

February 2018

**OYSTER SHELL  
ASSESSMENT REPORT  
BARTON FARM  
WINCHESTER  
(AY564)**

Prepared for Pre-Construct  
Archaeology

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## 1 INTRODUCTION

- 1.1 This document reports on the assessment of oyster shells recovered from 36 contexts excavated at the multi-period site of Barton Farm, Winchester, by Pre-Construct Archaeology (PCA) in 2015.
- 1.2 The shells were originally cleaned, quantified and bagged, by PCA staff and delivered to ARCA laboratories at the University of Winchester for assessment.
- 1.3 The objective of the assessment was to identify the possible source of the oysters, whether farmed or naturally sourced and possible consumption patterns.

## 2 METHODOLOGY

- 2.1 The methodology for the assessment follows that of Winder (2011) which defines both the range of sizes and the degree of marine infestation for each shell, as well as other diagnostic shell features within the context. Only shells with a complete hinge were assessed. Incomplete shells and fragments were counted, weighed and then discarded (see Appendix A)
- 2.2 Shells were initially divided into right (upper, flattened) valves and left (lower, cupped) valves and counted. This count provides potential evidence as to where the oysters may have been processed and/or consumed.
- 2.3 A metric was then taken for the smallest and largest shell within each context, both for left and right valves. The width or gape of the oyster was measured from the hinge to the opposite margin using a metric board. The length of the shell was not measured, this normally being less than the width or gape. In contexts where only incomplete valves were recovered the minimum value was recorded. This metric provides an estimate of the maturity of the oyster when harvested.
- 2.4 Following measurement the valves were checked individually to identify any types of marine infestations and encrustations either on or within each shell; these included: *Polydora ciliate*; *Polydora hoplura*, *Cliona celata*, calcareous tubes, barnacles, Bryozoa, bore holes and sand tubes (Winder 2008, 5-7). Also recorded were other features of the oyster shell material under the classifications of: thin, thick, chambered, chalky deposits, worn, flaky, colour/stained, oysters shells attached, irregular shape and

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cuts or notches (see Appendix B). These observations can assist in determining the type of marine environment the oysters have come from and whether they have been harvested from cultivated or natural beds.

### 3 DESCRIPTION AND ANALYSIS

3.1 A total of 307 oyster shells weighing 4,499g were recovered from the 36 contexts, giving an average weight of 14.6g per shell. The contexts were divided, using spot dates, into two periods, Romano-British and Post Medieval.

#### 3.2 Romano-British Contexts

3.2.1 Twenty-two Romano-British contexts yielded a total of 37 measurable shells comprising 22 left (L) and 15 right (R), weighing 520g. The average weight of the shells was 14g.

3.2.2 Five contexts (60011), (60015), (60018), (60035) and (60071) were associated with the aqueduct and accounted for eight shells (6L, 2R). The sizes ranged from 40-85mm. Thirteen contexts (10087), (10157), (10195), (10220), (10256), (10338), (10372), (10409), (10441), (10607), (10656), (10819), and (20013) had only one shell each accounting for four left shells and 10 right. Sizes ranged from 61-76mm. The fill (10056) of pit [10055] produced three shells (2L, 1R) with sizes from 36-65mm. Fill (10195) from grave [10193] yielded four shells (3L, 1R), measuring between 60-93mm. Two left shells came from (10487), the fill of ditch [10486] and a further three (2L, 1R) from (10950), the fill of ditch [10343]. These measured between 53-82mm.

3.2.3 The majority of the shells showed damage through root etching, with six (18%) also being worn and nine (27%) flaky. Infestations were restricted to three incidences of *Polydora cillata* and one of *Cliona celata*, while 20 (60%) shells showed *Polydora hoplura* (See table 1). Sixteen shells (48%) had chalky deposits and 8 (24%) had an irregular shape. Nine shells also showed staining of purple or an orange/yellow colour. There were no shells with oyster spat attached and only one shell showed cuts/notches from being opened.

<b>Infestation</b>	<b>RB No</b>	<b>RB %</b>	<b>PM No</b>	<b>PM %</b>
<b>No of valves</b>	<b>37</b>		<b>270</b>	
Polydora ciliata	3	9	9	4
Polydora hoplura	20	60	102	41
Cliona celata	1	3	7	3
Calcareous tubes	0	0	1	0.4
Barnacles	0	0	11	4
Bryozoa	0	0	3	1
Bore holes	0	0	31	12
Sand tubes	0	0	3	1

Table 1: Comparison of infestations between Roman-British and Post Medieval oyster shells

### 3.3 Post-Medieval Contexts

- 3.3.1 These Post-Medieval contexts were associated with the Hessian Camp dated to 1756 (McCulloch 2015, 6). They yielded 270 oyster shells, (146L, 124R) weighing 3,979g with an average weight of 14.6g.
- 3.3.2 Shells were recovered from the field kitchen complex (30007) and the subterranean dugouts [30096], [30190], [30206] and [40020]. In [30096] fills (30098), (30099), (30178), (30181) and (30242) yielded 17, 11, 9, 22 and one shell respectively, comprising 23 left and 37 right shells, measuring between 31-72mm. The backfills (30191) and (30192) from dugout [30190] had only one left shell each of 41 and 56mm.
- 3.3.3 The majority of shells came from (30207), the upper fill of [30206]. This accounted for 191 shells (108L, 83 R) weighing 3,023g with an average weight of 15.8g and a size range of 35-85mm. One right hand shell came from (30226) in this dugout. Three shells (3L, 1R) came from (40021) in dugout [40020] and measured 43-55mm.
- 3.3.4 Access trench [300126] had four shells (3L, 1R) from fill (30129). One right shell each, was recovered from contexts (50006). Context (30031), the top fill of latrine [30018], yielded four right hand shells and two left of size 50-65mm and seven valves (11g) from the common cockle *Cerrastoderma edule*. A further two right hand shells came from (30058) within the same latrine. In addition a right upper claw from an edible crab, *Cancer pagurus*, was found in fill (30056) from part of the field kitchen [30017].

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3.3.5 Very few shells showed root etching, 31 (12%) were worn and 25 (10%) were flaky. The full range of infestations were recorded: nine (4%) *Polydora ciliate*; 102 (41%) *Polydora hoplura*; seven (3%) *Cliona celata*; one with calcareous tubes; 11 (4%) with barnacles; three (1%) with *Bryozoa*; 31 (12%) with bore holes and three (1%) with sand tubes (see Table 1). In relation to other characteristics 30 (12%) were thin and 42 (17%) unusually thick, 18% (45) were chambered, 37% (92) had chalky deposits and 61% (153) were colour stained with a combination of purple and orange/yellow. Seventy-four shells (30%) were irregularly shaped and 25 (10%) had oyster spat attached. Only four shells showed notches/cuts from being opened.

#### **4. Interpretation**

4.1 The assessment of the oyster shell material shows that all the shells come from the common or flat oyster *Ostrea edulis*. Other marine species were lacking apart from the seven valves of the common cockle (*Cerastoderma edule*) from the latrine fill (30031) and an edible crab claw (*Cancer pagurus*) from (30056) in the field kitchen.

#### **4.2 The Romano-British Oysters**

4.2.1 The small number of shells (37) recovered from the Romano-British features makes an interpretation difficult, however, the lack of significant deposits of shell in any one context suggests that oysters were not a major part of the diet at this time. Campbell (2011, 361-2) suggests that such a perishable food stuff being transported inland may have been considered a delicacy particularly as other animal protein was much easier to come by and had a higher calorific value. Evidence from excavations in Winchester (Campbell 2011, 362) show that overall consumption during the Roman period was low and peaked during the late 3rd to mid 4th centuries.

4.2.2 The proportion of left hand valves (59%) to right hand valves (41%) indicates that oysters being transported to the site were probably brought in whole. The lack of other marine shells indicates that trouble was taken to sort them from the oysters.

4.2.3 Only one shell showed notches or cut marks indicating that they may not have been opened before cooking or that the individual opening them was exceptionally skilled. Small oysters can be eaten whole or uncooked while larger specimens can be cooked with the cupped valve down on a bed of hot coals or charcoal (Winder 1993,

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116). There were, however, no signs of burning on the shells so another method such as boiling or steaming may have been used.

4.2.4 The size of shells ranged from 31-93mm which suggests a wide range of ages. Oysters of 25mm or less are considered young, immature 'spat' and are not usually harvested. Shells at the Romano-British villa at Halstock had a mean shell size of 78.3mm with a size range of 33-115mm (Winder 1993, 115). As not all shells were measured for this assessment a direct comparison cannot be made.

4.2.5 From the limited infestations and the predominance of *Polydora hoplura* the Romano-British shells have probably come from the south of England. *Polydora hoplura* is virtually absent from the Essex and north Kent coasts (Winder 1993, 116) and also indicates a muddy rather than sandy environment (Kent 1988:42). The 48% of shells with chalky deposits suggests tidal river areas where there is rapid changes in salinity (Winder, 2008, 7). It is likely, therefore, that the oysters were collected from the Solent or Southampton Water area.

### **4.3 The Post-Medieval Oysters**

4.3.1 The greater number of shells (207) from the Post-Medieval contexts of the Hessian camp provides a larger sample from which to draw conclusions.

4.3.2 The sample of 54% left and 46% right valves suggests that the shells were being brought whole to site with them being prepared and eaten close to the dugouts and kitchens. With the exception of the cockle shells and crab claw there was no other evidence of shell fish being consumed in the camp which also suggests that care was being taken to sort the oysters.

4.3.3 Most of the shells appeared to come from the deliberate backfills of the features when the camp was closed down, indicating that the shells may have been in small dumps external to the living quarters and kitchens. With up to 6000 men being billeted at the camp (McCulloch 2015, 6) the relatively small number of shells would indicate that oysters were not a substantial part of the soldiers' diet.

4.3.4 The size of shells, ranging from between 31-85mm is slightly smaller than the Romano-British shells although the average weight per shell is marginally heavier at 15.8g compared to 14.6g. In appearance the shells were much better preserved, having spent

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less time in the ground, with the left hand shells being much frillier

- 4.3.5 With only four shells showing possible notches/cuts it suggests, like the Romano-British shells, that the oysters were being cooked whole in some way or skilfully opened. During the 18th Century oysters were being consumed in a variety of ways with larger ones being stewed with herbs and spices, roasted or baked in pies. By the end of the 18th Century the oyster industry was highly regulated and with industrialisation became a staple diet of the poor (Ysewijn 2018).
- 4.3.6 The wider range of infestations and encrustations found with the Post-Medieval oysters supports an estuarine source, while the incidents of *Cliona celata* (3%) and sand tubes (1%) indicates some, more sandy conditions (Kent 1988, 41). Barnacles (4%), bore holes (31%) and the incidence of oyster spat (10%) attached to the adult shells and the number of irregular shells (30%) is indicative of natural oyster beds rather than cultivated beds.
- 4.3.7 Where oysters are cultivated they are separated resulting in more regularly shaped, rounded shells. Pests such as the Sting Winkle or Oyster Drill (*Ocenebra erinaceus*) and the Dog Whelk (*Nucella lapillus*), which predate on the oysters, are removed (Bertram 1873, 257) resulting in few bore holes. The variation in size would also support this as farmed oysters are usually of a more consistent size. There were no incidents of rake holes which would again suggest the oysters were either handpicked or dredged.

## **5. Conclusion**

- 5.1 In conclusion it is likely that the oyster shells from both the Romano-British period and the Hessian camp were sourced from oyster beds at the mouth of the river Test at Southampton Water or along the Solent where estuarine conditions exist along with mud and sand. The site at Barton Farm is only some 17 miles from the Solent and the journey would be easily achieved in a day.
- 5.2 With the limited amount of shell recovered from both periods it suggests that oysters and other marine species were only a very small part of the diet.
- 5.3 With such small samples conclusions should be considered as tentative. Further analysis, including more detailed measurement, should be considered if larger deposits of shells are excavated in the future.

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## Appendix A

## Quantity and weight of shell recovered and discards

<b>Context Fill</b>	<b>Context Cut</b>	<b>Description</b>	<b>No</b>	<b>Wt (g)</b>	<b>Dis UM</b>
		<b>Romano-British - Totals</b>	<b>37</b>	<b>520</b>	
<b>10056</b>	10055	Single fill of pit	3	27	
<b>10087</b>	10086	Single fill of rubbish pit	1	14	
<b>10157</b>	10156	Fill of empty grave cut	1	2	
<b>10195</b>	10193	Fill of grave cut	4	91	
<b>10220</b>	10218	Uppermost secondary fill of ditch terminus	1	19	2 of 9g
<b>10256</b>	10253	Uppermost secondary fill of ditch	1	12	
<b>10338</b>	10335	Upper secondary fill of ditch	1	18	
<b>10372</b>	10370	Lower fill of rubbish pit	1	8	
<b>10409</b>	10408	Upper fill of possible enclosure/boundary ditch	1	13	
<b>10441</b>	10440	Fill of ditch	1	25	
<b>10487</b>	10486	Fill of ditch	2	37	2 of 4g
<b>10607</b>	10606	Upper fill of ditch	1	13	
<b>10656</b>	10655	Lower fill of ditch	1	15	
<b>10819</b>	10819	Fill of ditch	1	25	
<b>10950</b>	10343	Fill of ditch	3	37	5 of 10g
<b>20013</b>	20012	Single fill of ditch	1	2	
<b>20069</b>	20068	Upper fill of ditch	5	58	
<b>60011</b>	60010	Fill of slot through aqueduct	1	21	
<b>60015</b>	60014	Fill of slot through aqueduct	1	17	
<b>60018</b>	60017	Moist fill of ditch associated with aqueduct	3	83	
<b>60035</b>	60010	Fill of aqueduct within water channel	1	14	
<b>60071</b>	60070	Lower fill of slot through aqueduct	2	10	
		<b>Post Medieval- Hessian Camp Totals</b>	<b>270</b>	<b>3,979</b>	
<b>30031</b>	30018	Top fill of latrine	6	73	
<b>30058</b>	30018	Fill of latrine	2	45	
<b>30098</b>	30096	Bottom fill of circular subterranean dug out	17	207	3 of 14g
<b>30099</b>	30096	Upper fill of circular subterranean dug out	11	182	1 of 4g
<b>30178</b>	30096	Fill of circular subterranean dug out	9	135	1 of 4g
<b>30181</b>	30096	Fill of circular subterranean dug out	22	290	2 of 3g
<b>30242</b>	30096	Slot between field kitchen group [30007] and subterranean dug out	1	14	
<b>30129</b>	30126	Bottom fill of southern access trench around Hessian kitchen	4	12	1 of 6g
<b>30191</b>	30190	Primary backfill of subterranean dug out	1	10	
<b>30192</b>	30190	Chalky fill of subterranean dug out	1	9	
<b>30207</b>	30306	Upper fill, redeposited chalk, of subterranean dug out	191	3023	5 of 37g UM
<b>30226</b>	30206	Backfill of fireplace [30225]&[30227] in dug out	1	10	
<b>40021</b>	40020	Top fill of subterranean dug out [40020]	3	23	
<b>50006</b>	50004	Middle fill of subterranean dug out [50004]	1	12	
		<b>Total</b>	<b>307</b>	<b>4499</b>	

Appendix B  
 Analysis of infestations and shell features - Romano-British contexts

Context No.	No. LEFT	No. RIGHT	Weight (g)	<i>Polydora ciliata</i>	<i>Polydora hoplura</i>	<i>Cliona celata</i>	Calcareous tubes	Barnacles	Bryozoa	Bore holes	Sand tubes	Thin	Thick	Heavy	Chambered	Chalky deposit	Worn	Flaky	Colour / stain	Oysters attached	Irregular shape	Notches / cuts
10056	2	1	27	0	2	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	1	0
10087	1	0	14	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
10157	0	1	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10195	3	1	91	0	2	1	0	0	0	0	0	1	1	2	1	3	0	0	0	0	0	0
10220	1	0	19	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0
10256	0	1	12	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
10338	0	1	18	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
10372	0	1	8	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0
10409	0	1	13	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0
10441	1	0	25	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	1	0
10487	2	0	37	0	1	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	0	0
10607	0	1	13	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10656	0	1	15	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
10819	0	1	25	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
10950	2	1	37	0	3	0	0	0	0	0	0	1	0	0	2	2	0	3	2	0	1	
20013	1	0	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
20069	3	2	58	0	2	0	0	0	0	0	0	1	0	0	1	3	0	0	2	0	0	1
60011	0	1	21	0	0	0	0	0	0	0	0	0	1	1	0	1	1	0	0	0	0	0
60015	1	0	17	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
60018	2	1	83	0	1	0	0	0	0	0	0	0	2	0	0	2	2	1	0	0	2	0
60035	1	0	14	0	1	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	0
60071	2	0	10	0	1	0	0	0	0	0	0	0	0	0	0	0	1	2	1	0	0	0
<b>Total</b>	<b>22</b>	<b>15</b>	<b>520</b>	<b>3</b>	<b>20</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>6</b>	<b>4</b>	<b>5</b>	<b>16</b>	<b>6</b>	<b>9</b>	<b>9</b>	<b>0</b>	<b>8</b>	<b>1</b>
%	<b>59</b>	<b>41</b>		<b>9</b>	<b>60</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>27</b>	<b>18</b>	<b>12</b>	<b>15</b>	<b>48</b>	<b>18</b>	<b>27</b>	<b>27</b>	<b>0</b>	<b>24</b>	<b>3</b>

Appendix B  
Analysis of infestations and shell features - Post-Medieval contexts

Context No.	No. LEFT	No. RIGHT	Weight (g)	<i>Polydora ciliata</i>	<i>Polydora hoplura</i>	<i>Citona celata</i>	Calcareous tubes	Barnacles	Bryozoa	Bore holes	Sand tubes	Thin	Thick	Heavy	Chambered	Chalky deposit	Worn	Flaky	Colour/stain	Oysters attached	Irregular shape	Notches/cuts
30031	4	2	7	1	6	1	0	0	0	2	1	0	1	0	5	3	0	2	4	0	1	0
30058	2	0	45	1	2	0	0	0	0	1	0	0	2	1	1	0	0	1	2	0	0	0
30098	6	11	207	1	4	0	0	0	0	0	0	1	2	0	0	2	3	3	3	0	1	2
30099	1	10	182	2	6	0	0	0	1	0	0	2	1	2	0	0	6	1	1	0	3	1
30129	3	1	12	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0
30178	5	4	135	1	2	0	0	0	0	1	0	0	2	2	0	0	5	2	2	0	0	0
30181	10	12	290	2	5	0	0	0	0	0	0	3	4	3	0	5	7	3	6	1	5	0
30191	1	0	10	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
30192	1	0	9	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	1	0
30207	108	83	3023	1	74	6	1	11	2	27	2	22	30	14	38	81	3	13	131	24	62	1
30226	1	0	10	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	1	0	0	0
30242	1	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
40021	2	1	23	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0
50006	1	0	12	0	1	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	1	0
<b>Totals</b>	<b>146</b>	<b>124</b>	<b>3979</b>	<b>9</b>	<b>102</b>	<b>7</b>	<b>1</b>	<b>11</b>	<b>3</b>	<b>31</b>	<b>3</b>	<b>30</b>	<b>42</b>	<b>22</b>	<b>45</b>	<b>92</b>	<b>31</b>	<b>25</b>	<b>153</b>	<b>25</b>	<b>74</b>	<b>4</b>
<b>%</b>	<b>54</b>	<b>46</b>		<b>4</b>	<b>41</b>	<b>3</b>	<b>0.4</b>	<b>4</b>	<b>1</b>	<b>12</b>	<b>1</b>	<b>12</b>	<b>17</b>	<b>9</b>	<b>18</b>	<b>37</b>	<b>12</b>	<b>10</b>	<b>61</b>	<b>10</b>	<b>30</b>	<b>2</b>
<b>Grand Totals</b>	<b>168</b>	<b>139</b>	<b>4499</b>	<b>12</b>	<b>122</b>	<b>8</b>	<b>1</b>	<b>11</b>	<b>3</b>	<b>31</b>	<b>3</b>	<b>39</b>	<b>48</b>	<b>26</b>	<b>50</b>	<b>108</b>	<b>37</b>	<b>34</b>	<b>162</b>	<b>25</b>	<b>82</b>	<b>5</b>
<b>%</b>	<b>55</b>	<b>45</b>		<b>4</b>	<b>40</b>	<b>3</b>	<b>0.3</b>	<b>4</b>	<b>1</b>	<b>10</b>	<b>1</b>	<b>13</b>	<b>16</b>	<b>8</b>	<b>16</b>	<b>35</b>	<b>12</b>	<b>11</b>	<b>53</b>	<b>8</b>	<b>27</b>	<b>2</b>