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Ancient Monuments Laboratory
Report 5/95

ANGLO-SAXON HURDLES AND BASKETRY, COLLINS CREEK, BLACKWATER ESTUARY, ESSEX

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Summary

Wood from seven hurdle panels and a piece of basketry associated with the complex of fish-traps at this site has been examined. The hurdles were constructed mainly of birch, oak and willow/sallow roundwood stems with some hazel. Stems showed conspicuously slow growth rates. Plots of age/size distributions do not show tight clustering of points, as would be expected in roundwood from a single stand of managed roundwood. The large quantities of wood used at the site must, however, have come from managed woodlands. It is therefore thought that wood from more than one source was stockpiled for use in hurdle construction. The basketry was made of hazel roundwood stems, 1-3 years old at cutting and very neatly trimmed by longitudinal cuts to give uniformly-sized stems. The fragment could be part of a fish-basket.

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Introduction

The complex of wooden structures at Collins Creek is located on intertidal mudflats and shell ridges about 2km east of Osea Island, near the middle of the Blackwater Estuary, centring on TL 945 075. Wooden structures extend over an area of some 2 x 1 km, making this the largest known exposure of archaeological wood in eastern England, and probably in the country (Essex County Council 1991).

The Collins Creek post alignments were first recorded by Mr. Ron Hall during a sailing trip in 1990. During 1992 and 1993 survey work and sampling was undertaken by Essex County Council Archaeology Section in conjunction with the University of East London and the writer. Logistical problems were considerable, for the site is accessible only by boat, and is exposed only for a maximum of two hours at extreme low tides. However, a site plan has been prepared using satellite mapping techniques, (Fig. 1), sample areas of the alignments have been planned in detail, and wood samples collected for radiocarbon dating and possible dendrochronology . The site is dated from two radiocarbon samples to 640-675 AD Cal (UB-3485) and 882-957 AD Cal (UB-3486), but Groves (1993) found that the posts were mostly of roundwood, 10-35 years at felling and therefore unsuitable for tree-ring dating.

The most immediately conspicuous feature of the structures is the extensive series of post alignments, some of which form 'classic' V-shaped fish traps. However, there are evidently several phases of structure superimposed. Limited augering, undertaken by the writer, has shown that the southern east-west alignment was constructed along a ridge of firm sandy silt with abundant shells, mainly of *Cerastoderma edule* and *Hydrobia ulvae*, bounded on either side by soft muds up to 3.5 m deep. Further augering is proposed, but provisionally it seems that some of the alignments took advantage of such ridges to enclose an area which would have temporarily,during falling and low tide, been a 'lagoon' in which fish would have been confined and trapped.

More detailed examination has shown that the alignments are commonly associated with parallel lines of wattle panels, laid flat and in some cases fixed in position by posts driven through them. They clearly formed an integral part of the post-alignment structures. Some may originally have been fixed vertically between the posts, whilst others were probably laid horizontally and were possibly intended as walkways. Alongside the collection of post samples for a pilot dendrochronological study it was considered that this large collection of wattling merited attention. A sample area (Area A), actively eroding, was selected for detailed examination. A small piece of basketry (Area B) was also examined.

Area A.

This area of wood comprised at least seven wattle panels probably originally forming a continuous wide arc running roughly east-west (Figure 2). These panels, at a relatively high elevation, were more vulnerable to wave action than those on lower mudflats, which are generally subtidal, except at Spring Tides. Ron Hall had seen them perceptibly diminishing. They were therefore selected for recording and assessment as an example of the wattling at the site, before they entirely disappeared.

Since these panels were never exposed for more than about 2 hours per tide, generally less, a 'streamlined ' approach had to be adopted. Conventional planning methods were clearly too time-consuming, and a plan was therefore prepared by the team from The University of East London using digitised points from oblique photographs (Fig. 2). This plan is obviously less detailed than would be prepared in less difficult circumstances, but it does at least indicate the overall form of the wood and its main elements.

During sampling short notes were made about each panel and samples were taken from each surviving sail (S1 - Sn, going from west to east) and rod (R1 - Rn, going from north to south). Ideally, two samples per element should have been collected, but the panels were often fragmentary and time was very limited. Samples were taken, where possible, from the thickest (basal) parts of stems though often only very short lengths survived. Panel 1 was at the western end of the area. The samples collected were stored in methanol to harden them before sectioning. Criteria defined by Schweingruber (1978) were used for identification of sections. Stem diameters, presence/absence of bark and stem age were also noted.

Where possible, the width and completeness of the last ring was noted. In general, the widths of final rings indicated winter cutting, though some of the oak stems had narrow last rings with few late-wood vessels.

Panel A1

Well-defined wood, partly undercut by erosion. Surviving length 1.9m. Maximum width (sails) 0.9m. Rods surviving over width of 0.5m. 3 surviving sails, 12 rods.

	Diam (mm)	Bark?	Species	Stem Age	Notes
S1	26	N	Quercus	11	
S2	25	N	Betula	8	Traces of oblique cuts
S3	20	N	Salix	8	
R1	24	Y	Betula	11	
R2	12	N	Salix	10	
R3	12	N	Salix	10	
R4	12	Y	Salix	5	
R5	25	Y	Quercus	12	Oblique transverse cut
R6	22	Y	Betula	10	
R7	18	Y	Quercus	8	
R8	17	Y	Quercus	6	
R9	14	N	Salix	6	
R10	11	N	Salix	8	Eroded
R11	20	N	Salix	8	
R12	15	Y	Betula	9	

Panel A2

Well-defined wood, partly undercut by erosion. Surviving length 1.8m. Width of sails 0.5m. 3 surviving sails, 20 rods. End contiguous with A1.

S1	30	Y	Quercus	8	
S2	25	Y	Quercus	7	
S3	26	N	Indeterminate	c. 12	Decayed
R1	18	Y	Salix	12	
R2	21	N	Salix	12	
R3	16	Y	Betula	9	
R4	9	Y	Quercus	8	
R5	25	Y	Betula	12	
R6	13	Y	Salix	7	
R7	24	Y	Betula	9	
R8	24	Y	Betula	9	
R9	21	Y	Quercus	10	
R10	13	Y	Quercus	5	
R11	15	Y	Betula	5	
R12	14	Y	Betula	8	
R13	14	Y	Salix	6	
R14	11	Y	Salix	6	
R15	13	Y	Betula	6	
R16	10	Y	Salix	9	Forked
R17	20	Y	Salix	12	
R18	14	Y	Salix	7	
R19	16	Y	Salix	12	
R20	17	Y	Quercus	6	

Panel A3

Fairly well-defined. Surviving length 2.4m. Maximum width (of sails) 0.75m, rods surviving over width of 0.3m. 10 surviving sails, 15 rods. End contiguous with A2.

S1	22	Y	Salix	?	Oblique transverse cut
S2	41	Y	Betula	?	
S3	29	Y	Quercus	11	
S4	20	Y	Salix	11	Cut side-branch
S5	22	Y	Salix	13	
S6	20	Y	Salix	12	
S7	26	Y	Betula	9	
S8	23	Y	Betula	8	
S9	22	Y	Quercus	7	
S10	29	Y	Betula	10	
R1	15	N	Quercus	11	
R2	22	Y	Indet	11	Soft, degraded
R3	20	Y	Salix	12	
R4	18	N	Quercus	8	
R5	21	Y	Quercus	8	
R6	14	Y	Quercus	6	
R7	20	Y	Quercus	5	
R8	14	N	Quercus	5	
R9	12	Y	Corylus	4	
R10	18	Y	Betula	8	
R11	18	Y	Salix	12	
R12	25	Y	Quercus	10	
R13	20	Y	Salix	12	
R14	18	Y	Salix	10	
R15	24	Y	Betula ?	11	

Panel A4

Virtually destroyed by erosion. Short, 50cm, lengths of 4 sails survived. End contiguous with A3.

S1	29	Y	Betula	15	
S2	24	Y	Quercus	10	
S3	30	Y	Quercus	12	
S4	34	Y	Quercus	12	Oblique transverse cut

Panel A5

Badly eroded and obscured. Remnants of wattling over area 2.4x0.6m. 4 surviving sails, 14 rods. Gap of about 3m between A4 and A5.

S1	25	N	Quercus	10	
S2	22	N	Quercus	8	
S3	25	N	Indet	10	
S4	26	Y	Quercus	7	Oblique transverse cut
R1	20	Y	Indet	9	
R2	14	Y	Quercus	7	
R3	18	Y	Indet	?	
R4	17	Y	Indet	?	
R5	?	N	Indet	?	
R6	30	Y	Indet	?	
R7	11	N	Indet	?	
R8	10	Y	Indet	?	
R9	13	Y	Salix	5	

R10	9	Y	Indet	?	
R11	14	Y	Indet	?	
R12	13	Y	Indet	?	
R13	24	Y	Salix	8	
R14	18	N	Salix	6	

Most of the wood from this panel had very disrupted cell structure and was compressed.

Panel A6

Eroded and obscured. Area of wattling over about 1.5x0.8m. 7 surviving sails, 5 rods. Contiguous with A5.

S1	20	N	Quercus	7	
S2	25	N	Betula	c.6	
S3	25	N	Quercus	8	
S4	23	Y	Quercus	7	
S5	22	N	Quercus	9	
S6	24	Y	Quercus	7	Decayed
S7	27	Y	Quercus	10	
R1	15	Y	Betula	3	
R2	10	N	Quercus	4	
R3	11	Y	Indeterminate	?	Decayed
R4	18	Y	Quercus	4	
R5	14	N	Indeterminate	4	Cut side-branch

Panel A7

Well-defined. Surviving length 2.5m. Maximum width (sails) 0.85m, rods surviving over width of 0.5m. 8 surviving sails, 24 rods. End contiguous with A6.

S1	27	Y	Quercus	7	Trace of oblique cut
S2	32	Y	Salix	10	Oblique transverse cut
S3	28	Y	Quercus	12	Oblique transverse cut
S4	27	Y	Betula	4	Wedge-cut tip
S5	30	Y	Corylus	16	
S6	25	Y	Betula	5	
S7	25	Y	Corylus	15	Pencil-point, 4 facets
S8	25	Y	Corylus	13	
R1	17	Y	Salix	17	
R2	20	Y	Betula	?	
R3	21	Y	Betula	12	
R4	20	Y	Corylus	7	
R5	27	Y	Salix	16	
R6	13	Y	Quercus	3	
R7	15	Y	Betula ?	5	
R8	22	Y	Quercus	10	
R9	24	Y	Quercus	6	
R10	26	Y	Salix	8	
R11	26	Y	Salix	6	
R12	21	Y	Betula	9	
R13	18	N	Betula	8	
R14	11	Y	Betula	4	
R15	23	Y	Corylus	10	
R16	37	Y	Betula	12	Oblique transverse cut.
R17	24	Y	Corylus	10	
R18	13	Y	Corylus	6	

R19	17	Y	Salix	8
R20	19	Y	Betula	5
R21	19	N	Corylus	8
R22	22	Y	Salix	7
R23	14	Y	Betula	12
R24	26	N	Quercus	13

Area B (adjacent to Control Point 11)

At this location Philip Clarke (ECC) found a small area of basketry. It was lifted as an intact block on its clay matrix for recording in the laboratory. Hilary Major photographed the material, made a 1:1 plan and took samples from for identification and stem ageing. Locations of samples are shown on the plan Figure 3. Some of the samples were duplicates from the same stem as others, and these are indicated in brackets below. Some objects noted as bone on this plan proved, in fact, to be badly decayed wood.

	Diam (mm)	Bark?	Species	Stem age	Comments
A	9	Y	Corylus	2	One tangential cut
B	6	Y	Corylus	1	
C	10	Y	Corylus	2	One tangential cut
(D)	9	Y	Corylus	2	
E	5	Y	Corylus	2	
F	9	Y	Corylus	2	Two opposing tangential cuts
G	5	Y	Corylus	2	
H	5	Y	Corylus	1	
I	9	N	Corylus	3	One tangential cut
J	7	Y	Corylus	1	
(K)	9	Y	Corylus	2	3 tangential cuts
(L)	9	Y	Corylus	3	One tangential cut
M	5	Y	Corylus	2	Oblique transverse cut
N	-	-	Indet	-	Degraded wood scrap
O	6	Y	Indet	2?	Degraded fragment
P	13	Y	Corylus	8	
Q	c.16	N	Quercus	>4	Abraded
R	14	Y	Corylus	4	Halved (split) stem fragment
S	-	-	Quercus	-	Fragment.

The larger, 9-10mm, stems forming part of the basketry had been very neatly trimmed by tangential longitudinal cuts along their lengths so as to reduce their size to that of the smaller, 5-6mm, stems. This gave them sub-quadrilateral cross-sections.

Discussion

1) Wood utilisation

Wood composition of the hurdle panels from Area A and posts from other areas of the site (Groves 1993) is summarised in Figure 4. Only four taxa were identified: birch (*Betula* sp) , hazel (*Corylus* sp) , oak (*Quercus* sp) and willow/sallow (*Salix* sp). The *Salix* wood from the panels is positively distinguished from poplar (*Populus*) by its distinctly heterogeneous rays (Schweingruber 1978).

This mixture of taxa probably implies more than one woodland source. Oak predominated amongst the roundwood posts, with some birch and a little willow/poplar. In the panels, however, young roundwood stems of birch, oak and birch were roughly equally abundant, with some hazel.

2) Stem ages and diameters

A conspicuous feature of many stems is their slow growth rate: they commonly show many narrow rings. In Figures 5 and 6 age/size distributions of oak stems from Collins Creek are compared with oak stems from the Iron Age structure Context 96 at Blackwater Site 28 (Wilkinson and Murphy, inpress). The difference in

growth rates is striking, though difficult to explain. It presumably relates to some environmental variable.

In Figures 7 - 10 age/size distributions for oak, willow and hazel stems are shown in more detail. Points do not seem to be clustered, as would be expected from coppiced/pollarded roundwood from a single stand. Clearly the Collins Creek wood must have come from managed woodlands, for the huge quantities of straight roundwood stems used could not have been obtained otherwise. This lack of clustering sems to suggest that the roundwood used came from several different woodlands under different regimes, as the species composition of the wood would suggest. It is perhaps surprising that this very small area of wattling should have been made of material from more than one source. It may imply some centralised stock-piling of roundwood for hurdle construction, with a resultant mixing of wood imported from different locations.

3) Basketry (Area B).

The basketry from Area B was made of hazel stems, 1-3 years old, with some other components, probably not *in situ* and unrelated to the basketry. Definite functional interpretation of this small and flattened fragment of basketry is difficult. However it could be part of a fish-basket similar to that described by Godbold and Turner (1992, 51 and Fig 27) from the Welsh intertidal zone on the line of the second Severn crossing.

The conclusions to be drawn from this collection of wood are, at present, limited. However, they make a useful contribution to the growing wood data-base in East Anglia. It is anticipated that, once more data are available, comparative studies between sites will provide useful insights into woodland management methods at different periods.

References

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Schweingruber, F.H. 1978.
Microscopic Wood Anatomy. F. Flueck-Wirth: Teufen.

Wilkinson, T.J. and Murphy, P. in press.
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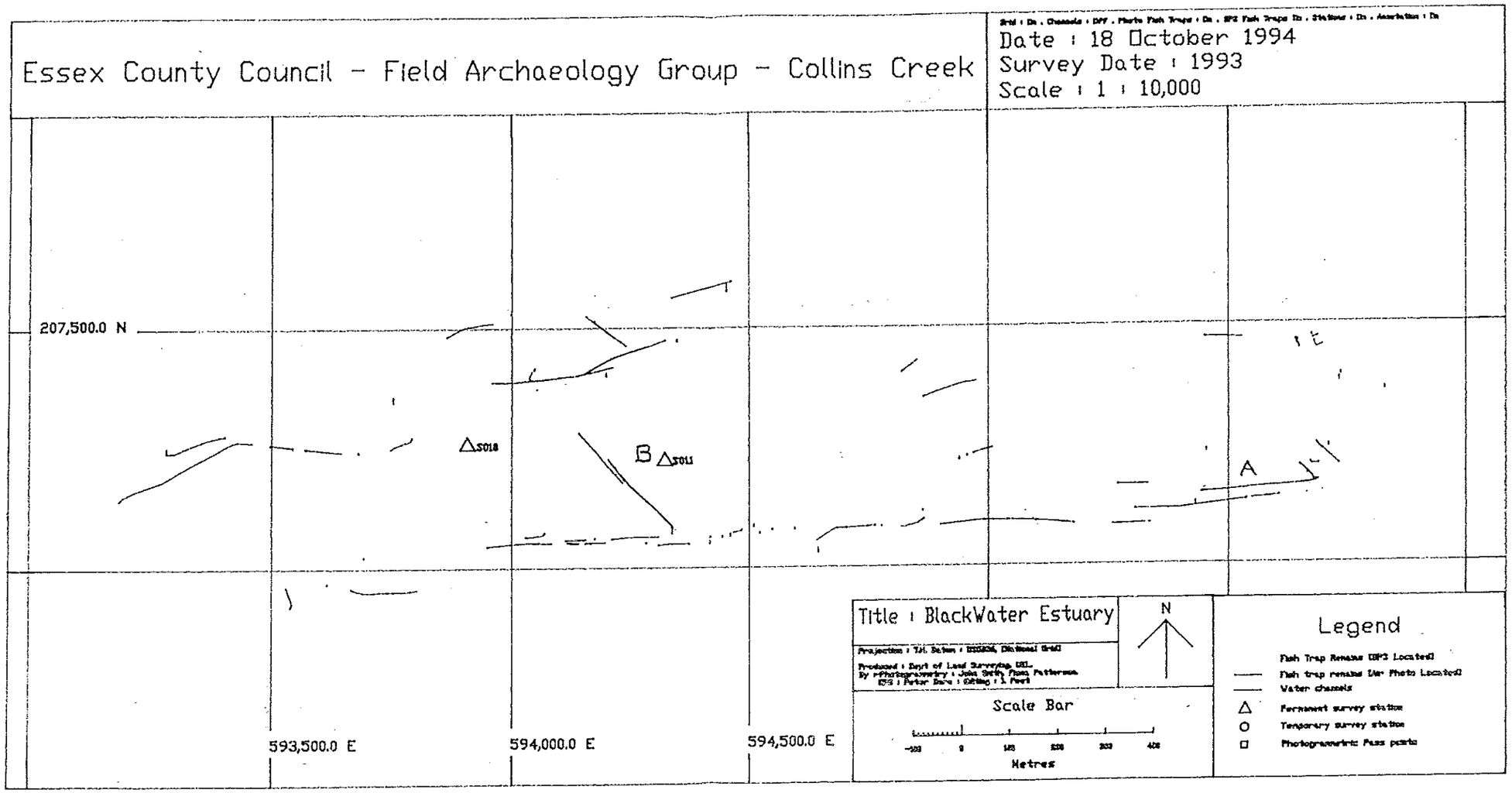

Figure 1. Collins Creek, Blackwater Estuary, Essex.
Plan of post alignments, prepared by University of East London, Department of Land Surveying.

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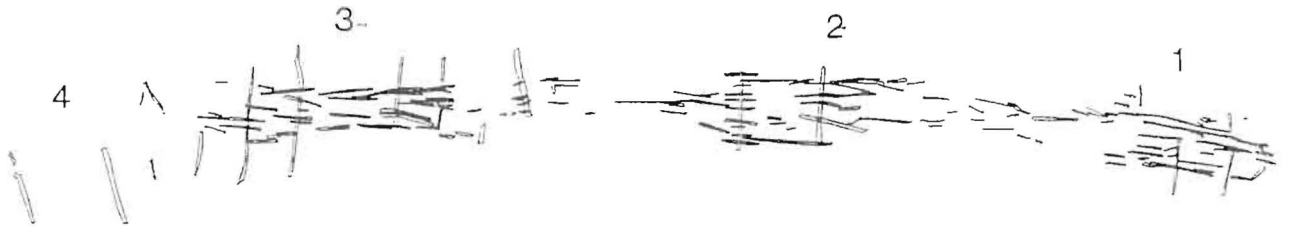
Figure 2. Collins Creek, Blackw
hurdle panels in Area A. Plotted f
photographs by The University of
Surveying.



Title: Blackwater Estuary
Wattling Remains A
Scale: 1 50
Plotted from photography by J.W.Smith
Department of Land Surveying
University of East London

ıter Estuary, Essex. Plan of
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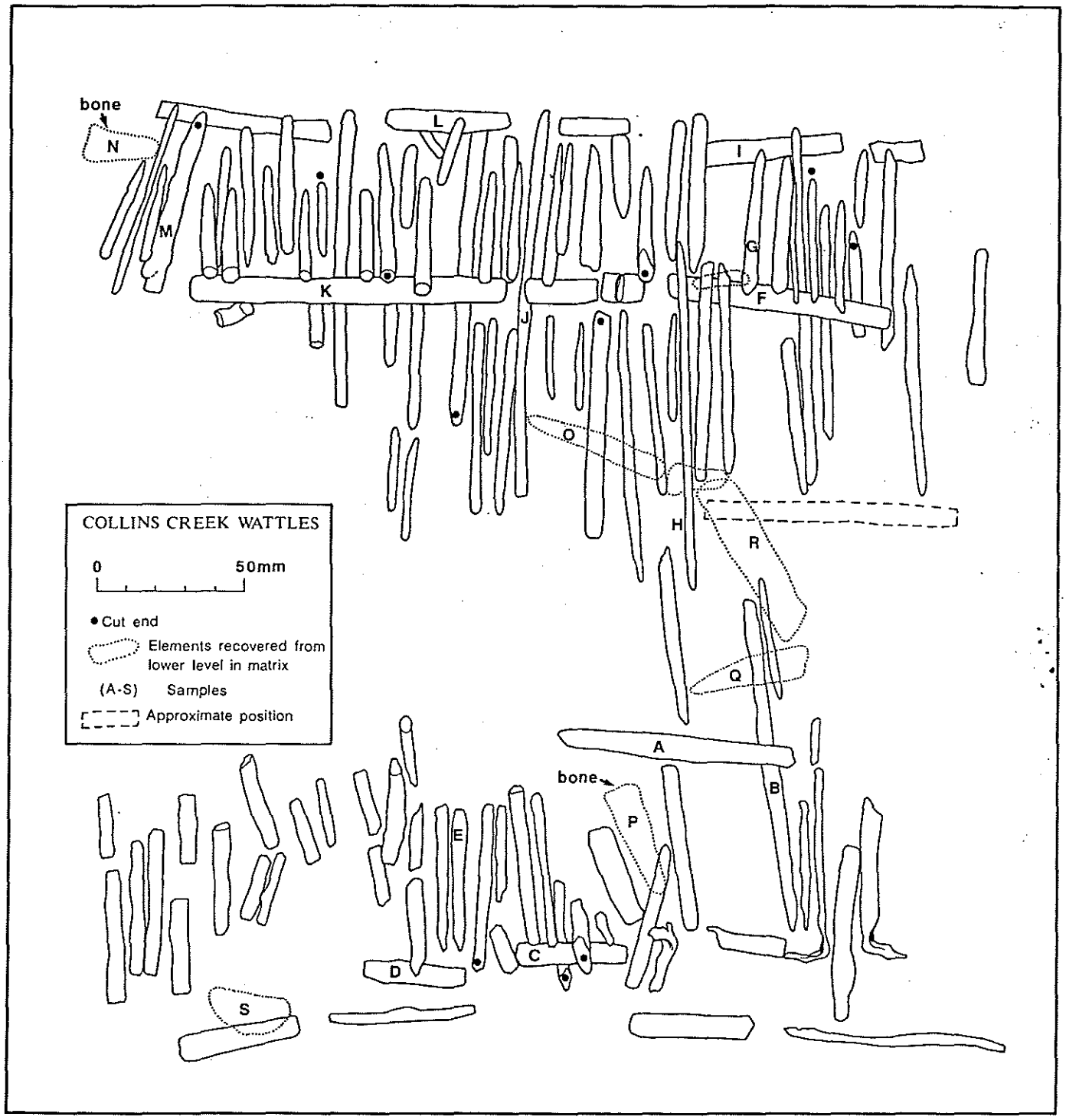

Figure 3. Collins Creek, Blackwater Estuary, Essex. Plan of basketry from Area B. Drawn by Hilary Major, Essex County Council.

Figure 4 (a). Species composition of hurdles in Area A. N = 114.

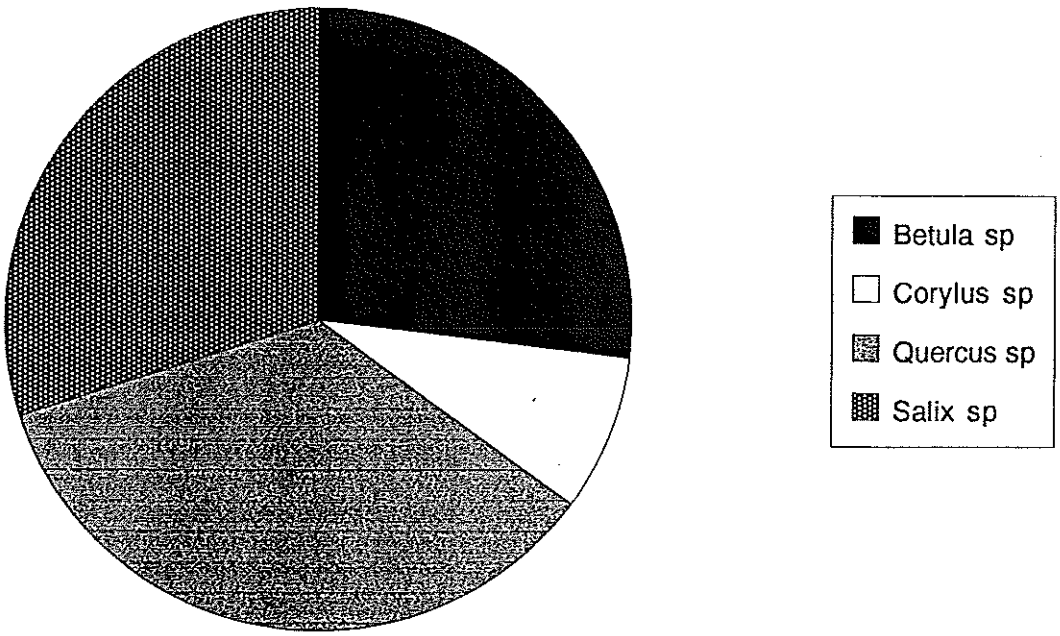

Figure 4 (b). Species composition of samples from posts.

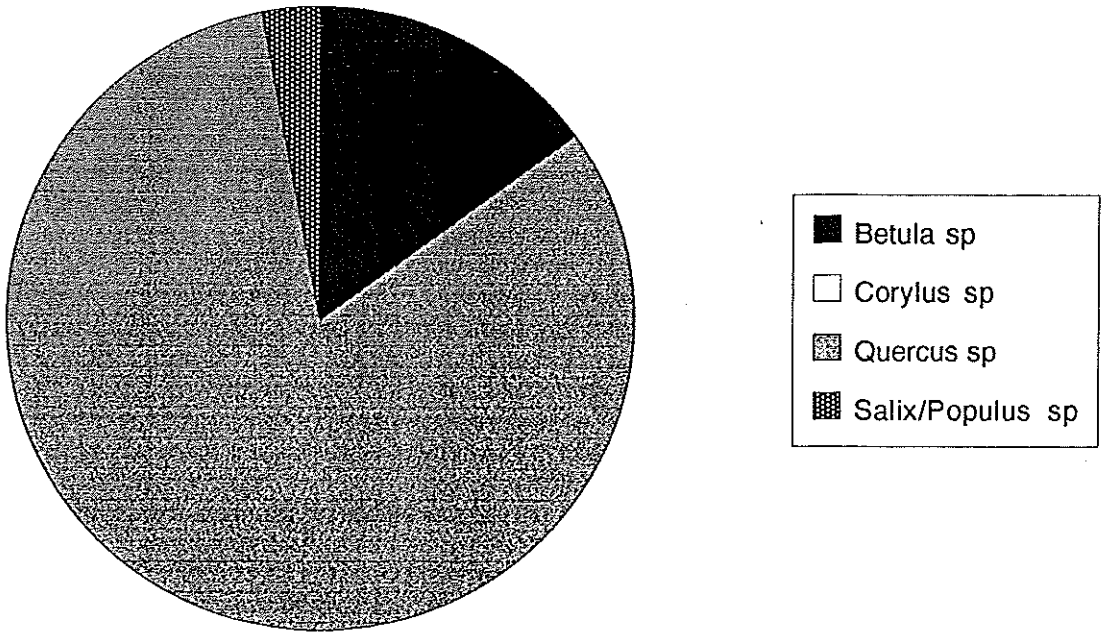

Figure 5. Collins Creek. Quercus roundwood (all contexts).

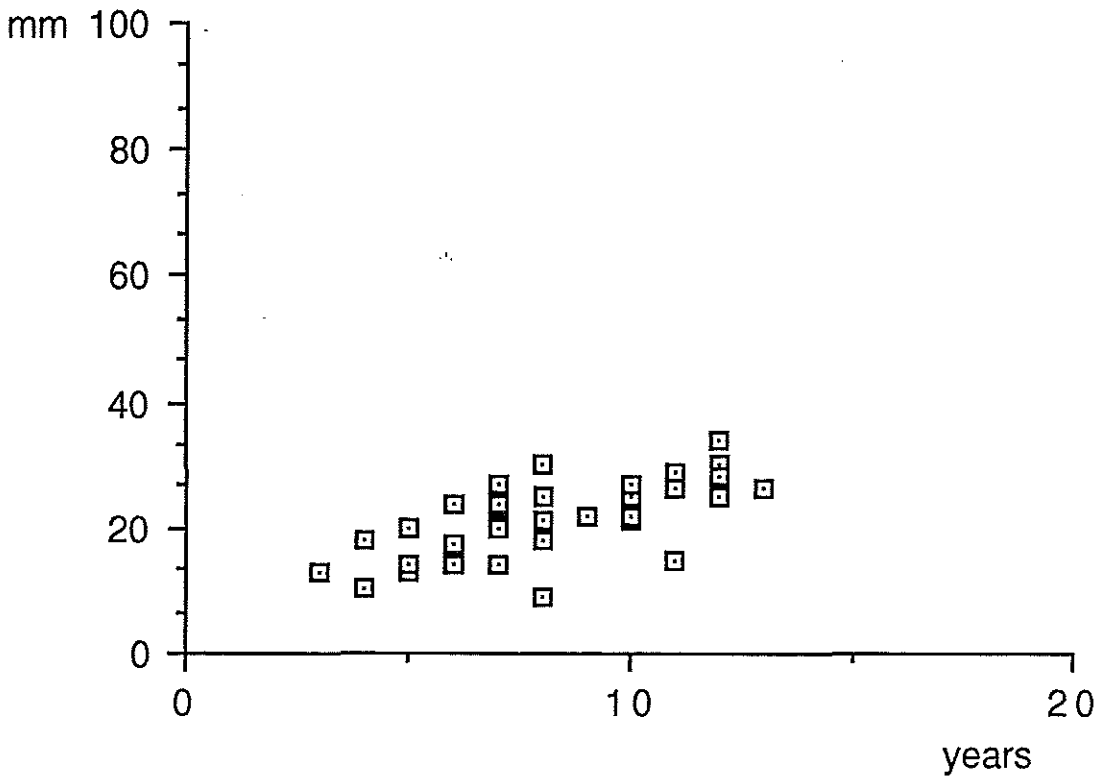

Figure 6. Blackwater Site 28. Ct. 96. Quercus roundwood.

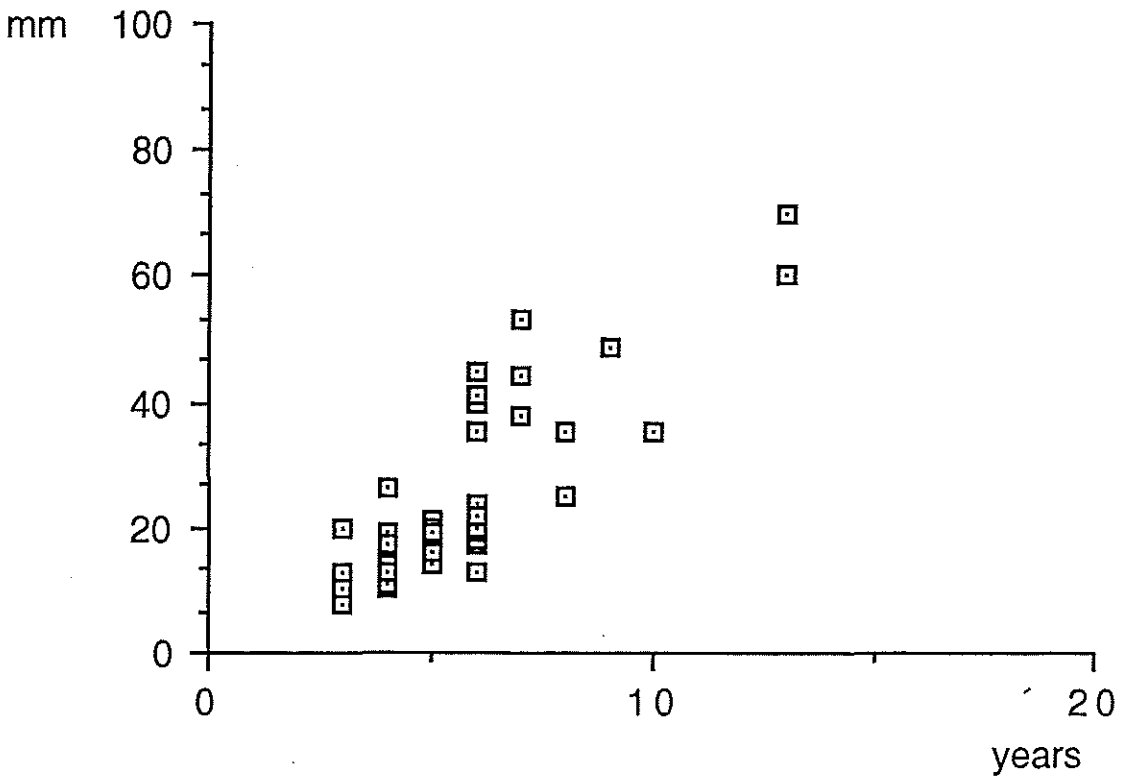

Figure 7. Collins Creek. Quercus roundwood.

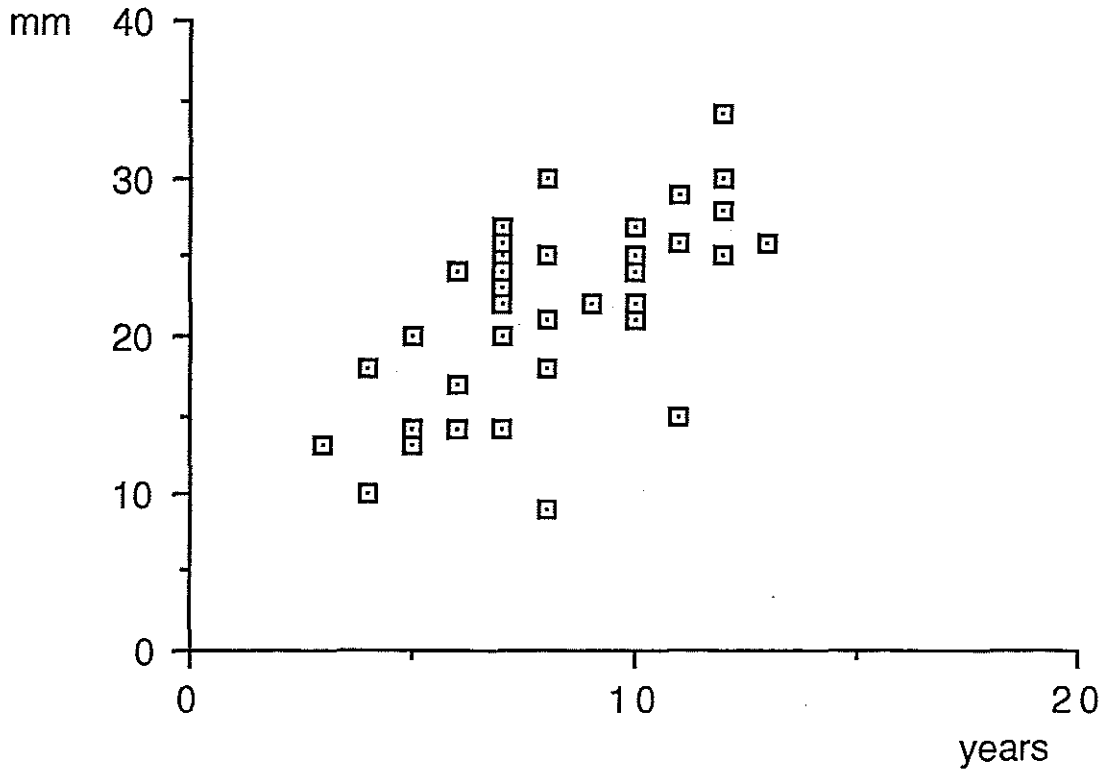

Figure 8. Collins Creek. Salix roundwood.

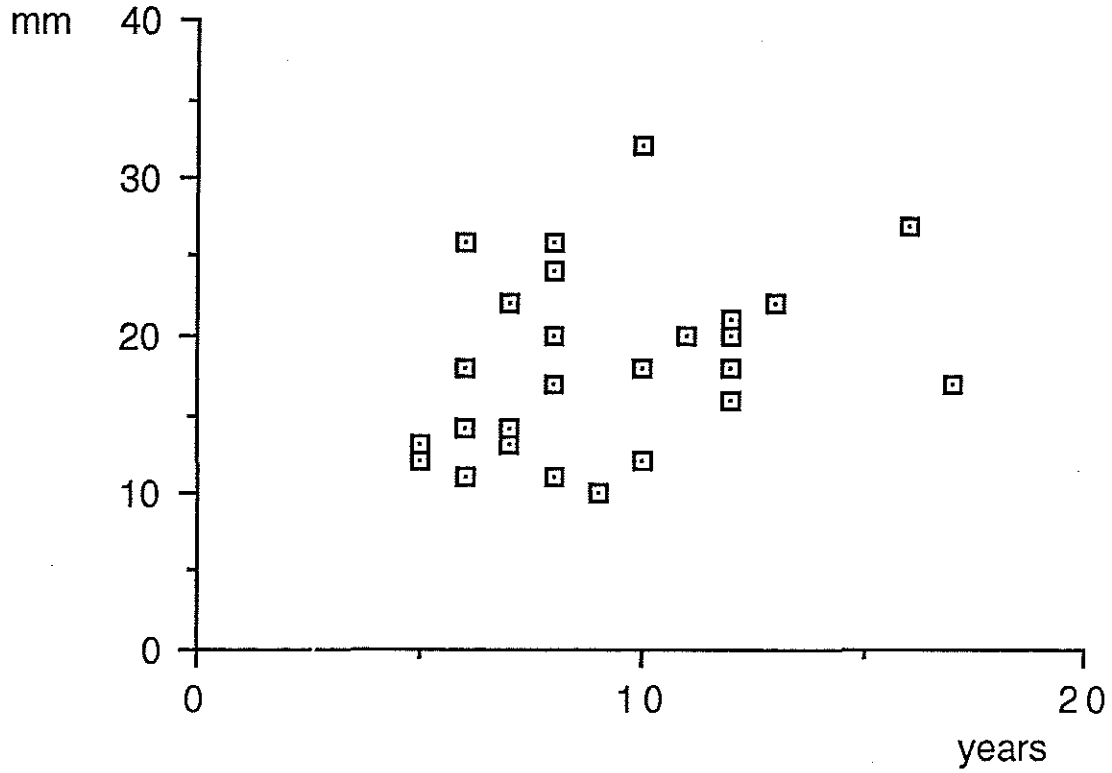

Figure 9. Collins Creek. Betula roundwood.

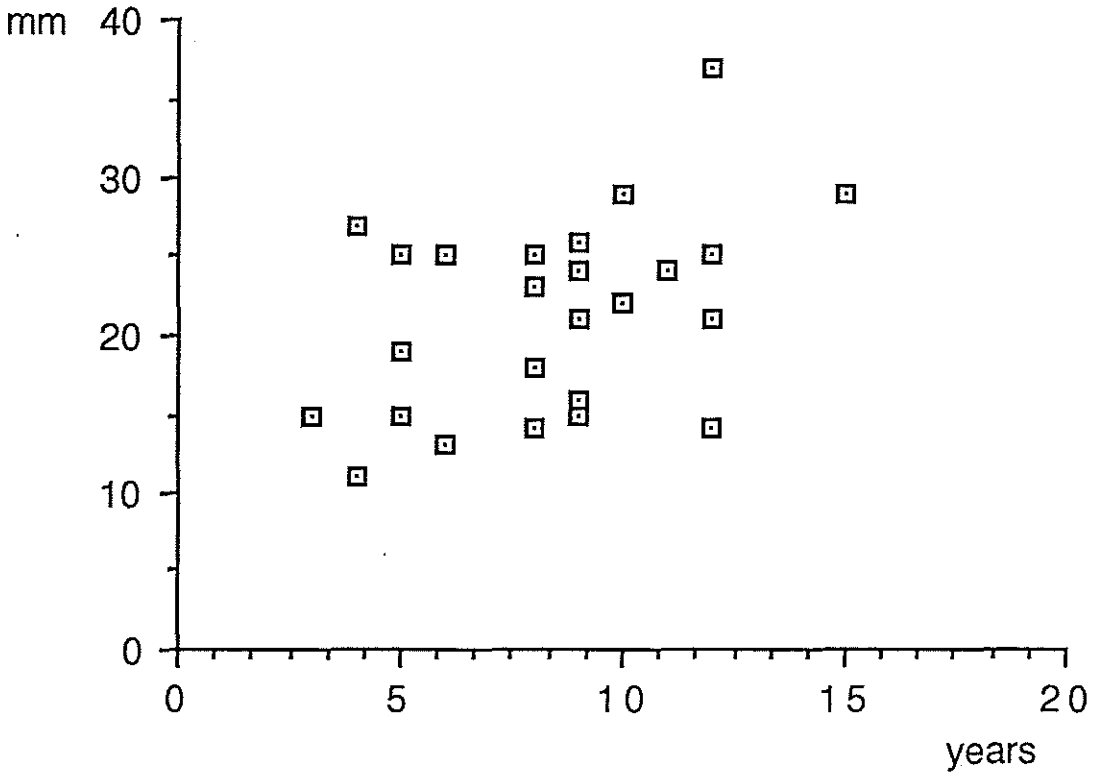

Figure 10. Collins Creek. Corylus roundwood.