



# DISCOVERING ANCIENT SOCIETIES IN PORTUGAL



# PLANNING CHECKLIST

## PLANNING CHECKLIST

### IMMEDIATELY

- Make sure you understand and agree to Earthwatch's **Terms and Conditions** and the **Participant Code of Conduct**.
- If you plan to purchase additional travel insurance, note that some policies require purchase at the time your expedition is booked.

### 6 MONTHS PRIOR TO EXPEDITION

- Log in at [earthwatch.org](http://earthwatch.org) to complete your participant forms.
- If traveling internationally, make sure your passport is current and, if necessary, obtain a visa for your destination country.
- Bring your level of fitness up to the standards required (see the Project Conditions section).

### 90 DAYS PRIOR TO EXPEDITION

- Pay any outstanding balance for your expedition.
- Book travel arrangements (see the Travel Planning section for details).
- Make sure you have all the necessary vaccinations for your project site.

### 60 DAYS PRIOR TO EXPEDITION

- Review the packing list to make sure you have all the clothing, personal supplies, and equipment needed.

### 30 DAYS PRIOR TO EXPEDITION

- Leave the Earthwatch 24-hour helpline number with a parent, relative, or friend.
- Leave copies of your photo ID and flight reservation number with a parent, relative, or friend.

**READ THIS EXPEDITION BRIEFING THOROUGHLY.** It provides the most accurate information available at the time of your Earthwatch scientist's project planning, and will likely answer any questions you have about the project. However, please also keep in mind that research requires improvisation, and you may need to be flexible. Research plans evolve in response to new findings, as well as to unpredictable factors such as weather, equipment failure, and travel challenges. To enjoy your expedition to the fullest, remember to expect the unexpected, be tolerant of repetitive tasks, and try to find humor in difficult situations. If there are any major changes in the research plan or field logistics, Earthwatch will make every effort to keep you well informed before you go into the field.

# Expedition Update



## All teams

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December 15, 2017

Dear Earthwatch Participants,

As of **December 15, 2017**, Earthwatch's travel insurance policy has renewed and, as part of that, our new emergency medical, evacuation and security assistance provider is **On Call International**.

On Call International is an industry leader that has been providing excellent medical, security and travel assistance services around the globe for over 20 years. Please see [oncallinternational.com](http://oncallinternational.com) for more information.

On Call's highly trained staff are available to you—day or night—for anything from routine pre-travel information, to medical advice in the field by phone, to help in the event of a medical or security emergency.

**On Call International's** 24-hour Global Response Center can be reached at:

**+1 603-952-2680**

*collect calls/reverse charges accepted*

**Toll-free from U.S. & Canada: 1-833-819-2939**

**Text Only: +1-603-945-0103**

**Email: [mail@oncallinternational.com](mailto:mail@oncallinternational.com)**

In addition to On Call, please remember that trained Earthwatch staff are also available to assist you 24-hours a day, seven days a week, at **+44 (0) 7900 895 752 (UK)** or **+1-978-461-0081 (US)**.

For more information on Earthwatch's travel insurance program, please see [earthwatch.org/expeditions/insurance](http://earthwatch.org/expeditions/insurance) or contact Earthwatch's internal insurance liaison at [insurance@earthwatch.org](mailto:insurance@earthwatch.org).

Please do not hesitate to contact us if you have any questions or concerns.

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# NOTE FROM THE PI

## DEAR EARTHWATCHER

Welcome and thank you for choosing our research project!

As an Earthwatch participant you will have the opportunity to be part of a research project on one of the biggest, and most important, shellmiddens in Europe. It has drawn the attention of the scientific community since it was first discovered in the late 19th century, and recently became a National Monument. Together with an interdisciplinary team, you will be able to engage in the archaeological excavations of one of the most important moments of human history in the Old Continent: the transition from the last hunter-gatherers to the first farming communities. During your expedition you will collect materials, such as faunal artifacts and lithic tools, personal adornments made out of shells and other materials, and even human remains, as it has happened on the course of past archaeological seasons. During your stay you will help us to collect all the data we need to answer our research questions in the field and also the lab. You will be working side by side with an experienced team of researchers that are eager to share all their knowledge with you and learn from you and your passion for archaeology. Both the archaeological site and field laboratory are located in a beautiful rural landscape in Central Portugal, near the Tagus River and just under an hour drive from Lisbon. Here you will be able to enjoy not only the peaceful surroundings, but also some of the most amazing Mediterranean food, and have contact with the land-farming processes and practices of one of the largest farmers and wine-makers in the region— Casa Cadaval.

We look forward to meeting you and working together on this important project!

Dr. Nuno Bicho

Dr. João Cascalheira

Dr. Célia Gonçalves's

Lino André





# THE RESEARCH

## DISCOVERING ANCIENT SOCIETIES IN PORTUGAL



### THE STORY

Around 8,000 years ago, Central Portugal underwent a dramatic shift in lifestyles from hunting and gathering to farming and herding (e.g., Bailey and Milner, 2002; Erlandson, 2001; Renouf, 1998). Globally, this transition was much more than a mere shift in where food came from. It was a change in the way people lived on the land, which, in turn, allowed them to stay in one place longer than previously possible. That led to shifts to more permanent housing, the emergence of true villages, and increases in social structure. In short, this transition is about when we became “us”.

Usually thought of as one culture (the “more advanced” agriculturalist) replacing another (the “more primitive” hunter/gatherers), there is increasing evidence to suggest these cultural systems coexisted (Bicho et al., 2013; Price, 2015).

The Mesolithic-Neolithic transition remains one of the most controversial issues in prehistory archaeology, attracting significant archaeological debate and extensive research. The common-held belief is that hunter-gatherers disappeared from Central Portugal around 7,000 years ago, and later, farmers and herders settled the area. But now, archaeologists are uncovering clues contradicting this.



By analyzing bone tools, shells (and other evidence of food-types consumed), ornaments and human remains, researchers will trace the transition between these periods to better understand the complex changes not only in technology and subsistence, but also in how people thought about themselves and the world around them, as well as the nature of their social interactions.

Due to its diversity of artifact assemblages, excellent faunal and human bone preservation, evidence for multiple site functions and the presence of a newly discovered wet context (e.g., Bokelmann, 2012; Conneller et al., 2009; Milner et al., 2011) Cabeço da Amoreira and Cabeço da Arruda are an ideal location to study the Mesolithic hunter-gatherers and their probable integration into the newly arrived exogenous Neolithic societies coming from the Mediterranean sea. At the same time, researchers will be looking to understand the impact of these food-producing societies on the natural environment, regional ecology, and cultural background.

## RESEARCH AIMS

Researchers seek to understand how individuals changed culturally and physically, how tools and technologies changed during this time, and how burial practices, rituals, and land use differed between the Mesolithic and Neolithic populations.

Researchers have already discovered several sets of human remains at the project site—key findings that have provided insights to the genetic continuity at the Mesolithic-Neolithic transition, enabling a better understanding of past human diets and mobility.

The goals of understanding and defining the Mesolithic-Neolithic transition process in the region are grounded in providing answers to the following set of research questions:

1. Is it possible to identify cultural and physical alterations in the local population, based on DNA and diet? And how are these possibly related population movement and integration?
2. Was there a differential use among Mesolithic and Neolithic populations (e.g., burial contexts, funerary rituals, prestige items and land use)?
3. What were the changes and/or continuities in technology?
4. How did the apparent changes in subsistence strategies impact social changes and the regional ecology?

## HOW YOU WILL HELP

Citizen scientists will be involved in both excavation and laboratory activities. The fieldwork is based on the following tasks:

- excavation
- total station and data recording
- software operation
- sediment screening
- sample collection

In the field laboratory participants will be involved in:

- washing, sorting and labeling archaeological materials
- floatation and processing of paleobotany samples

During the laboratory work hours there will be specialists in different research areas conducting sample analysis and citizen scientists are encouraged to watch and experiment in these tasks. Participants will be rotated on a daily basis between fieldwork and laboratory activities. All processes will be accompanied by in-depth explanations of their importance to the project in particular and for the preservation of past cultural heritage in general.





# DAILY LIFE IN THE FIELD

## PLANS FOR YOUR TEAM



Every day, the team will rise early and prepare for the field. After breakfast, everyone will be driven to the research sites where you will receive a daily briefing regarding the activities to be carried out that day, both at the field and the laboratory.

Excavation and laboratory activities will take place from 8 to 6, but there will be breaks in the day, as well as a long lunch, where you will gather with the staff to eat, socialize and talk about the work you are doing. During this time, participants can see and ask questions about the materials that are at the laboratory being processed. During fieldwork, the team will be split up into smaller groups. For example, you may join 2–3 other volunteers in the field excavating, or process findings with a partner. Sometimes, the team may be joined by local university and high school students who are there to learn. You will receive training on the activities and the basic tools and software used each day. You may visit different sites day to day, but all are close to one another and to the lab. The trip between the sites and the lunch place takes less than 10 minutes. When the team returns to the accommodations, all the data collected during the day is downloaded to the main database. The team will enjoy dinner out each night at local restaurant (chosen ahead of time by field staff).

### POLICIES

There is no smoking at the project site; only in designated areas.

### DAILY ACTIVITIES

Weather and research needs can lead to changes in the daily schedule. We appreciate your cooperation and understanding.

### ITINERARY

#### FOR ONE WEEK TEAMS:

DAY 1	Arrival in the late afternoon, dinner and then project orientation.
DAYS 2	Basic training, safety briefing and orientation to field sites, begin field work
DAYS 3–5	Excavation and laboratory work
DAY 6	Fieldwork and evening wrap-up for first week of work
DAY 7	Depart for airport

#### FOR TWO WEEK TEAMS:

DAY 1	Arrival in the late afternoon, dinner and then project orientation.
DAYS 2	Basic training, safety briefing and orientation to field sites, begin fieldwork
DAYS 3–5	Excavation and laboratory work
DAY 6	Fieldwork and evening wrap-up for first week of work
DAY 7	Depart for airport

### DAILY SCHEDULE

6:30 a.m.	Wake, breakfast and prepare yourself for the field
7:30 a.m.	Depart for field work
8:00 a.m.	Daily briefing about the day's activities
10:00 a.m.	Coffee, water and rest break
12:00 p.m.	Lunch at laboratory
2:30 p.m.	Resume fieldwork
4:00 p.m.	Water and rest break
5:00 p.m.	Meet in Lab to go through collected samples
6:00 p.m.	Return to accommodations to get ready for dinner
8:00 p.m.	Dinner out at a local restaurant





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# ACCOMMODATIONS AND FOOD

## ABOUT YOUR HOME IN THE FIELD

### SLEEPING

The team will stay at a farmhouse in the Salvaterra de Magos region close to the field site. It has comfortable rooms with 2–4 single beds, so volunteers can expect to share their room with another teammate depending on team size and makeup. Rooms will be split by gender. Rooms for couples are possible with advanced notice, but are not guaranteed. Unfortunately, single rooms are not available. Sheets, towels, pillows and blankets will all be provided.

### BATHROOMS

The bathrooms are shared (divided by gender) and have conventional flush toilets and hot showers.

### ELECTRICITY

Electrical sockets (outlets) in Portugal are 220-240 volts AC. The plug types that are commonly used are: "Type C" Europlug and the "Type E" and "Type F" Schuko.

### PERSONAL COMMUNICATIONS

All participants can be reached through mobile phones at any time. And because mobile network is available at the sites, e-mails and Skype can also be used.

All members of the project are equipped with mobile phones with mobile network and one staff member at each of both sites, Cabeço da Amoreira and Cabeço da Arruda, is equipped with a Walkie-Talkie radio for faster communication.

Please note that personal communication with outsiders is not always possible while participating in an expedition. Earthwatch encourages volunteers to minimize outgoing calls and immerse themselves in the experience; likewise, family and friends should restrict calls to urgent messages only.

### FACILITIES AND AMENITIES

There is a grocery market nearby that the staff will visit throughout the team for breakfast and lunch items. Volunteers are welcome to join this excursion for personal items or specific snacks they may wish to purchase. Volunteers are responsible for keeping their own rooms clean and will rotate the duty of cleaning the common areas, such as the kitchen, living room and bathrooms. A schedule will be determined at the start of the team.

### DISTANCE TO THE FIELD SITE

The distance between the house that Earthwatch participants are staying and the sites is very short and takes less than 10 minutes to get from one to another.

### FOOD AND WATER

The teams will eat local Portuguese cuisine, which is fresh from the many farms in the area. Soups and stews are typical in the area due to the presence of ancient convents and monasteries where they originate. Staff and volunteers will prepare breakfasts, lunches and snacks. Drinking water will be provided. Breakfast will take place at the accommodations, and field staff and volunteers will enjoy lunch together in the field, usually at the laboratory facilities. Fresh fruits and energy bars are available for snacks. Dinner will be arranged at local restaurants.

The following are examples of foods you may find in the field. Variety depends on availability. We appreciate your flexibility.

### TYPICAL MEALS

<b>BREAKFAST</b>	Bread, cheese, fresh fruit, coffee, tea
<b>LUNCH</b>	Sandwiches, deli meat, cheese, canned fish, vegetable salads, soft drinks
<b>DINNER</b>	Meat, grilled fish, fresh vegetables, a variety of stews and soups
<b>DESSERTS</b>	Local Portuguese desserts
<b>BEVERAGES</b>	Water, coffee, juice, soft drinks

### SPECIAL DIETARY REQUIREMENTS

Please alert Earthwatch to any special dietary requirements (e.g., diabetes, lactose intolerance, nut or other food allergies, vegetarian or vegan diets) as soon as possible, and note them in the space provided on your volunteer forms.

Vegetarians and lactose intolerant diets can be accommodated on this project if volunteers are prepared to be flexible. Vegan diets and kosher diets are rather difficult to accommodate. If you have a special diet, it is recommended that you bring some supplemental snacks.



# PROJECT CONDITIONS

## THE FIELD ENVIRONMENT

The project area is called Lezíria Ribatejana and it is located on the plain of the Tagus River. The landscape has gentle slopes (less than 5° degrees) and altitude ranges from 5 to 25 meters above sea level. The region's climate is mesothermal (type Csa in the Koeppen system), during the August-September period it is characterized by high temperatures, above 30°C/86°F, low temperature variations and rainfall. Nights are fresh and pleasant. And the predominant winds are from the north quadrant.

The Ribatejo region, where Muge Shellmiddens are located, is a transition zone between two major ecosystems: Atlantic (to the north) and Mediterranean (to the south). Because of this ecosystem complexity, the region is home to diverse range of flora and fauna. The native vegetation of this area is usually cork-oak woods, myrtles and shrubs of oaks. At the area, the grape vines dominate, however other species are also present: olive tree and fruit trees (e.g. pear, apple, quince, peach, orange, lemon and fig). The herbaceous vegetation is mainly composed by ruderal and nitrophilous species typical of agro-ecosystems. Both sites are surrounded by trees and is not unusual to see local fauna wandering around, mostly small herbivores like rabbits or hares, and birds of prey and herons, as well as farm animals that live to the property like cows, horses and donkeys.

### GENERAL CONDITIONS

The following are averages. Please check weather resources for your team dates for more accurate weather predictions. Projects have experienced unseasonable weather at all times of year.

#### AUGUST/SEPTEMBER:

**HUMIDITY:** 55%

**TEMPERATURE RANGE:** 64°F–89°F / 19°C–32°C

**RAINFALL:** .2–1 in / 5mm–20mm

### ESSENTIAL ELIGIBILITY REQUIREMENTS:

All participants must be able to:

- Follow verbal and/or visual instructions independently or with the assistance of a companion.
- Enjoy being outdoors all day in all types of weather (see above), in the potential presence of wild animals and insects
- Tolerate 77–85°F/25–30°C and higher daily temperatures and low humidity levels
- Traverse short distances of mostly flat terrain to reach research sites
- Walk, possibly in sand or uphill with a light pack, up to 1 miles/1.6km per day
- Bend and kneel to get low enough to access the ground for digging and trowelling in the sediment, several times per day
- Handle a shovel and trowel to sift through sediment, and lift and carry a bucket about 10–15 lbs./4.5–7 kgs of sediment
- Carry personal daily supplies such as lunch, water, and some small field equipment weighing 10 lbs./4.5 kgs or less
- Get up into and down out of a minibus and ride, seated with seatbelt fastened, for a total of about 30 minutes per day



# POTENTIAL HAZARDS

## DISCOVERING ANCIENT SOCIETIES IN PORTUGAL

HAZARD TYPE	ASSOCIATED RISKS AND PRECAUTION
Transportation	As in any country, transport is a risk. All minibuses and cars will be fitted with seatbelts, and all passengers must wear them whenever the vehicle is in motion. Only experienced drivers will drive vehicles. Each vehicle will contain a first-aid kit and a cell phone for communication. Participants may not drive, even their own cars, during the project.
Hiking	Participants are required to engage in demanding physical activities including walking over uneven terrain. Project staff will review the participants' physical abilities, and adjust the pace of the group as much as possible to accommodate needs. Due to the terrain, individuals with severe mobility restrictions may not be able to be accommodated.
Climate/Weather	The region can be very hot in August and September. Temperatures can be an average of 86–89°F/30–32°C in the peak of the day, but they have been close to 40°C in the past. Participants must be able to tolerate long periods of sun exposure during the summer months. Measures should be taken by participants to avoid dehydration and sun exposure, such as drinking water throughout the day, covering up with full-length trousers and shirts, and wearing sunglasses and a hat with a generous brim.
Dehydration	Participants will be reminded to drink plenty of water throughout the day and to bring at least 2 liters of water into the field each day; to wear high-factor sunscreen and appropriate clothing, including sunglasses, a wide-brimmed hat and/or scarf; to not overwork when jet lagged or tired, and to inform a staff member when feeling tired or ill. Team will take regular breaks as needed, and monitor participants for general health at all times.
Animals	Information will be provided prior to program to ensure proper medical awareness, and prior review of allergies listed in participant forms will be undertaken by field staff. Due to the large amount of trees, plants and insects in the area, we advise citizen scientists that suffer from pollen/insects allergies to bring appropriate medication. Scorpions are present in the area, but they are rare and not lethal.
Project tasks/ Equipment	Instruction will be provided on proper excavation technique and proper inspection of equipment to ensure safety. Adequate protective personal equipment (i.e., gloves, hiking boots) should be provided by each participant. Kneeling pads will be provided for participant use.



# HEALTH & SAFETY

## DISCOVERING ANCIENT SOCIETIES IN PORTUGAL



### EMERGENCIES IN THE FIELD

Project staff members are not medical professionals.

For emergency assistance in the field, please contact Earthwatch's 24-hour emergency hotline number on the last page of this briefing. Earthwatch is available to assist you 24 hours a day, 7 days a week; someone is always on call to respond to messages that come into our live answering service.

### IMMUNIZATIONS & TRAVEL VACCINATIONS

Please be sure your routine immunizations are up-to-date (for example: diphtheria, pertussis, tetanus, polio, measles, mumps, rubella and varicella) and you have the appropriate vaccinations for your travel destination. Medical decisions are the responsibility of each volunteer and his or her doctor, and the following are recommendations only. Visit [cdc.gov](https://www.cdc.gov) or [who.int](https://www.who.int) for guidance on immunizations.

If traveling from countries or region where yellow fever is endemic, you must have a certificate of vaccination.



# TRAVEL TIPS

## SUGGESTIONS FOR THE ROAD

### YOUR DESTINATION

**LANGUAGE:** Portuguese. The project will be conducted in English.

**TIME ZONE:** WET (Western European Time), GMT/UTC +0

**CULTURAL CONSIDERATIONS:** Casual, modest dress is acceptable nearly everywhere in Portugal.

**LOCAL CURRENCY:** The currency in Portugal is the euro (€). Coins and notes both have a common European side, along with a specific national side, but can be used in all countries that accept the euro. Note that in Portugal, the decimals are written after a comma and units of thousands are written before a point. For example 5.000 would be FIVE THOUSAND and 30,54€ would be 30 Euros and fifty four cents.

### COUNTRY AND PROJECT ENTRY REQUIREMENTS

Entry visa requirements differ by country of origin, layover, and destination, and do change unexpectedly. For this reason, please confirm your visa requirements at the time of booking and, again, 90 days prior to travel. Please apply early for your visa (we recommend starting 6 months prior to the start of your expedition). Refunds will not be made for volunteers cancelling due to not obtaining their visa in time to meet the team at the rendezvous. You can find up to date visa requirements via one of the following sites:

[www.passportsandvisas.com](http://www.passportsandvisas.com)

<https://www.travisa.com/>

If a visa is required, participants should apply for a TOURIST visa. Please note that obtaining a visa can take weeks or even months. We strongly recommend using a visa agency, which can both expedite and simplify the process.

Generally, passports must be valid for at least six months from the date of entry and a return ticket is required.

### CONTACT INFORMATION

You may be required to list the following contact information on your visa application and immigration form, or if your luggage does not make it to baggage claim at your destination:

**Lino Andre**

Phone: +351-913-774-302

ICArEHB—Universidade do Algarve

FCHS, Campus de Gambelas

Faro 8005-139

Portugal



# TRAVEL PLANNING

## RENDEZVOUS AND DEPARTURE INFORMATION

### RENDEZVOUS

**LOCATION:** Coffee Shop, next to arrivals main entrance in the Lisbon Humberto Delgado Airport (LIS), also known as Lisbon International Airport or Portela Airport, Lisbon, Portugal

**DATE:**

**Team 1(a, b):** Aug. 6, 2018

**Team 1a:** Aug. 6, 2018

**Team 1b:** Aug. 13, 2018

**Team 2 (a, b):** Aug. 27, 2018

**Team 2a:** Aug. 27, 2018

**Team 2b:** Sept. 3, 2018

**Team 3 (a, b):** Sept. 17, 2018

**Team 3a:** Sept. 17, 2018

**Team 3b:** Sept. 24, 2018

**TIME:** Pick up at the airport at 12:00 p.m. noon

Although Earthwatch can often suggest resources to help with travel planning, please remember that you are responsible for making your own travel arrangements to the rendezvous site and that airline information is subject to change. You are encouraged to register your travel itinerary with your embassy.

It is essential to the success of the expedition that you do not plan to arrive late or leave the expedition early.

### HOW TO MEET YOUR TEAM

Earthwatch participants will be met by staff members hold an Earthwatch sign at the Lisbon Humberto Delgado Airport (LIS), also known as Lisbon International Airport. You will meet at the coffee shop that is located next to the main entrance of the arrivals section. You will then travel by project van to the research site. The distance to the research site is approximately 70 kilometers (43 miles). Most of the drive is highway, and it will take about one hour.

### ARRIVING EARLY

Please do not arrive early at the project site. If you do choose to arrive in Portugal prior to the rendezvous, there are many sites and activities to keep you busy. Please consult a guidebook for suggestions of things to do during your stay.

### ARRIVING LATE

Do not reserve a flight that arrives after your team's scheduled rendezvous time. If you plan an arrival after your scheduled rendezvous time, you may be asked to reschedule at your own expense. If your flight is delayed and/or you miss the rendezvous, call project field staff member Lino Andre, at +351-913-774-302.

If you are unable to reach a project staff member, please contact Earthwatch's 24-hour emergency hotline number on the last page of this briefing.

### DEPARTURE

**LOCATION:** Lisbon Humberto Delgado Airport (LIS), also known as Lisbon International Airport or Portela Airport, Lisbon, Portugal

**DATE:**

**Team 1(a, b):** Aug. 19, 2018

**Team 1a:** Aug. 12, 2018

**Team 1b:** Aug. 19, 2018

**Team 2 (a, b):** Sept. 9, 2018

**Team 2a:** Sept. 2, 2018

**Team 2b:** Sept. 9, 2018

**Team 3 (a, b):** Sept. 30, 2018

**Team 3a:** Sept. 23, 2018

**Team 3b:** Sept. 30, 2018

**TIME:** Book a flight that departs after 12:00 p.m.

**NOTE:** Early departures cannot be accommodated except in cases of emergency. Before leaving a project early for any reason you must sign an Earthwatch release form.





# EXPEDITION PACKING LIST

## WHAT TO BRING

### EXPEDITION PACKING CHECKLIST

#### GENERAL

- This expedition briefing
- Your travel plans, rendezvous details, and Earthwatch's emergency contact information
- Photocopies of your passport, flight itinerary, and credit cards in case the originals are lost or stolen; the copies should be packed separately from the original documents
- Passport and/or visa (if necessary)
- Certification of vaccination (if necessary)
- Documentation for travel by minors (if necessary)

#### CLOTHING/FOOTWEAR FOR FIELDWORK

##### ALL TEAMS:

- Earthwatch T-shirt
- 2–3 lightweight, quick-drying, button-down long-sleeved shirts
- 2–3 pairs of quick-drying long pants
- Wide-brimmed sun hat or baseball hat
- Lightweight raincoat or poncho
- 4–5 pair of hiking socks (wool or synthetic—NOT cotton)
- Bandana
- Well worn in hiking shoes or boots with ankle support.
- Leather or cloth and rubber garden/work gloves

#### CLOTHING/FOOTWEAR FOR LEISURE

- At least one set of clothing to keep clean for end of expedition
- Sandals (preferably ones that can get wet)
- Light weight pants (jeans are not the best, if they get wet they will not dry before you leave)
- Shorts
- T-shirts / tank tops
- Sweatshirt / light jacket
- Tennis shoes / casual shoes
- Bathing suit

#### FIELD SUPPLIES

- Binoculars
- Daypack to carry and keep your personal items together and dry
- Sunscreen lotion with SPF 45

- Lip balm with sunscreen
- Field notebook and pencils
- 2 one-liter water bottles, OR 1 two-liter water bottle or reservoir
- Insect repellent
- Sunglasses
- Drybag or plastic sealable bags (good for protecting equipment like cameras from dust, humidity, and water)

#### BEDDING AND BATHING

**NOTE:** all bedding, as well as a bath towel, is provided at the research stations.

#### PERSONAL SUPPLIES

- Personal toiletries (biodegradable soaps and shampoos are encouraged)
- Antibacterial wipes or lotion (good for cleaning hands while in the field)
- Personal first aid kit (e.g., anti-diarrhea pills, antibiotics, antiseptic, itch-relief, pain reliever, bandages, blister covers, etc.) and medications
- Baby powder (recommended by field staff to relieve chafing in the hot, humid environment)
- Small Bottle of Aloe Vera or equivalent skin calming cream (good for bug bites and sunburn)
- Spending money
- Flashlight or headlamp with rechargeable batteries (don't forget your charger!)

#### OPTIONAL ITEMS

- Flip flops or sandals for the shower
- Camera, film or memory card(s), extra camera battery
- Hardware for sharing digital photographs at the end of the expedition
- Dry bag or plastic sealable bags (e.g. Ziploc) to protect equipment like cameras from dust, humidity, and water
- Books, games, art supplies, etc. for free time
- Earplugs for light sleepers

**NOTE:** Do not bring more luggage than you can carry and handle on your own. If traveling by air and checking your luggage, we advise you to pack an extra set of field clothing and personal essentials in your carry-on bag in case your luggage is lost or delayed.



# PROJECT STAFF

## YOUR RESOURCES IN THE FIELD



**NOTE:** The specific staff scheduled to run your team is subject to change.

**DR. NUNO BICHO** is the Director of Interdisciplinary Center for Archaeology and Evolution of Human Behaviour located at Universidade do Algarve in Portugal. Nuno studies the shift from dependency of natural and wild resources to the production of foods with agriculture and pastoralism and believes citizen science is fundamental in archaeology. He holds an M.A. and Ph.D. in Anthropology, from Southern Methodist University, Dallas and a Licenciatura in History from Universidade Lusitana in Lisbon. He has conducted fieldwork in the Picareiro Cave in central Portugal for seven years, Vale Boi in southern Portugal for seventeen years, the Cabeço da Amoreira in central Portugal, for nine years, and Mozambique for six years. He is thrilled to now bring Earthwatch volunteers to central Portugal to Casa Cadaval!



**DR. JOÃO CASCALHEIRA's** research seeks to understand how past hunter-gatherer populations have coped with climatic and environmental modifications over time, both in terms of technological developments and social dynamics. Muge shellmiddens are a very special place to study such adaptations given the particular level of complexity represented as well as its proximity to a particularly important environmental changing moment: the end of the ice age. He holds a M.A. and Ph.D. in Archaeology and a B.A. in Cultural Heritage from the University of Algarve.



**DR. CÉLIA GONÇALVES's** research focuses on a better understanding of the strategies used by prehistoric communities for the occupation of their territories – particularly, how the choice for site implantation was related with the natural surroundings, but also with the economic, technological, and social activities carried out by those populations. She holds a Ph.D. in Archaeology, a M.A. in Archaeology, and a B.S. Cultural Heritage from the University of Algarve. She has worked in the Cabeço da Amoreira shellmidden (Central Portugal), the Paleolithic site of Vale Boi (Southern Portugal) and Mozambique

**LINO ANDRÉ** is currently studying personal ornaments made out of marine shells and faunal remains from the Mesolithic and early Neolithic found in Portugal. He is particularly interested in what role these items perform in the social and economical relations between the Mesolithic population that inhabited the region and the exogenous Neolithic communities arriving from the Mediterranean regions. He holds a B.S. in Cultural Heritage and Archaeology from Universidade do Algarve and is currently in a doctoral program at Universidade do Algarve.



# RECOMMENDED READING

## YOUR RESOURCES AT HOME

### RESOURCES

#### ARTICLES

- CLEMENTZ, M. (2012). New insight from old bones: stable isotope analysis of fossil mammals. *Journal of Mammalogy* 93(2): 368-380.
- CARVALHO, A.F., and PETCHEY, F., (2013). Stable isotope evidence of Neolithic paleodiets in the coastal regions of Southern Portugal. *The Journal of Inland and Coastal Archaeology* 8 (3),361-383.
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- BICHO, N., UMBELINO, C., DETRY, C., PEREIRA, T., (2010). The Emergence of Muge Mesolithic Shell Middens in Central Portugal and the 8200 cal yr BP Cold Event. *The Journal of Island and Coastal Archaeology* 5, 86-104.
- ANDRÉ, L. and BICHO, N., (2016). Perforation techniques and traces of use on the Mesolithic adornments of the Trench area at Cabeço da Amoreira Shellmidden (Muge, central Portugal). *Comptes Rendus Palevol* 15, 569-580.
- GONÇALVES, C. CASCALHEIRA, J., BICHO, N., (2014). Shellmiddens as landmarks: visibility studies on the Mesolithic of the Muge valley (central Portugal). *Journal of Anthropological Archaeology* 36, 130-139.
- BICHO, N., (1994). The end of the Paleolithic and the Mesolithic in Portugal. *Current Anthropology* 35 (5), 664-674.
- BICHO, N., CASCALHEIRA, J., GONÇALVES, C., UMBELINO, C., GARCÍA RIVERO, D., ANDRÉ, L., (in press). Resilience, replacement and acculturation in the Mesolithic/Neolithic transition: The case of Muge, central Portugal. *Quaternary International*. Available online 28 February 2017. <http://dx.doi.org/10.1016/j.quaint.2016.09.049>

#### BOOKS

- BICHO ET AL. (editors). (2015). *Muge 150th: The 150th Anniversary of the Discovery of the Mesolithic Shellmiddens: Volumes I and II*. Cambridge Scholars Publishing.

#### PROJECT-RELATED WEBSITES

- <http://www.icarehb.com/projects/muge-shellmiddens>

#### EARTHWATCH SOCIAL MEDIA

- FACEBOOK: [facebook.com/Earthwatch](https://www.facebook.com/Earthwatch)
- TWITTER: [twitter.com/earthwatch\\_org](https://twitter.com/earthwatch_org)
- INSTAGRAM: [instagram.com/earthwatch](https://www.instagram.com/earthwatch)
- BLOG: <https://blog.earthwatch.org/>
- YOUTUBE: [youtube.com/earthwatchinstitute](https://www.youtube.com/earthwatchinstitute)



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## YOUR RESOURCES AT HOME

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- BICHO, N., CASCALHEIRA, J., MARREIROS, J., GONÇALVES, C., PEREIRA, T., DIAS, R., 2013. Chronology of the Mesolithic occupation of the Muge valley, central Portugal: The case of Cabeço da Amoreira. *Quaternary International* 308-309, 130-139.
- BOKELMANN, K. 2012. Spade paddling on a Mesolithic lake – Remarks on Preboreal and Boreal sites from Duvensee (Northern Germany). In: M.J. Niekus, R.N. Barton, M. Street and Th. Terberger (eds.), *A Mind Set on Flint: Studies in Honour of Dick Stapert*. Elde, Barkhuis, pp. 369-380.
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# EMERGENCY NUMBERS

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# MESSAGE FROM EARTHWATCH

DEAR EARTHWATCHER,

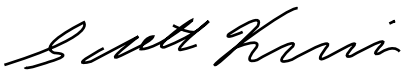
Thank you for joining this expedition! We greatly appreciate your decision to contribute to hands-on environmental science and conservation. It is volunteers like you who fuel our mission and inspire our work.

While at Earthwatch, I've had the opportunity to field on a few expeditions, most recently in Kenya with one of my daughters. Each expedition has touched me deeply, and made me proud to be able to roll up my sleeves alongside my fellow volunteers and contribute to such meaningful work.

As an Earthwatch volunteer, you have the opportunity to create positive change. And while you're out in the field working toward that change, we are committed to caring for your safety. Although risk is an inherent part of the environments in which we work, we've been providing volunteer field experiences with careful risk management and diligent planning for nearly 45 years. You're in good hands.

If you have questions as you prepare for your expedition, we encourage you to contact your Earthwatch office. Thank you for your support, and enjoy your expedition!

Sincerely,



Scott Kania  
President and CEO, Earthwatch





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