



PANACHE

Protected Area Network Across
the Channel Ecosystem

THE ENGLISH CHANNEL
one
ecosystem two
projects

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

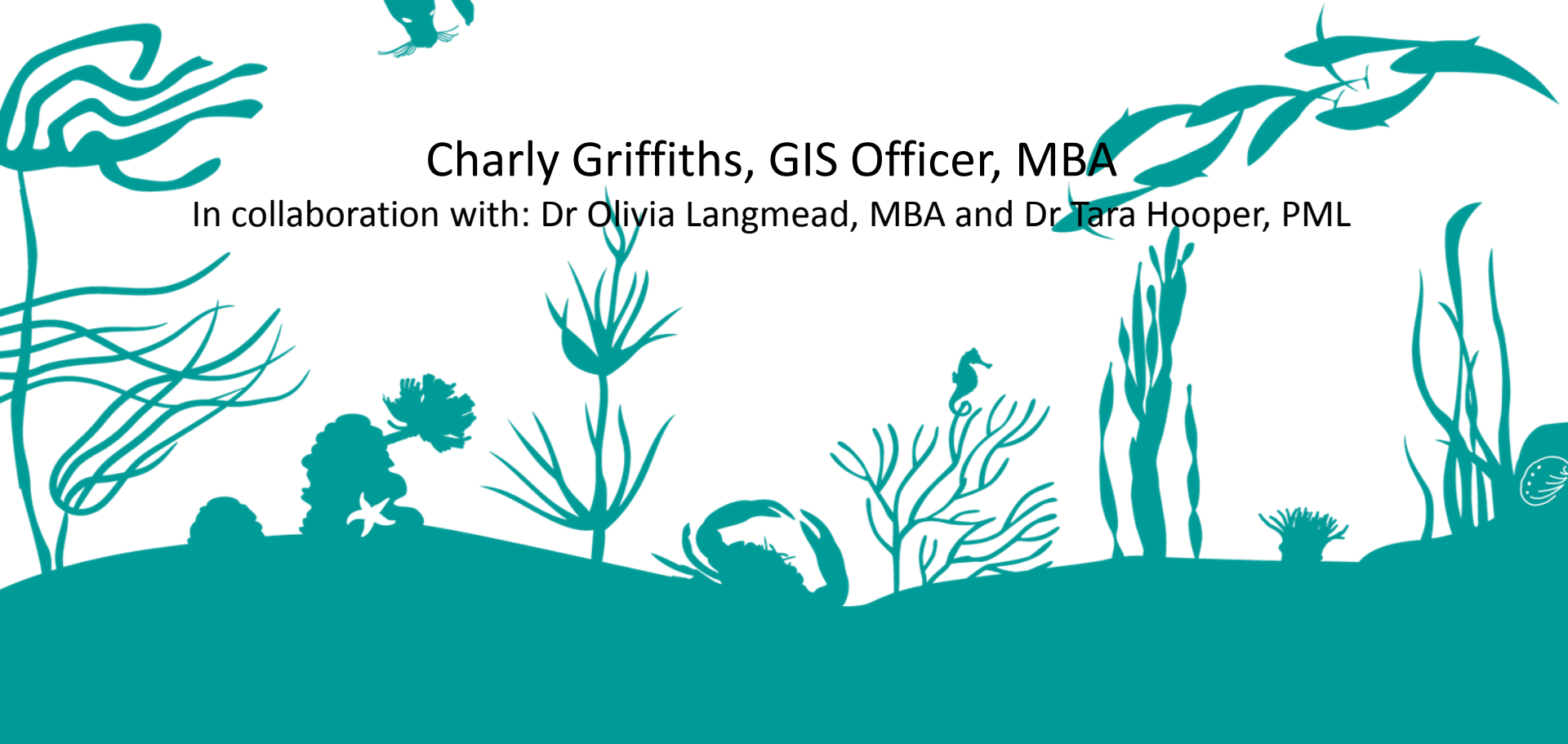
Applying GIS to stakeholder processes and Ecosystem Service Assessment

Methods from the UNESCO North Devon
Biodiversity Reserve

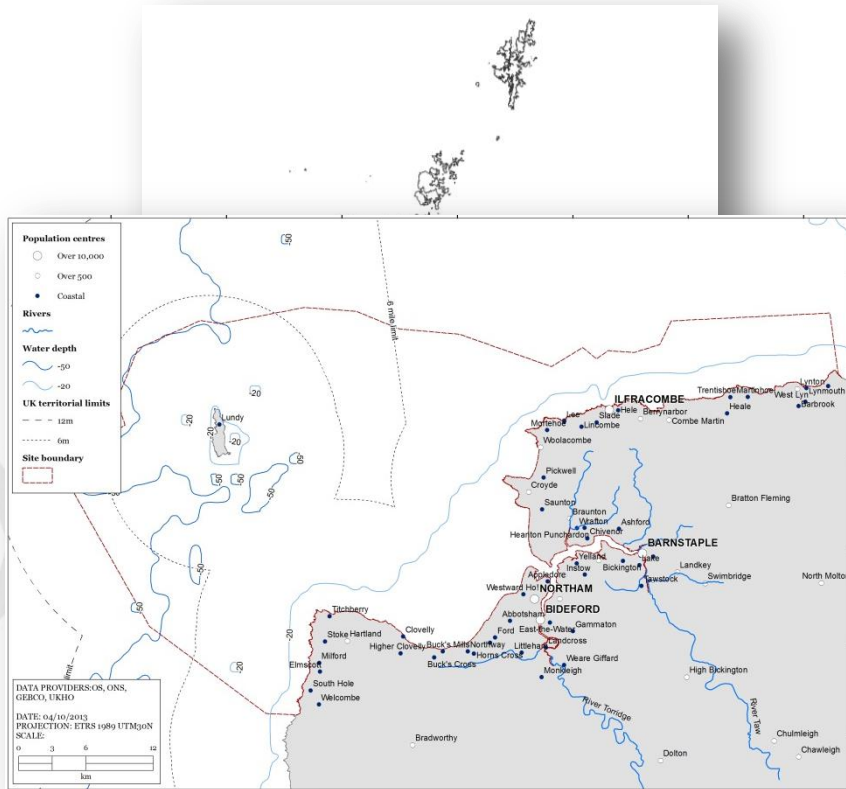


Charly Griffiths, GIS Officer, MBA

In collaboration with: Dr Olivia Langmead, MBA and Dr Tara Hooper, PML



What we're talking about



How do ecosystem services change in North Devon under different conditions?

- Ecosystem service assessment
- Scenario development
- Modelling ecosystem service change

Why use GIS?

- Spatial area
- Spatial interactions
- Spatial model to assess scenario changes

ECOSYSTEM SERVICE ASSESSMENT

Subtidal sediment habitats

Venerid bivalves in circalittoral coarse sand or gravel

SS.SCS.CCS.MedLumVen

Image: ©MarLIN



Nephtys cirrosa and Bathyporeia spp. in infralittoral sand

SS.IGS.FaS.NcirBat

Image: ©Francis Bunker

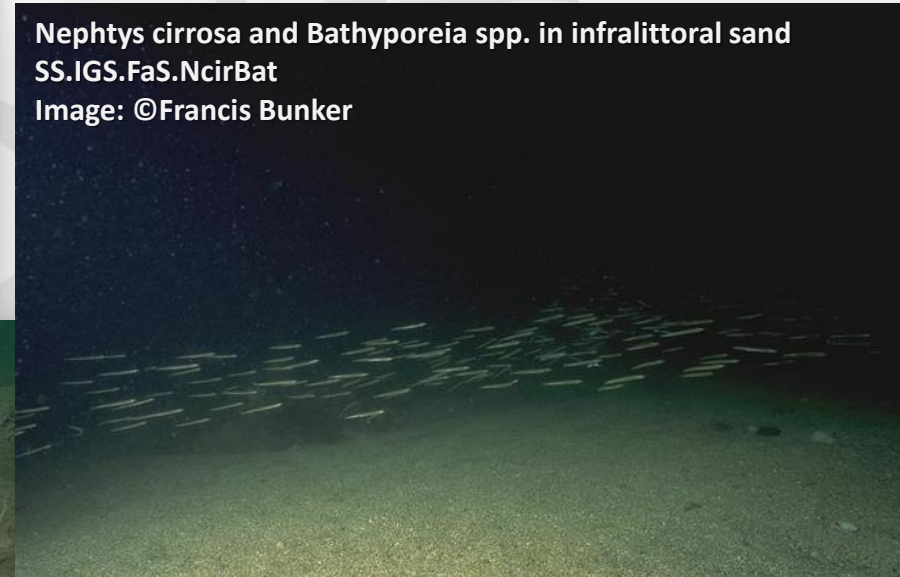
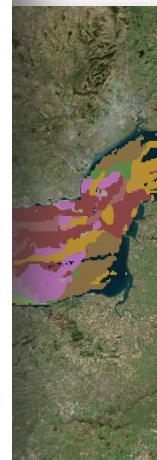
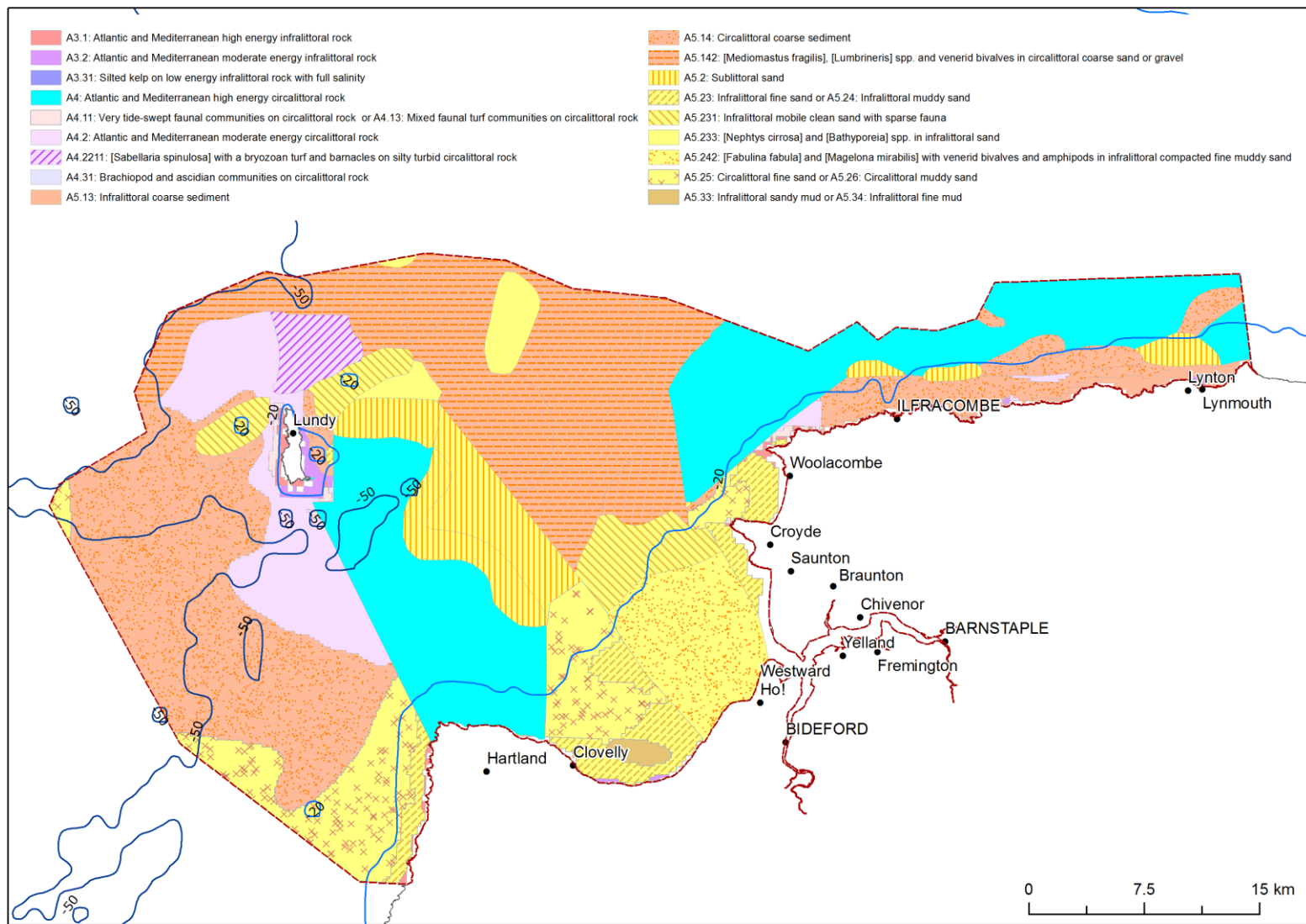


Image: ©Keith Hiscock



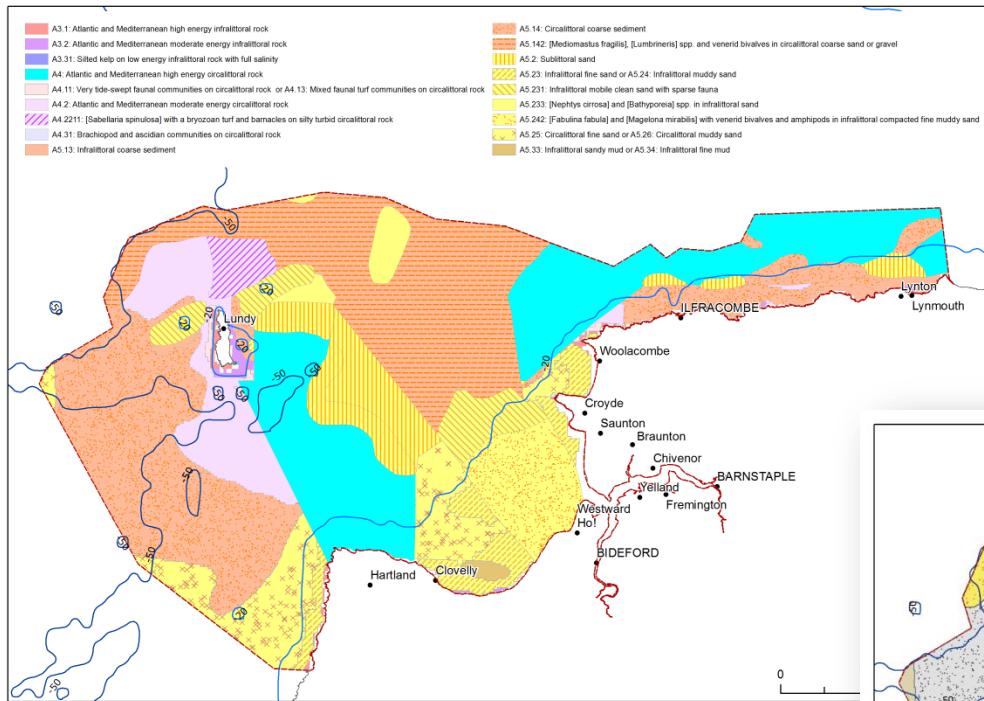
ECOSYSTEM SERVICE ASSESSMENT

Creation of benthic habitat map

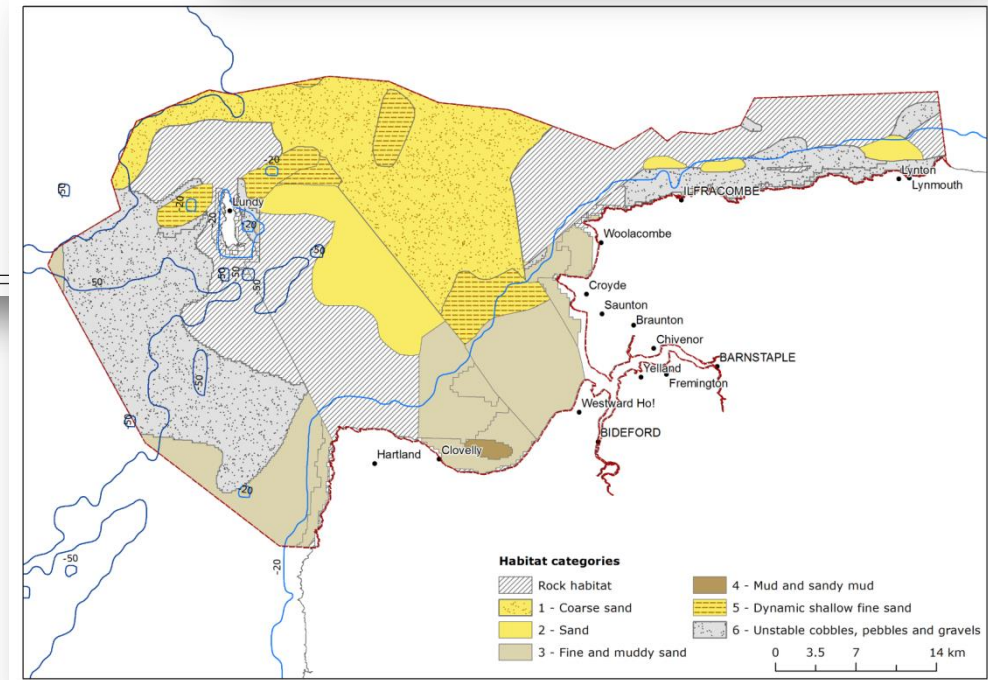


ECOSYSTEM SERVICE ASSESSMENT

Assign broad habitat types



27	SS.SBR.SMus.MytSS	SS	SBR	SMus	MytSS		04
28	IMX.EstMx.CreAph	IMX	EstMx	CreAph		Shingle, coarse sand, mixed sediments	97
28	IMX.FaMx.An	IMX	FaMx	An		Shingle, coarse sand, mixed sediments	97
28	IMX.FaMx.VsenMtru	IMX	FaMx	VsenMtru		Shingle, coarse sand, mixed sediments	97
28	IMX.KSwMx.LsacX	IMX	KSwMx	LsacX		Kelp	97
28	LMX	LMX				Shingle, coarse sand, mixed sediments	97
28	LMX.novo.HedMacMx	LMX	novo	HedMacMx		Shingle, coarse sand, mixed sediments	(97)
28	LMX.novo.HedOIMx	LMX	novo	HedOIMx		Shingle, coarse sand, mixed sediments	(97)
28	LMX.novo.HedScrMx	LMX	novo	HedScrMx		Shingle, coarse sand, mixed sediments	(97)
28	LMX.Psyllid	LMX	Psyllid			Shingle, coarse sand, mixed sediments	(97)
28	LMX.Psyllid.VS	LMX	Psyllid	VS		Shingle, coarse sand, mixed sediments	(97)
28	SS.SMx	SS	SMx				04



Hall, K., Paramor, O.A.L., Robinson L.A., Winrow-Giffin, A., Frid C.L.J., Eno, N.C., Dernie, K.M., Sharp, R.A.M., Wyn, G.C. & Ramsay, K. (2008). Mapping the sensitivity of benthic habitats to fishing in Welsh waters-development of a protocol. CCW [Policy Research] Report No: [8/12], 85pp.

ECOSYSTEM SERVICE ASSESSMENT

Level of ecosystem service provision

CARBON SEQUESTRATION



WASTE REMEDIATION

Schleswig-Holstein (2010)
Corophium volutator



FISH NURSERY

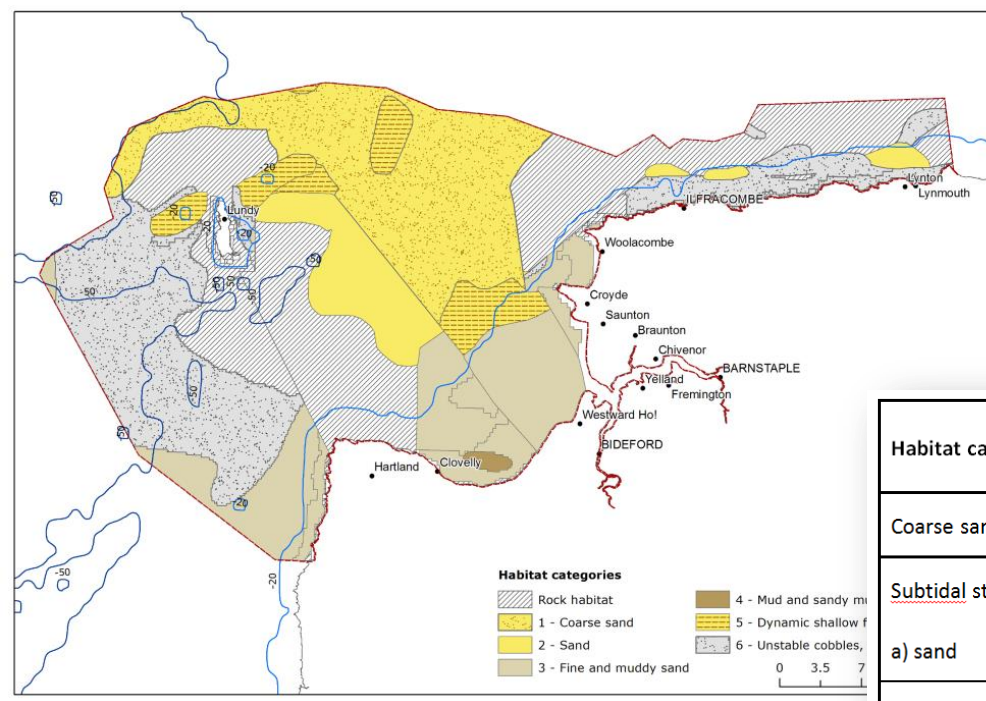


Portrait of Cod ©August Linnman



ECOSYSTEM SERVICE ASSESSMENT

Link service provision to broad habitat

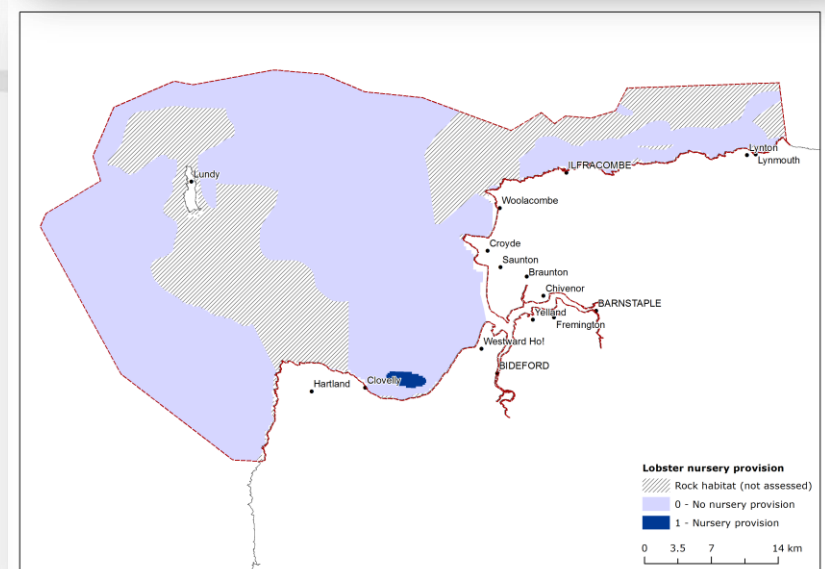
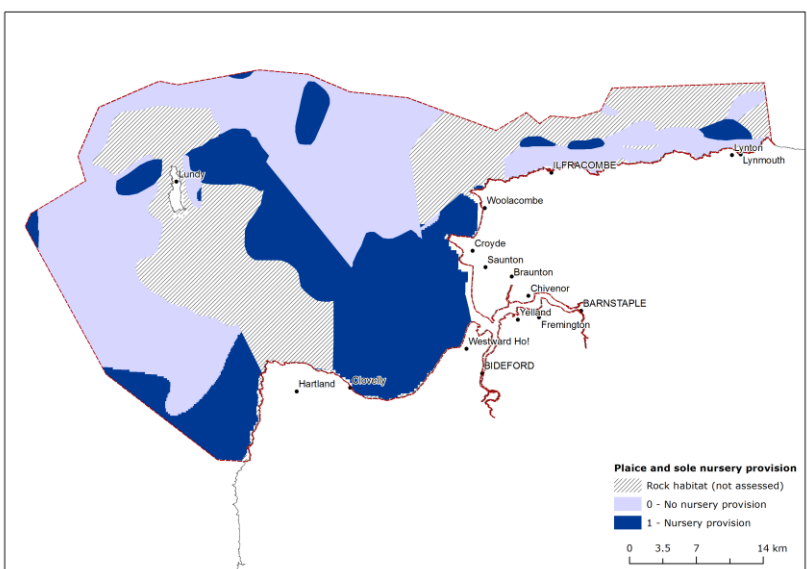
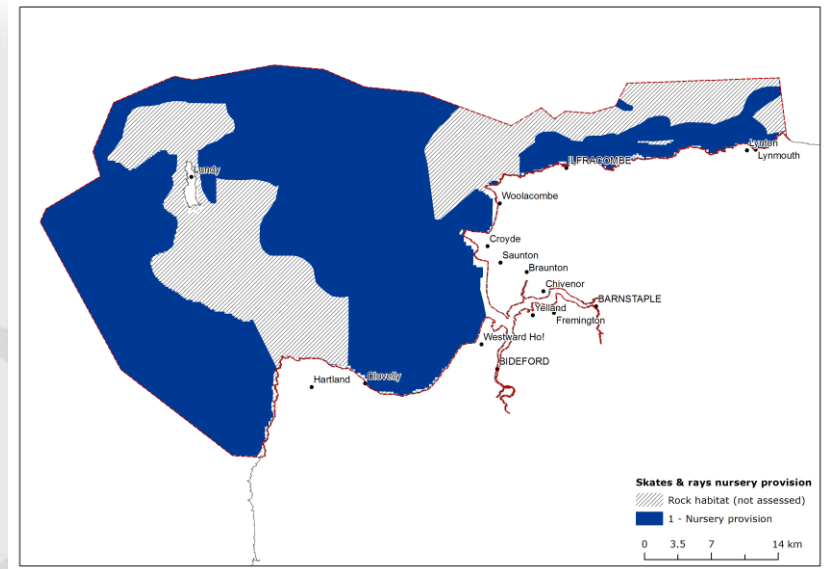
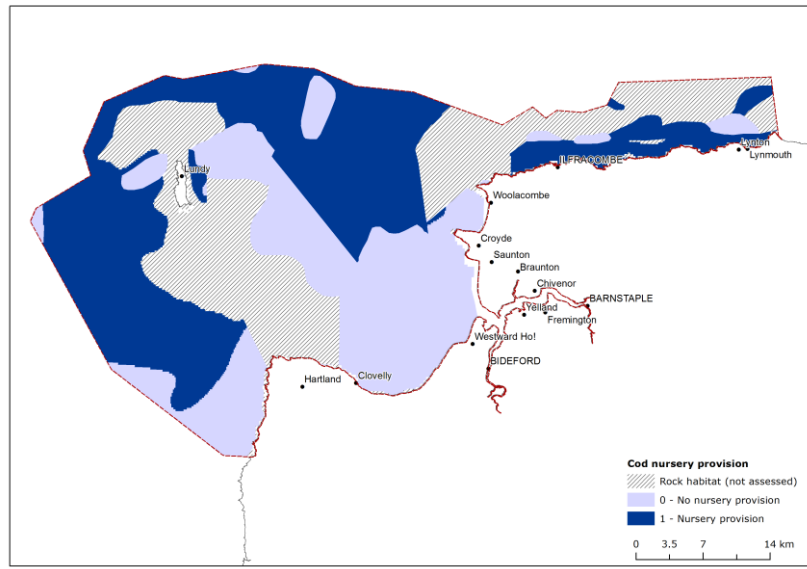


Habitat category	Nursery habitat				Waste processing	Carbon storage
	Bass, Sole, Plaice	Lobster	Cod	Skates & Rays		
Coarse sands/gravels	Low	Low	Significant	Significant	Moderate	Negligible
<u>Subtidal stable muddy sands, sandy muds and muds:</u>						
a) sand	Significant	Low	Low	Significant	Low	Negligible
b) fine & muddy sand	Significant	Low	Low	Significant	Low	Low
c) mud & sandy mud	Significant	Low	Low	Significant	Low	Low
Dynamic, shallow water fine sands	Significant	Low	Low	Significant	Low	Negligible
Unstable cobbles, pebbles, gravels	Low	Low	Significant	Significant	Low	Negligible
Confidence	High	Low	Low	Medium	Low	Low

Potential to supply ecosystem service: ■ Significant ■ Moderate ■ Low ■ Negligible

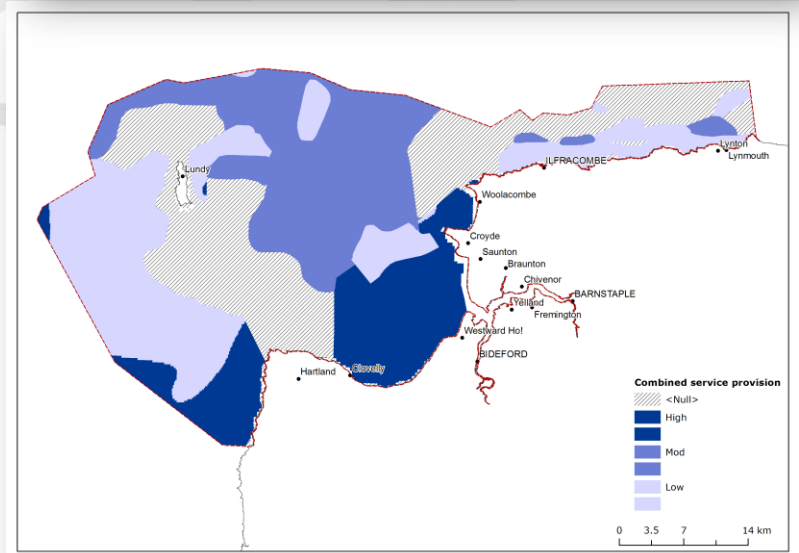
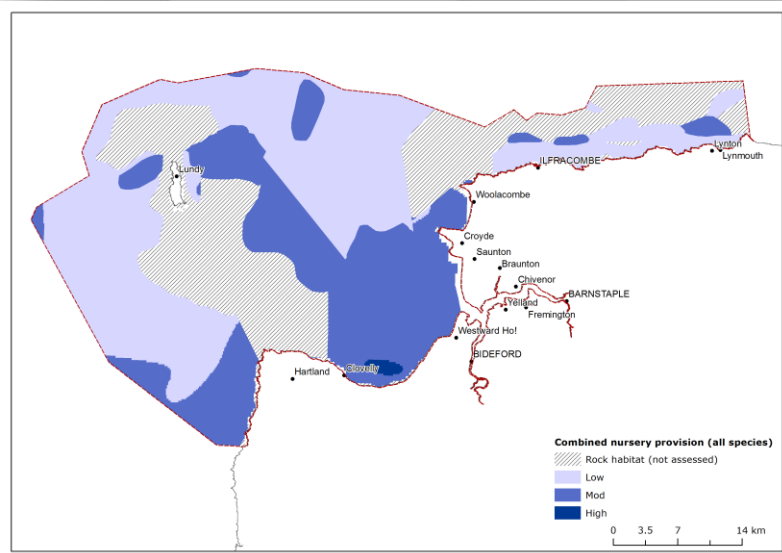
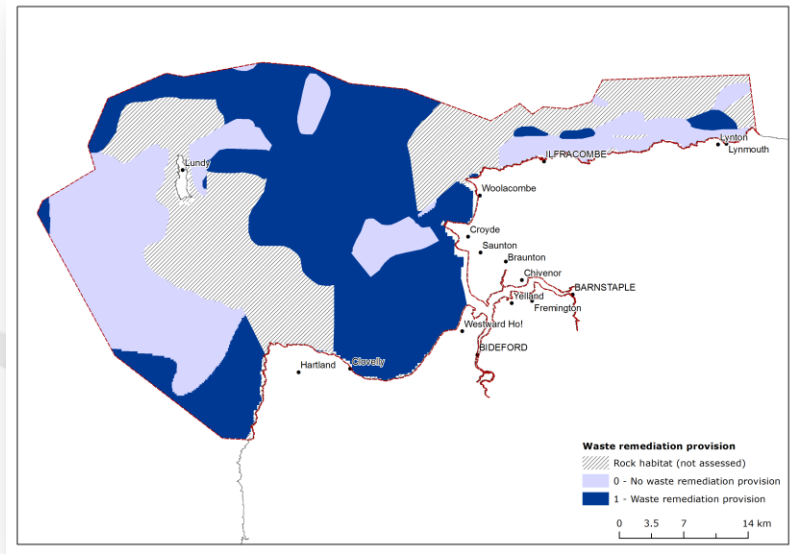
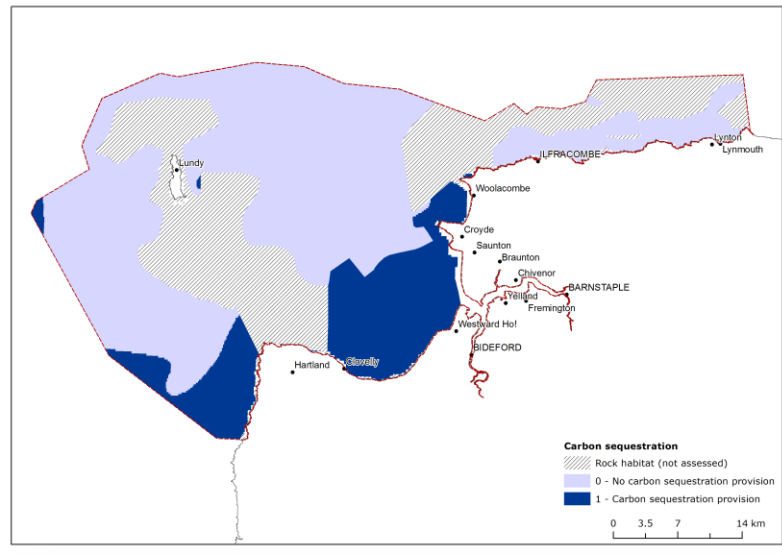
ECOSYSTEM SERVICE ASSESSMENT

Maps of level of ecosystem delivery



ECOSYSTEM SERVICE ASSESSMENT

Maps of level of ecosystem delivery



QUICK SUMMARY

- We decided which ecosystem we wanted to assess
- Looked at which habitats are present in our study area
- Decided which services we would assess
- Understood how our habitat information would have to be presented in order to link it to level of service provision
- Presented the level of ecosystem service provision within the UNESCO North Devon biosphere reserve

Any questions so far??



SCENARIO DEVELOPMENT

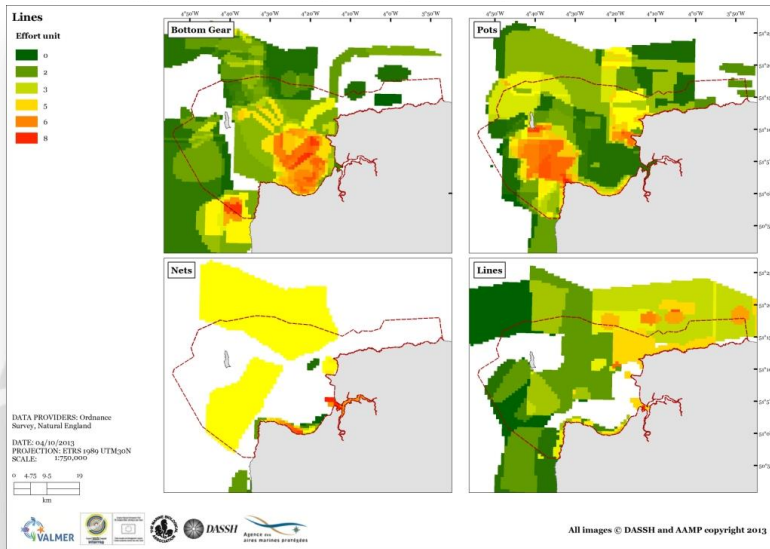
Working with our stakeholders

- *Mapping DIPSR analysis – maps of Drivers, Responses and State*
- *Present to stakeholders*
- *Incorporate additional information*
- *Suggestion and prioritisation of locally important scenarios*
- *Decision on final 3 scenarios*

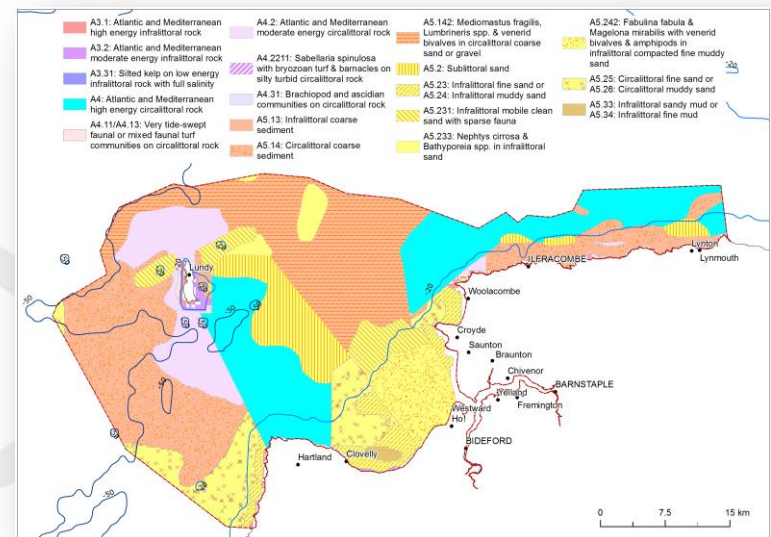
SCENARIO DEVELOPMENT

Scoping and stakeholder involvement

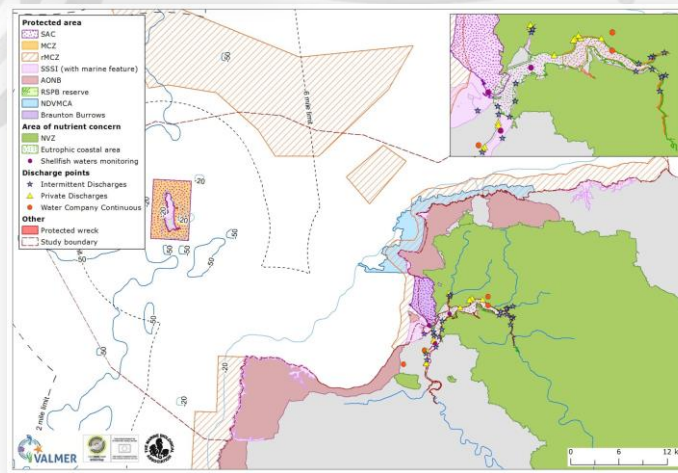
DRIVERS



STATE (Habitats)



RESPONSES



SCENARIO DEVELOPMENT

First Workshop to identify and prioritise scenarios

Initial scenarios (Stakeholder Workshop 2)	Elaborated by project team	Prioritised at Stakeholder Workshop 3	Final scenarios	Comments
Tidal development	Tidal development			Scored low importance by stakeholders
rMCZ designation	rMCZ designation	rMCZ designation	rMCZ designation	Tranche 2 rMCZs does not include Morte platform, thus two subscenarios including and not including Morte Platform were devised
Coastal change				Drivers and pressures on seabed habitats unclear
Increased nutrients	Increased nutrients	Decreased nutrients		Very restricted area (only within estuary) affected by pressure, ecological impacts uncertain
Aggregate extraction	Aggregate extraction	Aggregate extraction	Aggregate extraction	Extraction site underwent changes due to seabed depth constraints
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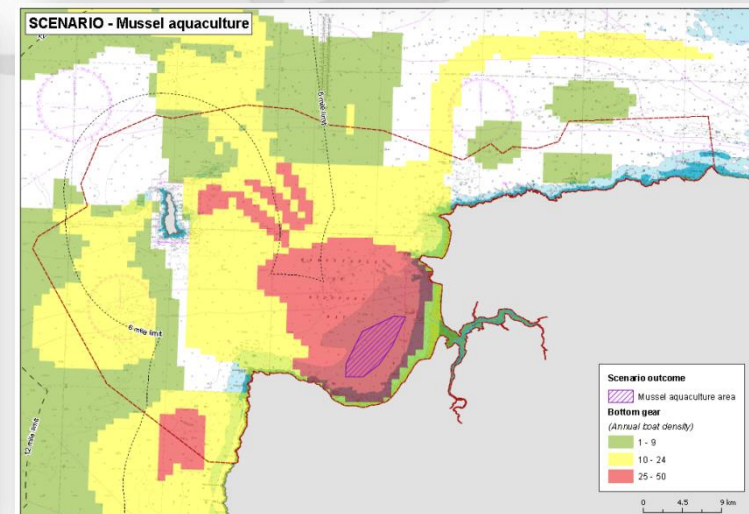
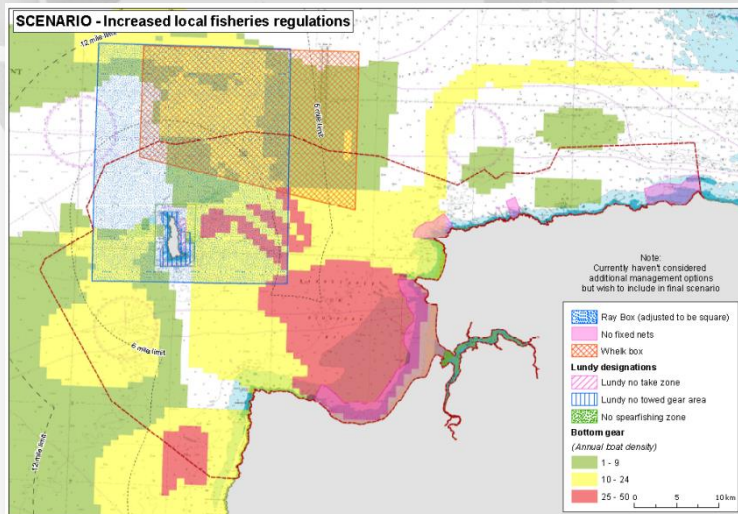
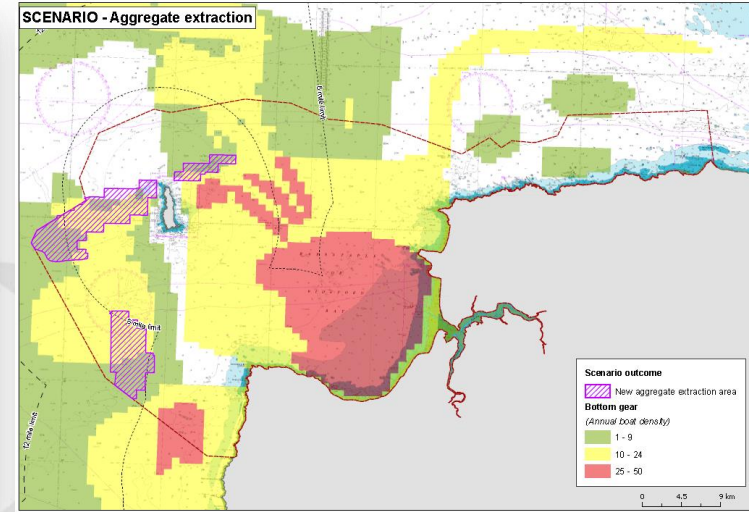
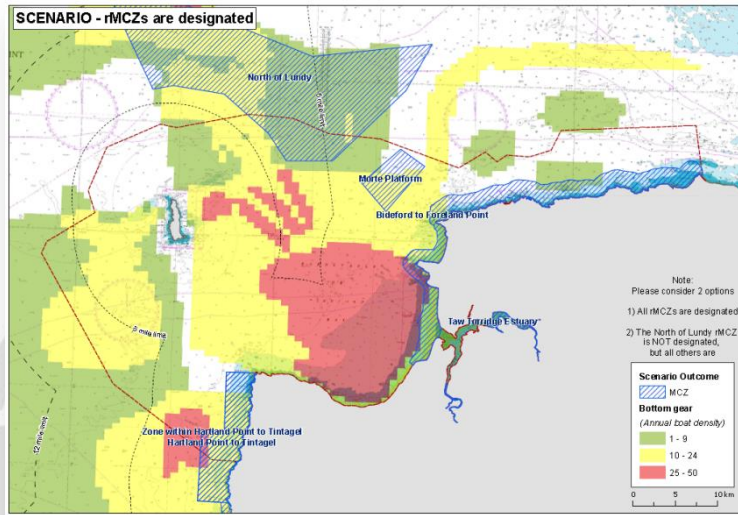


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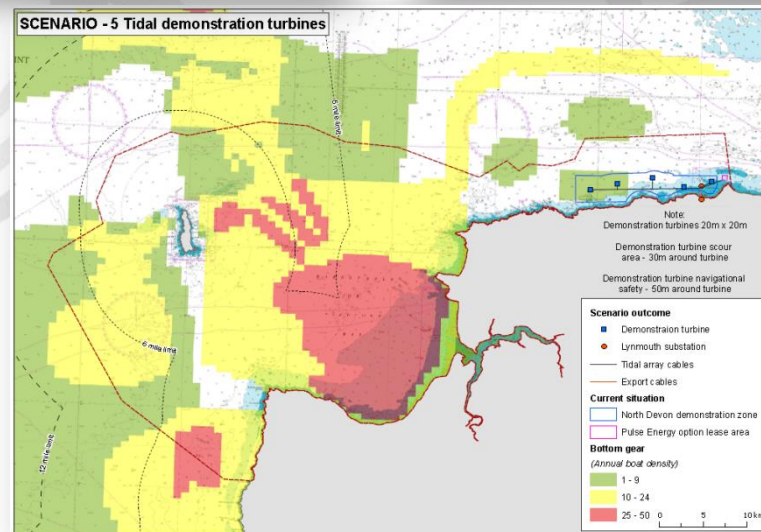
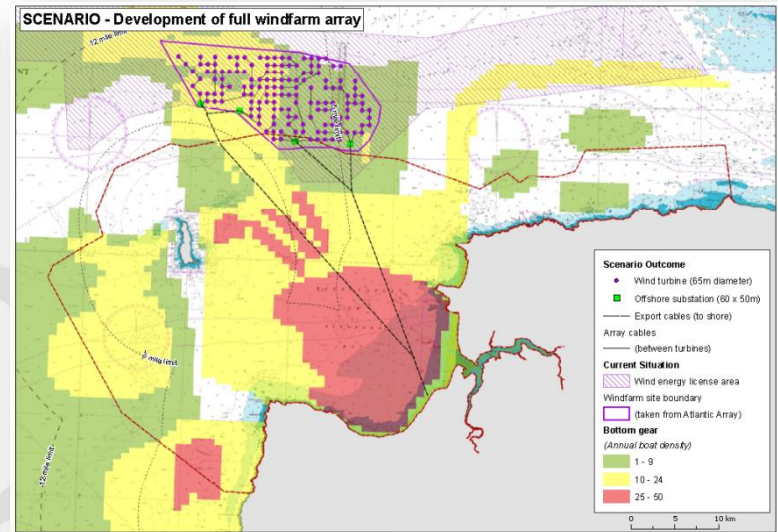
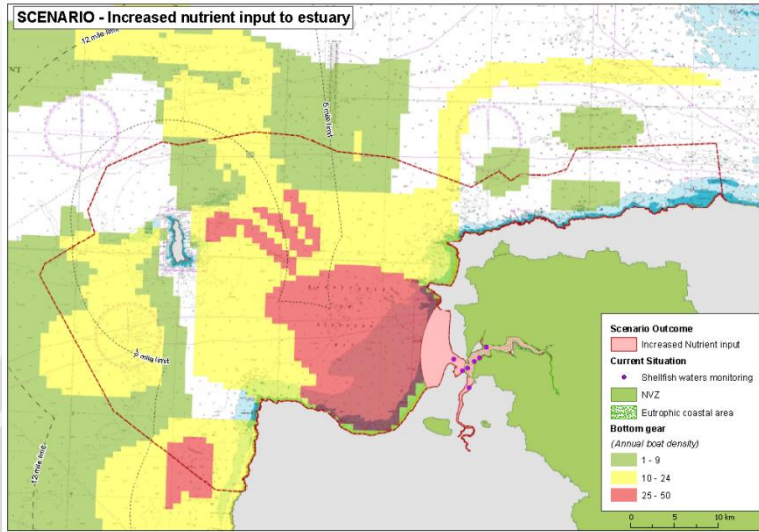
SCENARIO DEVELOPMENT


What the scenarios look like



SCENARIO DEVELOPMENT

What the scenarios look like





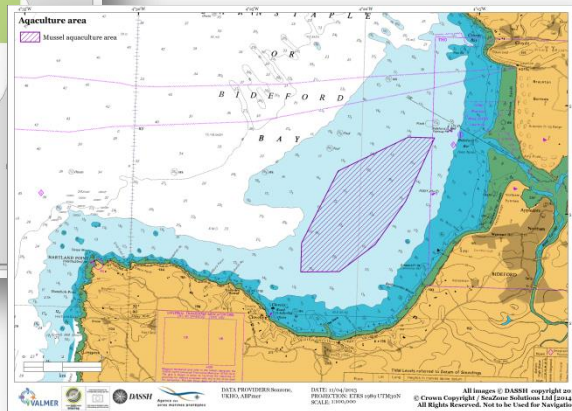
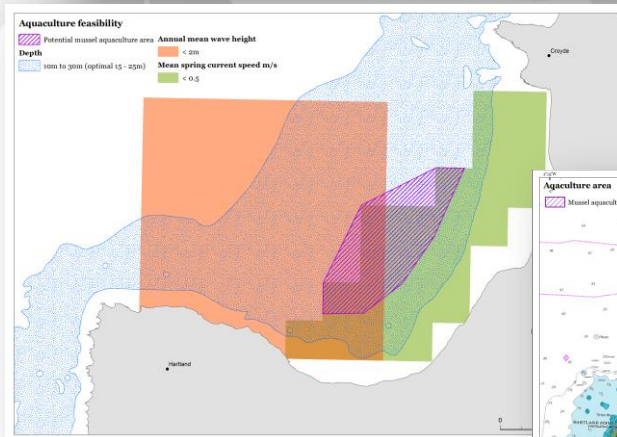
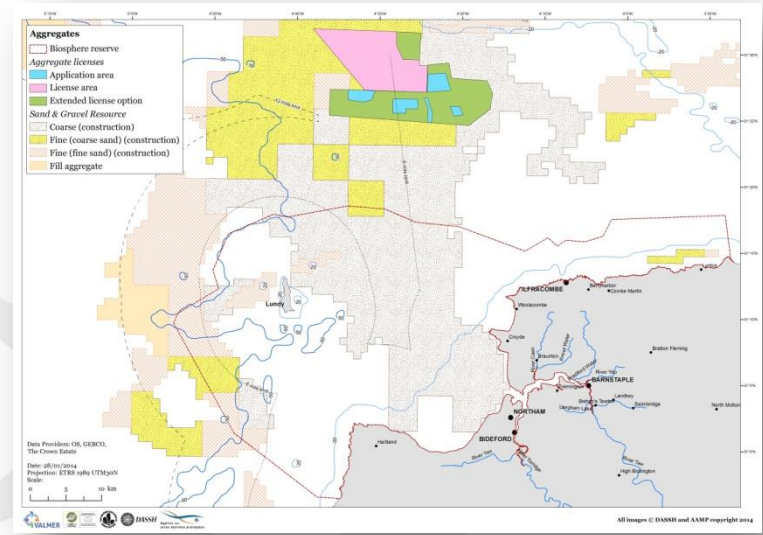
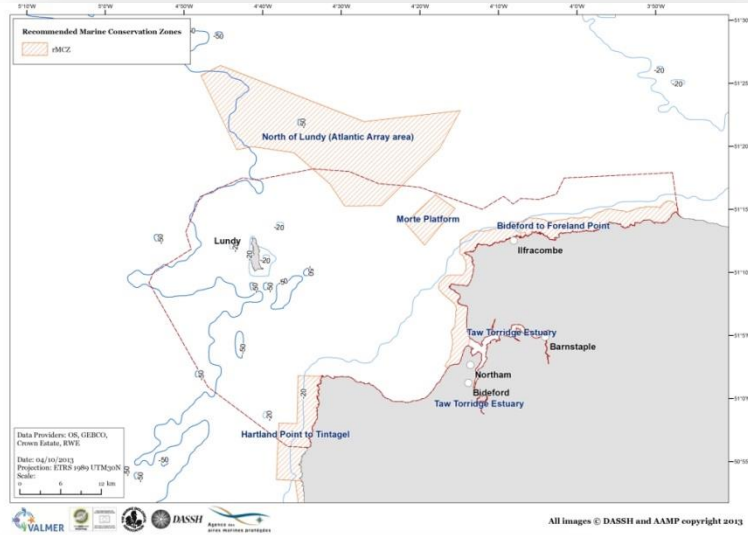
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SCENARIO DEVELOPMENT

Our final three scenarios



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QUICK RECAP

- We have established:
 - What scenarios we are going use to assess how levels of service provision may change
 - Which can then inform how the biosphere reserve might be managed (in theory).
 - What habitat we're looking at
 - What key services provided by this habitat we are going to assess
 - What levels of service provision they could potentially provide

Still awake?

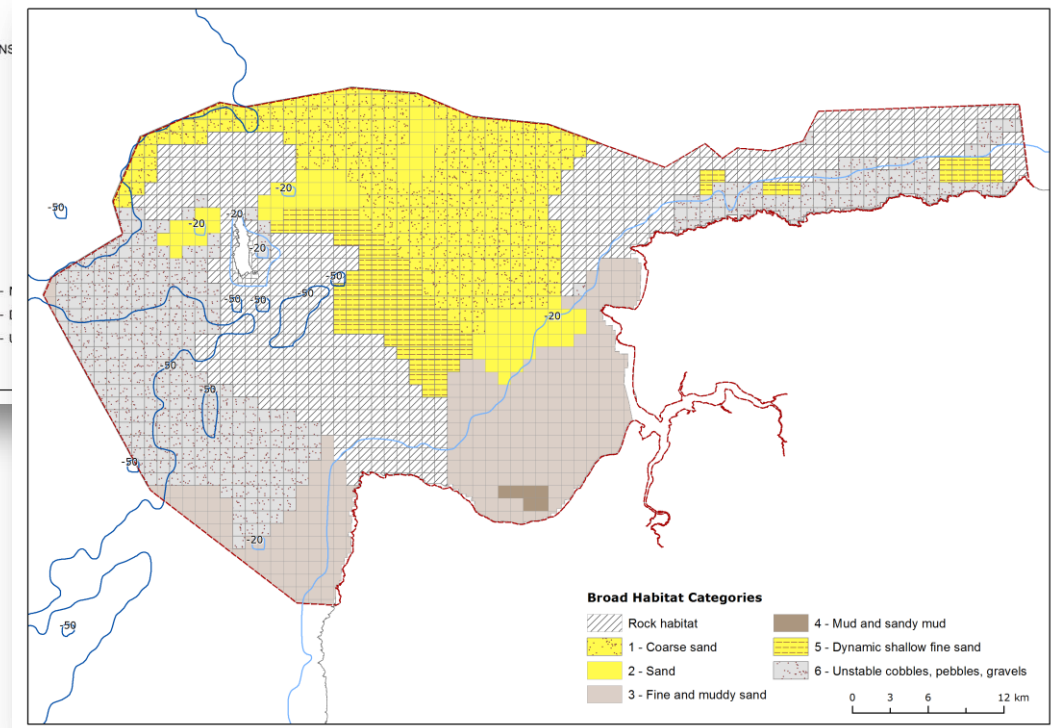
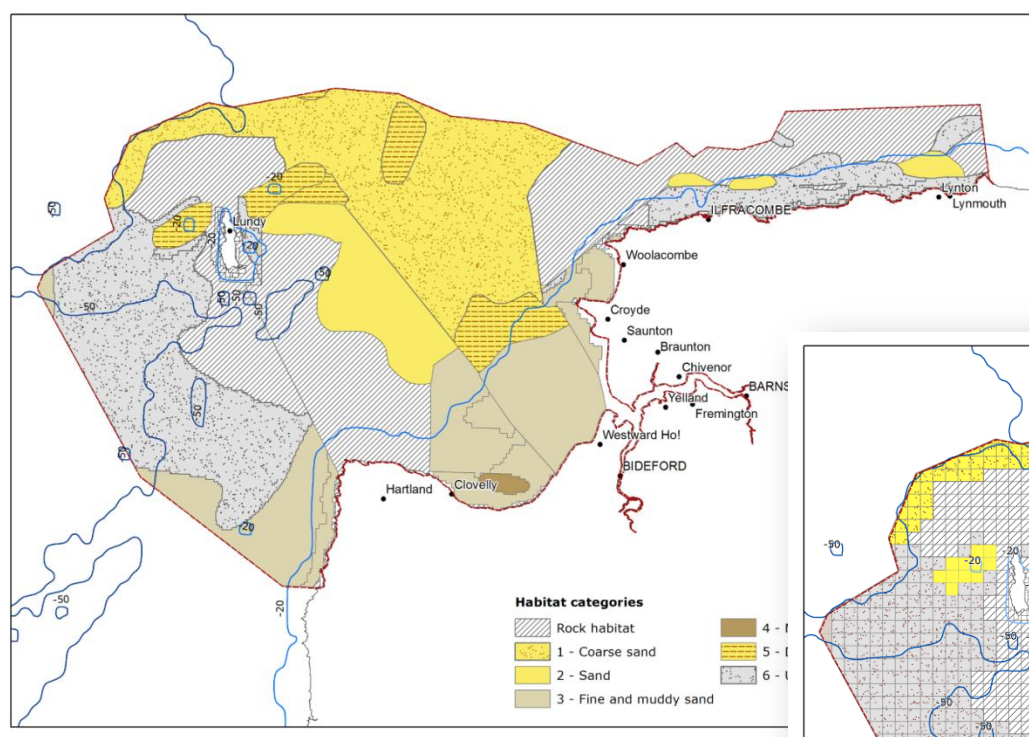
Any questions??



Image: ©Mila Zinkova

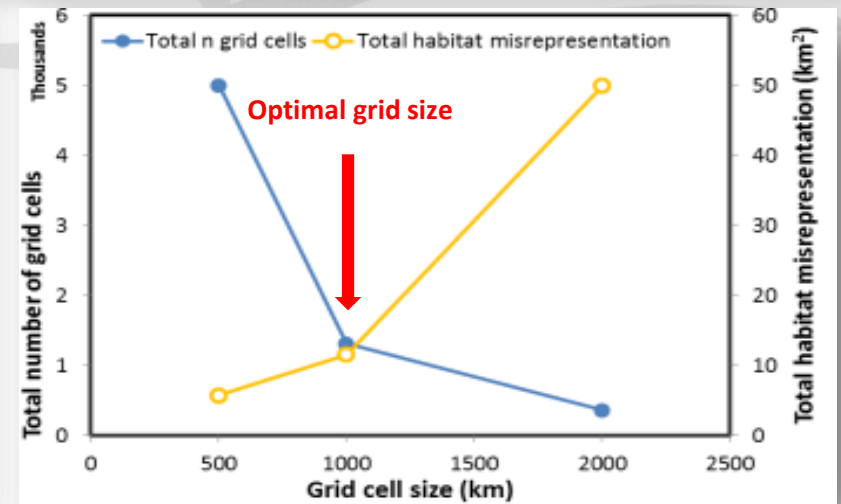
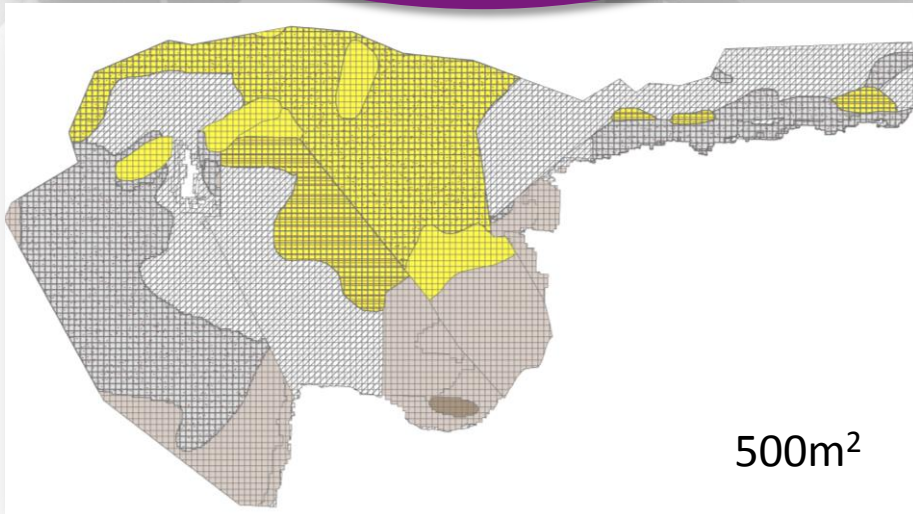
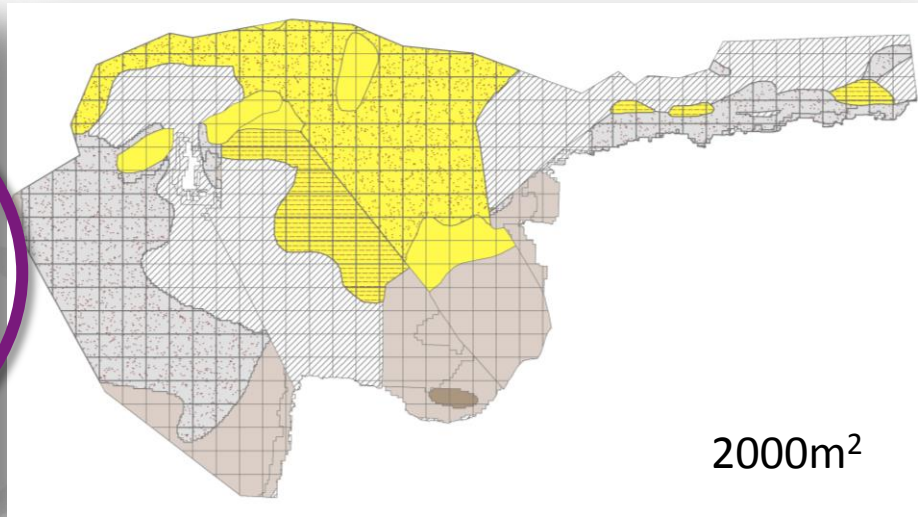
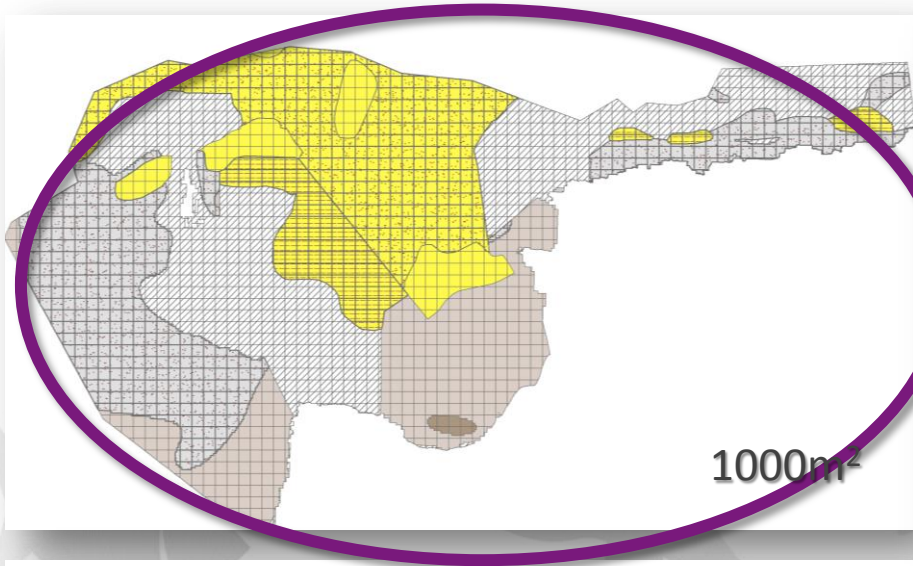
MODELLING CHANGE

Partitioning the study area



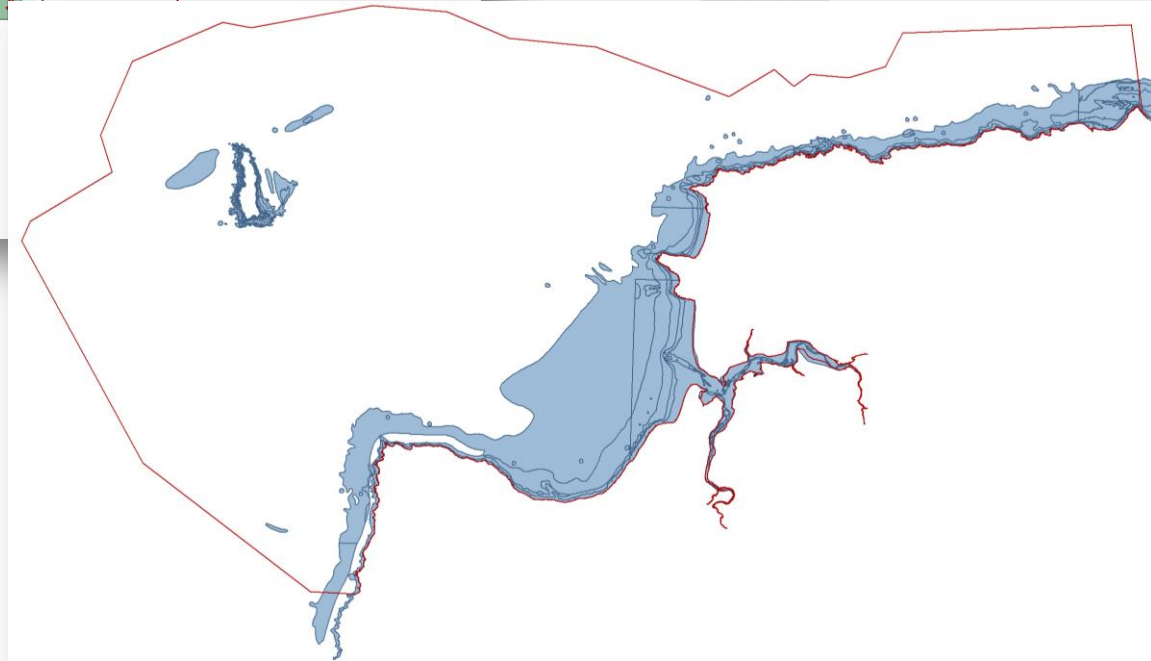
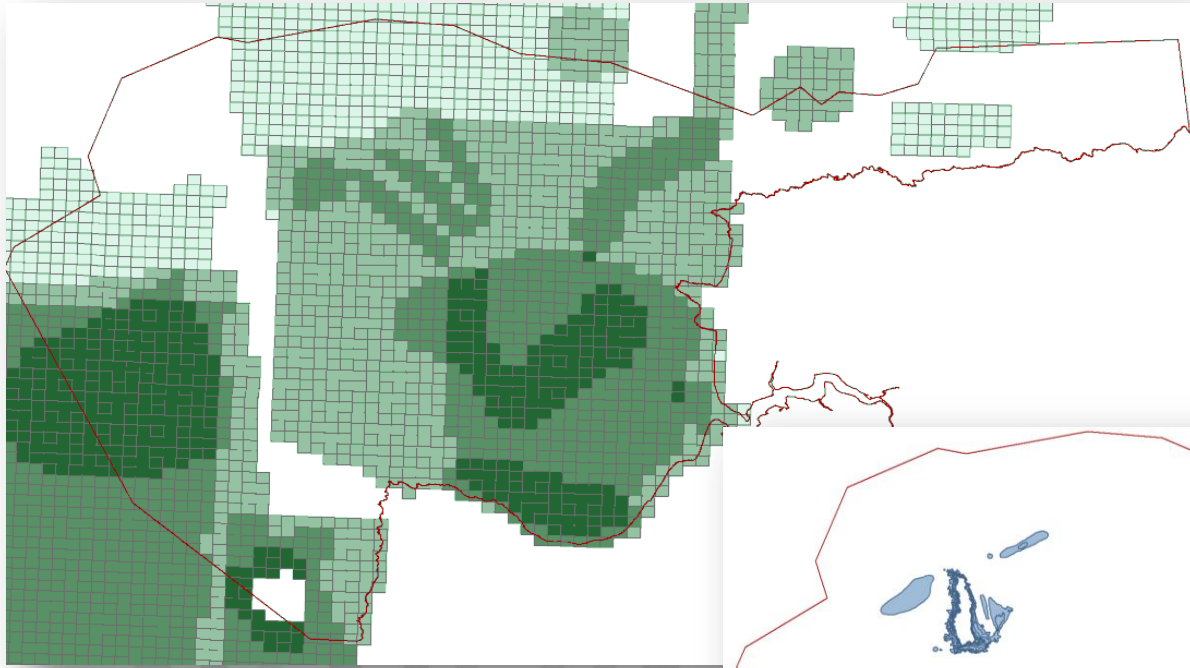
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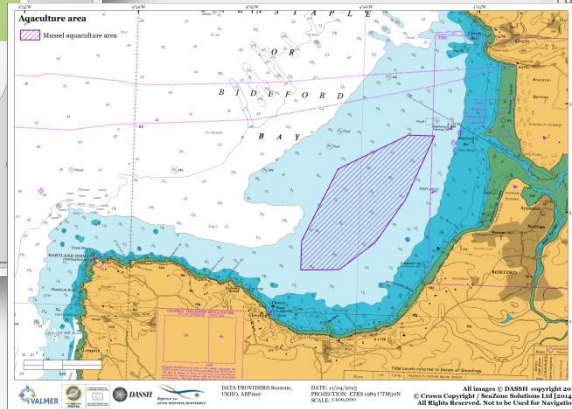
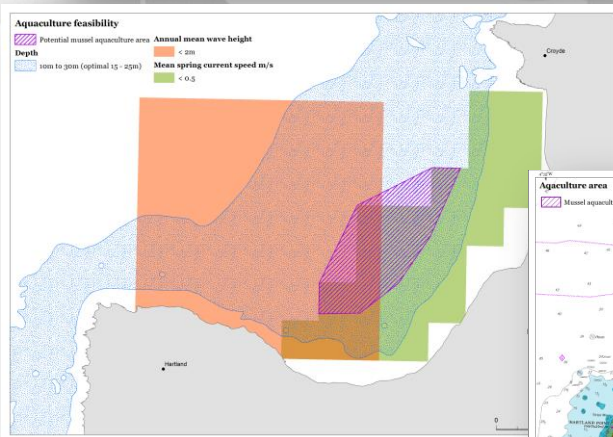
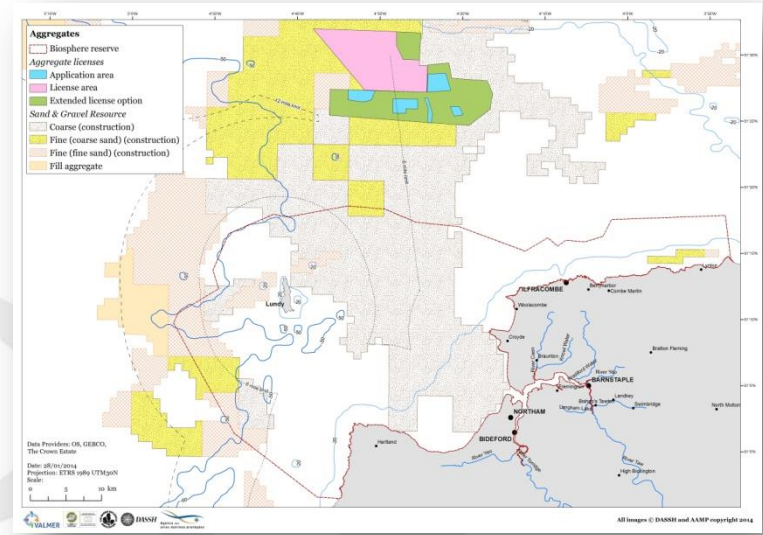
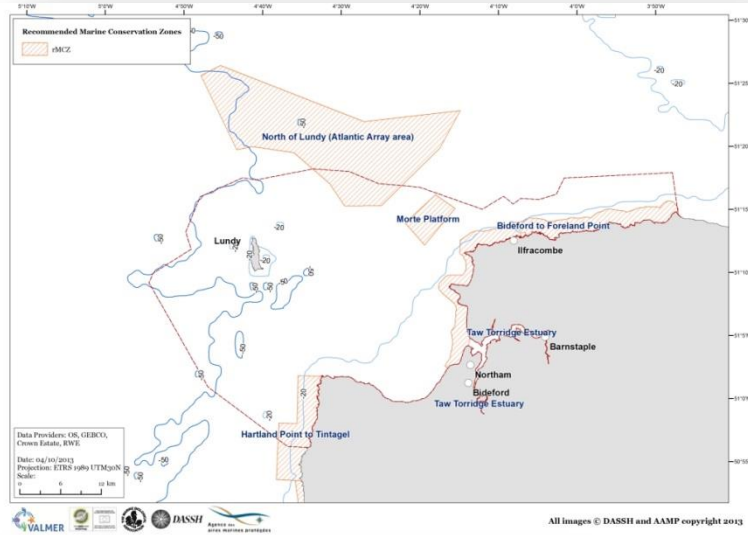
MODELLING CHANGE

Variables and pressures



SCENARIO DEVELOPMENT

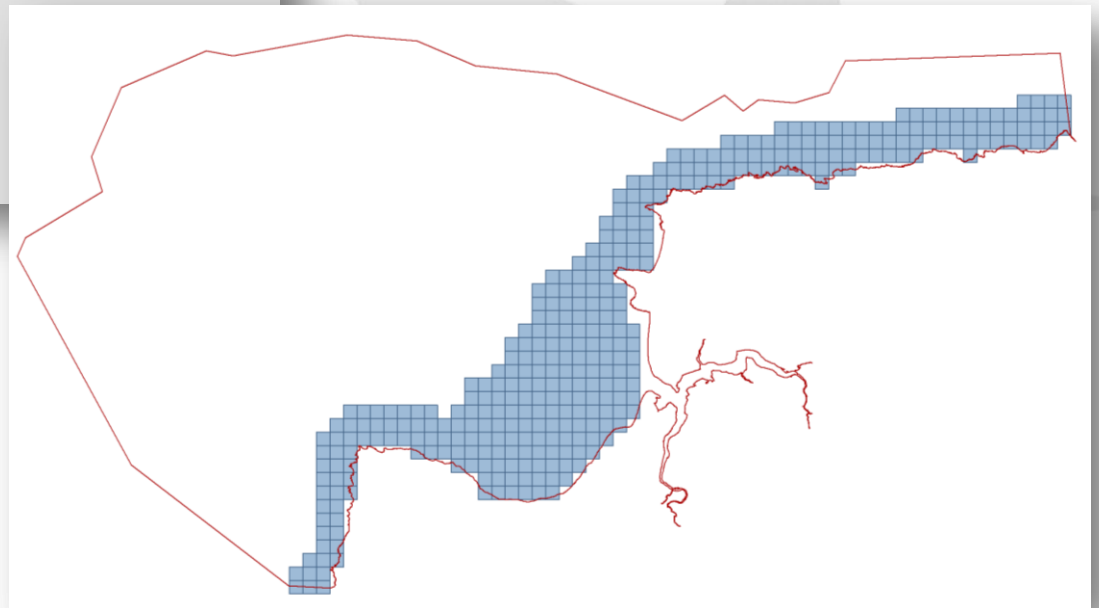
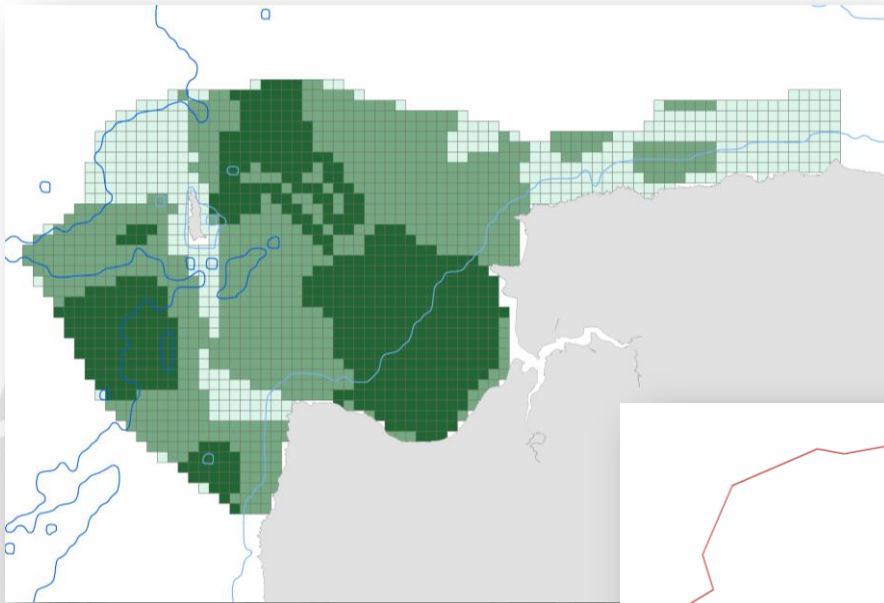
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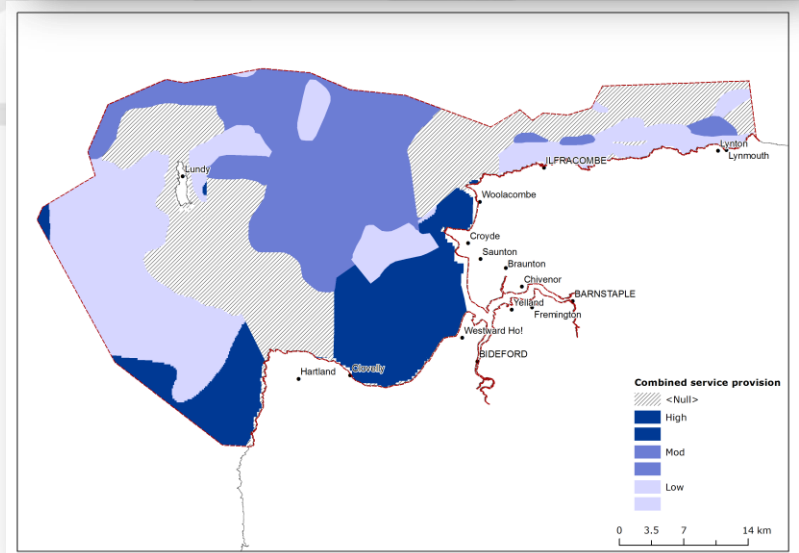
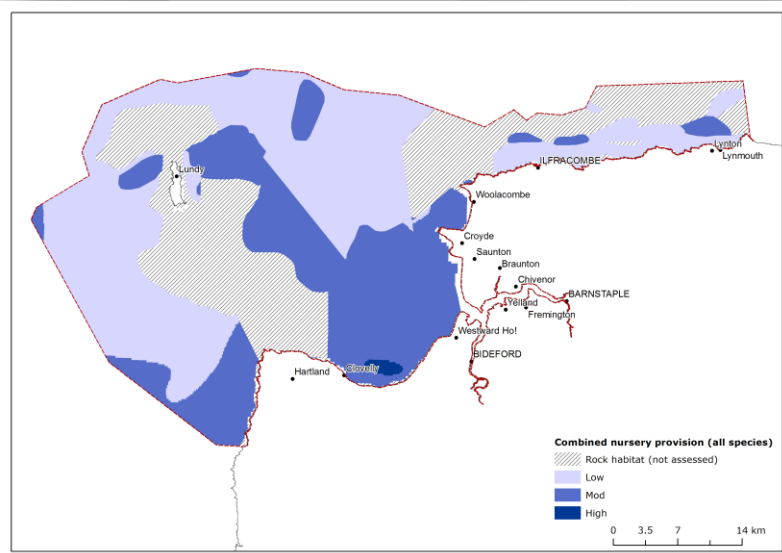
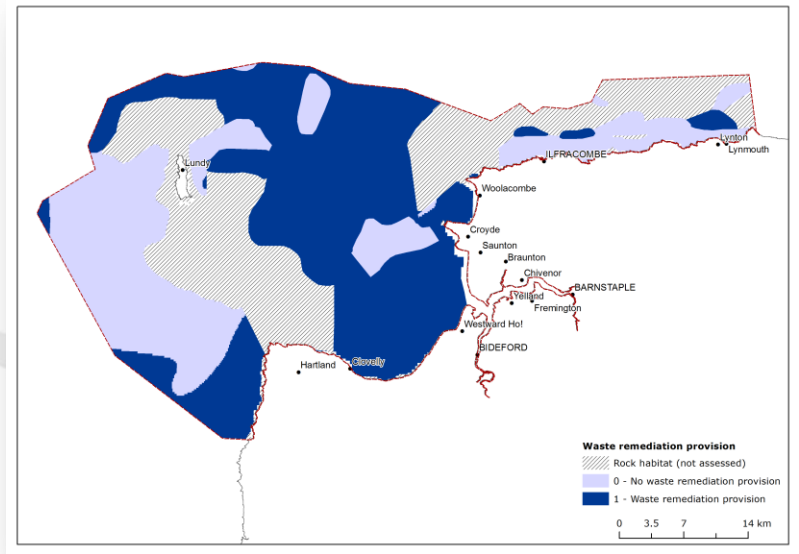
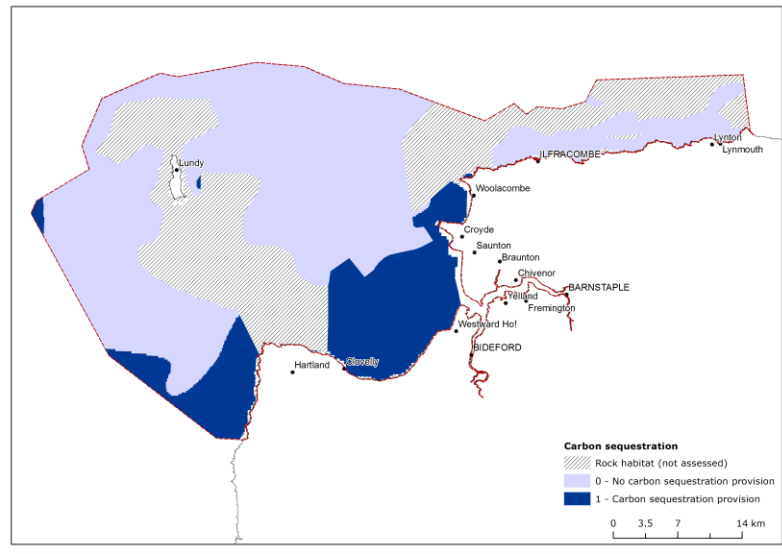
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MODELLING SCENARIO CHANGE



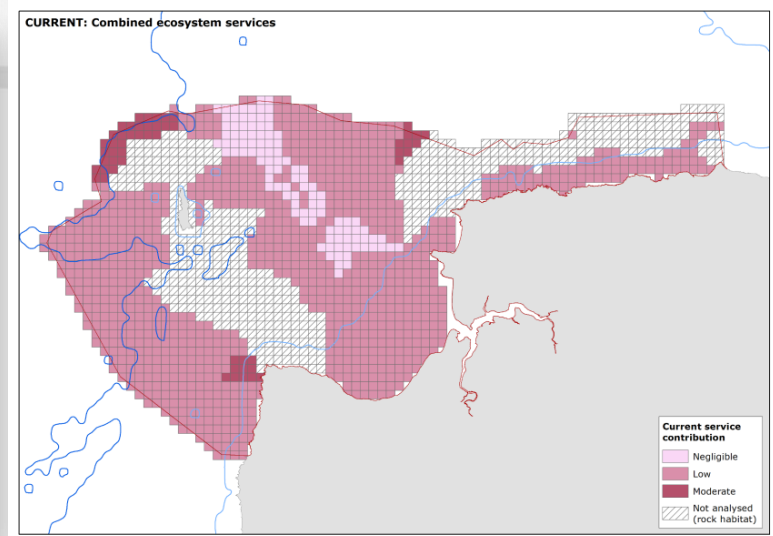
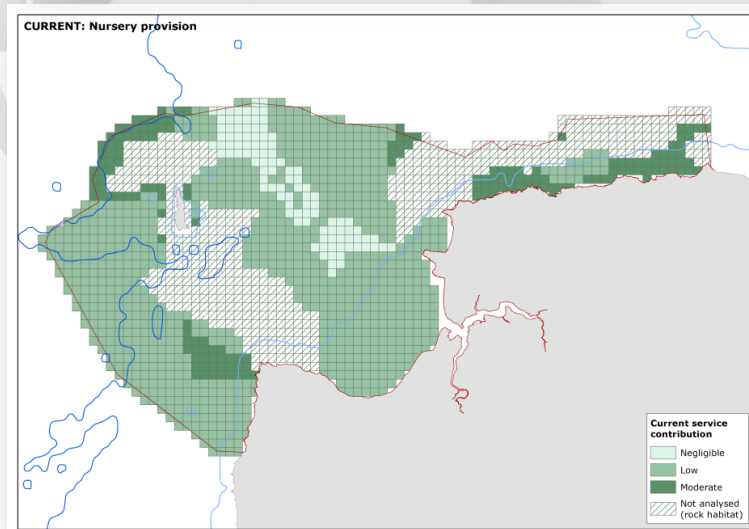
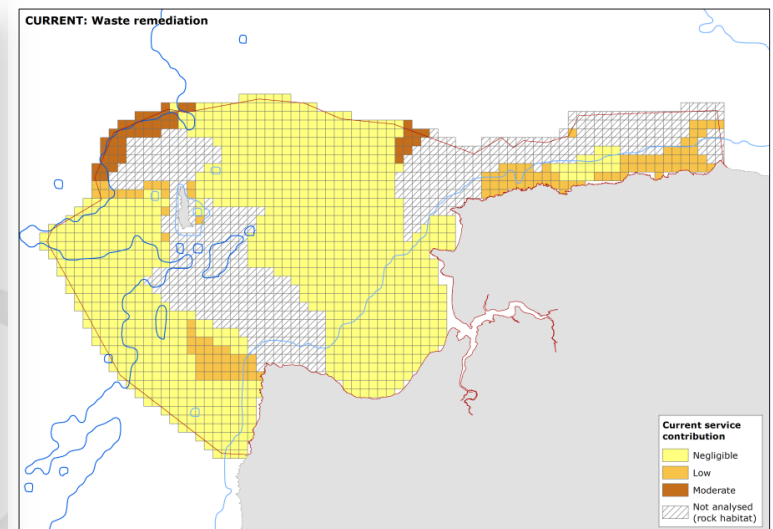
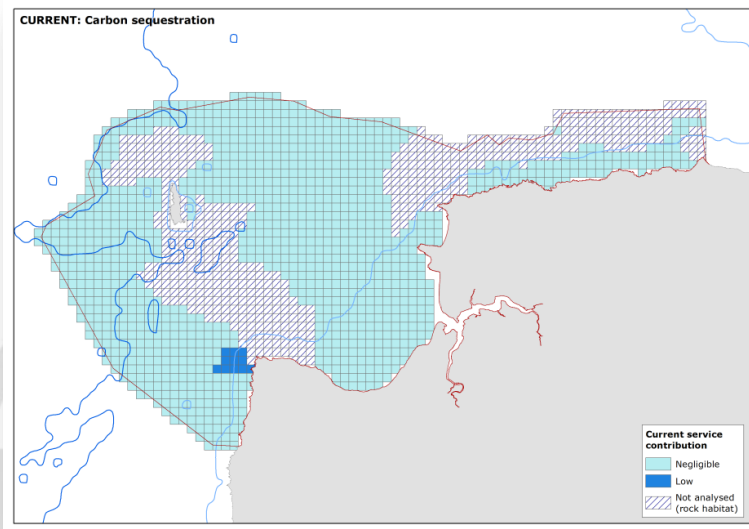
ECOSYSTEM SERVICE ASSESSMENT

Maps of level of ecosystem delivery

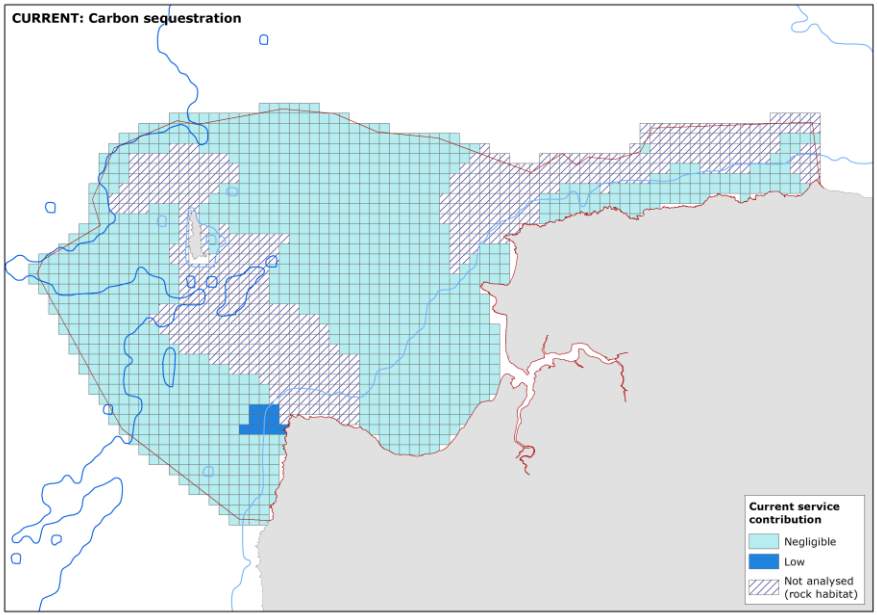


MODELLING CHANGE

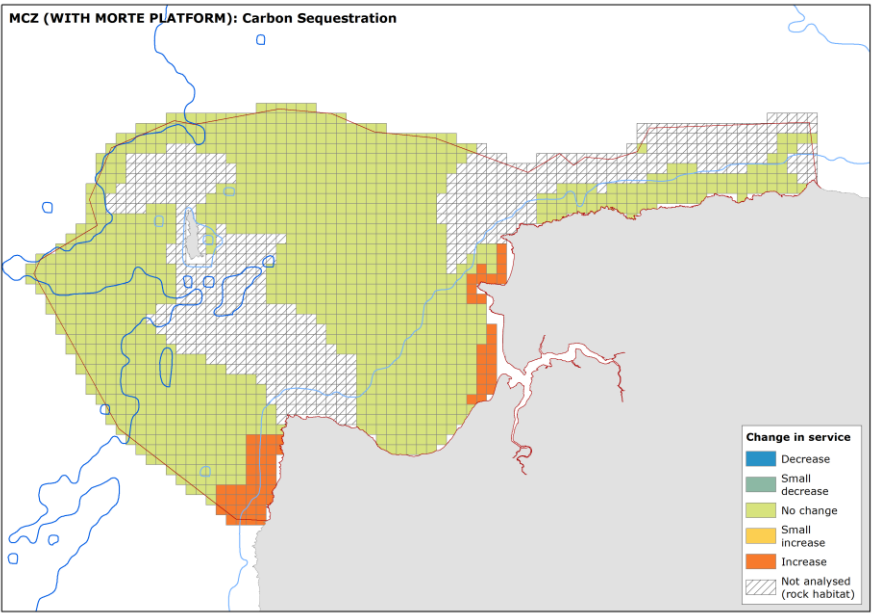
Actual service delivery



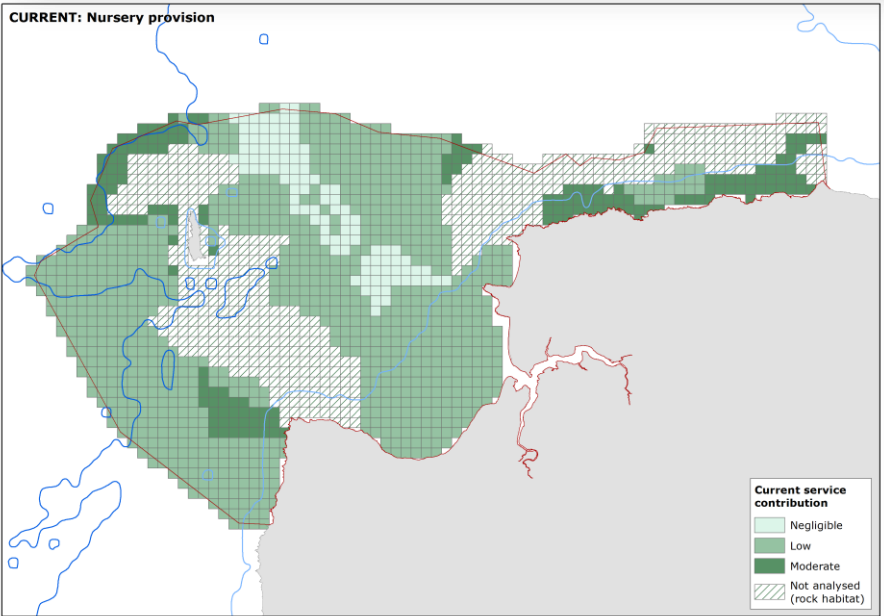
CURRENT: Carbon sequestration



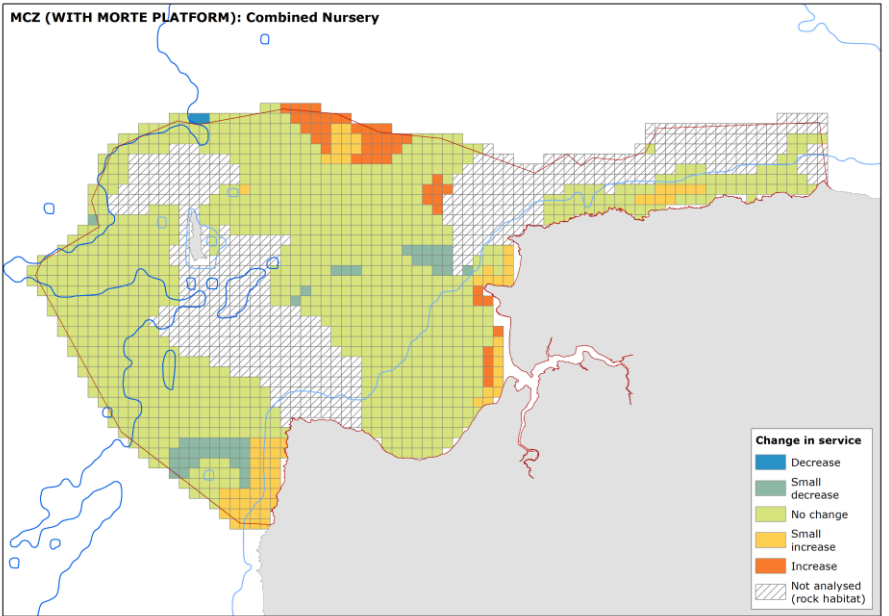
MCZ (WITH MORTE PLATFORM): Carbon Sequestration



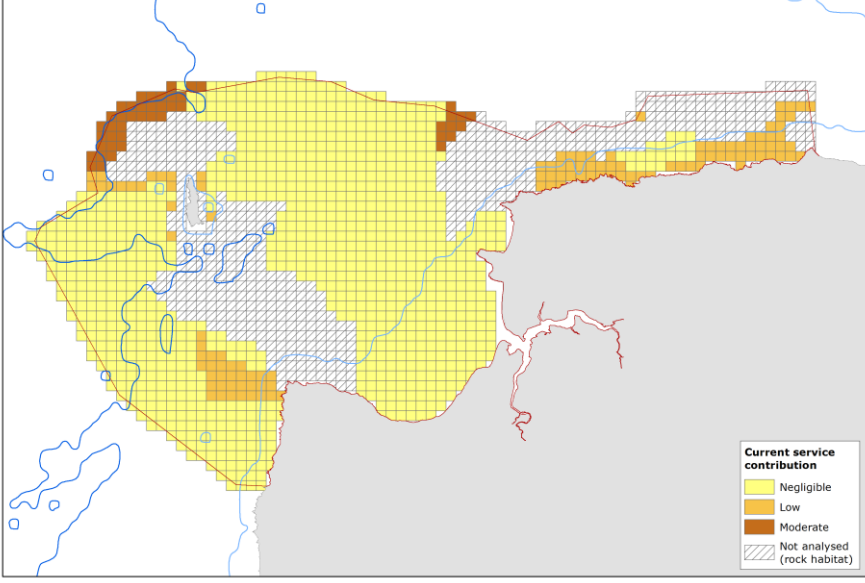
CURRENT: Nursery provision



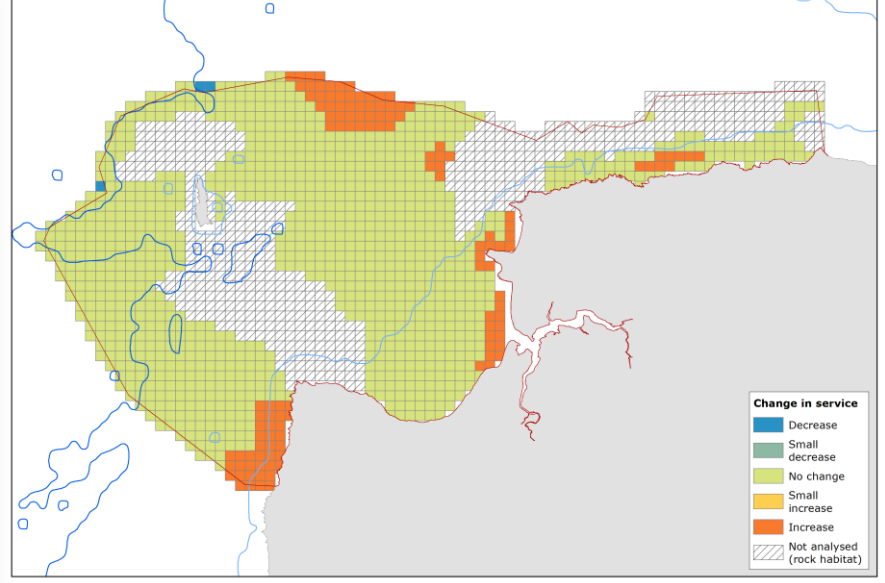
MCZ (WITH MORTE PLATFORM): Combined Nursery



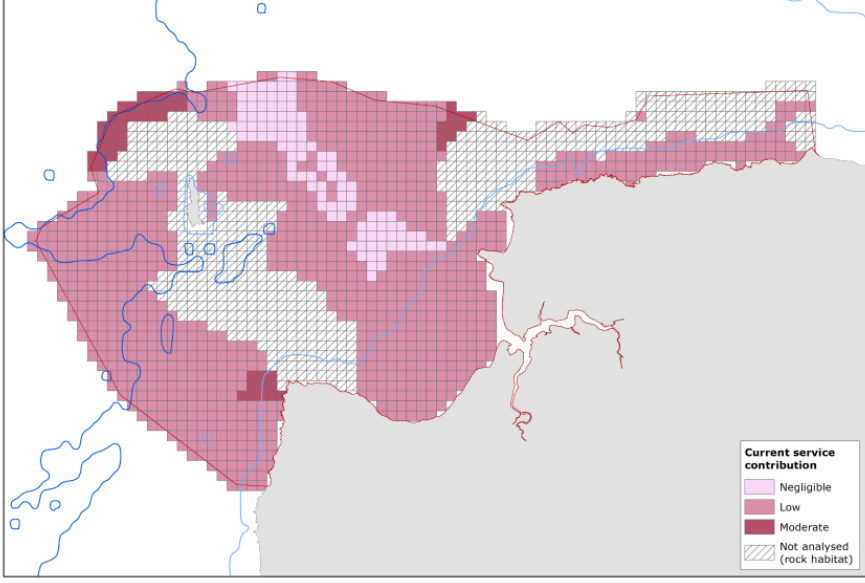
CURRENT: Waste remediation



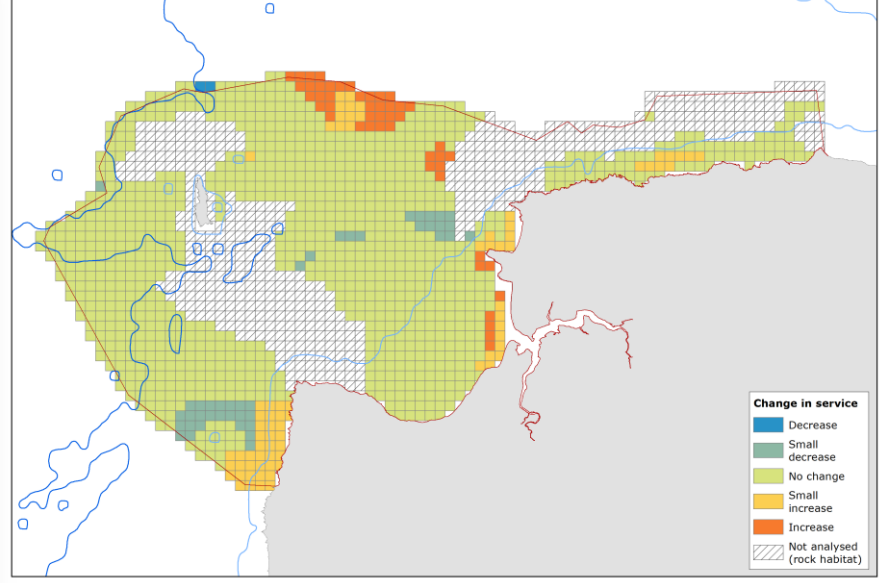
MCZ (WITH MORTE PLATFORM): Waste Remediation



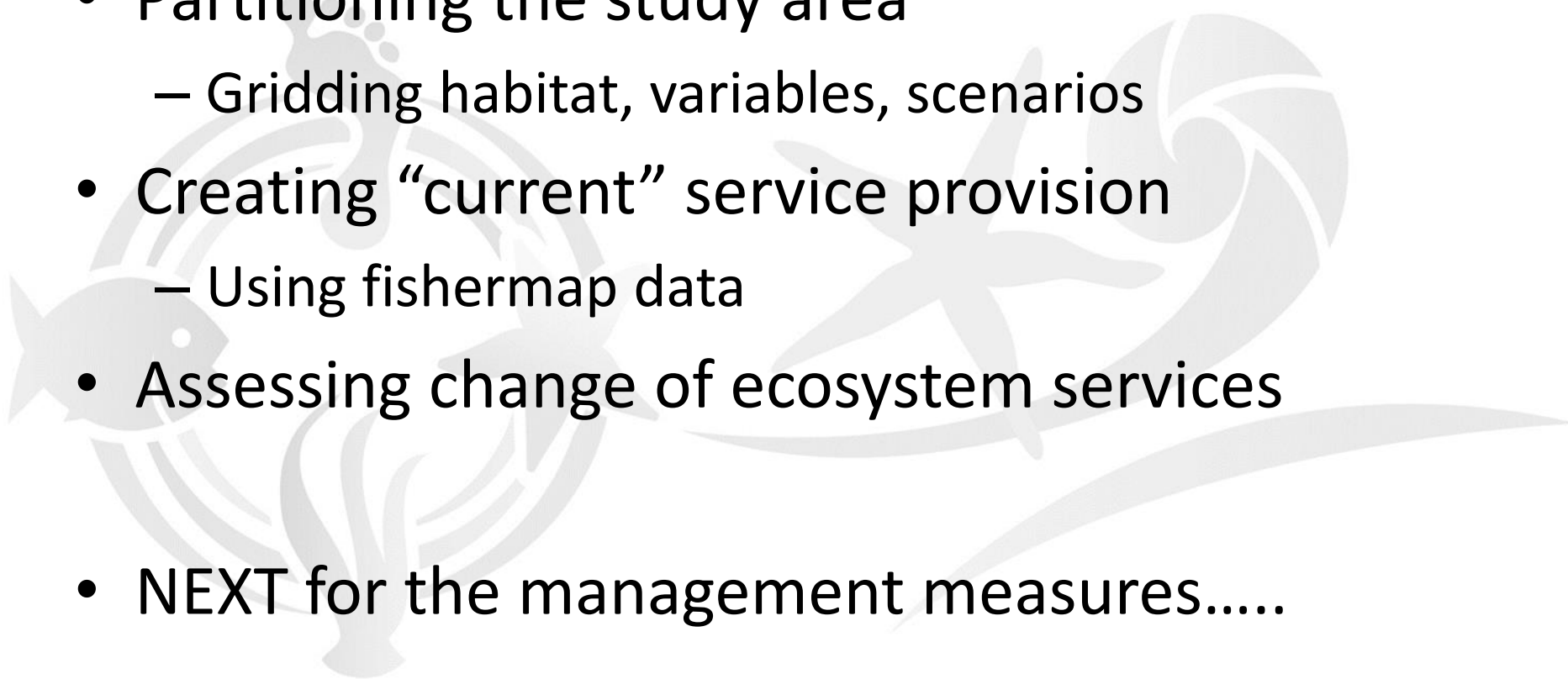
CURRENT: Combined ecosystem services



MCZ (WITH MORTE PLATFORM): Combined Ecosystem Services



Quick Summary

- Partitioning the study area
 - Gridding habitat, variables, scenarios
 - Creating “current” service provision
 - Using fishermap data
 - Assessing change of ecosystem services
 - NEXT for the management measures.....
- 

Thank you for your undivided attention
Any further questions?



Image: © João Paulo Corrêa de Carvalho



PANACHE

Protected Area Network Across
the Channel Ecosystem



Hampshire & Isle of Wight
Wildlife Trust
Protecting wildlife. Inspiring people.



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