

# Shell Midden

## Shell Midden

Shell midden material consists of molluscan faunal remains that form part of an Aboriginal place and are related to Aboriginal occupation. This material is considered part of the wider category of faunal remains, which are non-human animal remains, including the remains of both native and introduced species. The Shell Midden component allows for the recording of cultural deposits of molluscan fauna (shellfish). To record non-molluscan fauna, the non-lithic Artefact Table within the Artefact Scatter component form must be used (see Artefact Scatter and Low Density Artefact Distributions).

For all faunal remains which do not have a known origin, please refer to the section on Aboriginal Object Collections for recording guidance.

### 1.1 Establishing Cultural Origin of Shell Deposits

The origin of shell deposits **must** be carefully assessed in terms of whether they are the result of cultural or natural processes. Natural processes can result in shell deposits, such as shell beds, that are visually similar to cultural middens.

1. Cultural shell midden deposits can be distinguished from natural shell deposits by:
  - (a) the range of shell species represented:
    - (i) middens tend to comprise mainly one or two mollusc species, usually in a consistent size range
    - (ii) natural or storm deposits tend to comprise a range of mollusc species in a range of sizes
  - (b) the presence of other Aboriginal cultural heritage material (which must be recorded using the appropriate component forms):
    - (i) charcoal
    - (iii) flaked stone artefacts
    - (iv) fire-cracked rocks/burnt stone
    - (v) animal bone (particularly native / indigenous species)
    - (vi) Ancestral Aboriginal Remains
    - (vii) other cultural material.





## 1.2 Completing a new shell midden component form

Where fields are mandatory, they have been marked with an asterisk (\*).

### 1.2.1 *Extent descriptions for shell middens*

Where applicable, the following points must be included within extent descriptions for Shell Middens.

#### 1. Summary of direct observations about the shell midden

A short summary of the nature of the place and how it is being recorded. It should include, where relevant:

- (a) summary of observed species and associations with any other Aboriginal cultural heritage
- (b) if there are unique features about the shell midden, such as variation in observed species, densities or stratification, that are being treated as separate components
- (c) description of the shell midden's context e.g. surface/subsurface, any direct associations with landforms, sediments or other features
- (d) summary of the methodology employed as part of the assessment to locate the shell midden (e.g. subsurface excavation or surface survey). Any broader observations about the results of the assessment and unique features of the location relative to the overall results of the assessment
- (e) a summary of any archival research conducted that influenced the extent of the place.


#### 2. Summary of any constraints or limitations to the survey or subsurface testing (where applicable)

If there were limitations to the survey or subsurface testing, these should also be identified. These may include scenarios such as the following:

- (a) extent testing was constrained by the limits of the activity area
- (b) any obstructions to testing and survey, i.e. existing structures or dangerous materials (e.g. asbestos)
- (c) observations about areas of prior disturbance where testing was limited or absent and why.

#### 3. Predictive statements (if constraints/limitations were encountered)

Where there were constraints to the assessment of the shell midden's full nature and extent, a predictive statement is required to describe the likely extent of the place or at minimum where it may extend. This statement must be based on direct observations, knowledge about the constraints and information available from background research or desktop assessment.



Example A: an extent description based on direct observation only and landform:

*A surface and subsurface scatter of midden material was recorded on top of a dune crest. The dune is located at the confluence of a small unnamed estuary and Beach River. An initial survey recorded a small (2 x1 m) surface exposure of midden material, and subsequent subsurface testing identified a single stratified midden deposit within three 1x1m test pits on the crest and upper slopes of the hill. A total of 300 grams of shell material was recovered from the excavated deposits across all three test pits between Spit 1 and Spit 3 and consisted of Beaked Mussel (200 g/66%), Pipi (50 g/17%) and Abalone (50 g/17%). Subsurface testing on the lower slopes of the dune and the surrounding swale determined midden material was absent. Therefore, the extent of the shell midden is defined by the crest and upper slopes of the dune.*

Example B: an extent description that addresses all three points:

*An extensive surface scatter of midden material was recorded on the western bank of Beach River during survey and subsurface testing. Survey and subsurface testing on the plain that continues west beyond the bank did not identify any cultural heritage material. The western bank of Beach River is in the north-west of the activity area and continues for 300 metres beyond the activity area before terminating at the foot of steep cliffs. However, only that portion that was within the activity area was investigated (an area of approximately 900 sqm). Of the examined surface scatter, shell species were found to consist primarily of limpet (50%), with turbo (30%) and Ostrea (20%) also present. The scatter was evenly distributed across the portion of the riverbank within the activity area.*

*Further, the excavation of a single 1x1m test pit identified 10 grams of Limpet shell and three lithic artefacts (two flint complete flakes and one silcrete scraper) within the top 0.1m of the test pit within a sediment that may be described as silty sand. The assemblage of the recorded shell was highly fragmented, particularly for the surface material. Observations of the river indicate it has been impacted by cattle trampling; therefore, subsurface testing was targeted to the more intact portion of the bank. The place extent is defined by the riverbank landform element and the activity area; however, it could be expected that the scatter would extend north to the limits of the riverbank.*

### 1.2.2 **Other considerations**

- (a) Is the midden material an extension to a previously recorded Aboriginal Place? Is it the same landform, context, etc? Should it be recorded by a Record Edit? Compare and analyse. If a new Aboriginal Place is submitted, an argument for why it is necessary to register these as separate Aboriginal Places is required.

### 1.2.3 **Name & Location tab**

#### **Component name**

This field is an opportunity to specify a unique name for a component when there are two or more components, especially of the same component type. This is also useful when components are being used to distinguish between different stratigraphic layers within midden deposits or areas of different densities.



### Component location\*

This section is composed of three fields that specify the location of the component:

Easting*	Northing*	Zone*
----------	-----------	-------

The system automatically pre-populates these fields based on the PGC for the place, but they may be changed if necessary.

Considerations:

- (a) The component Easting and Northing (also referred to as Component Grid Coordinate or CGC) for one component of the Aboriginal place record must be the same as the PGC.
- (b) Where there is more than one component, each subsequent component must have a unique Easting and/or Northing.

### 1.2.4 ***Analysis tab***

#### **Environment**

Composed of three fields, this section requires details about the environment and context of the shell midden.

#### **Environment\***

Select a category that describes the immediate environment of the midden. See the glossary for the definitions of shell midden environment options.:

estuarine	lake	muddy shore	river
rocky shore	sandy shore	other (specify)	

**NB:** consideration should be given to the environmental conditions present at the place at the time of deposition when completing this field.

#### **Water Type\***

Record whether the environment is freshwater or marine.

#### **Context\***

Select one or more of the following four options to describe the context in which the shell midden was found.

cave	open	overhang	subsurface
------	------	----------	------------

#### **Midden Area**

Composed of three fields, this section requires details about the surface visibility and which portion of the midden was examined.



### **Ground Surface Exposure\***

Input a number that describes the percentage of ground surface visible. Refer to Place Extents regarding determining the GSV present at an Aboriginal Place.

### **Has the whole midden area been examined?\***

Select Yes or No.

### **Area Examined (m<sup>2</sup>)\***

Provide a number to indicate in square metres the area of the midden examined. The answer to this question should relate back to whether the whole midden was examined and if it was only sampled this figure should reflect the area sampled.

This field is completed to indicate the sample size used in the *Midden Census Table*. State the area examined in square metres (m<sup>2</sup>).

**E.g.1:** The surface extent of the midden covers 25m<sup>2</sup>, but a 2m<sup>2</sup> area is excavated and analysed, as two 1x1m test pits. Therefore, *Area Examined* = 2m<sup>2</sup>

**E.g.2:** The surface extent of the midden covers 42m<sup>2</sup>, but a 1m<sup>2</sup> area is measured out with a 1x1m string line, and all shell elements, broken and whole, are counted and recorded. Therefore, *Area Examined* = 1m<sup>2</sup>

**E.g.3:** 6m of a midden lens is visible in the eroding profile (face) of a cliff-top dune, but no subsurface testing is required or proposed. A length of 1m of the lens profile is marked out, and the shell elements, complete and broken, in that 1m are counted and recorded. In the Supporting Documentation's Additional Information field, the submitter describes the visibility of the lens profile, that no subsurface testing is required, and that the area examined is 1 linear metre, not 1 square metre.

### **Has excavation occurred?\***

Select Yes or No.

If yes is selected, the *Sediment Analysis Table* appears and details of the stratigraphy of the excavation pit in which shell midden material were encountered must be provided.

### **Sediment Analysis Table**

For definitions of the terms used in this table refer to the glossary (S.1.3). Each row in the table corresponds to one layer, horizon, or sediment deposit.

#### **Layer/Deposit (no. or name)\***

Provide a number or name for the excavated layer (e.g. Spit 1, XU 5, SU 3).

#### **Excavated area (no. or name)\***

Provide the number or name of the excavated area (e.g. STP 9, TP 23, Auger 7).

#### **Artefacts Present (Y/N)\***

Indicate whether artefacts are present within the layer.



### Max. density of cultural material (sqm)

Indicate the maximum density of cultural heritage per square metre in the layer.

### Min. density of cultural material (sqm)

Indicate the minimum density of cultural heritage per square metre in the layer.

### Sediment\*

Use this field to describe the composition of the sediment within the layer/deposit<sup>1</sup>.

clay	clayey silt	gravel	peat
sand	sandy clay	sandy silt	silt
silty clay	silty sand		

### Compaction\*

Select a category which describes the consistency of the sediment within the layer/deposit

compact	firm	friable	hard
indurated	loose	plastic	soft
spongy	stiff	strongly cemented	very soft
weakly cemented			

### Colour (Munsell)

Provide the colour of the layer/deposit in the standard format described in the Munsell Soil Colour Chart.

### pH reading

State the pH level of the layer/deposit as a numeral, taken from a pH test kit.

### Midden Type

Select a category which describes the shell midden layer/deposit

indeterminate	stratified	surface scatter
---------------	------------	-----------------

(a) **indeterminate**: one entry only is required for intermediate middens

(b) **stratified**: one or more entries are required for stratified middens

(c) **surface scatter**: one entry only is required for surface scatters

---

<sup>1</sup> Sediment texture options are based on McDonald and Isbell's (2009) field texture grade.



**Total Number of Layers**

If stratified is selected, record the total number of stratified layers.

**Midden Census Table**

The midden census is used to record details of the material in the midden. If the midden is stratified, a midden census entry is required for each stratified layer. If the shell midden material is a surface scatter or indeterminate, complete one midden census entry.

**Layer number\***

Indicate the layer/lens number as appropriate. Include '1' for surface scatter or indeterminate midden type

**Average thickness of layer (m)**

Record the average thickness of the midden layer/lens in metres.

**Average depth of the layer below the surface (m)\***

Record the depth below the surface to the top of the layer/lens. Record this depth in metres.

**Non-Shell Contents**

Record non-shell contents within the shell midden.

Ancestral Remains	charcoal	earth/soil features	manuports
non-human bone (specify)	stone / non-stone artefacts	stone features	other (specify)

Except for charcoal, all non-shell material associated with a shell midden must be recorded separately as specific components

For Aboriginal Ancestral Remains, complete the *Aboriginal Ancestral Remains Component (Burial) Form*.

For animal bone (i.e. non-molluscan fauna), complete the *Artefact Scatter Component Form*.

For earth/soil features, complete the *Earth Feature Component Form*.

For stone features, complete the *Stone Feature Component Form*.

For lithic/non-lithic artefacts, complete the *Artefact Scatter Component Form*.

**N.B.:** an LDAD cannot form part of a multi-component Aboriginal place.

**Shell Genus Census Table**

To complete the *Shell Genus Census Table*, a midden sample must be analysed. This can be in the form of:

- (a) a surface count of visible elements of a surface midden distribution, in a stated area (i.e. 1 x 1m square)
- (b) during subsurface testing in the form of an excavated bulk sample.



The analysis must be systematic and account for the relative frequency (i.e. %) in Minimum Number of Individuals (MNI) for the sample (Reitz & Wing, 2008).

**Shell Genus\***

Select the shell genus:

<i>Alathyria</i>	<i>Anadara</i>	<i>Austrochochlea</i>	<i>Austromytilus</i>	<i>Cabestana</i>
<i>Cellana</i>	<i>Chiton</i>	<i>Conus</i>	<i>Donax</i>	<i>Glycymeris</i>
<i>Haliotis</i>	<i>Katylisia</i>	<i>Mactra</i>	<i>Mytilus</i>	<i>Nerita</i>
<i>Notopala</i>	<i>Ostrea</i>	<i>Paphies</i>	<i>Polinices</i>	<i>Saccostrea</i>
<i>Scutus</i>	<i>Thais</i>	<i>Turbo</i>	<i>Velesunio</i>	<i>Unknown</i>

**N.B.:** For genus identification purposes, refer to First Peoples State Relations’ (2023) *A Guide to Shells Commonly Found in Aboriginal Shell Middens*, which can be found on the FPSR website, or a reputable shell identification manual.

**N.B.:** Genus and species names can be subject to change, resulting in species names varying in different publications.

**% of Layer/Scatter\***

Indicate the proportion of the samples total MNI that is made up of this genus. E.g. *Paphies* accounts for 43% of the total sample MNI.

**% Whole**

Calculate and indicate the relative frequency (%MNE) of the elements of this genus that are complete. E.g. There are 100 *Paphies* hinges in the sample, 62 of them are part of complete *Paphies* valves, therefore 62% of the *Paphies* elements are whole.

**% Broken**

Calculate and indicate the relative frequency of the elements of this genus that are broken or incomplete. E.g. There are 100 *Paphies* hinges in the sample, 62 of them are part of complete *Paphies* valves, therefore 38% of the *Paphies* elements are broken.

**% Burnt**

Calculate and indicate the relative frequency of the elements of this genus that are burnt or incomplete. E.g. There are 100 *Paphies* hinges in the sample, nine of them show evidence of burning, therefore 9% of the *Paphies* elements are burnt.

**1.2.5 A note on midden analysis**

To assist in the comparability between registered Aboriginal Shell Middens, users are encouraged to use the *Midden Census & Shell Genus Catalogue* template for all Shell Midden Components. The excel template *Midden Census & Shell Genus Catalogue.xlsx* can be found on the FPSR website.

If it necessary to record other attributes or details, new fields may be added to the existing template and saved as a separate spreadsheet.





## 1.2.6 *Supporting Documentation*

### **Non-Spatial Attachments**

- (a) Midden analysis spreadsheets\* (**required** where entries have been made in the midden census table).

**NB:** users are encouraged to use the *Midden Census & Shell Genus Catalogue.xlsx* which can be downloaded from the FPSR website to ensure consistency and comparability between all midden assemblages

Photographs of a representative sample<sup>2</sup> of the artefacts\*. Photographs of the context of the place that would aid in relocation of the place or are illustrative of the condition of the place components, including any locations containing disturbance or harm\*. Photographs must be fully labelled using the following convention for file names:

name of Aboriginal place / image title      date / year      photographer      description

E.g.: Talking Dog shell midden\_12\_Apr\_2023\_Joe Bloggs\_Nth view of shell midden.jpg.

The following **optional** documents can also be uploaded:

- (b) Photographs of the stratigraphic profile at the completion of excavation
- (c) Component extent plan
- (d) Illustrations of the stratigraphic profile if the shell midden material was found subsurface
- (e) Documents containing further contextual information about the shell midden material
- (f) Residue analysis details
- (g) Dating results documentation.

### General note on non-spatial attachments

Where documents are attached, an indication of sensitivity must be provided. VAHR policy states that documents automatically gain a sensitivity rating where they contain specific details relating to Aboriginal Ancestral Remains. However, a RAP or Traditional Owner may request a document be marked as sensitive for other reasons.

If Yes is selected, a reason for sensitivity must be provided in the text field.

It is preferable that where documents relate specifically to one component, that they are uploaded to that component form. However, if necessary, documents may be added to the *Supporting Documentation* tab on the place form.

If there are multiple photos, which are difficult to describe succinctly in the photo file names, submit a photo catalogue document that lists the photo file name and describes the features shown and the direction of the view.

---

<sup>2</sup> Representative sample refers to a curated selection that is illustrative of the nature of the place and assemblage. Consider grouping midden material by genus, environment, recovery depth or testing location.



### **Spatial attachments**

Types of spatial data that may be uploaded include:

- (a) a dataset containing a polygon feature of the component extent
- (b) a dataset containing a point feature of the component grid coordinates
- (c) a dataset containing polygon or point features for the location of each lens recorded
- (d) a dataset or datasets containing polygon or point features showing the locations where samples were taken.

**N.B.:** All spatial data must be provided in either ESRI shapefile or MapInfo .TAB file formats, with a GDA94 projection.

### **Additional Information\***

This is a free text field which can be used to describe any other details about the component which cannot be recorded elsewhere.

This may include a summary of the component including its overall dimensions in square metres, and a note of any other associated components for multi-component Aboriginal places.



## 1.2.7 Component Glossary- Shell Midden

**estuarine/muddy shore:** marine environment characterised by the presence and deposition of fine-grained particles in low energy, semi-enclosed environment e.g. enlarged areas around river mouths, tidal mudflats

**element:** in reference to faunal remains, element is the type of bone (eg: scapula, tibia) or specific shell feature (eg: valve hinge, apex)

**indeterminate:** subsurface midden lacking clear stratification or separation between layers

**lake:** inland shore environment that has been created by the fluvial processes of large (generally) freshwater-filled depressions

**non-molluscan fauna:** any faunal remains present at an Aboriginal Place that are not of the phylum Mollusca. These can include both native and introduced species utilised by Traditional Owners.

**manuport:** literally meaning “carried by hand”. These are stones that do not have any artefactual characteristics (i.e. battering, flaking, grinding), but are found in association with other Aboriginal cultural heritage material, and their material is not sourced from the local area; they have therefore been carried there by people. Manuports used to process molluscs may also lack clear diagnostic attributes (ie: pitting), due to the softness of the shell material relative to the stone manuport.

**molluscan fauna:** soft bodied invertebrate of the phylum Mollusca, usually wholly or partly enclosed by a calcium carbonate shell and found in Aboriginal Shell Middens. For the purposes of the Standards, these include molluscan classes; *Bivalvia*, *Cephalopoda*, *Gastropoda*, *Polyplacophora*, *Scaphopoda* and *Monoplacophora*.

**minimum number of individuals (MNI):** An analytical estimate drawn from the NISP. MNI is the smallest number of individuals necessary to account for all the skeletal elements (specimens) of a particular species present in an assemblage (Reitz & Wing, 2008, pp. 205-213). A reasonable understanding of the relationship between MNI and Minimum Number of Elements (MNE), and how they are calculated, is required to complete the midden census table.

**minimum number of elements (MNE):** minimum number of complete skeletal elements necessary to account for all observed specimens. The estimate is based on the number of whole elements that can be reconstructed from identified specimens (Reitz & Wing, 2008, p. 227). A reasonable understanding of the relationship between MNI and Minimum Number of Elements (MNE), and how they are calculated, is required to complete the midden census table.

**number of identifiable specimens (NISP):** A primary specimen count. Counted number of identified specimens grouped by species/taxa. (ie: Chiton Plate =761, Trout Otolith = 5). These values can be used estimate the relative abundance of taxa within an assemblage (Reitz & Wing, 2008, pp. 202-204).

**non-repetitive element (NRE):** in reference to molluscan fauna, NRE is an element that represents a single living, complete living mollusc and that can be counted a limited number of times (ideally, once) for a complete mollusc (eg. valve hinge, apex) (Burke, et al., 2017, p. 307).

**river:** inland environment of floodplains, gorges, gullies and mudflats that have been created with river processes

**rocky shore:** coastal environment characterised by rock platforms and rocks



**sandy shore:** coastal environment characterised by presence of sand

**specimen:** a non-human skeletal element.

**stratified:** one or more discrete in situ layer of Aboriginal cultural material separated by sediment. A single in situ midden lens or deposit is considered a stratified midden.

**terrestrial:** inland environments where the fauna species do not generally nest or spend most of their time in lake or river environments.

**other (specify):** may be used where faunal remains are sourced from more than one origin environment, such as terrestrial and estuarine.



## References

Burke, H., Morrison, M. & Smith, C., 2017. *The Archaeologists Field Handbook*. 2nd ed. Crows Nest: Allen & Unwin.

First Peoples - State Relations, 2023. *Guide to shells commonly found in Victorian Aboriginal shell middens*, Melbourne: Department of Premier and Cabinet, State of Victoria.

McDonald, R. C. & Isbell, R. F., 2009. Soil Profile. In: *Australian Soil and Land Survey Field Handbook (No.1)*. 3rd ed. Collingwood, Vic: CSIRO Publishing, pp. 147-204.

Reitz, E. J. & Wing, E. S., 2008. *Zooarchaeology*. 2nd edition ed. Cambridge, UK: Cambridge University Press.

## 1.3 Checklist

**Table 1. Shell midden & faunal remains registration checklist**

	Registration Detail	Completed?
1	Check PGC and place extent spatial data	<input type="checkbox"/>
2	Describe how the place extent was determined, and what characteristics were identified to interpret the deposit as cultural	<input type="checkbox"/>
3	Environment:	<input type="checkbox"/>
	a) Environment	<input type="checkbox"/>
	b) water type	<input type="checkbox"/>
	c) context	<input type="checkbox"/>
4	Midden area:	<input type="checkbox"/>
	a) ground surface exposure (%)	<input type="checkbox"/>
	b) area examined (m <sup>2</sup> )	<input type="checkbox"/>
5a	Has excavation occurred? Yes or No	<input type="checkbox"/>
5b	If yes, complete the sediment analysis table:	<input type="checkbox"/>
	i) layer / deposit name or number	<input type="checkbox"/>
	ii) excavated area name or number	<input type="checkbox"/>
	iii) presence of artefacts	<input type="checkbox"/>
	iv) Sediment description - composition, compaction	<input type="checkbox"/>
	v) Colour (Munsell) and pH Reading	<input type="checkbox"/>
6	Midden type: stratified, surface scatter or indeterminate	<input type="checkbox"/>
7	Total number of layers (stratified only)	<input type="checkbox"/>
8	Midden census table (complete one entry for surface or indeterminate middens, and one entry for each stratified layer):	<input type="checkbox"/>
	layer number	<input type="checkbox"/>
	average thickness of layer (m)	<input type="checkbox"/>
	average depth of layer below the surface (to the top of the lens/layer) (m)	<input type="checkbox"/>
	non-shell contents: ancestral remains, charcoal, earth/soil features, manuports, non-human bone, stone/non-stone artefacts, stone features, other (specify).	<input type="checkbox"/>
9	Shell genus census table:	<input type="checkbox"/>
	genus	<input type="checkbox"/>
	genus % MNI of total layer sample MNI	<input type="checkbox"/>
	% MNE of genus elements that are whole	<input type="checkbox"/>
	% MNE of genus elements that are broken	<input type="checkbox"/>
	% MNE of genus elements that are burnt	<input type="checkbox"/>
10	Provide Midden Census & Shell Genus Catalogue	<input type="checkbox"/>