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INNOVATIVE RESTORATION
PROCESS FOR THE PRESERVATION OF NAUTICAL HISTORY

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ABSTRACT

Nautical Heritage, a new discipline dedicated to historic boats, has developed as a topic of study in the field of Nautical and Naval Design with research and didactic headquarters in the University of Genoa's Architecture and Design Department (dAD). At present this includes two complementary fields of research: the cataloguing of Italy's boats and the definition of methods for their preservation. The purpose of this paper is to present the studies conducted and results achieved in the latter field of research. Specifically, this article falls under the heading of Process Innovation and demonstrates a new design tool for the restoration of still-functioning historic boats: the 'guidelines for the process of nautical restoration'.

KEYWORDS

process, innovation, guidelines, nautical restoration, new professions

Restoration, as a field, came about and was developed, in Italy as well as in the rest of Europe, after a lengthy 19th and 20th century debate and, historically, it was considered a discipline related to the field of architecture before it was eventually applied to those pieces of Cultural Heritage which are today widely recognised and shared as much by the scientific community as by the general population. Today the primary law that safeguards these objects in Italy is the Cultural Heritage Act – Leg. Decree no. 42 of 2004 and subsequent amendments and integrations – which also includes means of transportation and historic vessels with certain specific characteristics[1]. Nevertheless, this law, created for other categories of historical objects, has proven on multiple occasions to be incapable of safeguarding and facilitating the recovery of those which we refer to today as floating Nautical Heritage (Rosato, 2011; Morozzo, 2014; Zappia, 2017). Meanwhile, according to a more recent timeline that begins in the mid 1990s and extends to the present day, at the University of Genoa the role of the designer, much newer as compared to that of the engineer or the architect, has been asserting itself in academic training[2] and has progressively acquired its own professional dignity, replacing the architect in many fields of design. While the Masters of Design at the time that the Weimar School was created, and due to the logic of a developing historical process, were invariably primarily artists or architects, today, exactly one hundred years after the birth of Bauhaus, the various skills of these two distinct figures, which have often overlapped or have

been separated by a fine line, are now clearly established. Industrial and, by extension, nautical products now pertain overtly to the field of Design. Meanwhile, the contemporary effort which the Società Italiana di Design and the Icar/13 scientific Community have invested in the creation of a new design identity has introduced new areas of experimentation to our discipline which transcend the industrial product as it is traditionally understood to appear in fields of research that can be classified under the category of Design and Other Know-How[3], in which we can reasonably include all of the research activities conducted in the field of valorisation of Cultural Heritage from 2004 to the present day (Celaschi, 2008; Lupo, 2008; Bozzola, 2009; Irace et alii, 2014).

Based on this simple premise, the valorisation and preservation of Nautical Heritage currently tends to be the responsibility of a nautical designer rather than an architect, and finds practical feedback in Italy in those shipbuilding enterprises that, on the one hand, adhere to an artisan tradition that still exists but that is in crisis and, on the other, to a style of shipbuilding characterised by an industrial logic which is now outdated in terms of the practices that, not even a century ago, gave birth to the vessels of Italy's Nautical Heritage. Professional figures from the worlds of design and construction that co-exist and cooperate with one another to restore or preserve valuable vessels, work within a scenario whose historical context has yet to be studied to the same degree as other categories of Cultural Heritage and, as we have seen, with legal regulations that inadequately guide or direct the entire process of the valorisation of historical nautical objects.

There was no interest in Italy's historic naval vessels until 1982, a symbolic year (Zaccagni, 2007) after which the phenomenon slowly and painstakingly developed along two parallel trajectories. The first within a small circle of admirers of primarily privately owned vintage vessels; the second within several museums dedicated to the valorisation of publicly owned traditional crafts (Panella, 2014; Morozzo, 2018; Zignego, 2018). Currently, those who work in the field of vessel recovery base their work on personal capabilities and sensibilities which they have developed through direct experience and, lacking guidelines that can be applied to the entire restoration process, possess a freedom of action and interpretation that is not present in other sectors (Giacinti and Marino, 2006; Giacinti, 2008; Gnola, 2008; Morozzo, 2014). Furthermore, the gradual loss of traditional 'know-how' connected to the legendary figure of the 'shipwright' in favour of an industrial production of nautical vessels that, since the 1970s through to the present day, has developed with no regard for the field's origins, contributes to an increased degree of freedom of action (and uncertainty) for those who operate in the sector (Morozzo, 2017).

The dAD research group inserts itself within this context through ongoing research activities begun in 2012[4] and with methodological contributions which can be traced back to the modus operandi typical of designers. In particular, the line of research that is the subject of this paper is based on critical analysis of the sector[5] with a particular focus on the professional roles (old and new) that contribute to the recovery of historic vessels, the tools (traditional and contemporary) now used in shipyards, and the methods

and processes that are primarily used today (often subconscious or not particularly evident). The phases of preliminary research aimed at a critical summary of the scenario referenced have made it possible to identify what is lacking and what is needed within the sector (Morozzo, 2014; Bellia, 2014) in order to subsequently offer solutions and define a new and innovative tool capable of 'scientifically guiding' the restoration process for nautical vessels (Zappia, 2019). One 'methodological' tool that has been developed under the rubric of 'guidelines for the process of nautical restoration' has been created for the designer, or for anyone who intends to undertake the restoration of a vessel, starting from the initial research phase, all the way through to its new launch and ongoing maintenance.

The degree of innovative contribution made to the context into which the guidelines insert themselves is apparent in how the phases of the process of nautical restoration are managed, as well as in the proposed manners of integrating them so that they may be easily applied. In this sense, the way indicated by the 'guidelines' determines a 'radical' innovation of the process, introducing an all-new 'scientific' methodological and operative approach to a sector that is still principally, if not completely, self-referenced. Furthermore, though the 'guidelines' are inserted within a primarily Italian context of research and experimentation, the work carried out has permitted comparison – during both the definition and experimentation phases of the process – with various European entities and a deeper contextualisation with respect to the Anglo-Saxon state of the art of restoration. This is recognised as an absolute benchmark for European good practices in the sector, not only due to the strong and enduring nautical cultural tradition that characterises it, but also and above all as regards the activities of National Historic Ships UK, an advisory committee that safeguards British Nautical Heritage. In this sense the 'guidelines' not only follow the 'Decision-making process for nautical vessels from the National Historic Ships UK patrimony' (National Historic Ships UK, 2010), integrating it and rendering it complete, but are also the connecting link to the studies and practical proposals of Leonardo Bortolami (2018) which focused on a responsible approach to the recovery of wooden nautical crafts.

The research project that led to the creation of the 'guidelines' is currently in a phase of experimentation which has responded positively to the initial tests on several case studies presented in the doctoral thesis which illustrates them (Zappia, 2019), an activity which continues to involve the highest calibre of professional figures currently present in Italy, with the intention of fuelling the spirit of inclusion and collaboration within the sector of interest. Further applications will contribute to honing and redefining them in accordance with the results achieved once the current phase of experimentation is concluded.

Foundations of the Study and Method – The activity that was conducted predominantly, but not exclusively, uses Design Thinking as the preferred approach to the study and to the project, obviously considering it to be appropriate for the field of Design and

unique (in that it has never before been used) for the field of interest. The use of a tool that is typical to Design in a sector such as that of historic vessels, which is far removed from specific and rather 'conservative' rules, has made it possible not only to come up with solutions to complex problems, but also to examine the reference scenario using an approach that is unconventional in the world of historical vessels. Brainstorming and Lateral Thinking then assisted in the design phase, which led to the definition of the 'guidelines for the process of nautical restoration'.

The study is rooted in Genoa's academic environment, inserting itself in a field that is already active and whose previous inquiries have made it possible to easily define the broad landscape of Nautical Heritage in Italy, as well as the additional research that is still necessary. The work, which developed from this starting point, was structured into three main sections that trace the typical organisational sequence of Design Thinking: Understand, Explore, Materialise (Fig. 1; Zappia, 2019a). The first of these is, in turn, subdivided into one phase that is aimed at identifying and becoming comfortable with the context (Empathise), and a second one that is strictly aimed at defining the problem that needs of answer (Define). In order to carry out each phase, careful observation (both passive and active) of the sector was necessary, using tools that are typical of Design research (bibliographic sources, local analysis, mapping of shipyards and of ship design and recovery studios, meetings and interviews with professionals and experts from the sector, participation in seminars and conferences, etc.). Once the state of the art and the trends in the restoration of Italy's boats were identified, it became possible to recognise the lack of a methodological design approach that was 'strictly scientific' and shared among those who at present, in Italy, work on recovering these vessels. The subsequent Exploration phase, divided into Ideate and Prototype, has contributed to the application of the good practices which are currently found in the field of historic ship recovery, as well as to the rejection of incongruous design approaches and the identification of approaches that are absent or missing.

The specific parts of the recovery process were defined through study of the manuals[6] and of what happens not only in the sector's shipyards, but also within its design studios. Furthermore, the ongoing dialogue with experts has made it possible to draft a series of actions that are more or less recurrent in the procedures carried out by single operators during the restoration of a nautical vessel. For example: 80% of those surveyed identify, during the course of the restoration, a phase prior to the design and to the work in the shipyard which could be defined as research, analysis, or evaluation. To this end, four individuals out of five talk about historical research; two out of five talk about analysis of ships' construction categories; three out of five talk about analysis of the disrepair; and four out of five mention a dialogue with the shipowner as an important phase of the restoration. 60% of those surveyed then identify a design phase in which only one expert out of five talks about preliminary design, evaluation of the time frame, and the final project, while four out of five of these take into consideration an evaluation of the costs, and three out of five an evaluation of the crafts-

manship and the labour. An additional phase identified by 100% of experts pertains to the work done in the shipyards (Zappia, 2019).

The complexity of adapting these phases under the umbrella of a single and shared operative model is, therefore, apparent and also corroborated in four case studies of vessels analysed (Zappia, 2019) following direct interviews. The units examined are

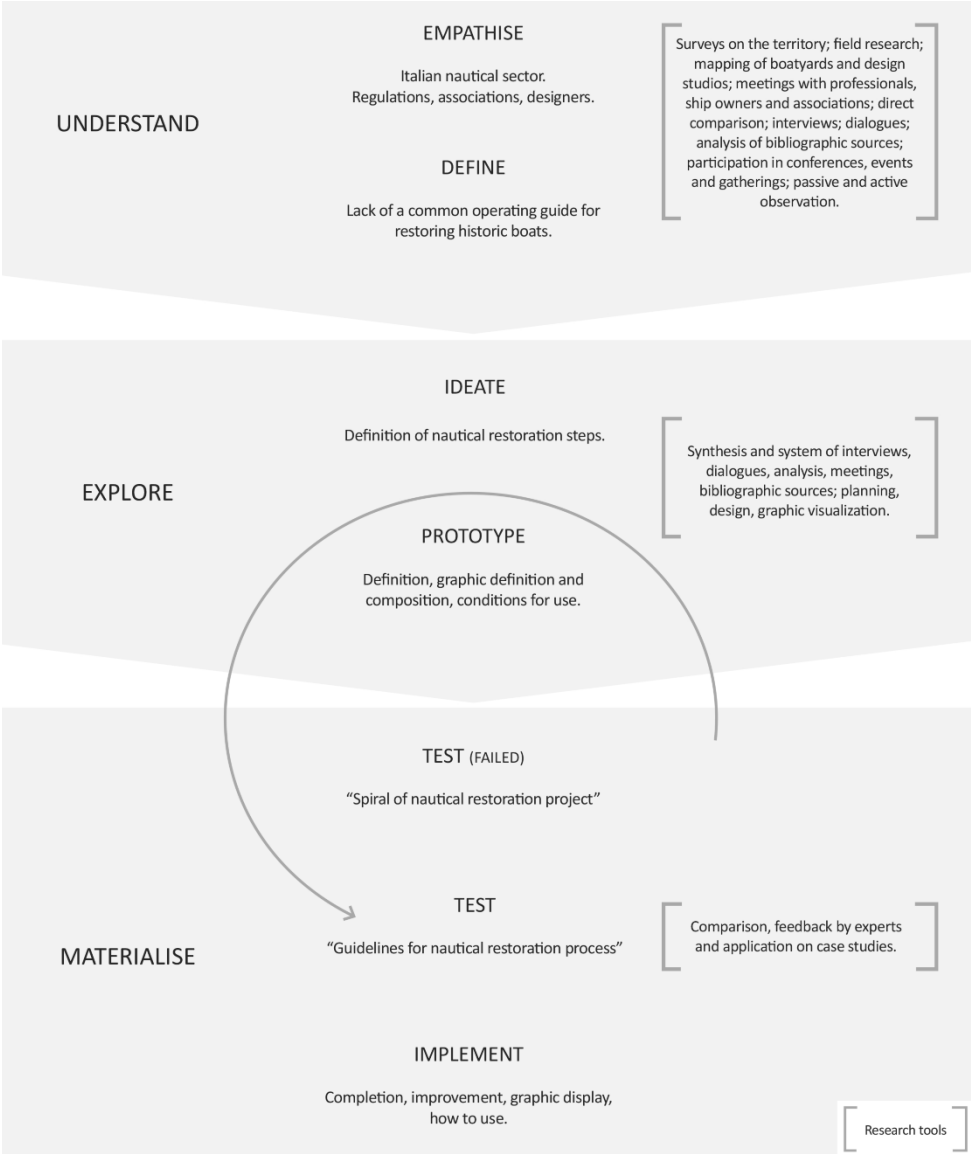


Fig. 1 - Design Thinking methodology applied to the research (credit: G. Zappia, 2019.)

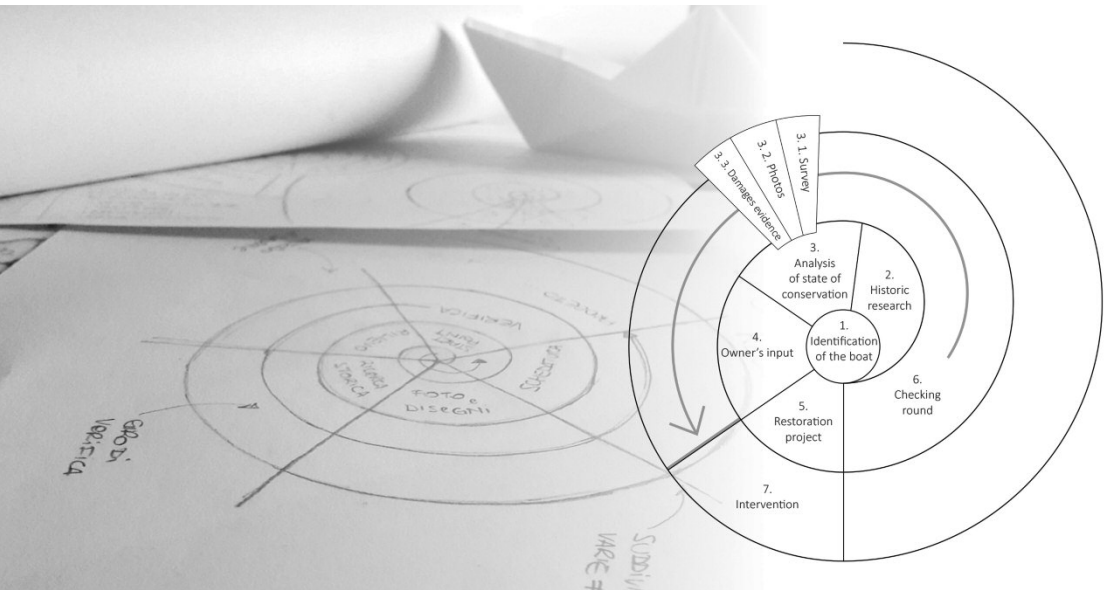


Fig. 2 - The spiral of nautical restoration. Sketches and graphic visualization (credit: G. Zappia, 2019).

representative of a wide range of possible restorations and are differentiated by the type of vessel as well as by the type of intervention. The only thing they have in common is that they all received awards and recognitions for being outstanding examples of recovery[7]. Subsequently, research activity has led to an attempt to establish a complete process for nautical restoration, 'saving' and organising the good practices found in the sector and inserting the phases that were considered to be missing. The first trials resulted in a unique graphic composition, in the form of a prototype, called 'spiral of the nautical restoration project' (Fig. 2; Zappia, 2019a). The spiral, thus defined because it was inspired from a project methodology that already exists in Naval and Nautical Design, was tested with unsatisfactory results as compared to the specific context of reference. Consequently, it was necessary to revisit the Materialise phase of the applied research in order to arrive at the definition and design of a new prototype capable of including and weighing as much as possible all of the phases identified, this time under the guise of a sequence diagram.

The organisational model proposed in the second instance, called 'guidelines for the process of nautical restoration', was, in its most current form, an object of comparison for experts from the sector and was newly tested on several case studies, both in 'reverse engineering' and in real time. Finally, following the positive outcome of the prototype's tests, upon completion of the entire design and adopted research sequence, the Implementation phase is currently underway, during which the results of the study are expected to be completed, refined, and implemented.

Guidelines for Nautical Restoration: Structure, Experimentation, and Optimisation – The 'guidelines for the process of nautical restoration', the result of the whole research project, is an entirely new tool for this sector which introduces process innovation. Primarily intended to be used by nautical designers and restorers, they insert themselves within the life cycle of an object, providing a guided design path which makes it possible to register the historical, cultural, and material value of the object, to adequately restore its operative functionality, and to keep it functioning through a perpetual cycle of checks and maintenance.

The structure of the 'guidelines for the process of nautical restoration', in its final form, characterised by a linear process flow diagram (Fig. 3; Zappia, 2019a), is made up of a first part called Research, the objective of which is to identify the historical and cultural value of the boat, describe its constructive forms and characteristics, and get a grasp of its condition at the moment it was found or at the start of the restoration. After this comes the phase known as Design, through which it is possible to identify the objectives of the restoration, choose the operative methods and the materials considered most appropriate to the specific case, and, lastly, draft, hone, and complete the design itself. The third part, Interventions, identifies the physical activities of the shipyard and allows for the timely monitoring of work with relation to the objectives established in the previous phases and the historical and cultural value of the boat. Finally, Post-restoration includes not only the planning of the maintenance necessary for preserving the working order of the boat over time, but also the cultural valorisation and dissemination of the material and immaterial value which the vessel, as a piece of Cultural Heritage, can convey.

Specifically, the part related to Research includes the identification and initial survey, through which the boat's data, such as name, category, type of propulsion, and affiliation are collected; the historical research, which makes it possible to collect historical information like the year and place of construction or launch, the designer, and any change in the boat's ownership, name, registration number, or use; the survey, in which all of the vessel's dimensions and material characteristics are defined; and the analysis of the state of preservation, which is necessary in order to document the boat's condition and any damages it has suffered (Fig. 4; Zappia, 2019a).

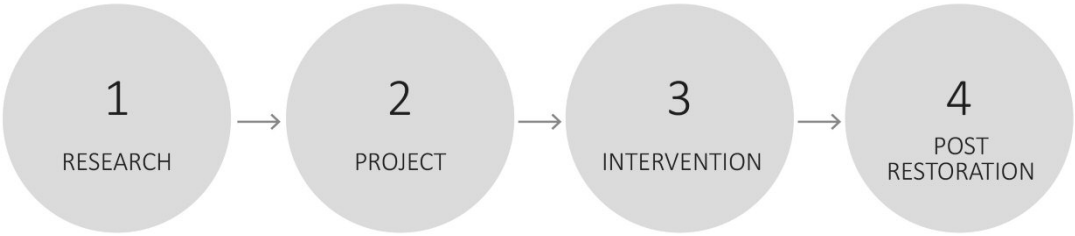


Fig. 3 - General structure of the 'guidelines for the process of nautical restoration' (credit: G. Zappia, 2019).

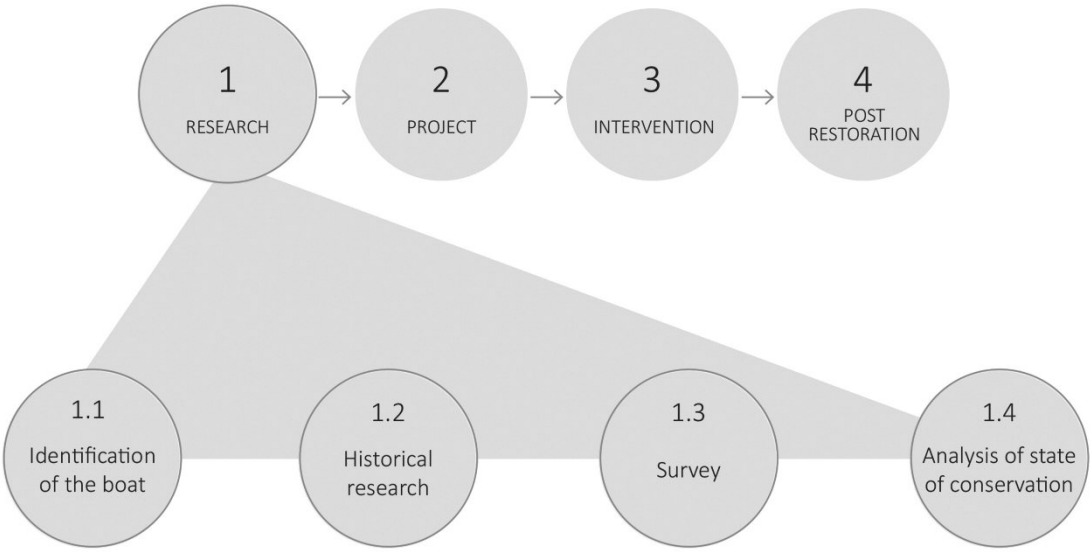


Fig. 4 - Composition of the 1st area of the 'guidelines for the process of nautical restoration' (credit: G. Zappia, 2019).

Meanwhile, the part known as Design is made up of five main steps. An initial phase of evaluation and assimilation of the history, the shipowner's input, and the available budget, followed by the definition of the objectives and goals of the restoration in order to develop an initial design proposal and, finally, the constructive and material technical evaluations. This stage includes numerous considerations and a lively and ongoing debate regarding the possibility and legitimacy of using modern building techniques and materials in the restoration of vessels, or, on the contrary, of using only techniques and materials that were in use at the time in which the boat was constructed (given the extent to which this is still realistic in practice)[8]. The final phase of Design is the completion and drafting of the project (Fig. 5; Zappia, 2019a).

The Interventions part is next, for which the structure of consecutive steps is maintained, but implemented. Here the boat is subdivided into different parallel work areas depending on the specific needs of the type of intervention, the shipyard, or the labour. For every area of the boat consequent activities are carried out: preliminary work, meaning work that comes before the actual restoration (for example: dismantling, sanding, stripping); verification, in which it is determined whether or not, after the preliminary work, the project still corresponds to the requirements or if new elements have emerged that require the project to be re-examined; execution of the project, in which the actual steps in the restoration process are identified; and finishing, which entails completion of the final construction activities on the vessel (for example: lacquering, sealing, painting). It must be emphasised that oversight of every phase in the restoration process is guaranteed by continuous and constant supervision which permeates the entire process

and that, from a practical standpoint, is identified by a series of questions aimed at verifying that every step complies with the objectives determined in the first phase, with the historical and cultural value of the boat, and with the shipowner's input. Finally, the part related to Post-restoration can be carried out by the designer himself via indication of the checks and maintenance cycles that are necessary for the specific vessel.

In Fruitful, a traditional Scottish vessel first launched in 1955, this process as just described finds the most complete application of 'reverse engineering' encountered during the research project (Zappia, 2019). Fruitful was built as a motorised fishing boat in Scotland's Millers shipyards in St. Monans. Following a series of vicissitudes that saw it dock in numerous ports around the country, accompanied by ten different owners, after sixty years it returned to the same area of the coast from which it first launched. Here, in 2016, within the shipyard of the Scottish Fisheries Museum, it began its restoration which was concluded nearly two years later.

The Research phase was conducted simultaneously by the designer and the shipowner who, through comparative analysis of historical photographs of the boat

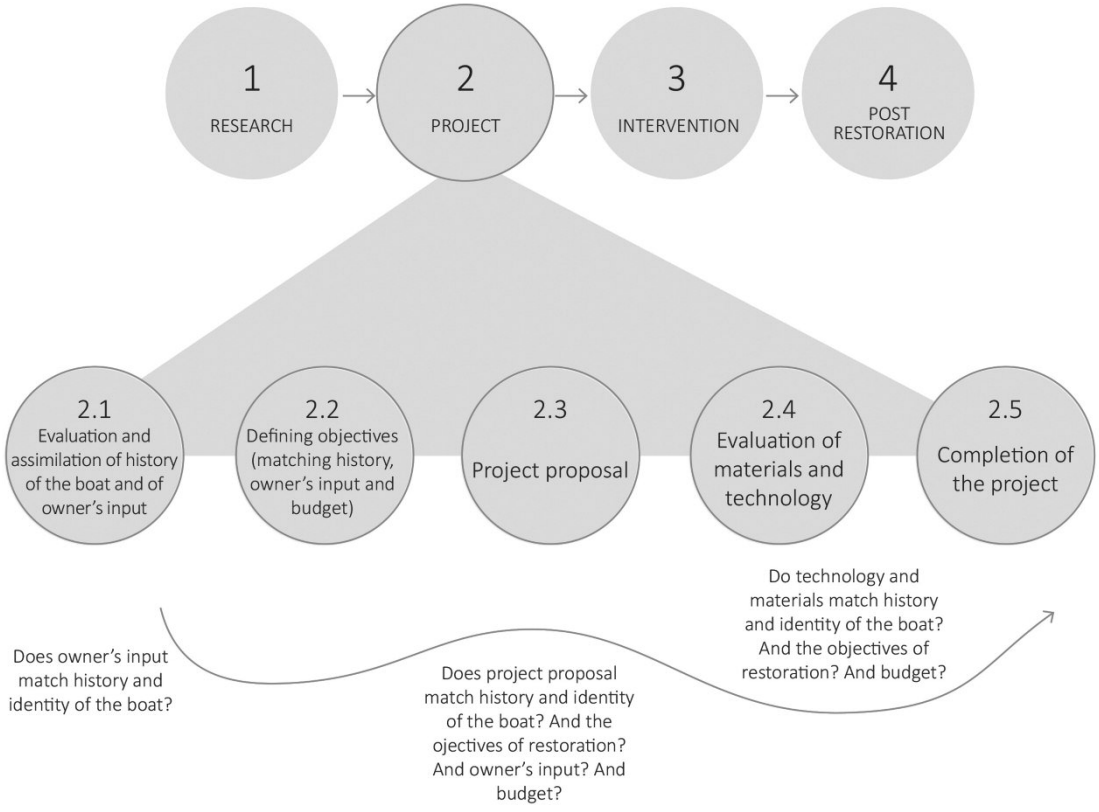


Fig. 5 - Composition of the 2nd area of the 'guidelines for the process of nautical restoration' (credit: G. Zappia, 2019).

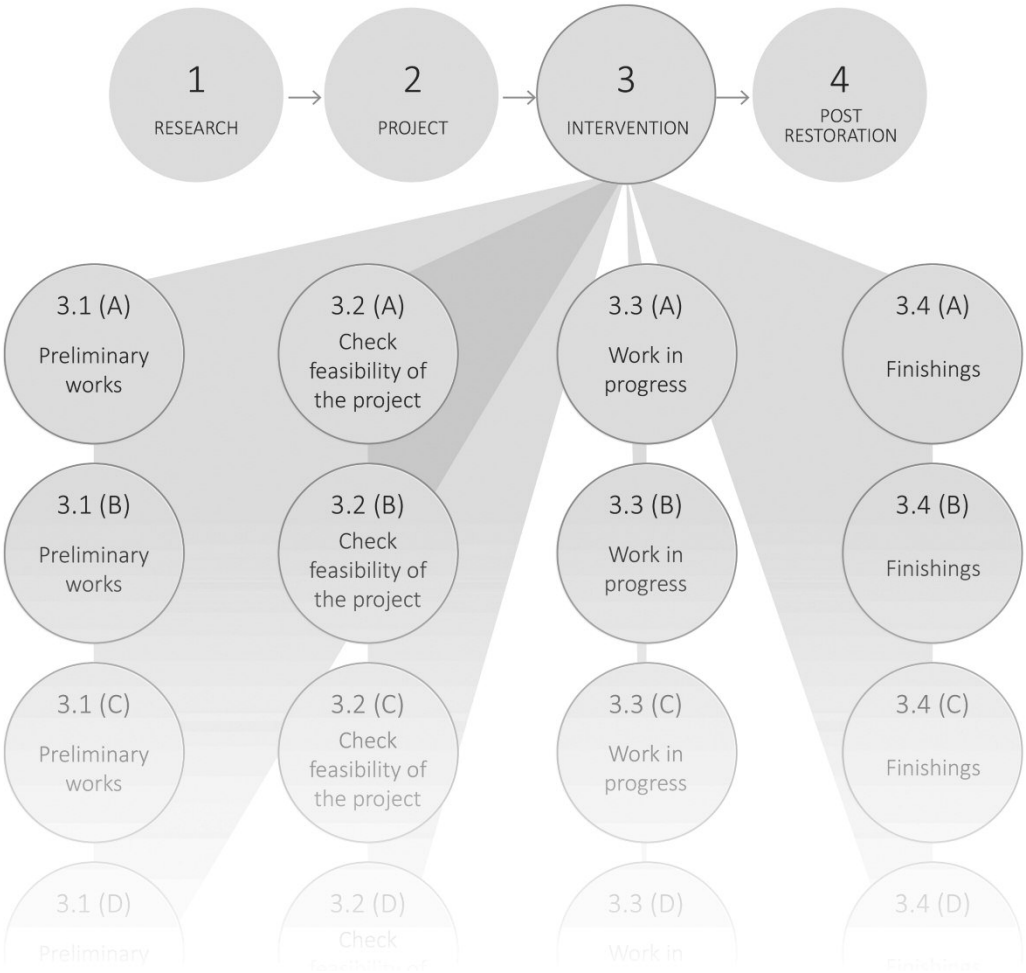


Fig. 6 - Composition of the 3rd area of the 'guidelines for the process of nautical restoration' (credit: G. Zappia, 2019).

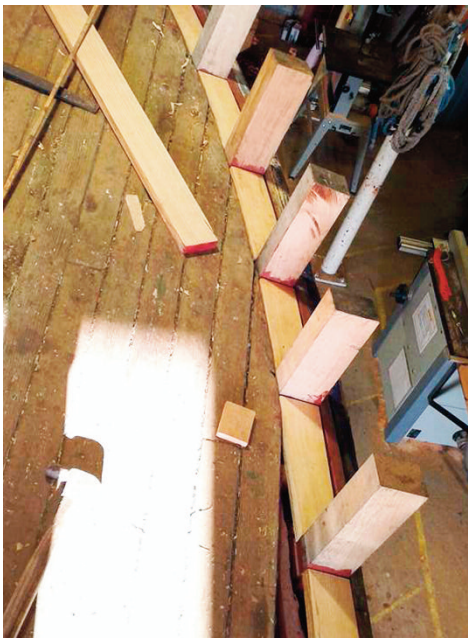
and drawings of vessels from the same shipyard as Fruitful and constructed in the same year (given that the vessel itself was entirely without documentation) and following the evaluation of its condition and the assessment of its damages conducted by the designer and subsequently documented, defined the objectives of the restoration. «Considering the modifications made over the years to be historically irrelevant interventions which had a considerable impact on the shape and aesthetic of the vessel, and given, on the other hand, the important historical testimony of this kind of vessel in its original state, the project intends to return the boat to its original conformation, even taking into consideration the necessary compromises made to ensure the navigability of the boat and its use for private recreation» (Zappia, 2019, p. 292). The Design

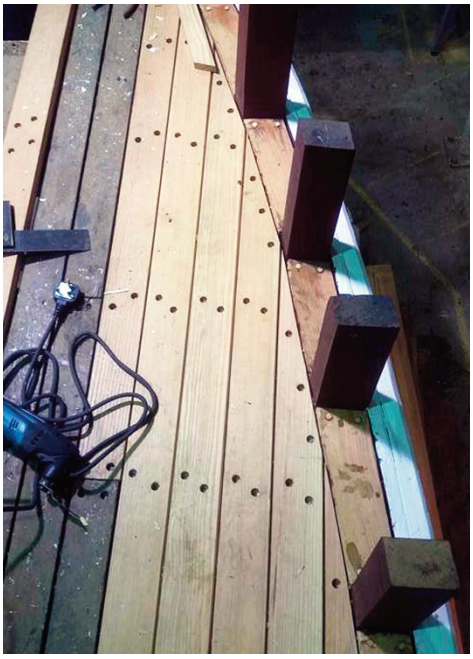
phase was completed following the enumeration of specific steps subdivided by area of intervention (ex. bulwarks, deck, interiors, etc.). Regarding the evaluation of construction techniques and materials, implicit in the shipyard's typical operative methods is the use of traditional techniques and materials that can be easily found in the area, with the occasional use of modern technologies when these represent a necessary compromise between preserving the boat's historical accuracy and ensuring an easier, more appropriate, and longer lasting restoration.

With respect to the interventions (Fig. 6), an initial attempt to simultaneously conduct phases 3.1 for all of the areas (A, B, C, etc.), and to then proceed with the subsequent phases only once the previous ones had been completed, had a negative outcome. In fact, the vessel was subdivided into 14 areas and certain limits could not be perfectly defined. This meant that while for the preliminary work it was possible to proceed simultaneously as suggested by the 'guidelines', for the restoration (phase 3.3) of certain areas (for example certain specific activities in the 'deck' area) it was necessary to wait for other areas to be finished (in this case the 'bulwarks') in order for them to be carried out and completed (Figg. 7-9). This situation demonstrated the impossibility of establishing strict rules and overly restrictive limits. Therefore the subdivision into steps and the configuration proposed by the guidelines' remain valid, taking due account however of the freedom of choice between the option of following the suggested steps simultaneously (first all of the 3.1 phases, then all of the 3.2, etc.), or, depending on the needs of each intervention, of the organisation of the shipyard, and of the labour, opting for a crossed sequence that is determined depending on the situation (for example, one could proceed with phases 3.1 and 3.2 for area A and subsequently begin phase 3.1 in area B before proceeding at the same time and concluding simultaneously with all of 3.4), while still maintaining the overall sequential nature: first 3.1 then 3.2 then 3.3 and finally 3.4, without ever proceeding backwards.

Ultimately, Fruitful was a verification model for the Post-restoration part as well. The designer drafted a chart containing the sequence of checks and maintenance specific to the boat while, in terms of cultural valorisation and dissemination, the shipowner actively participated in the organisation of gatherings of traditional vessels and historical-cultural events in which Fruitful was always front and centre (Figg. 10, 11).

Critical Considerations and Conclusions – Following the optimisation obtained by testing the 'guidelines' on Fruitful, additional trials were conducted in Italy with the dual objective of improving the process and getting those national entities that oversee the recovery of Italy's Nautical Heritage newly involved (once the process was defined). This inclusive approach, which has always been a part of the way in which the research project was conducted, brought to life a lively and well-rounded debate in the sector (Morozzo, 2018, 2018a) which nourishes the cultural aspects at the basis of the project (like the comparison with architectural restoration) as much as the practical-logistical aspects (like, for example, the operative activities of the shipyard). Both the scientific





Figg. 7-9 - Scottish Fisheries Museum shipyard, Anstruther, UK: Intervention on waterways, area 'bulwarks'; Completion of waterways intervention, area 'bulwarks'; Intervention on the deck (credits: L. Bortolami, 2017).

Fig. 10 - Fruitful at Anstrhther Harbour Festival, Anstruther, UK (credit: R. Wemyss, 2018).

Fruitful	1 week	2 week	3-4 months	6 months	1 year	1.5 year	2 year	6 year
Wet the deck with salt water	x							
Starting the engine		x						
Bilge cleaning			x					
Deck oiling				x				
Interior ventilation		x						
Painting with antifouling					x			
Check and possible change of anods					x			
Check and possible reset of pitch					x			
Painting								x
Mast oiling					x			
Sanding, primering and painting of metal components							x	
Cleaning or possible replacing of water pump impeller					x			
Cleaning or possible replacing of water and diesel filter					x			
Oil change, check and possible change of the oil filter							x	
Checking engine liquids						x		

Fig. 11 - Ordinary maintenance timetable of Fruitful (credit: G. Zappia, 2019).

community and the sector are demonstrating substantial interest in the process that has been defined and illustrated by the 'guidelines', recognising the innovation and benefit to the sector of historical nautical vessels.

With respect to the current scenario and to the approval with which they were met in the community of application, in the near future the popularisation of the 'guidelines for the process of nautical restoration' will contribute to establishing all-new professional figures capable of bringing together great design capability and skills that incorporate both tradition and innovation and both the material and immaterial culture of historical nautical vessels. It will also encourage the consolidation of good practices in nautical restoration, confining and limiting incongruous interventions and, finally, will contribute to the strengthening of a collective awareness of the actual 'value' of historical nautical artefacts. Furthermore, their widespread use will facilitate the simplification of certain phases of the process itself, which at the time of this study may seem complex or difficult to use, but which through practice and redefinition will certainly benefit from the experience acquired through use. Finally, it is possible that, once the use of the 'guidelines' as a tool for restoration projects has been strengthened and completely absorbed by the sector, their use may over time spark virtuous mechanisms capable, in turn, of determining production or product innovation, reflecting positively on the more specific activities of the shipyard. This final aspect is certainly of interest and relevance, and therefore we hope to be able to examine it in the future as a further development of our research activity.

ACKNOWLEDGEMENTS

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NOTES

1) Art. 10 and 11 of Leg. Decree no. 42 dated 22nd January 2004 – Cultural Heritage and Landscape Act (in accordance with article 10 of Law no. 37 dated 6th July 2002) and subsequent amendments and integrations. For additional information see: Morozzo della Rocca, 2014.
2) Genoa's School of Design was established in 1996 and went on to develop and structure itself over time, ultimately arriving at its current form of: a three-year bachelor's degree program in Product and Nautical Design, a master's degree program in Products and Events, a master's degree program in Naval and Nautical Design, a doctorate program in Architecture and Design, and an interdepartmental doctorate program in Maritime Science and Technology. For additional information see: Aa.Vv. (2006), *10 indesign. Dieci anni di progetti e prodotti della scuola genovese*, Alinea, Florence; Spadolini, M. B. (2009), *Design Scuola Territorio*, Alinea, Florence; Aa.Vv. (2015), *Design Navale e nautico dieci anni magistrali a master's decade*, Publisher goWare, Florence.
3) This refers to what has become an incredibly active debate in the scientific community and which is embodied once again in the topics of the 2019 National Assembly of the Italian Design Society. See: Società Italiana di Design – SID. [Online] Available at: http://www.societaitalianadesign.it [Accessed 23 April 2019].
4) University of Genoa, Architecture and Design Department:
- University research projects: URP 2012 – Restoration for Nautical Artefacts, Methodological and Disciplinary Observations, research director M. C. Morozzo della Rocca; URP 2013 – Strategies for the Valorisation, Safeguard, and Recovery of Historical Vessels, research director M. C. Morozzo della Rocca; URP 2016 – Nautical Heritage, Digital Tools for Understanding and Promoting Nautical Patrimony, research director M. C. Morozzo della Rocca; URP 2017 – Maritime and Sea Museums: Networks for the Consolidation and Cultural Growth of Nautical Heritage in Italy, research director M. C. Morozzo della Rocca; URP 2017 – Associations and Organisations for the Safeguard of Nautical Heritage: Networks for the Cultural Growth and Consolidation of Nautical Patrimony in Italy, research director M. I. Zignego.
- Research Agreements and Contracts: 2019 Three-Year Memorandum of Understanding with the Ministry of Defence – Italian Navy – Northern Naval Command for « […] the development of activities for the valorisation and recovery of Nautical Heritage, also through research projects applied to specific case studies. A research project that explores the topics of historical analysis and of strategies, methods, and protocols that are useful to the recovery and valorisation of the San Giuseppe Due motorsailer [...]», research directors M. C. Morozzo della Rocca, M. B. Spadolini, and M. I. Zignego; 2019 Research Contract with Yacht Club Italiano (Genoa) for «study and research activities relating to the valorisation and recovery of nautical culture and of material and immaterial Nautical Heritage, also through research projects applied to specific case studies. [...] Study of the Bigrin vessel [...]», research directors M. C. Morozzo della Rocca and G. Pellegri.
- Doctoral Thesis: Bellia, S. (2014), *Il Restauro Nautico. Criteri metodologici e scenari per la valorizzazione e il recupero delle imbarcazioni storiche*, Doctoral Thesis (cycle XXVI) in Nautical Design

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5) Ibidem, see: Research Projects URP 2012 and URP 2013.
6) The study of the manuals focused primarily on: the Barcelona Paper (EMH, 2003); the Regulations for the Tonnage and Racing of Classic and Vintage Yachts (CIM, 2018); the ASDEC Nautical Historical Registry (ASDEC); "Imbarcazioni in legno, il restauro consapevole" (Bortolami, 2018); "Yachts Restoration" (Morozzo, 2014).
7) The case studies examined are: the Barbara yacht, restored by E. Zaccagni, expert project manager in the field of refitting and restoration of vintage vessels assisted by R. Valeriani, Vice-President of Viareggio's Historic Sailboats Association and by the workforce of the F. del Carlo Naval Shipyard; the recovery of Big Class Lulworth, undertaken by the Faggioni Yacht Design Studio, for the past two generations committed to the recovery of classic or vintage sailboats; the auric cutter Star 1907 restored by its owner, P. Sivelli, with the help of Verbano's Vintage Sailboats Association; the dragon Acanto, restored by designer L. Bortolami for the development of his doctoral research.
8) The objective of the 'guidelines' is, specifically, to see this phase as a necessary point to reflect upon. It is not the intention or objective of the 'guidelines' to indicate which operative methods should be applied to the restoration of the vessel. Please refer to the recent publication entitled "Imbarcazioni in legno, il restauro consapevole" (Bortolami, 2018), which integrates and completes, from an operative standpoint, the 'guidelines for the process of nautical restoration', created to satisfy a methodological deficiency in the process.

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