4. RADIOCARBON DATING

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4.1 Introduction

A total of 15 sub-samples (Table 1) were submitted for radiocarbon dating from the archaeological excavations of Areas C, D, E, G, and H at Grantown Road, Forres, Moray. The samples comprised macrofossil inclusions of predominantly charcoal and hazelnut shell, including two samples of cereal caryopses. The material derives from: the fill, Context (1159), of a posthole of a roundhouse and fills of nearby pits in Area C; fills of a potentially late prehistoric palisade enclosure ditch ([1003A] and [1003B]) and postholes of an associated internal roundhouse feature in Area G; fills from a cluster of pits and postholes in Area E: fills of large likely medieval pits in Area E and fills of single large pits in Areas D and H. The radiocarbon results were incorporated into a Bayesian model to provide an informed dated sequence and estimates for the duration of activity on-site. It was anticipated that the radiocarbon dates from the present works could be compared to the dates of occupation from the multi-period site excavated at Grantown Road by Cook (2016). The radiocarbon results are conventional radiocarbon ages (Stuiver & Polach 1977). They have been calibrated using the internationally agreed terrestrial (IntCal20) calibration curve of Reimer et al (2020) and the OxCal v4.4 computer program (Bronk Ramsey 2009).

4.2 Methodology

The radiocarbon dates were analysed using a Bayesian approach, a form of Markov Chain Monte Carlo sampling, applied using the online program OxCal v4.4. Details of the algorithms employed by this program are available in Bronk Ramsey (1995; 1998; 2001; 2009). The model has been created with multiple sequences and phases reflecting the different archaeological time periods. The goal of this analysis is to provide a realistic estimate of the dates which define the phases of activity on-site.

4.3 Results

The dating model (Illus 17) represents multiple phases of activity at Grantown Road, spanning from the Early Neolithic to the medieval period. The model has excellent agreement (Amodel=110.2) between the radiocarbon dates and no outlying dates were identified within the model. The model is divided into each archaeological period and a date range is estimated for activity where three or more dates were produced (the Early Neolithic and Late Prehistoric periods). In the division of periods, the 'Early Neolithic' includes one date from hazelnut shell (SUERC-94898) from a fill of Pit [1129], which is actually of Early to Middle Neolithic date – an earlier, more clearly Early Neolithic date was recovered from a sample of hazelnut shell (SUERC-94898) from Pit [1134] in the same pit cluster in Area C. A date from a sample of pine charcoal (SUERC-94889) from Pit [1045] is for simplicity defined as Late Neolithic, but its date ranges from the Late Neolithic to the Chalcolithic. In addition, a date from a hulled barley cereal caryopsis (SUERC-94904) from a fill of Pit [1110] in Area D is described as early medieval here but corresponds with features described as 'Early Historic' by Cook (2016: 5).

The Early Neolithic phase included the largest concentration of dates (n=6), leading to a model of this phase providing an estimate for this period to commence between 3820 cal BC and 3640 cal BC with 95% probability, and to cease between 3515 cal BC and 3280 cal BC with 95% probability. The duration of activity was between 150 and 475 years with 95% probability. Activity in this phase was identified in both Areas C and E, and included a date from hazelnut shell (SUERC-94900) from a fill of Posthole [1158] of a roundhouse feature identified in Area C.

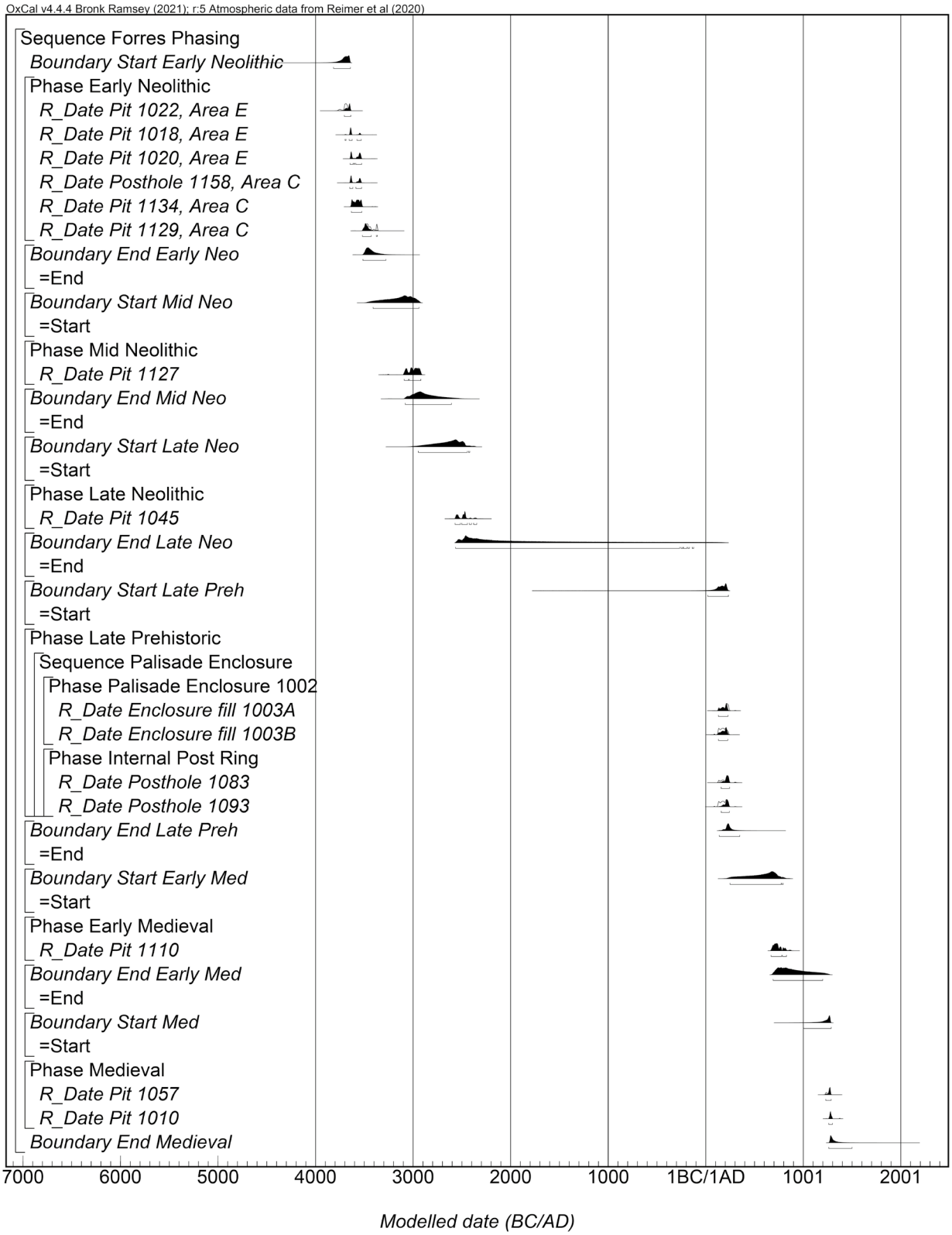
A single hazelnut shell sample (SUERC-94886) appears to provide a clearly Middle to Late Neolithic date, from Pit [1127] to the east of the Early Neolithic roundhouse in Area C. The sample from Pit [1127] gave a range between 3090 and 2920 cal BC at 95% probability. During excavation it was postulated that ceramics from this feature comprised Late Neolithic Grooved Ware, though the pottery analysis by MacSween does not confirm this. A single Late Neolithic to Chalcolithic date came from a pine charcoal sample (SUERC-94889) from Pit [1045] in Area H. This had a range of between 2570 and 2350 cal BC at 95% probability. Four dates were related to Later Prehistoric (Iron Age)

Table 1 Radiocarbon dates

Lab Code	Context No.	Feature No.	Description	Uncal (BP)	Calibrated 1-sigma (68.2%)	Calibrated 2-sigma (95.4%)
SUERC-94886	(1128)	Fill of Pit [1127], Area C	Nut Shell: Hazel	4394±23	3082–3068 cal BC; 3027–3006 cal BC; 2989–2931 cal BC	3091–2922 cal BC
SUERC-94898	(1130)	Fill of Pit [1129], Area C	Nut Shell: Hazel	4639±25	3498–3453 cal BC; 3378–3367 cal BC	3513–3424 cal BC; 3384–3360 cal BC
SUERC-94899	(1135)	Fill of Pit [1134], Area C	Nut Shell: Hazel	4778±22	3634–3629 cal BC; 3585–3531 cal BC	3640–3621 cal BC; 3606–3522 cal BC
SUERC-94900	(1159)	Fill of Posthole [1158], Area C	Nut Shell: Hazel	4829±24	3650–3633 cal BC; 3554–3540 cal BC	3656–3628 cal BC; 3582–3533 cal BC
SUERC-94904	(1112)	Fill of Structural Pit [1110], Area D	Cereal Caryopses: Hulled Barley	1260±24	690–750 cal AD; 761–770 cal AD	670–778 cal AD; 792–803 cal AD; 843–857 cal AD
SUERC-94887	(1019)	Fill of Pit [1018], Area E	Nut Shell: Hazel	4851±24	3657–3636 cal BC	3696–3632 cal BC; 3556–3538 cal BC
SUERC-94888	(1021)	Fill of Pit [1020], Area E	Nut Shell: Hazel	4819±23	3646–3632 cal BC; 3558–3538 cal BC	3651–3628 cal BC; 3583–3532 cal BC
SUERC-94895	(1060)	Fill of Pit [1010], Area E	Cereal Caryopses: Cultivated Oat	723±24	1269–1285 cal AD	1256–1298 cal AD
SUERC-94896	(1064)	Fill of possible recut [1062] of Pit [1057], Area E	Charcoal: Alder	757±24	1251–1280 cal AD	1224–1283 cal AD

Table 1 *contd.*

Lab Code	Context No.	Feature No.	Description	Uncal (BP)	Calibrated 1-sigma (68.2%)	Calibrated 2-sigma (95.4%)
SUERC-94897	(1023)	Fill of pit [1022], Area E	Nut Shell: Hazel	4915±25	3701–3660 cal BC	3761–3742 cal BC; 3731–3726 cal BC; 3715–3645 cal BC
SUERC-94890	(1003A)	Fill of Palisade Enclosure [1002], Area G	Nut Shell: Hazel	1845±21	131–214 cal AD	90–100 cal AD; 123–236 cal AD
SUERC-94894	(1003B)	Fill of Palisade Enclosure [1002], Area G	Charcoal: Alder	1864±22	87–105 cal AD; 121–175 cal AD; 192–212 cal AD	81–222 cal AD
SUERC-94905	([1099)	Fill of Posthole [1083], Area G	Charcoal: Hazel	1840±22	134–214 cal AD	91–100 cal AD; 124–239 cal AD
SUERC-94906	(1103)	Fill of Posthole [1093], Area G	Charcoal: Birch	1855±25	127–214 cal AD	85–230 cal AD
SUERC-94889	(1046)	Fill of Pit [1045], Area H	Charcoal: Pine	3964±23	2559–2536 cal BC; 2491–2464 cal BC	2570–2514 cal BC; 2502–2454 cal BC; 2418–2408 cal BC; 2362–2356 cal BC



Illus 17 Modelled radiocarbon dates plot

activity in Area G (Illus 11). Here fills of the ditch of a palisade enclosure, [1002], and from postholes of an internal post-ring roundhouse, provided material for dating. The model for this period indicates that this period of activity commenced between cal AD 20 and 230, and ceased between cal AD 140 and 350 (95% probability) with an estimated duration of up to 230 years with 95% probability. A sample of hulled barley cereal (SUERC-94904) from Pit [1110] in Area D, which was of unknown date during excavation, provided a range between cal AD 670 and 830 at 95% probability, indicating an early medieval date. Dates in the medieval period were recovered from samples of oat caryopsis (SUERC-94895) and alder charcoal (SUERC-94896) from fills of Pits [1010] and [1057]/[1062] respectively in Area E, with dates of cal AD 1260–1300 and cal AD 1230–1290 at 95% probability.

The variety of dates apparent at Grantown Road, Forres indicates that this area saw use at many times between the 4th millennium BC and the medieval period. Areas C, D, E, G, and H lie to the east of areas previously excavated on and reported by Cook (2016: 6), though in relatively close proximity to those areas evaluated in 2010. Cook notes that, 'The evidence recorded from the four excavations completed at Grantown Road, Forres, indicates a landscape occupied episodically from the Neolithic through the Late Bronze Age and Iron Age to the Early Historic period, comprising both domestic and funerary activity' (Cook 2016: 70). The radiocarbon dates suggest that at the present site there was a similarly extensive multi-period occupation, though with some indication here for medieval occupation, specifically around the 13th century AD, evidenced by Pits [1010] and [1057]/[1062] in Area E.

At the present site there is a range of Neolithic occupation, with a broadly Early Neolithic concentration of activity, including a roundhouse in Area C, and pits and postholes across Areas C and E which are of 4th millennium date (and likely largely from the first half of that millennium). In addition, two features were dated to the boundaries of the Middle to Late Neolithic and Late Neolithic to Chalcolithic periods (Pit [1127] in Area C and Pit [1045] in Area H respectively), suggesting that activity continued on the present site well into the 3rd millennium BC. This broad chronological range is in accord with the earlier excavations, where 'Neolithic activity on site is restricted to three possible structures and a series of pits ranging in date from the Early to Late Neolithic' (Cook 2016: 63). However, there is an absence of Bronze Age activity on the present site, unlike the earlier excavated areas, where 'spatially separate…dated features…lie within the Later Bronze Age' (Cook 2016: 64).

As with the earlier site to the west, where Cook noted 'the floruit of activity occurred during the last two centuries BC and the first two centuries AD, in the form of an extensive Iron Age settlement' (Cook 2016: 70), the present site contains evidence for late prehistoric occupation, around the 1st to 3rd centuries AD, in the form of a palisade enclosure, [1002], and associated post-ring roundhouse. This appears to correspond chronologically with Iron Age Phase 3 of Cook's excavations, which 'comprises the construction and excavation of the ring-ditch and souterrain between the end of the 1st century BC and the 3rd century AD' (Cook 2016: 68).

Also, in accord with the earlier works, only one feature of likely early medieval date was recognised – large Pit [1110], which dates to the second half of the 1st millennium AD. At the earlier site, 'only two structures and some isolated pits and areas of burning' were recognised as being of a similar date (Cook 2016: 69).