



PANACHE

Protected Area Network Across
the Channel Ecosystem

THE ENGLISH CHANNEL
one
ecosystem two
projects



FINAL CONFERENCE - MARCH 17th-18th 2015 - TORQUAY

A selection box of ESA methods: describing the approaches used in VALMER



Rémi Mongruel (Ifremer)

Tara Hooper, Nicky Beaumont (PML)
and colleagues



Methods used by Valmer study sites

A wide range of assessment methods were used by case study sites, depending on their particular needs (aim and scope of the ES assessment).

Ecological assessment methods: sensitivity assessment, ecological function qualitative assessment

Social sciences methods: interviews, surveys

Multi-criteria analysis: indicators, analytic hierarchy process

Economic methods: transport costs, choice experiment, ecosystem accounting, Bayesian belief networks

Cross-methods: INVEST, system dynamic modelling

*See all application examples in Valmer
WP1Guidelines document, section 5*

Recreation in Poole Harbour

Tara Hooper¹, Alex Brocklesby^{2,3} & Ken Buchan²

¹. Plymouth Marine Laboratory; ². Dorset County Council; ³. Dorset Coastal Forum

✧ Travel Cost Method
(monetary valuation)

🌿 Analytic Hierarchy Process
(wider preferences)



Rationale

- ✦ Little research has been carried out into how Poole Harbour is used by different recreational activities
- 🌿 The relationship between marine habitats and species and enjoyment of recreational activities is unknown
- ✦ Managers want to ensure Poole Harbour remains a desired place to visit for people doing these activities



Travel Cost Method

- ✦ A revealed preference technique: values are calculated based on information about how people actually behave.
- ✦ The value to a respondent of a particular location is based on the amount they are prepared to spend on travel to get there.
- ✦ Considered distance travelled (as calculated based on home post code) and mode of transport, with factors such as multiple destinations or multiple purposes for their visit also taken into account .



Online survey

- ★ Birdwatching [BDW] (148)
- 🌿 Kayak/canoeing [KYK] (132)
- ★ Kitesurfing [KSF] (104)
- 🏄 Jet/waterskiing [JWSK] (79)
- 🐟 Windsurfing [WSF] (83)

Jetskiing in Poole Harbour
Travelling to Poole Harbour

What was the main method of transport you used to get to Poole Harbour? (tick one)

Walk/cycle Private car/motorcycle Hire car Taxi Train Bus Boat

Other (please state)

How many other people travelled with you in the car?

Approximately how long was your total journey time from home to Poole Harbour? (Please indicate whether you are measuring this in minutes or hours, and then enter the number)

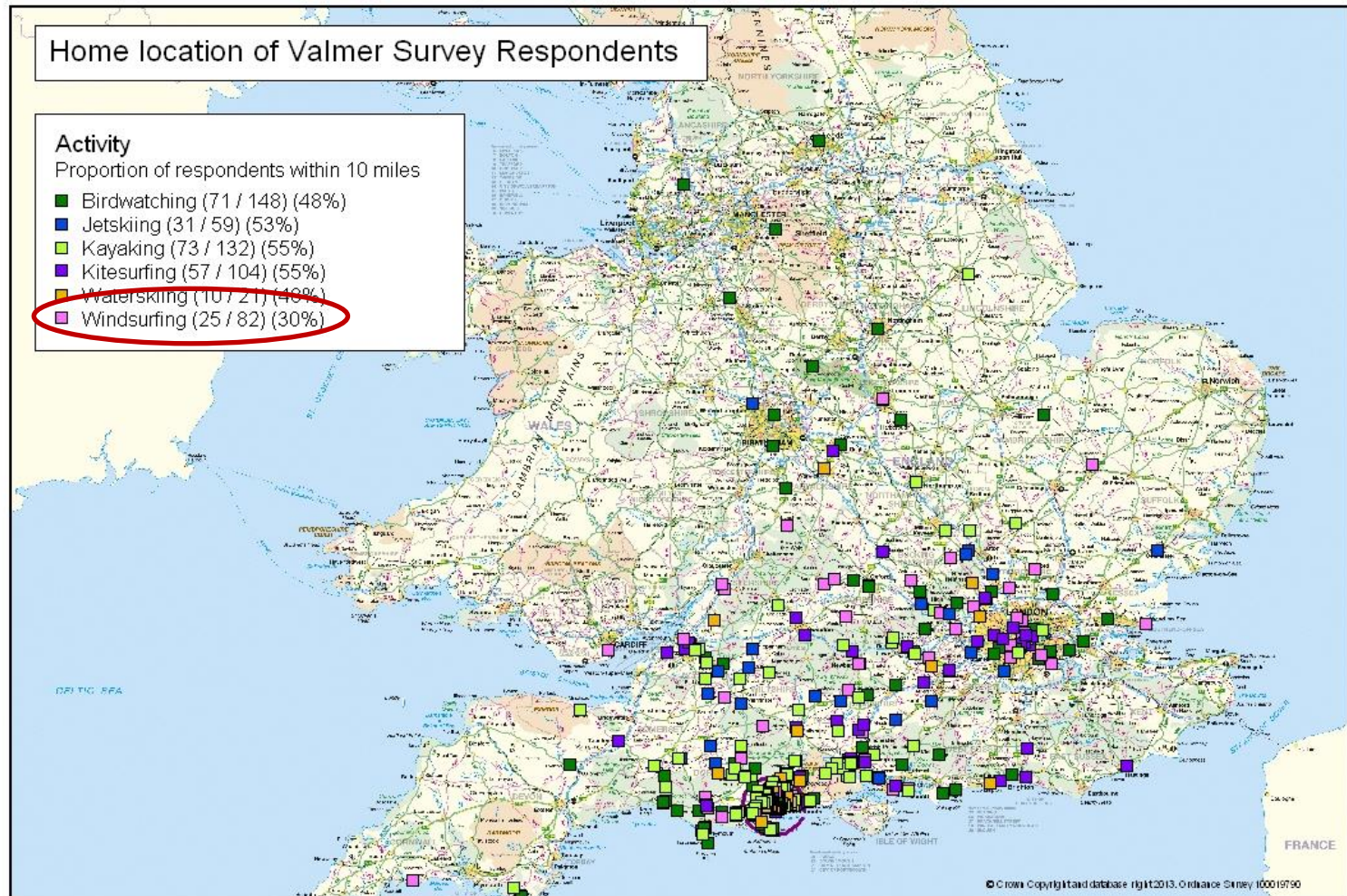
Minutes

Hours

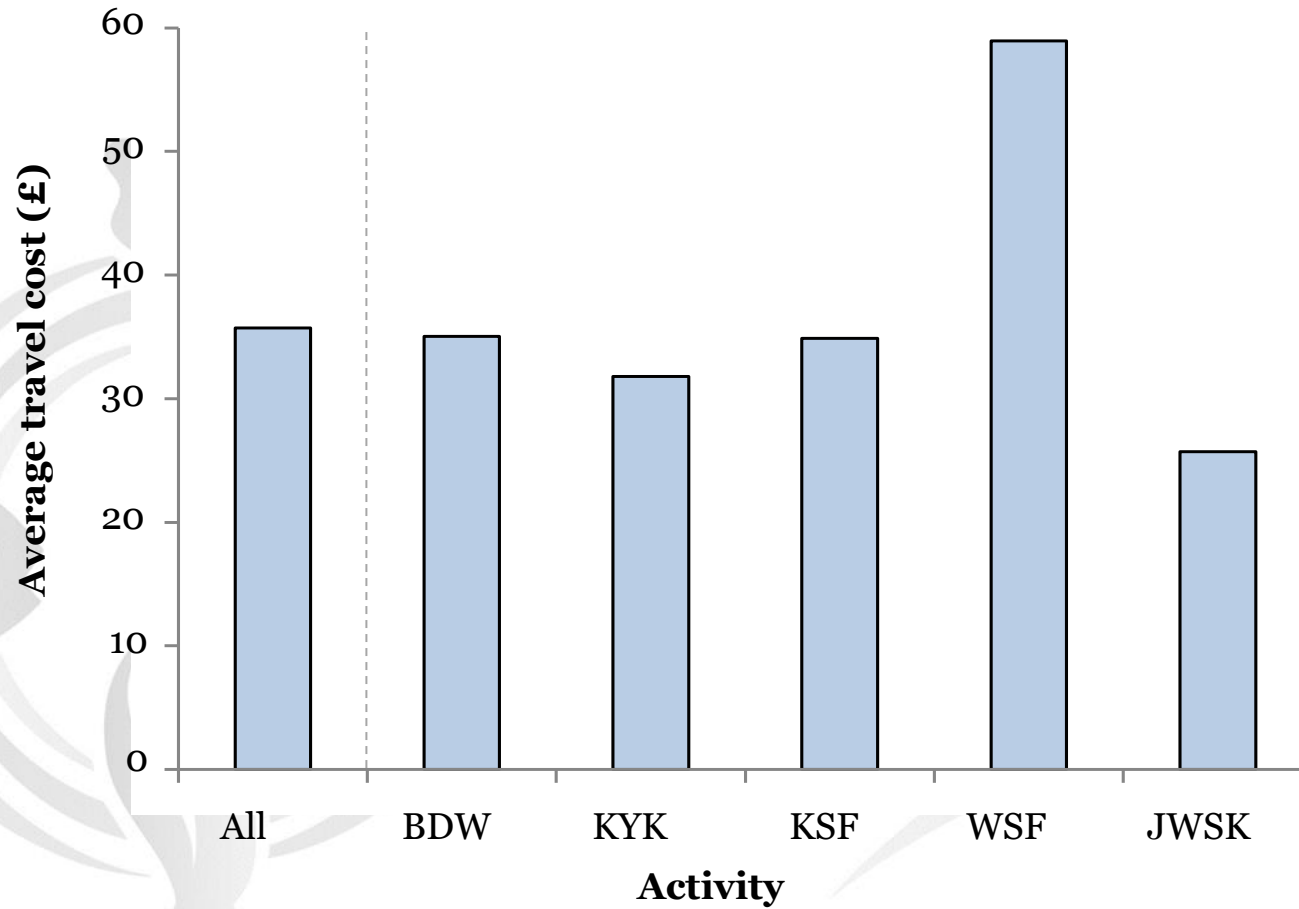
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16%

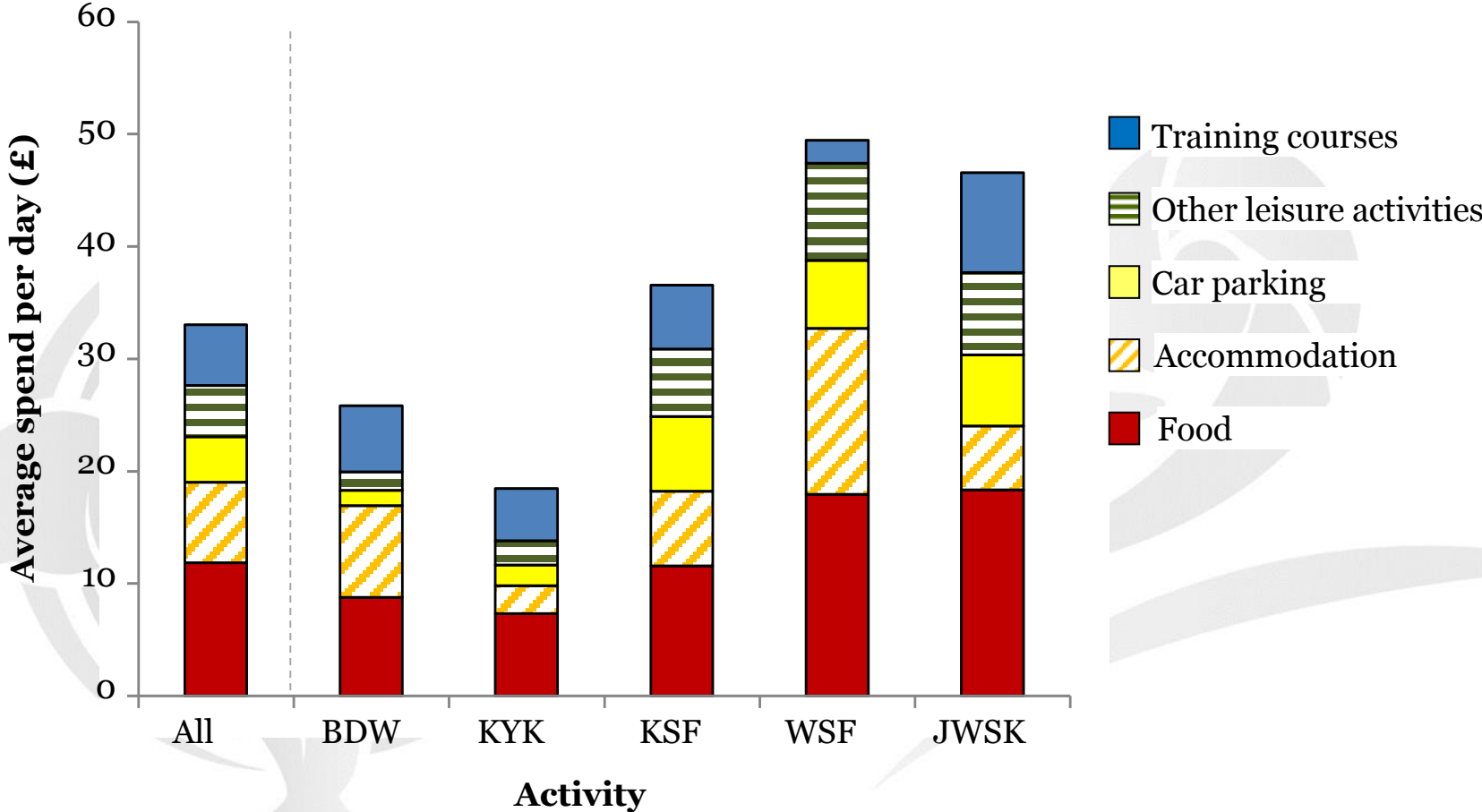
Home location



Travel cost

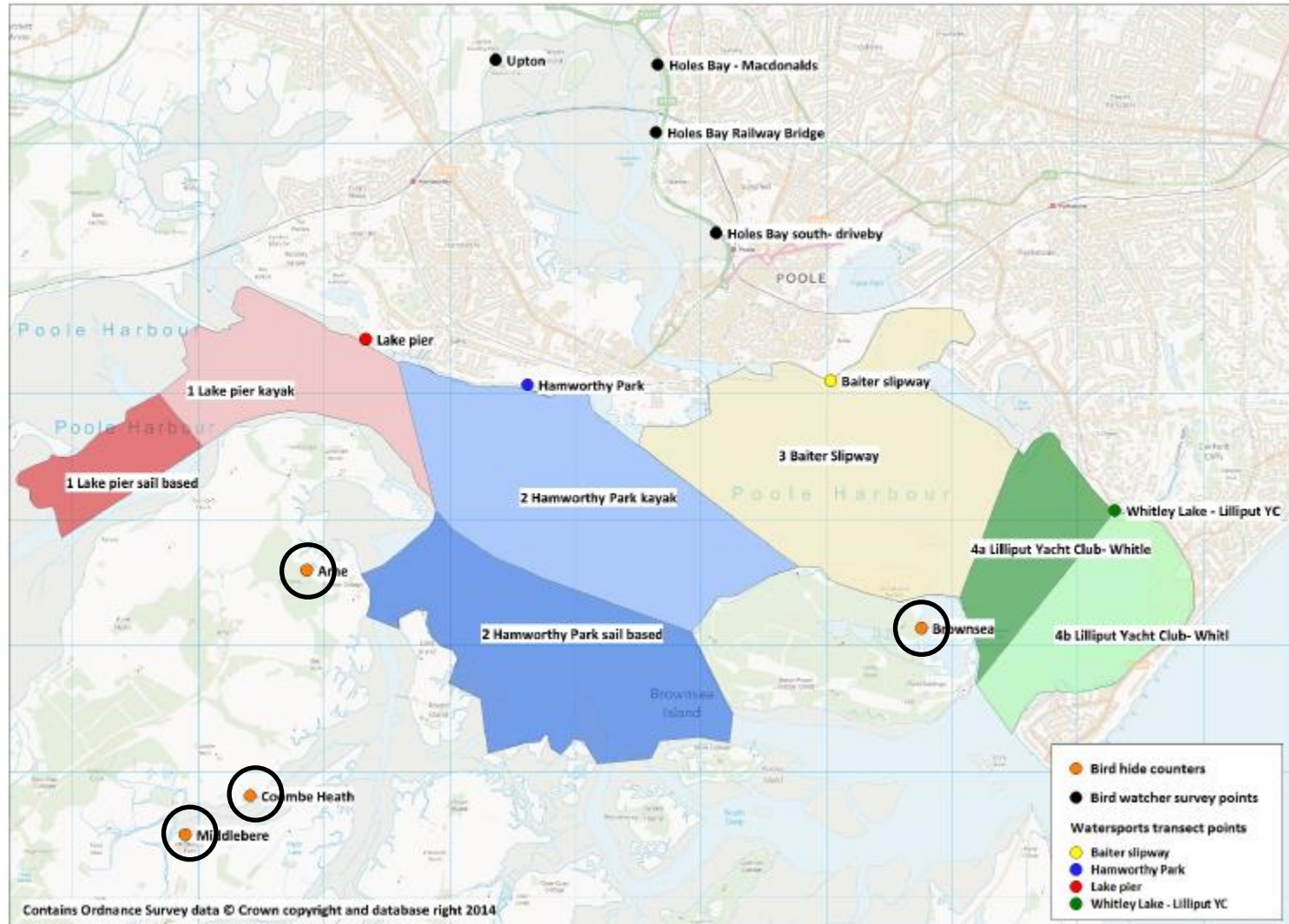


Local spending

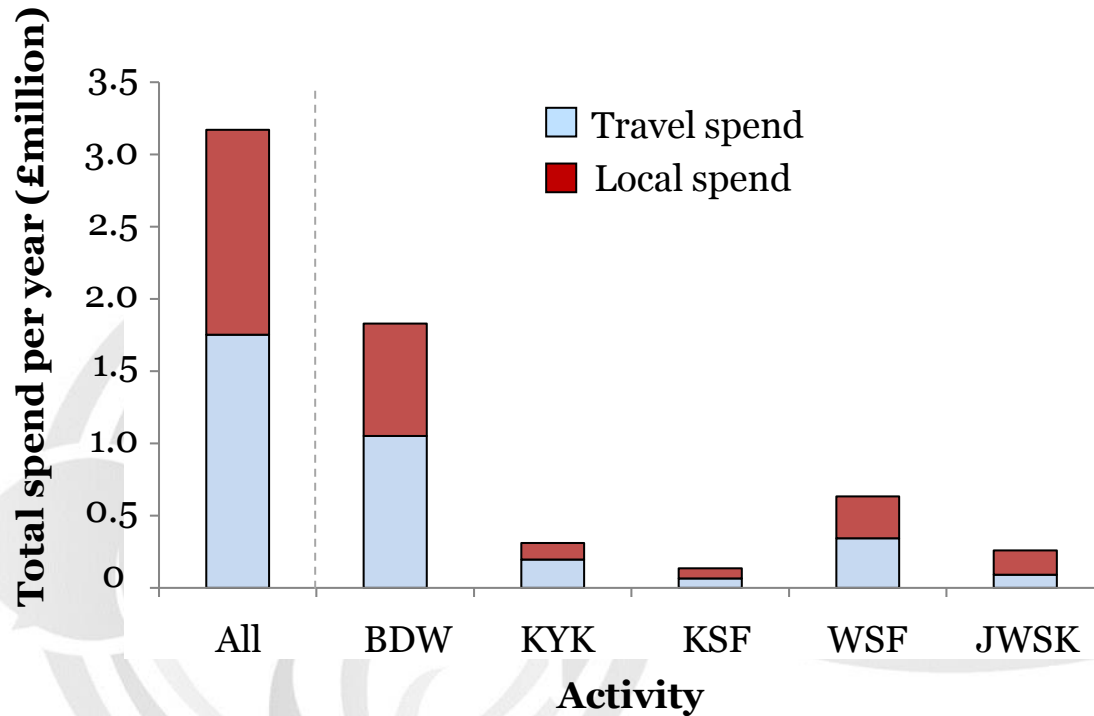


Commissioned count study in spring/summer 2014.....

- Watersports transects
- Bird hide counters



Total annual spend



Number of visits:

Birdwatching	30,031
Kayak/canoeing	6,199
Kitesurfing	1,904
Windsurfing	5,847
Jet/waterskiing	3,589

Analytic Hierarchy Process

- ★ A multicriteria technique providing a formal framework to compare different characteristics and express relative preferences.
- 🌿 Commonly used in environmental science for assessing preferences of multiple individuals.
- ★ Pairwise comparison approach is straightforward for respondents



Image courtesy of Poole Tourism

Poole Harbour: Broad Features



The Environment

The underlying natural features, including:

- the enclosed, sheltered nature of the harbour
- views of the water and coastline
- wildlife
- clean water in the harbour



Facilities

The availability of built infrastructure including:

- car parks and toilets
- slipways, moorings and bird hides
- cafés, shops, accommodation

Cost Factors

The cost of using the infrastructure and facilities, including:

- ferry/car parking charges
- permit fees/slipway fees
- nature reserve entrance fees



Poole Harbour: Specific Features



Views of the coastline

This describes the appearance of the harbour, overlooking the water.



Wildlife

This describes the different animals (for example, fish and birds) and the habitats in which they live (such as seagrass beds and saltmarshes).



Water quality

This describes how clean and clear the water is in the harbour, including bathing water quality.

Question Format



Environment

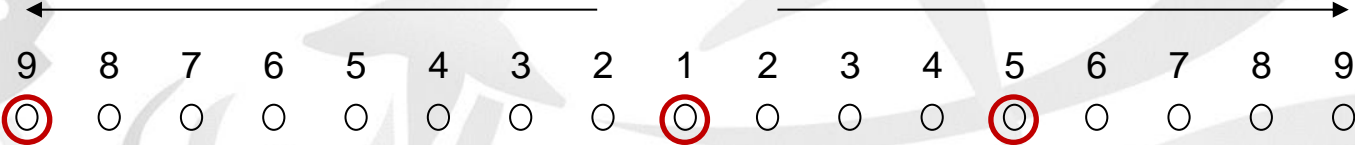


Facilities

Very much more important

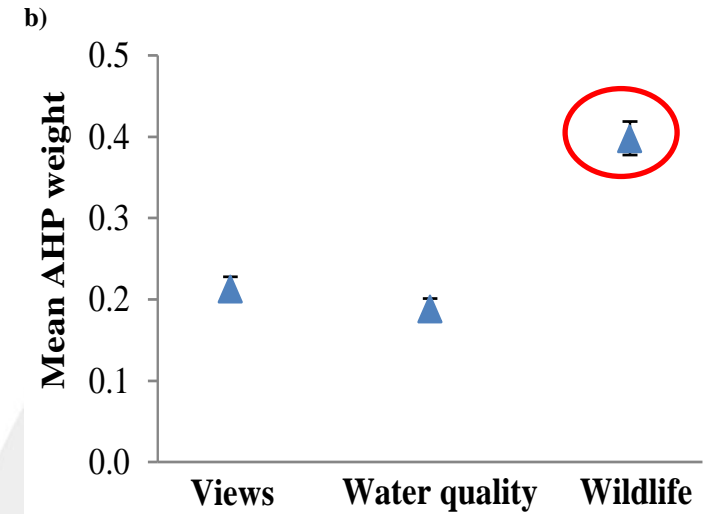
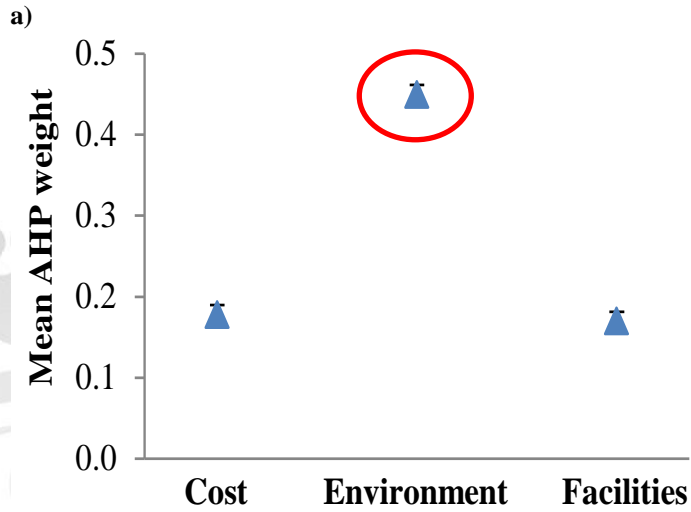
Equal importance

Very much more important

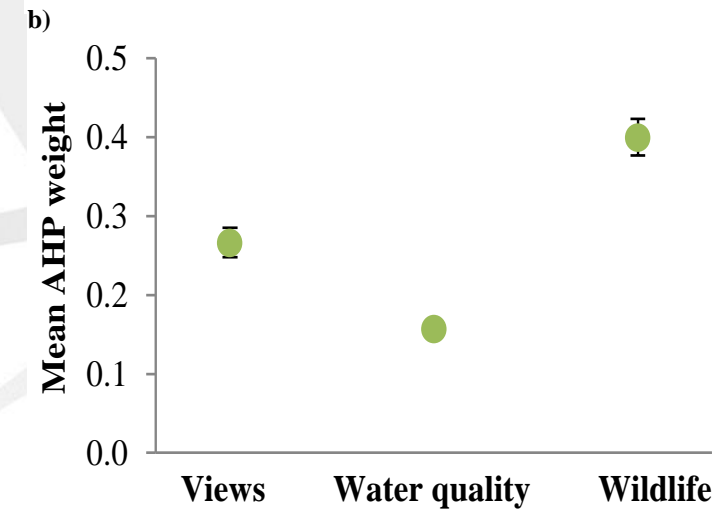
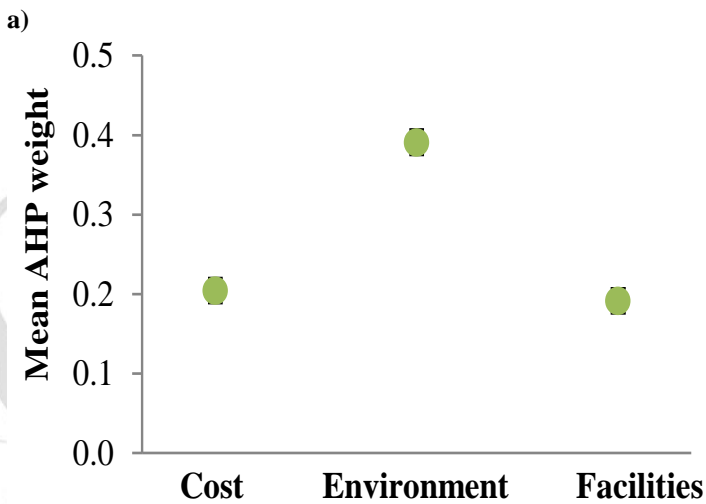


Results

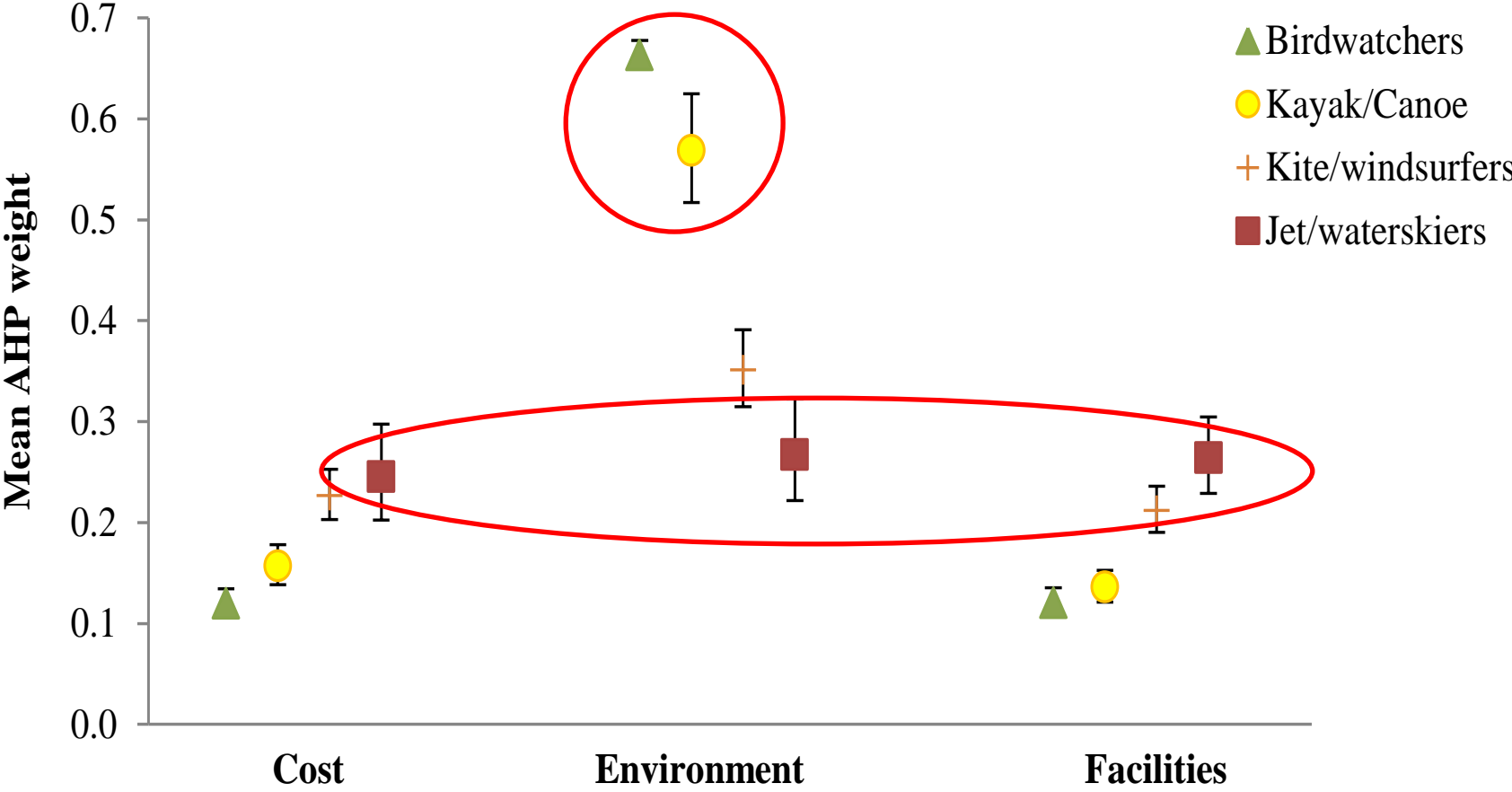
All
repondents
(n= 528)



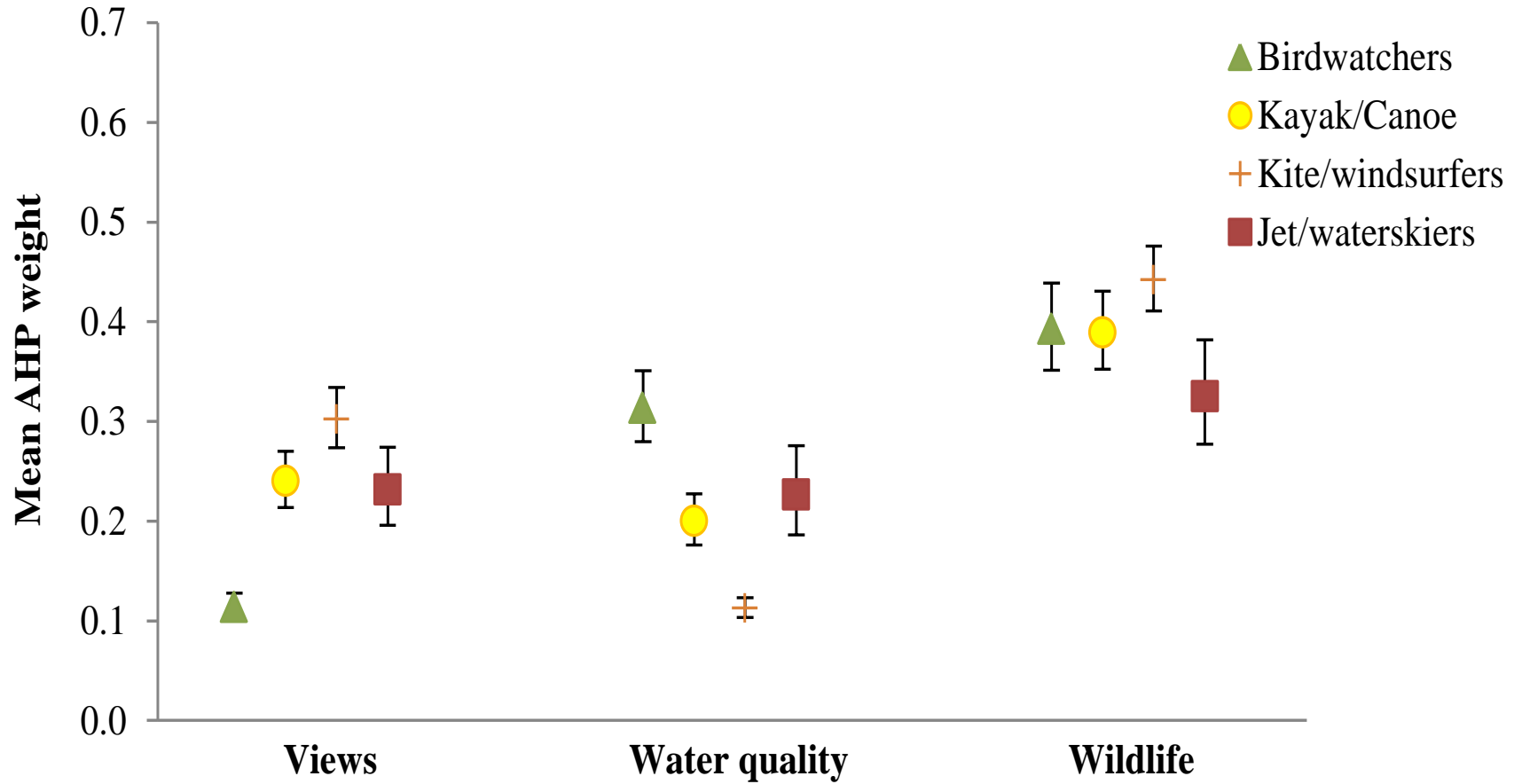
Excluding
birdwatchers
(n= 329)



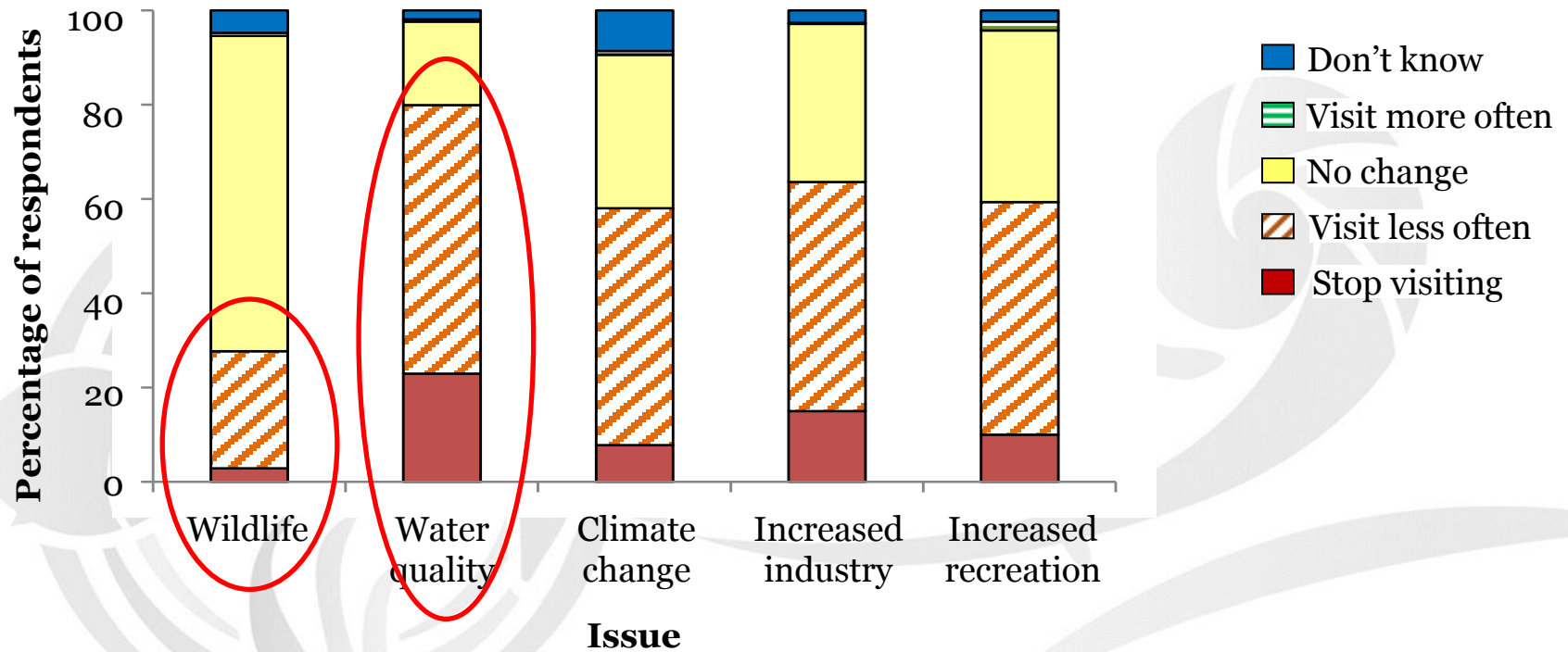
Results



Results



Management of Poole Harbour



Cultural Services within the Plymouth Sound to Fowey site

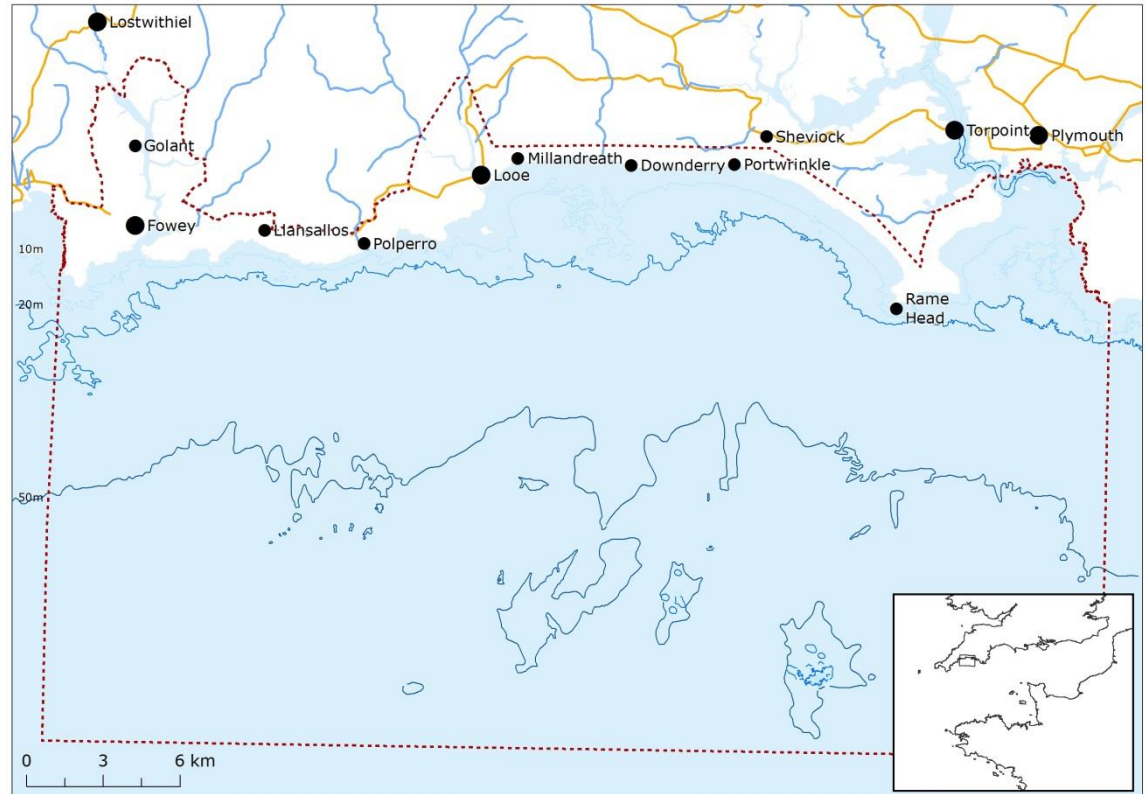
Cheryl Willis, Rob Fish &
Matt White
University of Exeter

with additional input from
PML, MBA, PU and CC



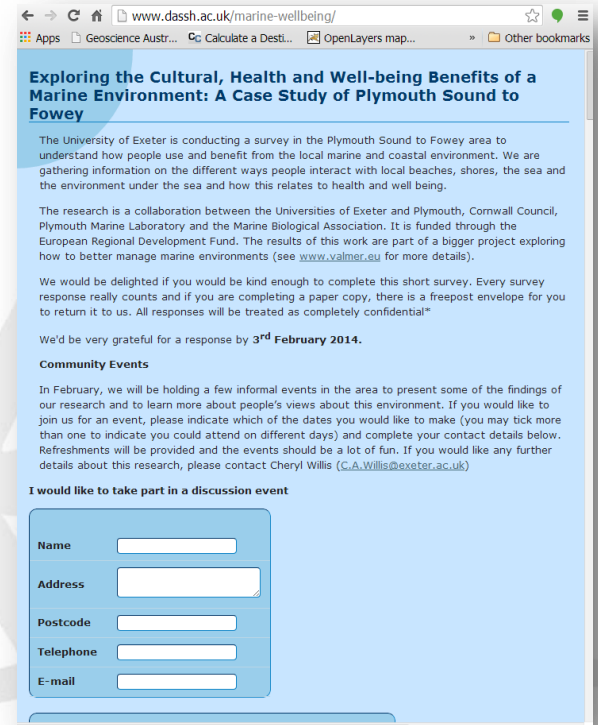
Background

- ★ Large site, with significant offshore component
- 🌿 Not an existing management unit
- ★ Stakeholders expressed a particular interest in increasing their understanding of cultural services



Survey and mapping

- ★ Survey sent to 1,600 households in the area
- 🌿 Also disseminated online
- ★ Respondents used green and red sticky dots to indicate places which were special or threatened in some way
- 👣 215 responses
- 🐟 A discussion event with a sample of respondents enabled a greater analysis of the patterns which were revealed through the survey and maps



The screenshot shows a web browser window with the URL www.dassh.ac.uk/marine-wellbeing/. The page title is "Exploring the Cultural, Health and Well-being Benefits of a Marine Environment: A Case Study of Plymouth Sound to Fowey". The content includes an introduction to the survey, a list of collaborating institutions (University of Exeter, Plymouth Marine Laboratory, and Marine Biological Association), and a request for responses by 3rd February 2014. It also mentions community events in February and provides contact information for Cheryl Willis. At the bottom, there is a form titled "I would like to take part in a discussion event" with input fields for Name, Address, Postcode, Telephone, and E-mail.

Exploring the Cultural, Health and Well-being Benefits of a Marine Environment: A Case Study of Plymouth Sound to Fowey

The University of Exeter is conducting a survey in the Plymouth Sound to Fowey area to understand how people use and benefit from the local marine and coastal environment. We are gathering information on the different ways people interact with local beaches, shores, the sea and the environment under the sea and how this relates to health and well being.

The research is a collaboration between the Universities of Exeter and Plymouth, Cornwall Council, Plymouth Marine Laboratory and the Marine Biological Association. It is funded through the European Regional Development Fund. The results of this work are part of a bigger project exploring how to better manage marine environments (see www.valmer.eu for more details).

We would be delighted if you would be kind enough to complete this short survey. Every survey response really counts and if you are completing a paper copy, there is a freepost envelope for you to return it to us. All responses will be treated as completely confidential*

We'd be very grateful for a response by **3rd February 2014**.

Community Events

In February, we will be holding a few informal events in the area to present some of the findings of our research and to learn more about people's views about this environment. If you would like to join us for an event, please indicate which of the dates you would like to make (you may tick more than one to indicate you could attend on different days) and complete your contact details below. Refreshments will be provided and the events should be a lot of fun. If you would like any further details about this research, please contact Cheryl Willis (C.A.Willis@exeter.ac.uk)

I would like to take part in a discussion event

Name

Address

Postcode

Telephone

E-mail

Spontaneous Associations with the 'sea' and the 'coast'

- adventure along away **beach** beaches beautiful **beauty** being blue
boating **boats** calm childhood children clean cliff cliffs coast **coastal** cold creatures
danger days **diving** dogs driftwood energy enjoyment environment excitement **family**
feeling fish **fishing** food **freedom** **fresh** friends from getting **good**
happiness happy health history holiday **holidays** home invigorating kayaking landscape laughter
leisure life love marine memories nature open path **peace** peaceful
pleasure pollution pools power **relaxation** relaxing respect rock
rockpooling rocks rowing **sailing** salt **sand** scenery seagulls seaweed smell
soothing sound sounds **space** stunning summer **sunshine** surf surfing
swimming time **views** **walking** walks water
waves wild wildlife wind work

Top 10 activities people like to do at the coast in Plymouth Sound-Fowey

Activity	Percentage of Respondents
Walking	77
Eating/drinking near the beach	68
Appreciating scenery from a car	53
Collecting Things	42
Observing Wildlife	38
Beach Play	37
Walking a dog	32
Reading	30
Creative Activities	26
Surface Water Sports	23

To me, the sea and the coast around here is a place:

1 (strongly disagree)

3 (neutral)

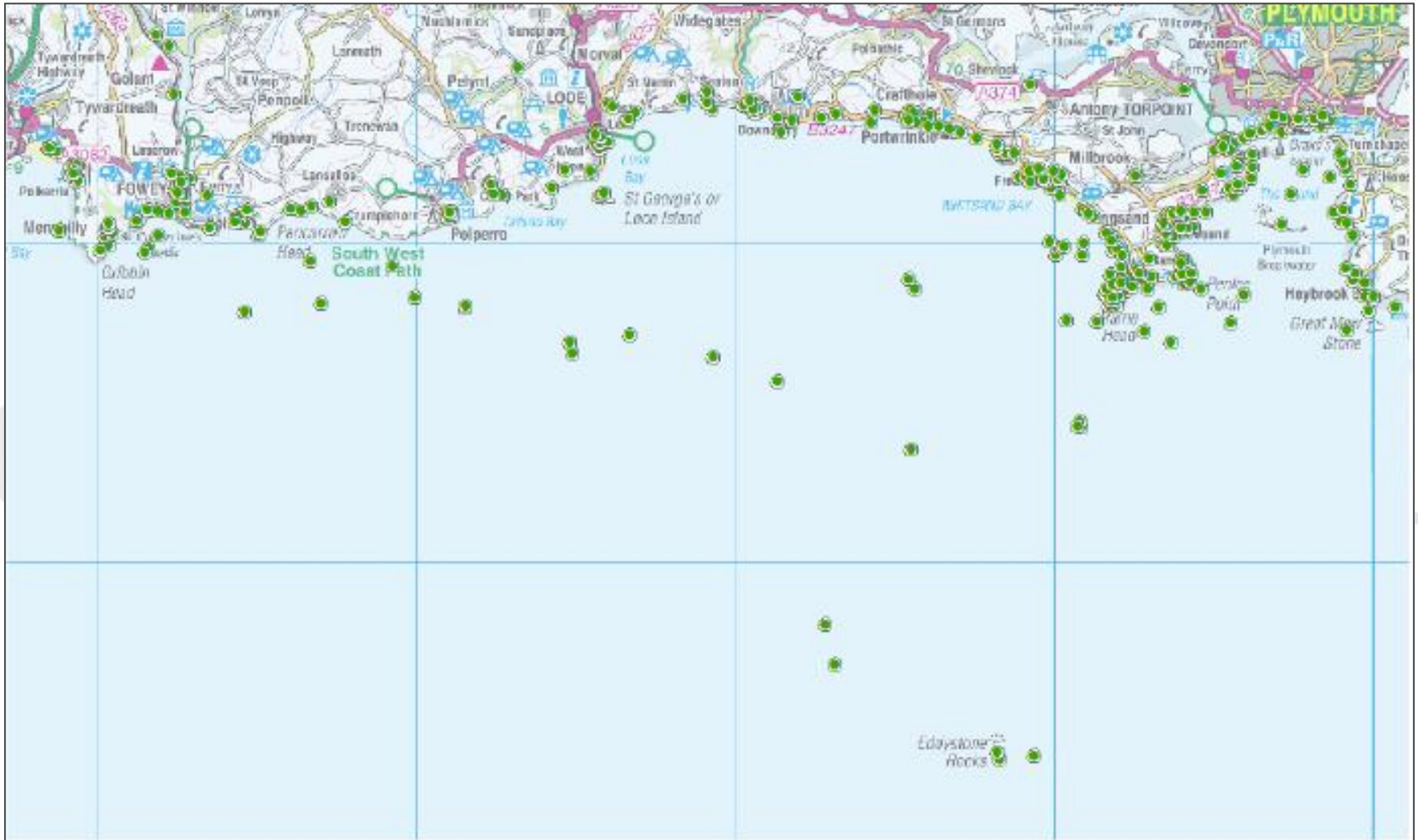
5 (strongly agree)

	Average rating	Strongly agree/tend to agree (%)	Strongly disagree/tend to disagree (%)
Where I can enjoy peace & quiet	4.45	91	4
Of great aesthetic quality	4.63	95	2
Which has enough space for me to do what I want	4.36	85	3
Of important natural value	4.72	94	2
Important for wildlife/biodiversity	4.68	94	2
Of important historic value	4.25	80	2
That I associate with literature/TV/art/films	2.94	21	35
Has a character all of its own	4.53	90	3
Where enjoyment can be free	4.55	91	5

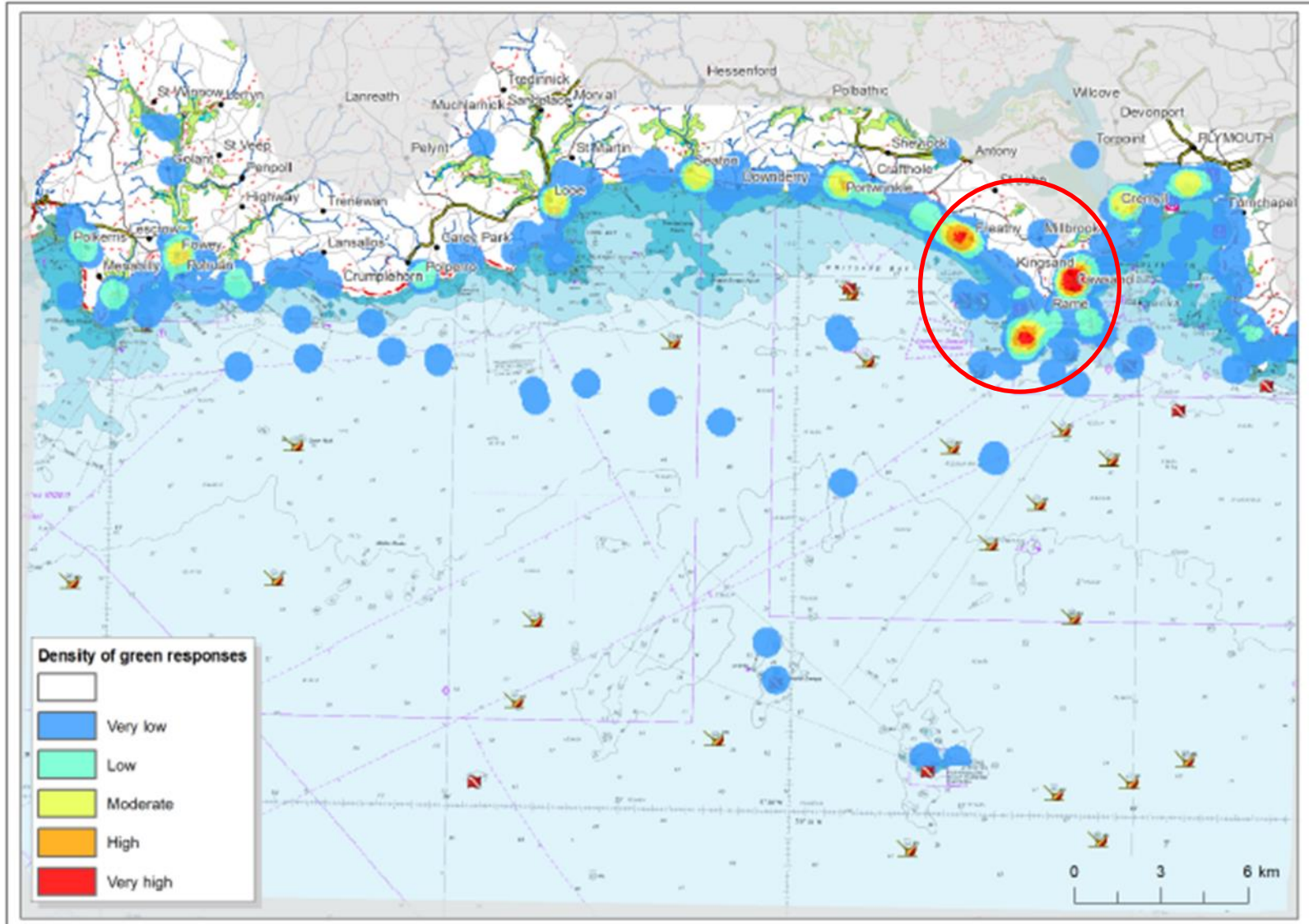
Well-being associated with frequency of visits and interactions

- ★ Significant differences were found in well-being, with those who ‘almost never’ spend time in/on the sea and at the coast reporting lower well-being compared to those who spend time there more frequently.
- 🌿 Over half strongly agreed that being in this area helped them to:
 - ★ feel relaxed and calm
 - 👣 clear their head and think
 - 🐟 feel closer to nature
 - feel refreshed and revitalised

Significant and valuable places

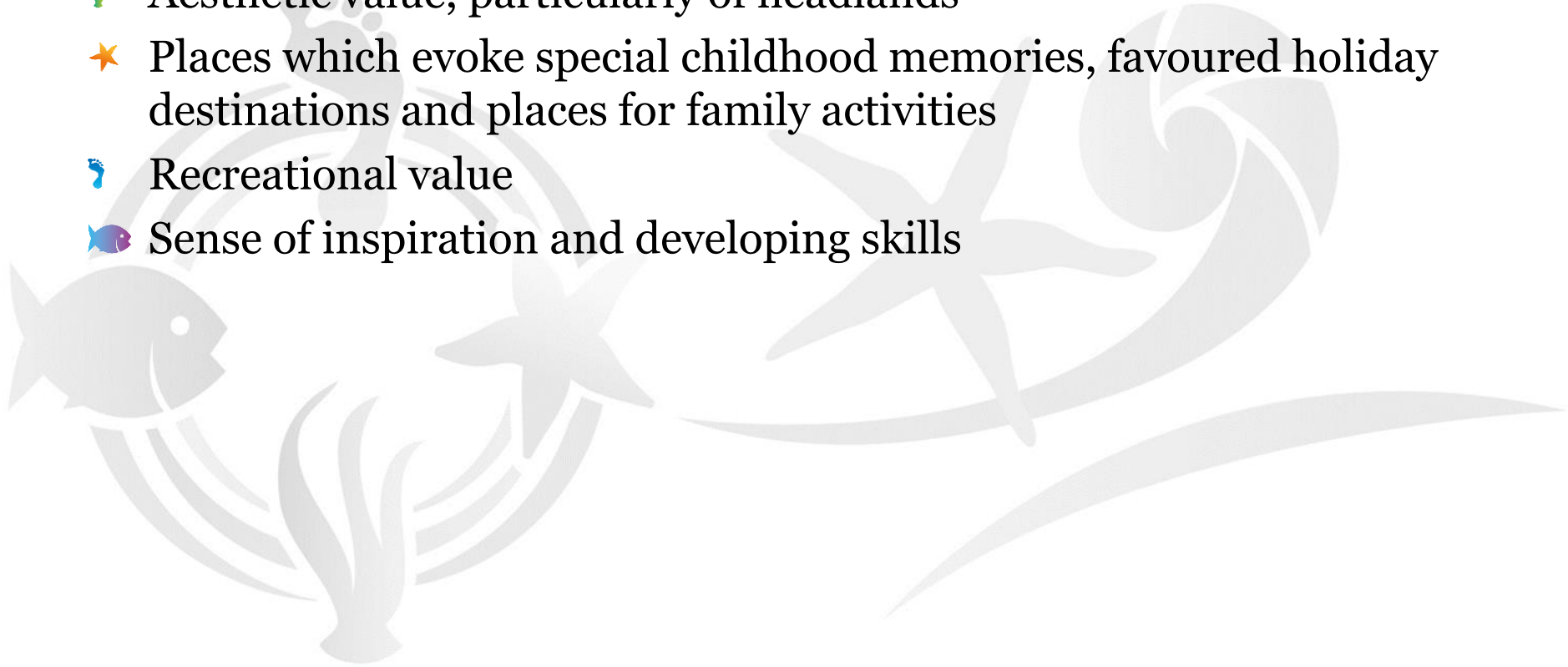


Significant and valuable places

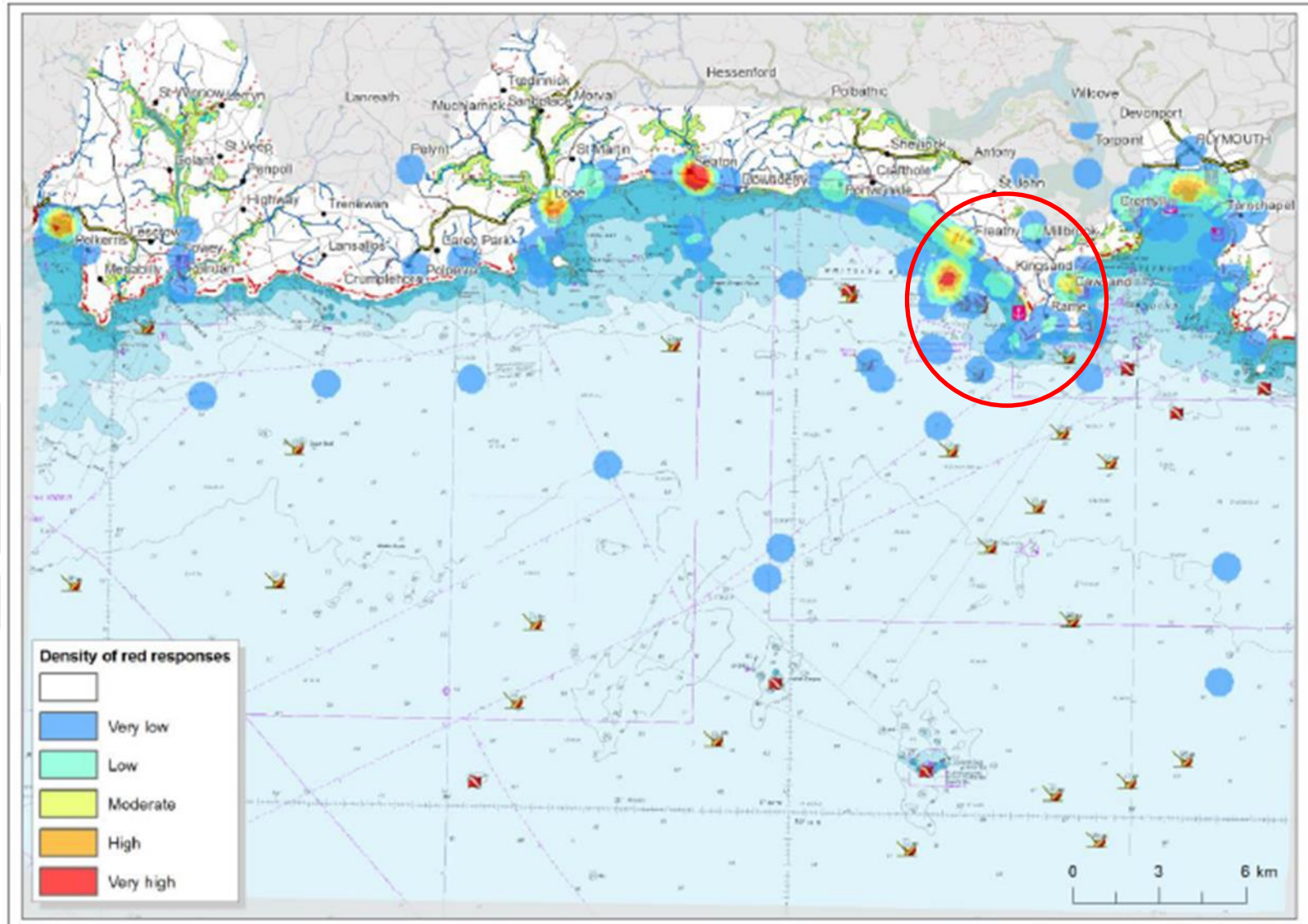


Significant and valuable places

- ★ Associated with the 'life', history and cultural heritage of the area, such as traditional fishing harbours.
- 🌿 Aesthetic value, particularly of headlands
- ★ Places which evoke special childhood memories, favoured holiday destinations and places for family activities
- 👣 Recreational value
- 🐟 Sense of inspiration and developing skills



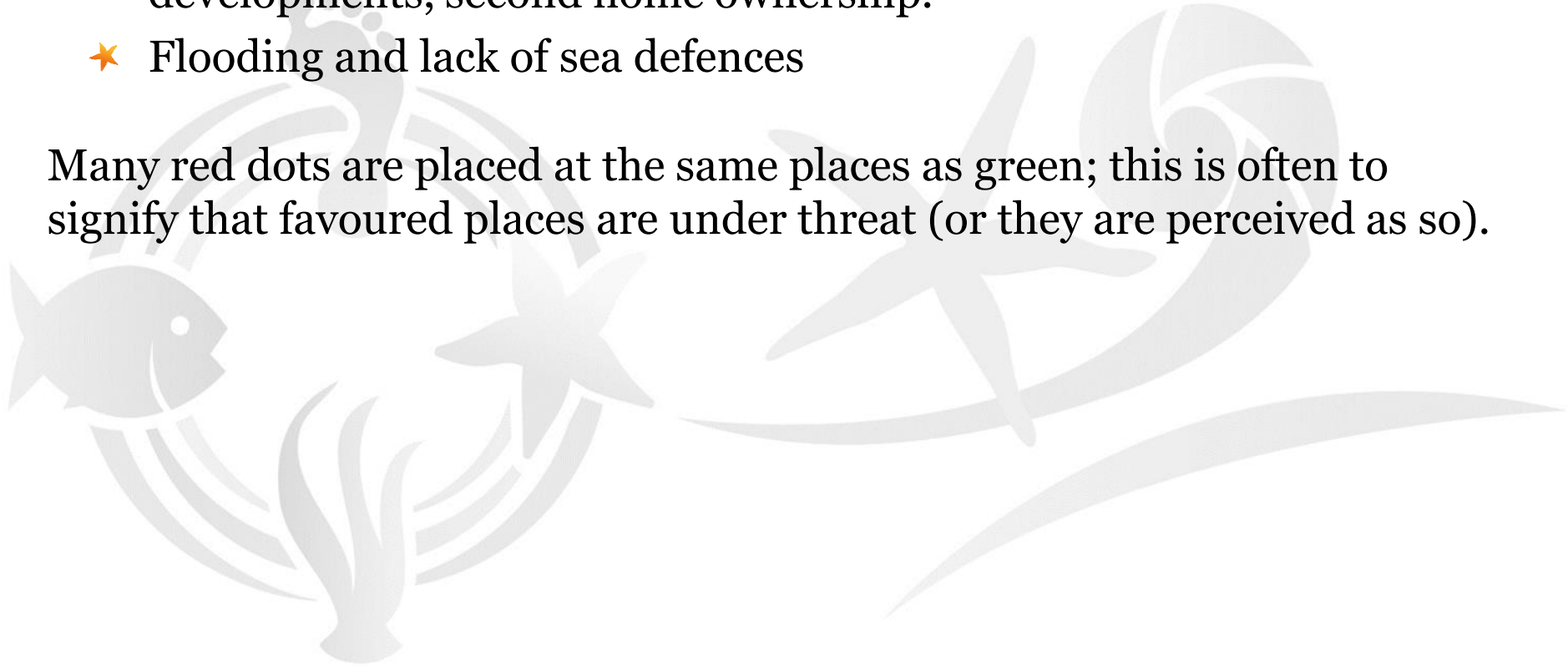
Places perceived as under threat or challenged



Places perceived as under threat or challenged

- ★ Poor environmental quality: Rame Head disposal site and littering.
- 🌿 Loss of culture, heritage and 'traditional feel': modern developments, second home ownership.
- ★ Flooding and lack of sea defences

Many red dots are placed at the same places as green; this is often to signify that favoured places are under threat (or they are perceived as so).



Ecosystem accounting for the initial diagnosis of the Normand-Breton Gulf

Economic methods

An environmental-economic accounting framework is developed by the statistical division of the United Nations with an experiment to ecosystem issue (SEEA-CF 2012; SEEA-EEA 2012)

An ecosystem accounting is expected to show the dependence of economic development on the environment and ecosystem services

Many accounting approaches can be developed to highlight these links: natural asset accounting, environment degradation expenses, etc.

In the VALMER project we developed an ecosystem satellite account combining physical values for ecological components (ecosystem and ecosystem services) and monetary values for economic components (human activities) for the GNB area. 2 human activities are distinguished.

This satellite account can be used for an initial diagnosis, but it could also be updated in a routine way to support management of a future MPA. **33**

Ecosystem accounting for the initial diagnosis of the Normand-Breton Gulf

Physical stock and flow account for marine and coastal ecosystem: indicating the presence, the production and the consumption of ecosystem services

System of National Accounts: input-output table integrating both the production account and the goods and services account

Indicators of ecosystem service presence

Indicators of Ecosystem service production

Regulating ecological processes

Environmental protection expenditure accounts (EPEA): environmental protection activities

Economic activities included in the production boundary of the SNA

Indicators of ecosystem service consumption

Human activities consuming ecological inputs

Extension of production boundary to household recreational services

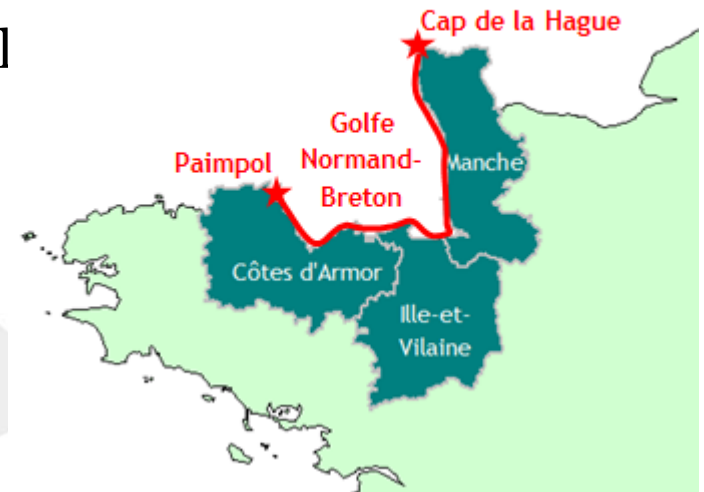
How to spot marine activities and expenses?

How to estimate cultural services?

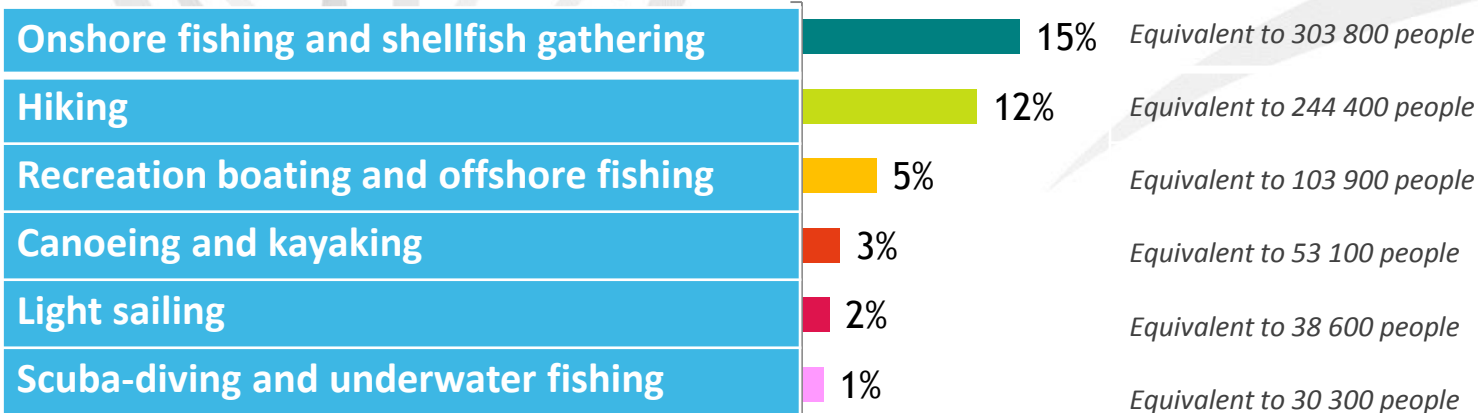
Black: System of National Accounts
Green: Ecosystem Satellite Account

Ecosystem accounting for the initial diagnosis of the Normand-Breton Gulf

Estimating ecosystem dependent recreational activities in the GNB: phone survey



3 departments, 1503 respondents, at least 25% practice one activity or more



Ecosystem accounting for the initial diagnosis of the Normand-Breton Gulf

Methodological challenge: production for own use of joint products...

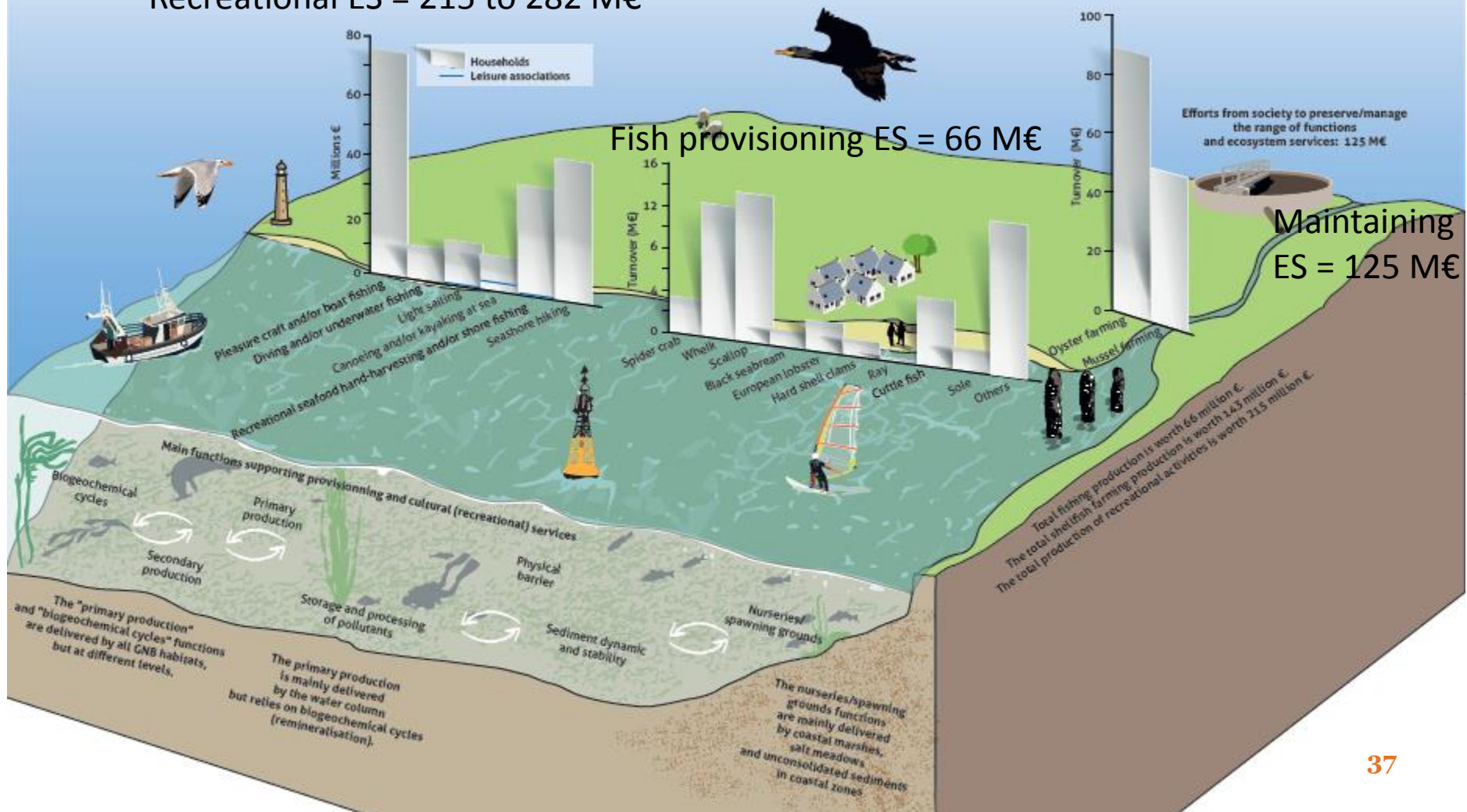
The means dedicated to the production of the recreational activity (including preparation time) were affected to ecosystem services or other services (sport) based on the real consumption time

	To benefit seascape	To benefit submarine seascape	To extract halieutic resources	To make sport	TOTAL
Onshore fishing and shellfish gathering	41 %	2 %	57 %		100 %
Hiking	66 %			34 %	100 %
Recreation boating and offshore fishing	41 %	2 %	52 %	5 %	100 %
Canoeing and kayaking	57 %	1 %	6 %	36 %	100 %
Light sailing	42 %			58 %	100 %
Scuba-diving and underwater fishing	9 %	45 %	26 %	20 %	100 %

Ecosystem accounting for the initial diagnosis of the Normand-Breton Gulf

Recreational ES = 215 to 282 M€

Shellfish provisioning ES = 143 M€



System dynamic modelling for comparing management options in the Iroise Sea PMA

Cross-methods



Philippe Le Niliot
Alice Vanhoutte-Brunier
Diane Vaschalde
Mahé Charles



Olivier Guyader
Martial Laurans
Anahita Marzin
Rémi Mongruel



Dominique Davoult

PNMI boundaries

Valmer case study site



Rationale of the PNMI case study site



Kelp management issues

What management options of kelp harvesting for combining

Sustainable exploitation of kelp forests



Laminaria digitata

Laminaria hyperborea

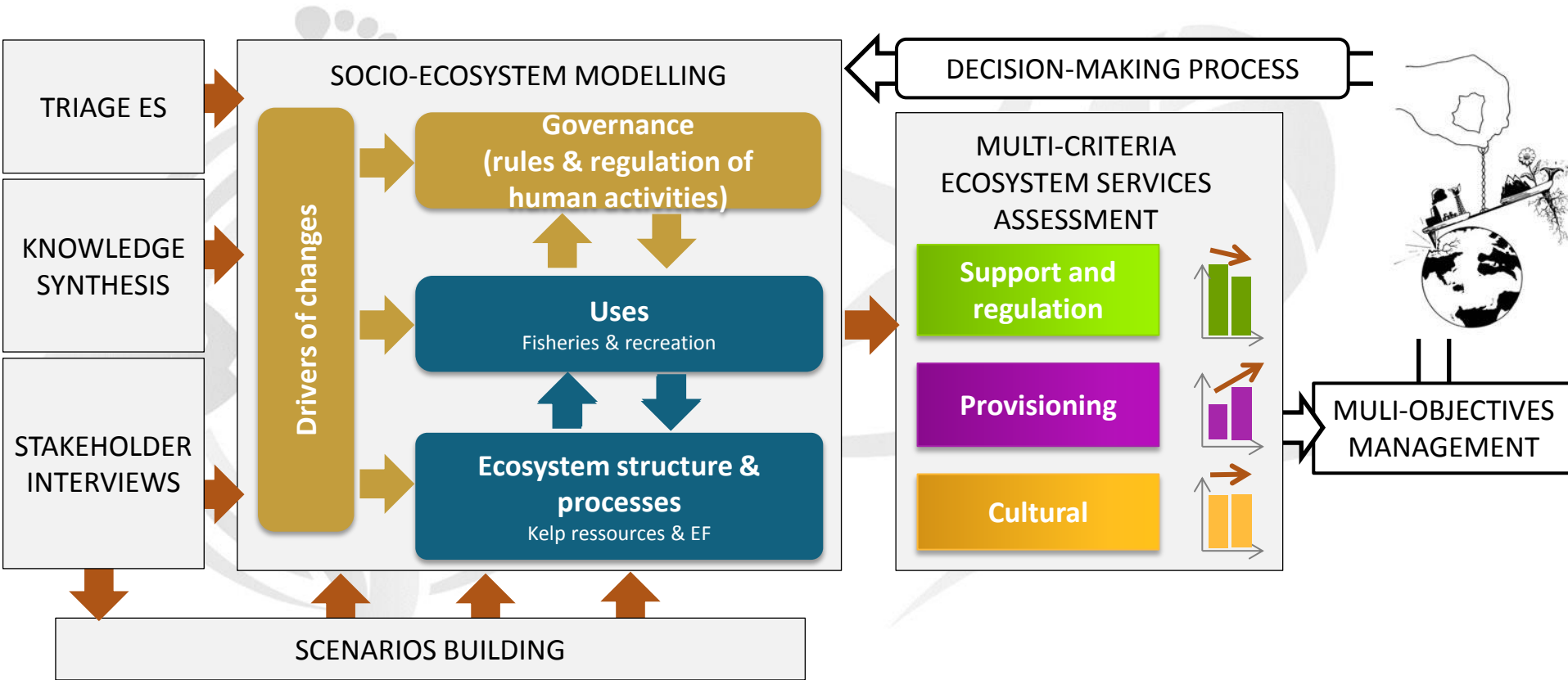


Habitats and biodiversity conservation

Preserve cultural heritage

ES assessment in the PNMI case study site

Participatory dynamic modelling



ESA in the PNMI case study site

Participatory dynamic modelling

1 Conceptual model

Ecological functions

Ecosystem services

Primary production

Kelp harvesting & Alginates



Food-web dynamics



Key habitats supporting strong biodiversity

Formation of species habitats

Key habitats for commercial species (abalone, lobster, fish)

Commercial fisheries (abalone, lobster, fish)



Nurseries & spawning ground

Key habitats for emblematic species (seabirds, bottle-nose dolphin, grey seal)

Remarkable species

Species & Genetic diversity



Ecotourism (sea life and seascape watching)



Formation of pleasant seascapes

Traditional activity (kelp harvesting)



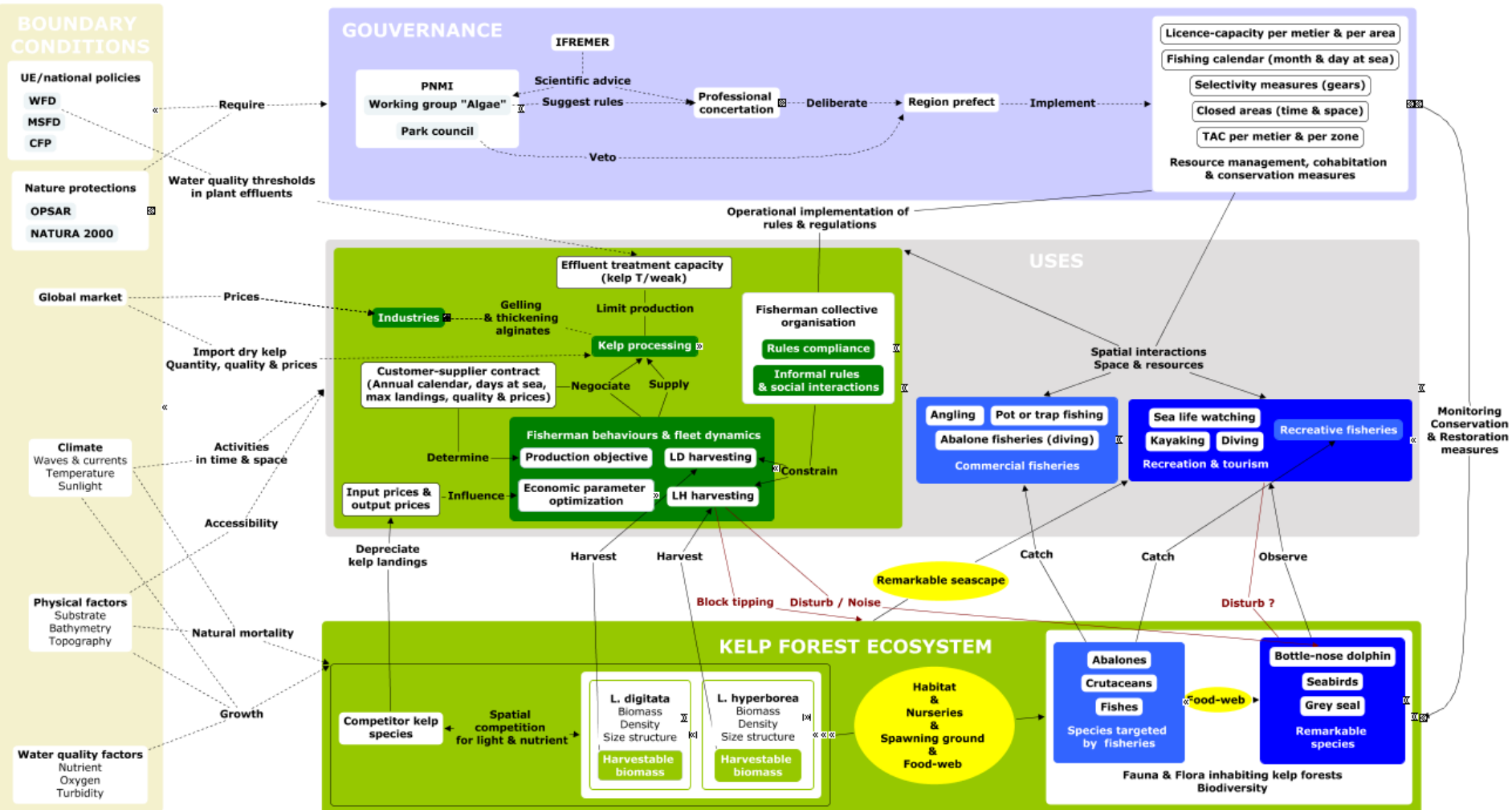
- Provisioning
- Support & Regulation
- Cultural

La Maison de l'Algue
TI AR BEZHIN - LANILDUT

ESA in the PNMI case study site

Participatory dynamic modelling

1 Conceptual model



ESA in the PNMI case study site

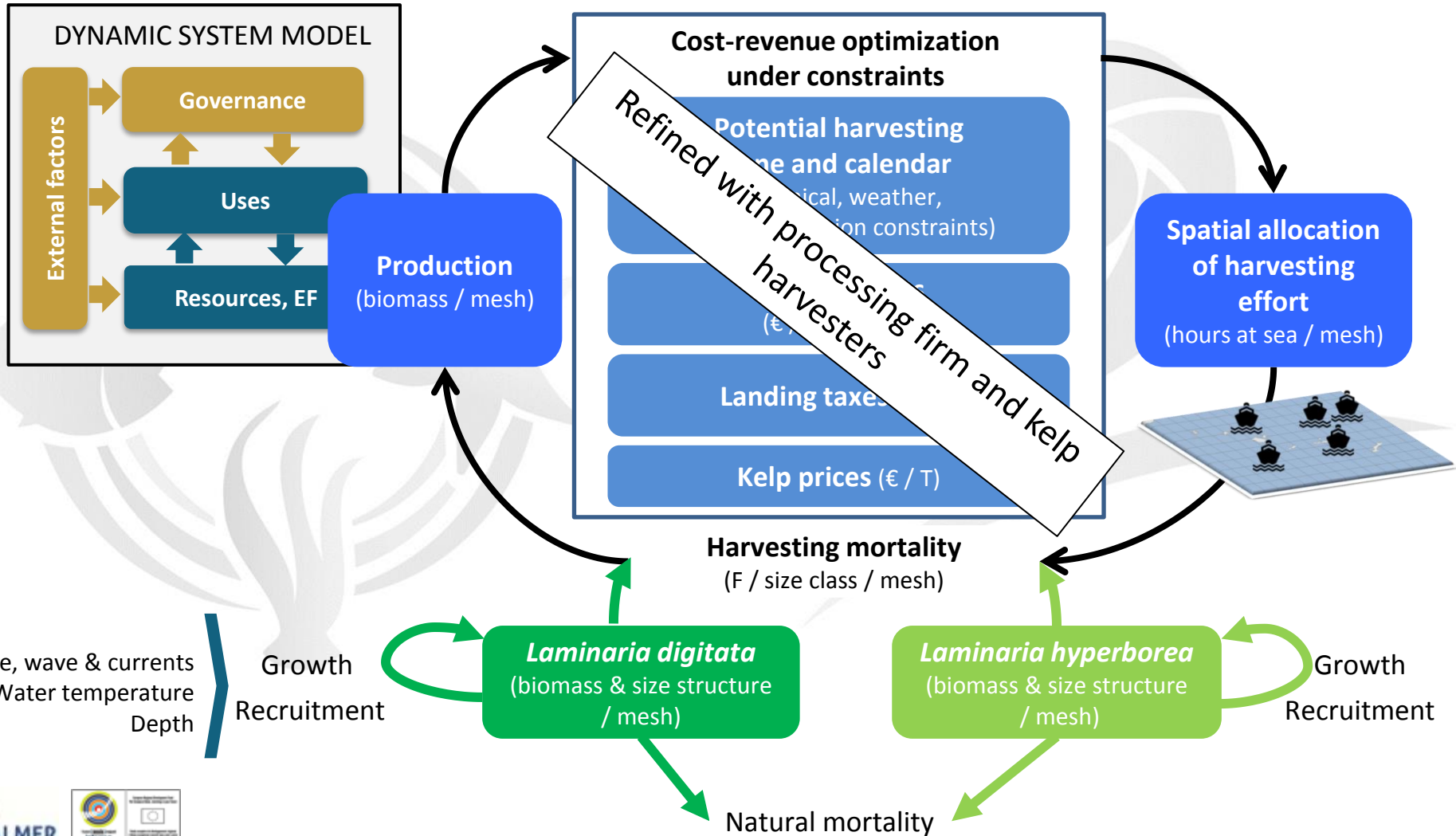
Participatory dynamic modelling

2

Dynamic system modelling

Laurans & Vanhoutte-Brunier et al., in prep.
Marzin et al., in prep.

At the heart of the system model: a bioeconomic model of kelp harvesting



Tide, wave & currents
Water temperature
Depth

Growth
Recruitment

Laminaria digitata
(biomass & size structure / mesh)

Laminaria hyperborea
(biomass & size structure / mesh)

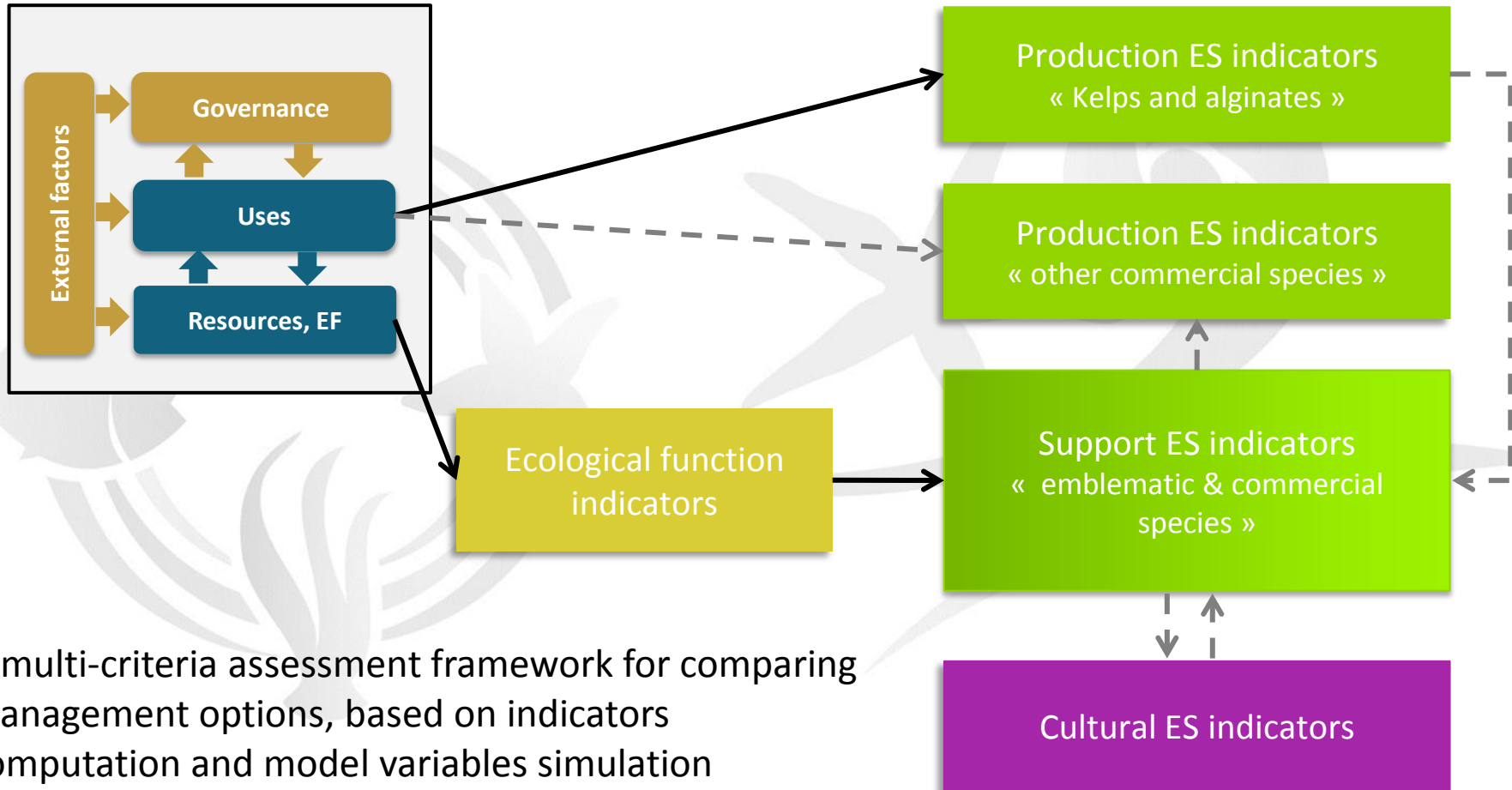
Growth
Recruitment

Natural mortality

ESA in the PNMI case study site

Participatory dynamic modelling

2 Dynamic system modelling
Laurans & Vanhoutte-Brunier et al., in prep.
Marzin et al., in prep.



A multi-criteria assessment framework for comparing management options, based on indicators computation and model variables simulation

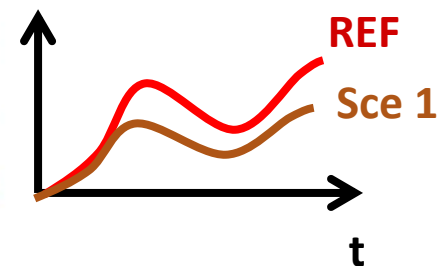
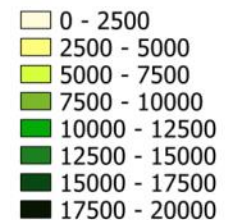
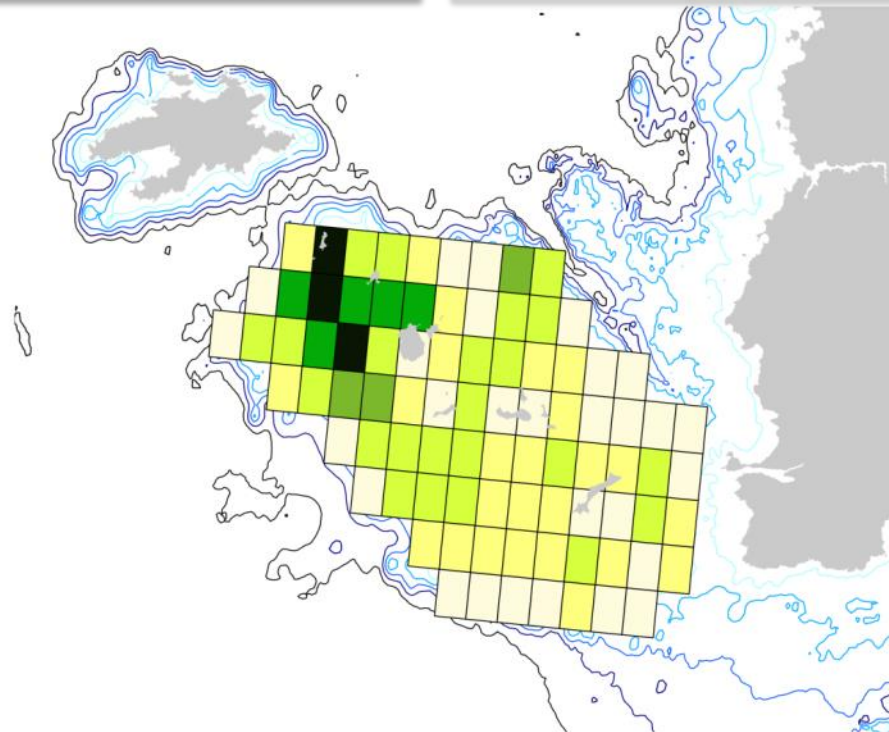
Indicators examples for state reference (2013):

Habitat state:
Biomass
L. hyperborea (tons)

Potential supply:
contribution to Grey
Seal life cycle
maintenance
(august) (%)

Actual supply:
Harvesting rate of
L. hyperborea (%)

Actual demand:
Eco-tourism
frequentation
(nb, n=5)



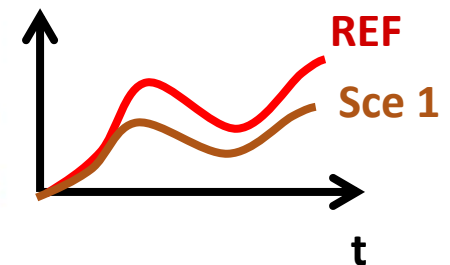
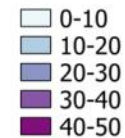
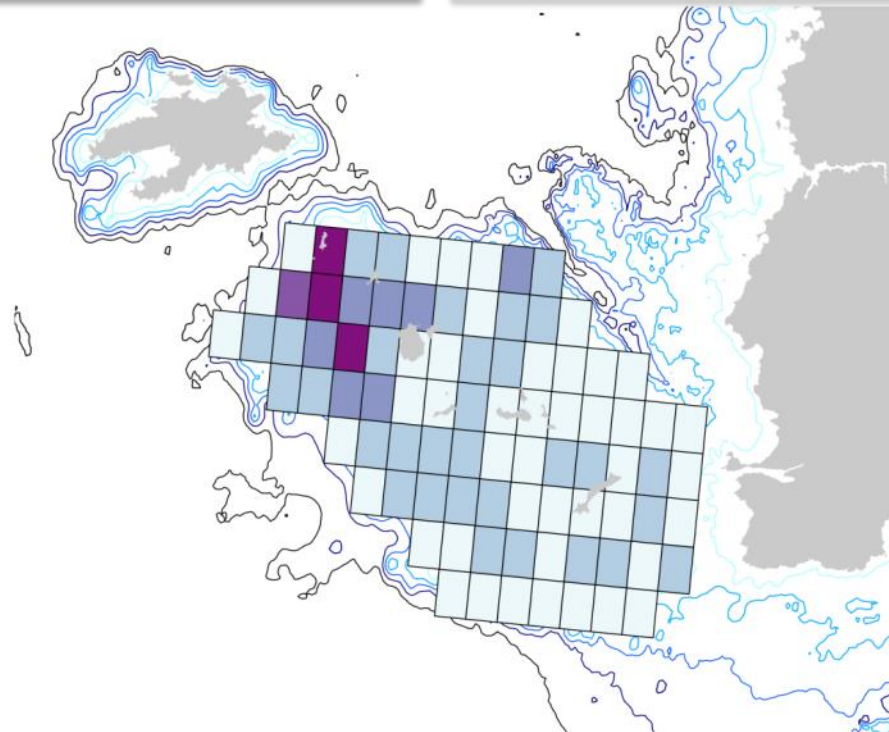
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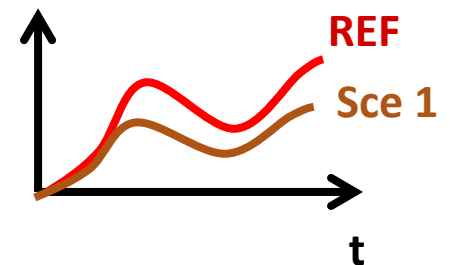
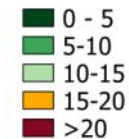
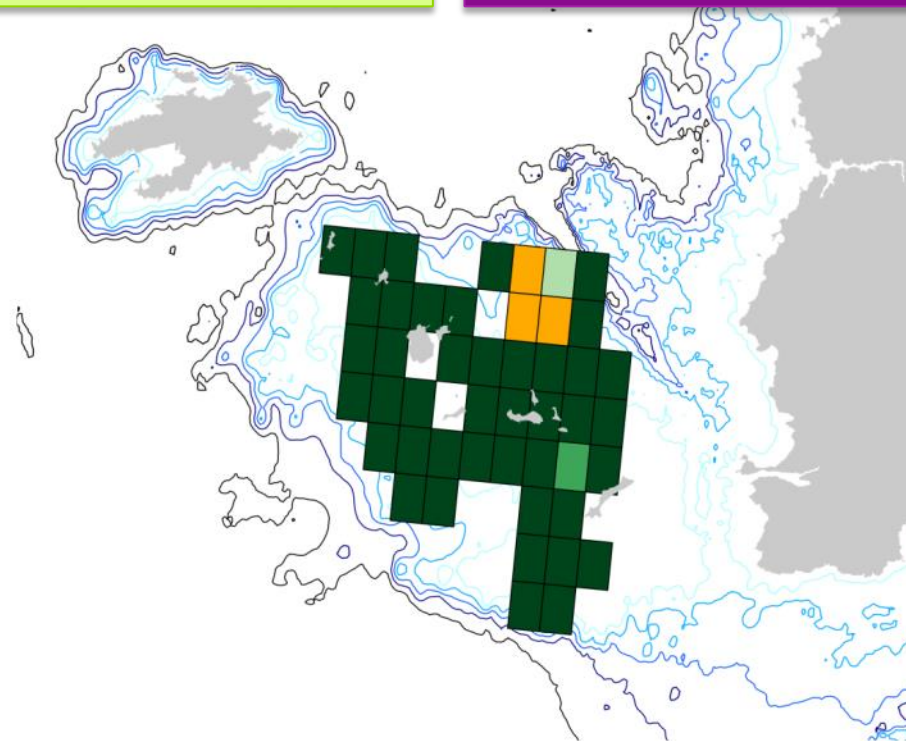
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(08/2013) (%)

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Actual demand:
Eco-tourism
frequentation
(nb, n=5)



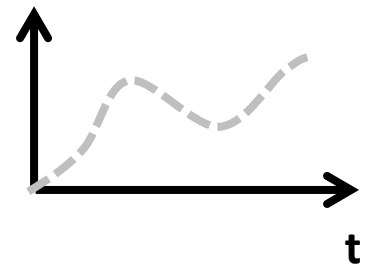
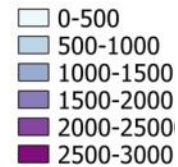
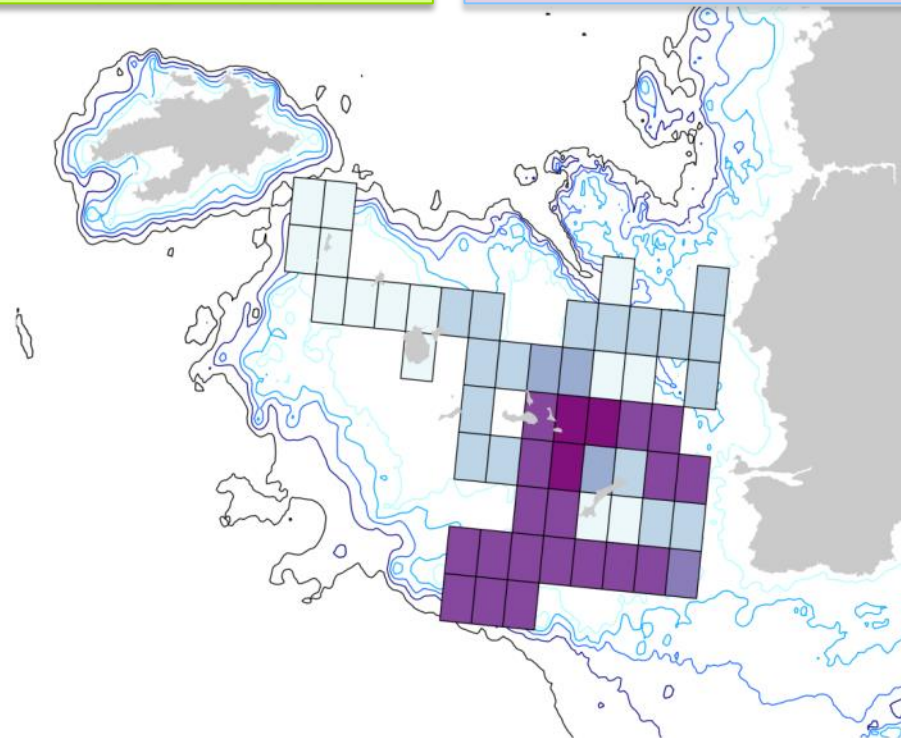
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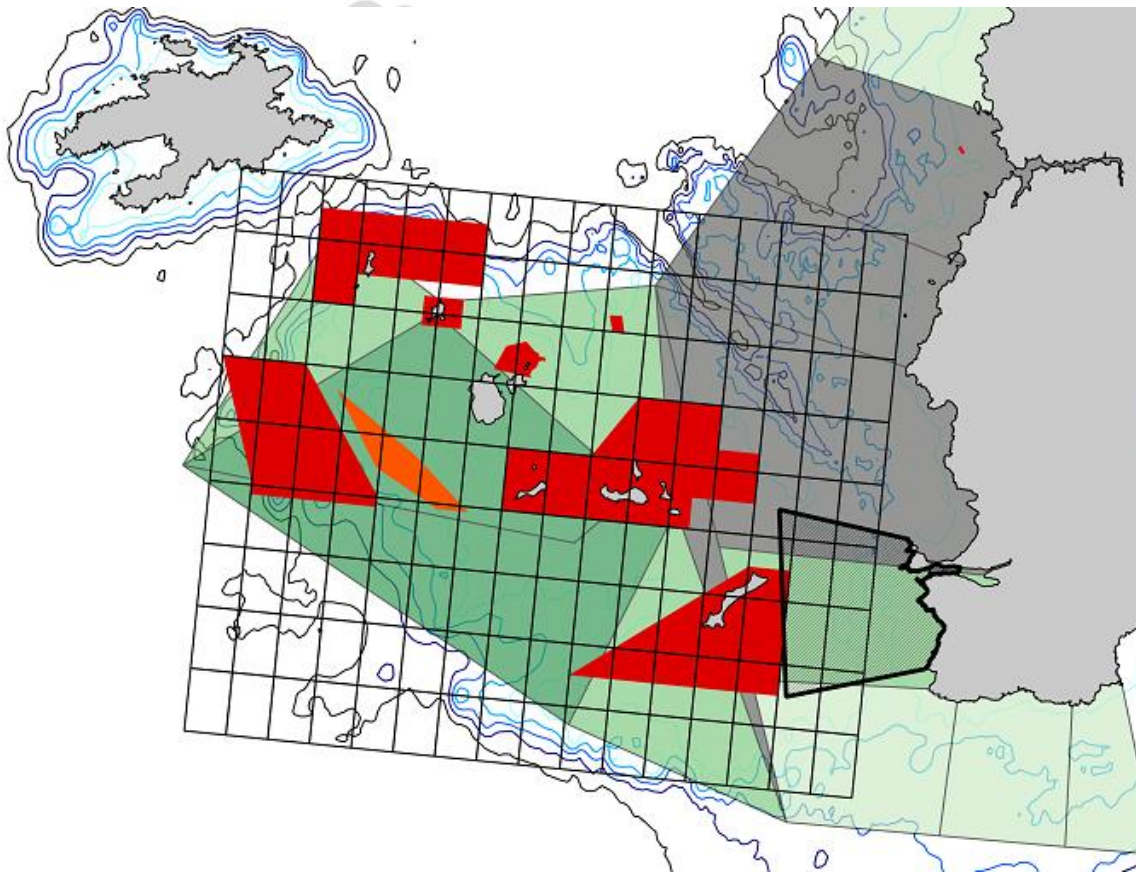
Actual demand:
Eco-tourism
frequentation
(nb, n=5)



Next: new insights from scenarios

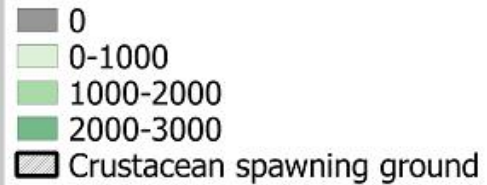
→ recent/near future rules evolution

→ *L. hyperborea* demand



New access rules in 2015
(rotation sectors, fallow time,
quotas)

Quotas in 2014 (tons):



Fine grid: 1' x 1'

Conclusions

With regard to undertaking a MESA the available resources, environmental setting, managerial needs and overarching context will always be highly variable, and it is essential that any assessment reflects this requirement.

VALMER WP1 GUIDELINES DOCUMENT: “A Framework for the Operational Assessment of Marine Ecosystem Services”

VALMER WP1 Report: “Ecosystem Service Assessment in Practice: Lessons Learned”

*See all application examples in Valmer
WP1 Guidelines document, section 5*



PANACHE

Protected Area Network Across
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