locations of objects which are now held in museums. In the case of the Loch Ryan survey, two findspots relating to recent mammoth specimen finds were added to the database so as to explore the immediate surroundings where the finds were discovered.
Miscellaneous	e.g. General location records such as General Views

Table 1. Categories of sites removed from database.

The resulting sites were uploaded to SCAPE's interactive Sites at Risk web map and published to the linked SCAPE Coastal Archaeology Recording App (Figure 3). This app was developed for the project. It allows users in the field to access the location and summary information about known sites, update existing site information and create new site records, including photographs and point and polygon location information. Satellite imagery and historic map layers provide additional information. All features of the app are fully functional offline.

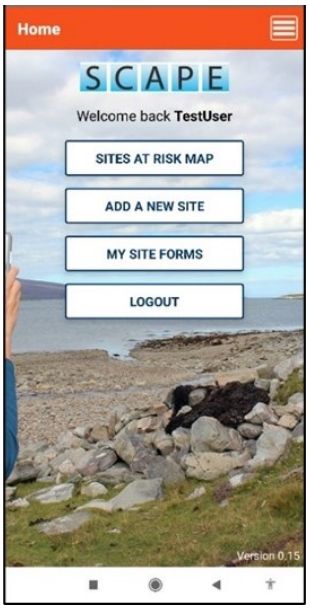

Figure 3A. App Home Screen

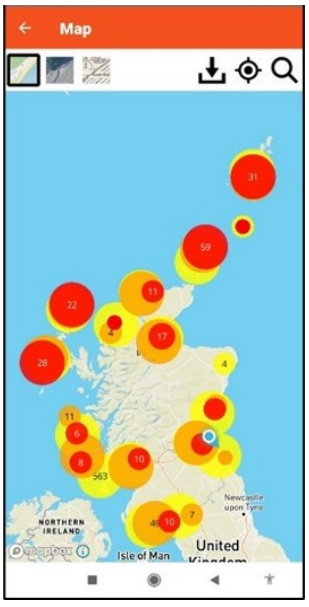

Figure 3B. Interactive Sites at Risk Map

Site markers are initially coloured green to indicate that they have not yet been visited and updated during the CCZA survey. Once visited and moderated, a colour code is assigned to each

marker to reflect the priority status of the site based on archaeological significance and physical vulnerability (see section 3.4).

3.3. Field survey

We target coasts identified as being susceptible to erosion for walkover surveys, which are undertaken three hours either side of low tide to gain the most visible exposure of the intertidal zone. We generally walk along the coast edge with good views over the intertidal zone and hinterland, deviating to visit known sites and to check features and anomalies. The SCAPE Coastal Archaeology Recording App is our primary recording tool. We also document the field evidence for coastline change and condition in general.

3.4. Moderation of records

After each walkover, the data collected using the app is submitted to the website and moderated by SCAPE officers. Moderation ensures that data is consistent and meets the standard required by Canmore. During moderation, the significance, condition, and vulnerability of each site is also assessed, and a priority based upon site significance and threat from erosion assigned. SCAPE applies a colour code to denote priority for action. Yellow indicates no action and is applied to sites of either low archaeological significance, and/or sites generally not threatened by erosion. Orange indicates monitor and is applied to sites of medium to high significance, or potential significance, under potential threat from coastal erosion. Red denotes action required and is applied to sites of high archaeological significance or potential significance which are observed as being impacted by coastal erosion (Hambly 2017, p. 11). These categories are not fixed and updated information, either not available during the survey, or as a result of monitoring or further investigation may result in the priority status of a site changing. Moderated sites are then published and information publicly available on the SCAPE Sites at Risk web map. Sites not visited in the surveys retain their green marker and are visible only to registered users.

4. Results

4.1. RESULTS: Coastal Change

4.1.1. Summary of coastal change

Loch Ryan is a sea loch, oriented broadly north-south, which extends for c.13km from its mouth, between Milleur Point on the Rhins of Galloway and Finnarts Point in South Ayrshire, to Stranraer town at its head. The geography of Loch Ryan means the coastline is sheltered from the higher wave energy of the open coast; however, nuisance erosion was noted to be a problem in a number of areas, with many instances of deterioration of hard coastal protections observed. Anecdotal evidence suggests that wake from large ferries is the cause of erosion in some places. The coastline of the loch has been modified in many areas, with many stretches of the coastline having defences in place to protect the soft coast, especially around the built-up area of Stranraer town, the old ferry-port of Stranraer and the currently operating ferry-ports at Cairnryan. North of McCulloch's Point failed historic coastal defences provide evidence that erosion is an ongoing issue, and fresh exposures of soft raised beach and marine deposits show this is still the case.

4.1.2. Notable areas of erosion (anticlockwise, east to west around Loch Ryan)

Leffnoll Point and Innermessan

To the east of Stranraer, at Leffnoll Point, the concrete embankment of the former Cairnryan Military Railway is showing significant deterioration and the beginning of erosion of the coast edge sediments behind (Figure 4). Along the coastline at Innermessan there are substantial rock armour hard defences which are largely intact (Figure 5A). The remains of the Cairnryan Military Railway shipbuilding yard at Innermessan are protected by this coastal defence to the north and south of the site, but are still at risk of deterioration and being undermined by wave action, with the slipways and remains of the concrete pontoon being particularly at risk of further erosion (Figure 5B,C).

Figure 4. Deteriorating concrete railway embankment at Leffnoll

Figure 5. A. Coastline at Innermessan defended by rock armour; B & C. Infrastructure relating to the Innermessan Military Railway [SCAPE ID: 15815] are at risk of deterioration and concrete elements being undermined, despite defences installed either side of the site.

It was noted that at least three reinforced concrete pontoon sections were noted to have been repurposed within the rock armour defence north of Innermessan (Figure 6A, B). It is thought that these structures were originally related to the Mulberry Harbour construction which took place at the Pile Construction Yard at Old House Point and these sections were subsequently towed to, and stored, at Innermessan (Gill, 1999). They have since been repurposed within the coastal defences in the area [SCAPE ID: 15815; 16268].

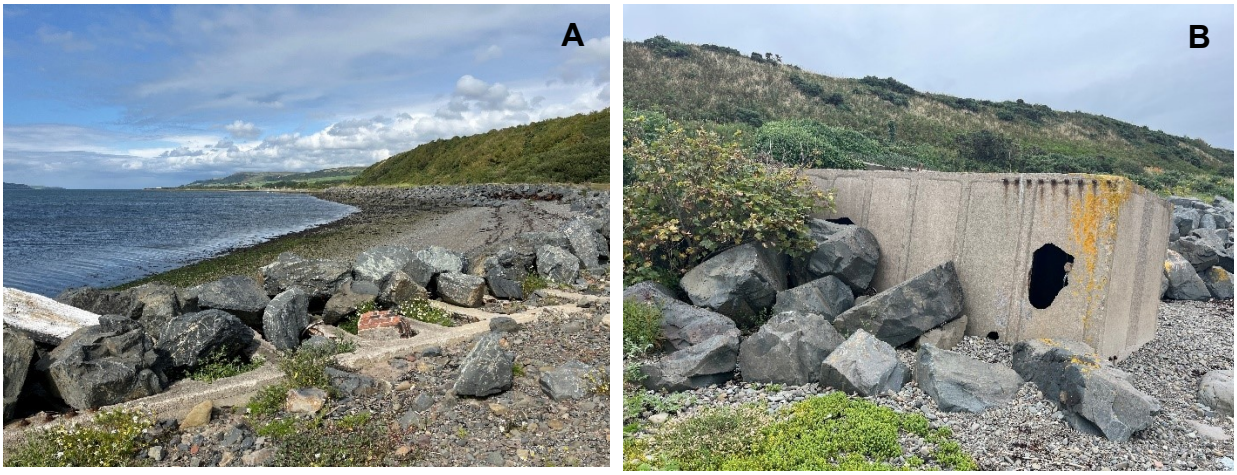

Figure 6 A. Reinforced concrete pontoon section repurposed within modern rock armour, Innermessan [SCAPE ID: 15815]; B. Reinforced concrete pontoon section placed within modern rock armour, c480m north of Innermessan Military Railway site [SCAPE ID: 16268].

Stranraer

The broken up remains of concrete coastal defences are scattered over the shingle beach between Stranraer and Innermessan (Figure 7A). In places the coastal path is eroding and exposing geotextiles and base courses of the landscaped coast edge (Figure 7B).

Figure 7.A. Remains of broken up concrete coastal defence and B. erosion of now vegetated coastal track with geotextiles exposed, between Stranraer and Innermessan.

Broadstone Rd/McCulloch's Point

On the western extremity of the urban area of Stranraer, c.230m between Broadstone Road and McCulloch's Point, the coastline is defended by a stretch of concrete sea wall. Local volunteers informed us that these defences had suffered collapse in the previous year and had been repaired earlier in 2023. However, clear signs of further deterioration were noted, especially at either end of the concrete defence, indicated an ongoing battle with erosion along this coastal stretch. At the northern end of the sea wall, at the boundary between defended and undefended coast, an area of accelerated erosion has occurred where wave energy is intensified at the juncture between hard engineering and unprotected coast edge (Figure 8A, B).

Figure 8A. Damage to concrete coastal defence at McCulloch's Point. Figure 8B. Large erosion "bite" where coastal defence finishes, and wave energy is accentuated.

At McCulloch's Point, we observed a series of historic failed coastal defences indicating a long-term eating away of the coastline at the point. The coast edge, composed of soft raised beach and marine deposits, is freshly cut with little vegetation or sign of recovery and so is vulnerable to further erosion through wave action. Evidence of a variety of past historic defences include lines of stone boulders (Figure 9A, B), collapsing stone walling abutting the coast edge (Figure

9C), and lines of wooden stumps which are likely to be the remaining elements of a previous defence (Figure 9D).

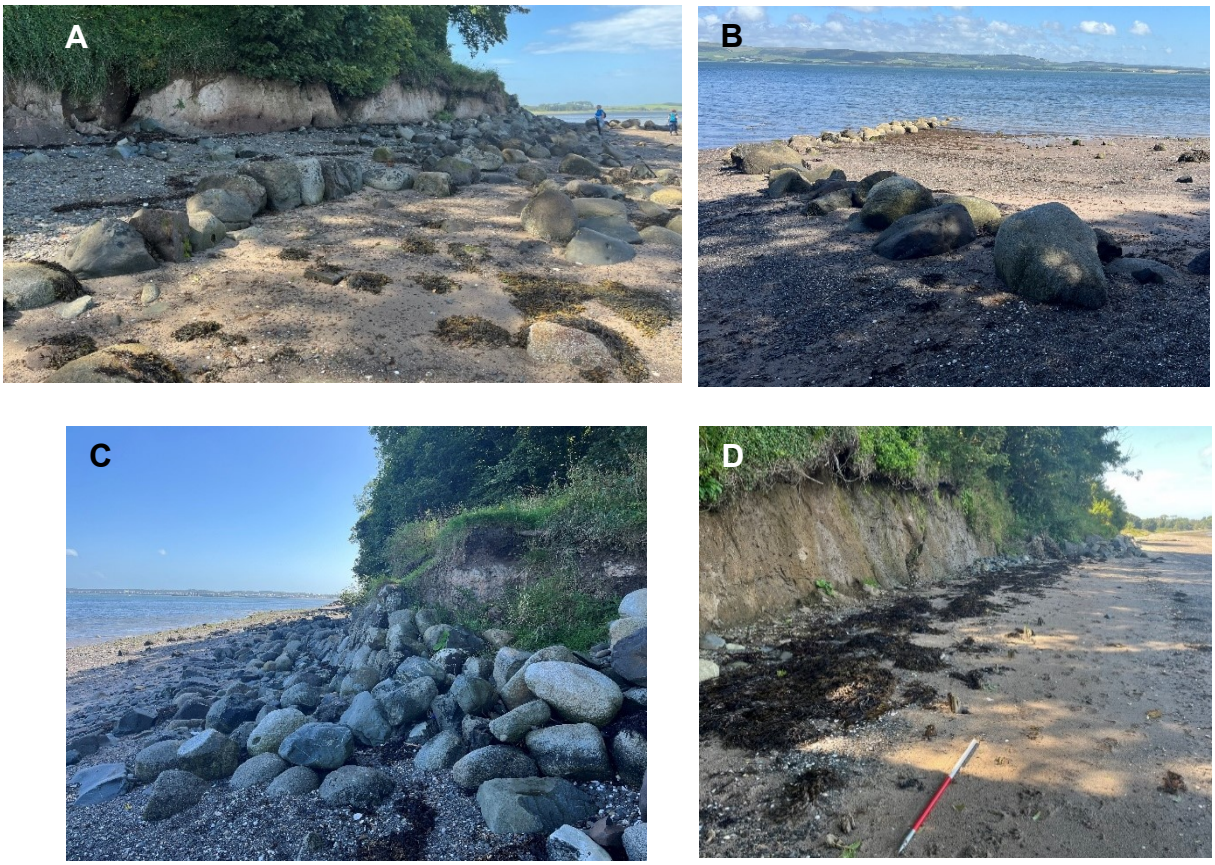

Figure 9. Evidence of past failed, or failing, coastal defences at McCulloch's Point and exposed eroding coast edge.

Kirkholm

At the Corsewall Burn on the coast east of Kirkholm, erosion was noted to the north of the outflow, whereas the coastline appears to be accreting to the south. Significant historic coastal change has occurred along this coastline around the burn mouth, with approximately 70m of erosion north of the outflow and 75m of sediment accreting to the south of the outflow over the last 130 years (Figure 10).

Figure 10. Comparison of coast edge using modern satellite imagery (High Resolution (25cm) Vertical Aerial Imagery, Getmapping 2022) and 1893 historic mapping (1:2500 County Series 1st Revision [TIFF geospatial data], Scale 1:2500. Tiles: wigt-nx0368-2.tif, wigt-nx0369-2.tif, Updated: 30 November 2010, EDINA Digimap supplied service).

4.2. RESULTS: Built heritage and archaeology

Sites were categorised into broad site types to aid discussion (Table 2) and a breakdown of the percentage of each site type recorded during the survey is provided (Figure 11). An overview of the main findings is given below followed by a short section highlighting notable sites and recommendations.

Site Type	Definition
Maritime Fishing	Fixed sites or objects with a direct link to fishing industry e.g. fish traps, fishing stations, bothies, boat houses, icehouses, winches.
Maritime Craft	Craft, ballast mounds, components of crafts such as timbers, boilers, capstans.
Maritime Harbours & Landing Places	Formal harbour structures associated with and serving settlements, e.g., built harbours, piers, jetties, breakwaters, docks. Informal and small-scale, landing areas or structures, e.g. cleared slipways, piers, jetties, breakwaters.
Maritime Safety and Navigation	Infrastructure related to navigation e.g. lighthouses, beacons and maritime safety e.g. rocket apparatus sites
Industry Processes and Works	Industry not directly related to fishing, e.g. rope works, brick works, tide mills, lime kilns, salt pans.
Industry Extractive	Extractive industries, e.g. coal mining, quarrying.
Transport, Infrastructure & Engineering	Railways, tracks, bridges, embankments, drainage.
Settlement & Agriculture Domestic	Buildings related to settlements
Settlement & Agriculture Agricultural	Buildings related to agriculture
Settlement & Agriculture Boundaries	Boundary stones, fences and walls demarking property or land boundaries.
Landscapes of resource exploitation & repeated human activity	Middens, shell middens, artefact scatters, lithic scatters, burnt stone, buried anthropogenic soils/ ground surfaces
Religious, Ritual & Funerary	Churches, burial sites, holy wells, crosses.
Defended Buildings, Castles and Forts	Remains of brochs, duns, castles and promontory forts.
Military WW2	Military sites constructed as part of Second World War coastal defences e.g. pillboxes, observation posts, gun emplacements, anti-tank cubes, anti-glider posts or roadblocks.
Military Other	Military sites which are not solely Second World War, e.g. Napoleonic or WW1 targets and rifle ranges or military bases and airfields.
Natural Features	Geologic or geomorphologic features e.g. sea stacks, mounds, intertidal peat, unmodified caves, unmodified springs.
Miscellaneous	Sites out with the outlined site types.

Table 2. Site type categories and definitions

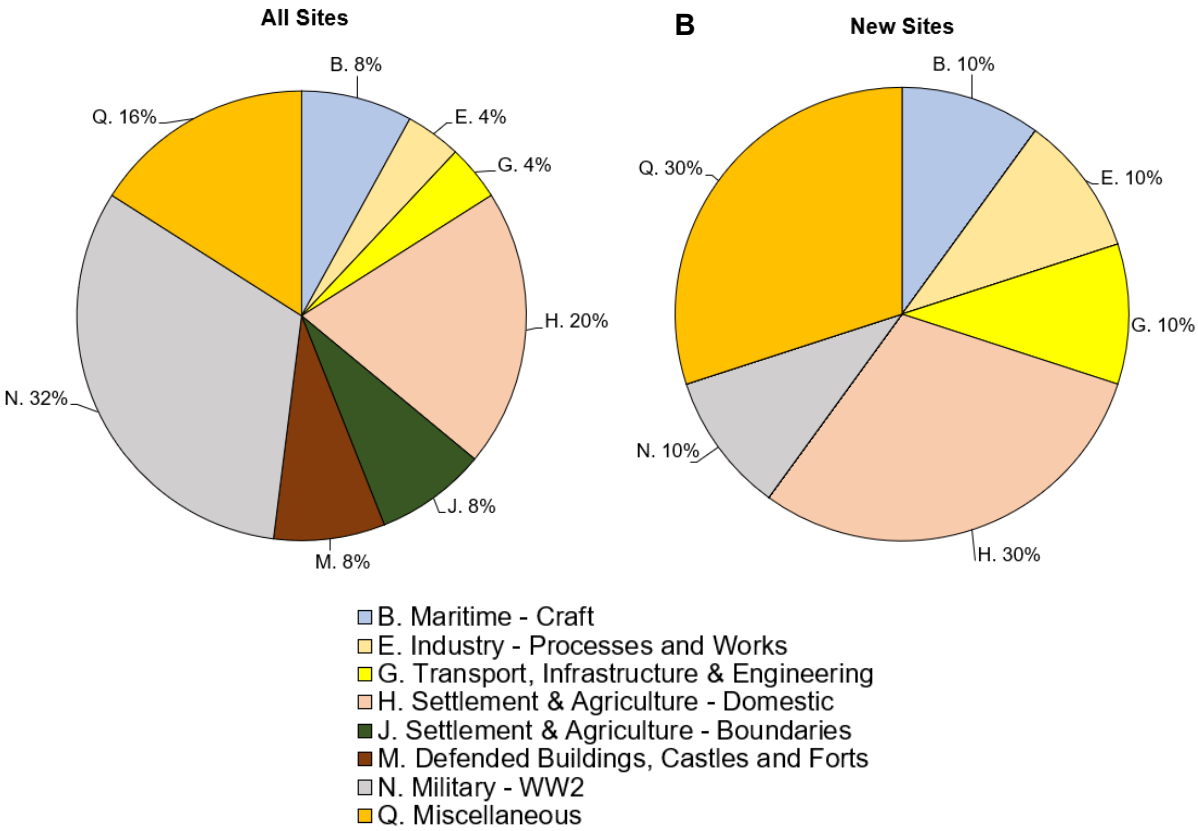

Figure 11. (A) All Loch Ryan sites updated during survey, arranged by category (n=25); (B) New sites recorded during the Loch Ryan survey, arranged by category (n=10).

4.2.1. Military

Innermessan, Cairnryan Military Railway [SCAPE ID: 15815]

The site was constructed in 1917 to build concrete ships to replace merchant navy shipping being sunk by the unrestricted U-boat war. In the second world war Innermessan camp was re-used and extended to service the tugs and lighters working on what was to become the South Deep Water Wharf. It would eventually be staffed by Royal Army Ordnance Corps and Royal Electrical and Mechanical Engineers personnel (Gill, 1999). A slipway had survived from WWI and a new one was added, and the jetty renewed. A few sidings were built alongside the line of the Cairnryan Military Railway where there was also a locomotive workshop (Bell, 2005). Figures 12 and 13 show historic photographs from 1944, when the site was in use.

Figure 12. Photograph of Innermessan slipway and workshops taken from jetty, 1944. Courtesy of Imperial War Museum. Photographer: Sergeant Palmer. © IWM H 40156

Figure 13. Photograph of Innermessan looking northwest from cliff. 1944. Courtesy of Imperial War Museum. Photographer: Sergeant Palmer. © IWM H 40123

Surviving elements include the concrete, iron, and wooden remains of a large main slipway, with an associated unroofed red brick winch house at the landward end, and an adjacent smaller railed slipway. Immediately behind the winch house are concrete platforms which were the foundations of numerous buildings, no longer surviving. The remains of a boat-shaped concrete pontoon are situated immediately to the south of the main slipway (Figure 14). These concrete pontoons, known as 'Beetles' were built to support floating roadways to be used at the D-Day landings. The dimensions of the concrete boat at Innermessan are smaller than other examples of beetles (see SCAPE ID: 13904 for an example of a Mulberry Harbour Beetle, tested at Cairnhead Bay). In addition to the concrete boat, the remains of an object on the south side of the site is filled with cork and bituman and is perhaps the remains of a float.

Fabrication of Mulberry Harbour pontoons, including four large 'Whale' beetles occurred at Cairnryan Harbour (Bell, 2005), and the remains of four Mulberry beetles were once located at Old House Point, Cairnryan [Canmore ID: 323688] before being removed during development of Loch Ryan Port. Arial photography of Innermessan taken in 2003 (NCAP,2023), and photography from 2009, shows nine reinforced concrete rectangular box-shaped structures lined up on the site. These are also believed to be Mulberry Harbour pontoons, which had been transported from the fabrication site at the Pile Construction Yard at Old House Point and stored at Innermessan (Gill, 1999). These were no longer *in situ* at the time of the 2023 survey. It is thought that these pontoon sections have now been repurposed within the coastal defences, with three identified during the CCZAS (Figure 6A,B).

Approximately 40m inland of the site is the remains of an iron vessel, not thought to be related to the WW2 construction yard. A concrete shed is built against the raised shoreline slope face. Photographs of each main element observed across the site are shown in Figure 15.

The site either side of the main slipway is defended by rock armour however the concrete, iron and wooden remains of the slipways and the remains of the concrete pontoon are not sufficiently defended and are at risk of further deterioration and collapse due to wave action.

Figure 14. Aerial view of Innermessan Cairnryan Military Railway site. (1) timber and concrete slipway; (2) railed slipway; (3) remains of concrete boat; (4) unidentified object (float?); (5) winch house; (6) concrete base; (7) concrete shed; (8) remains of hull of iron ship. https://scapetrust.org/sites-at-risk/site/15815.

Figure 15. Photographs of numbered elements located in Figure 10: 1) timber and concrete slipway; (2) railed slipway; (3) remains of concrete boat; (4) unidentified object (float?); (5) winch house; (6) concrete base; (7) concrete shed; (8) remains of hull of iron ship.

Leffnoll Point, Cairnryan Military Railway (SCAPE ID: 15820)

Infrastructure associated with the Cairnryan Military Railway at Leffnoll Point once included sidings capable of holding 2,000 wagons, locomotive sheds a water tower and a coaling stage (Bell, 2005). Figures 16 and 17 show historic photographs, taken in 1944, of the Leffnoll siding and coal bunkers in use.

Figure 16. Leffnoll Sidings looking northeast from water tower, 1944. Courtesy of Imperial War Museum © IWM H 40121.

Figure 17. Coal bunkers, Leffnoll sidings, 1944. Courtesy of Imperial War Museum © IWM H 40130.

During the August CCZAS, the point was vegetated and almost all traces of the once extensive railway development at Leffnoll are now gone. Exceptions to this are visible patches of concrete underfoot, within which iron railings can be observed (Figure 18).

Figure 18. Concrete remains with metal rails, Leffnoll Point (https://scapetrust.org/sites-at-risk/site/15820).

RAF Wig Bay flying boat base

It is thought that Loch Ryan was used by RAF flying boats from as early as 1929 (Murchie, 1992), but it was during WW2, that the RAF Wig Bay base was established for the servicing and maintaining of flying boats. In 1951, the base changed hands from the RAF to Short & Harland, the company that manufactured the Sunderland flying boats, however, the RAF maintained a presence at the base until 1957 (Smith, 1983). SCAPE, and local volunteers, conducted a rapid condition survey in March 2015, to record the surviving remains of the base and increase awareness of the WW2 history of Wig Bay. As a result of the survey, 34 features were recorded in detail. The August 2023 CCZAS focused on the heritage of the vulnerable coast, therefore, only features situated on the coastal survey routes were revisited and updated. These included two flying boat slipways at Wig Bay [SCAPE ID: 12372, SCAPE ID: 12377], a slipway at Glenside [SCAPE ID: 16238], a fuel jetty [SCAPE ID: 16173] and observation post [SCAPE ID: 21370]. Updated information was also provided on a possible flying boat wreck at Glenside (SCAPE ID: 16224). More details of the other RAF Wig Bay sites recorded during the 2015 surveys can be found on the SCAPE Sites at Risk webpage.

The two flying boat slipways, constructed from concrete with metal mesh extensions, are situated on Wig Sands (Figure 19A,B). The slipways were used to haul in flying boats for servicing and maintenance. The two mesh slipways extend much further offshore into the loch than is visible from the shore - the scale of the slipways can be appreciated on modern satellite imagery. Photographs were taken on the survey at approximately 1.5hrs off low tide.

Figure 19. Flying boat slipway (western slipway), Wig Bay. A. General view of slipway, looking southeast; B. Close up of iron mesh construction. (https://scapetrust.org/sites-at-risk/site/12372).

The more substantial concrete slipway at Glenside, c.29m wide, was also used for hauling flying boats out of the water for maintenance. Here, the surface is constructed of concrete pads laid upon a foundation of concrete filled sandbags. The slipway is still in use by the local sailing club.

The fuel jetty, situated c.380m north of the Glenside slipway, was constructed around 1940 to service RAF Wig Bay. It has a similar construction to the Glenside slipway - a foundation of cement and stone chipping filled sandbags overlain by pre-cast concrete slabs of the same material (Figure 20A,B). Remains of an iron rail was observed along both sides of the jetty.

Figure 20. A. View along concrete jetty, looking northeast across Loch Ryan; B. Side view of jetty showing foundation of cement and stone chipping filled sandbags, and pre-cast concrete slabs of the same material. Looking north (https://scapetrust.org/sites-at-risk/site/16173).

At the eastern end of Wig Bay is a solitary observation post, a rectangular structure built of red brick with a flat, reinforced concrete roof (Figure 15). Recently restored as part of the Solway Military Trail, the post is generally in good condition, with some cracking in the brick walls.

Figure 15. Observation post, Wig Bay. (https://scapetrust.org/sites-at-risk/site/12370).

4.2.2. Maritime

Craft

A known wreck site, situated just south of the slipway at Glenside, is thought to be that of a flying boat [SCAPE ID: 16224]. The wreck was not visible at the time of survey, however, it has been extensively researched and photographed at a very low tide by survey volunteer, Matt Halliday (Figure 21). The wreck is situated in relatively shallow water and on an extremely low spring tide, it has been seen on satellite imagery to be completely out of the water. The ribs of the wreck are jagged, where they have been cut down to the aircraft's waterline, presumably during scrapping *in situ*. The keel of the wreck is covered in concretions and seaweed, but there are recognisable rivet patterns, which could match those of a Short Sunderland. The other aircraft type that the wreck could be is that of a SARO Lerwick - a type of aircraft retired from service after only 3 years (21 built, 11 lost, 4 of which were lost at Wig Bay). A suggestion for identification of the wreck is the Short Sunderland T9073 [Canmore ID: 299200], as it was the only Sunderland at Wig Bay that caught fire as opposed to having "sank at moorings". This suggests that it would have been harder to have refloated the craft to be brought ashore for scrapping.

Figure 21. View of wreck at very low tide, looking northwest towards the coast. Glenside slipway can be seen in top right of photograph (https://scapetrust.org/sites-at-risk/site/16224). Photo credit: Matt Halliday.

Close to the site of the old Waulk Mill, approximately 760m to the northwest of McCulloch's Point, a 4m x 1m pile of sub angular stone has been interpreted as the remains of a ballast mound of a small boat (SCAPE ID: 16171, (Figure 22).

Figure 22. Ballast mound in intertidal zone close to the site of the Waulk Mill (https://scapetrust.org/sites-at-risk/site/16171).

4.2.3. Settlement and Agriculture – Domestic

Boat bank

The ruinous remains of two small stone buildings on either side of a stone-walled enclosure oriented parallel to the shore were recorded at Wig Sands, east of Kirkcolm. The northernmost building is the smaller of the two, where only parts of the walls survive (SCAPE ID: 15807, Figure 23). On the south side of the enclosure is the larger of the two buildings (SCAPE ID: 15808, Figure 24). It has twentieth century brick extensions and modifications which relate to its re-use in the Second World War. The complex is mapped on the first and second editions OS. The site is not currently at risk of coastal erosion.

Figure 23. Boat Bank Cot, North. Surviving northwest corner of building, looking north (https://scapetrust.org/sites-at-risk/site/15807).

Figure 24. Boat Bank Cot, South. North wall with modified brick-lined openings and brick internal wall (https://scapetrust.org/sites-at-risk/site/15808).

4.2.4. Settlement and Agriculture – Boundaries

A notable example of a large boulder which may have been a boundary stone or marker is situated c.80m offshore at McCulloch's Point (SCAPE ID: 15843, Figure 25). This feature is known as the 'Broad Stone' on the second edition Six Inch historic Ordnance Survey (1893). It is described in the OS Name Book as:

'*a large Stone of nearly circular [shape] about 5 feet high above the surface of [the] mud or sand on which it Stands. [It is] Situate within the tide mark.*'

Wigtownshire OS Name Books (1845-1849)

The second edition Ordnance Survey also depicts a boundary stone (marked B.S.) approximately 700m to the south which lies on the Stranraer Municipal Burgh Boundary. This marker was moved when the boundary line shifted, and is now not located [Canmore ID: 371383; 371384]. The Broad Stone itself is not labelled as a boundary stone on historic maps but due to its size and prominence in the landscape may have been used as a marker of sorts.

Figure 25. The 'Broad Stone' boundary(?) or marker (?) stone (https://scapetrust.org/sites-at-risk/site/15843).

4.2.5. Miscellaneous

McCulloch's Point/Broadstone House building

Situated on the coastal path at McCulloch's Point, there are the remains of a rectangular brick building, with only the south and west walls surviving (Figure 27A, B). The building is oriented N-S and dimensions are c. 12m X 6m, with surviving walls c. 2m high. The existing stone boundary/garden wall of Broadstone House forms the south wall with brick walls built against it to create the building. The building dates to sometime between 1847 and 1893, as it is depicted on the second edition but not the first edition Ordnance Survey. Interestingly, a jetty is mapped here on the first edition. Bricks within the construction are stamped with a "K" – these could be

A. Kenneth & Sons, Ayrshire, bricks (Scottish Brick History, 2023). A track leads to the building which may have been a boathouse or shed.

Figure 27. Remains of brick building at McCulloch's Point/Broadstone House; A: south gable wall, looking south; B: general view, looking at west wall, looking northwest (https://scapetrust.org/sites-at-risk/site/16170).

Mammoth findspots

Two findspots relating to recent finds of a mammoth bone [SCAPE ID: 16157] and mammoth tooth [SCAPE ID: 16159] were visited during the survey. The mammoth bone, approximately 0.6m in length, was found in 2018 by Nic Coombey, Solway Firth Partnership, when walking along the beach at McCulloch's point (Figure 28). The fragment of femur bone was found lying washed up on the sandy shore. It is 47,500 years old. In 2022, further north along the coast near

Kirkcolm, a mammoth tooth was spotted on the beach (>46,300 years old). The mammoth specimens which were discovered along the Loch Ryan coastline are rare and significant in helping to understand the past environment in this part of Scotland. Both are currently being analysed by Dr Andrew Kitchener, National Museums of Scotland to find out more about the mammoths themselves as well as the environment in which they lived.

In preparation of CCZAS findspots are usually removed from the heritage baseline as the object is no longer *in situ*, however, it is likely that the mammoth finds originate from nearby actively eroding exposures of raised beach and marine sediments rather being washed in from further afield.

Figure 28. Photograph of femur bone lying on the sandy beach where it was discovered in 2018 at McCulloch's Point. Photo credit: Nic Coombey.

5. Priority sites and recommendations

Three sites have been assigned a priority status based upon their vulnerability to coastal erosion and potential archaeological significance (Figure 29).

Two of these are the intertidal flying boat slipways in Wig Bay, which have a recommendation to monitor at 3–5-year intervals. The slipways are of reinforced concrete construction and have deteriorated since visited in 2015.

We have assigned a priority 2 status to the remains of Innermessan Camp in recognition of its significance as a now rare survival of infrastructure from the first and second World Wars in Loch Ryan. Innermessan tells the stories of the concrete shipbuilding yard in 1917, and the ship and locomotive servicing yard in the second World War related to the construction of the military port at Cairnryan and the Cairnryan Military Railway. It also contains Mulberry Harbour elements from their fabrication site at Pile Construction Yard just to the north of the port at Cairnryan. The

site is located a short walk from a holiday park and is well-visited by the public. It would benefit from on-site interpretation informed by a detailed survey of the visible elements and their condition.

Finally, the recent finds of mammoth bones from actively eroding raised marine sediments at McCulloch's Point and near the outflow of Corsewall Burn raise general awareness of the potential of further discoveries to be made along these parts of the west coast of Loch Ryan.

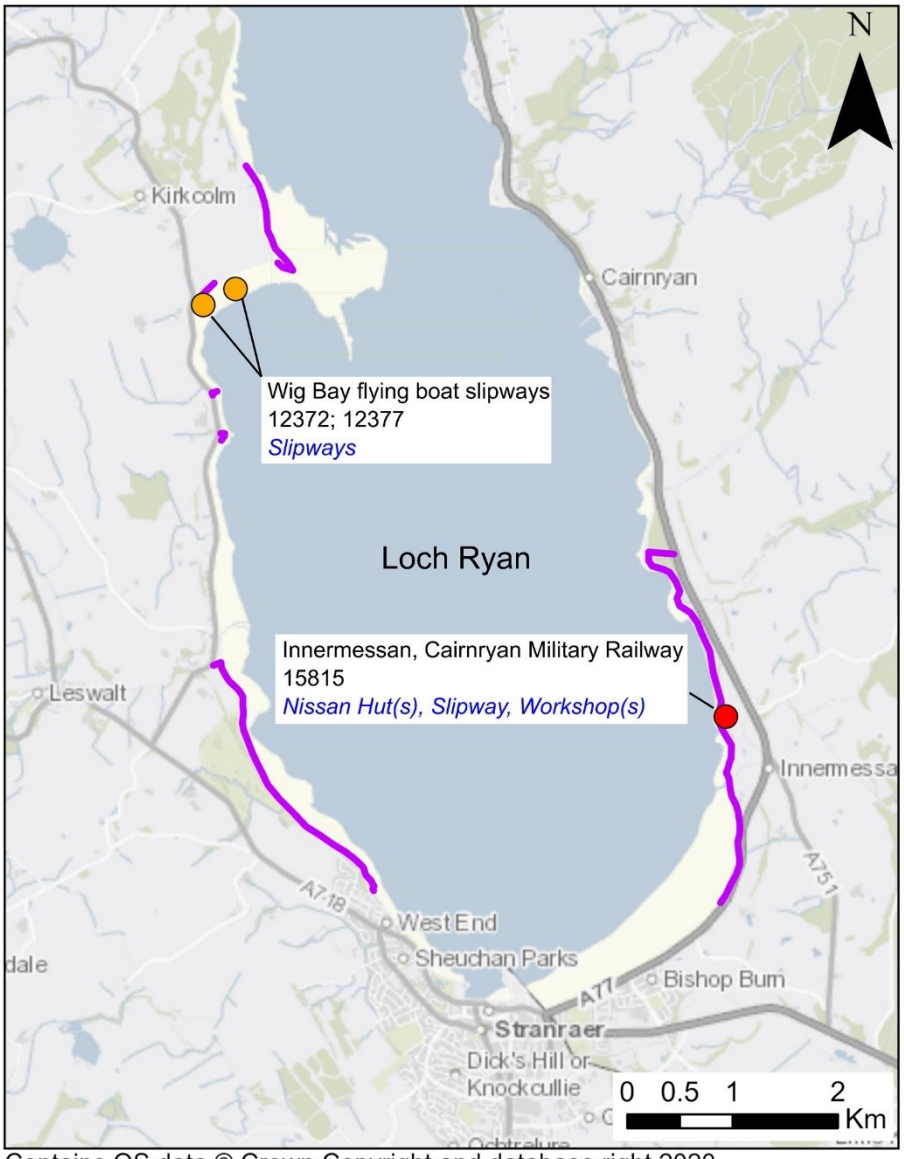

Figure 29. Three priority sites, one priority-2 site (red) and two priority-3 sites (orange).

Summary of vulnerability and recommended action for each site is given below.

Scape ID	Canmore ID	HER ID	Site Name	Site Type	Summary of vulnerability	Recommended Action
Military – WW2						
12372	91781	MDG26911	Wig Bay flying boat slipway	Slipway	Coastal erosion and deterioration	Monitor
12377	91781	MDG26908	Wig Bay flying boat slipway	Slipway	Coastal erosion and deterioration	Monitor
15815	90259	MDG10136	Innermessan, Cairnryan Military Railway	Nissen Hut(s), Slipway, Workshop(s)	Coastal erosion and deterioration	Monitor, survey, and recommendation for information panel

Table 3. Summary of priority sites.

6. Acknowledgements

Special thanks to all our volunteers who made the surveys so enjoyable and informative. We thank Nic Coombey for publicising the walks amongst local groups, joining us on the Loch Ryan surveys to share his knowledge about the area and mammoth finds. We also wish to thank Matt Halliday for providing us with his research and photographs of the Glenside wreck.

We are grateful to Peter McKeague, Historic Environment Scotland who provided heritage data for the survey area and to Andy Nicholson, Archaeology, Dumfries and Galloway Council, who provided heritage data from the local HER as well as passing on other additional valuable advice and information.

The survey was funded by Historic Environment Scotland through their Partnership Fund.

7. References

Bell, A. 2005. *Stranraer in World War Two*. Stranraer and District Local History Trust: Stranraer.

Cranston, M. *Scotland's Brick and Tile Manufacturing Industry: K.* Available online at: https://www.scottishbrickhistory.co.uk/k/ [Accessed 6 Nov 2023].

Fitton, J. M., Hansom, J. D. and Rennie, A. F. 2016. A national coastal erosion susceptibility model for Scotland. *Ocean & Coastal Management*, 132, 80-89.

Gill, B. 1999. *Cairnryan Military Railway 1941-1959*. Stranraer and District Local History Trust.

Hambly, J. 2017. *A review of heritage at risk from coastal processes in Scotland: Results from the Scotland's Coastal Heritage at Risk Project 2012-2016*. Available online at: https://scapetrust.org/wp-content/uploads/reports/A%20Review%20of%20Coastal%20Heritage%20at%20Risk%20in%20Scotland%202017.pdf [Accessed 18 Oct 2023].

Hurst, M. D., Muir, F. M. E., Rennie, A. F. and Hansom, J. D. 2021. Dynamic Coast: Future Coastal Erosion. *CRW2017_08. Scotland's Centre of Expertise for Waters* (CREW). Available online at: https://www.dynamiccoast.com/reports [Accessed 18 Oct 2023].

Murchie, A. T. 1992. *The RAF in Galloway*. G.C. Book Publishers Ltd: Wigtown.

SCAPE. 2015. A rapid condition survey of RAF Wig Bay. Available online at: https://scapetrust.org/wp-content/uploads/reports/2015-Wig-Bay-Survey-Report.pdf [Accessed 16 Nov 2023].

Smith, D. J. 1983. *Action Stations 7: Military airfields of Scotland, the North-East and Northern Ireland*. Patrick Stephens Limited: Cambridge.

Appendix 1. Known sites visited on 2023 survey

SCAPE ID	Site name	Site type	Periods	Easting	Northing	Canmore ID	HER ID
Maritime - Craft							
16224	Glenside	Flying Boat	Second World War	203617	566253	-	MDG25240
Settlement & Agriculture - Domestic							
15861	Low Innermessan	Farmstead	Post-Medieval	208357	563120	-	MDG27878
16156	Innermessan	Burgh	Medieval	208350	563200	60782	MDG941
Settlement & Agriculture - Boundaries							
15822	Deils Dyke	Earthwork	Period Unknown	207700	565100	60704	-
Defended Buildings, Castles and Forts							
15823	Innermessan Mote	Motte	Medieval	208417	563296	60771	MDG930
15832	Leffnoll Point	Fort	Period Unknown	207600	565100	60655	MDG817
Military – WW2							
12370	Wig Bay lookout post	Observation Post	Second World War	204085	568049	143427	MDG13360
12372	Wig Bay flying boat slipway	Slipway	Second World War	203339	567632	91781	MDG26911
12377	Wig Bay flying boat slipway north	Slipway	Second World War	203647	567783	91781	MDG26908
15815	Innermessan, Cairnryan Military Railway	Nissen Hut(s), Slipway, Workshop(s)	Second World War	208300	563720	90259	MDG10136
15820	Cairnryan Harbour, Cairnryan Military Railway	Railway	Modern, Second World War	207860	565000	90254	MDG10132
16173	Wig Bay	Jetty	Second World War	203472	566809	279873	-
16238	Glenside	Slipway	Second World War	203554	566406	565929	MDG21890
Miscellaneous							
15844	Stranraer, Craichmore, Stranraer Golf Course	Golf Course	Modern	203778	563197	308638	-
16157	McCulloch's Point	Findspot	Prehistoric	204811	562378	-	MDG27113

Appendix 2. New sites visited on 2023 survey

**Site has no HER reference number but details of the site were provided by the Dumfries and Galloway council archaeologist*

SCAPE ID	Site name	Site type	Periods	Easting	Northing
Maritime - Craft					
16171	Wauk Mill	Ballast Mound	Modern	204199	562830
Industry – Processes and Works					
16158*	McCulloch's Point	Waulk Mill, Fulling Mill	Post-Medieval	204096	562827
Transport, Infrastructure and Engineering					
15800	Kirkholm, Corsehall	Posts	Period Unknown	203724	568991
Settlement & Agriculture - Domestic					
15807	Boat Bank Cot, North	Building	Post-Medieval	203752	568884
15808	Boat Bank Cot, South	Building	Post-Medieval, Second World War	203757	568831
16172	Point House	House	Post-Medieval	203723	563759
Settlement & Agriculture - Boundaries					
15843	Broad Stone	Boundary Stone? Natural Feature	Nil Antiquity	204741	562493
Military – WW2					
16268	Innermessan	Concrete Structures	Second World War	208202	564161
Miscellaneous					
16159*	Kirkcolm	Findspot	Prehistoric	203862	568773
16170	McCulloch's Point, Broadstone House	Building	Modern	204859	562278