	Notes
Name of Meeting:	Isle of Wight Council (IWC) Environment & Sustainability Forum
Date and Time:	14th August 14:00 – 15:30
Chair:	Alaster Sims – Service Manager for Climate, Coast and Environment

- Introducing talkers and welcome to all

Intro to Bella:

- Recent Exeter Georgraphy Graduate
- Volunteer with HIWWT – who introduced her to the topic of seagrass – and microplastics concentration.

Research Focus:

- Investigated microplastic accumulation in seagrass sediments across three Solent sites: Ryde, Calshot, and Bromwich Beach.
- Compared seagrass areas vs. unvegetated areas.
- Seagrass meadows provide carbon storage/nursey habitats for fisheries and coastal protection.
- When selecting sites, different urbanisation models were taken into consideration. Ryd was the most urbanised area.
- Fieldwork was done in August 2024 – site accessed by foot at low tide. Used random quadrates with test sampling done 75m further away with no seagrass.

Key Findings:

- All samples contained microplastics, indicating widespread contamination.
- Seagrass areas had higher microplastic abundance than unvegetated areas.
- Calshot had the highest concentration despite being least urbanised.
- Fibres were the most common microplastic shape, likely from:
    - Clothing (via wastewater)
    - Fishing gear
- Black microplastics were most common, associated with higher contamination.
- Many of the results contradicted theories which therefore means more research is needed.
- Across the globe 95% of
- Fossil fuels from roads samples contained microplastics.

Implications:

- Seagrass may act as a microplastic sink, raising concerns for marine life and food chains.
- Urbanisation was not a clear predictor of microplastic levels.
- Hydrodynamics, wind direction, and seagrass characteristics may play larger roles.

Recommendations:

- Improve wastewater treatment and washing machine filters.
- Promote public awareness of microplastic sources.
- Further research needed using advanced techniques (e.g., FTIR spectroscopy).

Discussion Highlights:

- Interest in promoting washing machine second filters.
- Noted that there is a big focus nationally on water quality thanks to the Cunliffe Review Independent Water Commission: review of the water sector - GOV.UK. A lot of mention that microplastics are not currently monitored at waste water, and they want this to be focused on. The treatment standards are good, but even when you remove 98% in the effluent, the 2% still contains significant amounts in the 2%. Lots of positive things happening but still work to be done.
- Noted that we have a Biosphere designation – could we use this to highlight the cause demanding change?
- Potential for local action and policy change.
- Suggestion to share findings with Solent Protection Society.
- Cllr. Luccioni will take information back to her Committee for noting

Intro to Daneen:

- Part of the Island Nature Team commissioned by IW Council to prepare and deliver the IW Local Nature Recovery Strategy (LNRS).

Purpose of the LNRS:

- LNRS is a new spatial plan required by the UK Government across 48 county regions of England to define locally important habitats and species, and the priorities and measures for their recovery. It maps out where areas can have the greatest impact for recovery.
- Globally we are in the middle of a devastating Biodiversity crisis. The UK is one of the worst offenders.
- A key function of the LNRS is to reverse this crisis. The LNRS has a job to help create CC resilience in that area. Needs to deliver against the National 30 by 30 target. The target to manage 30% of the land for nature by the year 2030. With only 5 years to go this is a bit of a sprint.
- As they are created a co-produced by a whole range of local stakeholders, they provide a bespoke locally led decision making tool.
- They have a focus on increasing access to nature within communities. Helping to support the green subscribing.
- It is a spatial plan – has a interactive spatial map. New in a policy and strategy sense. A plan spatially to bring about the best benefits in the places that need them most.
- Published in May – 4th in country – exemplar strategy (DEFRA).

Components:

- Document has been created with 4 sections – along with the actual Spatial Map. This shows all currently protected areas, alongside the new opportunity areas.
    - Strategy Area Description – habitats, species, threats, opportunities.
    - Priorities & Measures – actions for habitat recovery.
    - Priority Species List – 400 species, 200 champions.
    - Technical Methods Document
    - Interactive Habitat Map – shows current and potential biodiversity areas.

Achievements to date:

- Over 200 engagement events have been held. Local experts have been consulted. Policy Alignments have been made. Data and Analyss has been collected. Ecosystem services and resilience has been considered and now the monitoring and implementing starts.
- All resources are now available in every library on the IW along with being available free to source online.

- LNRS already being used for:
    - BNG – Strategic Significant Uplift. If a developer is working within an area identified by the LNRS then there is an uplift of 15%
    - Engagement at festivals
    - In the IW Council Procurement requirements.
    - Larger grant applications showing the relationship to strategy in practice
    - Supporting public land management (parks cemeteries)
    - Support farmers access funding for environmental work
    - Ryde Sanderling project is already delivering on the LNRS in the year that it was published.
- Daneen then gave a tour of the Island Nature Website www.islandnature.org along with the strategy document loaded on there and habitat map. At a micro level you can click anywhere on the Island to identify measures within the land parcels on the Island.

Next Steps:

- Bespoke toolkits to help certain sectors including your own garden! An Island Nature Forum is coming together every quarter to build traction for the map measures. Continuing public engagement. Providing training for bespoke businesses. A monitoring tool will also be available soon, so that we can collect information to report back to the Government of what we have achieved on the Iland to report back.

Discussion Highlights:

- CC – Discussed the LNRS a lot at Council meetings – so impressed with the data. General thoughts are that BNG and nitrate credits can be an opportunity for investments. HIWWT are already doing this. PF – It is really positive, how can we move this forward? How do we get more projects under way? Also what about the Maritime protection?
    - DC – In term of sites for nature – yes working with environmental NGO is important. They have a lot of resources and knowhow. Move away from nature reserve, how can we maximise biodiversity around development sites, how can we work with farmers to emphasise corners of land that provide essential stepping stones. Private investment into nature based solutions is key. We have so much natural capital already. Development can coexist with nature. With regards to marine – it is incredibly important. Annoyingly the guidance changed midway through the LNRS process and we are bound by the mean low water level. There is work however on the way and the MMO are leading on this.
    - PF – Solent Forum is an important organisation are you doing work with them? DC – yes they have been an integral partner. Have ensured the cross boundary working. Next meting is in Cowes in October and LNRS will be at that.
- P-OM – Is similar work taking place in neighbouring regions? DC – Yes – Hampshire have just finished their consultation and are hoping to public by the end of the year. West Sussex looking to publish early next year.
- NC – A very complex story – where does action come from and who starts? DC - The LNRS is the starting point. We need to think about what it means for us. It is no longer about conservation areas, but there is something that can be very impactful at a local level. At the town and parish council level this could be transformative. We need new voices in those forums. NC - We have a small amount of money come in from the Centrica fund – can we work on a LNRS project with this? TFMZ are trying to think about how they use it hopefully we can find lots of connection points to be able to tell that story of change. DC – Yes excellent point and there are already conversations happening on that point. Essentially all the ingredients are in there and the tools are being set up. Setting up a toolkit bespoke for Parishes. Outside of the habitats how this can also relate to health and social economic matrix in their areas.

- LN – Tyring to work out how it works for us (volunteer for Greenpeace) is there a role working with organisations such as them who don't have land. Eg Glyphosate – DC – yes for something that is well evidenced and locally supported the LNRS is a brilliant tool to create some traction. Overarching measures (relationships, culture, ways of working) particularly with land management changes. Communication is key (e.g pollarding)
- AS – mentioned Sanderling projects as one of the new projects from LNRS
- PA – Trees – because the arboreal officers have little spare capacity, where damage is done to trees it is difficult to get somebody into an area to stop things? Can the LNRS help that? Can it beef up Tree Warden schemes, or direct funding to arboreal officers? Also interested in low mean water level being the cut off point – what about areas not owned by anybody? DC – Yes tree wardens are mentioned to support woodland management as a resource. There are some ideas for funding avenues. Recommend reading the tree and woodland section. Regarding all the catchments and rivers, they have been mapped with actions, enabling those actions will require Council and EA discussions.
- ST – Similar to Penny – around enforcement – there are lots of designations around our Parish, but we still have local people intent on damaging the environment and land owners who own woodland but damage it rather than enhance it. There doesn't seem to be much we can do, and although we are blue on the map a lot of land has been degraded already. DC – something that has some through consistently. The lack of resource to enforce. As a result of the interest we are now having discussions with Natural England on this. In terms of doing something about it – you can email us and we can give you advice on how to deal with any protected sites.
- DC - We will be launching a quarterly newsletter very soon to share project updates and case studies - please do email the email on the island nature website to be on the list! lnrs@arcbiodiversity.co.uk
- **AS – A big thank you to the presenters**

PF – IWALK – the need for support for Tree Wardens. T&P Councils are keen to get some training opportunity. Do we have any money from the Tree Trust? How can we help with this?
KL – Suggested brining this to her committee

Upcoming Events	**None**
PSQ:	**None**
Next Meeting	**9th October: 18:00pm**

An investigation into microplastic accumulation in seagrass sediments of the Solent

Presented by: Isabella Smart

14th August 2024

About Me

- University of Exeter BSc Geography Graduate
- Incoming MSc in Environmental Sustainability
- Live in the Solent area inspiring my area of research

Aim

Investigate whether seagrass increases microplastic concentrations

Objectives

1) Select 3 meadows in the Solent (different settings & urbanisation levels)

2) Undertake sediment sampling

3) Analyse & quantify microplastics

4) Statistically compare seagrass & unvegetated areas, & 3 sites

Context

- Seagrass meadows provide **carbon storage**, nursery **habitats** for **fisheries**, and coastal **protection**
- The Solent is composed of ***Zostera noltii*** and ***Zostera marina*** species
- Their ability to **trap** suspended particulate matter → speculations that they may act as **microplastic sinks** → enhancing sediment microplastic accumulation
- Microplastic pollution continues to **rise**, leading to concern

Site Selection

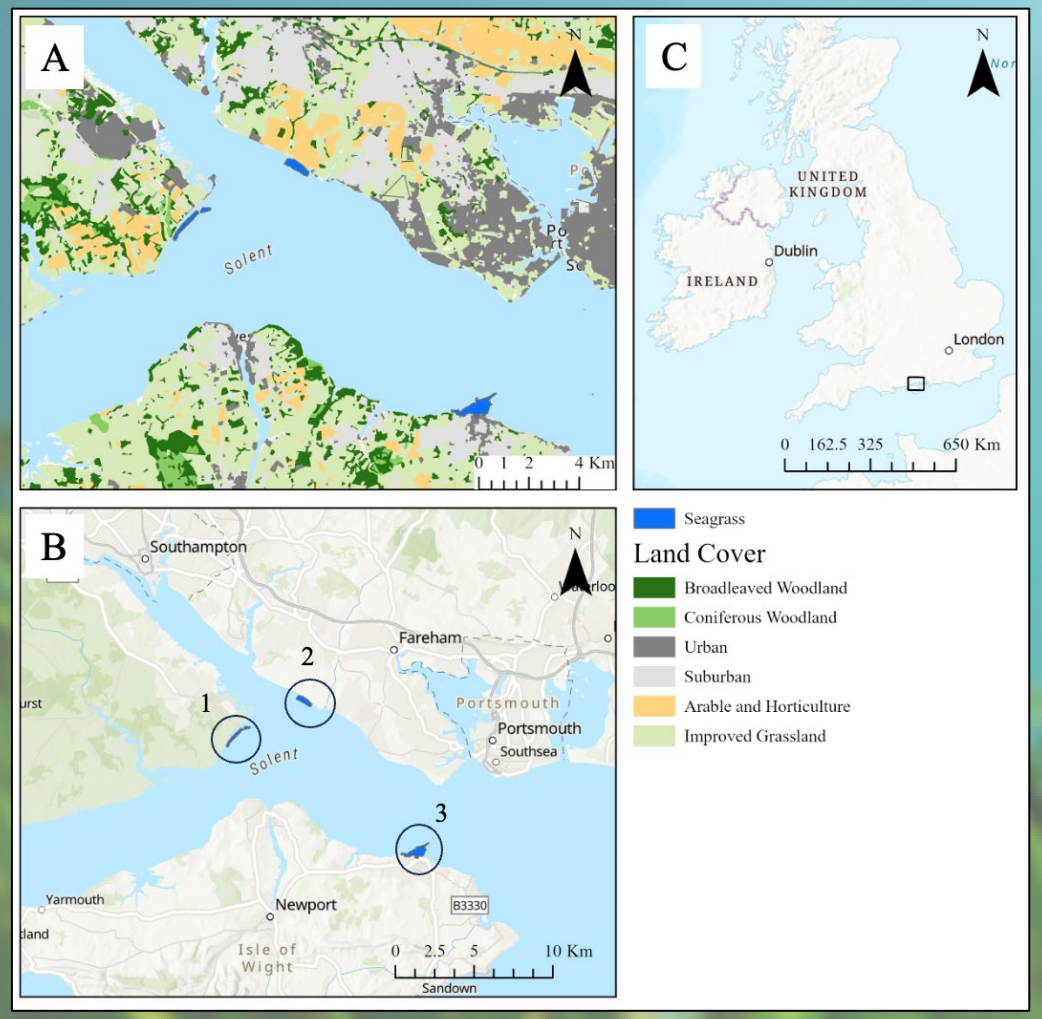


Figure 1: A) Land cover map. B) Seagrass meadows at the study sites: 1 – Calshot, 2 - Brownwich, 3 - Ryde. C) Overview map of the study site location. Study sites seagrass areas clipped from MagicMap (2025), made in ArcGIS Pro (Esri, 2025; Digimap, 2025)

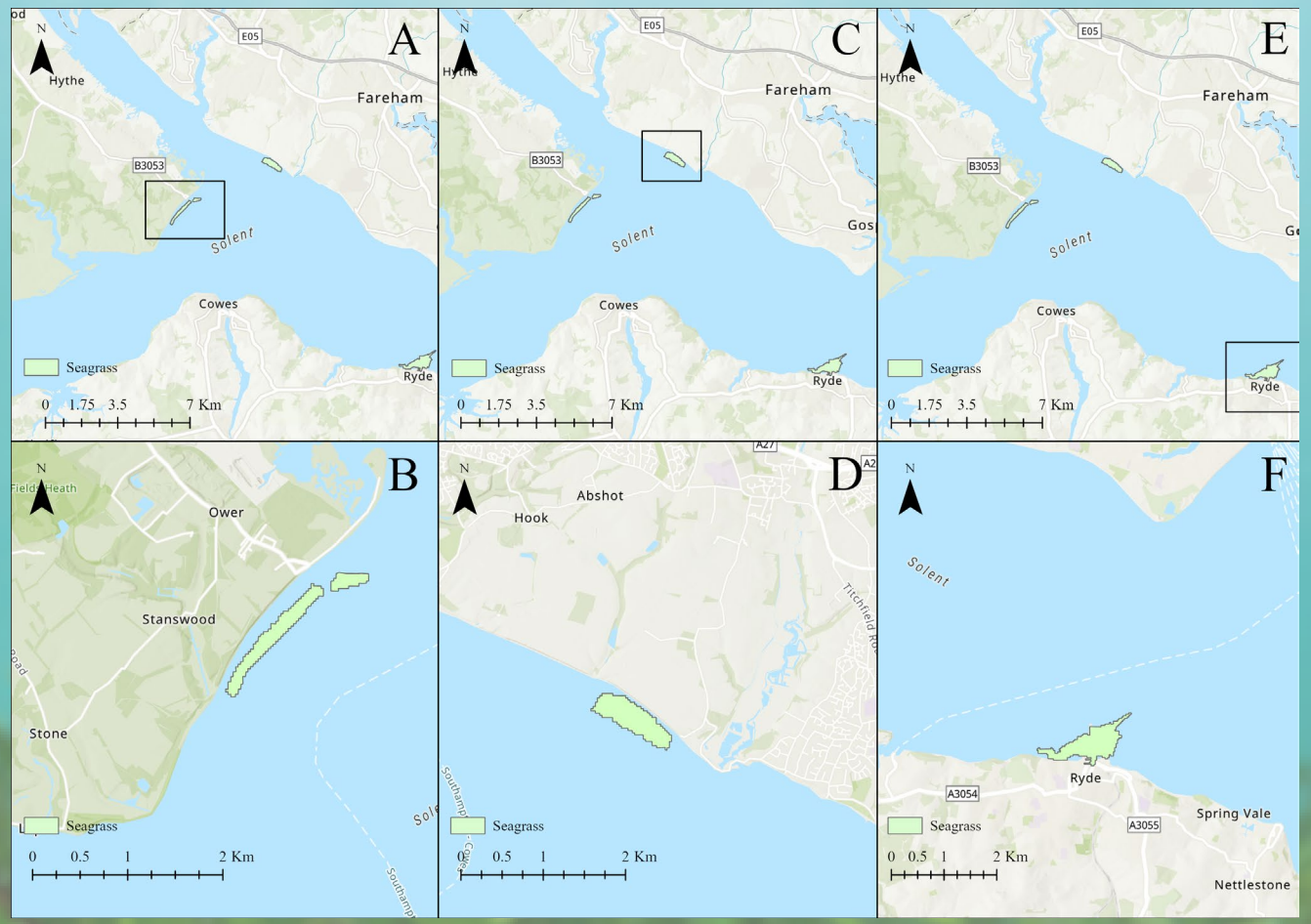


Figure 2: A) Location of Calshot in the Solent. B) Seagrass meadow sampled in Calshot. C) Location of Brownwich Beach in the Solent. D) Seagrass meadow sampled in Brownwich Beach. E) Location of Ryde in the Solent. F) Seagrass meadow sampled in Ryde. Sites seagrass areas only, as clipped from MagicMap (2025), made in ArcGIS Pro (Esri, 2025)

Fieldwork

Figure 3: Quadrat over a seagrass meadow

Figure 4: Sediment collection

Laboratory Analysis

Contamination Control

- Clean filter paper left out during lab work
- Gloves worn

Sample Preparation

- Samples and filter paper dried
- Samples Sieved
- Rifle split to get subsamples

Separation & Filtration

- Saturated NaCl solution added to samples
- Top 75-100ml poured into a vacuum filtration system over a filter paper

Microscopy

- Stereo microscope (1.5x) used
- MPs categorised by shape and colour

Laboratory Analysis

- A → Arrow 1 = black fibre, arrow 2 = transparent fibre, and arrow 3 = blue fragment
- B → Transparent fibre
- C → Blue fragment
- D → Black fibre

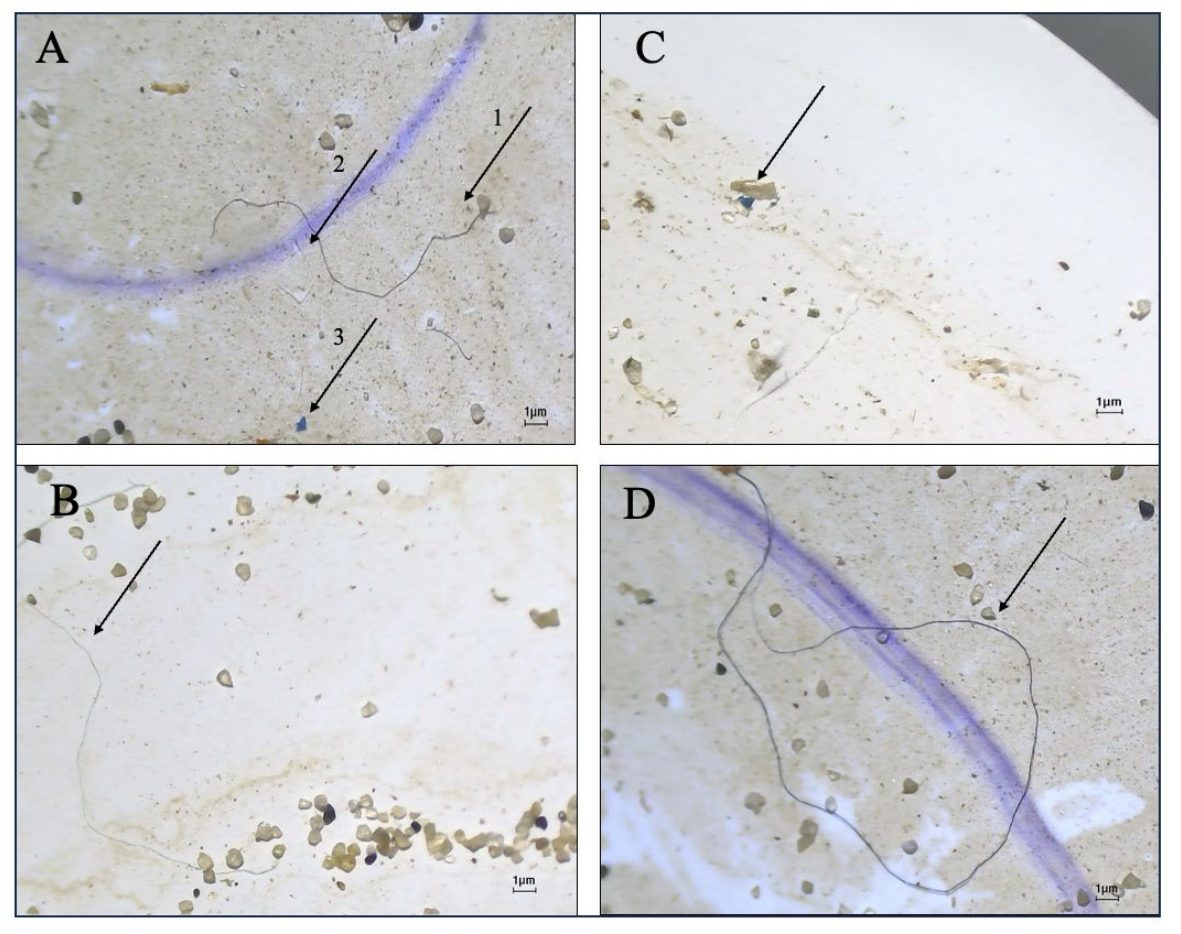
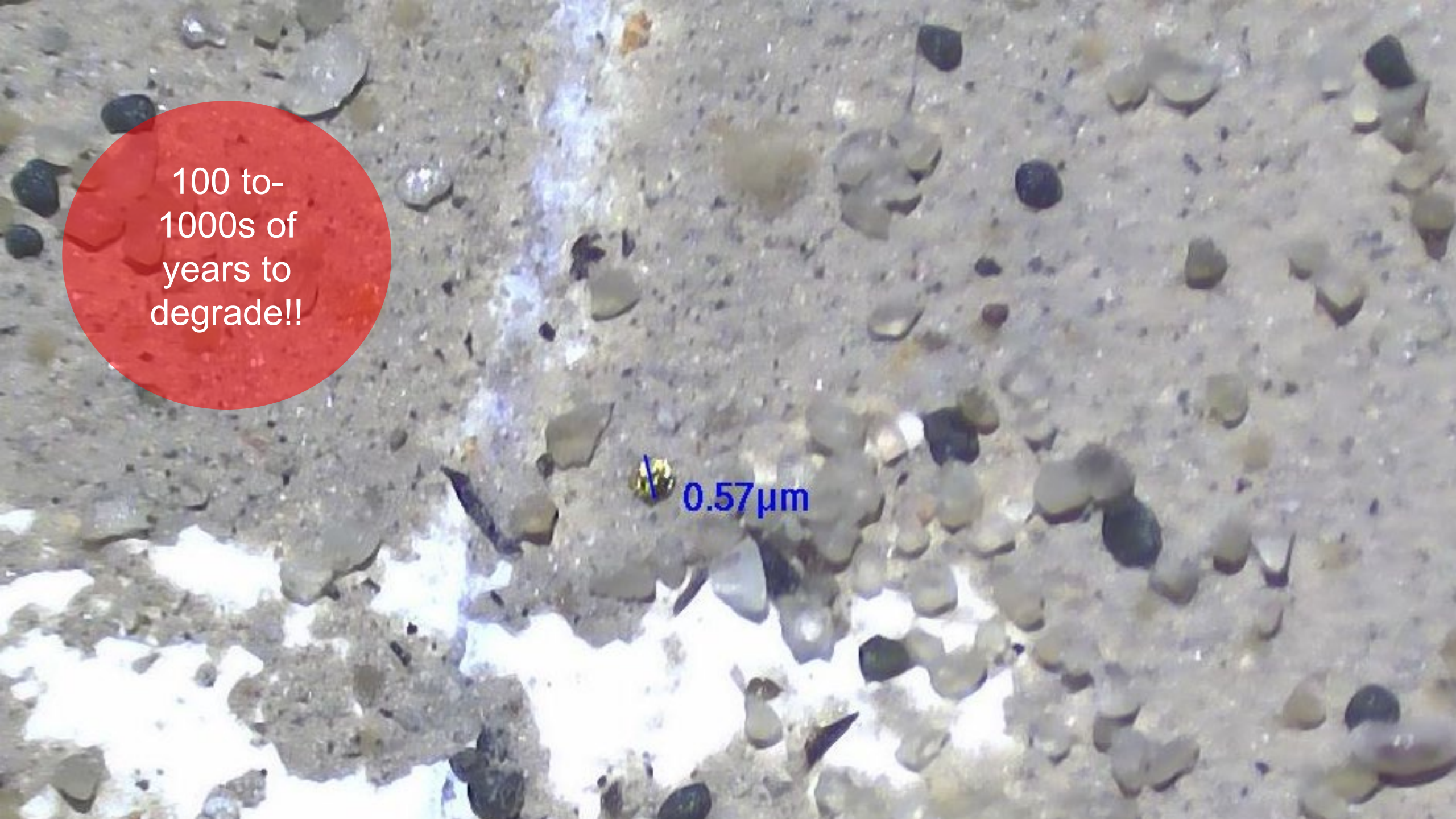


Figure 5: Typical microplastic in the sediment of both seagrass and unvegetated areas in Calshot, Ryde and Brownwich Beach


100 to-
1000s of
years to
degrade!!
0.57µm

Statistical Analysis

Table 1: Microplastic particles identified. Corresponding subsamples (1, 2, 3) created in the lab from the homogenised field sample for microplastic analysis

Sample number		Brownwich Beach	Ryde	Calshot
Seagrass sample 1	1	20	4	37
	2	6	11	39
	3	14	8	38
Unvegetated sample 1	1	7	22	12
	2	10	8	7
	3	9	13	7
Seagrass sample 2	1	7	25	17
	2	18	19	39
	3	13	10	37
Unvegetated sample 2	1	9	5	12
	2	8	7	22
	3	5	4	12
Seagrass sample 3	1	13	9	21
	2	15	9	27
	3	12	4	10
Unvegetated sample 3	1	9	8	18
	2	9	10	10
	3	5	3	11

100% MICROPLASTIC CONTAMINATION

Statistical Analysis

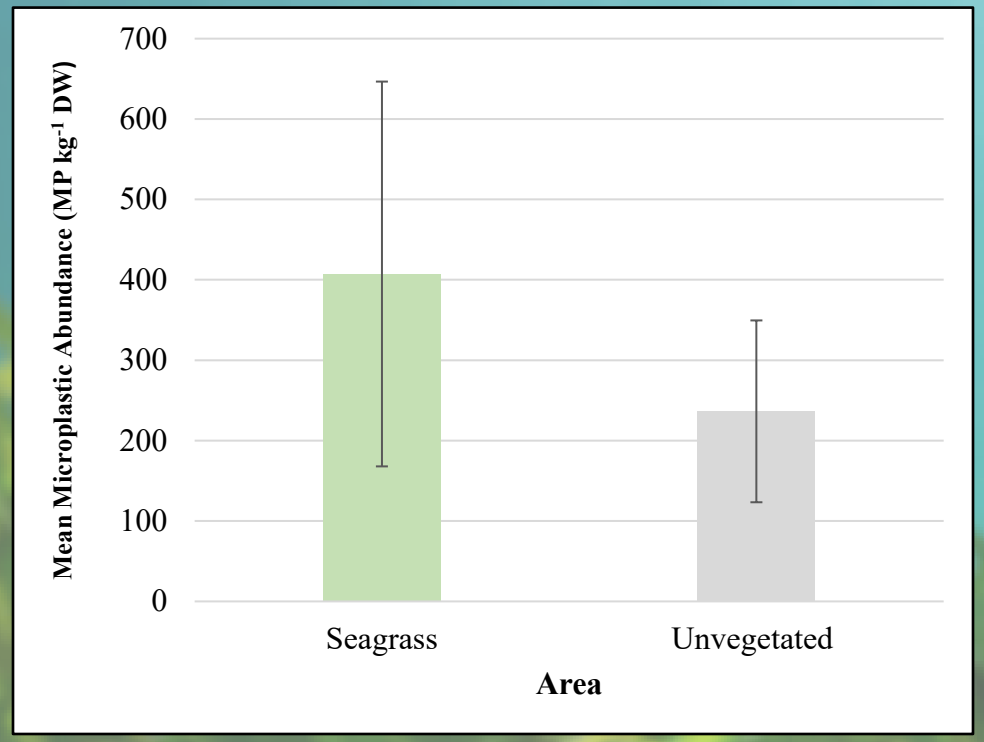


Figure 6: Mean sediment microplastic abundance of all seagrass samples (green) and all unvegetated samples (grey). Error bars represent ± 1 standard deviation (SD) around mean microplastic abundance

$$EI = \frac{A_{sg}}{A_{uv}}$$

ALL EXCEED 1

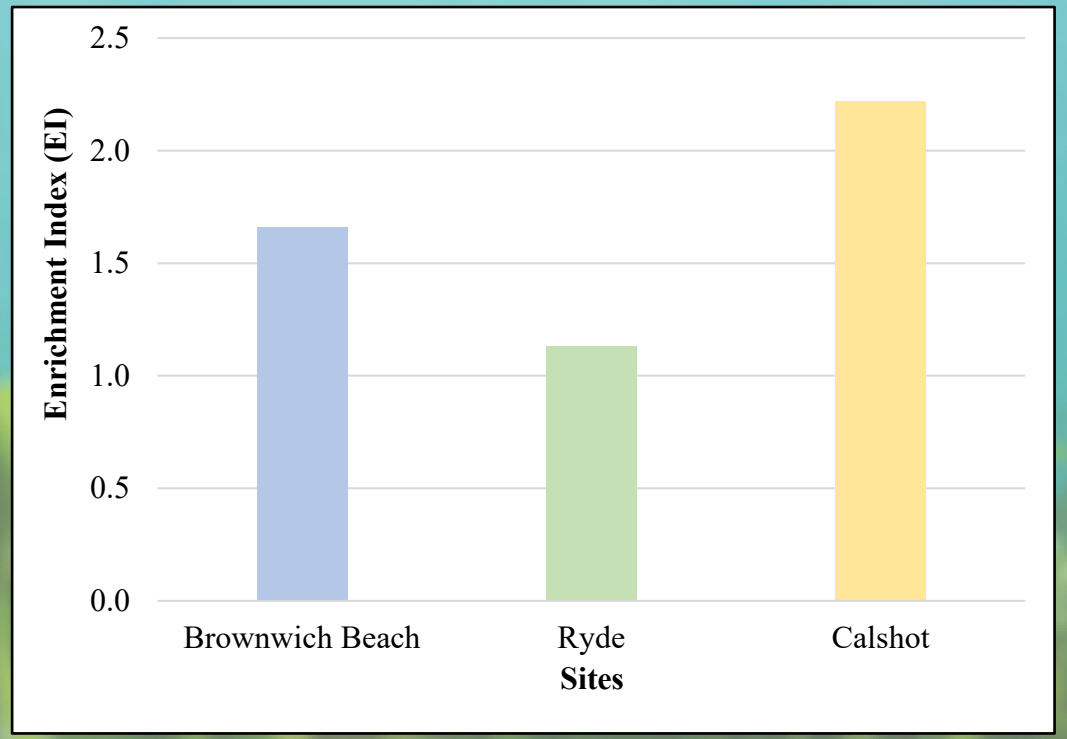


Figure 7: Enrichment index outputs of Brownwich Beach (blue), Ryde (green), and Calshot, (yellow)

Ryde

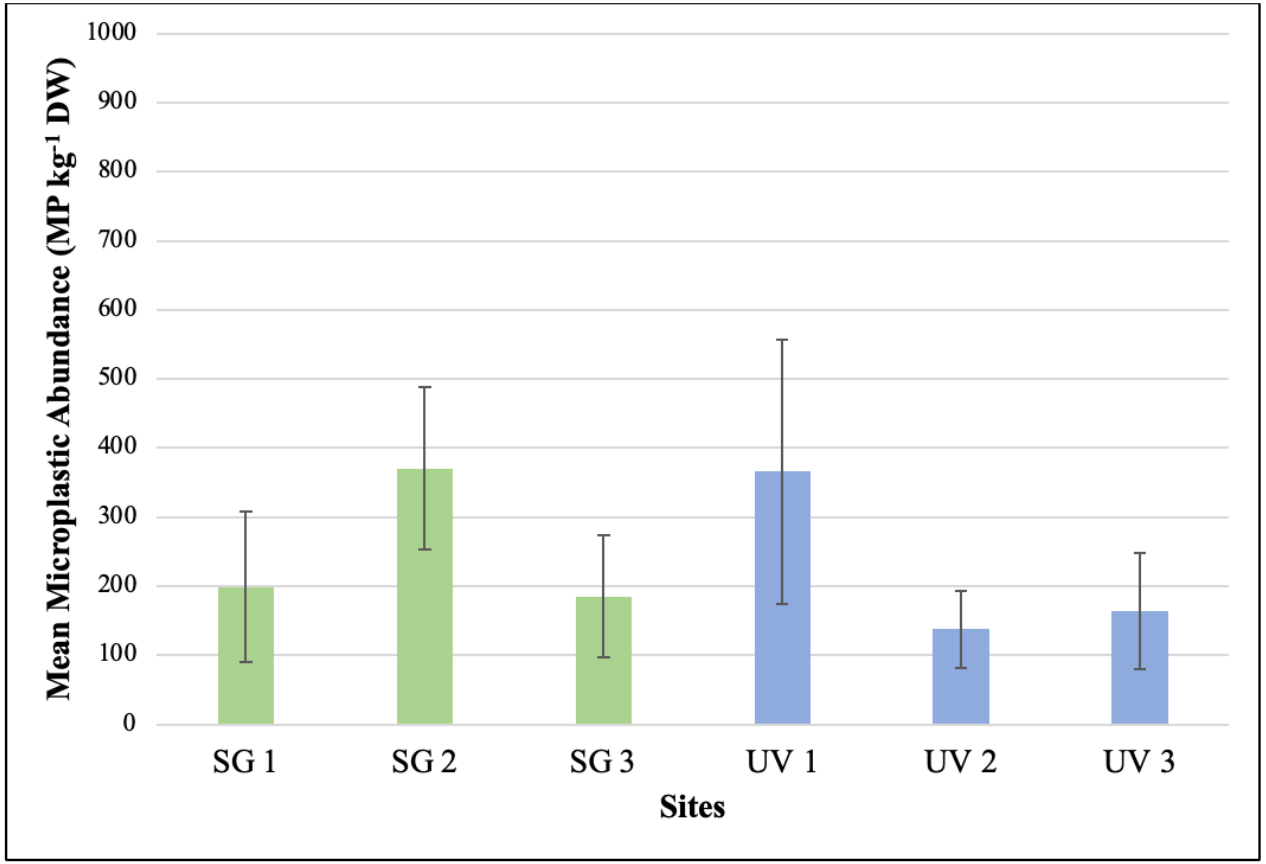


Figure 8: Mean sediment microplastic abundance of samples from seagrass (SG) areas (green), and unvegetated (UV) areas (grey) at Ryde. Error bars represent ± 1 SD around mean microplastic abundance

Table 2: Results of Student's two-sample t-test for the comparison of seagrass and unvegetated sediment microplastic abundance (MP kg^{-1} DW) at Ryde

t-value	*p*-value
0.44	0.67

NO STATISTICALLY SIGNIFICANT DIFFERENCE

Comparison Between Sites

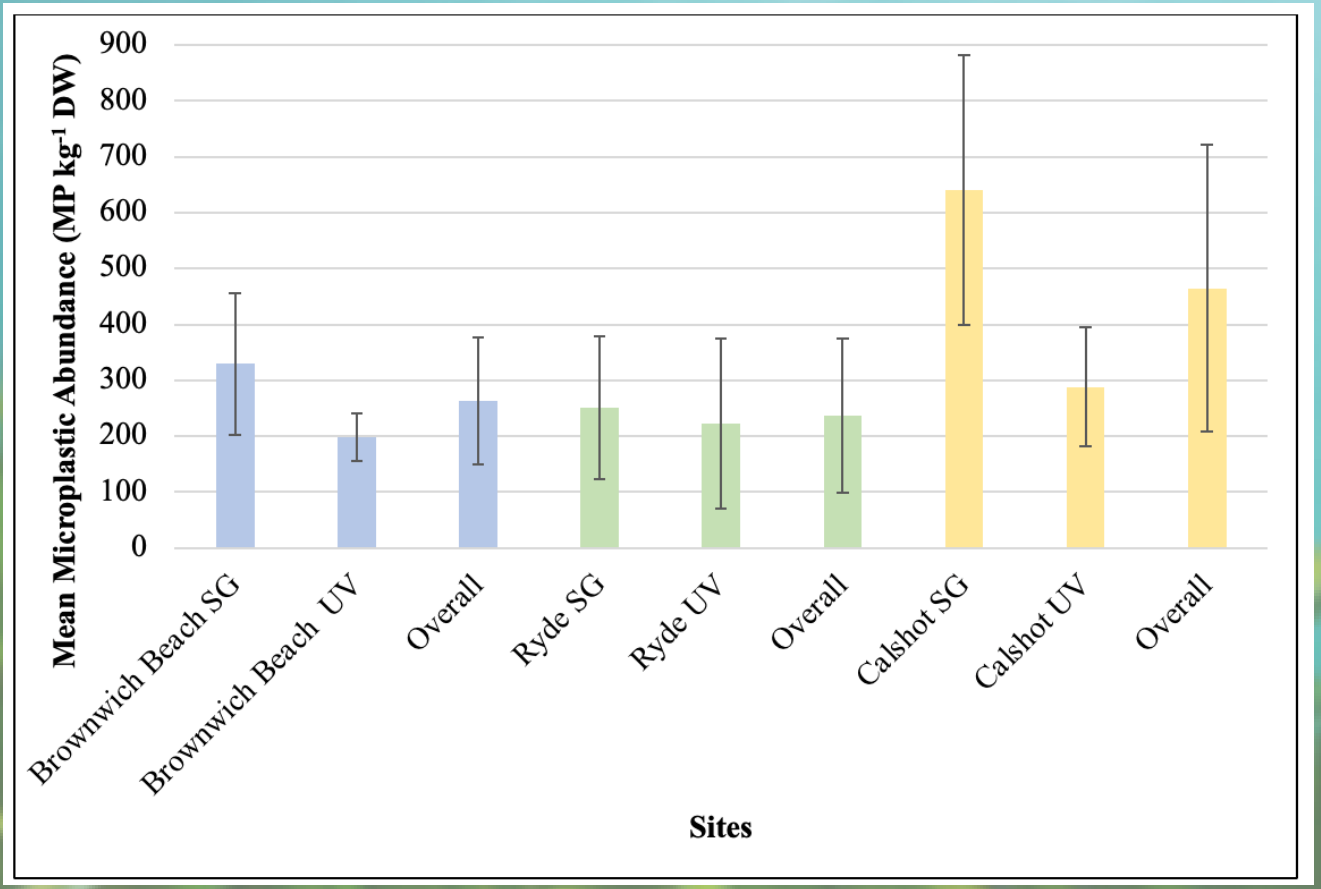


Figure 9: Mean sediment microplastic abundance for seagrass (SG) areas, unvegetated (UV) areas, and overall mean microplastic abundance. Error bars represent ± 1 SD around mean microplastic abundance

MPs Shape and Colour

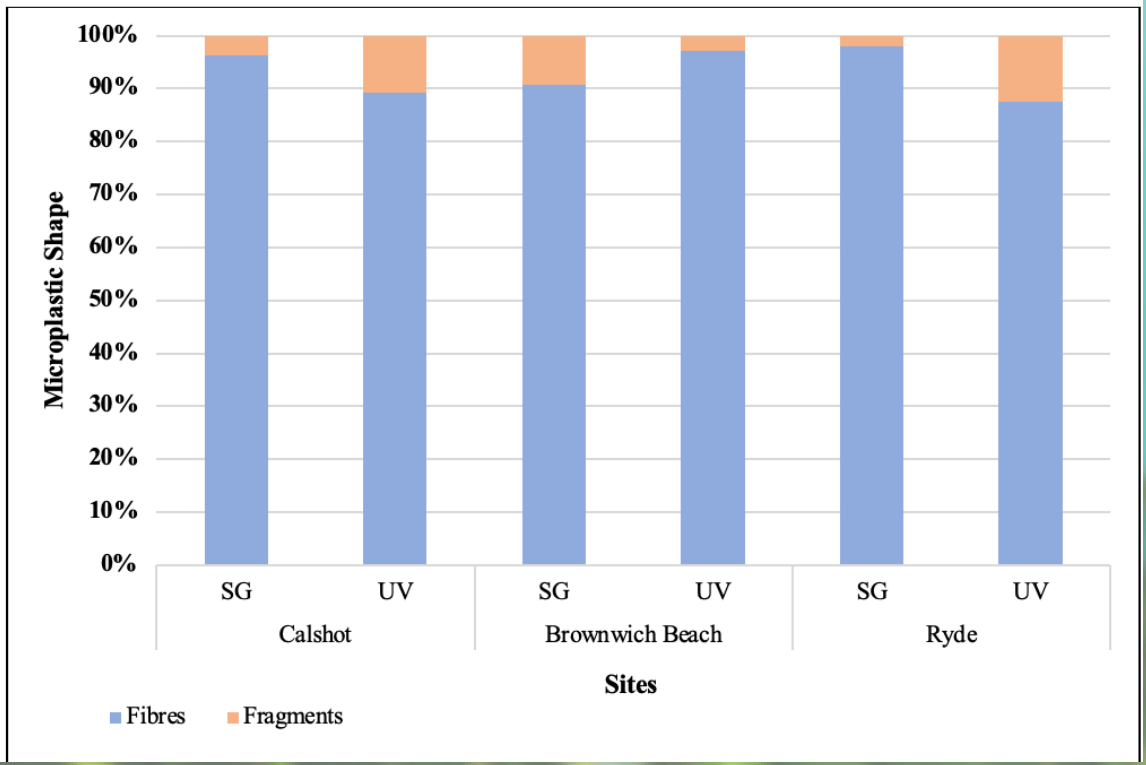


Figure 10: Percentage breakdown of the composition of microplastics in seagrass (SG) and unvegetated (UV) sediments

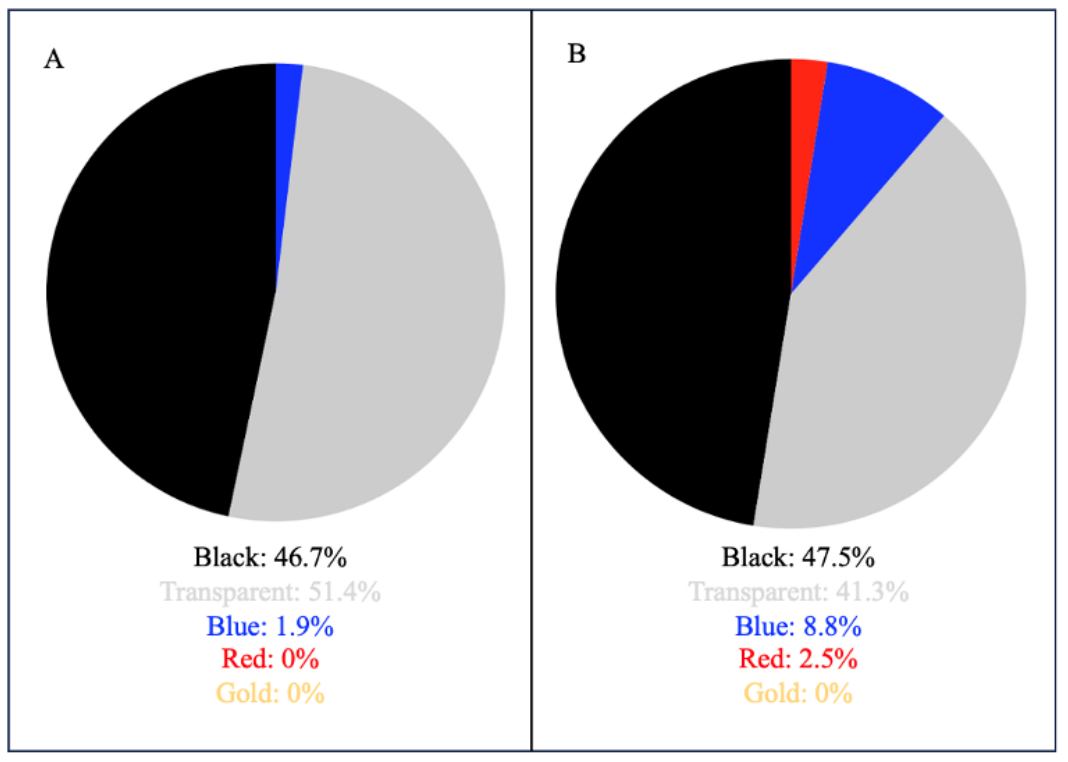


Figure 11: A) Proportions of microplastic colours (%) in Ryde seagrass sediment. B) Proportions of microplastic colours (%) in Ryde unvegetated sediment

Urbanisation

- **Ryde → Most** urbanised site, **lowest** average sediment MP abundance
- **Calshot → Less** urbanised site, **highest** average MP abundance
- Pattern **contradicts** expected theory

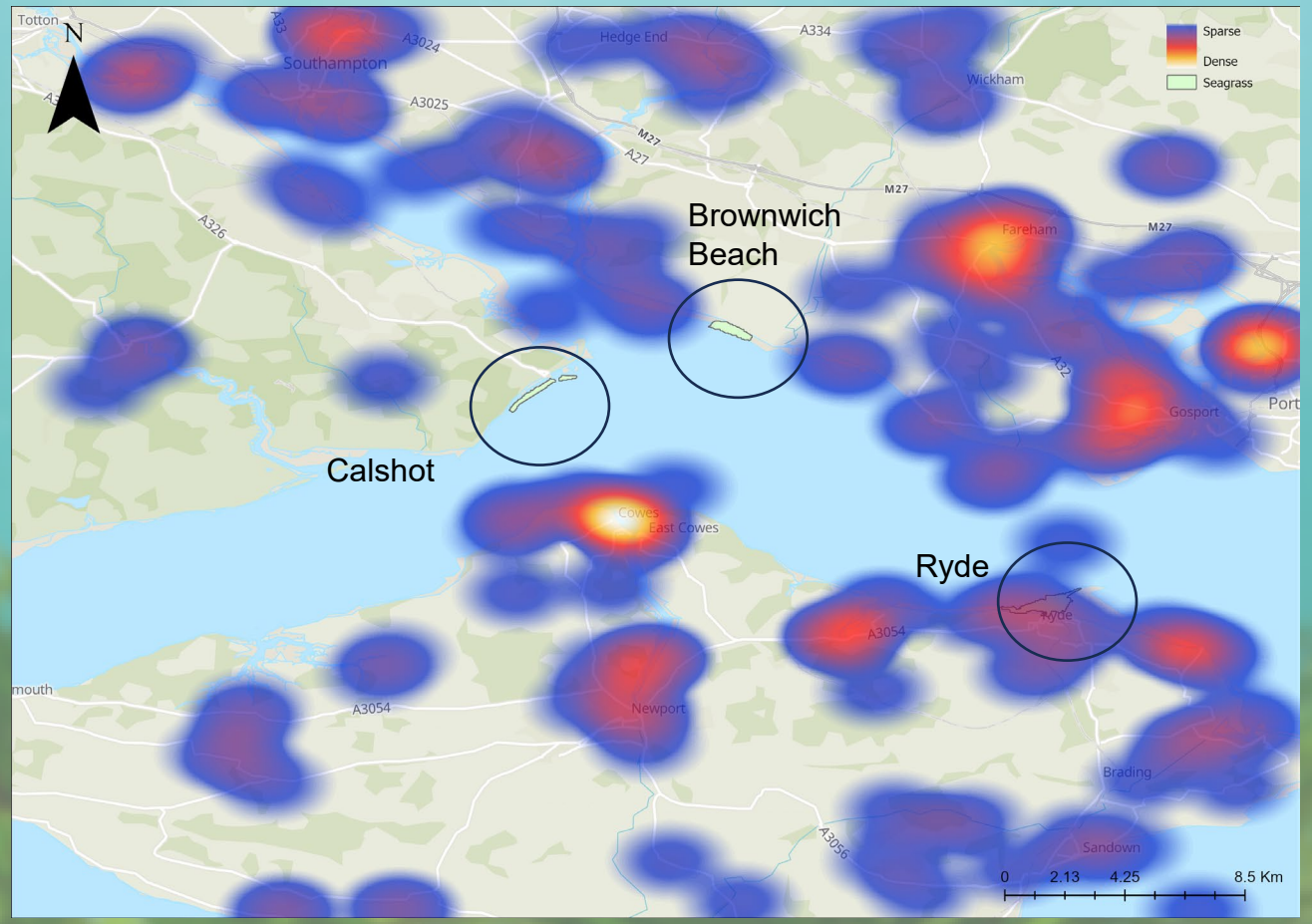


Figure 12: Heat map of the Solent

Tidal Variations

- **Calshot → ebb dominant** current, **highest** average MP abundance
- **Ryde** & **Brownwich Beach → weaker**, more **symmetrical** currents, **lower** average MP abundance
- Pattern **contradicts** expected theory

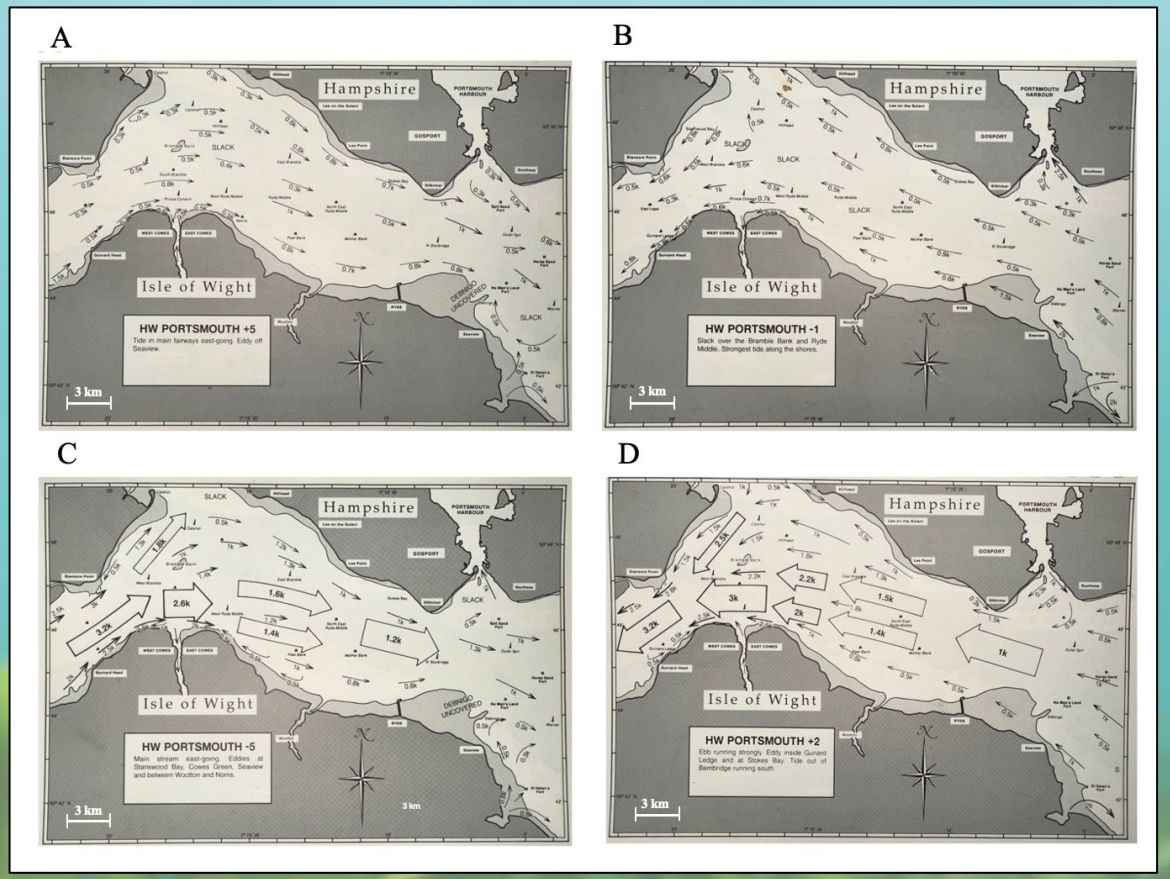


Figure 13: Four stages of the tidal cycle in the Solent based on high water (HW) at Portsmouth. A) Minimum flood tide of the Solent. B) Minimum ebb tide of the Solent. C) Maximum flood tide of the Solent. D) Maximum ebb tide of the Solent.

Wind Direction

- **West-southwest** prevailing wind direction
- **Ryde → offshore** zone, lowest average MP abundance
- **Brownwich Beach → onshore** zone, intermediate average MP abundance
- **Calshot → cross/offshore** zone, highest average MP abundance

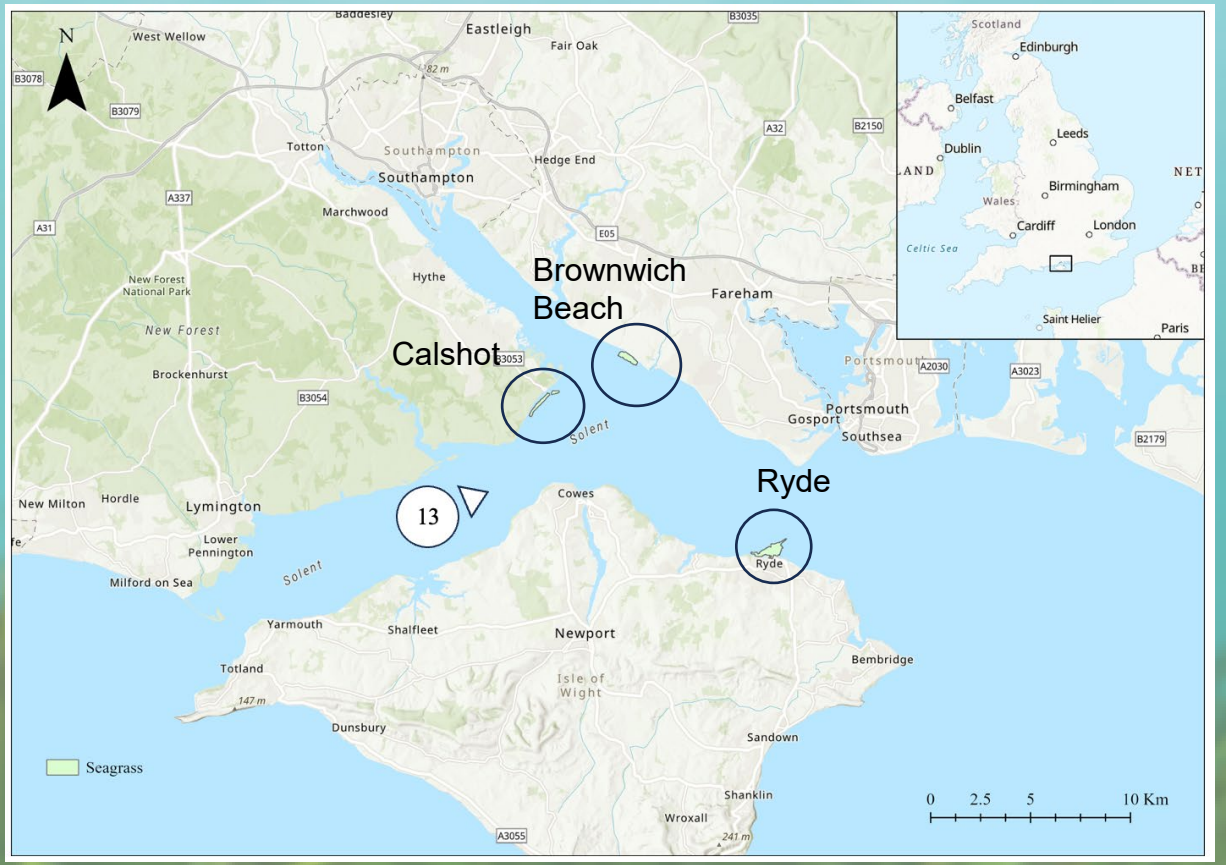


Figure 14: Prevailing wind direction and average speed of the Solent, based on observations taken from 07/2002 – 02/2015 (WindFinder, 2025). Sites seagrass areas only, as clipped from MagicMap (2025), made in ArcGIS Pro (Esri, 2025)

Seagrass Type

- Density Theory → more dense meadow = higher flow reduction

- Height Theory → taller canopy = increase in MPs

Table 2: Ryde seagrass site field observations

Quadrat	Sediment	Seagrass Cover (%)	Seagrass Species	Canopy Height Average (cm)	Epi Cover (%)
1	Sand	55	Zostera noltii	11.67	0
2	Sand	90	Zostera noltii	14.67	0
3	Sand/Mud	30	Zostera noltii	15	0
Mean	N/A	58	N/A	13.78	0

Table 3: Calshot seagrass site field observations

Quadrat	Sediment	Seagrass Cover (%)	Seagrass Species	Canopy Height Average (cm)	Epi Cover (%)
1	Sand/Clay	35	Zostera marina	29	20
2	Gravel/sandy mud	35	Zostera marina	21	17
3	Gravel/sandy mud	20	Zostera marina	20.33	17
Mean	N/A	30	N/A	23.44	18

Table 2: Ryde seagrass site field observations

Quadrat	Sediment	Seagrass Cover (%)	Seagrass Species	Canopy Height Average (cm)	Epi Cover (%)
1	Sandy/Gravel	30	Zostera noltii	22.33	0
2	Sandy/Gravel	75	Zostera noltii	20	35
3	Sandy/Gravel	75	Zostera noltii	17	10
Mean	N/A	60	N/A	19.78	15

Global Context

Source	Media	Location	No. of sites	Location type	Dominant seagrass species	*n*	% of samples containing MP	Dominant MP form	Dominant MP colour	Statistical difference between SG and UV
This study	NaCl	England	3	Coastal	*Z. marina, Z. noltii*	54	100	Fibres	Black	Yes
Tahir et al., 2019	ZnBr	Indonesia	3	Remote Island	*Halophila, Cymodocea, Enhalus, Thalassia, Syringodium,*	81	27	Fibres Filaments	Blue	n/a
Huang et al., 2020	ZnCl2	China	2	Coastal	*E. acodides*	12	100	Fibres Filaments	Blue	Yes
Jones et al., 2020	NaCl	Scotland	1	Island	*Z. marina*	25	100	Fibres	Blue	Yes
Krietsberg et al., 2021	NaCl	Estonia	15	Coastal	*Z. marina*	n/a	n/a	Fibres	Blue	Yes (not their own control)
Boshoff et al., 2023	ZnCl2	South Africa	2	Estuarine	*Z. Capensis*	72	96	Fragments	Blue	No
Unsworth et al., 2021	ZnCl2	England and Wales	8	Coastal and Estuarine	*Z. marina, Z. noltii*	80	98	Fibres Filaments	Blue	No

Limitations

- **Small** sample number
- **Resuspended** samples contained MPs
- MP **contamination** in the lab
- Counting MPs is a **subjective** process
- Equipment **restrictions**

Key Opportunities for Future Research

Complex modelling techniques

Explore pathways of black and transparent MPs

Understand ecological effects of fibres

Conclusion

- Microplastics found in **all Solent sediment samples** → evidence of widespread distribution
- **Higher MP accumulation** in *Z. marina* and *Z. noltii* seagrass beds vs. unvegetated areas
- Supports debate on whether **seagrass meadows enhance MP accumulation**
- Need for **standardised MP extraction methods** due to limited comparable studies
- Urbanisation not a major factor in MP distribution
- **Hydrodynamic and seagrass characteristics** show complex, site-specific influences → further research needed
- **Fibres** most common MP shape (aligns with literature)
- Dominant MP colour differed from literature → suggests colour variability


Any Questions?

ISLE OF WIGHT

Local Nature Recovery Strategy

Island Nature

Using the Isle of Wight Local Nature Recovery Strategy

Overview

What is the LNRS

Why we need to use an LNRS

How is the LNRS already being used

How to use the Isle of Wight LNRS

Next Steps

Questions

What is the LNRS?

A Local Nature Recovery Strategy (LNRS) is a new spatial plan, required by the government, across the 48 county regions of England

An LNRS is co-produced with local stakeholders to define locally important habitats and species, and the priorities and measures for their recovery

Unlike plans and strategies that have come before, the LNRS maps out areas where certain measures can have the biggest impact for local habitats and species

Island Nature

The Isle of Wight LNRS

The Isle of Wight LNRS

A 2-year process of wide-reaching engagement and data analysis has contributed to the publication of the Isle of Wight LNRS – the 4th published in the country!

What is the Isle of Wight LNRS made up of?

Part 1: Description of Strategy Area

Part 2: Priorities and Measures

Part 3: Priority Species

Technical Methods

Isle of Wight LNRS Local Habitat Map

APIB: Protected Sites and Irreplaceable Habitats

ACB: Areas identified in the LNRS process as locations that, with specified measures, could become important for biodiversity

ISLE OF WIGHT

Local Nature Recovery Strategy

Community & Sector Engagement

Over 200 engagement events; Webinars, public and sector-specific events, farmer engagement, surveys

Local Experts

Local expert habitat workshop and species long and shortlisting

Policy Alignment

Local, National and International

Data and Analysis

Local and national data for habitats, species, pressures and opportunities

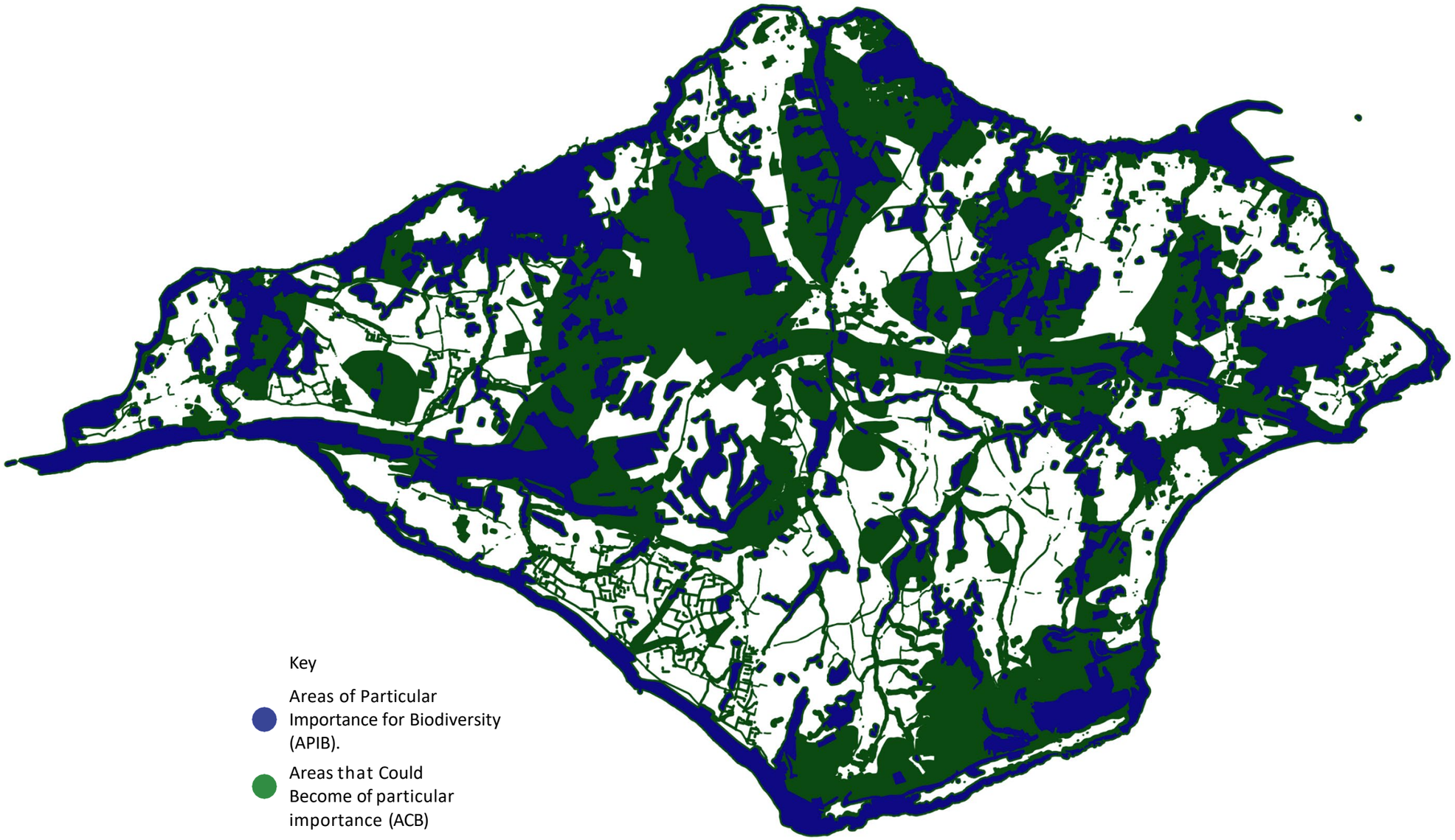
Ecosystem Service and Resilience

Climate change, human health and ecosystem function

Iterative and Deliverable

Continued review of what was proposed where, and its deliverability

Island Nature



Key

Areas of Particular Importance for Biodiversity (APIB).

Areas that Could Become of particular importance (ACB)

The Isle of Wight Local Habitat Map

Visible Located Priorities

Isle of Wight LNRS: National Exemplar!

The Isle of Wight sailed through the final Defra panel and legal process with flying colours!

‘National Exemplar’ feedback from Natural England and Defra

Minister for Nature quote for the Island!

Amazing wide-reaching media coverage

Island Nature

Why we need an LNRS

LNRS's are a result of the Environment Act (2021), with aims to address:

Biodiversity Loss

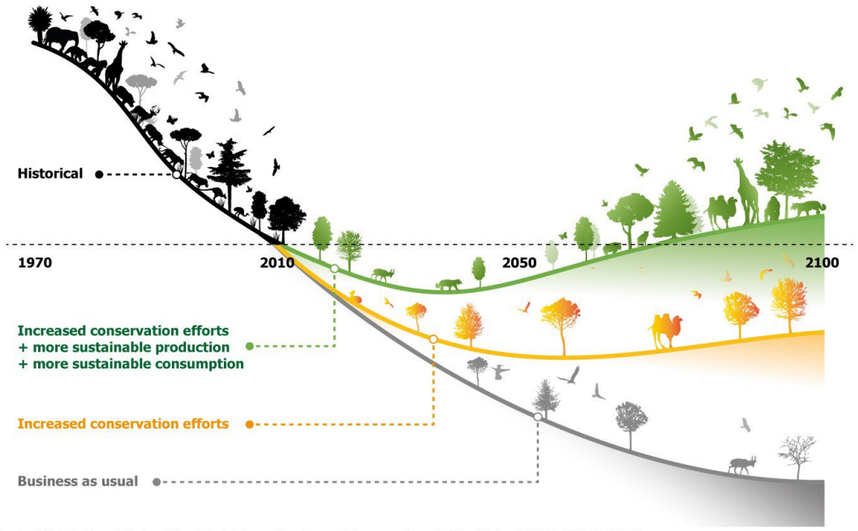
Climate Change Resilience

National and International Targets

Locally-led Decision Making

Access to Nature

Essential Tools for Spatially Coordinated Action



This artwork illustrates the main findings of the article, but does not intend to accurately represent its results (https://doi.org/10.1038/s41586-020-2705-y)

Island Echo, 2023

How the LNRS is already being Used

Biodiversity Net Gain

- Strategic Significance Uplift (15%)

Engagement

- FOCAS and Biosphere Festival, Business Expo
- LNRS documents and 10 Steps in Libraries
- LNRS engagement with Parishes and IWALC
- Isle of Wight Council Procurement

Implementation

- Project applications
- Public Land Management (parks, cemeteries, etc)
- Parish and Town Council decision-making
- Environmental Land Management Schemes for Farmers

Sanderling Recovery underway in Ryde this year!

How to use the Isle of Wight LNRS

1. Part 1: Description of Strategy Area
2. Part 2: Priorities and Measures
3. Part 3: Priority Species and Species Assemblages
4. Part 4: Technical Methods
5. Local Habitat Map

islandnature.org

Next steps

Bespoke Toolkits

- Business
- Farmers
- Parishes
- Gardens

Engagement

- Island Nature Forum
- Public Engagement
- Training
- Farmer support

Monitoring Action

- Projects: Landscape to Gardens
- BNG delivery
- Online map and survey app
- LNRS review and republish: 3-10 years

Island Nature Forum first Delivery Meeting, July 2025

ISLE OF WIGHT

Local Nature Recovery Strategy