



HYNISH BOUNDARY PROJECT

November 2018 Survey Report

Abstract

This report describes the ACFA survey of the field boundaries in the Ben Hynish area of Tiree undertaken between 13th and 17th November 2018. This preliminary work was carried out to develop and test methods for collecting data to map and analyse the field systems.

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Contents

1	Executive Summary	2
2	Introduction	2
3	Site Location	2
4	Project Methodology	3
4.1	Introduction	3
4.2	Blue Line Map	4
4.3	Notebook	5
4.4	Data Collection Forms	5
4.5	Classification	10
4.6	Mapping.....	12
5	Results.....	12
5.1	Photographs.....	12
5.2	Analysis.....	17
5.3	Mapping.....	18
6	Discussion.....	19
6.1	Boundary Form	19
6.2	Photo Form	20
6.3	Issues with recording lines	20
6.4	Adding Structures to the map.....	20
7	Recommendations.....	21
8	References.....	22
9	Appendix	23

1 Executive Summary

The hillside of Ben Hynish on the island of Tiree has a network of field boundaries which appear as linear features on Ordnance Survey aerial photographs. These lines were traced on the photographs using the geographical information software QGIS. The resulting “Blue Line” map of the linear features was used in the field survey to locate and identify each line. The iPad app “Tap Forms” was used to collect data on their characteristics, such as construction material, height and width. The resulting iPad data was uploaded to QGIS and used to display these characteristics on a map of the landscape. In previous surveys ACFA has recorded all the visible structures in this area. The aim of the current work is to produce a series of “RCAHMS style” maps of these boundaries and structures at various time periods.

2 Introduction

The Hynish Boundary Project aims to record and classify the boundaries in the Hynish area of Tiree shown in Figure 1. A method for doing this is being developed and tested in several surveys. The first of these was carried out between the 27th and 29th of September 2018 (Smith & Smith, 2018) while the second survey, described in this report, took place between the 13th and 17th of November 2018. Those involved in the project are Elaine Black, Hilary Fawcett, Fred Hay, John Holliday, Ailsa Smith and Edward Smith.

3 Site Location

The survey area is on the slopes of Ben Hynish which is situated on the Island of Tiree, off the west coast of Scotland as shown in Figure 1.

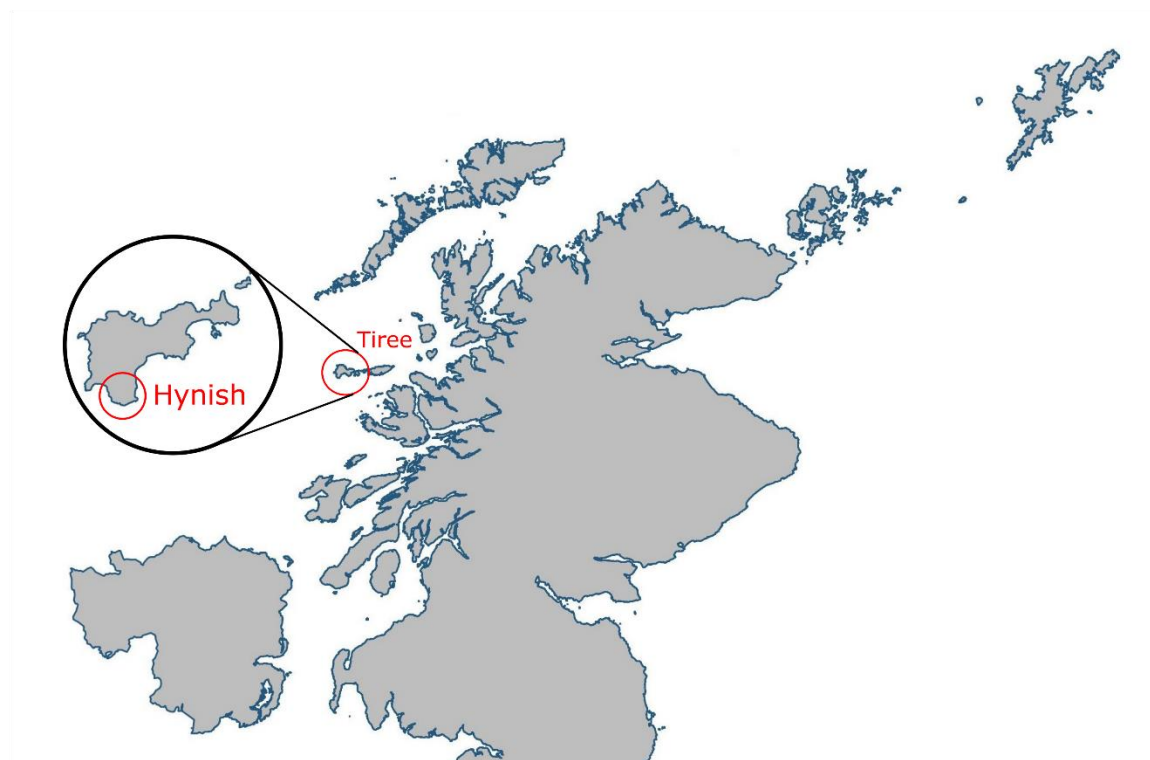


Figure 1 Hynish on Tiree

The image of part of the UK in Figure 1 was created using shapefiles from the DIVA-GIS website <http://www.diva-gis.org/gdata>

The boundaries recorded in the Project appear as ‘linear features’ on the aerial photographs published by the Ordnance Survey and have been recorded as ‘lines’ in the geographic information system program, QGIS (www.qgis.org). A map of some of these linear features is shown in Figure 2, where they are plotted as green lines. The map was drawn using the OS VectorMap District shape files for Tiree obtained from OS Opendata (2018). A dashed red line marks the boundary of the area covered by the Hynish Boundary Project, which corresponds to the area of “rough grassland” on the OS 1st edition map of 1882.

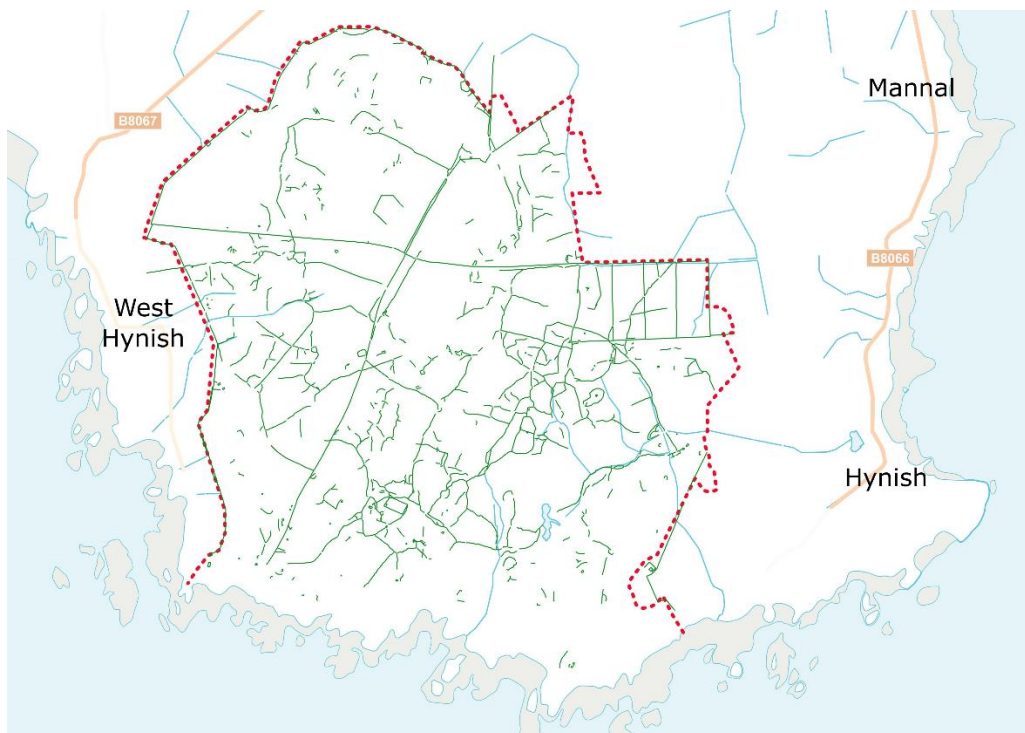


Figure 2 The area of the Hynish Boundary Project is bounded by a red dotted line. The boundaries are shown as green lines. Contains OS data @ Crown copyright and database rights 2018

4 Project Methodology

4.1 Introduction

In many ways, the survey was carried out as described in the Hynish Boundary Project September Report (Smith & Smith, 2018). The main difference was that most information was recorded on an iPad.

One of the main activities in the Hynish Boundary Project is to collect data relevant to a descriptive typology of the linear features in the Hynish landscape. To this end, the survey collected data on the height, width and material used to construct these lines. Also, details were recorded where any line overlies another. Although there was little sign of the sequencing of the lines in this survey, there is some evidence of it in areas yet to be surveyed. When this data has been collected and analysed, it is hoped that a sequential ordering of some of the lines can be developed and hence the relative ages of the banks.

Another objective for the survey is to produce a map of the boundaries, showing their position in the landscape and their relationship to any structures. Such maps are an important part of the landscape surveys undertaken by the RCAHMS such as that described in their survey of Bennachie (Royal Commission on the Ancient and Historical Monuments of Scotland, 2008). The production of such maps of the Hynish landscape is one of the objectives of the Hynish Landscape Project.

The drawing of these maps requires an accurate recording of the lines and their junctions. For example, it is important to record where lines join to form enclosures. Where possible, continuous networks of lines will be traced across the landscape. It may be that such networks of banks were built at the same time.

Another important detail to be drawn on these maps is the type of vegetation near the lines and any signs of cultivation. Areas of rig are visible in the aerial photographs in Figure 3 from which, information can be obtained, such as the distance between the rig (a little less than 3m in this case) and their direction in different areas. Such information will appear on the maps.



Figure 3 OS aerial photograph showing areas of rig bounded by field banks. The aerial photograph, taken in 2009, was downloaded from EDINA Aerial Digimap Service (2018 A).

Also, any interaction between the rig and the linear features will be recorded; particularly if any lines lie under, and so pre-date, the rig.

4.2 Blue Line Map

The network of field boundaries, which appear as linear features on Ordnance Survey aerial photographs, were traced as blue lines on the photographs using the geographical information system software QGIS. These lines were given unique numbers in the QGIS database. An A0 size image of an area of the resulting “Blue Line” map was downloaded to an iPad as a .jpg file. During the survey, the lines to be recorded were located using this “Blue Line” map, a section of which is shown in Figure 4. In the September survey, paper versions of the maps were used but in the November survey, an iPad

was used. The iPad version worked well because it is possible to zoom-in to show a particular area in detail and avoids the problems associated with handling paper documents in bad weather.

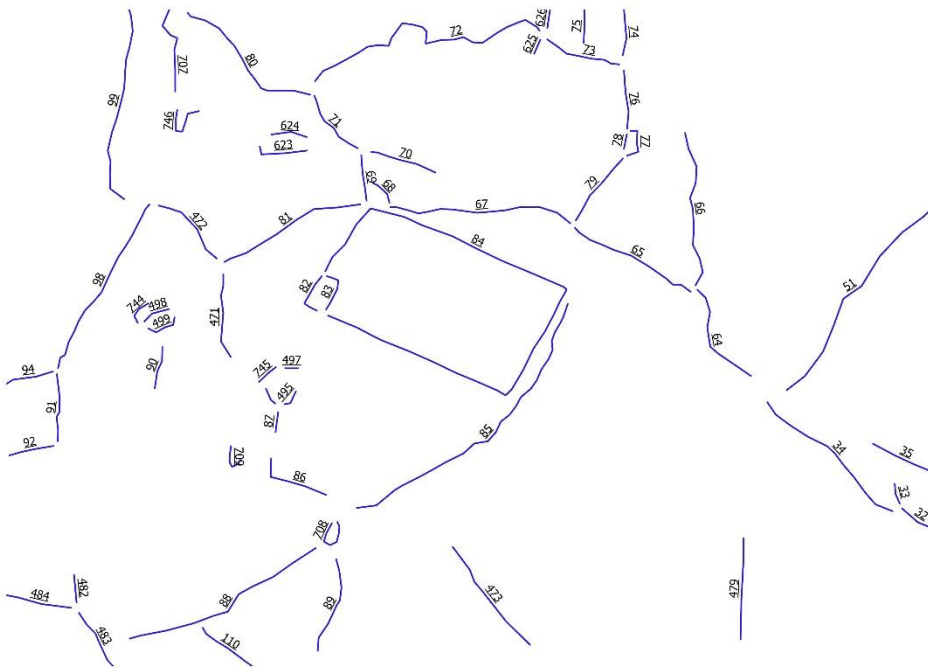


Figure 4 Blue Line map

4.3 Notebook

Notes on the layout of the lines in the landscape were recorded in a Notebook, as shown in Figure 5.

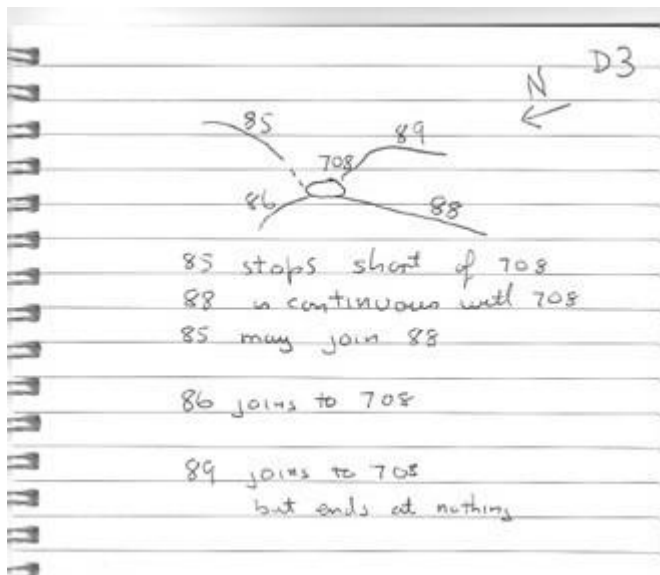


Figure 5 Notebook record D3 of junction of several lines with structure 708

It may be possible to replace the paper Notebook with an iPad to record this information. This will be trialled in the next survey.

4.4 Data Collection Forms

The principle behind the forms is to use tick boxes as much as possible to simplify data entry and standardise the terms used. In the September survey paper forms were used but in the November

survey an iPad form was used to record the lines while the photos were initially recorded on a paper form, then on an iPad. The iPad forms proved easier and quicker to complete.

There are now two forms, set up in “Tap Forms” on an iPad; a boundary form (Table 1) and a photograph form (Table 2). Table 1 and Table 2 list the fields, their “Tap Forms” type (number, date, text, check mark, note), the name of any Pick List (drop down list) used and the expected input. Screenshots of a completed iPad Boundary Form and Photographic form are shown in the Appendix.

Table 1 Boundary Form

Field	Type	Pick List	Input
Row Number	Number		Entry number, starts at 1, increments 1 automatically as new records added
Date	Date		Current date set automatically
Team Name	Text	Team Name	Select Team Name from list
Recorded By	Text	Initials	Select Initials from list
Line Number	Text		<p>Enter line number from the blue line map</p> <p>If the line changes from one line type to another along its length, 2 rows will be recorded, adding a and b to the line numbers, eg 35a and 35b. One of these will be given a new line number when it is recorded on QGIS.</p> <p>If the bank/wall is not recorded on the blue line map, type ‘New1’ if it is the first, ‘New2’ if it is the second, etc. It will be given a new line number when it is recorded on QGIS.</p>
Line Type	Text	Line Type	<p>Select the classification type of the bank/wall from the following list</p> <ul style="list-style-type: none"> • Turf and Stone • Stone and Turf • Drystone Dyke • Single Dyke • Revetment – Terrace • Stone and Turf Single Faced • Stone and Turf Double Faced • Dragons Teeth • Single Stone Wall Contiguous • Single Closely Packed Stones with Vegetation • Turf • Broad Turf Bank > 5m • Wire Fence • Shuttered Concrete • Structure • Possible Bank • Ditch • Stream

Field	Type	Pick List	Input
			<ul style="list-style-type: none"> • Path / Track • Natural
Maximum Height	Number		Enter maximum height of bank/wall in metres to one decimal place
Width	Number		Enter width of bank/wall at maximum height in metres to one decimal place
Degradation	Text	Degradation	Select the degradation level of the bank/wall from the following list <ul style="list-style-type: none"> • Poor • Medium • Good
Fragmentary	Check Mark		Tick if the bank/wall is fragmentary
Sunken	Check Mark		Tick if the bank/wall is sunken
Change In Ground Level	Check Mark		Tick if there is a change in ground level on either side of the bank/wall
Revetment	Check Mark		Tick if the bank/wall is partly or wholly a revetment
Terrace	Check Mark		Tick if the bank/wall forms a terrace
Vegetation on Line	Text	Vegetation	Select vegetation on top of the bank/wall from the following list <ul style="list-style-type: none"> • None • Turf • Turf and Heather • Heather • Other
Land Type Side 1	Text	Land Type	Select the land type on one side of the bank/wall from the following list <ul style="list-style-type: none"> • Improved grassland • Rough grass • Rough grass and heather • Heather • Rig and furrow • Lazy Beds • Cord Rig • Bog • Stream • Poached
Land Type Side 2	Text	Land Type	Select the and type on the other side of the bank/wall from the following list <ul style="list-style-type: none"> • Improved grassland • Rough grass • Rough grass and heather

Field	Type	Pick List	Input
			<ul style="list-style-type: none"> • Heather • Rig and furrow • Lazy Beds • Cord Rig • Bog • Stream • Poached
Junction Type Start	Text	Junction	<p>Select the junction type at the start of the line from the following list</p> <ul style="list-style-type: none"> • None • I • L • T • Y • X
Junction Type End	Text	Junction	<p>Select the junction type at the end of the line from the following list</p> <ul style="list-style-type: none"> • None • I • L • T • Y • X
Continues as Line Numbers	Text		List any line number(s) which are continuations of this line
Abuts Line Numbers	Text		List any line number(s) which this line abuts
Underlies Line Numbers	Text		List any line number(s) which this line underlies
Overlies Line Numbers	Text		List any line number(s) which this line overlies
Photo(s) Taken	Check Mark		Tick if any photos taken of this line
Associated Structure on Line	Check Mark		Tick if there is a structure on the line or at its ends
Nearby Structure	Check Mark		Tick if there is a nearby structure
Grid Reference of Structure	Text		Type grid reference of any nearby structure, to allow matching to ACFA reports
More than 1 Line Type	Check Mark		Tick if there is more than 1 line type along the line's length. If this is the case, there will be 2 records. One of these will be given a new line number from QGIS.
Sketch	Drawing		Can add a drawing of the junction(s) here if not annotating the blue line map or drawing in the field notebook
Local Name	Text		Type the local name for the bank/wall if known

Field	Type	Pick List	Input
Known History	Text		Type any known history of the bank/wall
Field Notebook (Entry Number)	Text		If a drawing has been made in the field notebook, type the entry number from the book here, eg D17.
Comments	Note		Type any comments needed

Table 2 Photograph Form

Field	Type	Pick List	Input
Row Number	Number		Entry number, starts at 1, increments 1 automatically as new records added
Date	Date		Current date set automatically
Team Name	Text	Team Name	Select team name from list
Photo Taken By	Text	Initials	Select initials of person taking photograph(s) from list
Image Number	Text		Type image number
Line Numbers in Image	Text		Type line number(s) shown in image
Photo Description	Text	Photo Desc	Select photo description from the following list <ul style="list-style-type: none"> • Line • Junction • Side View • Cross Section • Team at Work • Other
Direction Facing	Text	Direction	Select direction facing from the following list <ul style="list-style-type: none"> • N • S • E • W • NE • SE • NW • SW
Weather	Text	Weather	Select weather from the following list <ul style="list-style-type: none"> • Sunny • Cloudy • Raining • Snowing • Misty
Further Description	Note		Type description if 'Other' is selected in Photo Description above

4.5 Classification

The following classification of Line Types (**Table 3**) is used to classify the lines drawn from the aerial photos. It is not possible in the office to judge in all cases whether a line on the photo is natural or man-made. Even in the field, there can be doubt, which is why there is a 'Possible Bank' option.

The number of turf and stone types has expanded after the September and November surveys from the initial 'Dyke', 'Turf Bank', 'Turf/Stone Bank', 'Line of Stones' to those in the table below. It is hoped that adding sub-classifications can help with determining chronology and the purpose of the boundaries. Some, of course, are likely to be different stages in the weathering and robbing of boundaries. The height and width of the boundaries are also being recorded. Initially it was planned to record the typical height and width. This has now been revised to be the maximum height and width at the maximum height. Profiles of selected boundaries will be drawn. It will be possible to estimate the original height and width from slumped banks as opposed to robbed banks.

It might look odd to have both a 'Turf and Stone' as well as a 'Stone and Turf' option. This was added in the September survey as there appeared to be two distinctive stone/turf types of bank and it was thought this might help with a chronology.

When it came to rows of large stones, sometimes called 'Dragon's Teeth' and thought to be either just markers or the remains of stone walls since robbed, these were split into three in the November survey. Where there is a gap between the stones, they are classified as 'Dragons Teeth'. Where they are mostly touching each other, they are classified as 'Single Stone Wall Contiguous'. Where they are closely packed but it looks as if vegetation has grown up over them rather than being the remains of a turf and stone wall, they are classified as 'Single Closely Packed Stones with Vegetation'.

The current classification includes 5 of the 8 types in Branigan (2005).

Table 3 Line Types

Line Type	Description
Turf and Stone	Bank of turf and stone, with more turf visible than stone
Stone and Turf	Bank of turf and stone, with more stone visible than turf
Drystone Dyke	Improvement dyke, double skinned, capstone
Single Dyke	One stone thick, at least 2 courses of stone
Revetment – Terrace	Stone and turf revetment forming terrace / platform
Stone and Turf Single Faced	Stone revetted turf wall on one side, rounded bank on other side
Stone and Turf Double Faced	Stone revetted turf wall on both sides
Dragons Teeth	Row of large stones with gaps between stones, no evidence of turf
Single Stone Wall Contiguous	Row of large stones touching each other, no evidence of turf
Single Closely Packed Stones with Vegetation	Row of closely packed stones with vegetation starting to cover them
Turf	Bank of turf
Broad Turf Bank > 5m	Bank of turf, at least 5m wide

Wire Fence	Modern day fence or row of iron fence supports
Shuttered Concrete Structure	Wall made of shuttered concrete
Possible Bank	Line on aerial photo is part of a structure drawn by ACFA
Ditch	Slight remains may be relic of bank or natural
Stream	Line on aerial photo is a ditch
Path / Track	Line on aerial photo is a stream
Natural	Line on aerial photo is a path or track
	Line on aerial photo caused by geology, vegetation, rockfall

Some of these boundaries on the aerial photo appear on Turnbull's map and the Ordnance Survey first edition maps. This also helps with the chronology as the mapped boundaries would be the ones in use at the time of the surveys.

It is only occasionally obvious what lines form an enclosure on the aerial photos. The decision was taken when drawing the lines on the aerial photos to stop where the line meets another line at an angle. This is termed a 'junction' and as well as walking along each line, the junction type (**Table 4**) and the line relationship (**Table 5**) are also recorded, to allow the QGIS map to be updated. In QGIS language 'polygons' can be drawn over the lines marking out enclosures, pens or fields. Areas can then be automatically calculated. The 'Line Relationship' (**Table 5**) will be used both to inform the map and to establish the relative chronology of the intersecting lines where possible.

Table 4 Junction Types

Junction Type	Description
None	Line stops, possibly at natural feature
I	2 lines meet in a straight line, without a gap
L	2 lines meet at roughly a right angle
T	3 lines meet at roughly right angles
Y	3 lines meet at acute and obtuse angles
X	4 lines meet

Table 5 Line Relationship

Line Relationship	Description
Underlies Line numbers	Line number(s) which this line underlies
Overlies Line Numbers	Line number(s) which this line overlies
Continues as Line Numbers	Line number(s) which are continuations of this line
Abuts Line Numbers	Line number(s) which this line abuts

The Degradation in **Table 6** is recorded to help determine the chronology in conjunction with the surviving height and width.

Table 6 Degradation

Degradation	Description
Poor	Sinking into bog, robbed, degraded
Medium	Vegetation cover in parts, reasonable height, length and continuity
Good	Surviving to original height, length and continuity in most parts

The land type (**Table 7**) on each side of the bank/wall is recorded to help establish both the chronology and purpose of the boundaries. Areas of rig and lazy beds will be added to the maps on QGIS.

Table 7 Land Type

Land Type	Description
Improved grassland	Patches of green grass
Rough grass	Rough grass
Rough grass and heather	Mixture of rough grass and heather
Heather	Mostly heather
Rig and Furrow	Historic plough cultivation, either broad rig over 4.5m wide (Medieval) or narrow rig under 4.5m wide (Improvement)
Lazy beds	Method of spade cultivation consisting of banks that are up to 2.5m in width, with narrow drainage channels between them
Cord Rig	Prehistoric cultivation consisting of parallel ridges of earth around 1 m wide and 0.15 m high
Bog	Boggy ground
Stream	Stream
Poached	Land broken up into wet muddy patches by trampling

4.6 Mapping

The position and numbering of the lines are stored in a sqlite database to be plotted as maps in QGIS.

The data relating to line type, recorded on the iPad Boundary Forms, was extracted as a .csv file and merged with this database so that the linear features, differentiated by type, could be plotted in the landscape, as shown in Figure 15.

The survey data on lines and junctions can be used to identify the networks of lines and enclosures which form the base layer of a “RCAHMS style” map.

5 Results

5.1 Photographs

Photographs of some of the linear features, which were recorded in the surveys, are shown below.

- Drystone Dyke, shown in Figure 6
- Dragons Teeth, shown in Figure 7
- Stone and turf wall single faced, shown in Figure 8

- Stone and Turf, shown in Figure 9
- Turf and Stone, shown in Figure 10
- Revetment – terrace, shown in Figure 11
- Single closely packed stones with vegetation, shown in Figure 12
- Single Stone Wall Contiguous, shown in Figure 13



Figure 6 Drystone Dyke



Figure 7 Dragons Teeth



Figure 8 Stone and Turf, single faced wall



Figure 9 Stone and Turf



Figure 10 Turf and Stone



Figure 11 Revetment



Figure 12 Closely Packed Stones with Vegetation



Figure 13 Single Stone Wall Contiguous

5.2 Analysis

During the two surveys a total of 105 lines were recorded, 46 on 3 days in September and 59 in 5 days in November. This represents 12% of the total number drawn in QGIS on the aerial photos as at the time of the November survey. 24 was the most recorded in one day. Going forward, 20 seems a reasonable number for a team to record in one day.

Figure 14 below lists the number of QGIS lines walked over in the field by line type, together with the minimum and maximum typical height and width where recorded. 'Turf and Stone' walls comprise 33% of the lines surveyed with 'Stone and Turf' in second place with 26%. 10% of the lines seen on the aerial photos are in fact natural. 'Dragons Teeth' and 'Structures' are next with 7% each. The remaining 17% is comprised of 9 categories, some with only 1 example in the areas walked so far.

Looking at the minimum and maximum heights and widths, it can be seen that there is a wide range for the 'Turf and Stone' and 'Stone and Turf', indicating various levels of survival. Somewhat surprisingly the Stone and Turf Single Faced Bank has been recorded as 0.7m high and 2m wide, despite its good survival for a portion of its length. It was examples like this that prompted the decision to record the maximum instead of typical height in the future.

Line Type	No. QGIS Lines	Min of Typical Height	Max of Typical Height	Min of Typical Width	Max of Typical Width	% of Total
Turf and Stone	35	0.3	1.5	0.7	3	33%
Stone and Turf	27	0.4	1.5	0.8	2.3	26%
Natural	11					10%
Dragons Teeth	7	0.4	0.9	0.4	0.7	7%
Structure	7	0.3	0.3	0.4	0.4	7%
Stream	4					4%
Drystone Dyke	3	1.2	1.2	0.6	0.6	3%
Wire Fence	3					3%
Revetment - terrace	2	0.5	0.5	0	0	2%
Single Stone Wall Contiguous	2	0.7	0.8	0.4	0.6	2%
Possible Bank	1					1%
Single closely packed stones with vegetation	1	0.6	0.6	0.6	0.6	1%
Single Dyke	1	0.9	0.9	0.9	0.9	1%
Stone and Turf Single Faced	1	0.7	0.7	2	2	1%
Total	105	0.3	1.5	0	3	100%

Figure 14 Analysis of Line Types

It is hoped that a more quantitative analysis can be undertaken of the data collected during these surveys. For example, it seems possible that wall type is correlated to ground type, such that walls in boggy areas contain more turf than walls on steep, more exposed, slopes. Also, the distance between lines and structures may depend on the nature of the structure. The small rectangular structures seem mainly to be built in the line of walls while the larger, rounder structures tend to stand alone. It may be possible to quantify these observations and determine to what extent they are true.

5.3 Mapping

Information extracted from the iPad Boundary Forms as a .csv file was merged with QGIS so that the linear features, differentiated by type, could be plotted in the landscape, as shown in Figure 15.

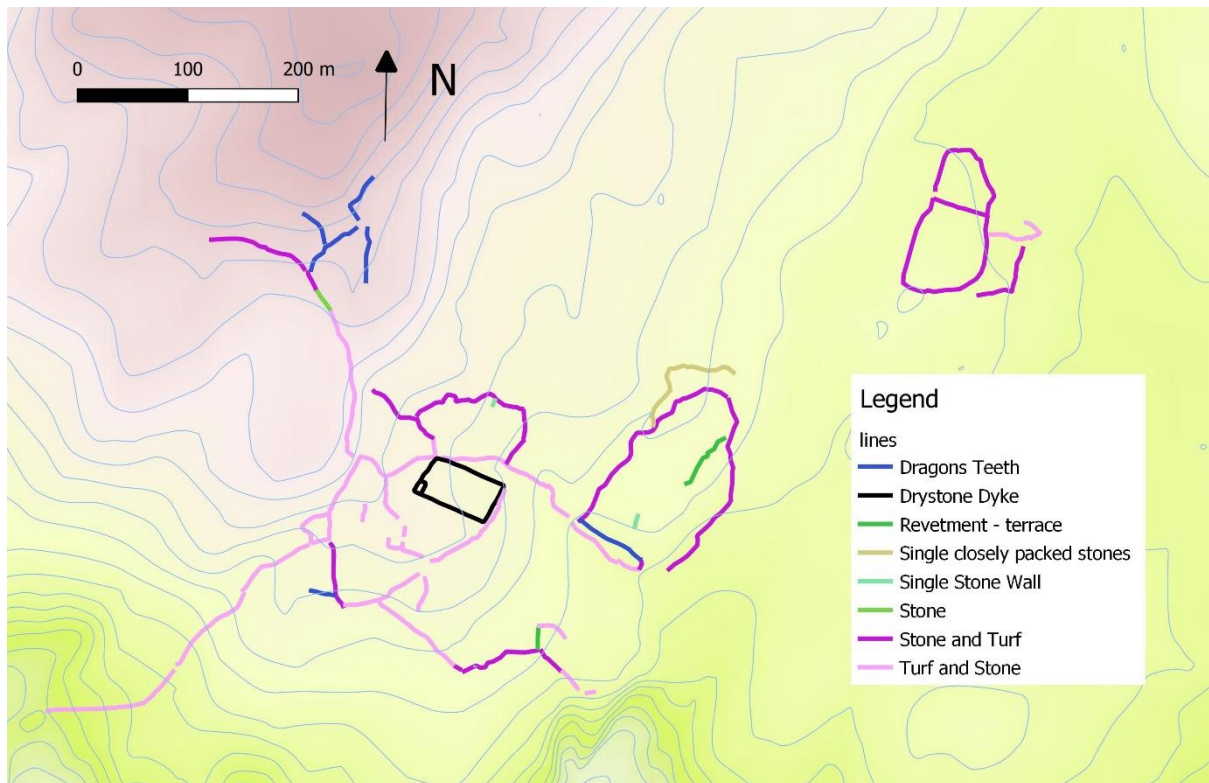


Figure 15 Plot of Linear Features recorded during the Survey. The height data was downloaded from EDINA Aerial Digimap Service (2018 B)

The contour lines and shading in this figure, was plotted using data from OS Terrain 5 (2018). Most of the sites are in relatively level areas. There was only one line in the area which drops sharply down to the sea in the southern part of the site. Also, there are few lines in the higher area in the north western part of the site where the ground is relatively steep. The enclosures which form “bean shapes” seem to lie in the more level areas.

6 Discussion

6.1 Boundary Form

For the September 2018 survey, the decision was taken to use spreadsheet type forms on waterproof paper. These were pre-printed with the QGIS line number, length, grid reference start and grid reference end of each line. There were 52 forms altogether going from line 1 to line 773, the final number at that time.

During the September survey, various shortcomings with this approach became evident. With the wind blowing, it was tricky to extract the correct sheet from the 52 to record the next line, especially where the next line number was several hundred different from the previous one. There was not enough space in some of the boxes. There was other information that needed to be recorded.

It was decided to design a new one-page form to record one line at a time. It would include tick boxes wherever possible to both cut down the time taken to complete the form and to ensure everyone used the same terms. The major addition was a box with the line relationship to other lines and a box with the junction type. Also added were some tick fields for additional characteristics of the banks / walls. Definitions of the allowable choices were included at the bottom of the form.

At the same time an online search was made to see what forms software was available for iPads as some members of our team had experience in using tablets on excavations instead of paper context forms. “Tap Forms” was recommended by several archaeologist users online. It was easy to duplicate the paper form in Tap Forms using “Pick Lists” for the boxes such as Line Type and Degradation.

The November survey used the iPad form on day one. It proved so easy to use that the paper forms were not used at all. The advantages of using the iPad form are

- No need to type the forms into Excel after the survey
- Quicker to fill in the form
- Form filling not affected by the wind, as paper forms are
- Form filling not affected by the rain if a waterproof cover is used
- Easy to make minor amendments to form during the survey

6.2 Photo Form

The same photo form was used for the September and November surveys, printed on waterproof paper. During the start of the November survey, it was noticed that filling in a paper form for the photo and an electronic form for the main survey form was awkward. A photo section was therefore added to the Boundary Form, ready for the second day, and used for the rest of the survey. However, this only allowed space for one photo to be taken per line and although most lines only need one photo, some need several if they are of particular interest. A separate Photo Form has now been set up on an iPad.

6.3 Issues with recording lines

Some lines change their type along their length; for example, Line 101 was Stone and Turf at one end and Stone at the other. Because of this it was decided to split the line at the approximate point where the change occurred. This location was noted in the Notebook and in QGIS the line was split into two. It is not thought that a GPS reading of the location would help because a good estimate of the position can be made using the Blue Line map with the aerial photograph.

On line 51 it was noted that the bank was much higher at one end than the other. It was decided that the height of a bank should be recorded at its maximum height since it was thought that this would be closer to its original height. Also, the width should be recorded at the place where the height is a maximum. It was thought that this section of the bank showed a good example of this type of line (Stone and Turf single faced wall Figure 3) and that a visual record should be made of the line at this point; possibly using photogrammetry. This should, if possible, be done for the other line types.

6.4 Adding Structures to the map

An important element of the landscape maps produced by the RCAHMS is the location of the buildings and other structures. ACFA has recorded these structures for Hynish and it is possible to merge these data with maps of the linear features drawn on the OS aerial photograph in Figure 16.

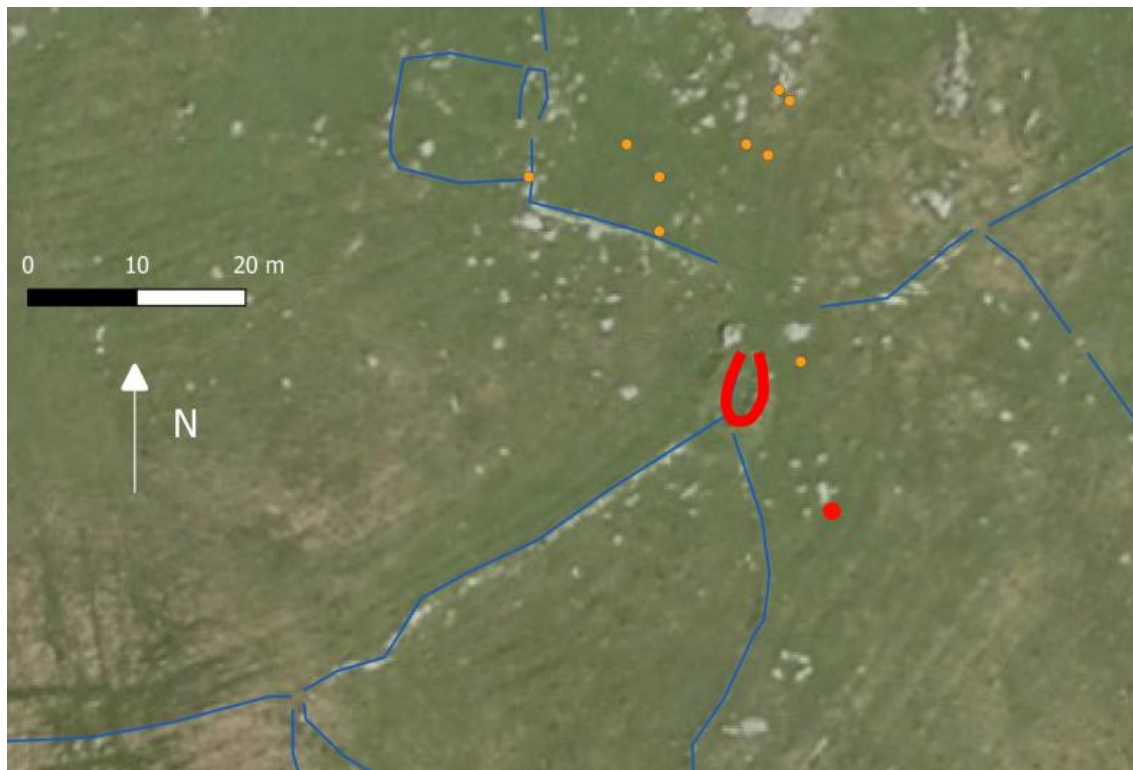


Figure 16 Dots indicate the GPS location of Structures. The red dot is the GPS location of the “house” Structure marked with a red line. The aerial photograph, taken in 2009, was downloaded from EDINA Aerial Digimap Service (2018 A).

One problem with Figure 16 is that the location of the Structures was recorded using a hand-held GPS device which has an error of about 10m. Because of this, it is difficult to link the dots to the correct Structure on the aerial photograph. For example, the location of the “house” structure shown as a red line on the aerial photograph in Figure 16, was recorded at the position shown by the red dot. The ACFA Structure survey has produced the clusters of orange dots shown in Figure 16 and it is difficult to link them with the structures visible on the aerial photographs. It may be possible to resolve this problem by using drone aerial photographs with the survey drawings. Alternatively, it may be necessary to use a sub-metre GPS device (BAJR, 2017) to locate the structures more accurately.

7 Recommendations

- Use an iPad to record data on each line.
- Use an iPad to show the Blue Line map for navigation.
- Compare use of iPad with use of Notebook to record junctions.
- Photograph each line.
- Take a detailed photographic record of each line type.
- Use drone photography to complete the Blue Line record.
- Use drone photography to relate the structures to the lines.
- Use drone photography to record any gaps / gates.
- Investigate areas where one line overlies another.
- Investigate areas where lines lie under an area of rig.
- Visit Barra where Brannigan (2005) has classified the principal types of land boundaries.
- Produce elevations and profiles of each line type.
- Consider other types of study, such as environmental analyses.

8 References

BAJR, 2017 The Geode – affordable sub metre GPS system

<http://www.bajrfed.co.uk/bajrpress/the-geode-affordable-sub-metre-gps-system/>

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9 Appendix

17:46 Tue 22 Jan
100%

Records
3 of 3
+ ☆ ≡

Row Number	3	
Date	17/01/2019	
Team Name	Pink	✓ ≡
Recorded By	AS	✓ ≡
Line Number	27	
Line Type	Stone and Turf	✓ ≡
Maximum Height	1.2	
Width	2.2	
Degradation	Medium	✓ ≡
Fragmentary	<input type="radio"/>	
Sunken	<input type="radio"/>	
Change In Ground Level	<input checked="" type="radio"/>	
Revetment	<input type="radio"/>	
Terrace	<input type="radio"/>	
Vegetation on Line	Turf	✓ ≡
Land Type Side 1	Rough grass and heather	✓ ≡
Land Type Side 2	Improved grassland	✓ ≡
Junction Type Start	Y	✓ ≡
Junction Type End	Y	✓ ≡
Continues as	51.55 00.00	

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Figure 17 Hynish Boundary Form 1

17:47 Tue 22 Jan
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Records
3 of 3
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Vegetation on Line	Turf	✓ ≡
Land Type Side 1	Rough grass and heather	✓ ≡
Land Type Side 2	Improved grassland	✓ ≡
Junction Type Start	Y	✓ ≡
Junction Type End	Y	✓ ≡
Continues as Line Numbers	51,55; 28,26	
Abuts Line Numbers		
Underlies Line Numbers		
Overlies Line Numbers		
Photo(s) taken	<input checked="" type="checkbox"/>	
Associated Structure on Line	<input type="checkbox"/>	
Nearby Structure	<input checked="" type="checkbox"/>	
Grid Reference of Structure		
More than 1 Line Type	<input type="checkbox"/>	
Local Name		
Known History		
Field Notebook (Entry Number)		
Comments	Substantial wall, like 55	

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Figure 18 Hynish Boundary Form 2

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Records
2 of 2
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Row Number	2	
Date	17/01/2019	
Team Name	Pink	✓ ≡
Photo Taken By	EAS	✓ ≡
Image Number	140299	
Line Numbers in Image	108	
Photo Description	Line	✓ ≡
Direction Facing	S	✓ ≡
Weather	Cloudy	✓ ≡
Further Description		

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Figure 19 Hynish Photographic Form