



Archaeology C14 Radiocarbon Dates Scheme Report

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| Name of Grantee: | Michael Lynch |
| Title of Project: | Excavation at Doolin Storm Beach, Ballaghline, Co. Clare |

Summary of report:

Report to the Royal Irish Academy on the results of three Radiocarbon Dates (2020) from the excavation at Doolin storm beach, Ballaghline, Co. Clare (15E0145).

The excavation in Ballaghline Townland in Co. Clare on a south/south-west facing storm beach between Doolin Pier and the mouth of the Aille River at Tráleathan has been ongoing since 2015. The site is located at high tide level along a stretch of limestone coastline consisting of storm beach stones/boulders and sand dunes with a natural clay layer beneath.

The winter storm of 2013/2014 had a dramatic effect on this coastline. Between ten and twenty metres of the sand dunes were completely washed away and, whilst much of the underlying clay layer had also been removed, large patches were still visible along the storm beach at high tide level. It was clear from inspection that the exposed clay layer was rapidly eroding. Assessment showed large quantities of shale flakes and some axe roughouts and hammerstones eroding from certain areas of the clay. This is a volatile storm beach even during normal weather conditions with the stones and boulders being constantly moved about. A monitoring and survey programme for approximately 250m of the storm beach was initiated and areas within the clay were identified with a high density of shale lithics along with occasional small pieces of charcoal and bone. A licence (15E0145) was granted to excavate the clay layer and excavation has continued since 2015 and will extend into 2021.

The shale material recovered is similar to that found by Matilda Knowles and the Limerick Field Club in 1899. This material which is now housed in the National Museum of Ireland and the Limerick Museum led to the designation of the Doolin 'Stone Axe Factory' and the site has subsequently been regarded in the Irish Archaeological literature as an important source of Neolithic and Bronze Age shale axes. The current excavation has shown that the manufacture of shale axe roughouts definitely took place here along with the production of other shale tools and RC dates have shown that this activity took place during the Mesolithic period. A single RC date provided by the RIA in 2016 (see report 1/12/2016) gave a Later Mesolithic date for Context 7 in Trench 1. Two further RC dates provided by the RIA in 2017 (see report 28/11/2017) gave a Later Mesolithic date for Context 6 in Trench 1 and an Early Mesolithic date for Context 13 in Trench 4. Subsequent dates provided by the writer confirmed the Mesolithic activity across the site.

In 2020 the RIA provided three further RC dates with the following results:

Sample 1: Charcoal: 15E0145:24:907; Pomoideae.

The RC date and calibration are as follows:

UBA-43219: Radiocarbon Age 6061 +/-57.

Calibrated: 68.3 (1 Sigma) Cal BC 5040 – 4897 (0.912)

Cal BC 4867 – 4850 (0.088)

95.4 (2 Sigma) Cal BC 5207 – 5162 (0.069)

Cal BC 5121 – 5095 (0.022)

Cal BC 5079 – 4827 (0.887)

Cal BC 4821 – 4797 (0.022)



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This sample was found in Context 24 (Trench 5E) with a group of three axe roughouts, a broken flaked shale piece and at least six thinning flakes. This was an area of intense knapping of axe roughouts. Trench 5E was the most easterly trench excavated within the survey area and closest to the mouth of the River Aille. This date with a median probability of 4,966 Cal BC relates well to four previously dated samples with medians between 4,850-5,000 Cal BC. All of these samples were recovered from trenches within 50m of the eastern end of the survey area. This date is important in validating the chronology and longevity of activity on this part of the site.

Sample 2: Charcoal: I5E0145:25:842; Hazel.

The RC date and calibration are as follows:

UBA-43220: Radiocarbon Age 7771 +/-43.

Calibrated: 68.3 (1 Sigma) Cal BC 6646 – 6569 (0.835)

Cal BC 6547 – 6530 (0.121)

Cal BC 6522 – 6516 (0.043)

95.4 (2 Sigma) Cal BC 6683 – 6671 (0.025)

Cal BC 6654 – 6479 (0.975)

This sample was found in Context 25 (Trench 5CE) with a group of thinning flakes from axe roughouts. Trench 5CE was approximately 8m north-west of Trench 5E and therefore also at the eastern end of the survey area. This early date with a median probability of 6,595 Cal BC is close to the transition from the Early to the later Mesolithic periods. It helps to corroborate the early Mesolithic date from the sample from Context 13 in Trench 4E which had a median probability of 7,209 Cal BC (RIA 2017). These two dates along with another early date from Trench 4B north (6,972 Cal BC median probability) indicate that the axe manufacturing at the site occurred over a protracted period of time. The three dates come from Trenches within 15m of each other at the eastern end of the survey area. Sample 2 was also closely associated with a soil sample selected for micromorphological thin section analysis, so should provide a chronological reference for the results of that analysis when they become available.

Sample 3: Charred Nut: I5E0145:26:871; Hazelnut.

The RC date and calibration are as follows:

UBA-43221: Radiocarbon Age 5988 +/-42.

Calibrated: 68.3 (1 Sigma) Cal BC 4936 – 4833 (0.903)

Cal BC 4813 – 4801 (0.097)

95.4 (2 Sigma) Cal BC 4995 – 4783 (0.987)

Cal BC 4745 – 4733 (0.013)

Sample 3 was found in Context 26 in Trench 5C with a dense concentration of mainly thinning flakes and axe roughout fragments. Trench 5C was approximately 20m to the northwest of Trench 5E (see sample 1 above). This date with a median probability of 4,877 Cal BC is the sixth date from the site to fall within the 4,850 to 5,000 Cal BC median probability range and gives clarity to the chronology of the Mesolithic activity across the site. These three dates are a valuable addition to the building of a chronology across the site, an essential element of the project. When the post-ex analysis of the lithics is completed and any changes in manufacturing techniques identified, it is anticipated that the RC dates will show how these changes occurred over time within the Mesolithic period.



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Please outline the objectives of the Project:

To recover the eroding archaeological material from the site before it is lost to storms weather etc.
To date the activity on the site mainly the manufacture of axe roughouts and other shale tools.
To provide a dated context for the Knowles collection of material in the NMI and Limerick Museum from this site.
To provide information on the techniques used in the manufacture of shale axes and other tools over time in prehistory, particularly in the Mesolithic period.

Please describe the methodology used in conducting the research:

Continual monitoring and collection of surface finds under licence from designated survey area on the storm beach.
Identify areas where archaeological material is being eroded from the clay layer'
Excavation under licence of the vulnerable archaeological material.
RC dating of the archaeological contexts.
Post-ex analysis of the lithics, organic material and soil samples.
Report and publication of results.

Please outline the findings of your research and/or milestones achieved:

Establishing areas of definite shale axe and other tool manufacture.
RC dates have established that this activity took place in the Mesolithic period whereas it was previously assumed to be Neolithic or Bronze Age.
A dated context for the Knowles material in the NMI and Limerick Museum has been established.
Established that Ballaghaline Doolin is a viable source for the shale axes and roughouts found at Fanore More sites 1 and 2 (the first known Mesolithic sites in Co. Clare) and further afield.
RC dates indicate that the activity on the site extends from the Early Mesolithic to the end of the Later Mesolithic period.

Please provide details of the dissemination of the outcomes from this project:

The excavation of the site is of great local interest but it is also important nationally.
Local volunteers from the Burrenbeo Trust took part in the monitoring, excavation and post-ex work.
This heightens the profile of the project among the north Clare communities.
The project can be considered to fall into the category of 'community archaeological projects'.
The dating of the site will be an essential part of the final Information on the site has already been disseminated to the local and wider communities through presentation under the Field Monument Advisor Programme.
Articles have already been published in publications such as Archaeology Ireland.
A presentation was given during heritage week on Fanore and Doolin in collaboration with Burrenbeo Trust and is currently available on their website platform or at <https://www.youtube.com/watch?v=irfDDCeueNo>



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How will you continue to communicate the results of your project and what are your publication plans?

As this is an ongoing project, information on the results will continue to be disseminated through presentations, publications and the Burrenbeo website. When the final report is concluded the results will be published and an academic paper will be submitted to an appropriate publication.

How did the award enhance your professional development?

The RIA's provision of RC dates, which is an important objective of the project, adds greatly to the results and interpretation of the site and therefore will enhance the stature of the final report among the wider archaeological community.

What plans (if any) do you have to further this project?

The project is ongoing and while erosion of the archaeological material continues more information will be collected and interpreted with analysis of the lithics and further RC dates being essential elements of the project.