ADS Scottish Database details

The idea of this database is to combine recording of high-resolution geographical co-ordinate information with detailed information on the use of coastal resources and food resources. This has been done in order to link the database to a GIS allowing visual interpretation of the distribution of sites and their related finds. Thus enabling a greater understanding of economy and resources in coastal regions in the Mesolithic/Neolithic transition period.

, for example. However the computer literacy and competency of the inputers also needs to be considered. The database must be securely designed to prevent inadequate data or accidental alteration of the database. These factors are ultimately is the greatest threat to the success of the database. Many other archaeological projects both past and present have had to make similar considerations in the context of their own research.

.3 The Finalised Database

The databse designed conttains a three-tiered hierarchy. The main site (named Metasite) is related to a Sub-site table (second level of Hierarchy –Site), where records are separated by fixed time periods (named time periods). So one Metasite can have two or more Sites where the location is identical, but the temporal data relates to more than one fixed time period, e.g. Mesolithic, Neolithic or any other named time period. At the third level of hierarchy a general object table has been created to provide a link to the many find tables and also a newly created date table (which combines information on real or diagnostic date information).

Figure 2.6 Showing the hierarchy of the final database

By adding an extra table (the Find General table) the cross linking from find

tables and date tables shown in figure 2.5 was abolished and now only one link is needed to connect all types of find (shown below in figure 2.7). Thus finally, a more rational design has been achieved, the end database design, which is detailed in the methodology below.

2.3.1 Database basics

The database created for this research is divided into twelve different tables of information. Each table containing information relevant either at site or find level. Each table is detailed in the following sections below. The simplified hierarchy shown in figure 2.6 above is broken down into smaller units in figure 2.7.

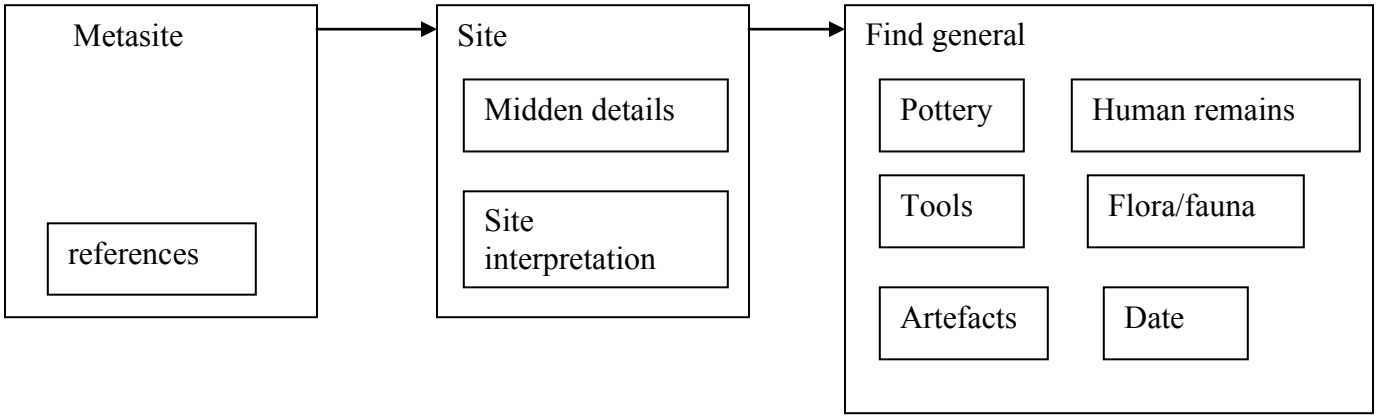
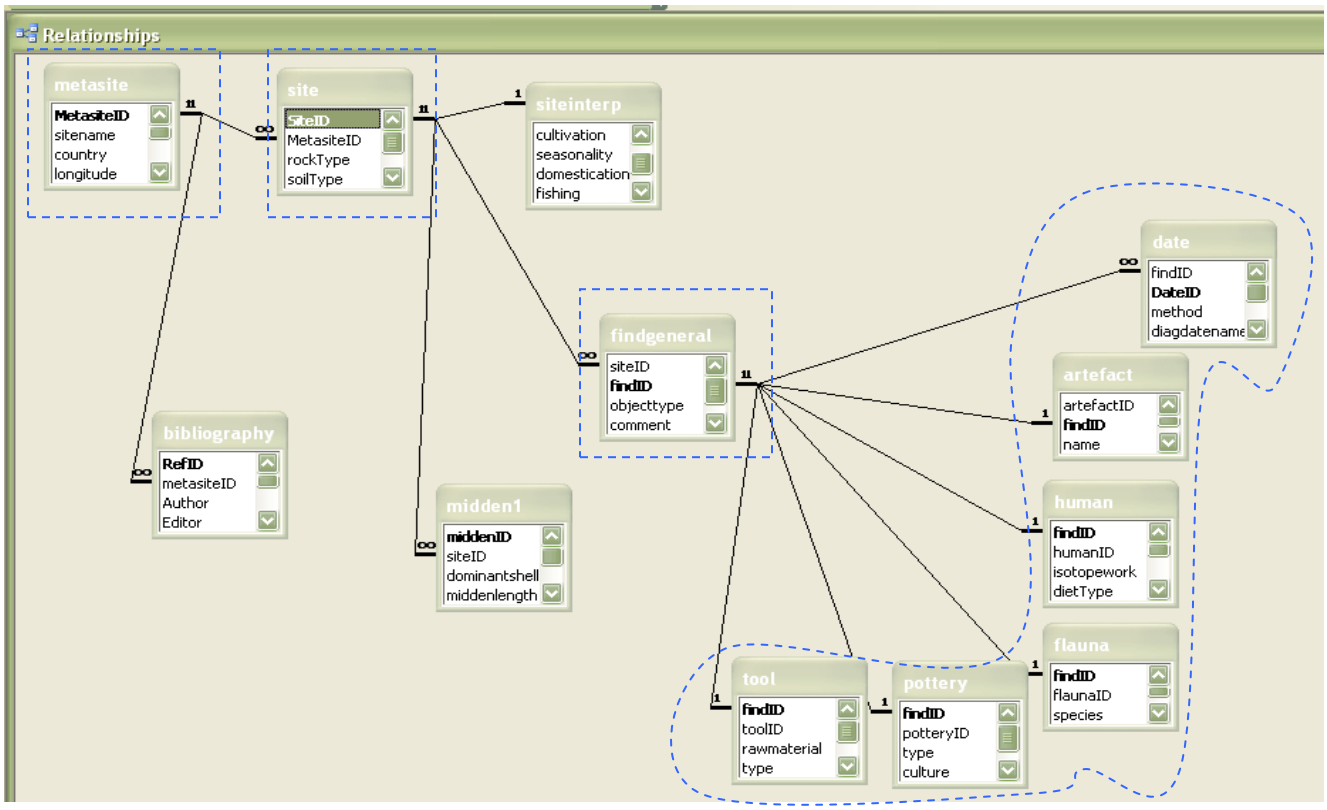


Figure 2.7 Shows a more detailed database heirachy. Illustrating the location of all tables

Through the hierarchical set up it is possible to record basic chronological information of a metasite (specific archaeological site location), through the creation of a 'Site' record for each chronological era. Then for each Chronological era, all finds can be recorded with or without an associated scientific or diagnostic date.

The 12 tables created in this project's database are joined to one another in quite a

complicated form (Shown in figure 2.8 below). The relationships can be identified where identical identifier fields e.g. Metasite ID, Site ID and Find ID allow tables to be linked as discussed earlier in the chapter introduction. I have tried to indicate the heirachical structure by outlining the different levels in blue dashed lines.



Circled in blue dots indicate tables key in the design of the relational database

Meta site – 1st hierarchical level (general details)
Site – 2nd hierarchical level (site details particular to specific time periods)
Find General – 3rd hierarchical level (which links general site information to the many find categories possible and also dates for finds)

Figure 2.8 Shows all the tables and their relationships as displayed in Microsoft Access, the lines between tables indicate relationships.

Using this database design, quite complex queries could be made on the database

involving find types, find quantities, find relationships to middens and more. Also information on sites in different locations, or involving different shore types or site types or site dates could also be investigated. For example if someone wanted to know how many human remains from the Neolithic were contained within shell middens, through the linked database all sites with middens which have evidence for human remains in them could be selected and also could be confined to only Neolithic records.

Although the database has been designed through a complex set of tables, the user interface is far less complex than the database design shown in figure 2.8. Only two separate pages need to be opened to record all the detail required for this project, figure 2.9.

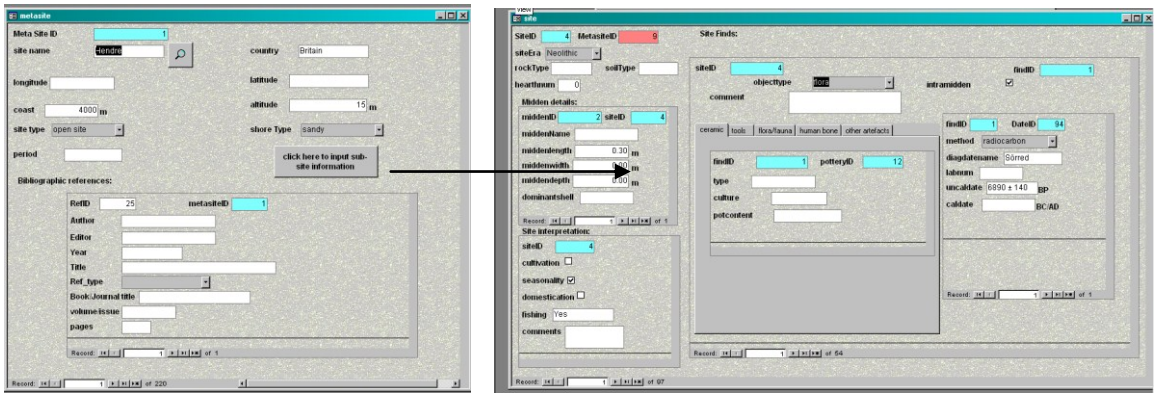


Figure 2.9 Shows the two page user interfaces, which incorporate all 12 of the linked tables in this project. This user interface design allows input of site data to be more straightforward. The first page records general site details and bibliographic detail. The second page records sub-site detail every record (page) relating to one chronological time period from a general site (named metasite). On the sub-site page all finds, middens, dates and site interpretation information is recorded

2.3.2 Table Design

In order to understand fully how the database was designed, the following sections detail all the fields included in each separate table within the database.

2.3.2.1 Database main site page

The front page of the database is called Metasite, it is the general site information page from which more detailed tables on chronology, finds and dates are linked. The most crucial fields in this table being site name and geographical coordinates, so that every site location is recorded and can later be plotted in GIS.

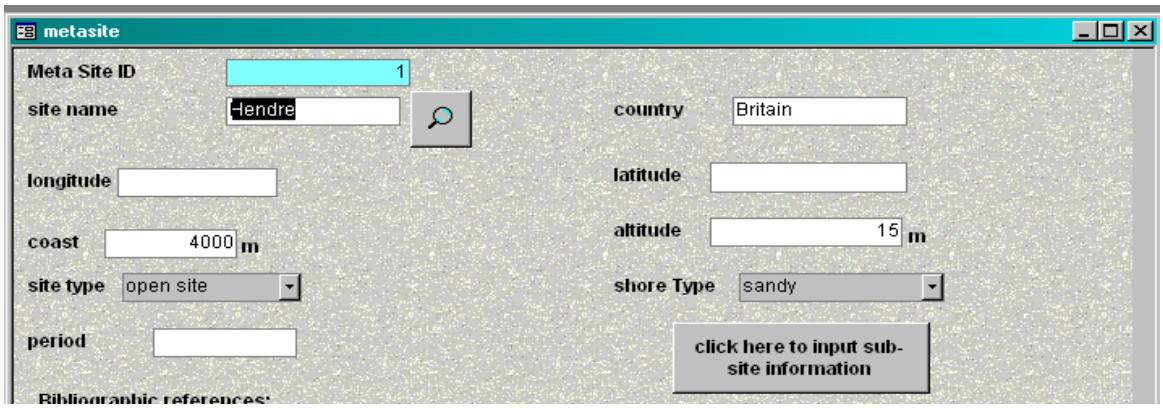


Figure 2.10 Showing the main front page interface of the database and the general details to be input on each site.

Field	Description	Reason for Inclusion
Meta Site ID	Key index number system. This is simply an automatic numbering system allowing every record to have a unique number	Each site has a unique identifier
Site Name	General known name for site as seen in written	So sites can easily be identified

	literature	
Click box 'Find Site'	A box which when clicked using the mouse, opens a query box where a full site name or first letter can be input to look for sites already input into the database	A useful tool for those inputting information into the database, to ensure there is no data duplication
Country	General region information	So records can be differentiated by country. (For the UK different regions are recorded)
Longitude Latitude	Coordinate information in WGS 84 format	For compatibility with GIS program
Coast	Distance from the modern coastline in metres	To allow a comparison with Holocene sea levels. Also provides a check system to prevent sites more than 5km inland being recorded, unless a site contains a large marine signature
Altitude	Height above modern sea level in metres	Useful general information to check against predicted altitude information obtainable using GIS
Site type	Fixed category system Open site Cave Rock shelter	To categorise site type, may give indications of different site use
Shore type	Fixed category system, Sandy Rocky Estuary (fixed category systems are discussed in section 2.3.2)	Simplifies possibilities for this field. The categorisation of shore type may indicate shell types present and also site use
Period	Records site temporal boundaries. If site contains more than one period the span of time will be recorded from earliest to latest. The names will be separated by a '-'. The periods are noted in broad literature based terms i.e.	General period reference to indicate the approximate age coverage of a site. If more than one period is recorded several 'sub site' records for each period will be included in the database

	Mesolithic, Neolithic, Medieval etc.	
Click box for sub-site table 'click here to input sub-site information'	A box which when clicked using the mouse opens the sub-site user interface, where detailed information on sites are recorded	Needed to access the other part of the database

Table 2.1 Explains each of the fields included in the database main site page.

4.3.2.2 Bibliography, sub-table

Attached to the Metasite page through a linked table, is a reference section. Allowing all references used in data input can later be retrieved. This will primarily be of use to the database users who may wish to know the sources used.

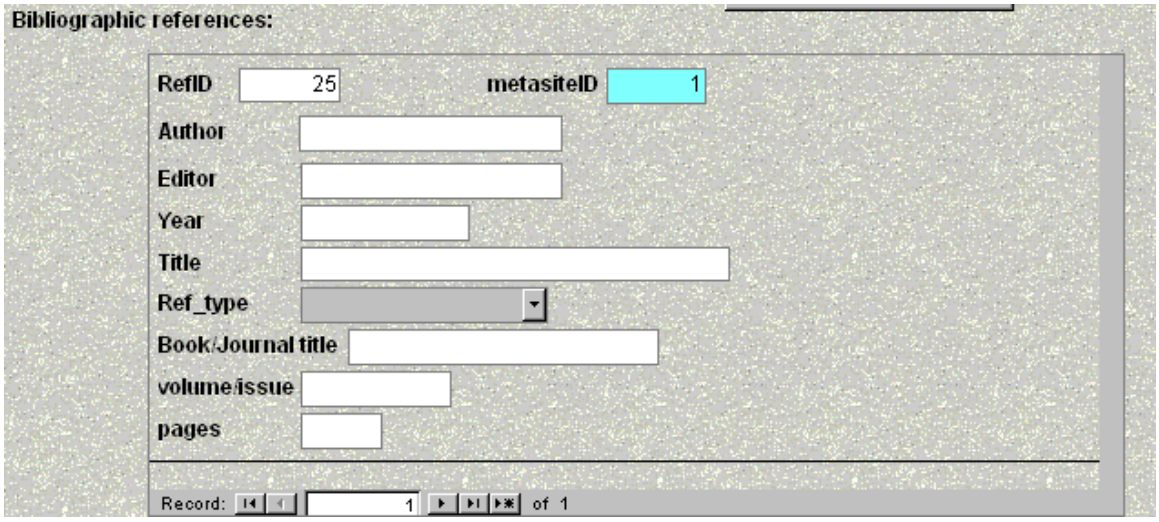


Figure 2.11 Figure showing the part of the database interface which contains the bibliographic table.

The fields included in this table simply help record all different source materials similar to bibliographic programs such as End Note (Thomson, www.endnote.com/)

2.3.3 Site details

The second user interface page of the database you navigate to from the first page by clicking on a box labelled ‘click here to input sub-site information’. This page allows one to record details on specific sites. This section is organised so that every ‘sub-site’ page contains all tables relating to finds and dates for a specific site location that additionally is confined to a specific time period i.e. all finds for the Mesolithic period of a site are recorded separately from Neolithic evidence. Many ‘sub-sites’ may be recorded for one metasite and for every ‘sub-site’ recorded, any number of finds, middens and dates can be recorded in association.

At the top left hand part of the ‘sub-site’ page general details including *site ID* (a unique identifier for each sub-site), *period of occupation*, *rock type*, *soil type*, *evidence for hearths* and also the related *Metasite ID* are recorded. The Metasite ID, a field mentioned in table 2.1, is the unique number given to every general site (Metasite) it is re-recorded on the sub-site page to enable the links of the relational database to work. Only by rerecording the Metasite ID from the first page of the database can the various sub-sites details be related to the Metasite details, i.e. geographical location and site name.

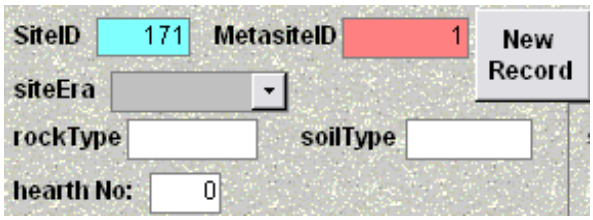


Figure 2.12 Shows the top left hand section of the sub-site page which records some general details connected to each sub-site which relates to each general time period for a Metasite. Fields include local rock type, soil type, number of hearth’s found. The different time period zones (Site era) used are mentioned in table 2.2 below. In this section is also a click box ‘new record’ which must be pressed at the start of any new ‘sub-site’ record otherwise the page will not validate as the relavant metasite ID will not have been properly assigned.

Field	Description	Reason for Inclusion
Site ID	Unique identifier for each	Needed for temporal

	chronological era	study, to separate out a site and finds according to general chronological phasing
Metasite ID	Identifier of mainsite, related to the metasite table (Table 2.1)	Identifier linking the sub-site sections to one main site.
Site Era	General chronological identifier 'Palaeolithic (250,000 – 8000 BC) Mesolithic (8000 – 4000 BC) Neolithic (4000– 2500 BC) Bronze age (2500 – 1,100 BC) Iron Age (1,100 – 500 BC) Roman (500 BC – 400 AD) Anglo-Saxon (400 – 1066 AD Viking (900 – 1066 AD) Norman (1066- 1485) Medieval (1485 – 1500 AD Later (1500 AD – Present)'	General categories chosen for the chronological eras as shown left have been left vague so that in analysis many sites can be compared
Rock type	Simple geological detail i.e. main rock type on site	Included at sub-site level as part of a site for one era may be related to a different rock type
Soil type	Main soil type on site	Included at sub-site level as part of a site for one era may be related to a different
Hearth no.	No. of human created fire places	No. of hearths located, useful evidence for fire and human occupation
Click box 'New Record'	Box that must be mouse clicked to set the 'Metasite ID' which is obtained from the relevant metasite	The click box is needed to ensure relations between 'metasite' and 'sub-site' are properly validated, so

	(general site page). For every new sub-site page created this box must be clicked first before any other details are entered	no cataloguing problems occur

Table 2.2 Showing the fields associated within the sub-site table, which is incorporated into the sub-site user interface, as shown in figure 2.8.

2.3.3.1 Midden details

Middens form a key site type at Mesolithic and some Neolithic coastal sites, thus it has been deemed important to record some details on shell middens. Fields included midden dimensions, in terms of length, width, depth and also the dominant shell found. Other details relating to shell middens can additionally be recorded in the finds table (section 2.3.3.3), where a tick box indicates whether any finds on a site were located within a midden.

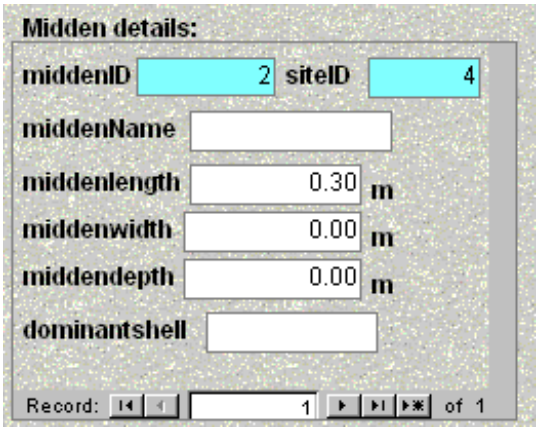


Figure 2.13 Shows the fields that record most information related to shell middens. On the sub-site user interface page this table is located on the left hand side underneath the sub-site general details described in section 2.3.3.

Field	Description	Reason for Inclusion
Midden ID	Unique identifier, autonumber	Unique identifier for every midden
Site ID	Identifier for sub-site record	Identifier linking midden to sub-site details
Midden name	Midden name	Name commonly used in literature for midden (can sometimes be different from general site name)
Midden length	Length in metres	the approximate

Midden width	Width in metres	dimensions of midden
Midden depth	Depth in metres	
Dominant shell	Shell present in greatest numbers	Might be useful indicating if dominant shells vary in different localities or in relation to different shore types

Table 2.3 Gives an explanation for the fields included in the midden table. For any given Sub-site i.e. a Metasite of a particular time period, any number of shell middens can be recorded.

2.3.3.2 Site interpretation

For each 'sub-site', general details on site interpretation are recorded to show indications of fishing and evidence for domestication, cultivation and seasonality. These are only recorded as tick boxes as although these economic indications are of interest, it is not the focus of the work. Thus detail of the evidence seasonality for economic or seasonality indicators are not required. However if any additional comments want to be added in relation to interpretative remarks on a site, they can be recorded in the comments box.

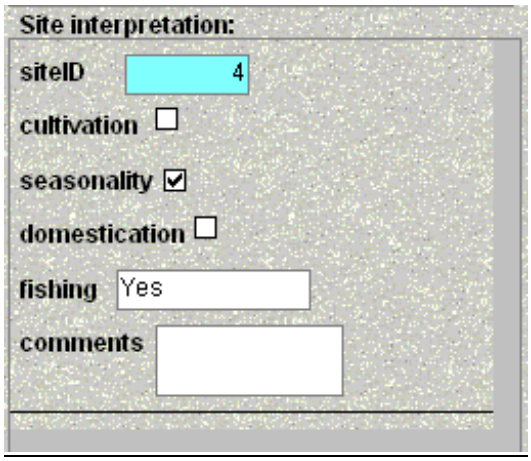


Figure 2.14 Shows fields that records interpretative evidence relating to the sub-site, located on the bottom left hand side of the Sub-site user interface page.

Field	Description	Reason for Inclusion
Site ID	Unique identifier for sub-site level	This limits recording to one entry for interpretative information for each chorological era of a site
Cultivation	Evidence for crops tick box	To give a general indication

Seasonality	Evidence for seasonal occupation, tick box	To give a general indication
Domestication	Evidence for domesticated animals, tick box	To give a general indication
Fishing	Evidence for fishing, write type of evidence	Evidence for specific fishing artefacts
Comments	Any other comments on the sub-site in general e.g. evidence for housing etc	A place to record features that could be interpreted that fit no other categories mentioned

Table 2.4 Explains the fields used in the site interpretation table shown in figure 2.13.

2.3.3.3 Site finds

The middle section of the 'Sub-site' user interface page is the general find section, within which all information regarding specific ceramic, lithic, flora, fauna, human remains and more unusual artefacts are recorded. The main table in this area is the 'general find' section where types of find, extra comments and a tick box indicating a finds contained within middens are recorded.

For every type of find different details are recorded, for example for ceramic and lithic evidence, find type is recorded i.e. scrappers, flakes, pot handles etc and for each find type the quantity is recorded in in the comments box in this section. For Flora and Fauna evidence every species type is recorded and if quantities are known this is recorded in percentage or total numbers per species. For Human remain evidence each individual is recorded or each piece of bone evidence if individuals are not identifiable. Lastly for other more unusual artefacts that do not fit into the categories already mentioned, individual finds are recorded. More details on find details recorded in sections 2.3.3.4 – 2.3.3.8 below.

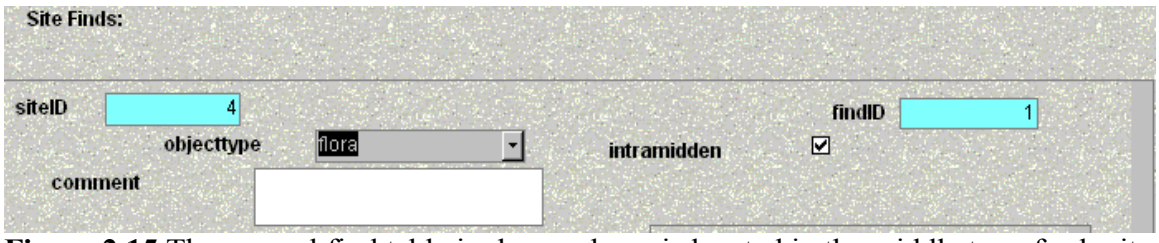


Figure 2.15 The general find table is shown above is located in the middle top of sub-site interface page.

Field	Description	Reason for Inclusion
Site ID	Unique identifier for sub-	Differentiates which era

	sites	this site belongs to for a site
Find ID	Each find will have a unique identifier	Each find (whether as a group or individual find) has a general find identifier so all types of find can easily be grouped together for analysis. Additionally, this field links all finds and dates to the 'sub-site' table
Object type	A list to define find category which relates to the separate find table 'Ceramic Tools Flora/fauna Human bone Artefact'	Splits finds into useful categories, a useful field useful for defining queries
Intramidden	Tick box for finds contained within middens	Useful for differentiating finds contained within middens
Comment	Any extra interesting or odd details about a particular find, find group. E.g. for lithics and ceramic quantity is recorded in this box	A chance to be able to record any extra details which might want to be incuded

Table 2.5 Explains the general finds table, which records general details such as find type for every find (or find group) entered.

2.3.3.4 Ceramics

The ceramic table records details of pottery artefacts, such as ceramic type, ceramic culture (where types have specific name related to pot typology) and also the content of the pot. The table it is linked to the 'general find' table discussed in section 2.3.3.3. By including categorised tables for types of find it allows details on finds to be recorded more efficiently with fewer redundant fields. If finds of all types had been

recorded in a single table many fields relating to find details would have been left blank every time a new find record was filled in. It should be noted that although the fields recorded in each of the five category find tables are fairly simple, the fact that different types of find have been categorised and put in separate tables will allow cross referencing queries on the completed database. For example a query could ask to select sites where there is evidence for TRB (Trichterbecker) ware and the faunal remains at the site are contained within a midden, thus very detailed queries will be possible.

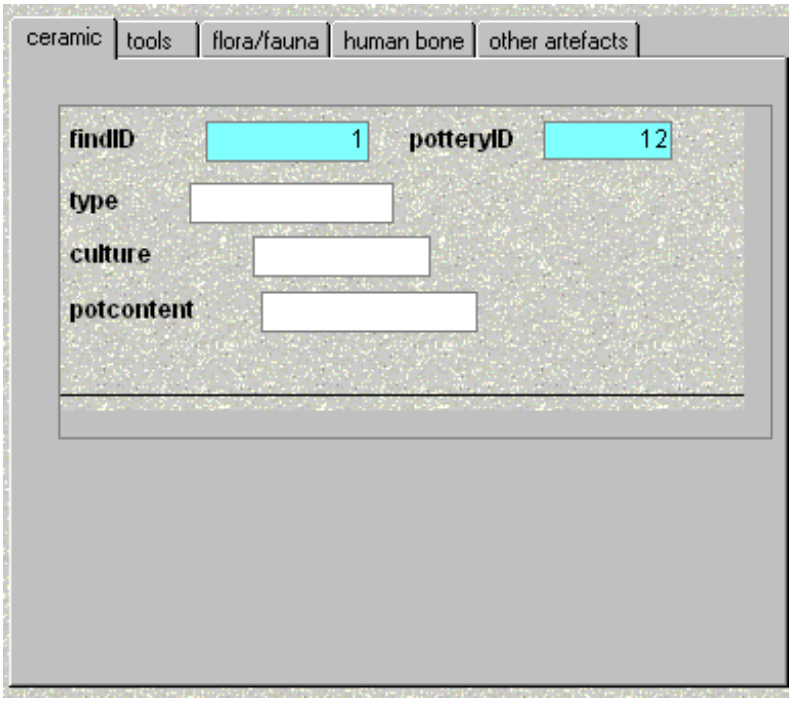


Figure 2.16 Shows the table with fields associated with ceramic finds.

Field	Description	Reason for Inclusion
Find ID	Unique identifier relating	Links the pottery table to

	to all finds	general find information
Pottery ID	Unique identifier for just ceramics	Allows pots to be queried and identified separately from other objects
Type	Pot type. e.g. base, handle, fragments etc or jug, wine vessel, cooking pots or decorated wares etc	May give evidence for type of occupation
Culture	Recorded if pot belongs to a known typology	May help understand the expansion of a culture
Pot content	Any residues present	May be interesting food consumption indicator

Table 2.6 Explaining the specific fields recording details on ceramic evidence.

2.3.3.5 Tools

The tools table is similarly another find category table linked to the find general table allowing recdording of e.g. flint, stone and bone implements. Fields record raw material, type of flint, industry (lithic typology) and evidence for flint working on site.

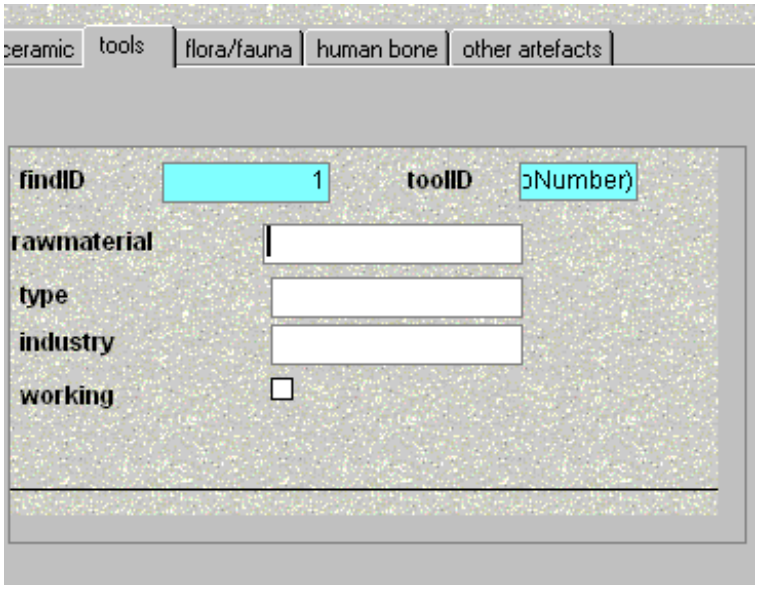


Figure 2.17 Shows the table with fields associated with lithic finds.

Field	Description	Reason for Inclusion
Find ID	Unique identifier relating to all finds	Allows all tables to be linked to the sub-site table
Tool ID	Unique identifier for tools	So tools can be indexed separately from other types of finds
Raw material	Stone or other material tool is constructed from	Helps to identify whether implement is organic or stone and whether material is locally sourced
Type	Tool type, e.g. scrapper, flake core, microlith etc	Allows the variety of tool types to be recorded from a site
Industry	Record if tool is from known typology	Might help understand the expansion of a culture
Working	Tick box for if there has been in situe tool making	Interesting information on possible site use

Table 2.7 Showing the fields recording details on lithic finds.

4.3.3.6 Flora/fauna

This is another find category table that records either flora or fauna remains. Fields record only species name and quantity (in percentage where possible). By recording species detail in terms of variety and numbers of specimens at sites, it is hoped a greater understanding of economy at coastal sites may be achieved.

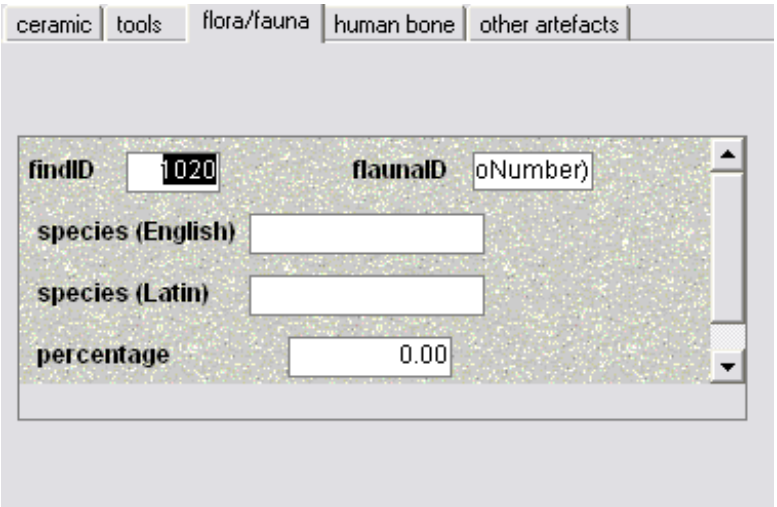


Figure 2.18 Shows the table with fields associated with faunal and floral remains.

Field	Description	Reason for Inclusion
Find ID	Unique identifier relating to all finds	Allows all flora/fauna recordsto be linked to the sub-site table
Flauna ID	Unique identifier for flora and fauna	A unique identifier to separately index plant and animal remains
Species (English)	Species recorded in English	Record the types of animals and plants present in an easily accessible manner
Species (Latin)	Species recorded in Latin	Record the types of animals and plants present. Often some species are more easily identified in Latin form
Percentage	Percentage of animals of each type found at a site, if known*	Useful to know the relative amounts of different species found at a site

*If percentage cannot be found or calculated from reports the quantities of animals present are recorded in the general find comment box

Table 2.8 Gives detail on the fields recording faunal and floral evidence.

2.3.3.7 Human bone

The human remains table is one of the more detailed category tables recording evidence for diet, form of burial and evidence for age, sex an even pathology (disease) from the remains studied.

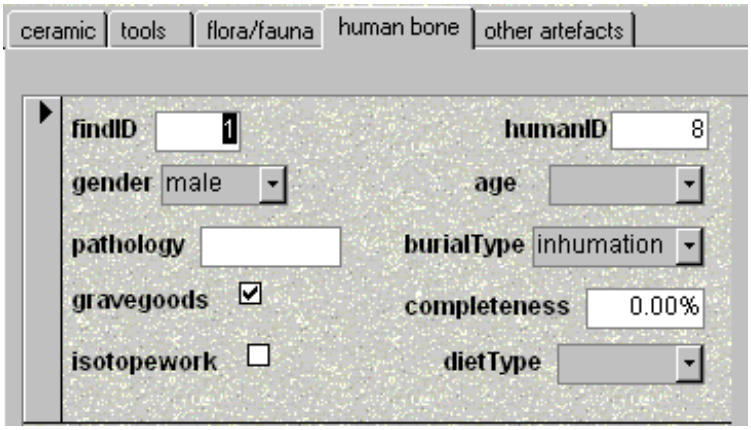


Figure 2.19 Shows the fields recording human remains.

Field	Description	Reason for Inclusion
Find ID	Unique identifier relating to all finds	Allows all human remains finds to be linked to the sub-site table
Human ID	Unique identifier for human remains	Allowing human remains to be indexed separately
Gender	Gender list 'Male Female Unknown'	Sex of the individual, useful detail (choose from a predefined list)
Age	Relative age list ' newborn Infant Juvenile Adult'	Useful detail to compare different archaeological remains on age at death (choose from a predefined list)
Pathology	Evidence for disease	Interesting to note what might be cause of death or what ailments hindered an individual during life
Burial type	Burial type list	Useful to compare

	'inhumation Multiple burial Cremation Loose bone'	different methods of body disposal, were there changes through time or space (choose from a predefined list)
Grave goods	Any artefacts or other finds found with the human remains	Any ritual visible in the burying of remains and any difference for social differentiation
completeness	How much of an individual is remaining in percentage	Can look at the degree of preservation or degree fragmentation at bad sites
Isotope work	Tick box indicating if test has been carried out	Indicates whether isotope work\has been done
Diet type	Indication of isotope work result 'Marine Terrestrial Mixed	Indicates type of diet individual followed in the last 10 years of life (choose from a predefined list)

Table 2.9 Gives explanation of details recorded on human remains.

2.3.3.8 Other artefacts

There is an additional table to record more unusual artefacts that do not fit into the previous categories mentioned, these can include evidence for jewellery, large structural remains e.g. boats. Basically any find that is unable to be recorded in the other find categories can be recorded here. Fields record the name commonly used in literature for the artefact and any further explanation or detail to describe the artefact.

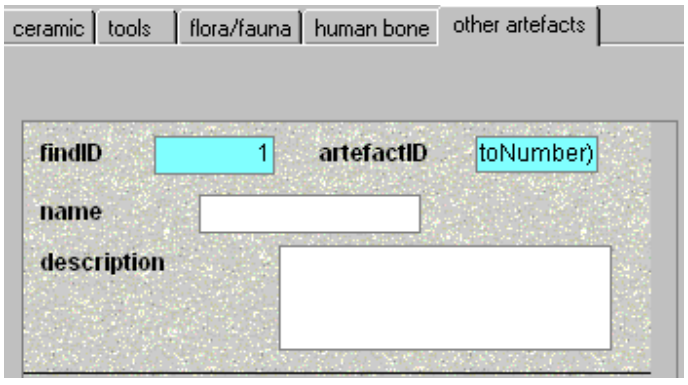


Figure 2.20 Showing the fields recorded for unusual artefacts.

Field	Description	Reason for Inclusion
Find ID	Unique identifier relating to all finds	Allows all artefacts to be linked to the sub-site table
Artefact ID	Unique identifier for other types of finds	So non categorised finds can be indexed separately
Name	Name of artefact	Form of identification
Description	More detail if needed	So that if find is unusual it can be better understood

Table 2.10 Explains the detail recorded for unusual artefacts.

2.3.3.9 Date details

Every site through the general find table is given a Find ID (a unique identifier number) allowing every find to have a unique number which can be linked up to a date table i.e. recording the date for a given find. This table allows several date records to be recorded for one find. The table is also designed to record radiometric dates e.g. radiocarbon, thermoluminescence, or Uranium series dating and diagnostic dates e.g. from typological study of lithic or ceramic evidence.

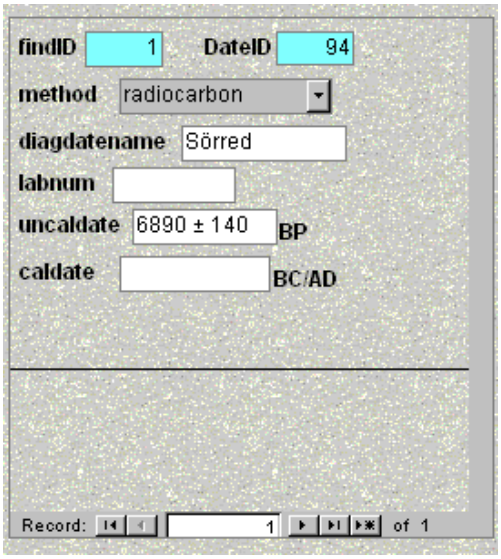


Figure 2.21 Showing what information is recorded for every possible date. Note that not all fields are filled in for every date as some fields relate to radiometric dates other fields

relate to diagnostic dates.

Field	Description	Reason for Inclusion
Find ID	Unique identifier relating to all finds	Allows all dates to be linked to the sub-site table
Date ID	A unique identifier for all dates recorded	Every date has a unique identifier, as it might be the case that one find has more than one date
Method	Dating technique list 'radiocarbon U-series Thermoluminescence Diagnostic Amino Racemisation'	Useful to record the different methods of dating so people can determine the reliability (choose from a predefined list)
Diag.date name	Industry/ culture allowing diagnostic dating	So the date recorded can be related to the typology suggested for the find
Lab number	Lab no recorded for real dating	The lab no. will help track down individual dates and where and when they were carried out
Uncalibrated date	Before conversion to BC/AD(errors also recorded)	An uncalibrated date is preferred for recording
Calibrated date	Date in BC/AD (errors also recorded)	Calibrated date recorded if uncalibrated is not available

Table 2.11 Explains what each field records relating to dated finds.