

# Marine Case Study



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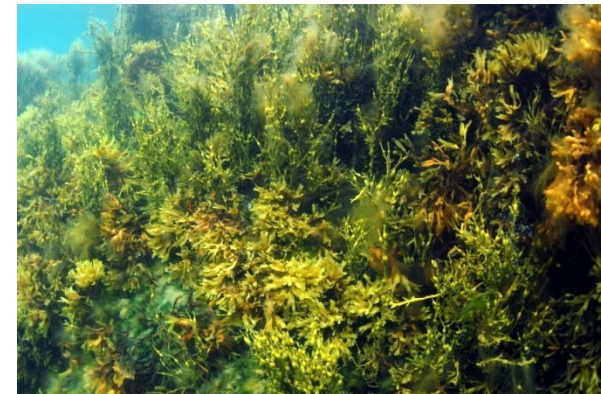
**Ciimar and University of Porto**



## REQUEST

### **Question identified by the scientific community**

What are the current trends in kelp forests in Europe and what is the evidence that these trends will affect the ecosystem's biodiversity and the provision of ecosystem services?





## Relevance of the question

**KELPS** → key species for the functioning of the kelp forests

**REEFS** ecosystem

Shelter		Fish
Habitat	FOR	Mammals
Food		Invertebrates
		Epibiota
		Other seaweeds

Coastal protection

Carbon sequestration

Water quality

Products: fertilizers, health, etc



## Relevance of the question

**KELPS** → key species for the functioning of the kelp forests

**REEFS** ecosystem

Shelter		Fish	} Also for deep sea and beach ecosystems
Habitat	FOR	Mammals	
Food		Invertebrates	
		Epibiota	
		Other seaweeds	

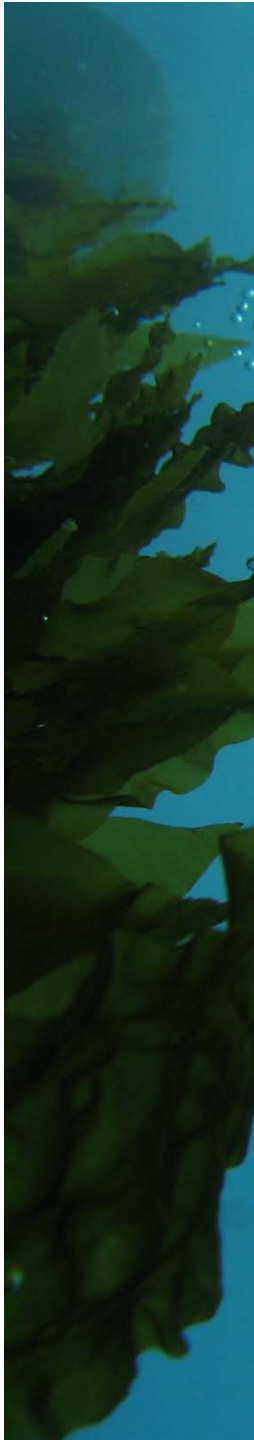


Coastal protection

Carbon sequestration

Water quality

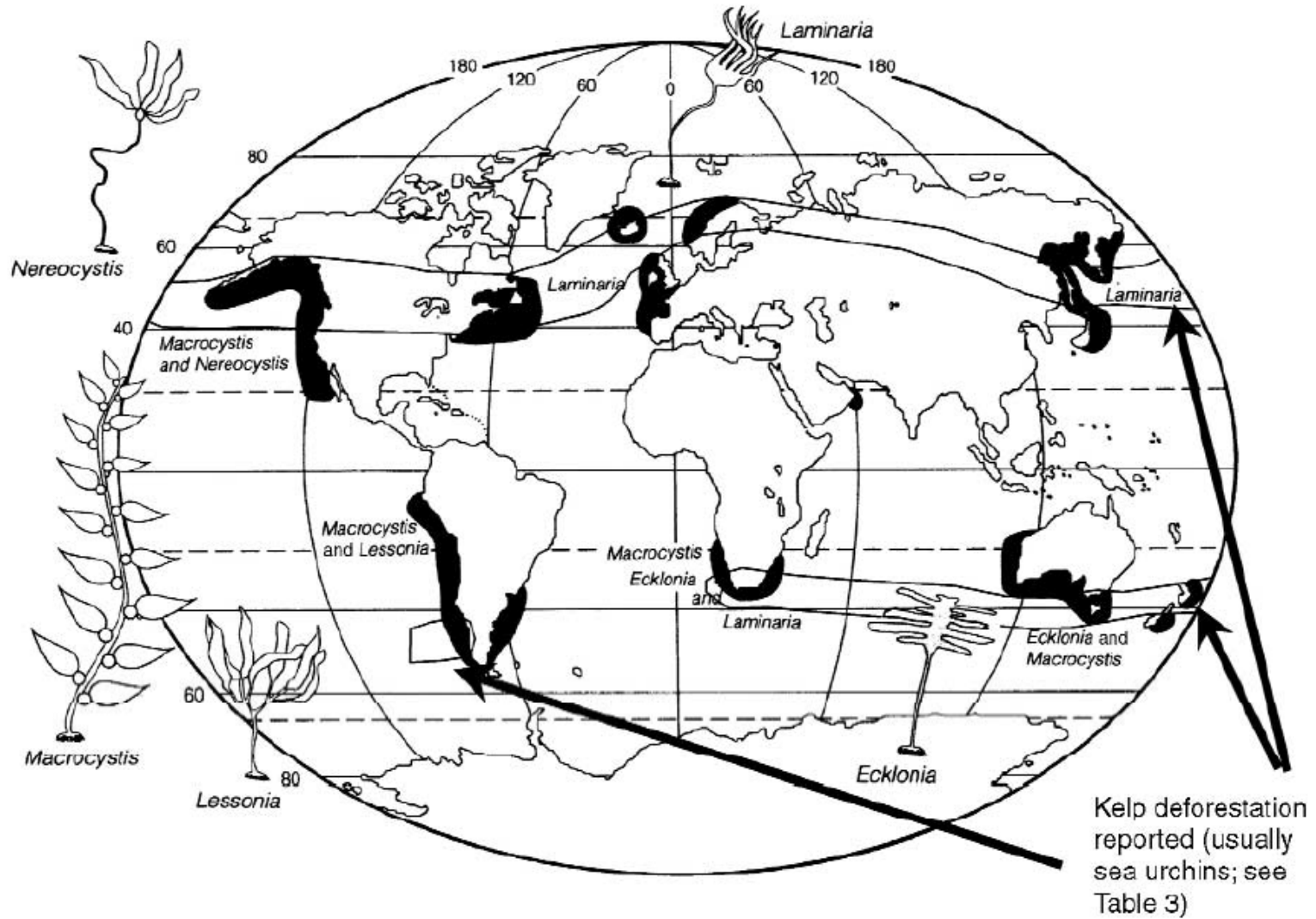
Products: fertilizers, health, etc



‘I can only compare these great aquatic forests . . . with the terrestrial ones in the intertropical regions. Yet if in any country a forest was destroyed, I do not believe nearly so many species of animals would perish as would here, from the destruction of the kelp. Amidst the leaves of this plant numerous species of fish live, which nowhere else could find food or shelter; with their destruction the many cormorants and other fishing birds, the otters, seals, and porpoise, would soon perish also; and lastly, the Fuegian[s] . . . would . . . decrease in numbers and perhaps cease to exist.’

Charles Darwin, 1 June 1834, Tierra del Fuego, Chile  
(Darwin 1909, pp. 256–257).







## Policy framework of the question

Water Framework Directive  
Marine Strategy Framework Directive  
Habitats Directive  
Natura 2000 Network

Coastal and halophytic habitats (**REEFS**)





## SCOPING

Dialogue with stakeholders and managers

At national and European level

Different level of interest

- No knowledge of the relevance
- Organizing meetings on management options for kelp





## SCOPING

### Contact with knowledge hubs for identification of relevant experts

Millenium Ecosystem Assesment

[NatureServe](#)

National Biological Information Infrastructure

[Society for Conservation Biology](#)

[SCOPE](#)

[Stockholm Environment Institute](#)

[TEEB Initiative](#)

[The Nature Conservancy](#)

[Union of Concerned Scientists](#)

[Worldwatch Institute](#)

[World Resources Institute](#)

[World Wildlife Fund](#)

[ASEAN center for Biodiversity](#)

[Conservation Commons](#)

[Critical Ecosystem Partnership Fund](#)

[Diversitas](#)

[Earthwatch Institute](#)

[Natural Capital Project](#)

[Ramsar Convention on Wetlands](#)

[Smithsonian Institute](#)

[Stockholm Resilience Centre](#)

[UNEP-ROE](#)

[Euromarine](#)

[Census of marine life](#)

[Global forum on oceans, coasts and islands](#)

[GOBI](#)

[IUCN Global marine program](#)

[Regional seas organization](#)

[UNESCO – Intergovernmental oceanographic comission](#)

[UNEP – World conservation monitoring center](#)

[Biodiversity Heritage Library](#)

[Convention for Biological Diversity](#)

[Collaboration for Environmental Evidence](#)

[Conservation International](#)

[Ecosystem Services Partnership](#)

[Global Biodiversity Information Facility](#)

[GEO BON](#)

[Global Invasive Species Programme](#)

[International Center for Trade and Sustainable Development](#)

[International Long Term Ecological Research Sites Network](#)

[International Association for Ecology](#)

[International Press Centre on Biodiversity Research](#)

[International Society for Ecological Economics](#)

[International Institute for Sustainable Development](#)

[IUCN Invasive Species Specialist Group](#)

[International Union of Biological Science – IUBS](#)

[IUCN specialist groups](#)

## SCOPING

69 experts identified by knowledge hubs





## SCOPING

### **Questionnaire sent to experts**

Trends in kelp forests in Europe

Drivers of changes

Effects of identified changes on the ecosystem services

Information on conservation/management programs

Willingness to give further input

Interest in the results





## SCOPING

### **52 experts answered the questionnaire**

Differences in trends found between geographical areas, kelp species and experts

Major gap of knowledge on the effects of kelps in fisheries and other services

Biodiversity is the main ecosystem characteristic known to be affected by the current trends in kelp forests

Multiple drivers identified, varying with the geographical area considered

All but one interested to give further input and see the results



## SCOPING

### **Main conservation/management programs for kelp forests in Europe identified**

#### **France**

Creation of Marine Protected Area in the Ushant sea “Mer d’Iroise”  
Management of harvesters and processors of kelp  
Monitoring programs

#### **Azores and Southern Iberian Peninsula**

Protected areas

#### **UK**

Control on kelp’s mechanical harvesting  
Marine protected areas (Scotland)

#### **Norway**

Restoration programs for kelp forests  
Monitoring programs  
Management plans for kelp harvesting

#### **Bay of Biscay**

Assesment program



## AGREEMENT ON TEAM AND PROTOCOL

# WORKSHOP

Presentation and discussion of the results of the scoping process

Presentation and discussion of the next steps for processing knowledge





## PROCESSING KNOWLEDGE



What are the current trends in kelp forests in Europe and what is the evidence that these trends will affect the ecosystem's biodiversity and the provision of ecosystem services?

### **EXPERT CONSULTATION**

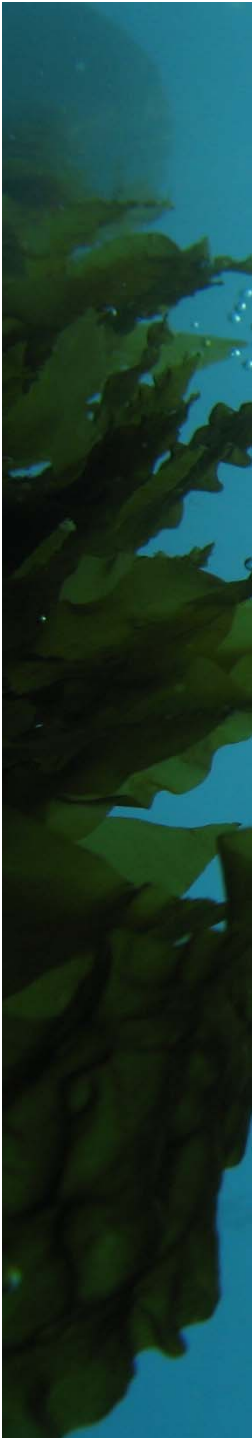
What are the trends of kelp forests in Europe?

### **SYSTEMATIC REVIEW**

What is the impact of changes in kelp forest density and/or area on fisheries and biodiversity?

### **ADAPTIVE MANAGMENT**

What are the main drivers of changes in kelp forests in Europe?





## Workshop

### EXPERT CONSULTATION

What are the trends of kelp forests in Europe?

Discuss results from questionnaire  
Agree in a group for a review



## Workshop

# SYSTEMATIC REVIEW

What is the impact of changes in kelp forest density and/or area on fisheries and biodiversity?

Discussion on the draft protocol for conducting the review





## Workshop

# ADAPTIVE MANAGEMENT

What are the main drivers of changes in kelp forests in Europe?