

Understanding Historic Vessels Volume 1

Recording Historic Vessels

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National Historic Ships

Foreword

The United Kingdom is fortunate in possessing a magnificent collection of historic ships and boats, distributed widely throughout these islands, reflecting our rich maritime history and the many innovations in marine technology and design that have been produced here over the past few centuries.

These fine old vessels are a difficult cultural resource to manage because they are built of perishable materials and often operate in a harsh, destructive environment. The first step in establishing a sound management policy is to find out the extent of the resource; that is, how many historic ships there are, where they are based and in what condition they are to be found. We have an excellent foundation on which to work in the form of the National Register of Historic Vessels (NRHV) which was set up over a decade ago by the former National Historic Ships Committee (NHSC). This Register includes data on British built vessels over 40ft in length, over fifty years old, which are based in the UK and are substantially intact (i.e. not degraded archaeological deposits). It contains details of many hundreds of ships and boats, some privately owned, others owned and managed by charitable trusts or museums.

Her Majesty's Government recently set up the new body National Historic Ships, governed by the Advisory Committee on National Historic Ships, to advise ministers on all aspects of historic ships and to actively promote the interests of this heritage sector. The committee is funded by the Department of Culture, Media and Sport. Its membership and its remit are set out as an appendix to this volume.

From among the many hundreds of vessels on the NRHV we have selected a Core Collection of 60 ships and boats which are of such great heritage merit that every effort must be made to protect them for the nation. Added to this is a second group of 155 Designated Vessels which are of considerable heritage merit and which include many vessels of great significance to the regional cultural diversity of our coasts. Together, these two groups comprise the National Historic Fleet.

In the course of building up the NRHV we have visited numerous historic ships and enquired of their owners about the extent to which their vessels were well-recorded. The enquiry revealed a rather mixed pattern. Across the sector as a whole we found some vessels where the record was poor or non-existent, while in others detailed and highly professional records existed. The situation is clearly capable of considerable improvement. It is vital that those responsible for historic ships aim to achieve good standards of recording as an essential step in the preparation of conservation management plans, which are now the *sine qua non* of grant-aid in the heritage sector. We must leave the shoe-box full of photographs behind us and aim for effective, systematically prepared records, capable of providing a sound basis for planning a long and healthy future for our historic ships.

To successfully achieve this aim many owners will require assistance. Fortunately, National Historic Ships is better resourced than its predecessor the NHSC and so, in our first full year

of operation, we have formulated plans to deploy our modest budget in ways where a small outlay might achieve a highly beneficial result. One way is to award grants to owners for essential work (in which we include good recording projects) on their vessels. In order to do this, the Committee has set up a Strategic Development Fund through which a range of awards for essential works have been made. However, we also see the need to establish simple guidelines on the recording process itself, so as to encourage good practice in this area. To this end we have commissioned this small volume, setting out the essential information required to prepare a useful and lasting record of your historic ship or boat. We have tried to keep the advice simple and hope the volume is user-friendly, avoiding too much professional jargon. No doubt you will let us know how well we have succeeded!

The guidance set out here should enable people of widely varied backgrounds and experience to put together an effective record of what they have and hence of what they need to conserve. However, it must be recognised that occasions will arise when an historic vessel has fallen into a sad decline and may be beyond salvation and it may become necessary to contemplate the loss of the vessel. In extreme cases of this kind where a ship might have to be broken up, it is still possible to save a valuable record of the ship's structure and operational life. In other words, the process of ship-breaking should be carefully managed to permit a full record of her structure to be made as she is dismantled - in a process of controlled de-construction. We have therefore written a companion guide, entitled *Deconstructing Historic Vessels: the responsible approach to a vessel at the end of her life*. Anyone contemplating the need to de-construct a ship should look at this second volume as well as the present volume on recording. The two works complement each other.

A third volume (*Conserving Historic Vessels*) on the principles and practice of conserving historic ships will be published in 2008. Together these three volumes will amount to a user's guide to the understanding and management of our maritime heritage of ships and boats.

No doubt in these first attempts we shall make mistakes and could do better in future. We therefore intend to amend these texts regularly, making them available via the National Historic Ships website, and we shall produce hard copies of the latest version every few years. We hope they may become well-thumbed working documents, present in every fo'c'sle of every ship listed on the National Register of Historic Vessels.

Robert Prescott
Chairman, Advisory Committee on National Historic Ships
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1. Understanding historic vessels - context

Historic vessels are preserved for many reasons. They can be simply beautiful objects and expressions of the shipwrights' art; they can embody technological advances, or be fine examples of a particular development in ship and boat building; they can be reflections of social or economic factors; they may have associations with heroism, famous incidents, or notable people. Whatever the reason, they are evidence of history and carry information about their working lives and human associations, the phases of their development, their present state, their relevance today, and what their needs are for conservation and, where appropriate, for restoration. There are also occasions where vessels cannot survive: they are too dilapidated or too insignificant to justify the great cost of conservation, or there is no one willing to take on such projects. Yet the information they hold may be important, and to lose such vessels without saving this information would be to miss an irremediable opportunity to broaden our knowledge and to hold that knowledge for future generations.

The National Register of Historic Vessels (NRHV) lists those ships and boats above 40 feet (12.19 metres) in length that meet certain other criteria (see Appendix A) which identify them as being of significance in the maritime history of the United Kingdom. It is essential that there is a practical way these vessels can be recorded, and that this information is held in an understandable and accessible form. It is equally important that when, despite all endeavours, these vessels become unsustainable, there is a properly thought-through process for ensuring that the essential information held in them is captured and preserved. This is particularly so for the vessels which together form the National Historic Fleet (the Core Collection and Designated Vessels lists of the NRHV) because of their outstanding national or regional importance.

Our series of 3 linked publications under the umbrella title *Understanding Historic Vessels* is designed to address these issues.

This volume, *Recording Historic Vessels*, sets out how to go about creating a record which ensures that the quintessential characteristics of the vessel concerned are captured. It also offers guidance on how to preserve this record in a safe, effective and accessible way.

Volume 2, *Deconstructing Historic Vessels*, maps out the steps leading up to the careful dismantling of an historic vessel which has come to the end of its days. This systematic dismantling will generate further information about the vessel and Volume 2 also gives advice on what to do with this new information (and in some cases recovered parts of the vessel) that emerges from this process.

The third volume *Conserving Historic Vessels* will provide the definitive approach to the conservation and restoration of historic vessels in the UK. It will review existing national and international practice and will map the conservation choices arising from the condition of the vessel concerned and the aims of the project.

The first two volumes are designed to recognise the relative importance and complexities of historic vessels and the differing circumstances of their owners. The resources of private owners and small trusts are different from those of the larger trusts, major museums, and national organisations which look after historic vessels. The approaches described here are designed both for the owner who does not have funds for professional surveys and for the larger institutions and trusts which often can command better resources. These approaches are intended to be practical and are set out in such a way that recording a vessel is a simple process which owners feel is feasible for them. National Historic Ships wants to encourage all owners to apply these approaches to their vessels at the level which is appropriate and achievable for their project. Furthermore, although these techniques have been specifically designed to address the need for accurate recording of vessels on the National Register, we also want to encourage owners of any interesting vessels to apply these approaches to their ships.

All this activity will create a body of vital information which will need to be properly archived. Owners are encouraged to keep the records themselves and to make provision for their survival in the long term. National Historic Ships will continue to hold information on all extant vessels on the National Register of Historic Vessels (NRHV). Information on ships comprising the National Historic Fleet (i.e. Core Collection and Designated Vessels) which have left UK waters or have been destroyed will be held in the newly-established National Archive of Historic Vessels (NAHV).

With the agreement of the owners, National Historic Ships will also hold a location list of the records of other Registered Vessels not with the National Historic Fleet which have left UK waters or have been destroyed.

All volumes of *Understanding Historic Vessels* will be published electronically on our website, www.nationalhistoricships.org.uk, and also will be available as hard copy. The

electronic versions will be reviewed and revised annually, with updated hard copies published on a three-year cycle. National Historic Ships will be happy to discuss specific questions which may arise once owners have read this document, and to advise on possible sources of funding to assist with recording work, particularly on those vessels in the National Historic Fleet.

We hope that users will find this guide practical and user-friendly. We look forward to the increased understanding of our historic fleet which will arise from the application of the principles and practices in this document to the United Kingdom's maritime heritage.

2. Setting the scene

Having an accurate and complete record for every vessel is crucial to understanding the significance of the ships listed in the National Register of Historic Vessels. The ideal situation would be to have such a record in place when a submission is made to have a vessel entered on the Register and this will certainly be expected for vessels seeking listing in the National Historic Fleet (Core Collection and Designated Vessels).

National Historic Ships strongly urges all historic vessel owners to undertake this research, not as an academic exercise but as an essential activity in understanding the significance of their vessels. Detailed, accurate records can also assist with the active management of a vessel, and are the starting-point in developing conservation management plans; the widely-accepted method of setting out how owners intend to preserve the significance of their vessels. The information secured through this research should be captured in the *Vessel Record*.

There are three key elements in the Vessel Record:

- Documentary and other tangible evidence from sources such as builders' plans and lines drawings, bills of lading, repair invoices, logbooks, diaries, letters, newspapers, journals, contemporary photographs, film and video footage, models, plans and photographs of past episodes of refit, repair and restorations, and ship portraiture.
- Oral histories derived from interviews with builders, owners, crew members, harbour-masters and other allied workers whose activities support the operation of a ship or boat. Oral testimony, often of value for its intrinsic content, can also have an impact on the day-to-day care and management of an historic vessel.
- Records produced from an up-to-date physical survey of the vessel.

The *Vessel Record* should not focus solely on operational life: the vessel may also have a significant life 'after service' which should not be overlooked.

Wherever possible, the documentary evidence and oral history should be brought together first and critically appraised to provide a sound context and direction to the work needed to achieve a good physical survey.

3. Assessing the significance of a vessel

The goal of researching a vessel's history is to gain a fuller understanding of the significance of:

- i. The vessel's uniqueness or typicality in terms of its type and function. Is she a surviving example of a once-common type or is it a one-off design?
- ii. The vessel's uniqueness or typicality in both a national and a local context. For example, the last local type of fishing boat to be built in a particular yard; the last of its type to trade or operate in a particular locality or a vessel such as a lifeboat involved in a famous rescue.
- iii. The vessel's contribution to a broad understanding of maritime history. For example, an 18th century warship may illustrate much about the practicalities of fighting under sail.
- iv. The vessel's contribution to technology, including her handling characteristics. Is she the sole surviving example of a particular type of propulsion unit; an important variation on a construction method; or a typical example of a certain type of sailing rig?
- v. The vessel's contribution to social and economic history, locally, nationally or internationally.
- vi. Any parts of the fabric, fixtures and fittings that are unique or rare survivors; or are typical of the type of vessel under consideration; or are of technological, social or economic importance.

Although the research will generate a considerable amount of information, it is essential that the conclusions stating what is significant about the vessel are drawn out and put down on paper. These conclusions should be condensed into a concise *Statement of Significance*, ideally involving no more than two sides of A4.

4. Significance, physical recording and the Vessel Record

It will probably not be possible to conclude a *Statement of Significance* without some physical recording. Nevertheless, documentary research is likely to provide a sufficient indication of the degree of physical recording required to complete the Vessel Record. For example, it may not be justifiable to record in detail the shape and construction of a small boat, the significance of which lay in its role as a ferry carrying passengers across a short stretch of sheltered water. Such unchallenging work may make few demands upon the vessel's physical and technological characteristics. On the other hand, shape, construction and technological innovation are of fundamental significance to a vessel built for speed or carrying capacity on the open seas and should therefore be recorded in detail.

The key question is:

How important are the shape, construction, technological attributes, interior arrangement and fittings of the vessel in contributing to its significance?

5. Determining the appropriate level of physical recording

Where a vessel's hull-form and construction are key elements of its significance, the appropriate level of physical recording must be established.

The *ideal* is that the vessel's shape and structure should be documented in sufficient detail so that accurate plans and cross-sections can be drawn in order that a precise replica or model could be built, correct in all details, from scantlings and frame shapes to fittings, materials and paint scheme.

This does not always mean that a full survey is necessary. The documentary research recommended in Section 1 will have established whether:

- i. other examples of the vessel type (both surviving and now lost) have been recorded
- ii. builder's plans, lines plans, surveyor's drawings and other plans survive

It should not be assumed that existing plans are accurate, or reflect the vessel in its current configuration. However, they can be used as a baseline check and, by comparing key dimensions and noting structural differences, additional, replacement or missing fittings, etc., it is possible to reduce greatly the amount of new recording work needed.

In addition to the existence of plans and the importance of the shape and construction for the significance of the vessel, four other factors will determine the level of recording:

- i. The cost of recording: a full professional survey to create construction plans will cost tens of thousands of pounds for large vessels. We recognise that private owners and smaller hard-pressed trusts may not have such sums at their disposal.

- ii. The time available for recording: commercial pressures and other constraints may require the recording to be completed within a short period of time; owners undertaking measured surveys themselves may have limited time to commit to the task.
- iii. The physical state of the vessel: a dilapidated vessel may have become severely distorted and may even be dangerous to work on. On the other hand, poor structural condition may make certain construction features more accessible.
- iv. Location of the vessel: vessels are easier to record when out of the water rather than when afloat.

Figure 1: The continuum of vessel recording methods

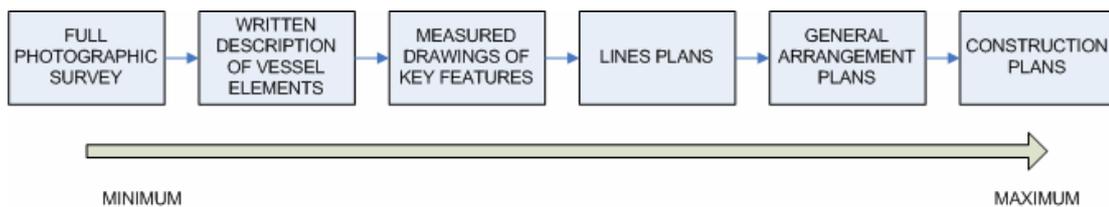


Figure 1 illustrates the relationship between the different levels of detail arising from the use of different recording methods. The various types of record can be thought of as arranged along a continuum, from a minimum of detail to a maximum of detail, with each additional stage on the continuum adding further to the complexity of the overall Vessel Record. Ideally, each of these stages should be completed to create a comprehensive technical record of the vessel. At the most basic level, a comprehensive photographic record (including video with narration, and accompanying written descriptions) should be created, and it is difficult to conceive of a case where an historic vessel would not require this. However, a photographic record alone is only acceptable as a Vessel Record when time, access and resources are so limited that no additional forms of recording can be undertaken. A better record would be created by adding to the photographic record a written description of all key features of the vessel. This could be enhanced by the inclusion of measured drawings of the most significant of these features. All three of these recording methods can be carried out without employing contractors.

On the other hand, the creation of lines plans, general arrangement plans and construction plans require a degree of specialist knowledge, and a quantity of specialist

equipment. This does not mean that this type of recording is beyond the ability of most vessel owners, but unless the results are accurate, it is not worth undertaking.

Before embarking on a full-scale measured survey, we recommend that a trial is undertaken by choosing a relatively simple feature, for example the external shape at a marked vertical section, and measuring it twice in order to test accuracy and effectiveness of the chosen recording methodology. If the results vary by more than 5 mm. in a metre, an acceptable standard of accuracy has not been achieved.

For measured surveys, there are two fundamental approaches:

- i. A 'shorthand' method – this is where it is assumed that as vessels are symmetrical about a longitudinal centreline, only half a vessel has to be recorded (unless it is severely distorted). Irregularities are smoothed out in the final drawings, which approximate to the builder's original intentions. This is the quicker of the two methods and, if supplemented with a comprehensive photographic survey, can provide an acceptable record.
- ii. A 'longhand' method – essentially the archaeological method of recording – where there are no assumptions about symmetry and no attempts are made to smooth out irregularities or distortions. Therefore evidence of the ship-builder's 'hand', any damage or deformation the vessel may have suffered, and any aberrations in the structure or general arrangements will be reflected in the drawings. This will take significantly longer than the 'shorthand' method and requires a higher degree of skill, particularly in plotting the results.

National Historic Ships prefers the 'longhand' method as this will provide a much greater level of detail, but we realise that there may be practical reasons of time and budget for adopting the 'shorthand' approach instead. In some cases it may be pragmatic to combine both, for example taking the 'shorthand' approach to the overall shape (where this is not of paramount significance) and the 'longhand' approach to the layout of working spaces. In such circumstances the results should not be combined in the same drawing.

A statement explaining the survey methodology adopted, including the names of the survey team, the date, scales and legends for any symbols used, must accompany all measured drawings.

6. Conventions

National Historic Ships does not have a preference for using the imperial system or the metric system for surveying. Most vessels on the National Register of Historic Vessels were built according to Imperial measurements, and therefore, by measuring in Imperial units, structures and their relationships may be more readily understood. There may be practical as well as cultural significance which may be lost if a different measurement system is used. Few professional surveyors or surveying systems now use the Imperial system and a decreasing number of people understand it. The best way of dealing with this is to hold the resulting measurement information in both forms. Where metric measurements are recorded, it is strongly recommended that all dimensions be given in millimetres. Using centimetres and millimetres together is a recipe for confusion and using metres may result in misplaced decimal points.

The size of the vessel will determine the scale of plans – conventional imperial scales are 1:48 and 1:96 and convenient metric scales are 1:50 and 1:100. On paper or tracing-paper plans, the scale should be noted on each drawing as well as shown on a rule (in case subsequent copying distorts the drawing).

In the sheer plan, the convention is to draw the vessel with the bow pointing to the right. For merchant ships it is customary to divide the length between perpendiculars into ten equal parts and to number the corresponding transverse sections or stations from 0 to 10, starting with 0 at the aft perpendicular. By contrast, warships are usually divided into 20 equal parts and the corresponding sections numbered from 0 to 20 or 21 but this time starting from the fore perpendicular, which is numbered 0 or 1, so that the aft perpendicular would be numbered 20 or 21. The aft perpendicular for merchant ships is through the centre line of the rudder stock, whilst both perpendiculars on warships are located where the hull centre line profile cuts the design waterline.¹ The shape of these sections is drawn up as the body plan, on the same base-line as the body plan. Whereas warships are frequently designed to be trimmed down by the stern, so that the design waterline is not parallel with the keel, merchant ships have no designed trim, their working draught being dependent on their lading, e.g. whether they are in ballast or carrying a cargo. Their load water-line is therefore drawn parallel to the keel. Vessels are often considerably altered in their working lives and these alterations will affect trim and

¹ Although this has only been the standard practice since the 1940s.

draught, so that design waterline may not be apparent from anything other than an original drawing.

On general arrangement drawings, plans and cross section drawings should include both halves of the hull (on the latter it is essential to indicate the direction of the view – by narrative or by arrows pointing in the direction of the view on the corresponding plan). With body plans (see Section 9.5) sections forward of the midship point are drawn in half-section to the right, those aft of amidships are drawn in half section to the left. On the half breadth plan showing the waterlines, it is necessary only to depict one side if the hull was intended to be symmetrical.

Lines plans may be drawn to either the inside or outside of the hull surface. Naval architects take their lines to the outside of the hull for the purposes of hydrostatics, while builders draw to the outside of frames (the so-called moulded dimensions). In riveted lapped construction a common, but not universal, convention was to take the lines to the outer surface of the inner strake. Practicality may be the determining factor, but if there is a choice the likely users of the plan should be considered: those plans drawn to the inside of the hull surface are useful to ship and boat builders; plans drawn to outside of the hull surface are more useful to model makers and for hydrodynamic analyses. Given the lack of a convention it is therefore imperative that it is noted on lines plans whether they are drawn to the inside or outside of the hull surface (and wherever possible hull surface thicknesses are recorded).

7. Using professional surveyors

For producing technical records – particularly where no historic plans exist which can be used as a baseline – consideration should be given to employing professional surveyors if they can be afforded. These could be naval architects, marine surveyors, archaeological surveyors or building surveyors, but whoever is finally chosen must have experience and an understanding of recording historic vessels. Where large or complex vessels are being recorded, the presence of an experienced ship surveyor is highly desirable. The inclusion of master craftsmen such as shipwrights, boilermakers and platers in the team can also be of great assistance in understanding and recording vessel type and construction.

The techniques and equipment used in recording are constantly evolving, but most methods have as their goal the production of the same type of conventional drawn records. The choice of method is largely one of cost, availability and experience.

As well as the issue of cost, the selection of a surveyor should be based on:

- guarantees of accuracy of the completed survey. For professional systems, guarantees should be +/- 5 mm over a range of 50,000 mm
- the format of the completed survey (for example, a set of vector drawings in a common software format)
- experience with surveying maritime craft
- experience in using computerised scanning methods which now have the capability of taking three-dimensional measurements to an accuracy of 1mm in 100m, and are extremely economical in time and cost²
- membership of appropriate professional organisations and demonstration of relevant experience and competences.

Some surveyors will offer to retain the drawings on their own systems and produce specific plans on request – this is not acceptable

² See www.heritage3d.org for an evaluation of this technology.

8. Briefing for a professional survey

Regardless of their experience, it should not be assumed that a professional surveyor can provide the information required for the vessel record without a detailed brief. The following sections outline the requirements for the various elements of a full vessel record which can form the basis of a brief. In order to ensure that the brief meets the need, best practice requires discussion on an outline brief between the person commissioning the survey and the chosen surveyor, to ensure that all relevant issues are covered, that all parties understand the nature of the record work to be undertaken and that a mutually agreed final brief is prepared.

Before any recording work is begun, a risk assessment should be carried out. National Historic Ships' generic risk assessment form is set out in Appendix B.

9. The recording continuum

9.1. Full photographic survey

The photographic survey should follow a logical route around the vessel, for example, from bow to stern on the starboard side, and stern to bow on the port side externally and then following the same pattern on each of the decks. Each photograph must include a common scale, such as a surveyor's ranging pole.

The photographic survey should be undertaken with a good quality camera, with a lens which does not distort significantly. A zoom facility with good close up focus will be invaluable for recording detail. Black and white prints, supplemented with colour slides to show colour schemes still offers the best results, but conventional photography is now being superseded by digital imagery. Although there are issues about the deterioration of slides over time, there are also very real concerns about the obsolescence of digital technology. It is important that digital images are taken at a high resolution (ideally 700dpi) and, even if shot in a JPEG³ format, are eventually saved in a TIFF⁴ format. JPEG files, although less space consuming, degenerate with every saving. Most digital cameras take photographs in JPEG format. A software programme such as Photoshop or Paintshop will convert them into TIFF files. Raw files⁵ are better for archival records, but not all cameras record in this format.⁶

The specification of the lens should be noted as this information is essential for computer programmes such as PhotoModeler that can create plans from digital images. These are becoming less expensive and easier to use. Even if there is no intention in the survey to use software, its use in the future would be possible if datum positions are established (i.e. the distance and direction of the camera from the subject) and noted. Each feature should be shot from three angles and the relative locations of shooting positions should be noted in a detailed log accompanying the photographic record (and ideally linked to a sketch plan of the vessel and site).

³ 'Joint Photographic Experts Group'. Files have the extension .JPG

⁴ Tagged Information File Format. Files have the extension .TIF. These take more space than JPEG files.

⁵ So named because they have not been processed.

⁶ Guidance can be found at www.tasi.ac.uk.

There are good grounds for taking digital video records as well as still shots. This allows the recorder to capture overall context views, from which still images can be obtained if required. Where vessels are still in operation or capable of being so, moving picture records are the only way to show how a vessel was worked. Where archive film footage exists, this should be kept in association with the new film material.

The ease and cheapness with which digital images can be taken can lead to the acquisition of more images than can be handled. To be useful, each file should be named, giving as much detail of the location as possible. In order to do this, it is important to develop explicit conventions for the chosen locations, for example LD_STB_5A for lower deck, starboard side, fifth photographing station, view looking aft. Filename conventions used should be noted in the accompanying documentation.

9.2. Written description of vessel elements

An accompanying written narrative, following the shooting sequence of the photographic survey, will considerably enhance the photographic survey. The narrative should explain what can be seen in each view as well as establishing the location and orientation of the images. Information to be recorded should also include:

- evidence of repairs
- evidence of changes to the vessel's structure or general arrangements
- evidence of damage
- identification of materials
- descriptions of tool marks

The written description should only deal with the vessel in its current form, not attempt to reconstruct previous features, although where there is evidence of these (for example markings on decks), this should be recorded.

For definitions of technical terms try: http://www.glossarist.com/glossaries/transport/nautical.asp
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9.3. Scale drawings of key features

The narrative description is almost certain to require the addition of scale drawings. If a vessel has features of particular significance – for example, accommodation arrangements or a unique bridge configuration – these should be measured and drawn up. Relatively small areas can be measured with accuracy by the conventional combination of tapes and plumb bobs. Using laser-based measuring technology should be reviewed. Even relatively inexpensive devices can create perfect vertical and horizontal datum lines.

If the recording of the vessel is not to be extended beyond the photographic survey, accompanied by the written description and a number of measured drawings (and where no historic plans of the vessel exist), consideration should be given to recording the midship section. This should be measured both inboard and outboard to show the thickness of the hull (and how this may vary), the disposition of the decks (including any camber) and the location of longitudinal elements such as stringers. Again, on relatively small vessels, this can be undertaken with conventional measuring apparatus.

9.4. Sketches of details

In certain circumstances, sketches showing specific details can be a better recording medium than photographs. This method is standard practice in building recording where the recorder wishes to emphasise details which a photograph cannot highlight. A good annotated sketch is a form of analysis and can identify salient features not clearly seen in a photograph. This may be particularly helpful where there are awkward angles of vision, or where there are so many features to record that a photograph cannot differentiate them all. Also, using a profile comb to record the intricate shapes of mouldings is helpful in the more highly finished vessels. All such sketches should be annotated and referenced back to the notes in the main record.

9.5. The lines plan

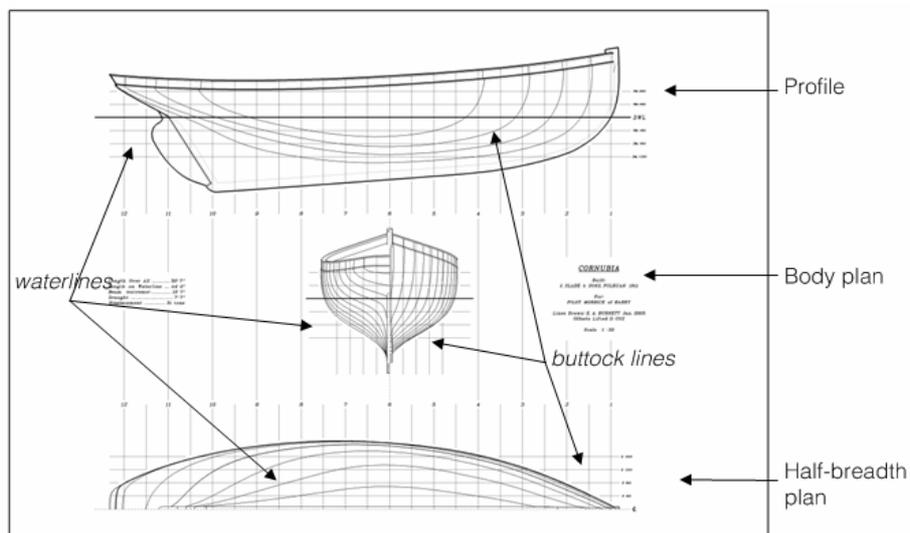
The lines plan, or draught, is the most useful document for reconstructing the hull shape and for analysis of performance. It depicts the shape in three views: plan, profile (the equivalent of the architect's elevation) and cross sections arranged in a body plan. As it is not produced by direct measurement but by deduction from a comprehensive measured survey, and consolidated in a table of offsets, consideration should be given to commissioning a professional surveyor. The basis for the lines plan is a minimum of eleven evenly spaced cross sections of the hull (half breadths) and from these are plotted:

- Body plan
 - a number (usually 11 or more; sometimes 21 for larger vessels) evenly spaced cross-sections, giving 10 or 20 volumetric blocks. Additional cross-sections may be needed fore and aft if there is a dramatic change of hull shape
 - relative heights of the waterlines (plotted on the half breadth plan)
 - relative spacing of the buttock lines (plotted on the profile plan)
 - stem post and stern or equivalent in 'head on' view
 - plot of 5 regularly spaced waterlines. More than 5 may be needed in certain vessels in order to define shape. It is often a good idea to include waterlines at each deck level

Vessels distorted over length might not be distorted in cross-section. Therefore accurate cross-sections may still be recorded in such vessels and when drawn on a correctly aligned centre-line, can produce an accurate vessel form. A good datum line down the centre of the vessel – possibly the keel or keelson, or for an open vessel, a taut line between bow and stern is essential. Basic radial measurements from points on a longitudinal centre-line at deck-beam levels in the bows of large wooden ships are also helpful for cross reference. Centre-line of beam to end of beam measures can be useful in distorted plating, or poorly accessible hulls.

- Profile of starboard side of vessel

- o shape of the sheerline
 - o shape of bow
 - o shape of stern
 - o location of keel line including scarfs and rabbet lines
 - o line of bilge keels or any other external appendage
 - o location of the positions of the cross sections
 - o plot of 5 regularly spaced buttock lines. A full definition of shape may also require diagonals, which can be set at 30% or 45% as appropriate
- Half breadth plan (plan of starboard side)
 - o shape of sheerline in plan in relation to the centreline of the vessel
 - o location of the positions of the 11 or 21 cross sections



Burnett Yacht Design

It should be noted whether lines are drawn to the internal or external surface of the hull.

For fixtures such as engines, it may be difficult to produce a precise measured drawing, but unless there is a known preserved example in a museum collection or similar, every effort should be made to do so. At the very least, a drawing of the space occupied is necessary. However, it is important that concise technical descriptions are given of the main propulsion system and transmission, prime method of power generation, steering and communications systems. Some fixtures and fittings such as winches and capstan may be unique and should be measured fully (if not already captured in the measured drawings of key features).

Warships will need to have a special description recording their weaponry and fighting capabilities.

Specialist ships (e.g. survey vessels or regionally specific fishing vessels) may need additional technological descriptions, including the use of locally-based terminology for the structures of vernacular working vessels.

9.7. Rigging

A rigging plan must include sufficient detail, including dimensions of all spars and fittings, to enable the theoretical re-rigging of the vessel from scratch. This should include running as well as standing rigging, and a belaying plan.

9.8. Construction plans

Construction plans are intended to give as much detail as possible of how a vessel was built and subsequently modified. Before commencing, careful consideration should be given to the degree of detail to be recorded. Again, the key question is one of significance: how is an understanding of the importance of the vessel enhanced by recording a particular aspect of construction? Unless clear parameters are set, the production of construction plans could become a lifetime project.

Items to consider are:

- Framing plan, showing the location and angular disposition of each frame, futtock, knee, stringer and beam
- Planking plan, showing the run of strakes and shift of butts. The equivalent for a metal vessel is a plating plan
- Sheathing plan
- Decking plans, showing the arrangement of deck planks and butts
- Fastening plans, for frames, sheathing, etc.
- Record of jointing and scarfing techniques
- Engine bearers, shaft logs, mast steps and mast partners
- Scantlings (size and thickness) of each significant feature

10. Preserving the record

Paper and film-based archives still provide the simplest and most reliable form of stored records. They are not reliant on technology in order to be accessed and, if good paper, appropriate inks, photographic paper, and high quality slides are used and stored in daylight free, dry, fireproof conditions, do not readily degrade. Few vessel owners will have access to CAD programmes, and therefore paper (or preferably the more stable tracing film) plans may be the only option. Where possible, these should be scanned to create vector files (which a good print bureau can undertake), but if this is not practical they should be saved as raw or TIFF files with a high resolution (700+ dpi).

Notwithstanding the above, many records produced will be in a digital format. It is essential that these are copied and the copies deposited in separate locations. It is recommended that the number of formats is restricted to:

- documents in RTF (rich text file) format which can be read by both PCs and Macs
- pictures and scans in raw or TIFF⁷ or
- drawings in DWG format⁸

This is not to say that these are the best formats, but they are the ones most likely to be supported for the greatest length of time. Nevertheless, all digital records should be reviewed every five years to ensure that they are still readable and steps undertaken to convert them if formats are likely to change before the next review. National Historic Ships will revisit this issue every five years and issue new guidance as necessary.

Back-up records should be held in alternative formats and stored separately in appropriate conditions. We will be taking on-going advice from National Libraries and Museums, Libraries & Archives and the Forum on Information Standards in Heritage (FISH) on best practice for record creation, storage, and retrieval.

⁷ Tagged Information File Format. Files have the extension .TIF.

⁸ This is the AutoCAD format.

11. Holding the record

Records should be held in perpetuity and wherever possible in such a way that they can be made available to researchers and other vessel owners. There may come a time when the recorded vessel can no longer be kept, or becomes so degraded that what remains no longer reflects what was once there. The Vessel Record then becomes the best surviving source of information. Where records are kept in private ownership, or by associations, National Historic Ships asks that a list of the information that makes up the Vessel Record and where it is kept, is lodged with us for reference. We also urge holders of records to identify a repository which can preserve the records in the event that a time comes when they themselves are no longer able to do so. We can advise on appropriate bodies and hold the records ourselves where necessary.

We also undertake to hold copies or the original record for all vessels in the National Historic Fleet. It is our preference that National Historic Ships holds an authoritative copy of the record for all such vessels. This record, which will be the companion record to the National Register of Historic Ships (NRHV), will be known as the National Archive of Historic Vessels (NAHV).⁹

⁹ National Historic Ships is in discussion with The National Archives to establish whether the records are covered by the provisions of the Public Records Act 1958.

12. Where to find further guidance

This document provides the essential information for recording vessels but further guidance on specific issues can be obtained from the sources given below.

On recording oral history:

Professional advice and support is offered by the Oral History Society, c/o Department of History, University of Essex, Colchester CO4 3SQ. The Society publishes a journal, *Oral History*.

On recording vessels:

The Nautical Archaeology Society runs a training course, 'Ship Science: Naval Architecture for Archaeologists' which would benefit owners unfamiliar with recording: <http://www.nasportsmouth.org.uk/training/index.php>.

The most comprehensive guides to recording vessels are the books edited by Anderson and Lipke (see Bibliography)

On physically preserving the Vessel Record:

Basic preservation guidelines are issued by the National Preservation Office (<http://www.bl.uk/services/npo/pdf/basic.pdf>),

Guidelines for the Care of Records is produced by the British Records Association (http://www.britishrecordsassociation.org.uk/publication_pages/Guidelines1.htm).

Also of relevance is the Arts & Humanities Data Service, *Digital Archives from Excavations and Fieldwork: guide to good practice*, London, 2000.

13. Afterword

We recognise that recording a vessel is a major undertaking for an owner, whether trust, institution or private individual. But the exercise will be immensely rewarding: it will give a sense of achievement that a permanent record of a vessel has been created and it will provide an intimate understanding of the vessel – her construction and her repair history – which cannot be gained in any other way.

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Appendix A. National Historic Ships Criteria and Scoring System

SCORE		0	1	2	3	4	5
1	Technological innovation	contains no design innovation of importance	contains one important design innovation	contains two or more important design innovations	add one point for identification of the designer of each named innovation (up to 4 additional points)		
2	Exemplary status – type and construction	very poor exemplar – type and construction	poor exemplar – type and construction	poor exemplar – type or construction	mediocre exemplar – type and construction	good exemplar – type or construction	good exemplar – type and construction
3	Exemplary status – function	very poor exemplar of functional category	poor exemplar of functional category		mediocre exemplar of functional category		good example of functional category
4	Aesthetic impact	no aesthetic appeal	no appeal to popular imagination; no design content	weak popular appeal; no design content	considerable popular appeal; no design content	high popular appeal; some design content	high art/design content
5	Historical associations with people and events	no historical associations	solely local significance	solely regional significance	regional significance with elements of national significance	national significance with elements of international significance	clear international significance
6	Socio-economic association	no socio-economic associations	solely local significance	solely regional significance	regional significance with elements of national significance	national significance with elements of international significance	clear international significance

SCORE		0	1	2	3	4	5
7.	Percentage of originality of the fabric of vessel, (hull & internal fittings)with reference to the end of her normal working life	<5%	<21%	21 – 40%	41 – 60%	61 – 80%	81 – 100%
8.	Condition	Integrity now being lost	Serious cause for concern over future integrity of vessel	some cause for concern	reasonably stable condition	condition suggests a secure future for the vessel	very good condition with regards to strength, infestation and care of fabric
9.	Age (date of build)		50-99 years old	100-149 years old	150-199 years old	200-249 years old	250+
10.	Scarcity of vessel type	100 plus	51 – 100 surviving examples	11 – 50 surviving examples	6 – 10 surviving examples	2 – 5 surviving examples	unique survivor
11.	Scarcity of vessel by function	100 plus	51 – 100 surviving examples	11 – 50 surviving examples	6 – 10 surviving examples	2 – 5 surviving examples	unique survivor

Criteria

The above are applied to vessels which are:

- Over 50 years old
- Over 40 feet (12.19 metres) not including the bowsprit
- Designed and built in the UK
- Based and operating in British waters or preserved ashore in the UK
- Substantially intact

Appendix B. Risk assessment framework

The following is National Historic Ships' generic risk assessment form for visiting historic vessels, provided here for reference only. Circumstances in which vessels are recorded vary enormously, and those undertaking this work must take all precautions to ensure their safety and those of others. National Historic Ships bears no liability for any omissions or the interpretation of this form.



Risk Assessment for undertaking visits to static vessels

Vessel name:
number:

Location:

Registration

Main Hazards:

- | | |
|--|---|
| <ul style="list-style-type: none"> ▪ Falling in the water ▪ Weil's Disease ▪ Head injury from low deck heads or rigging ▪ Transport from base to location of vessel ▪ Falling whilst boarding vessels/scaling ladders/rigging | <ul style="list-style-type: none"> ▪ Slip/trip/fall whilst on vessel ▪ Tetanus from rusty fittings ▪ Electrocution ▪ Asbestosis |
|--|---|

Persons at risk:

- | |
|--|
| <ul style="list-style-type: none"> • The vessel owner/custodian • Workers from the yard/marina where vessel is moored • Members of the public • Owners of other vessels moored nearby • Any of the National Historic Ships Unit team/Advisory Committee member taking part in a visit |
|--|

Pre-risk Factor (high):

Likelihood Rating 3

Severity Rating 5

Risk 15

Workplace Precautions:

Before each visit

1. The employer should implement a safe system of work with a step-by-step guide to organising and carrying out a vessel visit which covers all the safety aspects listed here. For the initial visits, employees should be supervised to ensure that the safe system has been implemented and disciplined if any areas have been neglected.
2. The employer should ensure that all employees undertaking vessel visits are properly briefed about the potential risks.
3. The employer should ensure that all employees are appropriately insured for the work they are going to undertake.
4. Ensure that employees always work in pairs or more and do not visit vessels alone.
5. Ensure that every employee is a competent swimmer.
6. Where vessels are under the jurisdiction of a company, the employer should ensure that they have an adequate health and safety programme to cover his employees during the visit.
7. A member of the team should contact the custodian of the vessel to enquire whether there are adequate toilets, washing and eating facilities on site, as well as the location of the vessel and likely state of tide for the visit.
8. An evaluation must be made on the likelihood of the presence of Asbestos.
9. The weather forecast for the area should also be checked beforehand and visits should not be undertaken in bad weather conditions unless the vessel is securely moored in a safe environment
10. The employer should inform employees that it is important to provide written notification as early as possible if they are pregnant or breastfeeding. An employee in either situation should not be taken on a visit where they may be exposed to travelling, awkward spaces, lifting or straining and inadequate facilities. Alternative office work should be offered.

During each visit

Before the site visit starts, the original Risk Assessment should be reviewed to ensure that all identified hazards (dangerous access, presence of asbestos etc) have been ameliorated.

1. Ensure that employees are provided with the following personal protective equipment free of charge:
 - Protective clothing (wet weather gear with high visibility markers, extra protection over knees and added warmth) – wear in bad weather or on vessels in poor condition
 - Face masks and protective gloves
 - Slip resistant shoes with steel capped toes – to be worn at all times
 - Lifejackets of at least 50 Newtons, serviced every two years. Employees should be trained in the use of these and they should be checked prior to each visit - to be worn on any vessel not moored alongside, or whilst in a dinghy.
2. A visit pack will be carried at all times by the employees whilst on a visit. This should contain a copy of this risk assessment form (to be checked before departure and altered for the specific visit if deemed necessary on arrival), a first aid kit, a torch (including spare batteries and bottles of water).
3. Whilst on a vessel, employees should be instructed to maintain a visual on each other where possible.
4. Employees will be given cards to carry indicating that they could have been exposed to Weil's disease. Ensure all cuts are covered with a plaster and hands are washed after visit.
5. Ensure that everyone is aware that key members of the team are carrying mobile phones with all relevant numbers and that these are fully charged and have been checked for good reception.

Post-risk factor (medium):

Likelihood 1

Severity Rating 5

Risk 5

Requirements:

1. Purchase lifejackets, shoes, first aid kit and torch (including spare batteries).
2. Obtain Weil's Disease cards and distribute to all employees.
3. Produce a safety guide and checklist for use in organising and undertaking visits.
4. Produce a supervision and training report after first visit.

Review:

Review after first vessel visit undertaken based on this risk assessment form and every six months thereafter. Also review this assessment on site before boarding the vessel and if any new hazards are apparent, they should be noted, the risk factors re-assessed and the employer informed if the risk is high.

Signed:

Date:

Legend used to calculate the Risk Factor:

Likelihood	Severity				
	1	2	3	4	5
1	1	2	3	4	5
2	2	4	6	8	10
3	3	6	9	12	15
4	4	8	12	16	20
5	5	10	15	20	25

Key:

Severity	
1	First Aid injury
2	Minor injury
3	3 day injury
4	Major injury
5	Fatality/disability

Likelihood	
1	Very unlikely
2	Unlikely
3	Likely
4	Very Likely
5	Almost Certain

Appendix C. About National Historic Ships

The Advisory Committee on National Historic Ships is an independent body sponsored by the Department of Culture, Media and Sport (DCMS) and established in 2006. Its remit is to advise government on all policy and technical matters relating to historic vessels in the United Kingdom, to advise grant making bodies such as the Heritage Lottery Fund and the Grant Fund for the Preservation of Industrial and Scientific Material (PRISM Fund) on applications from historic vessels and to support and advise historic vessel owners on developing sustainable futures.

Maintaining the National Register of Historic Vessels, set up by the preceding National Historic Ships Committee (1996 – 2006), is key to this role. The Register carries information on some 1,200 vessels which are:

- over 50 years old and built in the UK
- over 40 feet (12.19 metres) long, not including the bowsprit
- based and operating in British waters or preserved ashore in the UK
- substantially intact¹⁰

Of these, some 220 vessels have been identified as forming the National Historic Fleet, comprising 60 vessels of outstanding national importance (the Core Collection) and some 160 of special regional or subject significance (Designated Vessels). The Register carries crucial information on all Registered vessels, is a means through which comparative technical, social, and economic histories of the vessels are developed and is a material consideration in grant assessments. The Register is continually reviewed and improved, and a public version (which excludes private or sensitive information such as details of ownership) can be viewed on the National Historic Ships' website, www.nationalhistoricships.org.uk.

¹⁰ The Register does not include wrecks, which fall under the remit of the Advisory Committee on Historic Wrecks.

The Advisory Committee on National Historic Ships has set out an initial two-year programme of development with a focus on helping the sector to sustain itself in the long term. The programme includes this document, its sister publication on Deconstruction and a third volume on conserving historic vessels (a handbook to help owners look after their vessels to be published in March 2008); the creation of a gazetteer of sources of expertise on historic vessels; a skills audit to develop a greater understanding of what is needed to support historic vessels. National Historic Ships is also committed to promoting the development of National Ship Preservation Centres which can provide the skills and infrastructure to support the sector.

The Advisory Committee Members and the officers of National Historic Ships are:

Chairman: Dr Robert Prescott

Members at 31st October 2007:

Roger Hanbury	David Jenkins	John Kearon
Campbell McMurray	Sean Neeson	David Newberry
Tim Parr	John Robinson	Jane Ryder
Matthew Tanner	Simon Waite	

Officers

Director & Secretary to the Advisory Committee	Martyn Heighton
Co-ordinator	Paula Palmer
Case Officer	Simon Stephens
Advisor	Dr Eric Kentley

At its earliest meetings, the Committee identified as a priority an improvement in detailed knowledge of our historic vessels through the National Register of Historic Vessels and the National Archive of Historic Vessels. It sees this as fundamental to its own work. Consequently the Committee has debated, commented upon and agreed the final version of *Recording Historic Vessels* and *Deconstructing Historic Vessels* which comprise the first two volumes of *Understanding Historic Vessels*.