

**SEVENTH FRAMEWORK PROGRAMME
THE PEOPLE PROGRAMME**

Annex I - “Description of Work”*

PART A:

Grant agreement for: Initial Training Networks
Call identifier: FP7-PEOPLE-2013-ITN

Implementation mode: Multi-ITN

Project acronym: *ForSEADiscovery*
Grant agreement no.: 607545

Project full title: *Forest resources for Iberian Empires: Ecology and Globalization in the Age of Discovery*

Date of approval of Annex I by REA: 11/10/2013
Project start date: 01/02/2014

* This Annex I refers to the 2013 PEOPLE Work Programme (European Commission C (2012)4561 of 9 July 2012)

A.1 Project abstract

Keywords: Early Modern History, Nautical Archaeology, Timber trade, Forest resources, Geographic Information Systems

Abstract:

In the Early Modern Age (16th-17th centuries) the construction of ocean-going ships was paramount to the development of cultural encounters in what became the Age of Discovery and European expansion. In the case of the Iberian Empires, the establishment of new trade routes brought up the need for armed merchantmen, galleons and smaller vessels, placing unprecedented demands on Iberian forests for the supply of construction timber. Forestry and sea power became inextricably linked, creating new geopolitical tensions, alliances and forest regulations. Key questions in this context are: could Iberian forest resources sustain the increasing demand of sound timber, or was the wood imported from elsewhere? If so, how were the trade networks organized? And did the lack of raw material force the technological changes occurred in shipbuilding in the 16th century, or were they a result of exchange between Mediterranean and Atlantic shipbuilding traditions? This project will address these questions through a multidisciplinary and innovative training research program to improve the understanding of our historical past, our cultural heritage, and our knowledge of the use of resources for shipbuilding. The prerequisite for such approach is combining knowledge derived from Humanities and Life Sciences. The aims of the project are: i) to consolidate a research line combining historical research, underwater archaeology, GIS and wood provenancing methods (dendrochronology, wood anatomy and geo/dendrochemistry); ii) to increase the background and experience of trainees in the different research areas, by engaging the fellows in training courses and workshops aimed at developing their scientific, communication, and management skills; and iii) to develop their transferable skills for future careers in academia or the private sector whilst advancing the research fields through the integration of research tools, development of reference datasets and new discoveries.

PART B:

B.1 List of participants

B.1.1. List of Participants (full beneficiaries)

Beneficiary Number	Beneficiary short name	Private Sector (Y/N)	SME (Y/N)	Country	Month enter project	Month exit project
1 Network Coordinator	CSIC	N	N	Spain	1	48
2	UNLA	N	N	Portugal	1	48
3	USC (Bioaplic*/ ES2*)	N	N	Spain	1	48
4	UWTSD	N	N	United Kingdom	1	48
5	MALtd	Y	Y	United Kingdom	1	48
6	WU	N	N	The Netherlands	1	48
7	UL	N	N	The Netherlands	1	48
8	RUG	N	N	The Netherlands	1	48
9	UdL	N	N	France	1	48

(*): **Bioaplic**: Faculty of Forestry, Department of Botany; **ES2**: Faculty of Biology, Department of Soil Science.

B.1.2. List of Associated Partners (including role and status)

N°	Associated Partner name	Short name	Country	Organisation type	SME (Y/N)	Role in the project
10	Texas A. & M University	TAMU	USA	Public	N	RES/TR
11	DendroDDK	DDK	Denmark	Private	Y	RES/TR
12	Archaeonauta S.L.	ArchSL	Spain	Private	Y	RES/TR/ SEC
13	Nicolaus Copernicus University	NCU	Poland	Public	N	RES/TR
14	Dixit International	DIXIT	Sweden	Private	Y	TR/DISS/ OUT

B.2 S&T Quality

B.2.1. Objectives of the research programme

The **main objective of this multidisciplinary research training programme** is to increase the background and experience of trainees in the different research areas, and to develop their transferable skills for future careers in academia or the private sector, whilst advancing the research fields through the integration of research tools, the development of reference datasets and new discoveries.

This will be achieved by i) engaging the recruited fellows in training courses and workshops aimed at developing their scientific, communication, management and leadership skills; and ii) reciprocally applying methodological techniques of the Historical Sciences, Archaeology and Life Sciences, including tree-ring research and geo/dendrochemistry, to the study of exploitation of Iberian and other European forest resources for shipbuilding during the Age of Discovery and European expansion. The **legacy** of such a program will be a cohort of European researchers with a multi-disciplinary perspective, fostered within a trans-national network of academic and commercial, public and private sector established researchers. Geographic Information Systems (GIS) will be used as a data-integration tool to visualize layers of information provided by the different disciplines, allowing the study of historical utilization of Iberian Atlantic forest resources for shipbuilding, as well as the interaction between timber-trade networks in Europe during the Early Modern times.

The project has been designed in six Work Packages (WPs) (see Table 1). Three of these WPs are dedicated to research (WP1, *Historical wood supply and dynamic trade networks*; WP2, *Nautical archaeology and shipbuilding*; WP3, *Wood provenancing*). The remaining three WPs involve training activities (WP4), project management (WP5) and dissemination and outreach activities (WP6). The project will undertake **15 individual sub-projects** divided into the **three major research topics**.

Scientific and Technological Objectives:

- **STO1:** To create an inventory based on archival information of the sources of oak and pine used for shipbuilding in Atlantic Iberia during the Age of Discovery and European expansion (16th to 18th centuries) (WP1);
- **STO2:** To collate historical and archaeological information regarding construction features of specific ships in Atlantic Iberian shipyards and contemporary timber usage at a time of significant technological developments (16th and 17th centuries) (WP1 and WP2)
- **STO3:** To characterise the wood from those sources in terms of tree-ring patterns (ring width, pointer years), wood anatomy (species level) and geo/dendrochemistry (isotopes);
- **STO4:** To investigate how the supply of timber (both local supplies and imported timber) and its dynamic trade networks were organized (WP1 and WP3)
- **STO5:** To synthesize results from STO1 to STO4 to produce guidance on best practice for multi-proxy methods for the analysis and provenance of timber employed in 16th to 18th centuries wooden ships
- **STO6:** To develop a GIS-based model combining information from the different disciplines involved in the project (history, archaeology, wood provenancing) to provide a tool to study of the use of European forest resources for world exploration and European expansion between the 16th and 18th centuries (WP1, WP2 and WP3).

Table 1. List of Work Packages

Work package No	WP Type*	Work package title	Deliverables (D) /Milestones (M)**	Lead beneficiary	Start month	End month
WP1	RTD	Historical wood supply and dynamic trade networks	D1.1,D1.2/ M4,M10	CSIC/UL/RUG/ TAMU	6	41
WP2	RTD	Nautical Archaeology and shipbuilding	D2.1,D2.2,D2.3, D2.4 / M2,M3, M9	UWTSD/UNLA/ TAMU/ArchSL	6	44

WP3	RTD	Wood provenancing	D3.1,D3.2,D3.3, D3.4 / M5,M6,M7,M8	USC/WU/DDK/ NCU	9	44
WP4	TR	Training	D4.1,D4.2,D4.3, D4.4,D4.5,D4.6, D4.7,D4.8,D4.9, D4.10,D4.11, D4.12	All	9	32
WP5	MGT	Management	D.5.1,D5.2,D5.3, D5.4,D.5.5,D5.6/ M11	All	1	48
WP6	DISS/ OUT	Dissemination and outreach	D6.1,D6.2,D6.3, D6.4. / M1	All	1	48

*Types of activities: **RTD** = Research and technological development including scientific coordination; **TR** = Training, scientific as well as complementary skills; **MGT** = Management of the consortium - applicable for all funding schemes; **DISS/OUT** = Dissemination/Outreach activities.

**Relevant deliverables (D1.1, D1.2, etc.) and milestones (M1, M2, etc.) connected to the respective WP (see respective WPs in the Proposal).

B.2.2. Research methodology and approach

B.2.4. Description of research work packages

WP1. Historical wood supply and dynamic trade networks

This WP is focused on historical information about timber supply for shipbuilding in Atlantic Iberian dockyards between about 1500 and 1800 , the mercantile networks in this trade and the shipbuilding policies and the related forest resources policies of the Spanish and Portuguese crowns . The WP will undertake four ESRs (**ESR1, ESR2, ESR3, ESR4**) and one ER (**ER1**).

Research approaches and methodologies include:

- Compilation of historical data from archival documentation, historiography and existing historical databases about trade and navigation in the first global era (AD 1500-1800);
- Formulation of a GIS-oriented conceptual model to be used as an integration and sharing tool;
- Checking and unifying of the data collection; this entails selecting common and specific variables, as well as formulating the fields that are necessary in the model for the information to be entered correctly. This will be done in relation to each historic period and geographic area. Due to the massive amount of existing archival and historiographic documentation available, and to ensure the research efficiency of each ESR, three approaches have been defined: i) archival data collection; ii) databases and server management; and iii) web development and metadata editing.
- Creation of a GIS platform (in compliance with the European regulation for web data entry) for the integration and interchange of information from and among the ESRs and ERs of all WP along the research and training programme. The GIS will also be made available in open access to all via the Internet.
- **Integration of complementary methods (also applicable to WP2 and WP3):** the GIS will be used as a data integration engine and visualization tool for the analysis of different layers of information about mercantile networks and routes of timber trade. In addition, a layer mapping the location of the forest resources in Iberia during the researched period, and the existing and newly developed tree-ring chronologies, DNA and isotopic reference data (WP3) will be created. Once the information provided by all individual projects carried out by the ESRs from all WPs is integrated into the GIS we will use it to analyse and validate or refute existing hypotheses, and to identify unexpected tendencies or trends and to study the use of forest resources for shipbuilding in the Iberian Peninsula as engine for the economic expansion throughout history.

WP2. Nautical archaeology and shipbuilding

WP2 is dedicated to the comparative study of information from literature, historical archives and archaeological evidence about shipbuilding techniques in Atlantic Iberia in the 16th – 17th centuries, a period

of major technological and construction changes. Archaeological evidence will be compiled from existing reports of previously excavated and researched Iberian shipwrecks and from shipwrecks that will be excavated during the project (**ESR5, ESR6, ESR7, ESR8** and **ER2**). Protocols for effective sample and data recovery from both excavated and *in situ* shipwreck assemblages will be reviewed, developed and tested. This will include experimental underwater fieldwork in the Solent (United Kingdom) and the excavation and research of 16th century Iberian shipwrecks found off the Galician coasts (northwest of Spain) by Associated Partner 12 (Archeonauta). Information about shipbuilding techniques in Northern Europe and the Mediterranean will also be compiled to allow trans-geographical comparative analysis for the same period.

The **key elements of the research methodology and approach** will be:

- Historical/archive research to determine evidence from contemporary written sources for modes of exploitation of timber resources to deliver structural elements within ships. Synthesis of archaeological datasets from excavation of Iberian ships of the study period. Development of a database with key-construction features (architectural signatures) diagnostic of different shipbuilding traditions. This database will be uploaded into the GIS platform, in order to compare the features described on written sources with the archaeological evidence compiled by the ESRs.
- Review of existing dendro-archaeological approaches to the analysis of shipwreck assemblages and the development of sampling methods and strategies focused on *in situ* Iberian shipwrecks located in Atlantic and adjacent waters. **ER2** will be placed at MALtd initially and then with ArchSL to lead on development of techniques and delivery of research and excavation plan for Iberian shipwrecks in north-west Spain.
- Participation of **ESR5, ESR6, ESR7** and **ESR8** in fieldwork programmes with underwater archaeology and dendrochronology sample recovery components undertaken by the private Full Participant 5 (MALtd) and excavations of Iberian shipwrecks by the private Associated Partner 12 (ArchSL) and by companies or institutes outside (but linked to) the network, to select and sample ship-timbers.
- Registration of ring-widths from recovered samples and delivery of data samples and sub-samples to be analysed by the ESRs of WP3. Approaches employed here will comply with best practice standards in the United Kingdom (as defined by English Heritage).
- Development of digital techniques for 3D reconstruction of the growth pattern, age structure and morphology of parent trees employed in ship timbers in Iberian shipbuilding of the period. This will build on approaches examined during analysis of the 15th century Newport Medieval ship deploying a combination of Co-ordinate Measurement Machines (e.g. Faro-Arm), laser scanning, and 3D graphics software (Rhino) which is increasingly being used within Nautical Archaeology for data capture, analysis, visualisation and dissemination.

WP3. Wood provenancing

Wood provenancing will be realised by combining three **research methodologies and approaches** from the Life Sciences, i.e. tree-ring research, wood anatomy and geo/dendrochemistry. This unprecedented approach will be integrated by **ER3** in order to provide a set of empirical tools to ascertain the origin of timber found in shipwrecks. **ESR9** will be responsible for the construction of long tree-ring chronologies from oak and pine originating from different areas in Atlantic Iberia. These data will be merged with existing datasets from the Iberian Peninsula and NW Europe to enable dendrochronological dating and provenancing of timbers from shipwrecks. **ESR10** will undertake the task of developing methods for anatomical characterization of the wood of deciduous oak and pine species used for shipbuilding in Iberia in the Age of Discovery and European expansion. These will include species' identification, parts of the tree (main stem, branches) and mechanical properties of the wood. Although differentiation of oak and pine species is straightforward by the observation of the living trees, this has not been successfully achieved by the study of their wood anatomy yet. This is crucial to determine whether a ship was built in an Iberian shipyard or elsewhere, as oak and pine timber for shipbuilding was imported to Iberia in the Early Modern Period, but Iberian timber was not exported elsewhere for this use. If e.g. *Quercus faginea* or *Q. pyrenaica*, which are endemic to the Iberian Peninsula are found in great amounts as original structural timbers in a ship, it could be an indication that the ship was built in an Iberian shipyard. Simultaneously, **ESR11** will assess the use of the elemental and isotopic composition of the wood as a fingerprinting to develop a model for identifying its provenance; as trees mine soils for nutrients, they also incorporate other elements present in the minerals and the soil solution. Therefore, the geochemical composition of wood reflects the local lithology, offering good

prospects for the identification of the provenance. **ESR12** will investigate the extraction of isotopic biomarkers in the wood from living trees and waterlogged timbers from the researched shipwrecks.

Research methodologies and approaches for each discipline:

- **Tree-ring research:** Oak and pine stands will be sampled in areas of Atlantic Iberia identified by ESR1 and ESR2 (WP1) as suppliers of timber for shipbuilding in the 16th and 17th centuries. The selected sites (at least three per area) will be representative of known geographical areas, and cover the most recent centuries. Sampled trees (at least 30 per site, selected by **ESR9** and **ESR10**) will comprise old individuals to achieve long tree-ring chronologies, but also younger trees (up to 100 years old), to assess among other impacts of forest management gained from (historic) archives. Standard dendrochronological methods will be used to obtain tree-ring chronologies. To extend these chronologies back to the 16th century and beyond (period covered by the trees used to build ships of the Age of Discovery), two to five historical buildings with wooden roof-structures (e.g., churches, cathedrals, monasteries) will be targeted in the surroundings of the timber-supplying areas to bridge the chronologies from living trees and the wood from the shipwrecks.
- **Wood anatomy:** **ESR10** will identify wood anatomy markers in samples from living trees to (i) enable species differentiation for oaks (*Quercus robur*, *Q. petraea*, *Q. faginea*, *Q. pyrenaica*) and pines (*Pinus sylvestris* and *P. nigra*) commonly used for shipbuilding in Atlantic Iberia and the North of Europe during the 16th to 18th centuries, (ii) identify properties of the wood used in shipbuilding, (iii) detect wood anatomical variables that reflect ecological site conditions. Once the markers have been identified the validity of this approach can be tested on timbers from historic buildings before being applied to samples collected from shipwrecks. Genetic analyses could be performed to complement species identification based on wood anatomical features.
- **Dendro/geochemistry:** soil, rainwater and wood samples will be collected in collaboration with **ESR9** and **ESR10** at the sample sites for living trees. Elemental and isotopic compositions will be determined using AAS, XRF, ICP-MS (**ESR11**). Certified standard reference materials will serve for quality control of the analyses. We will use infrared spectroscopy (FT-IR) on wood samples and PLS modelling to study wood organic composition. **ESR12** will assess possible diagenetical effects on the composition of timber-finds due to burial and/or prolonged immersion in sea water.

Innovative Aspects and Methodological Synergies of ForSEADiscovery lies in the interconnection of the different disciplines (Life Sciences, History and Maritime Archaeology) through a GIS model what will be used for interdisciplinary analysis and the integration of sciences with historical approaches that will offer new opportunities to understand the processes and impacts of European maritime exploration and expansion. This is an approaching that has never been undertaken before.

Private Sector Involvement and role of the Associated Partners in the Consortium:

- **Role of private Full Partners (Maritime Archaeology Ltd.):** will ensure the contact of research fellows with the practicalities of running a company and conducting research projects in competitive environments. **MALtd** will employ an ER (20 person-months) and provide short secondments (three to eight weeks) to the other fellows.
- **Role of Associate Participants:** **TAMU**, will impart two training courses for the research fellows (“History of Wooden Shipbuilding” and “Books and Treatises on Shipbuilding”) (TSRS) and co-advisor for the WP2. **Nicolaus Copernicus University (NCU)** and **DendroDK (DDK)** will have a significant input into organisation and delivery of training of the fellows on dendroarchaeology and dendroprovenancing (TSRS). Instruction of the ESR7 and ESR8 from WP3 in the selection and sampling of trees in the sites defined by ESRs from WP1 and will participate in the sampling campaigns and will take part in the training courses organized by the **UWTSD**. **DendroDK** will also offer a secondment opportunity to allow an ER to gain experience in development and submission of research proposals in a commercial environment. Just as with the **TAMU**, **NCU** have indicated a 2% of time for supervision/advice of students. The researchers will get practice in talking about and communicating their research and results to the media (GTRS) though the production of news-items and short documentaries in collaboration with Dixit International (Associated Participant 14).

B.3 Training

B.3.1. Quality of the training programme

Training Programme objectives (TOs) of ForSEAdiscovery:

- **TO1:** To develop and enhance independent thinking through the training process, to produce in this way creative researchers with excellent transferrable skills, including the ability to transform abstract ideas into influential outcomes, by being able to (i) conduct methodologically and ethically sound interdisciplinary research, (ii) obtain research funding, and (iii) present research results to professional and lay audiences.
- **TO2:** To provide academic, private and public sector employers with researchers skilled in developing innovative concepts and able to apply a wide range of techniques and direct experience of interaction across disciplines and sectors.
- **TO3:** To create an active, life-long interdisciplinary network of young researchers whose personal contacts, support and expertise will help Europe to shape the future of research in the Humanities through the integration of disciplines from the Life Sciences.
- **TO4:** To cascade expertise and spread good practice throughout Europe by personnel exchange, and delivering European researchers able to become independent researchers and leaders in research of Cultural Heritage in the near future.
- **TO5:** To make a career in History, Archaeology and Heritage studies more attractive to ESRs by delivering a well-structured interdisciplinary training programme, supported by leading international scientists in state-of-the art technology and research infrastructure which covers a portfolio of interdisciplinary techniques.

Summary description of the training programmes offered; role and structure of the Consortium

To achieve the TOs, ForSEAdiscovery will provide training in:

a) **task-specific research skills (TSRS)**

b) **Generic and transferable research skills (GTRS)** (e.g. participation in conferences, workshops and meetings at local and network level). ForSEAdiscovery will establish a set of local and network activities oriented to provide integrated, complementary training to ESRs and ERs. This training will facilitate the embedding of ESRs and ERs in particular, in the coordination and organization of ForSEAdiscovery tasks.

Supervisory Board (SB): management of the training programme will be carried out by the SB in which all full participants and associated partners will participate. **SB** will have an important role in training:

- **SB** will organize the recruitment of ESRs and ERs setting up a committee composed by the Network Coordinator, the Research Coordinator of the research WP, the PI of the specific individual project, and an independent observer (e.g. member of human resources/personnel office of employing institution) to ensure transparency and candidate eligibility.

- The **SB** will assure that the recruitment and selection process is open (widely advertised), supportive and transparent, in full agreement with the European Code of Conduct for Recruitment of Researchers. The **SB** will clearly define the tools that ForSEAdiscovery will offer to ESR and ER to achieve the goals of the training program and to ensure that the trainees participate in the educational program outlined above.

- Research Coordinators (**RC**) and **SB** will be involved in setting up the individual projects and monitoring fellows' progress via individual PDPs and reports. Prior to recruitment of ESRs, the **SB** will agree on procedures for tracking student progress, which will complement those of the host institution and will ensure that the **SB** is informed of satisfactory progress and can take any necessary action to address problems or deficiencies quickly and effectively. Standard progress report forms will be completed for each ESR immediately prior to SB meetings which will coincide with full network meetings (annual) with intermediate 6 monthly 'virtual' meetings. Fellows will submit yearly short progress reports for the **RC**.

- Training Coordinator (**TC**) will act as the liaison between the **SB** and the ESR and ER and will inform ESRs and ERs of the decisions and procedures established by the **SB**.

The **SB** will define the procedures for inter-laboratory exchange through secondments. All ESR and ER will be encouraged to participate in exchanges for up to 30% of their time. Exchanges between academia and the private sector will be strongly promoted.

Each first supervisor/director of studies (as defined by host universities) for ESRs will participate in the **SB** ensuring each PhD student is compliant with university regulations whilst also receiving support from other senior academics within the network, and representatives from private sector participants.

Each fellow will have two clearly identified supervisors to whom they can refer for advice on their research. One supervisor will be local, and a second supervisor will be assigned from within the network (at the secondment laboratory or private sector organisation if applicable).

Fellows and supervisors will carry out a **training-needs assessment** based on the fellow's existing skills, the requirements of their personalised research project, and the fellow's longer term career plans. The training-needs assessment will be used to develop a **Personal Development Plan (PDP)**, which will form the basis of the fellow's training and individual learning objectives. The PDP will include a balance of training in TSRS and GTRS that will be tailored to the individual fellow.

Progress on the PDP timetable will be checked every three months through an (e-/teleconference) meeting between the fellow and supervisors. Following the meeting fellows will submit short progress reports to the **Training Coordinator (TC)** using collaborative editing technologies (wiki-based). Other formal assessments will be made at network meetings, where fellow's presentations will be evaluated by senior researchers. Fellows will update their **PDP** yearly with input from the supervisors, and their progress will be assessed by the **TC** and **SB**. **PDPs** will be tailored to the career stage of the fellows by rebalancing aspects of GTRS training.

Complementary GTRS training will be integrated into all aspects of training delivery. The specific topics offered to all fellows (regardless of their ForSEAdiscovery individual research project) will include:

- Development of scientific research approach: defining a scientific question; formulating hypotheses.
- Designing efficient methodological strategies to crucially evaluate and approach the hypotheses; data analysis methods; critical thinking; problem solving; logical reasoning.
- Critical appraisal of scientific literature.
- Communicating science to non-scientists: public engagement; social content of research; media communication.
- Research communication for professional and lay audiences: verbal (presentation skills), written (scientific writing).
- Networking, critical listening and participation in discussion meetings.
- Research management: managing and delivering a research project; timescales; expectations and outcomes; conference organisation; collaboration.
- Ethics in research: integrity in data analysis; data ownership and protection; confidentiality and conflicts of interest; professional responsibility and accountability.
- Leadership skills: project management; planning time and finance; health and safety issues; responsible working practices; team working; appreciating learning and working styles; mentoring.
- Career development: personal effectiveness; presenting own skills, attributes and experiences in the best light; self-development and strategic career planning; effective CV applications and interviews.

Role of the Associated partners, private sector in Training:

a) **Full Partner Maritime Archaeology Ltd (MALtd, UK):** will employ an ER for a 20-month training period and the ESRs from WP2 through secondments. This SME works in the commercial sector providing archaeological services (Environmental Impact Assessments) in the marine environment and commissioned research projects for English Heritage. MALtd, in combination with WP2 coordinator (UWTSD) and ER2, will oversee the training of ESRs in field-work, as well as in practical skills for the documentation and sampling *in situ* of suspected 16th/18th century wrecks in UK waters. This will provide researchers with the opportunity to work both within MALtd's commercial environment and with its sister organisation, the Hampshire and Wight Trust for Maritime Archaeology (non-profit organisation), which is a registered charity with a brief to educate the local community through active fieldwork, outreach and dissemination.

b) **Associated Partners** selected for the project are key-units to the proposed research training programme, and the integration of non EU-parties (TAMU, USA) is highly justified. Historic shipwrecks of European

origin are often discovered outside European waters, or in the waters of European states other than those in which they were built. Therefore the study of forest exploitation and timber-trade for shipbuilding requires collaboration at a European and Trans-Atlantic level, as it does the study of shipwrecks as historical archives and the development of regional (as opposed to country-based) tree-ring chronologies.

- The **Texas A&M University** (TAMU, USA) will grant ForSEAdiscovery researchers and network access to the most advanced shipwreck database existing nowadays. This database will be combined with the DynCoopNet historical database (CSIC Digital Repository). Two training courses on these databases, shipbuilding and shipwrecks will be imparted by TAMU at the CSIC for all recruited fellows.
- **DendroDK** (DDK, Denmark) is a sole-trader company specialised in dendroprovenancing shipwrecks. DDK will contribute to ForSEAdiscovery by broadening the network's expertise in the use of dendrochronological research to provenance ship-timbers, proving how commercial high-quality research is viable and contributing to training opportunities for ESRs. Furthermore, DDK will be the contact person with the Irish Underwater Archaeology Unit which is presently investigating two Iberian shipwreck sites with surviving hull structure, and will assist in delivery of a course on Dendroarchaeology at UWTSD.
- **Archaeonauta S.L.** (ArchSL, Spain) is a small company providing commercial archaeological diving services off the NW Atlantic Spanish coast including expansive surveys of the underwater archaeological resource, as well as intensive surveys of individual shipwreck sites. ArchSL has identified a number of shipwrecks with surviving hull structures which, through examination of exposed material culture (e.g. armaments, cargo or personal possessions), are thought to be Iberian in origin. A selection of these shipwreck sites will form the focus of a sustained program of fieldwork for the recovery of timber samples for ring-width and other analysis (WP2, WP3). The project design and implementation of this fieldwork will be delivered by ER2 with support from ESRs from WP2, under the direction and supervision of ArchSL, MSCST and the WP2 coordinator (NN, UWTSD).
- **Nicolaus Copernicus University** (NCU, Torun, Poland) will provide dendrochronological evidence for timber-trade from the Baltic to Western Europe and will contribute to the training of fellows in dendrochronology in their acquisition of scientific and research skills.
- **Dixit International** (Sweden) was founded in 1995 as an independent media company, focusing on current affairs and science productions in collaboration with Deep Sea Productions, a world leading company in the field of maritime archaeology. Dixit International will support the dissemination of scientific information for ForSEAdiscovery independently or in cooperation with specialised producers.

Contributions from outside the network (B.3.5)

The network Full Partners and Associated Participants have also their own networks, which include contacts with the public sector (e.g. Cultural Heritage agencies) and with private companies and associated laboratories. Visits to some of these research centres and laboratories will be organized by network members. If necessary, support for specific actions (e.g. sampling living trees or roof-timbers) or specific analyses will be subcontracted.

Workshops on complementary skills will be subcontracted to companies with high reputation at European level and offering tailor-made training content matching the requirements of the training programme.

B.3.2. Network-wide training events, schools, conferences, workshops

Table 2. Training activities

	Training events, workshops & conferences	Lead Organising Institution	Planned date	Planned venue
1	History of Wooden Shipbuilding (C1)	CSIC /TAMU	Dec 2014	CSIC
2	Books and Treaties on Shipbuilding (C2)	CSIC/TAMU	Dec 2014	CSIC
3	Network meeting (N1)	CSIC	Dec 2014	CSIC
4	Workshop (W1): Communication and Presentation Skills	CSIC	Dec 2014	CSIC
5	Historiography and archive research (C3)	RUG/UL	May 2015	RUG
6	Geographic Information Systems (C4)	CSIC	Sept 2015	CSIC
7	Dendrochronology and wood anatomy (C5)	WU/USC/NCU	Dec 2015	WU

8	Workshop (W2): Scientific communication and multidisciplinary team-work	WU	Dec 2015	WU
9	Network meeting (N2)	WU	Dec 2015	WU
10	Dendroarchaeology of Ships – Practice and Prospect (C6)	UWTSD/DDK	Nov 2016	UWTSD
11	Network Meeting (N3)	UWTSD	Nov 2016	UWTSD
12	Workshop (W3): Advanced Team and Project Management	UWTSD	Nov 2016	UWTSD

1. History of Wooden Shipbuilding (CSIC/TAMU).

Training in task- specific research skills (TSRS); imparted by network members; 4 days.

2. Books and Treatises on Shipbuilding (CSIC /TAMU)

Training in TSRS; the course will be imparted by the professor members of the Consortium; 4 days.

3. Network Meeting (CSIC)

Training in generic and transferable research skills (GTRS) (e.g. presentation of researchers and detailed working plans); 1 day.

4. Workshop in Communication and Presentation skills (CSIC)

Training in GTRS; imparted by CSIC specialists; 2 days.

5. Course in Historiography and archive research (RUG)

Training in TSRS; introduction to archives and archival research with hands-on experience; imparted by network members; 3 days.

6. Course in Geographic Information Systems (CSIC)

Training in TSRS; introduction to GIS with application to the individual research projects; imparted by the GIS laboratory in CSIC; 5 days.

7. Course in Dendrochronology and wood anatomy (WU)

Training in TSRS; preparation and processing of samples, acquisition of tree-ring data, x-dating and interpretation of wood anatomy features; course imparted by network researchers; 3 days.

8. Workshop in Scientific communication and multidisciplinary team-work (WU)

Training in GTRS; imparted by WU personnel; 2 days.

9. Network meeting (WU)

Training in GTRS (presentation progress reports); 1 day.

10. Course in Dendroarchaeology and provenancing (UWTSD)

Training in TSRS; inspection, selection and sampling of archaeological timbers for dendrochronological research; statistical tools for provenancing; imparted by network members; 3 days.

11. Network meeting (UWTSD)

Training in GTRS (presentation results, progress reports); 1 day.

12. Workshop in Advanced Team and Project Management (UWTSD)

Training in GTRS; imparted by UWTSD personnel; 2 days.

Both **TSRS** and **GTRS** will be delivered via three routes: (a) Locally, (b) Network-wide, (c) outside the network and (d) outreach activities.

Local training delivery: ESRs will be enrolled on **PhD programmes** at their host institution. ESRs will have the opportunity to choose the graduate courses offered by the host institutions in addition to ForSEAdiscovery-organized courses and meetings. More importantly, ForSEAdiscovery will propose mutual recognition of the graduate courses by the host institutions; this will allow ESR to choose among a broad spectrum of courses regardless of the host institution. The PhD programs are generally designed to meet the following objectives: i) to obtain detailed knowledge of a specific research topic, ii) to recognize problems and questions important to research within their area, iii) to design protocols and to conduct independent, productive research, iv) to critically analyse, evaluate and synthesize complex new ideas in their field of scientific specialization, v) to master research procedures and methods, and develop technical laboratory skills, and vi) to develop communication and teaching skills. Academic supervision of PhD candidates will be undertaken by host universities under their own regulations, with network wide supervision by the **SB** complementing this and providing additional training opportunities and support at a network level (including supervision and training provided by the recruited ERs).

Local training will include hands-on training through research by developing an **individual ForSEAdiscovery research project** (see *Table 3* of this Annex 1).

- ESR will give **one formal seminar per year to the entire department**. In the first year, the seminar will be based on the thesis plan (background, hypothesis, objectives, and work plan). Subsequent seminars

will show the results obtained and the most significant conclusions. This activity will be complemented by oral presentations included in the network activities.

- **Training exchange visits** will form part of local training and will facilitate personnel interdisciplinary training and intersectoral awareness. For ESRs, secondments up to three months will be undertaken for analyses or individual project-specific research. Additionally, secondments with private partners MALtd (Full Partner 5) and ArchSL (Associated Partner 12) and/or with academic partners have been planned for all ESRs to train skills from other disciplines and from the private sector. These placements will comply with the ITN call, not surpassing a 30% of the total recruitment period. Visits will facilitate information exchange through the partner laboratories, fostering future collaborations, and will equip fellows with skills not available “in house”. Exchanges will generate research synergies and a collective spirit amongst the fellows. Specifics will be based on the individual fellow’s PDP. Local Training will benefit from the locally organised courses (at home and visiting labs) which will cover most aspects of GTRS and TSRS (for example at UL all fellows can take courses of the postgraduate programme in Modern History). Attendance at the courses will be planned with the supervisors and recorded in the PDP. A visit to attend a specific course in another partner institution will be arranged if it is not provided locally.

Network-wide training delivery: This will be provided through presentations at network meetings, courses and workshops, thus delivering training on GTRS and TSRS will be combined through:

- Project kick-off and end meetings;
- **Network meetings** (three, one per year starting on month 9, December, 2014), organized by CSIC (partner 1, N1), WU (partner 6) and UWTSO (partner 4) in which the ESR’s and ERs will present themselves and their research to the network. The organising committee for each network meeting will be chaired by the local organiser and will contain a co-host, chairs of the research and training committees, project coordinator, fellows’ representative and project manager. Timing of training events will be in line with fellows’ research and programmes;
- Network meetings will be followed (or preceded) by 3-day **intensive courses** in specific research topics and/or skills (TSRS).
- As part of the TSRS, ForSEAdiscovery will offer six **courses** to the recruited fellows (**Table 2**) on specific scientific topics related to all the disciplines involved in the project (history, shipbuilding and underwater archaeology, dendrochronology, wood anatomy and provenancing). These courses will be imparted by network PIs (both Full Partners and Associated Participants).
- Three **workshops** on generic and transferable research skills (GTRS) will be organised by network Partners and Associated Participants coinciding with network meetings. The aim of the workshops will be to enhance the fellows’ skills in oral presentation (W1), scientific communication and multidisciplinary team-building (W2) and advanced team and project management (W3) (**Table 2**).

Training in dissemination and outreach activities: The consortium will ensure that the results will be made known to non-specialist audience by the participation of ESR, ER and PI in **audio-visual reports** (news-items, short documentaries) organised by Partner 14 (Dixit International) as the individual research projects progress. Additionally, the ESRs and ERs will be engaged in other outreach activities that promote the public engagement of researchers with the broader public:

- Dissemination of results to specialised audiences will be done through the attendance at established **international conferences** for specific research topics (e.g. International Association of Economic History, World History Association, IKUWA, ISBSA, EuroDendro, WorldDendro, etc). This will give the ESRs and ERs the chance to present their research, the ForSEAdiscovery project and themselves, enhancing the chances to expand and consolidate their network.
- The development of a **ForSEAdiscovery website** (designed by Partner 1 and ER assigned to him) will serve as the first platform to introduce the partners and their members to society.
- **Science fairs and oral presentations** at universities and secondary schools.
- Dissemination of results in the **media** and **social networks**.

B.4 Implementation

B.4.1. Workplan

Table 3. List of Fellows' individual projects

Fellow No.	Project Title	Host Institution	Relevant WPs	Duration (months)	Indicative start date
ES R1	Organisation, management and supply of forest resources for shipbuilding in Spain (AD 1500-1800).	CSIC (SP)	WP1, WP2, WP3	36	Aug 2014
ES R2	Portuguese forest resources and timber supply in the Age of Discovery and expansion (AD 1500-1800).	UL (NL)	WP1, WP2, WP3	36	Aug 2014
ES R3	The North European timber trade to Spain and Portugal (AD 1500-1800): Volumes and Transport.	RUG (NL)	WP1, WP2, WP3	36	Aug 2014
ES R4	Trading Networks involved in Timber Trade, 17 th -18 th centuries: mechanisms and routes.	RUG (NL)	WP1, WP2, WP3	36	Aug 2014
ER 1	Development and implementation of a GIS-based model for timber provenance and mercantile wood-trade routes.	CSIC (SP)	WP1, WP2, WP3	24	Oct 2014
ES R5	Reconstructing timber in Spanish-Atlantic shipbuilding - treatise and archaeology.	UWT SD (UK)	WP2, WP1, WP3	36	Aug 2014
ES R6	Developing dendro-archaeological approaches in Nautical Archaeology: integration of ring studies, dendrochronology and timber morphology (3D CAD) for the reconstruction of past forestry practice and exploitation.	UWT SD (UK)	WP2, WP1, WP3	36	Oct 2014
ES R7	16 th century shipbuilding in Portuguese dockyards: a historical and archaeological perspective.	UNL A (PT)	WP2, WP1, WP3	36	Aug 2014
ES R8	The Dendro-archaeology of Portuguese ships of the Early Modern Period.	UNL A (PT)	WP2, WP1, WP3	36	Oct 2014
ER 2	Research protocols for interrogation of shipwreck assemblages: recovery, documentation and analyses of structural ship timbers from <i>in situ</i> shipwrecks.	MALtd (UK)	WP2, WP1, WP3	20	Oct 2014
ES R9	Development and implementation of a tree-ring data network for the assessment of the date and provenance of Iberian ship-timbers.	USC (SP)	WP3, WP1, WP2	36	Oct 2014
ES R10	Application of ecological wood anatomy for species determination and wood provenancing of oak and pine from Atlantic Iberia.	WU (NL)	WP3, WP1, WP2	36	Oct 2014
ES R11	Identification of potential biomarkers of wood for provenancing.	USC (SP)	WP3, WP1, WP2	36	Oct 2014
ES R12	Geochemical fingerprinting of potential source areas of the wood.	UdL (FR)	WP3, WP1, WP2	36	Oct 2014
ER 3	Provenancing timber from a multidisciplinary approach: dendrochronology, wood anatomy and geo/dendrochemistry.	USC (SP)	WP3, WP1, WP2	24	Oct 2014

The network as a whole undertakes to provide a minimum of 500 person-months of Early Stage and Experienced Researchers whose appointment will be financed by the contract. Quantitative progress on this, with reference to the table contained in Part C and in conformance with relevant contractual provisions, will be regularly monitored at the consortium level.

B.4.2. Fellows individual research projects

Fellow ESR1	Host institution	Duration	Start date
	Instituto de Historia, Consejo Superior de Investigaciones Científicas (CSIC)	36	M6
Project title: Organisation, management and supply of forest resources for shipbuilding in Spain (AD 1500-1800) (WP1). Supervisor name: Ana Crespo Solana (CSIC) PhD enrolment: Y			

Objectives:
<ul style="list-style-type: none"> To compile data on timber supply of Spanish shipyards (16th to 18th centuries) from the historiography and archival sources and identify sources of timber supply of the main Atlantic Spanish shipyards.
Tasks and methodology:
<ul style="list-style-type: none"> To collect in the literature information concerning timber trade related to the Atlantic Iberia (1500-1800) shipbuilding industry. To compile information from archives and existing databases about navigation and timber trade
Results:
<ul style="list-style-type: none"> Database containing information about merchant networks, volume of timber trade and transport, and areas supplying timber for shipbuilding to Atlantic Iberia (16th to 18th centuries).
Dissemination:
<ul style="list-style-type: none"> Publications (Peer-reviewed): <i>Journal of Economic History</i>; <i>Tiempos Modernos</i>. <i>Revista online de Historia Moderna</i> (specialised monograph) International Conference: Presentation in the International Association of Economic History, FEEGI. Participation in outreach activities: Science Fair in Madrid, November 2016
Planned secondment (institution/start month/length in months/purpose):
<ul style="list-style-type: none"> RUG / Jan 2015 / 3 months / Search on Dutch archives, database management. UWTSD / Oct 2015 / 2 months / Comparative study contemporary forestry practice and timber supply in British Isles: historical, archaeological and structural approaches. Based in commercial sector Archaeological Services.
Risk assessment:
<ul style="list-style-type: none"> Given the numerous relevant archives in Northern Europe archival research will be conducted strategically, starting by the most important collections in Database and Digitalized material.

Fellow ESR2	Host institution Universiteit Leiden (UL)	Duration 36	Start date M6
Project title: Portuguese Forest resources and timber supply in the Age of Discovery and expansion (AD 1500-1800) (WP1).			
Supervisor name: Catia Antunes (UL)			
PhD enrolment: Y			
Objectives:			
<ul style="list-style-type: none"> To compile data on timber supply of Portuguese shipyards (16th to 18th centuries) from the historiography and archival sources and identify sources of timber supply of the main Atlantic Portuguese shipyards. To study the process of timber selection, acquisition, mechanisms of trading networks and transport. 			
Tasks and methodology:			
<ul style="list-style-type: none"> To collect in the literature information concerning timber trade related to the Atlantic Iberia (1500-1800) shipbuilding industry. To compile information from archives and existing databases about navigation and timber trade 			
Results:			
<ul style="list-style-type: none"> Database containing information about merchant networks, volume of timber trade and transport, and areas supplying timber for shipbuilding to Atlantic Iberia (16th to 18th centuries). 			
Dissemination:			
<ul style="list-style-type: none"> Publications (Peer-reviewed): <i>Journal of Economic History</i>; <i>Tiempos Modernos</i>. <i>Revista online de Historia Moderna</i>. International Conference: Presentation in the International Association of Economic History , FEEGI forum. Workshop Participation in outreach activities: Science Fair in Madrid, November 2016 			
Planned secondment (institution/start month/length in months/purpose):			
<ul style="list-style-type: none"> UNLA / Jan 2015 / 3 months / Introduction to Portuguese archives: archaeological and architectural approaches: GIS models, data entry and data analysis (UNLA) UWTSD / Oct 2015 / 2 months / Comparative study contemporary forestry practice and timber supply in British Isles: historical, archaeological and structural approaches. Based in commercial sector Archaeological Services. 			
Risk assessment:			
<ul style="list-style-type: none"> Given the numerous relevant archives in Northern Europe archival research will be conducted strategically, starting by the most important collections in Database and Digitalized material. 			

Fellow ESR3	Host institution Rijksuniversiteit Groningen (RUG)	Duration 36	Start date M6
Project title: The North European Timber Trade to Spain and Portugal (AD 1500-1800): Volume and Transport (WP1).			
Supervisor name: Jan Willem Veluweekamp (RUG)			
PhD enrolment: Y			
Objectives:			
<ul style="list-style-type: none"> To compile data on timber supply of from the historiography and archival sources. To identify and collect information for the study of trading networks and transport from the Baltic area to the Iberian Peninsula (16th – 18th centuries). 			

<p>Tasks and methodology:</p> <ul style="list-style-type: none"> To collect in the literature information concerning timber trade related to the trading routes between the Scandinavian-Baltic region and the Atlantic Iberia (1500-1800). To compile information from archives and existing databases about navigation and timber trade by using the Sound Toll Register Online
<p>Results:</p> <ul style="list-style-type: none"> Database containing information about merchant networks, volume of timber trade and transport, and areas supplying timber for shipbuilding to Atlantic Iberia (16th to 18th centuries).
<p>Dissemination:</p> <ul style="list-style-type: none"> Publications (Peer-reviewed): <i>Journal of Economic History</i>, <i>Tiempos Modernos</i>, <i>Revista online de Historia Moderna</i> International Conference: Presentation in the International Association of Economic History , FEEGI forum. Participation in outreach activities: Science Fair in Madrid, November 2016
<p>Planned secondment (institution/start month/length in months/purpose):</p> <ul style="list-style-type: none"> CSIC / Jan 2015 / 3 months / Search on Spanish archives, database management, training on GIS. UWTSD / Oct 2015 / 2 months / Comparative study contemporary forestry practice and timber supply in British Isles: historical, archaeological and structural approaches. Based in commercial sector Archaeological Services.
<p>Risk assessment:</p> <ul style="list-style-type: none"> Given the numerous relevant archives in Northern Europe archival research will be conducted strategically, starting by the most important collections in Database and Digitalized material.

Fellow ESR4	Host institution RijkUniversiteit Groningen	Duration 36	Start date M6
<p>Project title: Trading Networks involved in Timber Trade, 17th-18th centuries: mechanisms and routes (WP1). Supervisor: Jan Willem Veluwenkamp (RUG) PhD enrolment: Y</p>			
<p>Objectives:</p> <ul style="list-style-type: none"> To compile information from archives and literature about merchant networks involved in the timber trade between Scandinavian-Baltic area and the Iberian Peninsula. To study the mechanisms of trading networks and transport. 			
<p>Tasks and methodology:</p> <ul style="list-style-type: none"> To collect in the literature information concerning timber trade related to the Atlantic Iberia (1500-1800) shipbuilding industry. To compile information from archives and existing databases about navigation and timber trade 			
<p>Results:</p> <ul style="list-style-type: none"> Database containing information about merchant networks, volume of timber trade and transport, and areas supplying timber for shipbuilding to Atlantic Iberia (16th to 18th centuries). 			
<p>Dissemination:</p> <ul style="list-style-type: none"> Publications (Peer-reviewed): <i>Journal of Economic History</i>; <i>Tiempos Modernos</i>, <i>Revista online de Historia Moderna</i>. International Conference: Presentation in the International Association of Economic History, FEEGI forum. Workshop Participation in outreach activities: Science Fair in Madrid, November 2016 			
<p>Planned secondment (institution/start month/length in months/purpose):</p> <ul style="list-style-type: none"> CSIC / Jan 2015 / 3 months / GIS on trading networks, historical perspectives. Spanish trading networks UNLA / Jul 2015 / 2 months / Portuguese, trading networks and mechanisms 			
<p>Risk assessment:</p> <ul style="list-style-type: none"> Given the numerous relevant archives in Northern Europe archival research will be conducted strategically, starting by the most important collections in Database and Digitalized material. 			

Fellow ESR5	Host institution University of Wales Trinity Saint David (UWTSD)	Duration 36 months	Start date M6
<p>Project title: Reconstructing timber in Spanish-Atlantic shipbuilding - treatise and archaeology (WP2). Supervisor name: Nigel Nayling (UWTSD) PhD enrolment: Y</p>			
<p>Objectives:</p> <ul style="list-style-type: none"> To compile information from written sources (archives and literature) and databases about shipbuilding techniques and associated forestry management in Spanish Atlantic in the 16th and 17th centuries, and known or suspected Spanish shipwrecks To make an inventory of key-construction features found in previously researched Spanish shipwrecks. To assess and analyse excavated Spanish ship timber assemblages To select a limited number of demonstration Spanish shipwreck sites for potential survey and dendrochronology analysis To survey and sample selected sites, carry out ring-width analysis and supply subsamples to others. To synthesise results and assess best practice. 			
<p>Tasks and methodology:</p> <ul style="list-style-type: none"> Combined documentary research, collation of archaeological information, timber characterisation and dendrochronology. Synthesis of results and dissemination. 			

<p>Results:</p> <ul style="list-style-type: none"> • GIS layer on Spanish shipwrecks. • Best practice and protocols for dendro-archaeological fieldwork. • Synthesis of site specific studies
<p>Dissemination:</p> <ul style="list-style-type: none"> • Articles in international journals (e.g. IJNA) • Presentations at international conferences (e.g. ISBSA, IKUWA, EuroDendro). • Dissemination at science fairs, lectures at universities, news items and presentations to non-specialist audiences.
<p>Planned secondment (institution/start month/length in months/purpose):</p> <ul style="list-style-type: none"> • MALtd / May 2015 / 2 months / Hands-on experience in commercial sector: timber recording, excavation, ship documentation and timber sampling. • ArchSL / Jul 2015 and Jul 2016 / 2+2 months / Shipwreck excavation, recording and timber sampling and analysis • CSIC / Feb 2016 / 2 months / Search on Spanish archives, database management; training on GIS.
<p>Risk assessment:</p> <ul style="list-style-type: none"> • Restricted access to sites and their data - work with heritage agencies to reduce risk.

Fellow ESR6	Host institution University of Wales Trinity Saint David	Duration 36 months	Start date M9
<p>Project title: Developing dendro-archaeological approaches in Nautical Archaeology: integration of ring studies, dendrochronology and timber morphology (3D CAD) for the reconstruction of past forestry practice and exploitation (WP2).</p> <p>Supervisor name: Nigel Nayling (UWTSD) PhD enrolment: Y</p>			
<p>Objectives:</p> <ul style="list-style-type: none"> • To contribute to an inventory of key-construction features found in previously researched Spanish shipwrecks. • To assess and analyse excavated Spanish ship timber assemblages • To select a limited number of demonstration Spanish shipwreck sites for potential survey and dendrochronology analysis • To survey and sample selected sites, carry out ring-width analysis and supply subsamples to others. • To synthesise results and assess best practice 			
<p>Tasks and methodology:</p> <ul style="list-style-type: none"> • Collation of archaeological information on timber usage in Spanish ships. • Develop approaches to 3D reconstruction of past forestry practice/timber usage. • Recover samples from underwater sites for timber characterisation and dendrochronology. • Synthesis of results and dissemination 			
<p>Results:</p> <ul style="list-style-type: none"> • GIS layer on Spanish shipwrecks. • Best practice and protocols for dendro-archaeological analysis including post-excavation digital approaches. • Synthesis of site specific studies 			
<p>Dissemination:</p> <ul style="list-style-type: none"> • Articles in international journals (e.g. IJNA) • Presentations at international conferences (e.g. ISBSA, IKUWA, EuroDendro). • Dissemination at science fairs, lectures at universities, news items and presentations to non-specialist audiences. 			
<p>Planned secondment (institution/start month/length in months/purpose):</p> <ul style="list-style-type: none"> • MALtd / May 2015 / 2 months / Hands-on experience in commercial sector: timber recording, excavation, ship documentation and timber sampling. • ArchSL / Jul 2015 and Jul 2016 / 2+2 months / Shipwreck excavation, recording and timber sampling and analysis. 			
<p>Risk assessment:</p> <ul style="list-style-type: none"> • Restricted access to sites and their data - work with heritage agencies to reduce risk. 			

Fellow ESR7	Host institution Universidade Nova de Lisboa e do Algarve	Duration 36 months	Start date M6
<p>Project title: 16th century shipbuilding in Portuguese dockyards: a historical and archaeological perspective (WP2).</p> <p>Supervisor name: Rosa Valera Gomez (UNLA) PhD enrolment: Y</p>			
<p>Objectives:</p> <ul style="list-style-type: none"> • To compile information from written sources (archives and literature) and databases about shipbuilding techniques and associated forestry management in Portuguese Atlantic in the 16th and 17th centuries, and known or suspected Portuguese shipwrecks • To make an inventory of key-construction features found in previously researched Portuguese shipwrecks. • To assess and analyse excavated Portuguese ship timber assemblages • To select a limited number of demonstration Portuguese shipwreck sites for potential survey and dendrochronology analysis • To survey and sample selected sites, carry out ring-width analysis and supply subsamples to others. • To synthesise results and assess best practice. 			

<p>Tasks and methodology:</p> <ul style="list-style-type: none"> • Combined documentary research, collation of archaeological information, timber characterisation and dendrochronology. • Synthesis of results and dissemination.
<p>Results:</p> <ul style="list-style-type: none"> • GIS layer on Portuguese shipwrecks. • Best practice and protocols for dendro-archaeological fieldwork. • Synthesis of site specific studies
<p>Dissemination:</p> <ul style="list-style-type: none"> • Articles in international journals (e.g. IJNA) • Attendance at international conferences (e.g. ISBSA, IKUWA, EuroDendro). • Dissemination at science fairs, lectures at universities, news items and presentations to non-specialist audiences.
<p>Planned secondment (institution/start month/length in months/purpose):</p> <ul style="list-style-type: none"> • ArchaSL / Jul 2015 and Jul 2016 / 2+2 months / Shipwreck excavation, recording and timber sampling and analysis. • UWTSD / Oct 2015 / 2 months / Comparative study of contemporary ship construction in Northern Europe. Article preparation. Based in commercial sector Archaeological Services.
<p>Risk assessment:</p> <ul style="list-style-type: none"> • Restricted access to sites and their data - work with heritage agencies to reduce risk.

Fellow ESR8	Host institution Universidade Nova de Lisboa e do Algarve (UNLA)	Duration 36 months	Start date M9
<p>Project title: The Dendro-archaeology of Portuguese ships of the Early Modern Period (WP2). Supervisor name: Rosa Valera Gomez (UNLA) PhD enrolment: Y</p>			
<p>Objectives:</p> <ul style="list-style-type: none"> • To compile information from written sources (archives and literature) and databases about shipbuilding techniques and associated forestry management in Portuguese Atlantic in the 16th and 17th centuries, and known or suspected Portuguese shipwrecks • To make an inventory of key-construction features found in previously researched Portuguese shipwrecks. • To assess and analyse excavated Portuguese ship timber assemblages • To select a limited number of demonstration Portuguese shipwreck sites for potential survey and dendrochronology analysis • To survey and sample selected sites, carry out ring-width analysis and and supply subsamples to others. • To synthesise results and assess best practice. 			
<p>Tasks and methodology:</p> <ul style="list-style-type: none"> • Combined documentary research, collation of archaeological information, timber characterisation and dendrochronology. • Synthesis of results and dissemination. 			
<p>Results:</p> <ul style="list-style-type: none"> • GIS layer on Portuguese shipwrecks. • Best practice and protocols for dendro-archaeological fieldwork. • Synthesis of site specific studies 			
<p>Dissemination:</p> <ul style="list-style-type: none"> • Articles in international journals (e.g. IJNA) • Attendance at international conferences (e.g. ISBSA, IKUWA, EuroDendro). • Dissemination at science fairs, lectures at universities, news items and presentations to non-specialist audiences. 			
<p>Planned secondment (institution/start month/length in months/purpose):</p> <ul style="list-style-type: none"> • USC-BIOAPLIC / May 2015 / 2 months / Hands-on training on wood id and dendrochronological research of samples recovered from shipwrecks. • ArchSL / Jul 2015 and Jul 2016 / 2+2 months / Shipwreck excavation, recording and timber sampling and analysis. 			
<p>Risk assessment:</p> <ul style="list-style-type: none"> • Restricted access to sites and their data - work with heritage agencies to reduce risk. 			

Fellow ESR9	Host institution University of Santiago de Compostela (USC), Faculty of Forestry, Department of Botany (BIOAPLIC)	Duration 36 months	Start date M9
<p>Project title: Development and implementation of a tree-ring data network for the assessment of the date and provenance of Iberian ship-timbers (WP3). Supervisor name: Ignacio García González (USC) PhD enrolment: Y</p>			
<p>Objectives:</p> <ul style="list-style-type: none"> • Construction of multi-century Iberian oak and pine tree-ring chronologies for key areas from where timber was supplied for shipbuilding • Dating of samples from ship-timbers collected by ESRs from WP2 			

<p>Tasks and methodology:</p> <ul style="list-style-type: none"> • Collation of past environmental data on past vegetation, and assessment/identification of areas capable of delivering timber resources for contemporary shipbuilding industries (literature research, search on historical maps and pollen databases). • Sampling of living oak and pine trees at forest stands in different areas pointed out by literature and by the archival information retrieved by ESR of WP1 to construct tree-ring chronologies (standard dendrochronological techniques). • Sampling of roof timbers from buildings located close to the selected stands to extend chronologies back to the 15th century (standard dendrochronological techniques)
<p>Results:</p> <ul style="list-style-type: none"> • High-quality long-span tree-ring chronologies from oak and pine species from Atlantic Iberia reaching back to at least the 15th century • Dendrochronological dating of shipwrecks
<p>Dissemination:</p> <ul style="list-style-type: none"> • Publications (peer reviewed): Dendrochronologia, J. Archaeol. Sci., Trees, J. Cult. Herit., Eur. J. For. Res. • International conferences: TRACE (2014), Eurodendro (2015), ISBSA14 (2015), IKUWA5 (2016) • Outreach: participation in short documentaries, preparation of news items, use of digital media to disseminate results, participation in educational activities at universities, schools, science fairs, museums, etc.
<p>Planned secondment (institution/start month/length in months/purpose)</p> <ul style="list-style-type: none"> • UdL / Apr 2015 / 1 month / Introduction to geochemistry analyses; analysis of data. • ArchSL / Aug 2015 and Aug 2016 / 1+1 months / Shipwreck excavation, recording and timber sampling and analysis. • WU / Sep2016 / 2 months / Analysis of data, writing articles.
<p>Risk assessment:</p> <ul style="list-style-type: none"> • A delay in sample collection from historic buildings can arise due to bureaucracy to obtain sampling permits. This will not hamper the proposed approach, but just extend the sampling campaign.

Fellow ESR10	Host institution Wageningen University (WU)	Duration 36 months	Start date M9
<p>Project title: Application of ecological wood anatomy for species determination and wood provenancing of oak and pine from Atlantic Iberia (WP3).</p> <p>Supervisor name: Ute Sass-Klaassen (WU)</p> <p>PhD enrolment: Y</p>			
<p>Objectives:</p> <ul style="list-style-type: none"> • Determination of wood-anatomical characteristics to enhance precision of wood provenancing by providing information on species detection, micro-climate, specific site conditions and past forest management • Identification of anatomical biomarkers to determine the provenance of wood used in Atlantic Iberia for shipbuilding 			
<p>Tasks and methodology:</p> <ul style="list-style-type: none"> • Sampling of living oaks from Atlantic Iberia and pines at least two other main timber • Analysis of quantitative and qualitative wood-anatomical characteristics of living oak and pines to identify anatomical biomarkers for oak and pines species for high-precision dendroprovenancing 			
<p>Results:</p> <ul style="list-style-type: none"> • Tree-ring database including records on wood-anatomical characteristics of oak and pine species from Atlantic Iberia reaching back to at least the 15th century 			
<p>Dissemination:</p> <ul style="list-style-type: none"> • Publications in peer reviewed journals: e.g. Annals of Botany, American Journal of Botany, Trees, Dendrochronologia, IAWA Journal. • International conferences: Eurodendro 2015, TRACE 2014, COST STReESS meetings • Outreach: participation in short documentaries, preparation of news items, use of digital media to disseminate results, participation in educational activities at universities, schools, science fairs, museums, etc. 			
<p>Planned secondment (institution/start month/length in months/purpose)</p> <ul style="list-style-type: none"> • USC-BIOAPLIC / March and Nov 2015 / 1+1 months / Collection of samples; acquisitions and analysis of data (practical exchange); introduction to biomarkers • UdL / Apr 2015 / 1 month / Introduction to geochemistry analyses; analysis of data • ArchSL / Aug 2015 and Aug 2016 / 1+1 months / Shipwreck excavation, recording and timber sampling and analysis 			
<p>Risk assessment: No risks have been identified</p>			

Fellow ESR11	Host institution University of Santiago de Compostela (USC), Faculty of Biology, Department of Soil Science (ES2)	Duration 36 months	Start date M9
<p>Project title: Identification of potential biomarkers of wood for provenancing (WP3)</p> <p>Supervisor name: Antonio Martínez Cortizas (USC)</p> <p>PhD enrolment: Y</p>			
<p>Objectives:</p> <ul style="list-style-type: none"> • Use of the geochemical composition of the wood to trace the physical environment (local soils, lithological materials, rainfall water) where the wood was formed 			

<p>Tasks and methodology:</p> <ul style="list-style-type: none"> • Pyrolysis-GC/MS of wood from shipwrecks and living trees in sites. • FTIR-ATR analyses of wood from shipwrecks and living trees in sites. • Analyses of trace elements in wood from shipwrecks and living trees in sites.
<p>Results:</p> <ul style="list-style-type: none"> • Geochemical biomarkers that allow provenancing of oak and pine species used in ship building
<p>Dissemination:</p> <ul style="list-style-type: none"> • Publication (peer-reviewed international journals): Organic Geochemistry, Journal of Applied Pyrolysis, Journal of Archaeological Sciences, Geochimica Cosmochimica Acta • Presentation at international meetings and conferences (EGU Meeting 2015 and 2016) • Outreach: participation in short documentaries, preparation of news items, use of digital media to disseminate results, participation in educational activities at universities, schools, science fairs, museums, etc.
<p>Planned secondment (institution/start month/length in months/purpose):</p> <ul style="list-style-type: none"> • WU / Apr 2015 / 2 months / Introduction to dendrochronology and wood anatomy. • UdL / Jul 2016 / 2 months / Analysis of data, writing articles
<p>Risk assessment:</p> <ul style="list-style-type: none"> • Low concentrations of some trace elements in wood samples may occur, hampering their detection; this can be overcome by using high-sensitive techniques (as ICP-MS) from external laboratories.

Fellow ESR12	Host institution Université de Lorraine (UdL)	Duration 36 months	Start date M9
<p>Project title: Geochemical fingerprinting of potential source areas of the wood (WP3) Supervisor name: Anne Poszwa (EdL) PhD enrolment: Y</p>			
<p>Objectives:</p> <ul style="list-style-type: none"> • Use of the geochemical composition of the wood to trace the physical environment (local soils, lithological materials, rainfall water) where the wood was formed 			
<p>Tasks and methodology:</p> <ul style="list-style-type: none"> • Geochemical analyses (soils, rocks, water, and wood) on samples collected at the same sites as in T3.2. • Isotopic analyses of soils, rocks, water and wood from shipwrecks to compare the overall geochemical composition. 			
<p>Results:</p> <ul style="list-style-type: none"> • Isotopic fingerprinting of wood and soils to allow provenancing of oak and pine species used in ship building • Geochemical database of the sources of elements in oak and pine from Atlantic Iberia. 			
<p>Dissemination:</p> <ul style="list-style-type: none"> • Publication in peer-reviewed international journals (<i>European Journal of Soil Science, Journal of Archaeological Sciences, Geochimica Cosmochimica Acta</i>) • Presentation at international meetings and conferences (EGU Meeting 2015 and 2016) • Outreach: participation in short documentaries, preparation of news items, use of digital media to disseminate results, participation in educational activities at universities, schools, science fairs, museums, etc. 			
<p>Planned secondment: <i>institution/start month/length in months/purpose</i></p> <ul style="list-style-type: none"> • WU / Sept 2016 / 2 months / Analysis of data, writing articles • USC-BIOAPLIC / March and Nov 2015 / 1+1 months / Collection of samples; introd. to dendrochronology and wood anatomy 			
<p>Risk assessment: No risks have been identified</p>			

Fellow ER1	Host institution Instituto de Historia, CSIC	Duration 36	Start date M9
<p>Project title: Development and implementation of a GIS-based model for timber provenance and mercantile wood-trade routes (WP1) Supervisor name: Ana Crespo Solana (CSIC) PhD enrolment: N</p>			
<p>Objectives:</p> <ul style="list-style-type: none"> • Building Conceptual model and historic GIS for exchange of information between ESR along their training • GIS Data model with historical, Dendro and Archaeological Information 			
<p>Tasks and methodology:</p> <ul style="list-style-type: none"> • To insert the historical data in a database • To insert the compiled information in a GIS model using an already, existing prototype created by the Networks Coordinator • To map the Iberian and foreign timber production areas supplying key-dockyards in Atlantic Iberia 			
<p>Results:</p> <ul style="list-style-type: none"> • A GIS oriented Database model 			
<p>Dissemination:</p> <ul style="list-style-type: none"> • International conferences (World History Association, FEEGI Forum, Congresos Internacionales de la IDE de España) • Dissemination at science fairs (November 2016), • Lectures at universities • Peer-reviewed articles in specialized Journals. 			

Planned secondment (institution/start month/length in months/purpose):
<ul style="list-style-type: none"> • MALtd / Jun 2015 / 1 month / Management of archaeological Data • RUG / Sep 2016 / 2 months / Analysis of data, writing articles
Risk assessment:
<ul style="list-style-type: none"> • GIS prototype should be checked with the new conceptual model

Fellow ER2	Host institution MA Ltd	Duration 20 months	Start date M9
Project title: Research protocols for interrogation of shipwreck assemblages: recovery, documentation and analyses of structural ship timbers from in situ shipwrecks (WP2) Supervisor name: Nigel Nayling (UWTSD) PhD enrolment: N			
Objectives: <ul style="list-style-type: none"> • Development of techniques and delivery of research and excavation plan for Iberian shipwrecks in north-west Spain 			
Tasks and methodology: <ul style="list-style-type: none"> • The project design and implementation of fieldwork in North-West Spain and UK. • Field-based training of ESRs • Training of ESRs in field-work, as well as in practical skills for the documentation and sampling <i>in situ</i> of suspected 16th/18th century wrecks in UK and Spanish waters 			
Results: <ul style="list-style-type: none"> • Guidance on best practice in dendrochronology and timber characterisation studies in nautical archaeology with emphasis on diving operations and sampling procedures 			
Dissemination: <ul style="list-style-type: none"> • Articles in international journals (e.g. IJNA) • Attendance at international conferences (e.g. ISBSA, IKUWA, EuroDendro). • Dissemination at science fairs, lectures at universities, news items and presentations to non-specialist audiences. 			
Planned secondment: <ul style="list-style-type: none"> • UWTSD / Oct 2015 / 2 months / Hands-on training on project design and management, ship timber and dendrochronological research of samples recovered from shipwrecks. • ArchSL / Jul 2015 / 2months / Project Management of excavation of Iberian shipwreck site(s). • CSIC / Jun 2016 / 1 month / Practical training inserting data on GIS; data analysis. 			
Risk assessment: <ul style="list-style-type: none"> • Restricted access to sites and their data - work with heritage agencies to reduce risk 			

Fellow ER3	Host institution University of Santiago de Compostela (USC), Faculty of Forestry, Department of Botany (BIOAPLIC)	Duration 24 months	Start date M9
Project title: Provenancing timber from a multidisciplinary approach: dendrochronology, wood anatomy and geo/dendrochemistry (WP3) Supervisor name: Ignacio García González (USC) PhD enrolment: N			
Objectives: <ul style="list-style-type: none"> • Elaboration of a methodology for precise dating and provenancing of ship-timbers by integrating the different results of WP3 			
Tasks and methodology: <ul style="list-style-type: none"> • Integration of all three methods (tree-ring research, biomarkers and geochemical tracers) using selected samples from shipwrecks (collected by the ESRs of WP2) for protocol development and cross-validation • Application of the developed integrated methodology to all samples from shipwrecks. • Training and supervision of ESRs in the selection and sampling of living trees and building structures for dendrochronological research and in dendrochronological methods and statistical techniques • Establishing contacts that will grant access to forests, buildings and shipwreck timbers in Iberia 			
Results: <ul style="list-style-type: none"> • Protocol for an integrated approach, (tree rings, biomarkers, isotopes) to maximise the precision of wood dating and provenancing 			
Dissemination: <ul style="list-style-type: none"> • Publications in peer reviewed journals: e.g. <i>American Journal of Botany</i>, <i>Trees</i>, <i>Dendrochronologia</i>, <i>International Journal of Nautical Archaeology</i>. • International conferences: TRACE (2014), Eurodendro (2015), ISBSA14 (2015), IKUWA5 (2016) • Outreach: participation in short documentaries, preparation of news items, use of digital media to disseminate results, participation in educational activities at universities, schools, science fairs, museums, etc. 			
Planned secondment: <ul style="list-style-type: none"> • UdL / Apr 2015 / 1 month / Introduction to geochemistry analyses; analysis of data. • ArchSL / Aug 2015 and Aug 2016 / 1+1 months / Shipwreck excavation, recording and timber sampling and analysis. • CSIC / Jun 2016 / 1 month / Practical training inserting data on GIS; data analysis. • WU / Sep 2016 / 2 months / Comparative analytical approaches - dendrochronology and wood anatomy; writing articles. 			

B.4.3. Management structure, organisation and procedures

B.4.3.1. Network organization and management structure

The overall objective of this WP is the coordination and management of all technical aspects of the project (including dissemination and outreach activities) from beginning to end. The management structure is designed to provide executive, financial management and scientific and training coordination support.

The **AGENCIA ESTATAL CONSEJO SUPERIOR DE INVESTIGACIONES CIENTÍFICAS (CSIC)**, Host institution, commits itself (i) to ensure that the work will be performed under the scientific guidance of the Network Coordinator, (ii) to support the Network Coordinator in the management of the project, providing reasonable administrative assistance, in particular as regards to timeliness and clarity of financial information, the general management and reporting of finances, the organisation of project meetings and/or workshops, training courses and other activities as well as the general logistics of the project; (iii) to provide research support to the Network Coordinator and the Network Participants and Associated Partners throughout the duration of the project in accordance with FP7 rules, in particular as regards infrastructure, equipment, products and other services as necessary for the conduct of the research, and ensure that the recruited fellows enjoy, on a royalty-free basis, access rights to the background and the foreground needed for their activities under the project.

Objectives of the Management:

- A)** To finalise the consortium agreement between the partners and clarify all administrative, management and financial procedures to the partners.
- B)** Overall management and coordination of consortium meetings, workshops and activities and to prepare and continuously develop a plan for the use and dissemination of foreground
- C)** Administration of human resources, including the recruitment of research fellows.
- D)** To assure that all the operative and governing bodies are fully operative.
- E)** Financial management rules to provide the financial and executive management and scientific and training coordination support.
- F)** Definitions of procedures, voting methods and responsibilities of the various decision-making bodies within the consortium, and to clarify all administrative, management and financial procedures to the partners.
- G)** Individual and collective responsibilities and liabilities of partners to the consortium
- H)** Criteria of competitiveness, internationality and equal opportunity.
- I)** Mutual recognition of the training program by the Institutions involved.
- J)** To monitor the ESR training and review and approve the inter-hosts institution exchanges through secondments of ESR and ER
- K)** To develop and maintain a project website for project coordination and dissemination of results
- L)** To coordinate all reports and the making of the Final Reports once the ITN is finished; to coordinate the annual review of fellows and the maintenance of progress records and the monitoring of project activities, milestones and deliverables.

Network Coordinator will dedicate 80% of her full-time employment at the CSIC to the project, 50% to management tasks and 30% to the supervision of fellows and research. A full-time person will be employed by the project to assist Network Coordinator with managerial and financial tasks.

Supervisory board composition, function and competences: The SB will be composed of all members of the Consortium. The composition will be:

- the Network Coordinator
- the **Principal Investigator** (PI) of each individual project
- the **Training and Scientific Coordinators** (TC and SC)

Function and competences will be: the management of the training programme in which all full participants and associated partners will participate; the recruitment of ESRs and ERs by setting up a committee composed of (at least) the Network Coordinator, the Research Coordinator of the research WP and the PI of the specific individual project, and an independent observer (e.g. member of human resources/personnel office of employing institution) to ensure transparency and candidate eligibility.

The SB aims to clearly define the tools that ForSEAdiscovery will offer to ESR and ER to achieve the goals of the training program and to ensure that the trainees participate in the educational program outlined above. Research Coordinators (RC) and SB will be involved in setting up the individual projects and monitoring fellows' progress via individual PDPs and reports.

The consortium will encourage participation of ESR and ER in the coordination and organization of the network. An elected ESR will be part of the Consortium.

Rules for internal co-ordination, monitoring and reporting: Prior to recruitment of ESRs, the SB will agree procedures for tracking student progress which will complement those of the host institution and ensure that the SB is appropriately informed of satisfactory progress and can take any necessary action to address problems or deficiencies quickly and effectively. Progress report forms in a standardised format will be completed for each ESR immediately prior to SB meetings which will coincide with full network meetings (annual) with intermediate 6 monthly 'virtual' meetings. Fellows will submit yearly short progress reports for the RC.

Rules for effective decision making including contingency planning: As the project progresses changes may occur to work packages, personnel and deliverable dates, as the occurrence of some activities (e.g. the attendance to established conferences) are outside the reach of the consortium.

The impact of any changes will be assessed and mitigated by effective communication between all partners to alleviate any conflicts or problems and the agreement of alternative plans and corrective actions. Most partners have extensive experience in FP7 projects, and plans for use of foreground, and all of them have appropriate personnel and mechanisms in place to ensure effective and efficient delivery and management of activities.

Methods and tools for effective network communication: A website of ForSEAdiscovery will be implemented during the 3 months of the project. Network workshops, conferences and courses are scheduled throughout the life of the grant at different sites in the network. The management structure for courses will involve collaboration between partners (host; co-organiser/s). For each training event, the local coordinator at the host site will chair the local organising committee, exploiting local expertise and facilities for efficient organisation. Network coordinator will present the proposed meeting structure to SB 3 months prior to the meeting, and budgetary approval will be sought. It will be possible to invite external participants, advertising widely, making arrangements for accommodation, providing necessary information to participants ahead of time. Progress on the PDP timetable will be checked every three months through an (e-/teleconference) meeting between the fellow and supervisors. Following the meeting fellows will submit short progress reports to the Training and Scientific Coordinator. Other formal assessments will be made at network meetings, where fellow's presentations will be evaluated by senior researchers. Fellows will update their PDP yearly with input from the supervisors and their progress will be assessed by the Supervisory board.

Creating research networks is a crucial step for each scientist. Therefore, ForSEAdiscovery partners will act as mentors to introduce ESRs and ERs in scientific forums. The multidisciplinary network that will derive hereby and from the short-term visits to different institutes and private companies from within and outside the consortium, as well as from the attendance to national and international conferences and the organization of dissemination activities, is likely to increase their subsequent grant and job opportunities.

Meeting calendar for management including mid-term review:

According to the Special Clause 5 bis of Article 7 of the Grant Agreement, a mid-term review meeting must be organised, preferably during month 20-22 of the project. The venue and organisation of this meeting will be of the responsibility of the coordinator, and the timing and location of the meeting must be agreed with the REA project officer.

B.4.3.2. Financial management: The Host partner Institution (CSIC) and the Network Coordinator have experience in dealing with all Framework Programme matters. As a result, it has extensive experience of EU funded projects and in-depth expertise of Marie Curie rules including financial management, reporting, auditing and researcher agreements. Financial management will be overseen by the Network Coordinator who will be supported by a team of dedicated Framework Programme administrators. Financial management costs will be largely assumed by the Coordinating Partner (97'94%). The remaining part (2'05%) will be distributed among the other participants. All ForSEADiscovery partners will jointly establish control procedures. Overall, all of the Network partners have a long experience in participating and co-ordinating EU projects. Procedures for financial management and control will be based on the experience of the Consejo Superior de Investigaciones Científicas (CSIC) concerning funding agreement.

B.4.3.3. Recruitment strategy: The following steps will be taken:

- a) A general advertisement will be published for all positions in the network. Advertisements and publication of vacancies for ERs and ESRs will be on English language websites and major journals and forum, in the websites of the Host and partners institutions, and in EURAXESS. The costs will be covered by management budget.
- b) Each partner will submit the list of candidates received and their CVs to the training and scientific coordinators, to ensure eligibility criteria and fairness in the selection process. The SB will define appropriate recruitment strategy, ensuring positive discrimination towards female researchers. An active policy on recruitment in female forums will be followed to aim at achieving the presence of 50% female researchers. The group will follow the recommendations of the European policy on Women and Science. Various measures will be implemented to encourage women to participate in the project, including flexible work schedules and evaluation by results, as well as mobility allowance for family dependants.
- c) All positions will be advertised on the ForSEADiscovery web page, through the European Researchers' Mobility Portal, the CORDIS Server, according to the **Code of Conduct for Recruitment** of Researchers and eligibility criteria included in the Marie Curie portal. This document will be based on the Code of Conduct for the Recruitment of Researchers <http://ec.europa.eu/research/mariecurieactions/index.htm>
- d) The positions will be advertised too at the web pages of individual partners and institutions involved.
- e) Those candidates that fulfil eligibility criteria will be interviewed by the Principal Investigator of the lab in which he/she showed interest. Finally, at the time of recruitment, the appointed researchers will be given a brochure with their rights and duties of their work contracts and social benefits as employees of an EC-funded network. The importance of training and career planning will also be emphasized.

- **Conflict resolution protocol**

ESR and ER who experience any type of conflict that affects their performance and compliance with their contracts will proceed as follows:

- a) They will inform their supervisor (PI) and will try to solve the problem without involvement of the **TC or the SC**. The TC and SC will be informed of the results. We anticipate that most conflicts will be solved at this stage.
- b) In case that ESR or ER and the supervisor do not reach a solution, the **TC and SC** will intervene to mediate.
- c) In exceptional cases in which **TC and SC** mediation is unsuccessful, the TC will inform the Network Coordinator (NC), which will receive two written reports from the researcher and supervisor involved. The NC and TSC will make a final decision. The NC will report at stage **c** of the progress of the conflict resolution to the Advisory Board (AB) on the decision taken.

B.4.3.3. Gender aspects: The ForSEaDiscovery project will respect an appropriate gender balance in all its activities. This includes an equal opportunity policy during the recruitment of ESRs and ERs. All calls will contain a specific note stating that "**The ForSEADiscovery project promotes an equal opportunity policy and female applicants are strongly encouraged to join the consortium**". Moreover, during the run of the whole project the consortium will be alert that gender-balance is guaranteed in teams that are in charge to organise workshops and dissemination events. The fact that the actual consortium is already very well-gender balanced reflects that gender-balance is already been very well realised in our research disciplines. Our ambition is to further promote the relevance of this issue especially among our ESRs.

B.4.3.4. Intellectual property: ForSEADiscovery will establish firm guidelines and formalize a consortium agreement, adhering closely to current EC legal rules, which will be mutually agreed on and signed by all members. Newly developed dendrochronological data and metadata, as well as created reference isotope data will be made openly available after publication of results in reference open databases (e.g. ITRDB <http://www.ncdc.noaa.gov/paleo/treering.html>, or DCCD <http://dendro.dans.knaw.nl/>).

B.4.3.5. Subcontracting (if applicable): The participation of subcontractors has not been foreseen.

B.4.3.6. Third parties (other than subcontractors) (if applicable): The participation of third parties has not been foreseen.

B.4.3.7. Consortium Agreement: ForSEADiscovery will be organized on the basis of a **Consortium Agreement**, which will be made effective at the start of the project. The governing body will be the **Supervisory Board (SB)**, composed by all the IPs (full partners) of the ITN Network. In this way, all the Full Participants will be represented in the SB. The **Network Coordinator** will ensure that this ITN Network “ForSEADiscovery” will be organized efficiently, with good communication among all partners. A Consortium Agreement will be signed by the network and submitted to the REA within the first 2 months of the project.

B.4.4. Project monitoring and key performance indicators

Periodic and final reports are contractual deliverables, according to Article 4 and II.4 of the Grant Agreement. In addition, progress reports are due at the end of the first and third year in order for the REA to monitor the implementation of the project.

When preparing those documents, the coordinator should report according to the following key performance indicators and specify the means to monitor them.

B.4.4.1. Research Activities

- Research results obtained (including a short description of progress on the individual projects) and deviations, if any, to the original research work plan.
- Scientific highlights and achievements (scientific/technological breakthrough, patents, awards, prizes etc...).
- A full list of individual and joint publications, directly related to the work undertaken within the project (including citation index and impact factor), with appropriate acknowledgment of the funding source.
- Intersectoral and multidisciplinary collaboration.

B.4.4.2. Training Activities

- Implemented training events/activities and deviations, if any, to the original training plan (including Career Development Plans, coaching or mentoring activities in place at each host institution).
- Participation of the fellows in training events and meetings from the network (workshops, seminars, summer schools, etc), and at international conferences outside the network (names, places, dates).
- Transferable skills training (e.g. project management, presentation skills, language courses, ethics, intellectual property rights, communication, entrepreneurship, etc.).
- Implementation of visits/secondments undertaken within the network to both full participants and associated partners.

B.4.4.3. Management activities

- Status of ESR/ER recruitments at each participant, and relevant issues related to the recruitment strategy/process and gender balance, with justification for any deviation from the original plan.
- Effectiveness of networking, communication and decision-making between stakeholders.
- Effectiveness of the "training events and conferences": external participation and integration in the training programme.

- Effectiveness of the financial management and compliance with Marie Curie salary rates.
- IPR management and commercial exploitation of research results.

B.4.4.4. Dissemination and outreach activities

- Implementation and analysis of the proposed outreach activities and deviations, if any, to the original work plan.
- Analysis of the dissemination activities.

B.5 Impact

B.5.1. Impact towards the policy objectives of the programme

This multidisciplinary research programme can only be approached from an international perspective. This perspective is secured by involving researchers from Poland, Denmark, the Netherlands, Great Britain, France, Spain, Portugal and USA. The cooperation will stimulate the integration of the recruited researchers in a European working environment, and will ensure that they develop specific skills to enhance their career opportunities in both academia and the private sector and that complement their career beyond the network.

Scientific and academic skills: ForSEADiscovery is a highly innovative training program, as it aims at truly integrating the Humanities and Life Sciences. This unprecedented approach offers a unique chance for ERs and ESRs to investigate a topic with different concepts and methodological tools provided by the Humanities and Life Sciences. Integration of research results within ForSEADiscovery will be realized through a GIS-based model to address questions with a historical background from multiple perspectives.

The creation of new links between individuals and research groups will allow ESRs and ERs to acquire a scientific background characterized by a multidisciplinary approach to a common problem. This network will offer researchers the possibility to participate in courses, meetings, visits and workshops organized by the consortium. In addition, the combination of private-sector and academic interaction will allow the ESRs and ERs to acquire integral knowledge to be able to make more educated choices of future directions in their research careers.

Technical skills: ForSEADiscovery offers a unique opportunity to train a multidisciplinary generation of scientists. Due to the strong divisions between the Social and Life Sciences, research on wood as a historical construction material has been lacking ESRs and ERs with a multidisciplinary view, or the technical and scientific capacity to envision the potential of researching wooden objects from the Cultural Heritage.

ESR and ER trained in ForSEADiscovery will have the capability to approach and solve a great variety of technical problems. These qualifications will make ForSEADiscovery ESR and ER attractive not only to the academia, but also to private-sector markets.

Networking, management and leadership skills: Creating research networks is a crucial step for each scientist. Therefore, ForSEADiscovery partners will act as mentors to introduce ESRs and ERs in scientific forums. The multidisciplinary network that will derive hereby and from the short-term visits to different institutes and private companies from within and outside the consortium, as well as from the attendance to national and international conferences and the organization of dissemination activities, is likely to increase their subsequent grant and job opportunities. Furthermore, ForSEADiscovery is intended to nurture a future group of outstanding researchers capable of successfully leading teams both for academia and private sector and aims to train researchers not only in scientific and technical skills, but also in the capacity to lead a group of people, a trait often neglected in current training programs. The spirit of the training provided by the consortium is to involve ESR and ERs actively in decision-making at all levels. Moreover, the Training and Scientific Coordinators as well as the Network Coordinator will strongly encourage ESR and ER to participate in ForSEADiscovery management. To improve leadership and management capacity, the network will organize workshops on the skills necessary to lead and manage a group in industry or in academia.

Scientific and Technological impact: The research questions presented in this proposal have never been approached from a multidisciplinary perspective. However, the assessment of historical and cultural heritage demands such approach, and researchers require a portfolio of interdisciplinary techniques. Disciplines from the Life Sciences can provide empirical evidence to documentary historical sources, but existing training programmes are fragmented and based around single disciplines. This does not capture the complexity of timber supply and trade networks in the Age of Discovery and European expansion, and therefore such a narrow perspective harms researchers' international competitiveness. In contrast, ForSEADiscovery brings together diverse but complementary techniques and approaches, to provide training that crosses traditional boundaries.

- a) The recruited fellows from WP3 (Life Sciences disciplines) will develop sets of "tools" that are currently lacking, such as long-span oak and pine reference tree-ring chronologies, an isotopic reference dataset for the timber supplying areas in Atlantic Iberia, as well as a wood identification key related to

dendrochemical and other biomarkers that will allow the differentiation of wood species and provenances that are currently impossible to discern from each other.

- b) The development of such reference datasets from tree-ring research, wood anatomy, and dendro/geochemistry meant to facilitate the characterization of Iberian wooden heritage will strongly improve the assessment and understanding of underwater archaeological remains worldwide.
- c) The comparison of tree-ring and wood-anatomical data and written sources will improve our knowledge of former long-distance timber trade from Northern Europe to Iberia in the Age of Discovery and expansion.
- d) The cooperation between research groups will help researchers from the different disciplines developing, improving, and implementing their set of tools (tree-ring, wood anatomy and isotopic datasets) to answer historical and ecological questions.

Contribution of ForSEAdiscovery to improve the European training capacity

ForSEAdiscovery will propose mutual recognition of the training program to the institutions involved. The research periods spent by ESRs at partner laboratories will be recognized as part of their PhD training. It is intended to consolidate this system of mutual training and recognition within PhD and Post-Doctoral programs so that it will continue beyond this project.

ForSEAdiscovery will promote and foster new scientific collaborations. The proposed research is set in a complex scenario that goes beyond the capacity and expertise of a single institute or laboratory, therefore the establishment of multidisciplinary, multi-site approaches through a network is a necessity. Consolidating this multidisciplinary, international research network will increase the chances of national and international funding, creating possibilities for follow-up research as well as training opportunities for young researchers.

We intend to extend our collaboration to future calls within Framework Programmes, expecting to achieve a ForSEAdiscovery network of laboratories, institutes and companies with different perspectives and common goals. This way, we anticipate a long-term effect of ForSEAdiscovery to attract funding to train researchers.

B.5.2. Plans for exploitation of results and Dissemination strategy

Impact of the ForSEAdiscovery outreach activities

We anticipate that the outreach activities proposed will impact society and ESRs and ERs at different levels:

- a) Providing a better understanding of history and science, improving the public's knowledge about the Age of Discovery and European expansion from a new multidisciplinary perspective. **Short documentaries and news-items** will be produced to achieve this goal with support of associated partner 14 (Dixit International). Exposure to the media will enhance the chances of new sources of funding.
- b) Promoting interest in history and science among young students. As many partners of ForSEAdiscovery belong to public universities, **science fairs** and **lectures at universities** presenting historical questions approached from disciplines from the Life Sciences will stimulate undergraduates to pursue a scientific multidisciplinary career.
- c) Through direct interaction of researchers with a non-specialized audience from different backgrounds of society, ESRs and ERs will get acquainted with the public perception of history, science and research. **Lectures** will be planned for this purpose **at local museums, cultural heritage associations and amateur underwater archaeology clubs, etc.** Researchers will thus learn to improve their communication skills, and understand what society expects from them.
- d) Giving visibility to the project and disseminating the results through **publications in peer reviewed high impact journals** will increase new opportunities for funding. ForSEAdiscovery partners will be invited to different forums organized by their host institutions to promote interaction with the private and public sectors and expand their funding opportunities.
- e) The techniques and skills acquired by the researchers through ForSEAdiscovery, will allow the use and **transfer of knowledge** through technology to the private sector.

As required by Annex II of the grant agreement, the coordinator will ensure that all publications and presentations by members of the project consortium - including all funded fellows - acknowledge the

EU financial support received. This acknowledgement will specifically refer to the Marie Curie Initial Training Networks (ITN) action, as well as the project number and acronym.

B.5.3. Outreach activities

Direct public engagement of ForSEAdiscovery researchers will be a high priority. The actions proposed will allow rapid, updated access to the organization, research and results of the consortium. All fellows will take part in the activities organized by the Consortium. The set of activities include (Table 4):

Table 4. Outreach plan

Outreach activity	Description	Fellows involved	Estimated month
ForSEAdiscovery website	<ul style="list-style-type: none"> • A project website will be created to inform the general public about the Consortium, scientific goals and its relevance for society, methods employed, results and the Marie Curie ITN program; ESRs and ERs will keep the information about their individual projects updated at all times 	ALL	February 2014 to January 2018
New-items (radio, internet, tv-channels, newspapers), short documentaries	<ul style="list-style-type: none"> • An article presenting the project will be sent to major national papers in all countries involved at the beginning of the project, highlighting the relevance of research for society; the Marie Curie ITN program will be properly acknowledged • Press notes will be sent to local newspapers where and when fellows are carrying out the research or sampling activities (at archives, at sea, in buildings, etc.) to increase awareness about cultural heritage and good research and conservation practices. • Short documentaries will be made covering the sampling actions (living trees, historical buildings, shipwrecks), the research performed at each lab and the major results 	(project PIs) ALL ALL	April 2014 Jan 2015 to Oct 2016 Jan 2015 to Oct 2016
Science fairs	<ul style="list-style-type: none"> • The Consortium will organise a Science fair in Madrid (Spain) at the end of 2016, which will be advertised in advance via internet forums and local/national/international media to attract students from schools and universities from all over Europe; information will be presented in different languages.. 	ALL	Nov 2016
Lectures at schools, universities, community organisations, etc.	<ul style="list-style-type: none"> • Fellows will act as Marie Curie Ambassadors presenting their research and the Marie Curie program at schools, universities and local community organizations where they are placed and also at their places of secondment; they will have to schedule the lectures according to their agenda. 	ALL	Dec 2014 to Nov 2017
e-resources (social/professional media)	<ul style="list-style-type: none"> • Fellows will create a ForSEAdiscovery group in Facebook, LinkedIn, Twitter and other e-media where updates and e-newsletters will be regularly posted 	ALL	Dec 2014 to Nov 2017

B.6 Ethical issues

The Beneficiaries accept to uphold the highest standards of scientific integrity and ethical conduct during the implementation of the grant agreement.

The Beneficiaries confirm that it is their responsibility to ensure that approvals by appropriate local and/or national authorizations are obtained for underwater archaeology. Copies will be forwarded to the Commission prior to the commencement of the research.

The Beneficiaries confirm that they will not affect or destroy the protected underwater habitat.

PART C:

Overall indicative project deliverables

A3.1: Overall Indicative Project Deliverables

Project Number ¹	607545	Project Acronym ²	ForSeaDiscovery
-----------------------------	--------	------------------------------	-----------------

One Form per Project

	Initial Training 0-5 years						Total
	Early-Stage researchers			Experienced researchers			
	Months	Researchers	% Fixed amount contract (B)	Months	Researchers	% Fixed amount contract (B)	Months
CSIC-HI	36	1	0%	24	1	0%	60
UNLA	72	2	0%	0	0	0%	72
USC	72	2	0%	20	1	0%	92
UWTSD	72	2	0%	0	0	0%	72
MA Ltd	0	0	0%	24	1	0%	24
WU	36	1	0%	0	0	0%	36
UL	36	1	0%	0	0	0%	36
RUG	72	2	0%	0	0	0%	72
UdL	36	1	0%	0	0	0%	36
Overall Total	432	12	0%	68	3	0%	500

PART D:

Overall maximum EU contribution

A3.2:

Overall Maximum European Union Contribution

Project Number ¹	607545	Project Acronym ²	ForSeaDiscovery
-----------------------------	--------	------------------------------	-----------------

One Form per Project

	Living allowance (1)	Mobility allowance (2)	Contribution to training expenses of eligible researchers and research/transfer of knowledge programme expenses(3)	Management activities (including audit certification) (4)	Contribution to overheads (5)	Total
Year 1	284,261.33	70,252.50	140,400.00	95,537.15	59,045.09	649,496.07
Year 2	673,405.00	162,608.40	324,000.00	99,537.00	125,955.04	1,385,505.44
Year 3	590,042.50	148,073.40	295,200.00	95,537.00	112,885.29	1,241,738.19
Year 4	260,521.67	69,929.50	140,400.00	99,537.00	57,038.82	627,426.99
Total	1,808,230.50	450,863.80	900,000.00	390,148.15	354,924.24	3,904,166.69

Appendix 2: Extract from the 2013 PEOPLE Work Programme

Structure of the cost categories applicable for ITN (adapted from Table 3.1 and 3.3 of the WP)

This information does not substitute the relevant information of the 2013 People Work Programme, which should be consulted for further details.

1 Monthly living allowance	2 Monthly mobility allowance	3 Contribution to the training expenses of eligible researchers and research/transfer of knowledge programme expenses	4 Management activities (including audit certification if applicable)	5 Contribution to overheads
<p>Flat rate of :</p> <p>38 000 Euro/year for ESRs and 58 500 Euro/year for ERs</p> <p>Rate for individual countries is obtained by applying the correction coefficients listed in Table 3.2 of the WP.</p>	<p>Flat rate allowance to cover expenses linked to the personal household, relocation and travel expenses of the researcher and her/his family in the host country: reference rate of EUR 700 for researchers without a family and EUR 1000 for researchers with a family.</p> <p>Rate for individual countries is obtained by applying the correction coefficients listed in Table 3.2 of the WP.</p>	<p><u>For multi-partner ITNs and IAPP:</u> Flat rate of EUR 1800 per researcher-month managed by the host organisations to contribute for expenses related to the participation of researchers to training activities; expenses related to research costs; execution of the training/partnership project and contribution to the expenses related to the co-ordination between participants.</p> <p><u>For EID and IPD:</u> Flat rate of EUR 1200 per researcher-month managed by the host organisation(s) to contribute for expenses related to the participation of eligible researchers to training activities and expenses related to research costs, as well as to contribute to the expenses related to the co-ordination between participants.</p>	<p>Maximum of 10% of the total EU contribution.</p>	<p>10% of direct costs except for subcontractors and the costs of the resources made available by third parties which are not used in the premises of the beneficiary.</p>

EU27 and Associated Countries correction coefficients (adapted from Table 3.2 of the WP)

For other countries (such as ICPC and third countries), please consult the WP.

Austria	106.2
Belgium	100.0
Bulgaria	62.7
Cyprus	83.7
Czech Republic	84.2
Denmark	134.1
Estonia	75.6
Finland	119.4

France	116.1
Germany	94.8
Greece	94.8
Hungary	79.2
Ireland	109.1
Italy	106.6
Latvia	74.3
Lithuania	72.5

Luxembourg	100
Malta	82.2
Netherlands	104.1
Poland	77.1
Portugal	85.0
Romania	69.5
Slovak Rep.	80.0
Slovenia	89.6

Spain	97.7
Sweden	118.6
UK	134.4

Albania	63.1
Bosnia & Herz.	74.4
Croatia	83.0
FYROM	60.6
Iceland	95.0
Israel	96.4
Liechtenstein	109.9
Moldova	64.3

Montenegro	65.0
Norway	140.6
Serbia	74.0
Switzerland	119.6
The Faroes	134.1
Turkey	98.4

Appendix 2: Milestones and Deliverables.

Table: List of Milestones

WP Miles. No.	Milestone	Lead beneficiary	Month
6 1	Project website.	CSIC	February 2014- January 2018
2 2	Thesaurus of shipbuilding construction features with reference to timber characteristics observed in historic written sources and archaeological records completed.	UWTSD, UNLA,ArchSL, MALtd	November 2015
2 3	Demonstration sites selected, project designs agreed and all permissions for fieldwork obtained.	UWTSD, UNLA,ArchSL, MALtd	April 2016
1 4	Database of historical information specific areas in Atlantic Iberia where oak and pine wood was logged to supply specific Atlantic Iberian shipyards with timber for shipbuilding from the 16 th -18 th centuries.	CSIC, UL,RUG	June 2017
3 5	Establishment of a network of oak and pine tree-ring chronologies for dating and provenancing timber used in ships in the 16 th -18 th centuries.	USC, WU	June 2017
3 6	List of anatomical characteristics that allow reliable differentiation among respectively, deciduous oak and pine species and differentiation between stem and branch wood.	USC, WU	June 2017
3 7	Identification of biomarkers and geochemical tracers for oak and pine species growing in the Iberian Peninsula in areas associate with Early Modern timber production for shipbuilding.	USC, UdL	June 2017
3 8	Characterization of the geochemical composition of the wood of timber-finds from shipwrecks.	USC	June 2017
2 9	Data on suspected Iberian shipwreck sites collated and built into GIS-data model.	UWTSD, UNLA,ArchSL, MALtd	September 2017
1 10	GIS-data model.	CSIC	January 2018
5 11	Final report with project results.	All	January 2018

Table: List of Deliverables

WP	Deliver. No.	Deliverable	Lead Participant/ Other Participants	Nature	Dissemination	Month
5		Kick –off meeting (Management and Supervisory Board 1)	CSIC/ All PIs			8-10 April 2014
6	6.1	Project website	CSIC	O	RE/PU	February 2014- January 2018
6	6.3	Dissemination of research at international conferences and submission of original articles for publication	All Full participants	P,O	PU	September 2014-March 2018
6	6.4	Participation in local outreach activities by individual Fellows and in documentaries and news items	All Full participants	E	PU	September 2014-to the end of the Project
6	6.2	Project spaces in professional and social networks (LinkedIn and Facebook)	All Full participants	R,O	PU	December 2014- November 2017
4	4.1	History of Wooden Shipbuilding (C1). Training in Task-Specific Research skills (TSRS)	TAMU/ CSIC	O	CO	December 2014
4	4.2	Books and Treatises on Shipbuilding (C2). Training in TSRS	TAMU/ CSIC	O	CO	December 2014
4	4.3	Network Meeting (N1). Training in Generic and Transferable research skills (GTRS)	RUG	O	CO	December 2014
4	4.4	Workshop (W1): Communication and Presentation Skills. Training in GTRS	RUG	O	CO	December 2014
4	4.5	Historiography and archive research (C3). Training in TSRS	RUG	O	CO	May 2015
5	5.1	Plan for use and dissemination of foreground	CSIC	R	CO	March 2015
5	5.2	Progress report	CSIC	R	RE	April 2015
4	4.6	Geographic Information Systems (C4). Training in TSRS	CSIC	O	CO	September 2015
2	2.1	GIS layer on Iberian Shipwreck sites	UWTSD, UNLA/, ArchSL, MALtd	O	RE	November 2015
2	2.2	Method statements for guidance on best practice and protocols for dendro-archaeological fieldwork, timber characterisation and data collation and presentation	UWTSD,	R	PU	November 2015
5	5.3	Progress report	CSIC	R	RE	November 2015
4	4.8	Workshop (W2): Scientific communication and multidisciplinary team-work. Training in GTRS	WU	O	CO	December 2015
4	4.7	Dendrochronology and wood anatomy (C5). Training in TSRS	WU	O	CO	December 2015

4	4.9	Network meeting (N2). Training in GTRS	WU	O	CO	December 2015
5	5.4	Periodic report to the European Commission	CSIC	R	RE	March 2016
4	4.10	Dendroarchaeology of ships.- Practice and Prospect (C6). Training in TSRS	UWTSD, DDK	O	CO	November 2016
4	4.11	Network Meeting (N3) Training in GTRS	USC	O	CO	November 2016
4	4.12	Workshop (W3): Advanced Team and Project Management. Training in GTRS	USC	O	CO	November 2016
5	5.5	Progress report	CSIC	R	RE	April 2017
2	2.3	Site specific reports for dissemination and archive deposition for selected shipwreck sites	UWTSD, UNLA, ArchSL, MALtd	R	RE	June 2017
2	2.4	Synthetic reports on efficacy of different scientific approaches to timber characterisation of Iberian Ships of the 16 th and 18 th century	UWTSD, UNLA,/ ArchSL, MALtd CSIC, UpL	P	PU	June 2017
3	3.1	Tree-ring database including records on tree-ring width from and wood- anatomical characteristics of oak and pine species from Atlantic Iberia reaching back to at least the 15 th century.	USC (BIOAPLIC), WU	O, P	PU	June 2017
3	3.2	Biomarkers that allow provenancing of oak and pine species used in ship building.	USC	P, R	RE	June 2017
3	3.3	Geochemical database of the sources of elements in oak and pine from Atlantic Iberia.	UdL/USC	O, R	PU	July 2017
3	3.4	Protocol for an integrated approach, (tree rings, biomarkers, isotopes) to maximise the precision of wood provenancing.	All Full Participants	P	PU	July 2017
1	1.1	Database containing information about merchant networks and areas supplying timber for shipbuilding to Atlantic Iberia from the 16 th through the 18 th centuries.	CSIC, RUG, LU	O	RE	March 2018
1	1.2	GIS data model with historical information provided by the other research work packages	CSIC	R,O	PU	March 2018
5	5.6	Final report	CSIC	R	PU	March 2018

List of Secondments

Fellow No.	Host Beneficiary	Place of secondment	Length of secondm. (months)	Purpose
ESR1	CSIC	RUG	3	Search on Dutch archives, database management.
		UWTSD	2	Comparative study of contemporary forestry practice and timber supply in British Isles: historical, archaeological and structural approaches. Based in commercial sector Archaeological Services.
ESR2	UL	UNLA	3	Introduction to Portuguese archives; archaeological and architectural approaches; GIS models, data entry and data analysis.
		UWTSD	2	Comparative study of contemporary forestry practice and timber supply in British Isles: historical, archaeological and structural approaches. Based in commercial sector Archaeological Services
ESR3	RUG	CSIC	3	Search on Spanish archives, database management; training on GIS.
		UWTSD	2	Comparative study of contemporary timber importation into British Isles - historical, archaeological, and structural review. Based in commercial sector Archaeological Services.
ESR4	RUG	CSIC	3	GIS of trading networks, historical perspectives, Spanish trading networks.
		UNLA	2	Portuguese trading networks and mechanisms.
ER1	CSIC	MALtd	1	Management of archaeological data.
		RUG	2	Analysis of data, writing articles.
ESR5	UWTSD	MALtd	2	Hands-on experience in commercial sector: timber recording, excavation, ship documentation and timber sampling.
		CSIC	2	Search on Spanish archives, database management; training on GIS.
		ArchSL	4	Shipwreck excavation, recording and timber sampling and analysis.
ESR6	UWTSD	MALtd	2	Hands-on experience in commercial sector: timber recording, excavation, ship documentation and timber sampling.
		ArchSL	4	Shipwreck excavation, recording and timber sampling and analysis.
ESR7	UNLA	UWTSD	2	Comparative study of contemporary ship construction in Northern Europe. Article preparation. Based in commercial sector Archaeological Services.
		ArchSL	4	Shipwreck excavation, recording and timber sampling and analysis.
ESR8	UNLA	USC (BIOA.)	2	Hands-on training on wood id and dendrochronological research of samples recovered from shipwrecks.
		ArchSL	4	Shipwreck excavation, recording and timber sampling and analysis.

ER2	MALtd	UWTSD	2	Hands-on training on project design and management, ship timber and dendrochronological research of samples recovered from shipwrecks.
		ArchSL	2	Project Management of excavation of Iberian shipwreck site(s).
		CSIC	1	Practical training inserting data on GIS; data analysis.
ESR9	USC	WU	2	Analysis of data, writing articles.
		ArchSL	2	Shipwreck excavation, recording and timber sampling and analysis.
		UdL	1	Introduction to geochemistry analyses; analysis of data.
ESR10	WU	USC	2	Collection of samples; acquisitions and analysis of data (practical exchange); introduction to biomarkers.
		ArchSL	2	Shipwreck excavation, recording and timber sampling and analysis.
		UdL	1	Introduction to geochemistry analyses; analysis of data.
ESR11	USC	WU	2	Introduction to dendrochronology and wood anatomy.
		UdL	2	Analysis of data, writing articles
ESR12	UdL	WU	2	Analysis of data, writing articles.
		USC	2	Collection of samples; introduction to dendrochronology and wood anatomy.
ER3	USC	UdL	1	Introduction to geochemistry analyses; analysis of data.
		CSIC	1	Practical training inserting data on GIS; data analysis.
		ArchSL	2	Shipwreck excavation, recording and timber sampling and analysis.
		WU	2	Comparative analytical approaches - dendrochronology and wood anatomy; writing articles.