

## *SEA practice in Ireland - SEA Effectiveness, SEA Action Planning and AI*

### *Thematic Session: Improving Strategic Environmental Assessment practice in the EU and the wider world – can AI help?*

*Saturday May 3<sup>rd</sup> 14.00 -15.30*



Senior Scientific Officer, Environmental Protection Agency  
Ireland

[t.omahony@epa.ie](mailto:t.omahony@epa.ie)

[www.epa.ie](http://www.epa.ie)



# Areas to be covered

- ❑ Role of EPA in SEA
- ❑ Ireland's SEA Statistics
- ❑ Role of AI –
  - Screening
  - Scoping
  - Baseline Environment
  - Alternatives
  - Monitoring
- ❑ SEA and AI , the Way Forward

# Key Aspects of EPA role in SEA Effectiveness aspects



- ❑ Coordinate and provide Secretariat for National SEA Forum
- ❑ Commission SEA Effectiveness Reviews – I/II
- ❑ Implement SEA Action Plan I/II
- ❑ Preparation of SEA related Guidance and Applied SEA Research
- ❑ Promotion of Good Practice in SEA
- ❑ Maintain SEA Statistics
- ❑ Promotion of sector SEA take up - Advocacy Role

# AI - How effective is Strategic Environmental Assessment in Ireland



Strategic Environmental Assessment (SEA) in Ireland has made significant progress, but challenges remain. A **second review of SEA effectiveness** found that while SEA is increasingly integrated into planning, monitoring remains a weak point.

## Key Findings on SEA Effectiveness in Ireland:

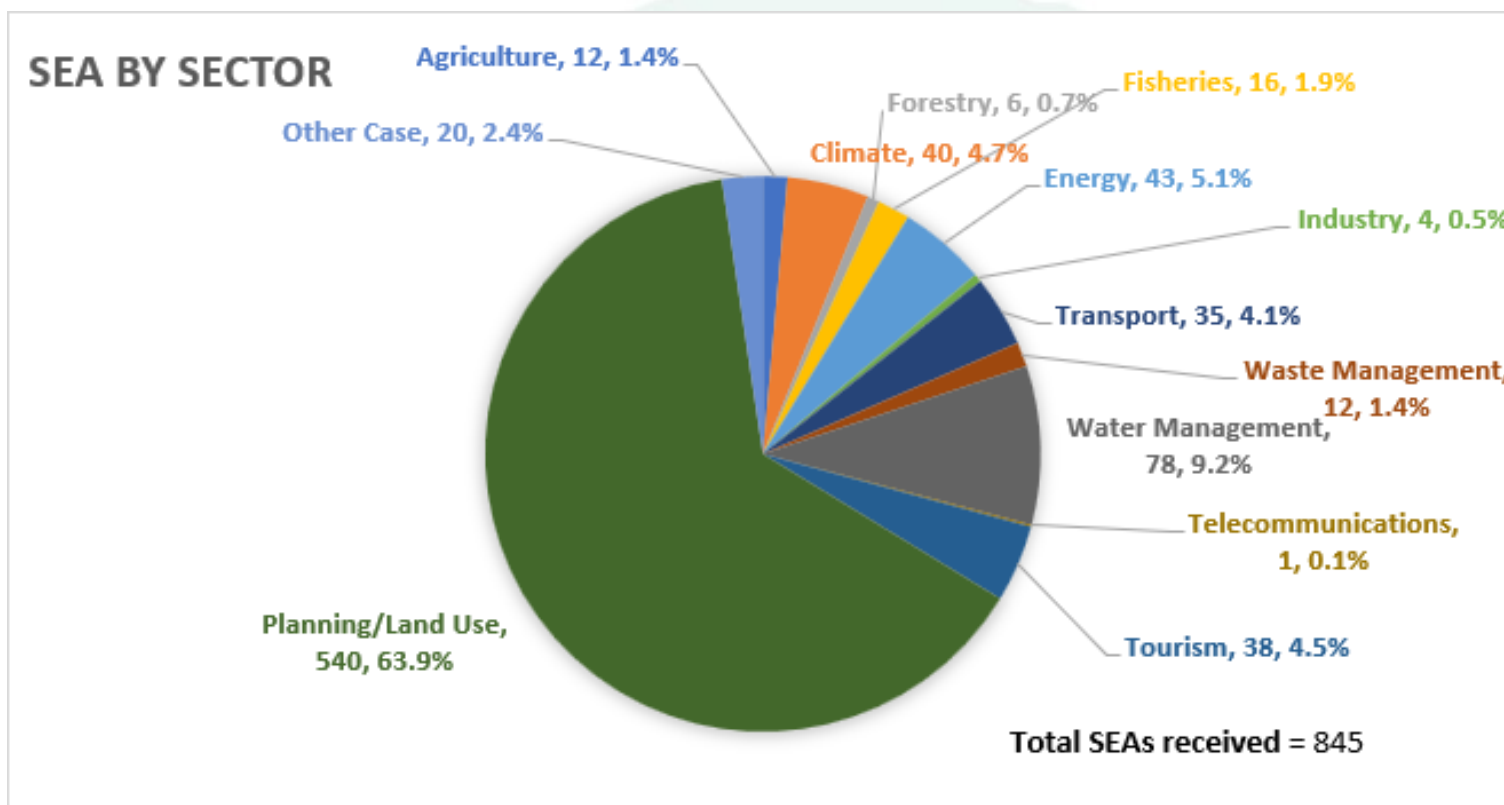
- **Improved Procedural Effectiveness** – SEA is now more embedded in planning processes, with greater engagement from governmental bodies.
- **Legal Challenges Driving Change** – Increased scrutiny from Irish and EU courts has led to better environmental integration.
- **Environmental Awareness** – SEA has contributed to better environmental integration in planning, though its influence is sometimes difficult to measure.

- **Monitoring Gaps** – The biggest challenge remains the lack of effective monitoring, with plan-makers needing clearer guidance.
- **Public Engagement** – While SEA consultations occur, they often fail to fully engage the public.

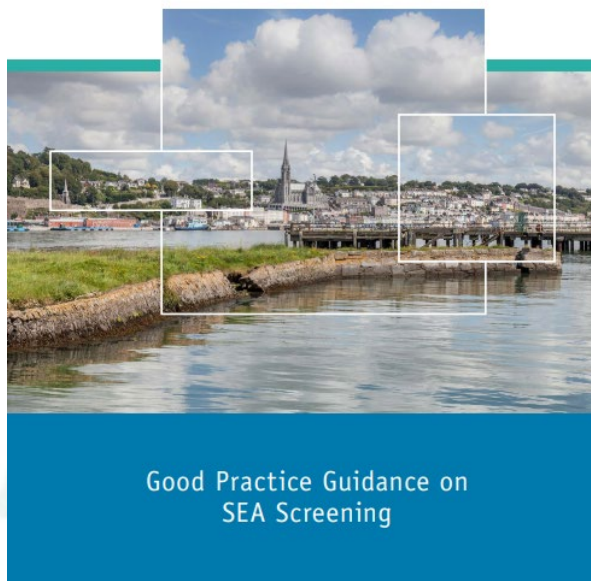


For a deeper dive, you can explore the full report [here](#). Would you like insights on how SEA compares to other environmental assessment methods?

# SEA BY SECTOR & LEVEL OF ACTIVITY JULY 2004 TO Q1 2025 - 845



# EPA Guidance SEA and Screening Good Practice Guidance



Good Practice Guidance on  
SEA Screening

Strategic Environmental Assessment Screening | Good Practice Guidance

## TABLE OF CONTENTS

<b>1. INTRODUCTION</b>	<b>1</b>
1.1 Purpose of the Guidance	1
1.2 Overview of SEA	2
1.3 The Benefits of SEA	2
1.4 Current Shortcomings in SEA Screening	2
<b>2. IN A NUTSHELL</b>	<b>3</b>
2.1 Aim and Purpose of SEA	3
2.2 Who Does it Apply to?	3
2.3 What Plans and Programmes Require SEA?	4
2.4 Mandatory SEA	5
2.5 Consequence of not Carrying out SEA	5
<b>3. SEA LEGISLATIVE REQUIREMENTS</b>	<b>6</b>
3.1 The SEA Directive (2001/42/EC)	6
3.2 The Relevant Recitals	6
3.3 Article 2	7
3.4 Article 3	7
3.5 Annex II	7
3.6 Transposing Irish Legislation	8
3.6.1 European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 (S.I. 435/2004 as amended by S.I. 200/2011)	8
3.6.2 Planning and Development (Strategic Environmental Assessment) Regulations 2004 (S.I. 436/2004, as amended by S.I. 201/2011)	9
<b>4. KEY CONCEPTS</b>	<b>10</b>
<b>5. THE SCREENING PROCESS</b>	<b>12</b>
5.1 Stage 1 – Applicability	14
5.1.1 Outcome from Stage 1	16
5.2 Stage 2 Screening – Case-by-Case Consideration	16
5.3 Stage 3 Determination	21
<b>6. TEMPLATES</b>	<b>22</b>
6.1 Applicability Template 1	22
6.2 Screening Report Template 2	24
6.3 Screening Determination Template 3	29



# AI - Cork County Council are developing a new County Development Plan can you screen the Plan with respect To the Annex II Criteria of the SEA Directive



AI can certainly help you consider how Cork County Council's new **County Development Plan** aligns with the **Annex II Criteria of the Strategic Environmental Assessment (SEA) Directive**.

The Annex II criteria guide the screening process to determine whether a **plan or program** requires full SEA based on its environmental impact. Here's how the Plan might be assessed:

## Key Screening Considerations (Annex II Criteria)

### 1. Characteristics of the Plan

- **Scope & Influence**: Does the plan set a framework for projects requiring Environmental Impact Assessment (EIA)?
- **Cumulative Impact**: Will policies contribute to broader environmental effects beyond Cork County?
- **Environmental Protection**: Does the plan comply with international and national environmental regulations?

### 2. Potential Environmental Effects

- **Biodiversity & Ecosystems**: Does it affect Special Areas of Conservation (SACs), Special Protection Areas (SPAs), or Natural Heritage Areas (NHAs)?
- **Water & Air Quality**: Will proposed developments impact water bodies or air pollution levels?
- **Resource Use & Climate Change**: Does it align with sustainable energy and climate adaptation goals?
- **Human Health & Landscape**: Could the plan lead to risks for public health or alter significant landscapes?

AI - Cork County Council are developing a new County Development Plan can you screen the Plan with respect To the Annex II Criteria of the SEA Directive ctd..



#### 4. Scope of the Plan & Framework for Development:

- The County Development Plan influences future projects, including those requiring Environmental Impact Assessment (EIA).
- It guides urban expansion, infrastructure upgrades, zoning, and natural resource management.
- Since this framework significantly influences development it likely warrants a full SEA assessment.

#### 5. Likely Significant Environmental Effects:

##### Biodiversity & Ecosystem Protection

- The Plan affects Special Areas of Conservation (SACs) and Special Protection Areas (SPAs), such as Cork Harbour & the Blackwater River.
- It should mitigate potential habitat loss, ensure green infrastructure connectivity, and protect key wildlife corridors.

Warrants  
Full SEA Assessment



## Cork County Council SEA Baseline - Freshwater Pearl Mussel Catchment

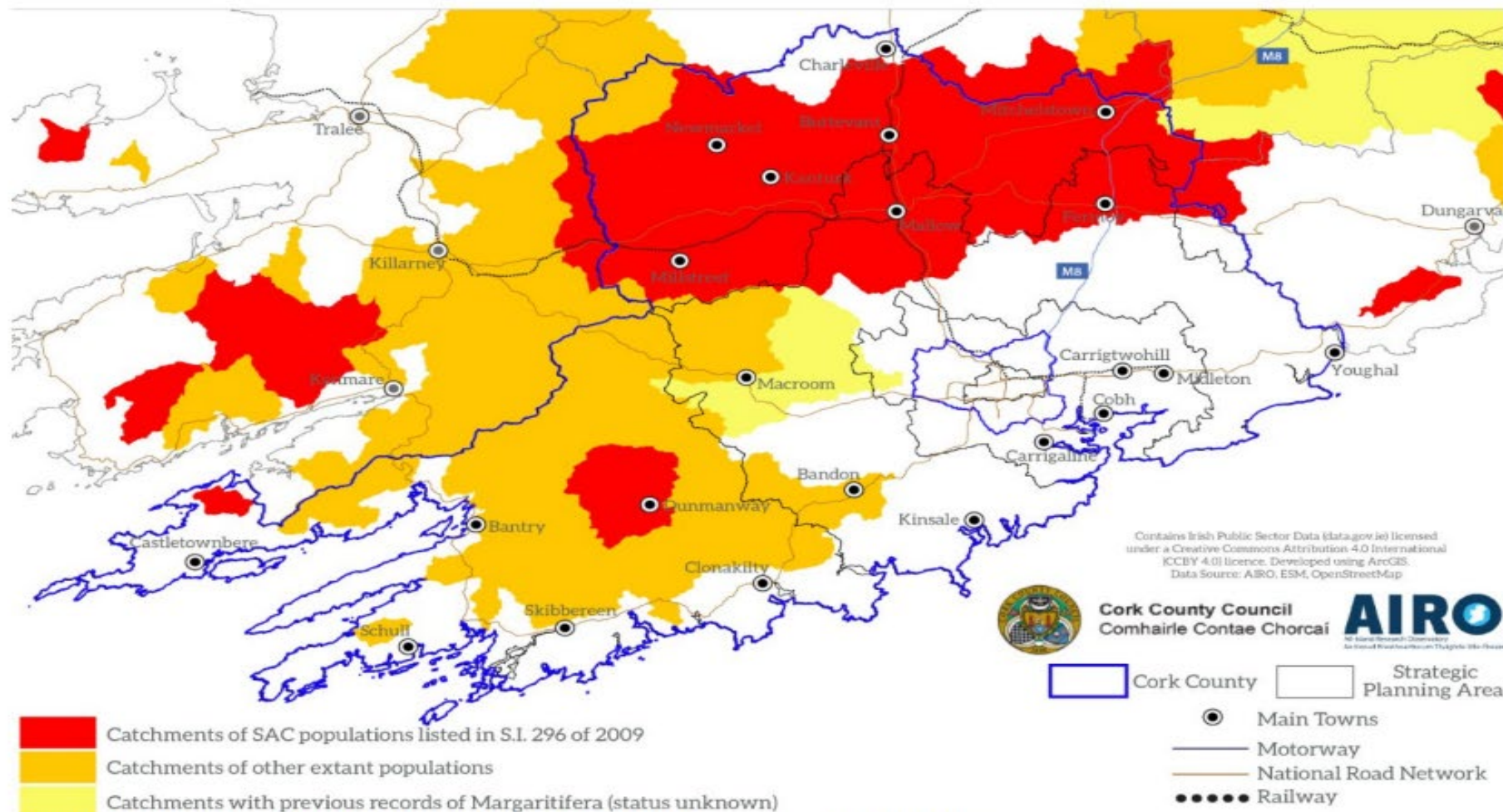


Figure 6.2.2 – Freshwater Pearl Mussel Catchments in Cork County Data source – ESM and NPWS

AI - Cork County Council are developing a new County Development Plan can you screen the Plan with respect To the Annex II Criteria of the SEA Directive ctd..



### **Likely Significant Environmental Effects**

**ctd:**

#### *Resource Efficiency & Climate Resilience*

- Does the Plan prioritize renewable energy integration (such as offshore wind in Cork Harbor)?
- Are climate adaptation strategies incorporated, especially for flood-prone areas?
- SEA should evaluate how urban developments reduce carbon emissions and energy consumption.

#### *Human Health & Landscape Integrity*

- The Plan should ensure that urban growth does not compromise public health due to increased pollution, noise, and congestion.
- Major developments must respect scenic landscapes and protected views, such as areas along the Beara Peninsula and West Cork coastline.



# EPA SEA and Landscape Guidance

## West Cork – Scenic Landscape/ Seascape



Good practice guidance on  
Strategic Environmental Assessment (SEA)  
and Landscape





AI - Cork County Council are developing a new County Development Plan can you screen the Plan with respect To the Annex II Criteria of the SEA Directive ctd..



## Sensitivity of Affected Areas

### Urban vs. Rural Development

- SEA screening should assess whether urban intensification leads to overdevelopment, while rural policies risk **population decline** or **landscape fragmentation**.
- Sustainable rural development policies must balance **housing needs** with the **protection of agriculture lands and natural habitats**.

## Coastal & Marine Considerations

- Cork's coastal zones are sensitive to **climate change impacts, including rising sea levels and erosion**.
- SEA must examine **marine spatial planning** and whether **industrial expansion near Cork Harbour affects biodiversity**



County Cork Biodiversity Action Plan 2009-2014  
Contae Chorcaí Plean Ghníomhartha Bhitheagsulacht 2009-2014



Net Worth	100	Net Worth	100
Assets	100	Assets	100
Liabilities	100	Liabilities	100
Equity	100	Equity	100
Debt	100	Debt	100
Income	100	Income	100
Expenses	100	Expenses	100
Assets	100	Assets	100
Liabilities	100	Liabilities	100
Equity	100	Equity	100
Debt	100	Debt	100
Income	100	Income	100
Expenses	100	Expenses	100



Neelima Mehta	Department of Family Health
Neelima Department of Family Health	Department of Integrative Health
Neelima Department of Family Health	Department of Integrative Health
Neelima Department of Family Health	Department of Integrative Health
Neelima Department of Family Health	Department of Integrative Health

[illegible]



## Cork County Council SEA Baseline - Climate Change/Biodiversity Scenario

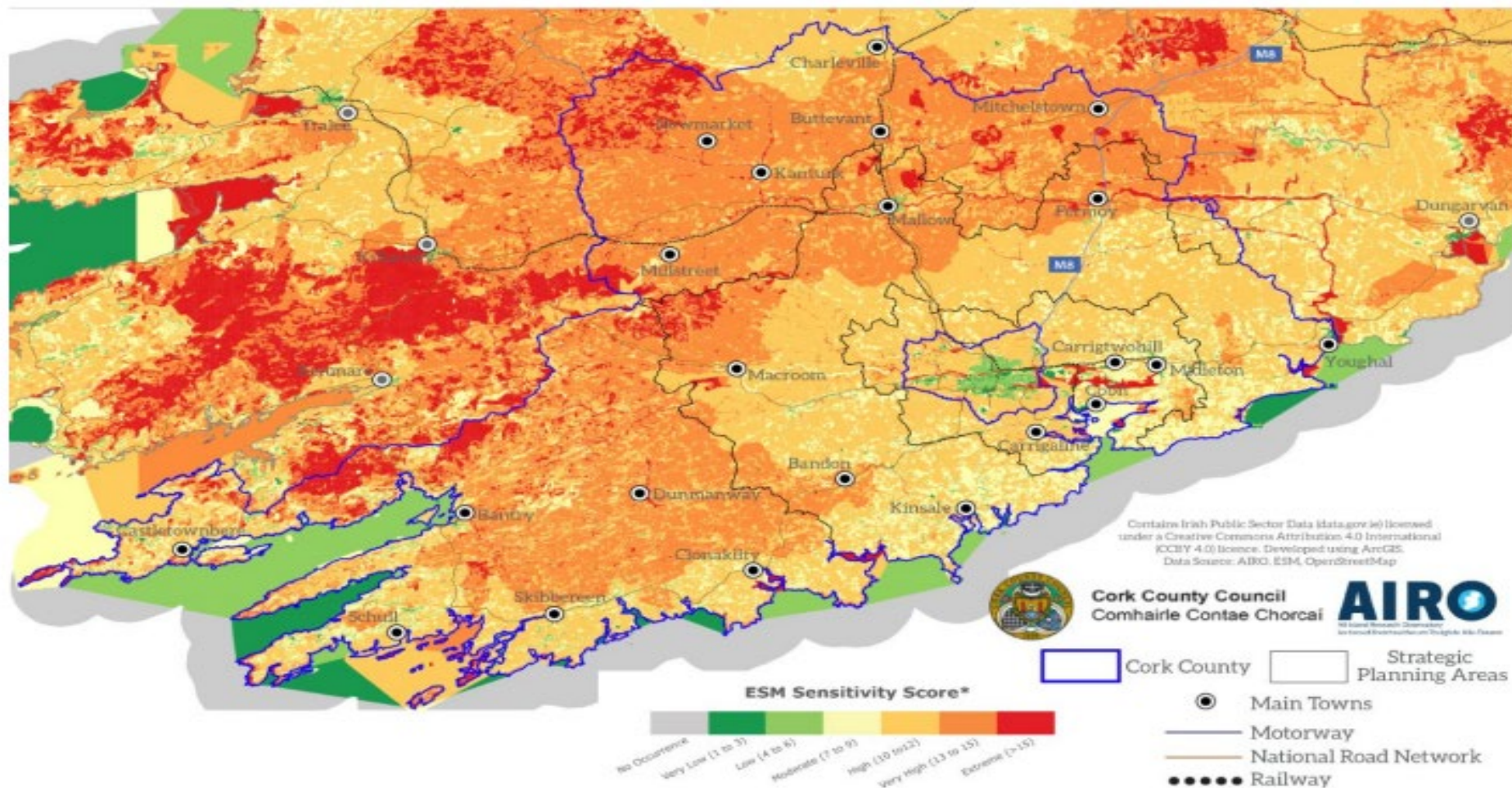


Figure 6.2.3 –Environmental Sensitivity Map illustrating Climate Change and Biodiversity Scenario. Data source – ESM



## Final Assessment: Is Full SEA Required?

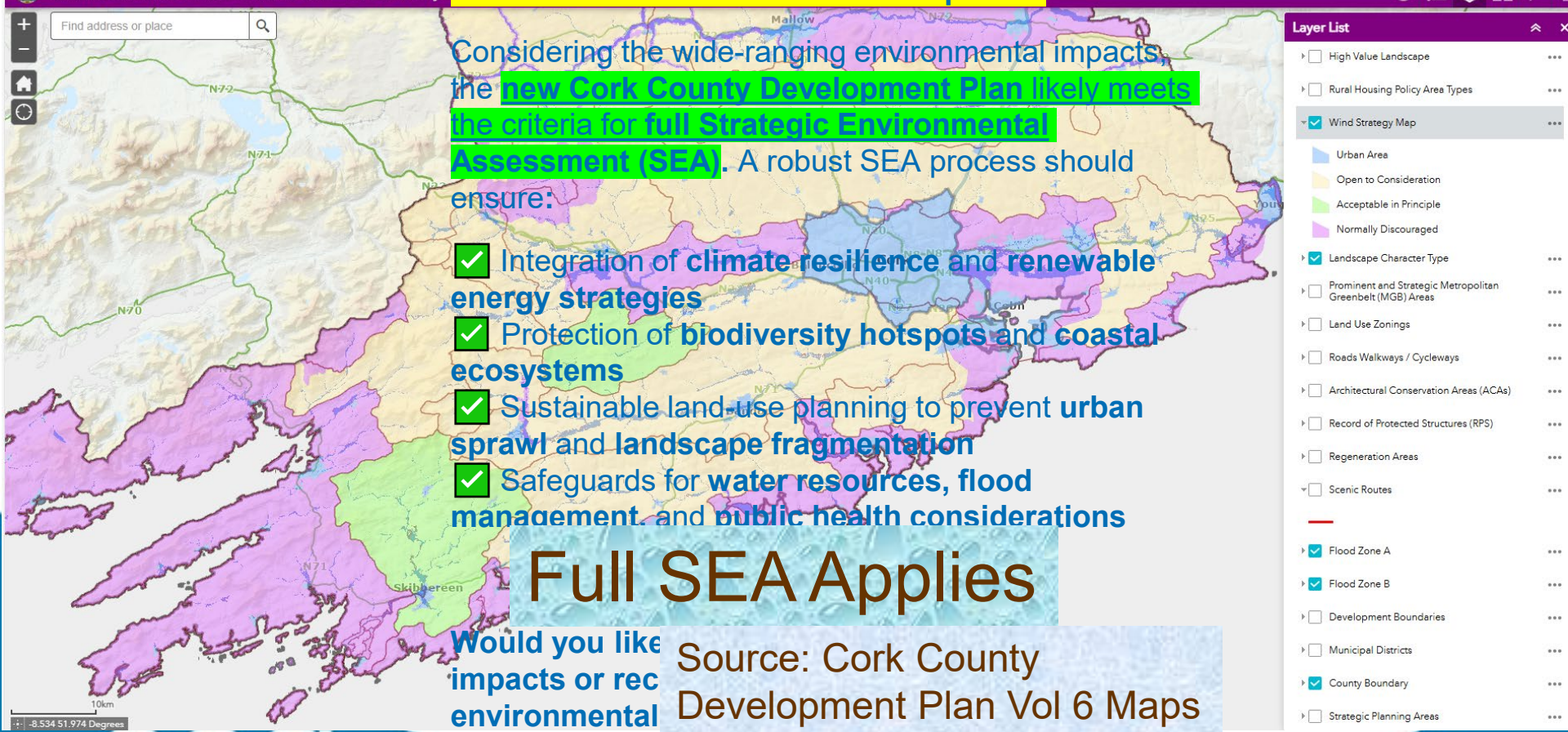
Considering the wide-ranging environmental impacts, the **new Cork County Development Plan likely meets the criteria for full Strategic Environmental Assessment (SEA)**. A robust SEA process should ensure:

- ✓ Integration of **climate resilience and renewable energy strategies**
- ✓ Protection of **biodiversity hotspots and coastal ecosystems**
- ✓ Sustainable land-use planning to prevent **urban sprawl and landscape fragmentation**
- ✓ Safeguards for **water resources, flood management, and public health considerations**

# Full SEA Applies

Would you like  
impacts or rec  
environmental

Source: Cork County  
Development Plan Vol 6 Maps



# AI Strategic Environmental Scoping of significant environmental issues for South Coast Designated Marine Area Plan (DMAP)



The **South Coast Designated Maritime Area Plan (SC-DMAP)** is Ireland's first forward spatial plan for **offshore renewable energy (ORE)**, focusing on the **Celtic Sea**. The plan identifies four maritime areas for potential offshore wind development, ensuring environmental protection while supporting Ireland's clean energy transition.

## Key Environmental Issues in SEA Scoping:

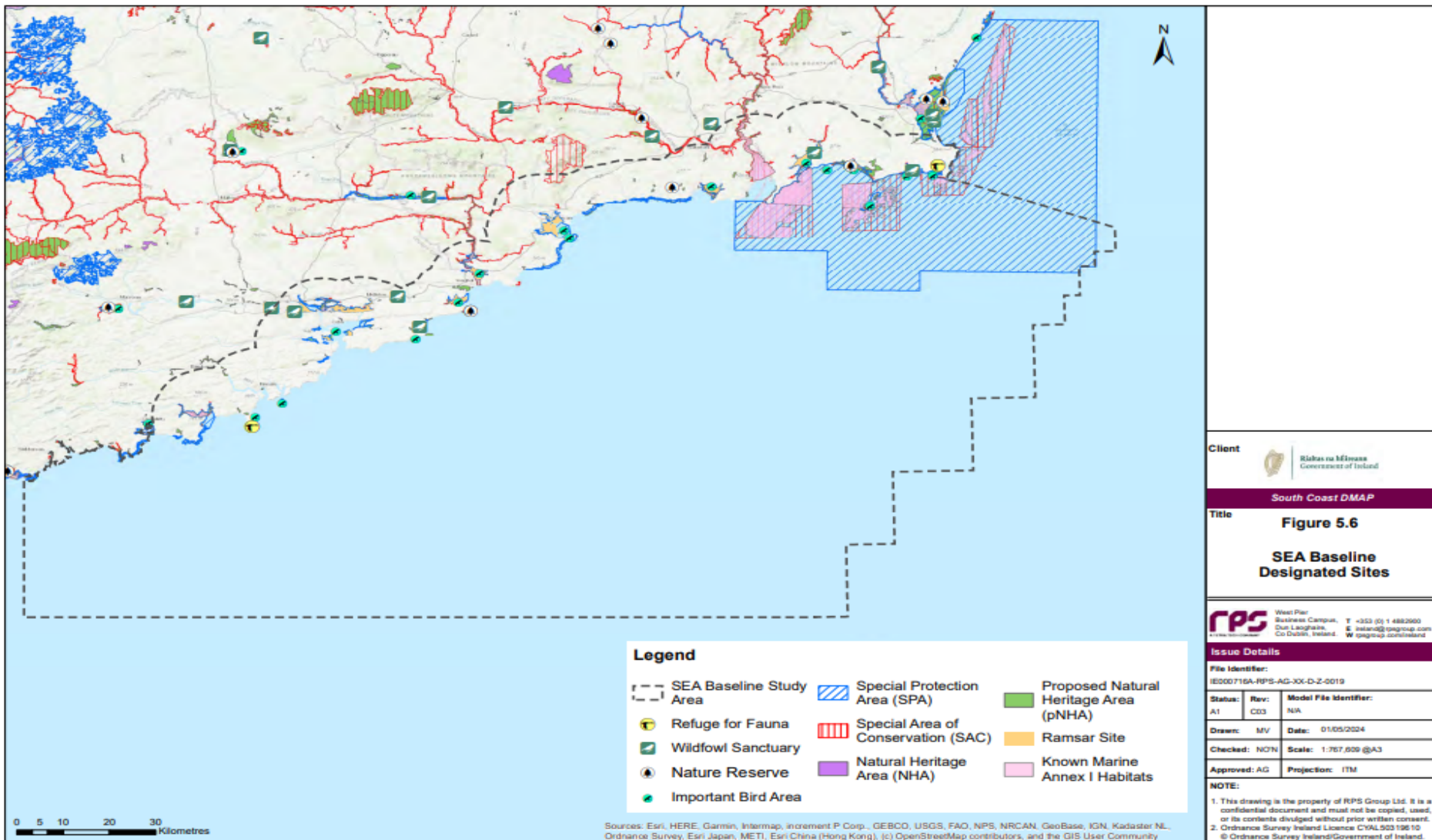
### 1. Biodiversity & Marine Ecosystems:

- Impact on **marine habitats**, including **seabird populations** and fish stocks
- Protection of **Special Areas of Conservation (SACs)** and **Marine Protected Areas (MPAs)**.

### 2. Water Quality & Coastal Erosion:

- Potential effects of offshore wind infrastructure on **water currents and sediment transport**.
- Strategies to **mitigate coastal erosion** and maintain **water quality standards**.

# South Coast DMAP: Ecological Designations





# South Coast DMAP: Technical and Environmental Exclusions

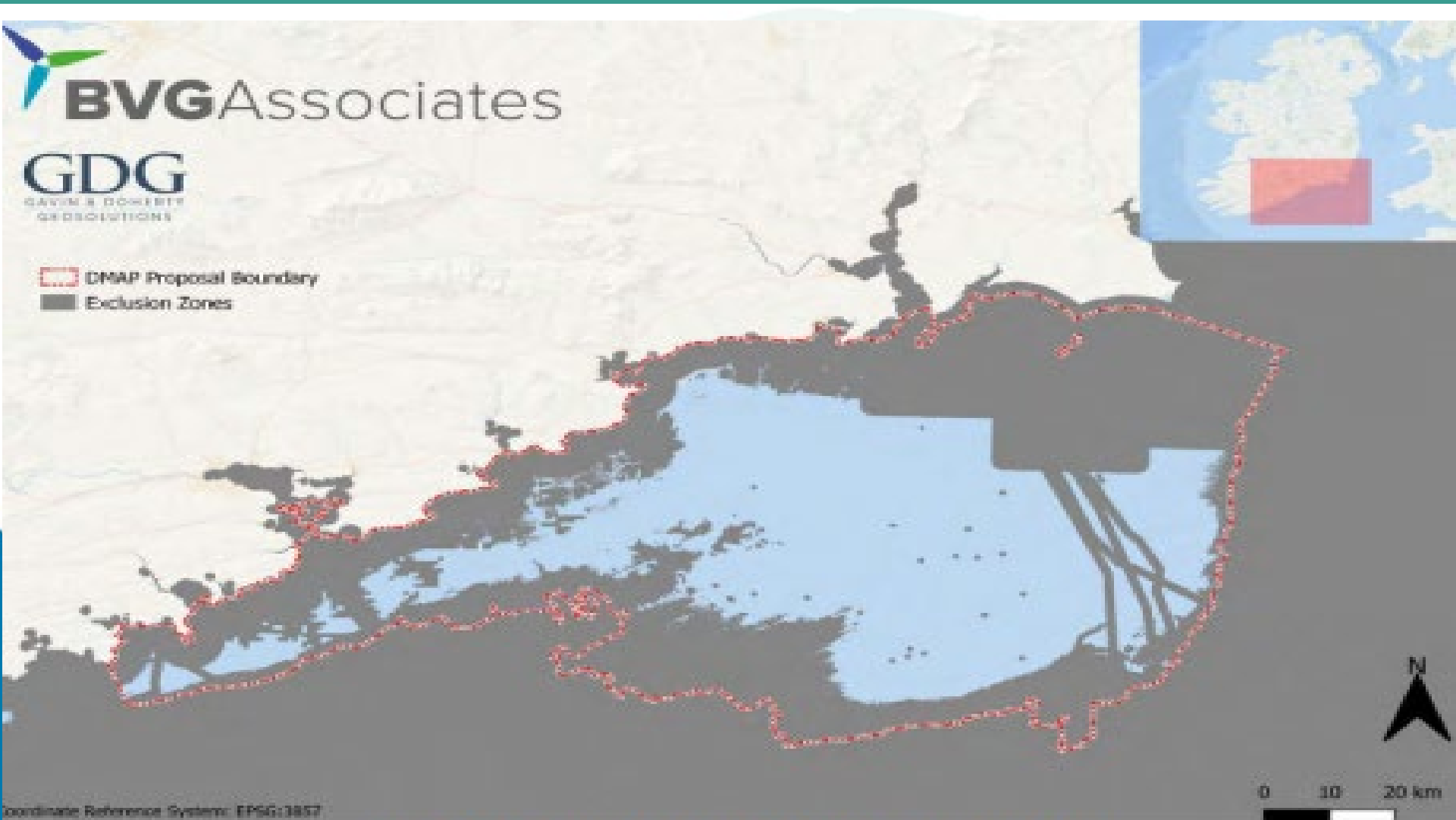


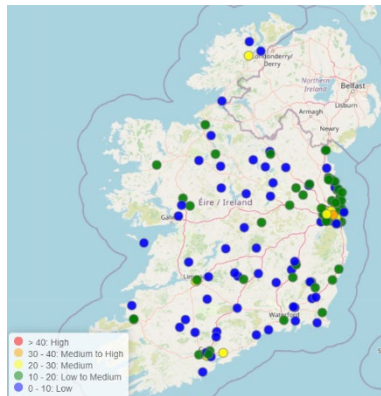
Figure 7-8: Combined Technical and Environmental Exclusions

# Potential use of AI: Baseline Environment

## Description: Air Quality - National Level Plan



### Summary of Air Quality for Ireland for use in Baseline Environmental Description of National Plan:



Dublin City Council, Fingal County Council, South Dublin County Council and Dun Laoghaire-Rathdown County Council

### Dublin Region Air Quality Plan 2021

Air Quality Plan to improve Nitrogen Dioxide levels in Dublin Region



Ireland's air quality is influenced by both natural and human activities. While Ireland benefits from its geographical location, with prevailing south-west winds reducing transboundary pollution, challenges remain in urban and rural areas. Key contributors to air pollution include emissions from home heating, agriculture, transport, and energy generation.

The European Union's Air Quality Directives set standards for monitoring and reducing emissions, aiming to protect health and ecosystems. Despite these measures, areas of poorer air quality have been identified, with nitrogen dioxide levels being a concern in urban regions.

Efforts to improve air quality include local air pollution sensors and management plans, such as [Dublin's Air Quality Management Plan](#). The [Environmental Protection Agency's expanded monitoring program](#) provides comprehensive data to address these challenges. If you'd like more detailed insights or specific data, let me know!

# Potential use of AI: Baseline Environment

## Description: Air Quality - National Level Plan



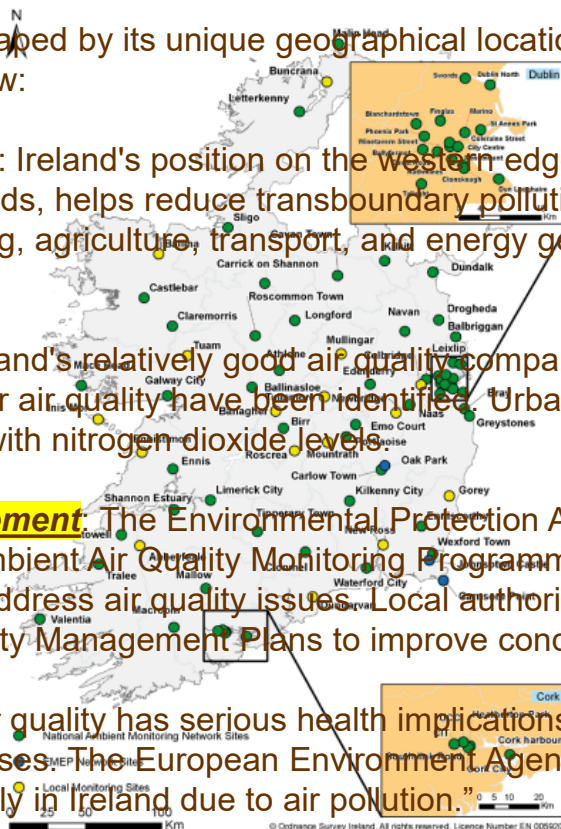
"Ireland's air quality is shaped by its unique geographical location and human activities. Here's a detailed overview:

**Geographical Influence:** Ireland's position on the western edge of Europe, with prevailing south-west winds, helps reduce transboundary pollution. However, local sources like home heating, agriculture, transport, and energy generation contribute to air pollution.....

**Challenges:** Despite Ireland's relatively good air quality compared to other European countries, areas of poorer air quality have been identified. Urban regions, particularly Dublin, face challenges with nitrogen dioxide levels.

**Monitoring and Management:** The Environmental Protection Agency (EPA) has expanded its National Ambient Air Quality Monitoring Programme, providing comprehensive data to address air quality issues. Local authorities, like those in Dublin, have developed Air Quality Management Plans to improve conditions.

**Health Impacts:** Poor air quality has serious health implications, including respiratory and cardiovascular diseases. The European Environment Agency estimates over 1,300 premature deaths annually in Ireland due to air pollution."



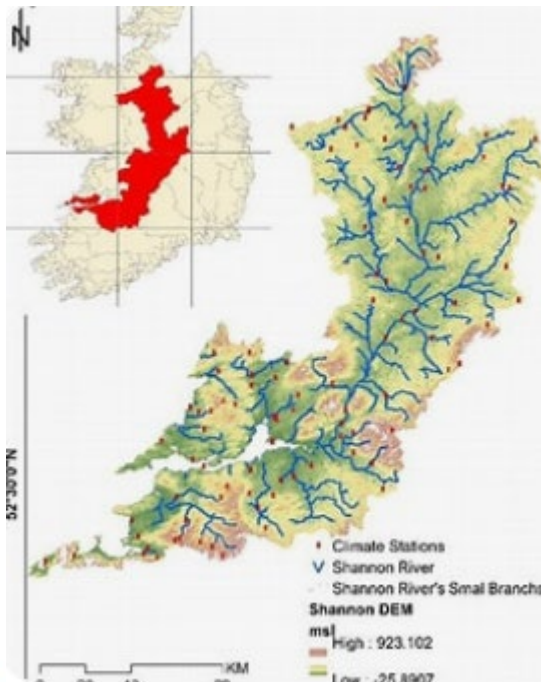
For more detailed information, you can explore the Clean Air Strategy or the EPA's Air Quality Assessment. Let me know if you'd like further assistance!



# Potential use of AI: Baseline Environment

## Description: Water Quality – Regional Level

### Plan

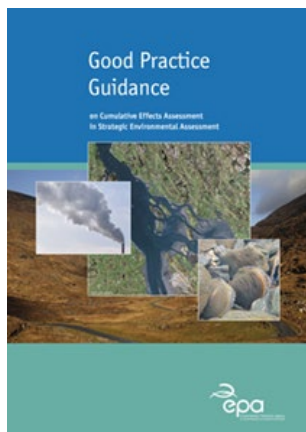


The **Shannon Catchment**, Ireland's largest river basin, plays a vital role in the country's water quality and ecosystem health. Here's a baseline overview:

1. **Geographical Scope**: The Shannon Catchment spans a vast area, including rivers, lakes, and groundwater bodies. It is characterized by diverse landscapes, from flat, boggy regions to undulating terrains.
2. **Water Quality Status**: Recent assessments indicate that a significant portion of surface water bodies in the catchment are not meeting the "Good Ecological Status" required under the EU Water Framework Directive. Groundwater bodies, however, generally maintain good status.
3. **Pressures on Water Quality**: Key pressures include **agricultural runoff**, **urban wastewater**, and **industrial discharges**. These activities contribute to nutrient enrichment, leading to issues like eutrophication in some water bodies...

For detailed data and reports, you can explore resources like the Upper Shannon Catchment Report or the Shannon Catchment Factsheet. Let me know if you'd like further insights!

# SEA Guidance – Procedural & Sectoral :Transforming SEA Practice



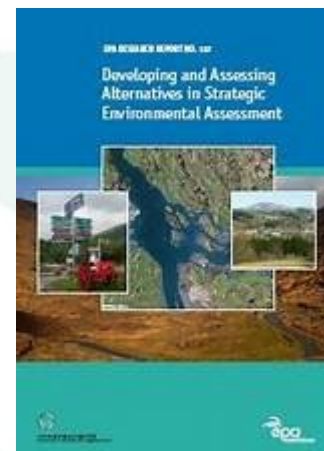
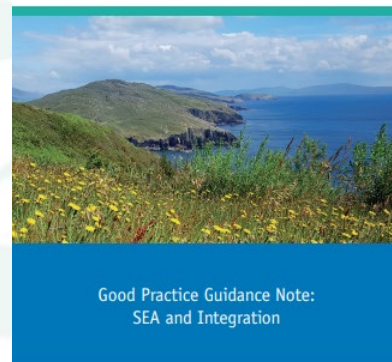
## **Procedural Guidance:**

- ❑ Alternatives
- ❑ Monitoring & SEA Statements
- ❑ Cumulative Effects
- ❑ Screening



## **Sectoral Guidance:**

- ❑ Land Use Planning
- ❑ Forestry
- ❑ Energy
- ❑ Tourism



## **Additional: Public Participation, KPIs, Integration,**

## **In prep: PRO Health, Proposed: SEA and Scoping**

<http://www.epa.ie/monitoringassessment/assessment/sea/resources/>

# AI - Clare County Development Plan is being reviewed, generate reasonable spatial scenarios that could be explored in the Strategic Environmental Assessment process



As Clare County reviews its Development Plan, the **Strategic Environmental Assessment (SEA)** process can explore various spatial scenarios to balance sustainable growth, environmental protection, and economic development. Here are some reasonable alternatives:

## 1. Compact Growth & Town Expansion

- Focus on **densifying existing urban areas** like **Ennis, Shannon, and Kilrush** to reduce urban sprawl.
- Encourage **mixed-use development** to enhance walkability and public transport efficiency.
- Protect **green belts and ecologically sensitive areas** by limiting expansion beyond designated zones.

## 2. Coastal Protection & Climate Resilience

- Implement **strict zoning regulations** to limit construction in flood-prone coastal areas.
- Strengthen **natural buffers** such as wetlands and dune systems to combat rising sea levels.
- Encourage **sustainable tourism** with eco-friendly infrastructure that minimizes environmental impact.

# AI - Clare County Development Plan is being reviewed, generate reasonable spatial scenarios that could be explored in the Strategic Environmental Assessment process

As Clare County reviews its Development Plan, the **Strategic Environmental Assessment (SEA)** process can explore various spatial scenarios to balance sustainable growth, environmental protection, and economic development. Here are some reasonable alternatives:

## 4. Industrial & Green Energy Hub

- Designate strategic zones for offshore wind farms and solar parks
- Expand port and logistics infrastructure in Shannon Estuary while ensuring compliance with environmental safeguards.
- Develop a green enterprise zone, supporting industries committed to sustainability.

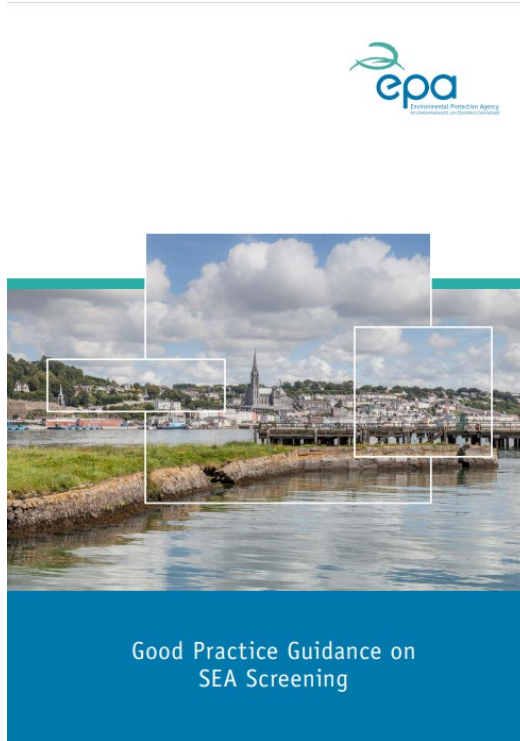
## 5. Biodiversity & Ecosystem Protection

- Limit development near **designated wildlife corridors** to safeguard biodiversity.
- Enhance **blue-green infrastructure** to support habitat connectivity.
- Strengthen protections for **Special Areas of Conservation (SACs)** and **Natural Heritage Areas (NHAs)**.

Would you like a deeper dive into a specific scenario, or insights on how they align with the county's broader goals?



# SEA Aspects which could potentially benefit from AI



- ☐ SEA Screening
- ☐ SEA Scoping
- ☐ Baseline Environmental Description- National / Regional / Upto date SoER Links
- ☐ Alternative Scenario Development and Assessment
- ☐ Assessment of Effects against SEA Framework / Objectives
- ☐ Cumulative Effects Assessment
- ☐ **Monitoring of significant environmental effects/ Interrogation of data and Trends**
- ☐ Non – Technical Summary Preparation
- ☐ SEA Case Law review
- ☐ Capacity Building – AI Ongoing learning

# SEA and AI – The Way Forward - Ireland

- ❑ Continue to apply SEA to key Plans – National Planning Framework National Restoration Plan efficiently and effectively with/ without AI
- ❑ Explore the application of AI to the key stages of SEA PRACTICE - Screening, Scoping, Baseline Environment, Alternatives, Assessment of effects – Cumulative effects, Monitoring
- ❑ Test the feasibility of using AI to prepare consolidated summary SEA Guidance from EPA suite of SEA Guidance(X 20)
- ❑ Focus on the potential application of AI to Environmental Monitoring (and Reporting)
- ❑ Quality Assurance and Control - Ground Truthing AI Searches
  - ❑ AI generated information only as good as the information uploaded to the web
  - ❑ Guidance on use of AI in SEA incl. GIS/ AI linkages, Research



*Thank you*



*Go raibh maith agaibh*

*Grazie*

# AI: IAIA 2025 Bologna

## Some references over last few days



Assessment

Research

Technology

Impact

Forestry/ Fisheries

Indicators

Transport

Integration

Adaptive Management

Land Use/ Long term Monitoring

Intelligence

Natural Capital

Transport

Energy

Landscape

Litigation

Industry

GIS

Ecosystem Services

No-Go Areas

Climate Change/ Capacity Building

Emissions



# Let's continue the conversation!

Message me your questions or comments in the IAIA25 app.

**Tadhg O'Mahony**

*Senior Scientific Officer, Environmental Protection Agency*

*Ireland*

*t.omahony@epa.ie*

**#iaia25**

*www.epa.ie*