An Roinn Fiontar,
Turasóireachta agus Fostaíochta
Department of Enterprise,
Tourism and Employment

WE'RE TAKING CLIMATE ACTION

Tourism Climate Change Sectoral Adaptation Plan 2025-2030

Contents

Executive Summary

This is Ireland's first Tourism Climate Change Sectoral Adaptation Plan. In economic terms, tourism remains hugely important and provides a significant contribution to the Irish Exchequer. In 2024, there were 6.6 million overseas visitors to Ireland, resulting in €6 billion in export revenue, excluding fares (€8.2 billion including fares), while the total value of domestic overnight trips by residents in Ireland was estimated at €3.6 billion. It is estimated that Ireland's tourism sector accounts for around 3.7% of all tax revenue while average employment in tourism industries in 2024 was estimated at 228,800.

Ireland's climate is changing, with projected increases in average temperatures, changes to precipitation patterns and more frequent and intense extreme weather events. Throughout 2024 and 2025, storms Isha, Bert, Darragh, and Éowyn caused widespread disruption across the country, highlighting the importance of enhancing resilience and adapting to the impacts of climate change and extreme weather events.

National Adaptation Framework (NAF)

The NAF outlines a whole of government and society approach to climate adaptation in Ireland. Ministers with responsibility for the relevant sectors are required under the Climate Action and Low Carbon Development (Amendment) Act 2021 to submit Sectoral Adaptation Plans (SAPs) to the Government. SAPs were previously prepared for the following areas: -

- Biodiversity,
- Water Quality,
- Communication Networks,
- Electricity and Gas Networks,
- Flood Risk Management,
- Built Environment and Planning,
- Transport Infrastructure,
- Water Services Infrastructure,
- Built and Archaeological Heritage,
- Health,
- Agriculture,
- Forestry and
- Seafood.

Under the NAF 2024, 13 priority sectors are required to prepare SAP's or update their existing ones. Tourism is identified as one of these priority

sectors. Accordingly, this SAP aims to identify challenges and opportunities of a changing climate for the tourism sector in order to maintain the attractiveness of Ireland for holidaymakers and continue to support resilient communities via provision of employment and economic opportunities. It is acknowledged that the tourism sector itself overlaps many environmental, economic and social realms. Accordingly, many measures in other SAP's will be of relevance to tourism and proposed mitigation measures will also benefit the tourism sector.

Using the 6-step approach from the Sectoral Planning Guidelines for Climate Change Adaptation, a Tourism Sectoral Adaptation Team was established in 2024 to lead the process of adaptation planning for the tourism sector. The core of this team consisted of tourism and climate action officials from within the Department of Tourism, Culture, Arts, Gaeltacht, Sport and Media and representatives from the two tourism agencies, Fáilte Ireland and Tourism Ireland. Additionally, the Department of Climate, Energy and the Environment; the Environmental Protection Agency; and the Climate Action Regional Offices provided expertise in national and local climate risk assessment and adaptation planning.

National Climate Change Risk Assessment (NCCRA)

Ireland's first NCCRA was published by the EPA in June 2025. It focuses on the risks to Ireland from hazards caused, intensified, or influenced, by climate change. These include hazards, such as fluvial flooding, heatwaves and wildfires, rising sea levels, changing precipitation patterns, and long-term temperature shifts.

The priority risks identified for Ireland in the NCCRA requiring action in the next five years to increase resilience are: -

- Extreme wind
- Coastal erosion & Coastal Flooding
- Flooding
- Heat

All of these priority risks will be of relevance to various degrees to the tourism sector. Flooding is of significance due to the potential impacts on tourism accommodation and attractions, and due to the impacts on the built and natural heritage that attracts holidaymakers. In addition, flooding issues will impact the transport infrastructure that allows tourists reach their destination. Projected increases in rainfall and sea level rise, along with possibly more intense storms, will increase the risk of flooding in Ireland. Given the proximity either to the coast or to rivers of most tourist destinations, potential exposure of the sector is considerable. By the end of the century, without action to reduce the risk, the consequences for the sector are expected to be critical.

The coastal location of many tourist destinations also means that they are exposed to risks from coastal erosion and coastal change. To date, the consequences of coastal erosion for the sector as a whole have been relatively limited, but because of the increasing rate of coastal change, it is expected that they will become substantial by the middle of this century. A variety of attractions and amenities are at risk.

Summer rainfall is expected to decline with climate change. Combined with the more certain increase in air temperature, this will create challenges for elements of the tourism sector in relation to vegetation management, including the need for irrigation and the need to prevent and manage wildfire. Some elements of the sector will be impacted by lower water levels in our waterways. Combined with projected increases in population, longer, drier, warmer summers may result in water shortages. The consequence of longer, drier, warmer summers and increased resource demand for the sector as a whole is expected to become substantial by the middle of this century.

A decrease in summer rainfall is, however, likely see an increase in rainfall at other times potentially resulting in structural damage, water damage and possible damage to transport infrastructure. This may present challenges in terms of promoting year-round tourism

Implementation of this Plan should prioritise reducing the consequences for the sector of the climate related hazards identified by the NCCRA. However, under the current most likely global greenhouse gas emissions scenario, some of the climate hazards are not expected to have a substantial impact on the sector as a whole until at least the end of the century. This allows time to investigate them further during the course of implementation of this Plan. Climate change may also present some opportunities for Irish tourism, and these are also detailed in this SAP.

In line with the NCCRA, impacts for the tourism sector as a whole were categorised as *Limited*, *Substantial*, *Critical*, or *Catastrophic* according to the extent and frequency of damage caused by the hazard; impact on the functioning of the sector; the extent and pervasiveness of the hazard; and whether (and to what extent) impacts to the tourism sector cascade to other sectors:

Risk severity	Damage	System functionality	Extent and pervasiveness	Cascading effects
Catastrophic	Very large and frequent	Irreversible loss	Very large extent or very high pervasiveness	Irreversible cascading effects beyond system boundaries
Critical	Large and frequent	Long-term disturbance	Large extent and high pervasiveness	Long-term cascading effects beyond system boundaries
Substantial	Substantial losses	Temporary or moderate disturbance	Moderate extent or pervasiveness	Temporary cascading effects beyond the system
Limited	Limited or rare losses	No significant disturbance	Limited extent or pervasiveness	No cascading effects beyond system boundaries

This Tourism SAP sets out three goals for the next five years:

Goal 1: Increase the tourism sector's understanding of the relationship between climatic variables and the tourism sector in Ireland, to improve our ability to address the impacts of climate change on the sector

Goal 2: Build a shared awareness of climate change and its impacts, and necessary steps to develop resilience, across the tourism sector in Ireland, particularly amongst tourism-dependent communities

Goal 3: Build resilience to reduce the consequences of the most significant climate risks faced by the tourism sector.

A series of actions will ensure that these goals are met. Importantly, it is envisaged that implementation of Goal 3 will reduce, within the time frame of this Plan, the consequences to the sector of the three climate

hazards considered to be most significant and requiring the most urgent action.

Key actions include:

- Commission research to define and improve understanding of current and projected future relationship between climate and tourism in Ireland
- Incorporate climate risk assessment into new and updated Destination and Experience Development Plans (DEDP's). DEDP's which are led by Fáilte Ireland are five-year strategic plans designed to enhance the tourism offering within specific areas.
- Future Fáilte Ireland schemes providing financial assistance will include relevant conditions / measures / safeguards around climate adaptation
- Engage with officials in Northern Ireland to align actions on an all-island basis, as appropriate
- Ensure that the tourism agencies are prepared to avail of any opportunities for Ireland as a result of climate change.

Key deliverables will include delivery of training in climate risk assessment and adaptation to tourism businesses, the inclusion of adaptation actions in local tourism plans, and the integration of tourism-specific adaptation actions in Local Authority Climate Action Plans.

Implementation of adaptation actions will mostly be led by the Department of Enterprise, Tourism and Employment and its tourism agencies. The sector will benefit from co-operation established with other sectors and government bodies during development of the Plan. This is the first Adaptation Plan to address businesses, predominantly, many of them in the SME sector. As such, it may assist other enterprises in starting to look more closely at preparation for the future climate of Ireland. In this regard, DETE has begun to map the climate adaptation efforts that are currently underway at local and national levels to make businesses more resilient in the face of climate change. Whilst the enterprise sector is not mandated to produce a sectoral plan under the National Adaptation Framework, the Department is working with stakeholders to prepare a high-level plan that will identify measures that businesses can take to increase their climate adaptation preparedness. This will also be relevant to tourism enterprises.

Adaptation planning is an iterative process. Accordingly, there will be learnings from the challenges developing this Plan, and the likely

challenges during implementation of the Plan. This Climate Change Sectoral Adaptation Plan is the first stage in an ongoing process of ensuring that the tourism sector builds resilience to this growing challenge, continuing to provide valuable income and employment to communities throughout Ireland, and delivering enjoyable experiences for Ireland's tourists.

With regard to any potential costs or additional administrative requirements, none of the proposed actions in this Climate Change Sectoral Adaptation Plan should create additional burdens for tourism businesses. It is fully recognised that the additional costs of climate adaptation should not be borne by small or medium sized enterprises operating with limited financial and human resources. The main purpose of this Climate Change Sectoral Adaptation Plan is to prepare the tourism sector for the climate change which is inevitably coming. Accordingly, while industry is listed as a stakeholder in a lot of the Actions, all are either led by the Department or it's tourism agencies. Most Actions relate to research work or skills gap analysis which will ultimately help businesses. Similarly, the raising of awareness of climate change is not intended to place any additional burden on enterprise.

1. Climate Change & Climate Adaptation

1.1 Climate Change

1.1.1 GLOBAL CLIMATE CHANGE

Climate change means a change in the state of the climate that can be identified (e.g. using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer (see **Glossary**). Human activity causing increased emissions of **greenhouse gases** (GHGs) has led to widespread and rapid changes in all components of the global climate system (Environmental Protection Agency (EPA) 2023).

The Intergovernmental Panel on Climate Change (IPCC) uses Representative Concentration Pathways (**RCPs**) to assess climate changes, impacts, and **risks** across large regions of the globe. Different RCPs have been developed to represent a broad range of climate outcomes, including[1]:

- **RCP 4.5**, a **medium-low emissions scenario**: total **radiative forcing** is stabilised before 2100 through employment of a range of technologies and strategies for reducing GHG emissions, and
- **RCP 8.5**, a **high emissions scenario**[2]: characterised by increasing GHG emissions over time, leading to high GHG concentration levels

Global warming **will continue to increase** in the near term (2021–2040), mainly due to increased cumulative GHG emissions in nearly all considered scenarios and modelled pathways.

Risk associated with climate change is determined by three factors: climate change **hazards** (such as increased rainfall), **exposure** to these hazards (for example, where houses are located in flood plains), and **vulnerability** to these hazards (for example, age profiles or availability of transport) (Department of Climate, Energy and the Environment (DCEE) 2024a, based on IPCC Risk Framework).

[1] https://tntcat.iiasa.ac.at/RcpDb/dsd?Action=htmlpage&page=welcome
[2] https://www.met.ie/climate/climate-change#:~:text=Warming%20is%20enhanced%20for%20the,3%C2%B0C%20in%20winter

1.1.2 CLIMATE CHANGE IN IRELAND

Ireland's climate is changing in line with global changes. Annual average temperatures have increased, as has annual precipitation, and mean sea level has risen, as have surface sea temperature and ocean acidity (Cámaro García et al. 2021, EPA 2023).

The TRANSLATE project has produced Regional Climate Models (RCMs) to provide projections for the climate in Ireland on average over different time periods under different RCPs (O'Brien & Nolan 2023). This downscaling of global models adds to the uncertainty already inherent in the global models. Climatologists use an ensemble of models to estimate uncertainty in each RCM. For example, the projected mean surface temperature increase over Ireland under RCP 8.5 by the end of the century varies from 1.94°C to 3.63°C depending on the model used, relative to the reference period 1976–2005. Thus, it can be said that under RCP 8.5, by the end of the century on average across Ireland, air temperature is expected to have increased by 2.78°C (the average over the ensemble), but it should be noted that the increase could be considerably more or less. In the case of surface temperature, all models show an increase under this RCP by the end of the century. For some climatic variables, however, the direction of change is less certain.

1.2. Impact of Climate Change on Tourism

Globally, as a climate-exposed sector, tourism has suffered economic damage from climate change (IPCC 2023). It is highly vulnerable to rising sea levels, and more extreme weather resulting in rising insurance costs (Nicholls 2014). Severe storms, with associated winds, waves, rain, and storm surges can disrupt the transport, power, and water supplies on which the industry relies. However, climate change will not affect all forms of tourism equally: urban tourism will likely be less impacted than coastal tourism, and, in relation to the primary purpose of travel, those visiting family will be less impacted than those travelling for beach tourism.

The occurrence of single weather events will mostly influence **tourists**' choice of *activities* while at a destination (Figure 1.1) rather than their choice of *destination*, though it may dissuade 'last minute' tourists. Temporary unfavourable weather, extreme weather, and climate variability might be expected to have greater impact on domestic tourism than overseas tourism, since overseas tourists generally book holidays well in advance. Repeated unfavourable / extreme weather could potentially cause reputational damage, affecting both domestic and overseas tourism. Long-term closure or damage to tourist accommodation

/ attractions / hospitality directly affects the tourism product and other tourism trade, and its capacity to continue to service tourists.

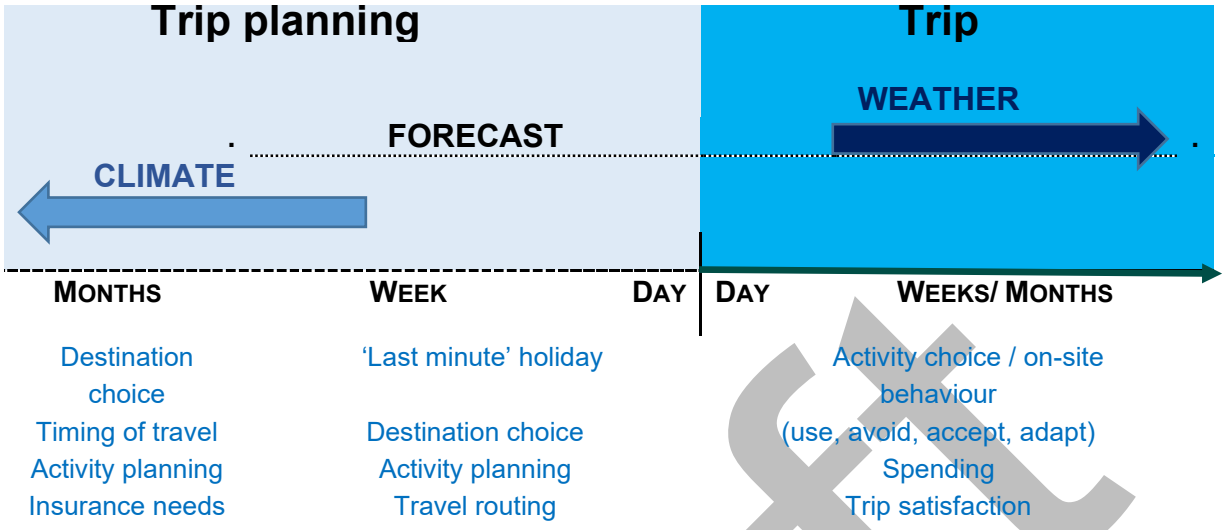


Figure 1.1. Relevance of timing of climate and weather information to tourists' decisions. Image adapted from eco-union (2019).

Despite climate change risk to tourism being relatively low across Europe compared to many other regions of the globe (Peeters & Papp 2023), the European Climate Risk Assessment Report (European Environment Agency (EEA) 2024) includes tourism as one of the economic sectors substantially impacted by extreme climate events in recent years.

1.3. Climate Adaptation

1.3.1 WHAT IS CLIMATE ADAPTATION?

Climate adaptation can be defined as the process of adjustment to actual or expected climate and its effects, in order to moderate harm, or to take advantage of potentially beneficial opportunities (IPCC 2022). Climate adaptation is one component of climate action (Figure 1.2). The other is climate mitigation. Mitigation actions focus on limiting the rate and scale of future climate change by reducing levels of greenhouse gas emissions and increasing GHG sinks. Adaptation actions aim to limit exposure and vulnerability and thus reduce the impacts of climate change, or to take advantage of any opportunities presented by climate change. **Resilience** refers to the ability to absorb and respond to climate change by implementing effective adaptation actions and sustainable development to reduce negative **climate impacts**, while also taking advantage of any opportunities.

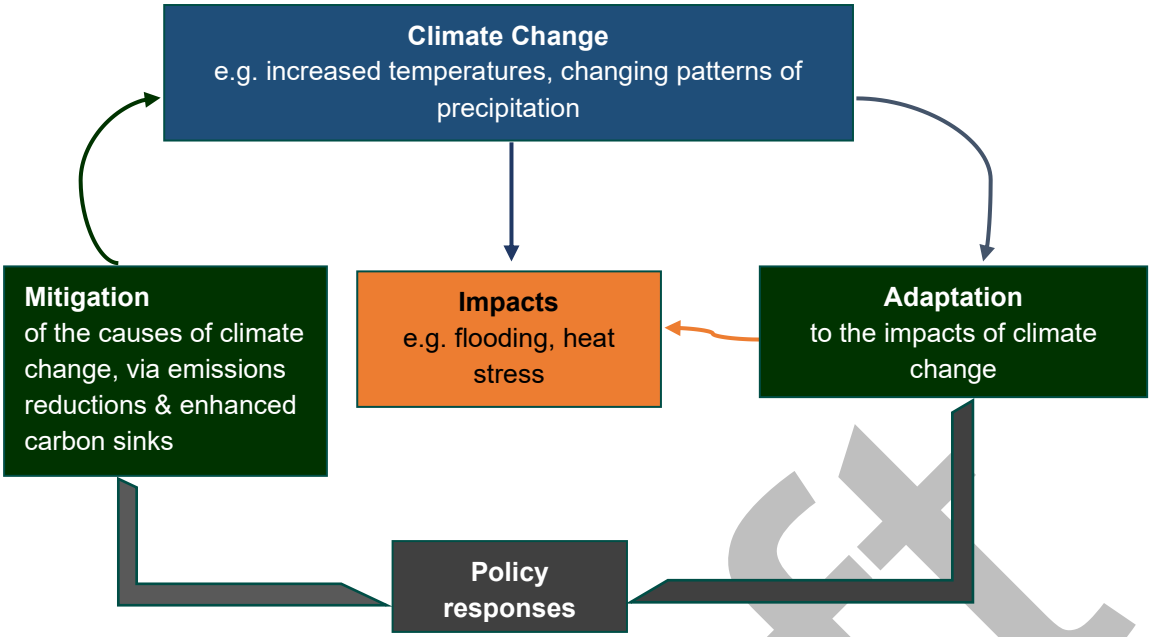


Figure 1.2. Climate Adaptation addresses the impacts of climate change and complements Climate Mitigation in overall Climate Action Policy.
Adapted from https://www.climateireland.ie/adaptation/what-is-climate-adaptation/.

1.3.2 ADAPTATION POLICY IN IRELAND

The Climate Action and Low Carbon Development (Amendment) Act 2021 set a national objective to transition to a climate resilient, biodiversity-rich, environmentally sustainable and climate-neutral economy by 2050 at the latest (EPA 2023).

Ireland's National Adaptation Framework (NAF) outlines the national strategy for the development of adaptation measures. Ireland's second NAF was published in 2024 (DCEE 2024b), encompassing core principles of **just resilience**, nature-based solutions (**NbS**), and avoiding **maladaptation**.

Under this second NAF, Tourism is one of the sectors required to produce a Climate Change Sectoral Adaptation Plan in 2025 (Table 1.1). Although Deignan et al. (2022) produced guidance on climate adaptation for businesses in the hospitality and tourism sector, no previous plan has addressed climate change risks for the Irish tourism sector as a whole.

To ensure a coherent and consistent approach across sectors for this cycle of adaptation planning, DCEE produced revised guidelines for sectoral adaptation planning (DCEE 2024a).

Local Authorities were required to prepare Local Authority Climate Action Plans (LACAPs) incorporating both mitigation and adaptation in 2024[3]. The four Climate Action Regional Offices (CAROs) coordinate development of local climate action across local authorities.

Table 1.1. Sectors for which Sectoral Adaptation Plans are being published in 2025.

Theme	Sector	Lead Department
Natural Environment	Biodiversity	Department of Housing, Local Government and Heritage
	Water Quality	
Built Environment & Infrastructure	Communication Networks	Department of Culture, Communications and Sport
	Electricity & Gas Networks	Department of Climate, Energy and the Environment
	Flood Risk Management	Office of Public Works
	Built Environment & Planning*	Department of Housing, Local Government and Heritage
	Water Services Infrastructure	
	Transport Infrastructure	Department of Transport
Human	Built & Archaeological Heritage	Department of Housing, Local Government and Heritage
	Health	Department of Health
Economy	Agriculture	Department of Agriculture, Food and the Marine
	Forestry	
	Seafood	
	Tourism	Department of Enterprise, Tourism, and Employment

*Initially, a scoping exercise will be conducted for this sector.

Table adapted from DCEE (2024b).

[3] https://www.climateireland.ie/adaptation/adaptation-guidance-and-plans/local-authority-climate-action-plans/

2. Climate Change Adaptation Planning for the Tourism Sector

2.1 Approach Used in Developing this Plan

To develop this SAP, the Department of Tourism, Culture, Arts, Gaeltacht, Sport and Media (DTCAGSM) followed the sectoral adaptation guidelines prepared by DECC (2024a). The Tourism Division in DTCAGSM moved to the Department of Enterprise, Tourism and Employment (DETE) in June 2025.

2.1.1 ESTABLISHING A SECTORAL ADAPTATION TEAM

The first step of the adaptation planning cycle, "Preparing the Ground", requires establishing a Sectoral Adaptation Team (SAT), consisting of a Core Team and a Planning Team.

A Core Team was established that incorporates expertise in tourism as well as climate action and sustainability. It included representatives from the key units of relevance in DTCAGSM and its two key Tourism Agencies, Fáilte Ireland and Tourism Ireland (Figure 2.1).

Figure 2.1. Sectoral Adaptation Team established for the Tourism Sector in 2024, consisting of a Core Team and a Planning Team.
DTCAGSM, Fáilte Ireland, and Tourism Ireland as the three key bodies for the tourism sector were represented on both teams. DECC, the EPA, and CARO provided additional adaptation planning experience to the Planning Team.

DTCAGSM had a mission to lead the sustainable development of Tourism, Media, and the Gaeltacht, and promote participation in the Culture, Arts, and Sports sectors and the Irish language, supporting social progress, and enhancing cultural and economic growth across Irish society. Regarding

Tourism, the Department's goal was to support the development of a sustainable Tourism sector, with a particular emphasis on supporting balanced development in communities throughout the country, whilst protecting our environment and natural resources (DTCAGSM 2023).

DETE has a vision to make Ireland the best place to succeed in business across all parts of the country, with vibrant competitive enterprises, more high-quality employment, growing trade, fair workplaces and higher productivity. The Department's mission is to lead on sustainable economic development through the creation and maintenance of high-quality employment across all parts of the country by championing enterprise and supporting SMEs.

Fáilte Ireland is Ireland's National Tourism Development Authority. Its role is to support the long-term sustainable growth in the economic, social, cultural, and environmental contribution of tourism to Ireland. In partnership with Government, State Agencies, Local Authorities, representative groups, and industry, Fáilte Ireland develops tourism across Ireland by creating destination development plans and networks, and by investing in infrastructure, activities, visitor attractions, and festivals.

Fáilte Ireland also provides consumer and buyer insights, mentoring, business supports, training programmes, and buyer platforms, to help tourism businesses innovate and grow. Fáilte Ireland is responsible for domestic holiday marketing across four regional experience brands namely: Wild Atlantic Way, Ireland's Ancient East, Ireland's Hidden Heartlands, and Dublin.

Tourism Ireland is the all-island tourism marketing organisation accountable to the North South Ministerial Council (NSMC) established under the Good Friday Agreement. The organisation has responsibility for all-island destination marketing, Tourism Brand Ireland, the overseas tourism office network, the delivery of regional and product marketing, and promotion activity in cooperation with Fáilte Ireland and Tourism Northern Ireland.

Fáilte Ireland and Tourism Ireland work together to support Business Tourism, managing the bidding for and securing of larger conferences, meetings, and events to be hosted in Ireland.

Partnership on adaptation planning for the Tourism Sector was broadened through the Planning Team, which included representatives from DCEE,

the EPA, and CARO (Figure 2.1). The Planning Team was co-chaired by the Principal Officers for the Tourism Policy Unit and the Strategic Policy Unit in DTCAGSM up until June 2025, after which continued refinement of the Plan, including via public consultation, was led by an amended SAT chaired by the Tourism Policy Unit in DETE.

A range of other organisations provided advice to the SAT during development of this Plan (Figure 2.2).

Figure 2.2. Organisations that provided advice and information to the Tourism Sectoral Adaptation Team during development of the Sectoral Adaptation Plan.

2.1.2. SKILLS GAP ANALYSIS

For the development of the first Climate Change Sectoral Adaptation Plan for the Tourism Sector, the Core Team of the SAT considered the following to be desirable skills to have within the SAT:

- Understanding of tourism policy, nationally and internationally
- Detailed knowledge of the tourism product in Ireland, markets, and marketing
- Understanding of national and international climate action policy and approaches, particularly in relation to climate adaptation policy
- Scientific training
- Extensive experience in undertaking literature reviews
- Data analysis skills
- Experience in writing plans or proposals, including budgeting
- Basic understanding of meteorology and climate science and **climate projections**
- Basic knowledge of climate risk assessment

All of the above skills were met within the established SAT. Some of the SAT members had extensive training in climate change analysis, including undergraduate, postgraduate, and professional certificate qualifications. Under Ireland's Public Sector Climate Action Mandate (which is updated annually in the Climate Action Plan), all senior management are required

to undertake climate action training. DTCAGSM's Learning & Development (L&D) division encouraged all staff to undertake the online *Introduction to Climate Action* training available through civil service L&D as part of the annual performance monitoring cycle. Similar arrangements are in place for DETE staff.

Thus, no skills gap was identified in relation to the SAP *development* process. However, *implementation* of climate adaptation across the entire sector will require training and guidance across the diversity of businesses and organisations that make up the sector. Actions to address this challenge are included in Chapter 4 "Adaptation Goals and Actions". Additional technical/environmental/adaptation skills may be needed to implement and monitor the plan.

2.1.3. CONSULTATION WITH THE CLIMATE CHANGE ADVISORY COUNCIL

The Climate Change Advisory Council (CCAC) met with individuals from the SAT twice in 2024. Informal advice on an early draft of this Plan was provided by the CCAC in February 2025, and the first draft formally reviewed by the CCAC and by the EPA in March 2025. Advice was also sought from a range of other organisations at this stage.

Taking into account feedback from this process, the draft was revised, considered by the Planning Team, revised further, and made available for public consultation. The final version was approved by the Department's Management Board

2.1.4. PUBLIC CONSULTATION

A public consultation process, based on the revised draft Plan (see above) took place in… X organisations provided submissions, and all submissions were fully considered prior to the finalisation of text…..

2.2. The Tourism Sector in Ireland

2.2.1. VALUE TO THE ECONOMY AND SOCIETY

The tourism sector in Ireland contributes significantly to the Exchequer and to employment and the Government is committed to the further sustainable growth of the sector in the years ahead. Ireland's Tourism Satellite account for 2019 (as published in 2023) shows that the sum of inbound and domestic tourism expenditure for that year was €10 billion (including fares to Irish carriers in the case of inbound tourism) (Central Statistics Office (CSO) 2024a). The sector directly provided work for an estimated 284,800 full-time equivalent employees, in almost 46,000

tourism-related enterprises. This represents a tourism share of more than 13% of total full-time jobs in the overall Irish economy. Seventy-four percent of these jobs relate to the accommodation or food and beverage sectors. Tourism Direct Gross Value Added (**TDGVA**; see **Glossary**) was estimated to be approximately €13.5 billion, which equated to a total Gross Value Added (**GVA**) share of 4.4% in the Irish economy.

Tourism contributes to essential employment in all counties, which is particularly important in regional locations outside the main cities where other employment opportunities are limited (Department of Public Expenditure, NDP Delivery and Reform (DPENDR) 2023). Tourism contributes to National Strategic Outcomes (NSO) in the National Development Plan (NDP) regarding strengthening rural economies and communities and enhancing amenity and heritage. The *Tourism Policy Framework 2025-2030* (DTCAGSM 2024) highlights further economic and social benefits from tourism to communities across the country.

2.2.2. TOURISM DEMAND

2.2.2.1 Overseas Tourism

Overseas tourism (**visitors** from outside the island of Ireland) is an important source of tourism revenue: the Tourism Satellite Account for 2019 shows that overseas visitors accounted for 48% of visits, but 76% of tourism expenditure (when carrier fares are included) (CSO 2024a). In 2023, over 69% of overseas visitors came from just four countries: Great Britain, United States, Germany, and France. Great Britain accounted for a slightly higher percentage of total visits than mainland Europe as a whole, followed by North America and 'other' regions i.e. regions other than Great Britain, mainland Europe, or North America (Tourism Ireland 2024). The share of total ***holidaymakers*** was greatest from mainland Europe, followed by North America, and then Great Britain (CSO 2024b).

Although seasonality of tourism in Ireland is lower than on average across the EU[4], there is nonetheless a marked tendency towards increased tourism in summer, with August being the busiest month of the year, and February the quietest. It has been a long-standing policy objective to extend the tourism season, to provide more year-round employment opportunities in the sector.

[4] https://tourism-dashboard.ec.europa.eu/destination?lng=en&ctx=tourism&tu=IE&tl=0&stu=IE&ts=TOURISM&pil=level-indicator&is=TOURISM&cl=tourism&clc=environmental-impact&fvs=false

Dublin is the most popular destination in Ireland for overseas **visitors** (Fáilte Ireland 2021). The next most popular destinations are the south-west and west. However, it has been a policy objective to support employment in less-developed tourist regions. Fáilte Ireland's Regional Tourism Development Strategies (RTDSs) also aim to disperse visitors outside of the hotspots in the more mature tourism destinations of Dublin and the southern Wild Atlantic Way, and to grow tourism revenue in the less developed tourism areas of the northern part of the Wild Atlantic Way, Ireland's Ancient East, and Ireland's Hidden Heartlands (Figure 2.3).

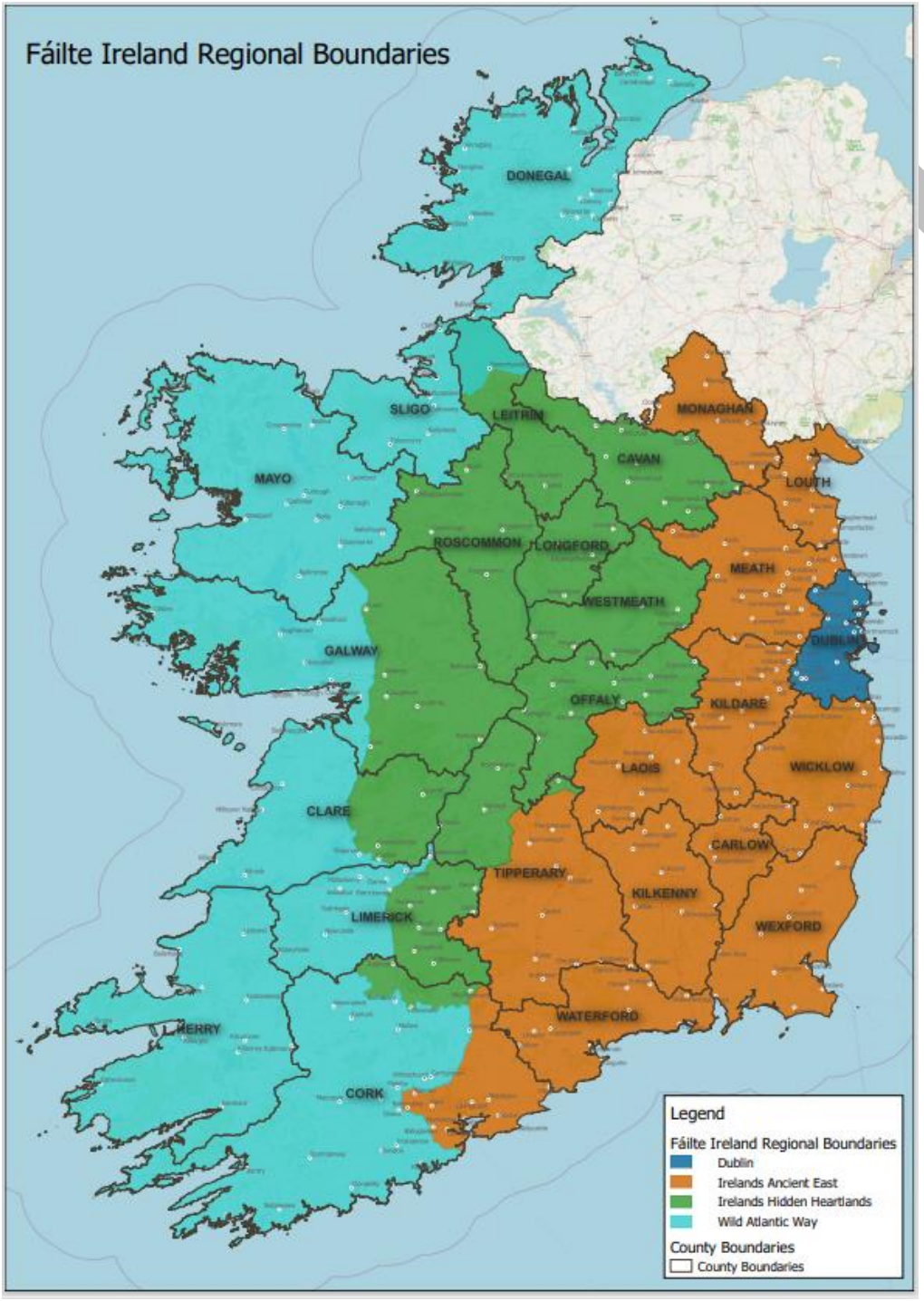


Figure 2.3. Fáilte Ireland's four experience brands.

Overseas visitors are attracted to Ireland by its beautiful scenery; plenty of things to see and do; interesting history and culture; good range of natural attractions; friendly, hospitable people; safe and secure destination; and natural, unspoilt environment (Fáilte Ireland 2021). Across the four countries that account for the majority of **tourists** to Ireland, many visit sites of historical interest (particularly churches / cathedrals and heritage / visitor centres) and engage in pastimes or events (Tourism Ireland 2020). Fáilte Ireland (2021) estimated that in 2019, 25% of overseas visitors engaged in hiking or cross-country walking, 4% in cycling, 2% in golf, and about 1% in equestrian activities and 1% in angling.

2.2.2.2 Domestic Tourism

Domestic tourists have different preferences to overseas visitors. The south-west receives the most domestic trips, most nights of stay by domestic visitors, and greatest domestic spend (Fáilte Ireland 2023a). July to September is the busiest quarter for domestic holidaymakers, followed by April to June. Fifty-four percent of domestic holidaymakers in 2022 took part in short-distance hiking or walking, 13% longer distance hiking or walking, 37% swimming, 10% took boat tours, 10% visited adventure parks, 6% engaged in watersports, 6% cycled short distances, 3% cycled long distances, 6% played golf, and 4% took part in fishing or angling.

Domestic holidaymakers' preferred leisure experiences were touring by car, shopping, and visiting indoor attractions. Visiting historic houses or castles (28%), visitor or interpretative centres (16%), or museums or galleries (15%) was less popular amongst domestic holidaymakers than amongst tourists from Ireland's main overseas markets. More than a quarter of domestic holidaymakers visited nature reserves / national parks and gardens.

In addition to tourism (involving at least one overnight stay), Irish residents take day trips within Ireland. Seasonality of day trips is less marked than that of holidays, with 30% of day trips in July to September, closely followed by October to December (29%) and April to June (24%) (Fáilte Ireland 2023a).

2.2.2.3 Tourism from Northern Ireland

In 2023, 1.3 million tourists visited the Republic of Ireland from Northern Ireland, spending €0.4 billion, thus accounting for about 17% of total tourists and 7% of total revenue (excluding carrier receipts) (FI_Key-Tourism-Facts-2023_National-SumFI_Key-Tourism-Facts-2023_National-Summ)OBJ) OBJ)

2.2.3. TOURISM OFFERING

2.2.3.1 Tourism Product

Fáilte Ireland defines the 'tourism product' as accommodation and visitor attractions (Figure 2.4).

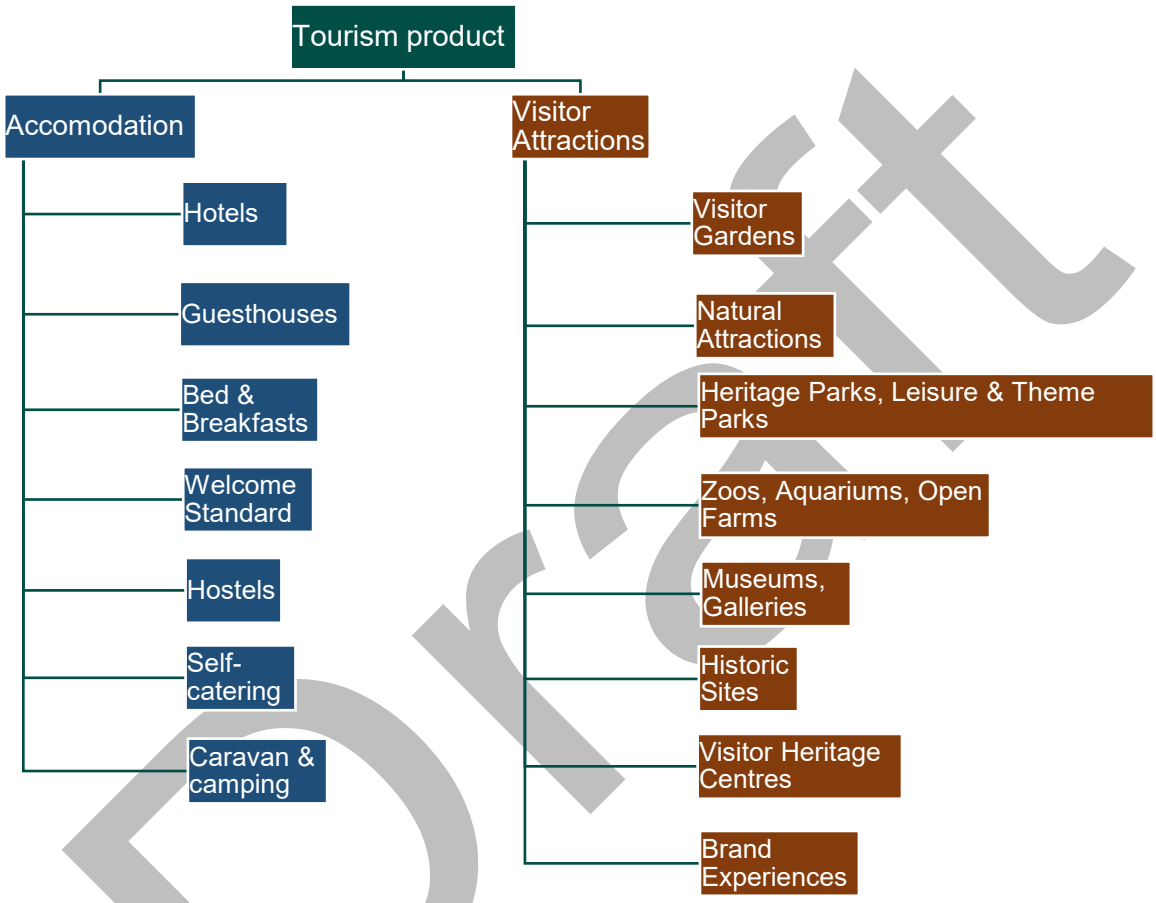


Figure 2.4. The Tourism Product in Ireland.
Information from Fáilte Ireland (2023a).

2.2.3.2 Broader tourism-relevant trade

While not necessarily solely (or even mainly) intended for the tourist market, many types of trade such as restaurants or golf courses rely heavily on tourists and/or contribute significantly to the tourist experience (Figure 2.5).

2.2.3.3 Broader attractions, activities, and events

Trade that is less clearly linked to tourism and many non-trade attractions and activities contribute to the tourist experience[5] (Figure 2.6). Festivals

[5] Tourism Activities and Attractions - Dataset - data.gov.ie

and events[6], such as sports events, cultural events, and business conferences can be an important component of attracting visitors in the off-peak season and to outside of traditional tourism hotspots.

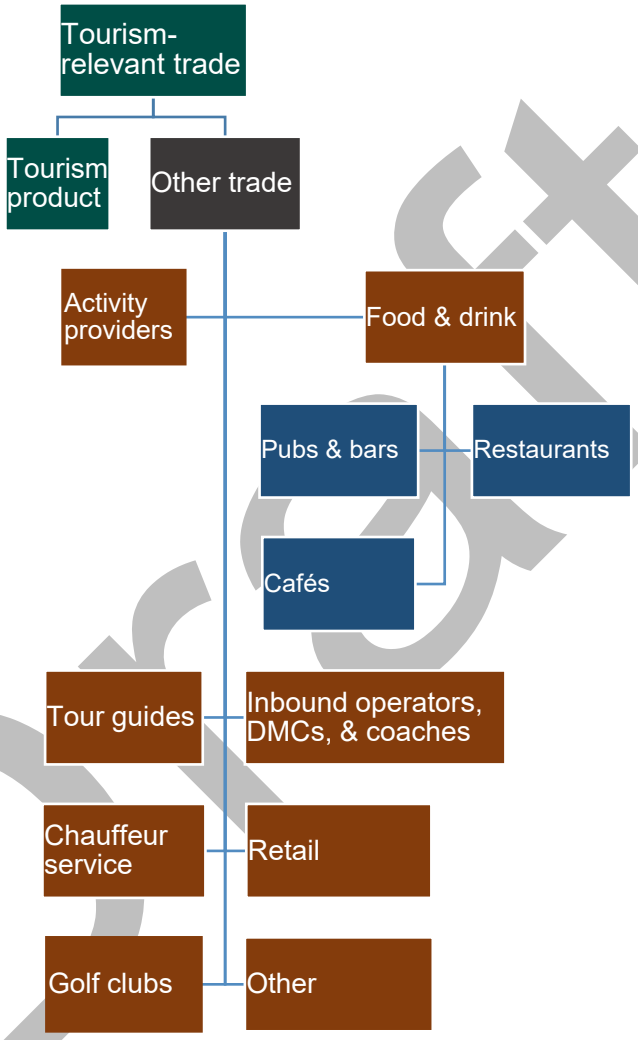


Figure 2.5. Trade of relevance to tourism in Ireland.
Information from Tourism Activities and Attractions - Dataset - data.gov.ie and Fáilte Ireland (2024).
DMC: Destination Management Company

[6] Events - Dataset - data.gov.ie

Figure 2.6. The broader tourism sector in Ireland.

2.2.4. THE TOURISM SECTOR AS A SYSTEM

DECC (2024a) recommends breaking down the sector into different sub-systems and elements, in order to assess the impact of different climate hazards on different elements. Such a breakdown is provided in Table 2.1.

Table 2.1. Components of the Tourism Sector 'system' for the purposes of a system-based approach to climate change risk assessment.

Sub-system	Element	Sub-element	Part
Tourism-relevant trade	Tourism product	Accommodation	Hotels Guesthouses Bed & Breakfasts Welcome Standards Hostels Self-catering Caravan & Camping
		Visitor attractions	Visitor Gardens Natural Attractions Heritage Parks, Leisure & Theme Parks Zoos, Aquariums, Open Farms Museums, Galleries Historic Sites Visitor Heritage Centres Brand Experiences
	Other trade	Activity providers	
		Food & drink	Pubs & bars Restaurants Cafés
		Tour guides	
		Inbound operators, DMCs, & coaches	
		Chauffeur service	
		Retail	
		Golf clubs	
		Other	

Other attractions & activities	Destinations	Beaches Towns Monuments Harbours / piers Islands	
	Angling		
	Walking trails		
	Cycling trails		
	Other		
Festivals & events	Festivals		
	Other events		

2.3. Strategic Policy Context

2.3.1. INTERNATIONAL AND EUROPEAN UNION TOURISM POLICY

Tourism has the potential to contribute, directly or indirectly, to all of the UN Sustainable Development Goals (SDGs). It is specifically included within targets in Goals 8, 12, and 14, on inclusive and sustainable economic growth, sustainable consumption and production, and the sustainable use of oceans and marine resources, respectively.

The priority area 'Resistance and inclusion' in the European Agenda for Tourism 2030 includes improving the resilience of tourism services and destinations to service diverse audiences in all seasons and various locations. Tourism businesses and destinations are encouraged to take part in climate adaptation actions as part of the green transition of EU tourism.

2.3.2. NATIONAL TOURISM POLICY

A tourism policy framework 2025–2030 was published in November 2024, which set out key policy objectives to ensure the sustainable growth of Irish tourism in the period to 2030. The Programme for Government *"Securing Ireland's Future"* commits to publishing a new tourism policy to 2030, setting out a vision to grow the sector across Ireland. The new policy will reflect the Programme for Government and other government priorities, as well as considering any additional supports that need to be put in place to further support the sector.

2.3.3. OTHER RELEVANT NATIONAL POLICIES

One of the objectives of the *National Biodiversity Action Plan* (NBAP) is to secure nature's contribution to people, with a particular focus on tourism, heritage, and language. *Water Action Plan 2024*, Ireland's third River

Basin Management Plan, aims to protect and improve all of Ireland's waterbodies. It notes that Ireland's tourism industry relies on our image as a green island with well-stocked, healthy fisheries; with unpolluted estuaries without excessive algae or algal blooms; and with clean beaches next to good quality bathing waters. *Harnessing Our Ocean Wealth* considers a healthy marine ecosystem to be an enabler of promotion of marine tourism.

Our Rural Future includes an ambition for rural Ireland to become a destination of choice for outdoor activities and adventure tourism, providing employment opportunities in rural areas (see also *Embracing Ireland's Outdoors*). *Our Rural Future* recognises the importance of marine and coastal tourism; *Food Vision 2030* references potential for development of rural eco-tourism. *Our Living Islands* notes that despite traditional reliance of some islands on tourism for employment and revenue, large numbers of tourists bring pressures, which might be alleviated by dispersal over a longer season. Protection of biodiversity and habitats supports sustainable island tourism.

Heritage Ireland 2030 recognises the importance of Ireland's heritage, including national monuments, historic sites, and inland waterways, in appealing to tourists. One of its objectives includes integration of the role of heritage in sustainable tourism.

2.3.4. REGIONAL AND LOCAL TOURISM STRATEGIES AND POLICIES

The RTDSs (see section 2.2.2 Tourism Demand) provide a strategic framework for the 35 Destination and Experience Development Plans (DEDPs) that will sit beneath them (when all have been developed), as well as informing the Local Authority Tourism Strategies.

2.3.5. OTHER RELEVANT REGIONAL STRATEGIES

The *Eastern & Midland Regional Spatial & Economic Strategy 2019-2031* makes several references to the relevance of natural and cultural heritage and relatively unspoilt landscapes to tourism. Growing outdoors tourism in the Midlands complements efforts to provide a Just Transition away from use of peat in energy production. Green and blue infrastructure features significantly in this Strategy, with reference to its potential to both create jobs through tourism and protect biodiversity. The *Southern Regional Spatial & Economic Strategy* recognises the importance of monitoring the impact of tourism development and infrastructure on sensitive natural, archaeological, and built heritage. The *Northwestern Regional Spatial & Economic Strategy* notes the need to develop tourism in the off-peak season.

3. Climate Impact Screening

3.1 Current Climate Impacts

The following Climate Impact Drivers (**CIDs**; see **Glossary**) / hazards were found (see Appendix I Method Used for Climate Impact Screening) to have had some impact on at least one element of the tourism sector over the last 30 years (Figure 3.1): above average or increased rainfall or unfavourable weather; below average rainfall or dry summers; extreme or heavy rainfall; pluvial or fluvial flooding; hydrological drought; storms; snow and ice or icy conditions or heavy snowfall; coastal flooding; erosion or rockfall; marine heatwave or ocean warming.

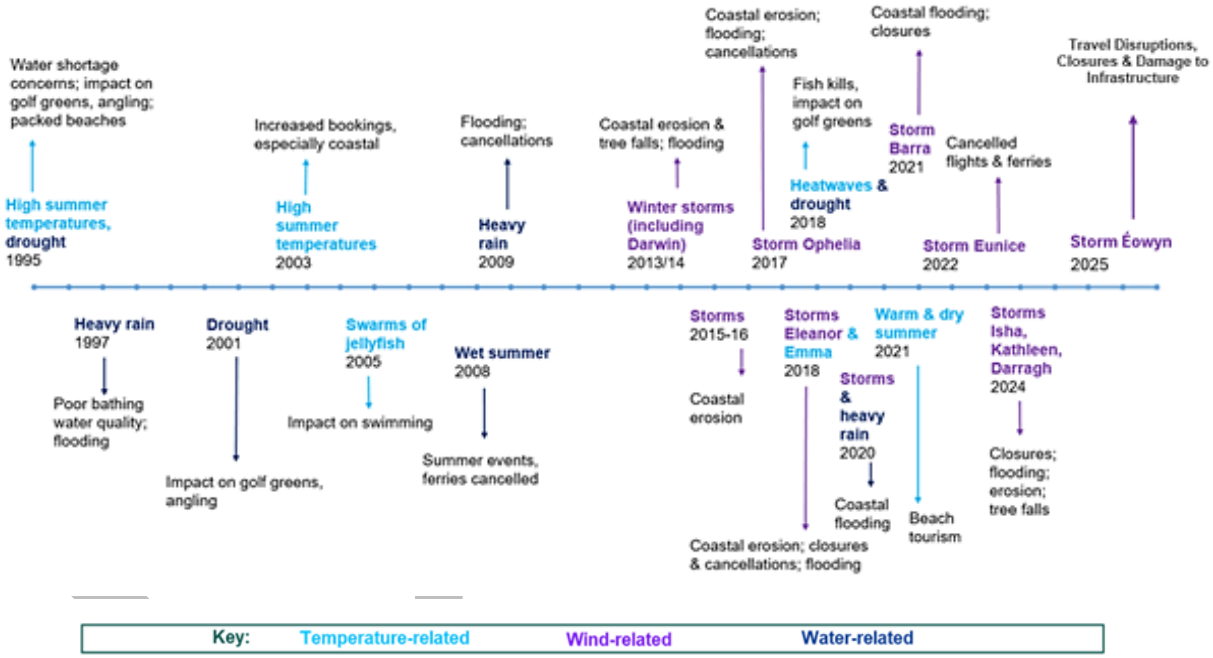


Figure 3.1. Weather events that affected elements of the tourism sector in Ireland 1995-2025.

Adapted from the style of a figure in DECC (2024a).

An example of the view of tourism businesses on how they were impacted by weather over an entire year is provided in Case Study 3.1.

Case Study 3.1 Impact of weather in 2024 on tourism businesses

Forty-three percent of respondents to Fáilte Ireland's *Tourism Barometer* survey at the end of 2024 (Fáilte Ireland 2025)[7] believed that unusual weather conditions in 2024 resulted in a decrease in volume of business; 42% believed that such weather had no impact; and 3% believed that unusual weather resulted in an increase in volume. For example, a respondent from a golf club in Co. Mayo suggested that extreme heat in southern Europe drove tourists further north for conditions that are more temperate. Twelve per cent did not know whether unusual weather affected business volume. A disproportionally high percentage (70%) of respondents representing cafés believed that unusual weather conditions resulted in a decrease in business volume. More than half of caravan parks, restaurants, activity providers, and tourism-related businesses in Ireland's Ancient East, expressed this belief.

Only 33% of businesses in Dublin answered that weather events affected business *operation* in 2024, compared to 56% in other regions. Only 15% of business in the **inbound tour operator** / DMC sector was affected. Heavy rainfall (leading to flash flooding) and severe windstorms had the greatest impact, followed by freezing temperature, storm power surge, and heavy snowfall. Caravan parks, activity providers, and cafés appeared to be most vulnerable. For example, a respondent from a café in Co. Tipperary noted that severe ice and snow resulted in loss of operational days. Caravan parks were much more likely than other sectors to have been affected by groundwater flooding.

3.2 Future Climate Impacts

Certain hazards will be of less concern under projected climate change. For example, summer rainfall is projected to decrease, although this is uncertain – reducing 'unfavourable' weather for e.g. camping during the peak season. Hazards relating to extreme cold are expected to decrease. On the other hand, storm damage to destinations may be worse in future, as storms, albeit fewer in number, become more intense. Hazards relating to both dry summers and heavy rainfall and flooding will increase, as will coastal erosion and ocean warming.

Regarding emerging risks, Deignan et al. (2022) consider that higher temperatures and their impact on tourists and staff can be a risk to

[7] 920 respondents

tourism businesses. For example, high temperatures can cause health risks, and there is likely to be increased pressure on tourist amenities such as beaches; some tours or activities may not go ahead if temperatures are too high, and passenger comfort on public transport may be reduced. However, summer temperatures are not projected to reach those normal in popular tourist destinations in e.g. southern Spain *prior* to detectable climate change, nor those considered too hot by tourists (Rutty & Scott 2010).

Various authors have suggested potential benefits to tourism from warmer, drier summers, such as increased opportunities to diversify tourism, growing areas such as eco-tourism or activity tourism (Kelly & Stack 2009, Sweeney et al. 2013). Kelly & Stack (2009) stated that warmer temperatures and lower summer precipitation are likely to attract tourists, especially from southern Europe where climate can become uncomfortable, as well as encouraging people to stay at home – a concept frequently reiterated both in national and international literature (e.g. Forfás 2010, Matei et al. 2023, EEA 2024). A potential shift in tourism patterns relates not only to tourist discomfort in traditionally popular destinations under high temperatures, but also to risks from forest fires (Nicholls 2014, Otrashenko & Nunes 2022, EEA 2024) and water shortages and erosion of Mediterranean beaches (e.g. Forfás 2010). However, a European Travel Commission (ETC) (2023) survey found that only 7.6% of respondents were concerned about extreme weather events (lower than concerned about rising costs, personal finances, war, booking and cancellation policies e.g. regarding refunds, and too many tourists in the destinations they wanted to visit). On the other hand, 28% of respondents to a 2023 Tourism Ireland survey of 1,000 respondents in each of seven markets agreed that extreme events such as heatwaves had affected choice of holiday destination. Tourists may, in future, choose to go to the same countries as currently, but choose different locations within those countries (see e.g. Barrutiabengoa et al. 2024), or travel to the same destinations but at a different time of year (Destination Analysts 2019, GREC-SUD 2024, Nam et al. 2024).

3.3 Changing Demographics and Tourism Trends

The Irish population is projected to grow significantly (CSO 2024c). Distribution of the population within Ireland may also change, in line with planned growth outside of the cities (draft revised *National Planning Framework* (NPF)) and increasing cost of homes and rent in the cities.

Globally (Peeters & Papp 2023), and particularly in the EU-28 (United Nations World Tourism Organization (UNWTO) 2013), tourism is projected to grow rapidly in the coming decades. Tourism Ireland forecasts numbers of visitors to Ireland to increase by 32% compared with 2023.

Increased population and increased numbers of tourists will lead to increased exposure to climate hazards and may accentuate some of their impacts.

The population in Ireland and Ireland's major tourism markets is ageing (Eurostat 2020, CSO 2024c, Houses of Commons Library 2024, PRB 2024), potentially resulting in an increased proportion of older visitors, who may be relatively vulnerable to higher temperature, *with potential cascading risks for the Health Sector*.

This change in the average age of tourists also has implications for the season in which tourists travel: older tourists are more likely to avoid increasingly high summer temperatures in southern Europe. However, they are likely to be in a position to travel to the same region outside of the main tourist season, rather than choosing destinations further north in Europe with milder summers. The proportion of the EU adult population without children is set to increase by 2050 (Eurocontrol 2021), increasing the proportion of the passenger-base in a position to take advantage of the forecasted widening period of optimal tourism climate in Europe. While this might increase the opportunity to extend the season in Ireland, tourists who can travel at any time of year may choose to continue to go to the same destinations as now but avoid extreme summer heat.

3.4 Sectoral Consequences of Climate Change

Following Climate Impact Screening, a set of 10 risks / opportunities for the tourism sector were identified (Table 3.1). Urgency to act ranges from maintaining a watching brief to action required now. It is important to recognise that many of the actions necessary to address these risks will need to be addressed by actors outside of the tourism sector itself and as such will be addressed in other SAPs.

Table 3.1. Summary of climate risks and opportunities for the tourism sector in Ireland, with their estimated sectoral consequences currently, and by mid and late century, confidence in the assignments of consequence, and urgency with which action is required.

No.	Impact statement	Time	RCP	Consequences	(confidence)	Urgency
1	Increased frequency of flooding of destinations and tourist businesses and facilities, resulting in damage, temporary to long-term closures, loss of income, insurance risk, and reduced tourism offering	**Present**		*Substantial*	(very high)	**More action needed**
		2050	4.5	*Substantial*	(high)	
			8.5	*Substantial*	(high)	
		2100	4.5	*Critical*	(high)	
			8.5	*Critical*	(high)	
2	More rapid coastal change and erosion resulting in difficulty accessing, or damage or submergence or deterioration in quality of visitor amenities	**Present**		*Limited*	(high)	**More action needed**
		2050	4.5	*Substantial*	(low)	
			8.5	*Substantial*	(low)	
		2100	4.5	*Substantial*	(low)	
			8.5	*Critical*	(low)	
3	Warmer temperatures and greater evapotranspiration, combined with drier summers, resulting in increased challenges for management of vegetation and risk of fire, reduced river flows, and reduced availability of water resources	**Present**		*Limited*	(high)	**More action needed**
		2050	4.5	*Substantial*	(low)	
			8.5	*Substantial*	(low)	
		2100	4.5	*Substantial*	(low)	
			8.5	*Substantial*	(low)	
4	Warmer temperatures resulting in the Irish climate being perceived as more favourable for tourism, leading to increased tourist demand and facilitating diversification and extension of the season	**Present**		*Limited*	(high)	**Further investigation needed**
		2050	4.5	*Limited*	(low)	
			8.5	*Substantial*	(very low)	
		2100	4.5	*Substantial*	(very low)	
			8.5	*Very high*	(very low)	
5	Extreme rainfall causing damage to walking trails, increasing risk of contamination of bathing water, impacting beach tourism, and reducing opportunities for water-based activities	**Present**		*Limited*	(very high)	**Further investigation needed**
		2050	4.5	*Limited*	(moderate)	
			8.5	*Substantial*	(moderate)	
		2100	4.5	*Substantial*	(moderate)	
			8.5	*Substantial*	(moderate)	
6	Increased air temperature reducing comfort of tourists and staff in the tourism sector, requiring adjustments by tourism businesses	**Present**		*Not yet detectable*		**Further investigation needed**
		2050	4.5	*Limited*	(low)	
			8.5	*Substantial*	(low)	
		2100	4.5	*Substantial*	(low)	
			8.5	*Substantial*	(low)	
7	Increased rainfall leading to damage to historic buildings, archaeological sites, and golf courses, and reducing tourist demand during rainy seasons	**Present**		*Limited*	(high)	**Further investigation needed**
		2050	4.5	*Limited*	(moderate)	
			8.5	*Limited*	(moderate)	
		2100	4.5	*Substantial*	(moderate)	
			8.5	*Substantial*	(moderate)	
8	Continued disruption to travel and tourism operations from storms, and increased intensity of storms leading to damage to tourist destinations and visitor attractions	**Present**		*Limited*	(very high)	**Sustain current action**
		2050	4.5	*Limited*	(high)	
			8.5	*Limited*	(high)	
		2100	4.5	*Limited*	(high)	
			8.5	*Limited*	(high)	
9	Extreme cold resulting in icy conditions or snow, leading to closure of attractions and cancellations of flights and ferries, and disrupting road and rail travel	**Present**		*Limited*	(very high)	**Sustain current action**
		2050	4.5	*Limited*	(very high)	
			8.5	*Limited*	(very high)	
		2100	4.5	*Limited*	(very high)	
			8.5	*Limited*	(very high)	
10	Ocean warming and acidification leading to changes in marine species composition, impacting on sea swimming and marine nature tourism	**Present**		*Limited*	(very high)	**Watching brief**
		2050	4.5	*Limited*	(high)	
			8.5	*Limited*	(high)	
		2100	4.5	*Limited*	(high)	
			8.5	*Limited*	(high)	

3.5 Summary of Climate Impact Chains

The key climate-related risks and opportunities facing Ireland's tourism sector, based on a comprehensive assessment of climate impact chains are shown below. A more detailed overview is provided in **Appendix II**. The summary identifies the primary hazards, sectoral vulnerabilities, and cascading consequences of climate change, while also highlighting current and potential adaptive measures. It should be highlighted that many of these adaptive measures will be undertaken as part of the broader response to climate change, but the aim is to support evidence-based policy development and strategic planning to enhance the resilience and sustainability of tourism in the face of a changing climate).

3.5.1. Flooding

Increased frequency of flooding of destinations and tourist businesses and facilities, resulting in damage, temporary to long-term closures, loss of income, insurance risk, and reduced tourism offering.

Hazards: Increased fluvial, pluvial, and coastal flooding due to rising precipitation and sea levels.

Vulnerabilities: High sensitivity in coastal and river-adjacent tourist areas; low adaptive capacity due to external flood defence reliance.

Impacts: Damage to infrastructure, closures, income loss, public health risks, and reputational damage.

Adaptive Measures: Flood risk assessments, emergency response plans, nature-based solutions (NbS), improved drainage, and community training.

3.5.2. Coastal Erosion

More rapid coastal change and erosion resulting in difficulty accessing or damage or submergence or deterioration in quality of visitor amenities.

Hazards: Accelerated erosion from sea level rise, storms, and human activity.

Vulnerabilities: High in soft sediment coasts and heritage sites; erosion is irreversible.

Impacts: Loss of beaches, habitats, and infrastructure; access issues; reputational damage.

Adaptive Measures: Dune stabilisation, visitor management, erosion monitoring, and integrated coastal zone management.

3.5.3. Warmer, Drier Summers

Warmer temperatures and greater evapotranspiration, combined with drier summers, resulting in increased challenges for management of vegetation and risk of fire, reduced river flows, and reduced availability of water resources.

Hazards: Increased evapotranspiration, vegetation growth, and drought risk.

Vulnerabilities: Moderate sensitivity; high adaptive capacity with efficient water use.

Impacts: Water shortages, wildfire risk, damage to natural and built assets, and reduced water quality.

Adaptive Measures: Water conservation, fire risk management, drought-tolerant landscaping, and improved irrigation systems.

3.5.4. More Attractive Climate for Tourism

Warmer temperatures resulting in the Irish climate being perceived as more favourable for tourism, leading to increased tourist demand and facilitating diversification and extension of the season

Hazards: Warmer, drier summers improving Tourism Climatic Index (TCI).

Opportunities: Extended tourism season, increased demand, and diversification.

Impacts: Increased income, improved staff morale, extended tourism season and potential for regenerative tourism.

Adaptive Measures: Infrastructure investment, visitor management, targeted marketing, and emissions monitoring.

3.5.5. Extreme Rainfall

Extreme rainfall causing damage to walking trails, increasing risk of contamination of bathing water, impacting beach tourism, and reducing opportunities for water-based activities.

Hazards: Increased frequency of heavy rainfall events.

Vulnerabilities: Moderate; localised impacts.

Impacts: Trail damage, water contamination, beach closures, and reduced water sports opportunities.

Adaptive Measures: Trail reinforcement, water quality monitoring, public advisories, and infrastructure upgrades.

3.5.6. Heatwaves

Increased air temperature reducing comfort of tourists and staff in the tourism sector, requiring adjustments by tourism businesses.

Hazards: Rising maximum temperatures and increased heatwave frequency.

Vulnerabilities: Low overall, but higher for elderly and vulnerable groups.

Impacts: Discomfort, health risks, increased energy and water demand, and reputational damage.

Adaptive Measures: Shading, ventilation, scheduling adjustments, health protocols, and energy-efficient cooling.

3.5.7. Increased Rainfall in Autumn, Winter, and Spring

Increased rainfall leading to damage to historic buildings, archaeological sites, and golf courses, and reducing tourist demand during rainy season

Hazards: Higher seasonal rainfall and storm intensity.

Vulnerabilities: Moderate; impacts on heritage and outdoor tourism.

Impacts: Structural damage, reduced tourist demand, and increased maintenance costs.

Adaptive Measures: Conservation programs, all-weather infrastructure, and seasonal activity planning.

3.5.8. Storms

Continued disruption to travel and tourism operations from storms, and increased intensity of storms leading to damage to tourist destinations and visitor attractions

Hazards: Fewer but more intense storms.

Vulnerabilities: Moderate; coastal and forested areas most exposed.

Impacts: Infrastructure damage, closures, travel disruption, and public safety risks.

Adaptive Measures: Risk assessments, emergency planning, resilient infrastructure, and improved communication systems.

3.5.9. Extreme Cold

Extreme cold resulting in icy conditions or snow, leading to closure of attractions and cancellations of flights and ferries, and disrupting road and rail travel.

Hazards: Decreasing frequency of frost and ice days.

Vulnerabilities: Low; impacts are temporary.

Impacts: Travel disruption, closures, and increased heating costs.

Adaptive Measures: Winter readiness campaigns, flexible scheduling, and accessibility improvements.

3.5.10. Ocean Warming

Ocean warming and acidification leading to changes in marine species composition, impacting on sea swimming and marine nature tourism

Hazards: Rising sea temperatures and acidification.

Vulnerabilities: Low; nature tourism still developing.

Impacts: Changes in marine biodiversity, reduced attractiveness of coastal destinations, and health risks.

Adaptive Measures: Pollution control, biodiversity monitoring, and adaptive nature tourism strategies.

4. Adaptation Goals and Actions

4.1 Adaptation Vision and Goals

Based on the understanding gained during Steps 1-4 of Adaptation Planning, a vision and goals to realise that vision were developed.

The vision for Ireland's tourism sector is one that sustainably and proactively adapts to the challenges and opportunities of a changing climate in order to maintain the attractiveness of Ireland for holidaymakers, and to continue to support resilient communities across Ireland via provision of employment and economic opportunities through to the end of the century.

Goal 1: Increase the tourism sector's understanding of the relationship between climatic variables and the tourism sector in Ireland, to improve our ability to address the impacts of climate change on the sector

Goal 2: Build a shared awareness of climate change and its impacts, and necessary steps to develop resilience, across the tourism sector in Ireland, particularly amongst tourism-dependent communities

Goal 3: Build resilience to reduce the consequences of the most significant climate risks faced by the tourism sector

During the climate impact assessment, it became evident that the relationship between climate hazards and tourism in Ireland is not well understood. Thorough research assessing impacts on tourism businesses, and on tourists, is essential to reduce uncertainty in projected impacts. *(Goal 1)*

While the sector has increased its awareness of the need to decarbonise in recent years, there is less awareness of the *impacts* of climate change and the need to prepare. Raising awareness over the next five years is therefore an important component of this Plan. *(Goal 2)*

Finally, by starting to enhance its resilience to climate change now, the sector will be well prepared for increasingly severe impacts. *(Goal 3)*

4.2 Adaptation Resourcing

The integration of climate adaptation actions into decision-making and policies across all pertinent sectors will require Exchequer funding.

Successful adaptation requires that an analysis of future climate change impacts is mainstreamed into decision-making and policies across all relevant sectors. It is important that this includes the allocation of sufficient funding, capital investment and public expenditure to adaptation measures, such as flood risk management and cross-cutting adaptation measures across relevant sectors. It is also a clear objective however, that no additional financial or bureaucratic burden is placed directly on individual enterprises. All adaptation actions in this Plan will be led by the Department and its agencies with industry co-operation and input where appropriate.

4.3 Adaptation Actions

While some of the proposed actions below do not have significant resource implications, it is acknowledged that others can only be implemented if additional resources are allocated to the relevant lead agencies. Accordingly, climate adaptation measures will need to fully be considered as part of all future budget discussions.

Within each of the Adaptation Goals, actions were developed to ensure that we achieve the Goals within the five years of this Adaptation Plan:

Goal 1: Increase understanding

Action 1.1: Commission research to define baseline and climate resilience targets for the tourism sector that reflect current threats and guide future adaptation efforts	
Lead:	DETE
Stakeholders:	**Failte Ireland,** Met Éireann, Tourism Ireland, Department of Environment, Climate, Energy and the Environment (DCEE), CARO, EPA, Tourism & related businesses, Irish Tourism Industry Confederation (ITIC)
Delivery:	Q3 2030
Milestones:	
Design project proposal:	Q3 2026
Commence research:	Q3 2027
Commence monitoring indicators:	Q1 2028
Determine appropriate targets:	Q4 2029
Implementation indicator / output: Research report	
Costing & resourcing: Estimate approximately €300 k. Competitive research programmes such as that run by EPA may provide a source of funding for this action.	
Context: This will be a key action to ensure that understanding of the relevance of climate change to this sector, including understanding of economic impacts, is greater in five years' time compared to now.	

Relevant cross-sectoral policy issues: Coastal, Urban environment, Health impacts, Built environment
Relevant to other SAPs: Flood Risk Management, Biodiversity, Built & Archaeological Heritage, Transport Infrastructure, Built Environment & Planning, Health, Agriculture, Water Quality, Water Services Infrastructure
Relevant adaptation principles: Just resilience, Avoiding maladaptation, NbS
Relevant strategies: European Agenda for Tourism 2030, *Tourism Policy Framework 2025-2030*, *Heritage Ireland 2030*, *Embracing Ireland's Outdoors*, *Our Rural Future*, *Harnessing Our Ocean Wealth*, *Our Living Islands*, NBAP, *Water Action Plan 2024*, *National Skin Cancer Prevention Plan 2023-2026*
Relevant SDGs: 

Action 1.2: Undertake a skills gap analysis re adaptation (and possibly NBS/biodiversity) across the tourism sector and tailor training programme accordingly
Lead: Fáilte Ireland
Stakeholders: DETE
Delivery: Q2 2026
Implementation indicator / output: Follow up survey engagement
Costing & resourcing: TBC
Context: This will highlight the gaps in skills within the sector in order to allow targeted training to take place, helping to a shared awareness of climate change and its impacts, and necessary steps to develop resilience, across the tourism sector in Ireland, particularly amongst tourism-dependent communities.
Relevant SDGs: 

Action 1.3: Integrate questions, as appropriate, into relevant Fáilte Ireland surveys e.g. *Tourism Barometer*, regarding tourism businesses' experiences of weather impacts
Lead: Fáilte Ireland
Stakeholders: DETE
Delivery: Q1 2030 *Milestones:* Barometer 2025: Q1 2026 Barometer 2026: Q1 2027 Barometer 2027: Q1 2028 Barometer 2028: Q1 2029 Barometer 2029: Q1 2030
Implementation indicator / output: Engagement with relevant questions
Costing & resourcing: Existing resources should be sufficient, as Fáilte Ireland already undertakes regular surveys, and integration of weather-related questions commenced in 2024, during development of this plan (see Case Study 3.1).

Context: This will build a picture over time of impact of weather on the industry and also serve to increase awareness of climate change impacts (Goal 2) across the industry.
Relevant SDGs:  

Action 1.4:	**Review and revise consumer sentiment reporting to include holidaymakers' views in relation to climate impacts, and what climate related factors influence their choice of holiday destination**
Lead:	Tourism Ireland
Stakeholders:	DETE
Delivery:	Q3 2030
Milestones: Design survey: Initial survey: Redesign survey, using learnings: 2nd survey:	 Q3 2026 Q3 2027 Q3 2028 Q3 2029
Implementation indicator / output: Engagement with survey	
Costing & resourcing: Existing resources should be sufficient, as Tourism Ireland has a data and insights team proficient in this type of work.	
Context: Climate impact screening revealed that little is known about climate changes would encourage or discourage holidaymaking in Ireland – this action will serve to address this knowledge gap.	
Relevant SDGs: 	

Action 1.5:	**Estimate sectoral consequences of risks identified in this Plan, following implementation of the Plan to inform the next adaptation plan.**
Lead:	DETE
Stakeholders:	DCEE
Delivery:	Q4 2030
Milestones: Determine current (2030) adaptive capacity for each risk: Develop climate impact chains and estimate sectoral consequences using same approach and same projections as used in this Plan:	 Q4 2030 Q4 2030
Implementation indicator / output: New sectoral consequence estimates included in next SAP	
Costing & resourcing: Existing resources should be sufficient, as the work involved is equivalent or less than that involved in estimating the sectoral consequences included in this SAP, which was undertaken within the Department.	

Context: This action will ensure that the effectiveness of implementation over the five years of this SAP is measured and understood and will provide a key input for development of the next SAP.
Relevant cross-sectoral policy issues: Coastal, Urban environment, Health impacts, Built environment
Relevant to other SAPs: Flood Risk Management, Biodiversity, Built & Archaeological Heritage, Transport Infrastructure, Built Environment & Planning, Health, Agriculture, Water Quality, Water Services Infrastructure
Relevant adaptation principles: Just resilience, Avoiding maladaptation, NbS
Relevant strategies: European Agenda for Tourism 2030, *Tourism Policy Framework 2025-2030*, *Heritage Ireland 2030*, *Embracing Ireland's Outdoors*, *Our Rural Future*, *Harnessing Our Ocean Wealth*, *Our Living Islands*, NBAP, *Water Action Plan 2024*, *National Skin Cancer Prevention Plan 2023-2026*
Relevant SDGs: 

Goal 2: Build a shared awareness

Action 2.1:	**Raise awareness within the tourism sector about impacts of climate change and need for adaptation through a dedicated information on the Fáilte Ireland website**
Lead:	Fáilte Ireland
Stakeholders:	Tourism & related businesses
Delivery:	Q3 2028 *Milestones:* Establish webpage: Q3 2028
Implementation indicator / output:	# visits to webpage
Costing & resourcing: Existing resources should be sufficient, as Fáilte Ireland has a team in place that creates and maintains a wide range of types of webpages via its website, https://www.failteireland.ie/.	
Context: As Fáilte Ireland's website is a key resource for the industry, this action is important for developing awareness across this diverse industry.	
Relevant cross-sectoral policy issues: Coastal, Urban environment, Health impacts, Built environment, Disaster Risk Reduction (DRR)	
Relevant to other SAPs: Flood Risk Management, Biodiversity, Built & Archaeological Heritage, Transport Infrastructure, Built Environment & Planning, Health, Agriculture, Water Quality, Water Services Infrastructure, Forestry, Seafood	
Relevant adaptation principles: Just resilience, Avoiding maladaptation, NbS	
Relevant strategies: European Agenda for Tourism 2030, *Tourism Policy Framework 2025-2030*, *Heritage Ireland 2030*, *Embracing Ireland's Outdoors*, *Our Rural Future*, *Harnessing Our Ocean Wealth*, *Our Living Islands*, NBAP, *Water Action Plan 2024*, *National Skin Cancer Prevention Plan 2023-2026*	
Relevant SDGs: 	

Action 2.2:	**Develop a series of brief guides on main climate impacts for tourism, based on work conducted during Climate Impact Screening, for different elements of the tourism sector**

Lead:	DETE/Tourism Agencies
Stakeholders:	Tourism & related businesses
Delivery:	Q3 2030
Milestones: Share draft guides with SAP Implementation Group:	Q3 2029
Implementation indicator / output: At least four guides published	
Costing & resourcing: Existing resources should be sufficient, as this work builds on extensive research conducted within the Department during Climate Impact Screening (see Chapter 3 and Appendix I).	
Context: A wealth of information regarding different elements of the tourism sector was gathered during the Climate Risk Assessment steps, and developing industry-focused guidance specific to each key element will be a key action to increase awareness.	
Relevant cross-sectoral policy issues: Coastal, Urban environment, Health impacts, Built environment, Disaster Risk Reduction (DRR)	
Relevant to other SAPs: Flood Risk Management, Biodiversity, Built & Archaeological Heritage, Transport Infrastructure, Built Environment & Planning, Health, Agriculture, Water Quality, Water Services Infrastructure, Forestry, Seafood	
Relevant adaptation principles: Just resilience, Avoiding maladaptation, NbS	
Relevant strategies: European Agenda for Tourism 2030, *Tourism Policy Framework 2025-2030*, *Heritage Ireland 2030*, *Embracing Ireland's Outdoors*, *Our Rural Future*, *Harnessing Our Ocean Wealth*, *Our Living Islands*, NBAP, *Water Action Plan 2024*, *National Skin Cancer Prevention Plan 2023-2026*	
Relevant SDGs: 	

Action 2.3:	**Engage with Northern Ireland Tourism officials to align actions on an all-island basis, as appropriate**
Lead:	**DETE**
Stakeholders:	**NSMC**/Tourism Ireland
Delivery:	Q3 2030
Milestones: Present SAP to NSMC:	Q1 2026
Implementation indicator / output: # actions aligned	
Costing & resourcing: Existing resources should be sufficient, as Tourism Ireland is a North-South body and there is already Shared Island collaboration between departments and agencies.	
Context: Officials from both jurisdictions input into papers for the North South Ministerial Tourism Council, at which climate change impacts and biodiversity is a standing item.	
Relevant strategies: NPF	
Relevant SDGs: 	

Action 2.4:	**Raise awareness of climate adaptation actions in destinations and in tourism businesses through the generation of case studies**

Lead:	Fáilte Ireland
Stakeholders:	Local Authorities, Tourism & related businesses
Delivery:	Q3 2030
Milestones: First case study developed:	Q3 2028
Implementation indicator / output: # case studies	
Costing & resourcing: Existing resources should be largely sufficient, as this work will builds on extensive collaboration by Fáilte Ireland with local authorities, including in the development of DEDPs, and with tourism businesses. However, opportunities to harness e.g. Community Climate Action Funding or other sources should also be investigated, to broaden the potential of this action.	
Context: Developing destination-focused and industry-focused case studies will be a key action to increase awareness.	
Relevant cross-sectoral policy issues: Coastal, Urban environment, Built environment	
Relevant to other SAPs: Flood Risk Management, Biodiversity, Built & Archaeological Heritage, Water Services Infrastructure	
Relevant adaptation principles: Just resilience, Avoiding maladaptation, NbS	
Relevant strategies: NDCA, *Our Rural Future*, *Heritage Ireland 2030*	
Relevant SDGs: 	

Goal 3: Build resilience

Action 3.1:	**Incorporate climate adaptation into Phase Two of Fáilte Ireland's Climate Action Programme to align with its next strategy (2027-2029)**
Lead:	Fáilte Ireland
Stakeholders:	DETE, OPW, DCEE, Met Éireann, CARO, EPA
Delivery:	Q3 2030
Milestones: Publish Strategy with details of Phase II: OPW to develop module for this training on future flood risk (to address Priority Impact No. 1):	Q1 2027 Q2 2027
Implementation indicator / output: # businesses undertaking training	
Costing & resourcing: Fáilte Ireland's Climate Action Programme Phase I is established and has resulted in a network of businesses engaging with the agency on climate mitigation. Fáilte Ireland will need to utilise experience from Phase I in addition to learnings during involvement in development of this SAP since April 2024 to determine whether additional resources are required for Phase II and address any such requirement in collaboration with DETE.	

Context: To date, Fáilte Ireland's Climate Action Programme has focused on decarbonisation. It provides a structure and experience that similarly can be utilised to train tourism and related businesses in assessing their own climate risks and enhancing their own climate resilience by taking concrete action to mitigate these risks. Inclusion of climate adaptation in Phase II of this Programme will be a key action to increase resilience of the sector.
Relevant cross-sectoral policy issues: Coastal, Urban environment, Health impacts, Built environment, DRR
Relevant to other SAPs: Flood Risk Management, Biodiversity, Built & Archaeological Heritage, Transport Infrastructure, Built Environment & Planning, Agriculture, Water Quality, Water Services Infrastructure, Forestry
Relevant adaptation principles: Just resilience, Avoiding maladaptation, NbS
Relevant strategies: *Tourism Policy Framework 2025-2030*, *Heritage Ireland 2030*, *Embracing Ireland's Outdoors*, *Our Rural Future*, *Harnessing Our Ocean Wealth*, *Our Living Islands*, NBAP, *Water Action Plan 2024*
Relevant SDGs: 

Action 3.2:	**Incorporate climate adaptation into strategies, as appropriate, developed under all National Tourism Policy Statements**
Lead:	DETE, Fáilte Ireland, Tourism Ireland, Local Authorities
Stakeholders:	Tourism & related businesses
Delivery:	Q3 2030
Milestones: Fáilte Ireland publish new Capital Investment Strategy: Q1 2026 DETE publish new Accommodation Strategy: Q1 2027	
Implementation indicator / output: # strategies incorporating climate adaptation	
Costing & resourcing: Existing resources should be largely sufficient, as there are already commitments to produce relevant strategies under national tourism policy.	
Context: This action is important to mainstream climate adaptation throughout relevant strategies.	
Relevant cross-sectoral policy issues: Coastal, Urban environment, Health impacts, Built environment, DRR	
Relevant to other SAPs: Flood Risk Management, Biodiversity, Built & Archaeological Heritage, Transport Infrastructure, Built Environment & Planning, Agriculture, Water Quality, Water Services Infrastructure, Forestry	
Relevant adaptation principles: Just resilience, Avoiding maladaptation, NbS	
Relevant strategies: *Tourism Policy Framework 2025-2030*, *Heritage Ireland 2030*, *Embracing Ireland's Outdoors*, *Our Rural Future*, *Harnessing Our Ocean Wealth*, *Our Living Islands*, NBAP, *Water Action Plan 2024*	
Relevant SDGs: 	

Action 3.3:	**Update Regional Tourism Development Strategies (RTDSs) in their next iteration (2027-2031) to include regional climate risks, where appropriate, and adaptation actions to address them**
Lead:	Fáilte Ireland
Stakeholders:	DETE

Delivery:	Q2 2027
Milestones: To be set out in Fáilte Ireland's next strategy:	Q1 2027
Implementation indicator / output: Four RTDS incorporating climate risk & adaptation	
Costing & resourcing: Existing resources should suffice, as this can be integrated into already scheduled development of new RTDSs.	
Context: Inclusion of climate adaptation in RTDSs is a key action, as this will aid mainstreaming of climate adaptation into all future tourism development and initiatives.	
Relevant cross-sectoral policy issues: Coastal, Urban environment, Health impacts, Built environment, DRR	
Relevant to other SAPs: Flood Risk Management, Biodiversity, Built & Archaeological Heritage, Transport Infrastructure, Built Environment & Planning, Agriculture, Water Quality, Water Services Infrastructure, Forestry	
Relevant adaptation principles: Just resilience, Avoiding maladaptation, NbS	
Relevant strategies: *Tourism Policy Framework 2025-2030*, *Heritage Ireland 2030*, *Embracing Ireland's Outdoors*, *Our Rural Future*, *Harnessing Our Ocean Wealth*, *Our Living Islands*, NBAP, *Water Action Plan 2024*	
Relevant SDGs: 	

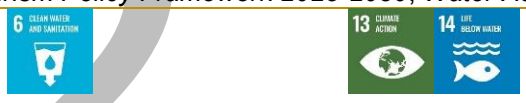
Action 3.4:	**Where appropriate, incorporate climate risk assessment and adaptation measures into new and updated Destination Experience Development Plans (DEDPs)**
Lead:	Fáilte Ireland
Stakeholders:	DCEE, DETE, Local Authorities
Delivery:	Q3 2030
Milestones: To be set out in Fáilte Ireland's next strategy:	Q1 2027
Implementation indicator / output: # DEDPs incorporating climate risk assessment	
Costing & resourcing: Existing resources should suffice, as this can be integrated into already scheduled development / updating of DEDPs.	
Context: DEDPs contain location-specific plans: integration of climate risk assessment into these DEDPs should pave the way for practical projects that enhance resilience of destinations and communities.	
Relevant cross-sectoral policy issues: Coastal, Urban environment, Health impacts, Built environment, DRR	
Relevant to other SAPs: Flood Risk Management, Biodiversity, Built & Archaeological Heritage, Transport Infrastructure, Built Environment & Planning, Agriculture, Water Quality, Water Services Infrastructure, Forestry	
Relevant adaptation principles: Just resilience, Avoiding maladaptation, NbS	
Relevant strategies: *Tourism Policy Framework 2025-2030*, *Heritage Ireland 2030*, *Embracing Ireland's Outdoors*, *Our Rural Future*, *Harnessing Our Ocean Wealth*, *Our Living Islands*, NBAP, *Water Action Plan 2024*	
Relevant SDGs: 	

Action 3.5:	**From 2027, all future Fáilte Ireland schemes providing financial assistance[8] will include relevant conditions / measures / safeguards around climate adaptation**
Lead:	Fáilte Ireland
Stakeholders:	DCEE, DETE, Local Authorities
Delivery:	Q3 2030
Implementation indicator / output:	# supports including climate adaptation considerations
Costing & resourcing: Existing resources should suffice, as this can be readily integrated into Fáilte Ireland's grant schemes.	
Context: Heritage Council and DHLGH conservation grants that incorporate climate adaptation requirements can be used as a model for inclusion of relevant criteria in diverse tourism grants.	
Relevant cross-sectoral policy issues: Coastal, Urban environment, Health impacts, Built environment, DRR	
Relevant to other SAPs: Flood Risk Management, Biodiversity, Built & Archaeological Heritage, Transport Infrastructure, Built Environment & Planning, Agriculture, Water Quality, Water Services Infrastructure, Forestry	
Relevant adaptation principles: Just resilience, Avoiding maladaptation, NbS	
Relevant strategies: *Tourism Policy Framework 2025-2030*, *Heritage Ireland 2030*, *Embracing Ireland's Outdoors*, *Our Rural Future*, *Harnessing Our Ocean Wealth*, *Our Living Islands*, NBAP, *Water Action Plan 2024*	
Relevant SDGs:	

Action 3.6:	**Fáilte Ireland, to explore proposals for targeted financial support to the tourism industry specifically for climate adaptation measures**
Lead:	Fáilte Ireland
Stakeholders:	DETE
Delivery:	Q3 2030
Implementation indicator / output:	Plan for climate adaptation measures
Costing & resourcing: Development of new grant schemes will require additional funding. Fáilte Ireland and DETE will provide a case for such a scheme once details are determined after gaining a greater understanding of the industry's need for supports during the early years of implementation of this SAP. Competitive non-Exchequer co-financing opportunities such as the EU LIFE Programme for Environment and Climate Action should also be considered.	
Context: Heritage Council and DHLGH conservation grants that incorporate climate adaptation requirements can be used as a model for inclusion of relevant criteria in diverse tourism grants.	
Relevant cross-sectoral policy issues: Coastal, Urban environment, Health impacts, Built environment, DRR	

[8] See https://www.failteireland.ie/Identify-Available-Funding.aspx for current and past funding schemes

Relevant to other SAPs: Flood Risk Management, Biodiversity, Built & Archaeological Heritage, Transport Infrastructure, Built Environment & Planning, Agriculture, Water Quality, Water Services Infrastructure, Forestry
Relevant adaptation principles: Just resilience, Avoiding maladaptation, NbS
Relevant strategies: *Tourism Policy Framework 2025-2030*, *Heritage Ireland 2030*, *Embracing Ireland's Outdoors*, *Our Rural Future*, *Harnessing Our Ocean Wealth*, *Our Living Islands*, NBAP, *Water Action Plan 2024*
Relevant SDGs: 

Action 3.7:	**Improve water use efficiency in the accommodation sector (addresses an aspect of Priority Impact No. 3)**
Lead:	Fáilte Ireland
Stakeholders:	Uisce Éireann
Delivery:	Q3 2030
Milestones: Promote guide to Water Management: Q4 2025 Memorandum of Understanding between Fáilte Ireland and Uisce Éireann regarding water stewardship in sector: Q4 2026	
Implementation indicator / output: Improvement in water use efficiency metric across participating businesses	
Costing & resourcing: Additional costs beyond already planned work should be minimal.	
Context: Improving water use efficiency has co-benefits for climate mitigation, given the energy requirements to clean and pump water. This action builds on Fáilte Ireland's guidance for hotels regarding water use efficiency, as well as guidance regarding sustainable events and festivals.	
Relevant cross-sectoral policy issues: Urban environment, Built environment	
Relevant to other SAPs: Water Services Infrastructure	
Relevant adaptation principles: Avoiding maladaptation	
Relevant strategies: *Tourism Policy Framework 2025-2030*, *Water Action Plan 2024*	
Relevant SDGs: 	

As previously stated, many Actions contained in other SAP's will be critical for the tourism sector. Examples of other measures that will be led by Departments and agencies other than DETE/Fáilte Ireland/Tourism Ireland but with the particular significance for tourism include:-

CARO and Local Authorities will ensure:

- Tourism issues are incorporated into all LACAPs in their next iteration (2030-2035);

- Climate adaptation measures are incorporated into Local Authority Tourism Plans &
- The development of #ProtectOurDunes or similar to protect sand dunes, maintaining habitats and amenity resources

Met Éireann will engage on the development of climate projections for the fire index which will determine tourism sector's requirements. The Department of Culture, Communications and Sport will investigate potential for climate adaptation within museums and art galleries of significant interest to tourists and the HSE will work with Local Authorities to promote and advance skin protection in tourist destinations.

These are some examples of the cross sectoral cascades resulting from climate adaptation measures.

Full implementation of Tourism Climate Change Sectoral Adaptation Plan should lead to a gradual reduction in the estimated sectoral consequence of risks, particularly for the three most highly prioritised risks (Figure 4.1).

Meeting Goal 1 in the 2025-2030 SAP should result in increased confidence in projections, particularly for those priority areas considered to need further investigation. The consequences for those areas should be clearer following implementation of successive Plans, allowing later Plans to include adaptation actions to specifically reduce those risks, or benefit from the opportunity, if appropriate.

Potential Adaptation Pathways:

			Current estimate		After implementation of SAPs	
Impact statement	**Time**	**RCP**	**Consequences**		**Consequences**	
Increased frequency of flooding of destinations and tourist businesses and facilities, resulting in damage, temporary to long-term closures, loss of income, insurance risk, and reduced tourism offering	**Present**					
	2050	4.5	*Substantial*	➡	*Limited*	
		8.5				
	2100	4.5	*Critical*	➡	*Substantial*	➡
		8.5				
More rapid coastal change and erosion resulting in difficulty accessing, or damage or submergence or deterioration in quality of, visitor amenities	**Present**		*Limited*			
	2050	4.5		➡	*Limited*	
		8.5	*Substantial*			
	2100	4.5				

			Current estimate	After implementation of SAPs
Impact statement	**Time**	**RCP**	**Consequences**	**Consequences**
		8.5	*Critical*	*Substantial*
Warmer temperatures and greater evapotranspiration, combined with drier summers, resulting in increased challenges for management of vegetation and risk of fire, reduced river flows, and reduced availability of water resources	**Present**		*Limited*	
	2050	4.5	*Substantial*	*Limited*
		8.5		
	2100	4.5		
		8.5		

Figure 4.1. Potential Adaptation Pathways for the three highest impact risks for the tourism sector.

4.4 Cross-sectoral Interdependencies

4.3.1. CROSS-SECTORAL ENGAGEMENT

Tourism by its nature involves cross-sectoral engagement and interaction with many arms of Government. [9]. For example, Fáilte Ireland participates in a range of cross-sectoral initiatives relating to sustainability and related areas, such as LIFE on Machair (as partners along with DAFM and Teagasc, in a project coordinated by DHLGH), and the Blueway Project (alongside Waterways Ireland, Sport Ireland, Sport Northern Ireland and Tourism Northern Ireland). Fáilte Ireland meets regularly with DHLGH and OPW regarding capital works projects and other initiatives at heritage sites in state care. Development of RTDSs and DEDPs involves substantial cross-sectoral and local engagement, as is clear within those strategies and plans. The current phase of Fáilte Ireland's Climate Action Programme was developed in response to the Decarbonisation of the Commercial Built Environment initiative led by the Department of Enterprise, Trade and Employment. One of the key references in this SAP (Kelly & Stack 2009) was co-produced by the Heritage Council and Fáilte Ireland, with the Fáilte Ireland co-author more recently participating in implementation of the 2019 Climate Change Adaptation Plan for Built and Archaeological Heritage, and inputting into development of this Tourism Climate Change Sectoral Adaptation Plan. Fáilte Ireland is co-financing (with DHLGH) research into adaptation options for selected sites of both heritage and tourism interest. During 2024-2025, DTCAGSM also participated in

[9] p. 28: 'The Department and the tourism agencies work in strategic partnership with other Departments and agencies, building relationships to improve visitor experiences, support sustainable environments and develop cross-promotion opportunities…The partners include Coillte, Waterways Ireland, National Parks and Wildlife Service, Údarás na Gaeltachta, National Monuments Service and the Office of Public Works (OPW). There is also close alignment with the Department of Rural and Community Development and the Department of Enterprise, Trade and Employment.'

stakeholder / cross-sectoral meetings and workshops relating to implementing the 2019 Climate Change Adaptation Plan for Built and Archaeological Heritage and developing the 2025 SAP for that sector. The Tourism Division in the Department of Transport, Tourism and Sport provided feedback during development of some of the 2019 SAPs, including that for Transport Infrastructure. Regular updates on development of this Tourism SAP were provided to the National Adaptation Steering Committee (NASC), to ensure that other Departments producing SAPs for other sectors were aware of developments in the Tourism adaptation planning process. From early 2024 onwards, DTCAGSM and its tourism agencies participated in the NCCRA[10] process led by the EPA, increasing cross-sectoral engagement of the sector on climate adaptation. Tourism SAT members participated in various cross-sectoral workshops organised by DECC and by the National Framework for Climate Services.

During 2024, development of this SAP was brought to the attention of other sectors within DTCAGSM (culture, arts, and sport share many of the same climate impacts as tourism) via the Department's Climate Policy Working Group and quarterly Climate Reports to the Management Board. Additionally, use of the León et al. (2023) database to determine baseline and projected TCI for Ireland was presented to the Department's Data & Insights Group. The dedicated sustainability issue of the Department's newsletter in March 2025, *Nuacht Glás*, organised by the Department's Green Team, featured an article on climate impacts and adaptation.

The cross-sectoral Biodiversity Working Group was informed about progress on this SAP in February 2025, and the SAP is referenced in DTCAGSM's 2025 reporting on implementation of its Biodiversity Duty under the Wildlife (Amendment) Act. Regular updates were provided to the Tourism Council of the NSMC during development of this Plan.

Met Éireann, the Department of Health, Sport Ireland, National Parks and Wildlife Service (NPWS), the OPW, the Local Authority Water Programme, the Department of Health, DHLGH (Heritage), the Heritage Council, DAFM, and other potential stakeholders were consulted in the first half of 2025 regarding possibly collaborative actions. These consultations led to the development of actions 3.9 and 3.11, as well as agreement of diverse

[10] Ireland's first National Climate Change Risk Assessment (NCCRA) provides a comprehensive national overview of the potential risks and opportunities posed by climate change for Ireland

public bodies to participate as stakeholders in actions such as 1.1, 1.4, 3.1, and 3.8.

As detailed in the Climate Impact Chains in section 3.5, developments in climate adaptation undertaken by diverse sectors, such as flood risk management or heritage, have benefitted the adaptive capacity of the tourism sector.

4.3.2. TRANSBOUNDARY ISSUES AND INTERNATIONAL CONTEXT

The CCAC found that the likelihood, magnitude, and severity of risk to human mobility from reduced air travel due to the effects of extreme weather on UK and global airports affecting business operations, revenues, and jobs in the tourism sector in Ireland would all be low (medium confidence), with short-lived consequences, negligibly affecting the overall economy (CCAC 2024). Risk to airport infrastructure is included in Priority Impact No. 9 in relation to snow and ice. Some airports within Ireland's key tourism markets experience flooding or high temperatures. Storms (Priority Impact No. 8) additionally pose risks to flights and sailing because of unsafe flying / sailing *conditions* (as opposed to disruption to infrastructure). Both of these types of risk (infrastructure and travelling conditions) affect people in Ireland travelling abroad for holidays, as well as people travelling to Ireland.

All risks identified for tourism in Ireland will also be risks in Ireland's competitor destinations. For example, in recent years, flooding has affected tourism in Slovenia (see case study 4.1), Greece, the Emilia-Romagna region of Italy, southern Germany, Austria, Hungary, Poland, Romania, and Czechia, while wildfires have also impacted tourism in other European countries.[11]. Erosion of beaches is a greater problem on Mediterranean coasts, including for Mediterranean islands such as the Balearic Islands, than along Atlantic coasts. Drought for many decades already has been far more of a concern in e.g. the Algarve (see case study 4.1) and Costa del Sol than is projected to become in Ireland. Fire risk in Ireland is not projected to reach that which has been common over the last two decades in Portugal, Spain, Greece, and Italy. Discomfort due to heat in Ireland is not projected to reach that which is a normal part of life for many months in many regions of the globe, including popular tourist destinations. The appeal of Ireland's climate in future (Priority Impact No.

[11] https://www.travelandtourworld.com/news/article/tourism-sector-faces-major-setbacks-as-wildfires-in-portugal-and-devastating-floods-in-poland-romania-austria-czech-republic-and-hungary-threaten-european-travel-industry/

4) will be partly dependent on aversion to climates in competitor destinations.

The impact of local or national extreme events on supply chains has been noted for Priority Impacts 1 (flooding), 3 (warmer, drier, summer), and 8 (storms). Equally, supply chains for tourism businesses in Ireland can be disrupted by extreme weather events in major source countries for the supplies, and more extreme events globally may lead to increased food prices, affecting hospitality.

Case Study 4.1 How is the tourism sector in other countries adapting to climate change?

Tourism response to severe flooding across Slovenia

Two-thirds of Slovenia was affected by record-breaking rainfall early August 2023 – during peak tourism season. Damaged railways and motorways and collapsed bridges caused travel disruptions and restricted access to some outdoor activities and attractions. Several hiking trails were closed due to fallen trees and water-damaged paths. Some cultural events and water activities were cancelled or rescheduled. The floods also caused evacuations from campsites and damage to personal belongings of campers.

The Slovenian Tourism Board regularly updated local DMCs. It communicated via a dedicated webpage and social media updates on any new developments in the crisis-affected areas. It warned visitors about possible contamination of drinking water in flood-affected areas and redirected them to unaffected regions. Visitor numbers remained stable. Staff developed a guide to prepare for future events. Since spring 2024, real-time information on domestic and international visitor numbers is recorded, to help predict visitor flows and travelling patterns in situations such as during extreme weather.

Tourism response to water shortage in the Algarve, Portugal

The Algarve experienced severe water shortages in 2023, followed by severe drought in 2024. At the beginning of 2024, the six reservoirs in the region were at 25% of their capacity, leading to government regulations to reduce water consumption by 15% in the urban sector, including tourism.

Turismo de Portugal introduced a Sustainability Communications campaign and a voluntary 'Save Water' certification, with funding to help businesses achieve the certificate.

5. Implementation, Review, & Evaluation

5.1 Implementation Plan

Two governance actions will ensure efficient implementation, monitoring, and review:

Action G.1:	**Establish Tourism Sectoral Adaptation Plan (SAP) Implementation Team**
Lead:	DETE
Stakeholders:	Fáilte Ireland, Tourism Ireland, DCEE, CARO, EPA, DHLGH, NPWS
Delivery:	Q4 2025
Milestones:	
Invite representatives:	Q4 2025
Establish Terms of Reference:	Q4 2025
Context: Recognising the need for enhanced collaboration on climate adaptation, this will be broader than the current SAT, including those bodies mandated to protect Ireland's natural and built heritage (NPWS and DHLGH – Heritage section, respectively). The SAP Implementation Team will meet at least annually, facilitating identification of challenges in implementing the 2025-2030 SAP, and supporting the development of the next SAP.	

Action G.2:	**Report on implementation of the SAP**
Lead:	DETE (as chair of the SAP Implementation Team)
Stakeholders:	Fáilte Ireland, Tourism Ireland, DCEE, CARO, EPA, DHLGH, NPWS
Delivery:	Q3 2030
Milestones:	
Report on relevant action in Climate Action Plan 2025:	Q3 2025
Commence annual reporting within the Department:	Q1 2026
Commence providing quarterly updates on implementation to the NASC:	Q2 2026
Commence annual reporting to the CCAC:	Q2 2026
Context: Ensures internal reporting by adaptation action leads, reporting within the lead Department, and reporting to external bodies such as the Climate Action Delivery Board, the NASC, and the CCAC.	

5.2. Indicators

Climatological and impact indicators related to each of the priority climate impacts identified in Chapter 3 Climate Impact Screening could be used as a guide as to what to monitor or investigate in actions to address Goal 1 (see section 4.1 Adaptation Vision and Goals):

No.	Impact statement	Climatological indicator	Impact indicator
1	Increased frequency of flooding of destinations and tourist businesses and facilities, resulting in damage, temporary to long-term closures, loss of income, insurance risk, and reduced tourism offering	Annual precipitation Annual # extreme precipitation events Sea level rise Annual # storm surges Windspeed during storms Annual # storms	Annual # recordings of flooding of tourist destinations Annual # recordings of flooding of tourist businesses, facilities, or events Annual loss of income due to flooding Annual cost of repair due to flooding Annual # permanent or long-term closures due to flooding Insurance premiums # flood-related insurance claims
2	More rapid coastal change and erosion resulting in difficulty accessing, or damage or submergence or deterioration in quality of, visitor amenities	Annual precipitation Annual # days with extreme precipitation Sea level rise Annual # storm surges Windspeed during storms Annual # storms	Annual # of recordings of closures of visitor attractions / amenities due to erosion or rockfall Metres land lost to erosion Annual # attractions or amenities damaged by erosion or rockfall
3	Warmer temperatures and greater evapotranspiration, combined with drier summers, resulting in increased challenges for management of vegetation and risk of fire, reduced river flows, and reduced availability of water resources	Summer average, average maximum, and average minimum temperature Summer potential evapotranspiration Summer precipitation Spring average temperature Autumn average temperature Fire hazard index Summer river flows Degree days Start of growing season	Volume of irrigation water used # wildfires # records of wildfires in close proximity to accommodation or attractions # records of difficulties in water-based activities due to low river flows. # days with water restrictions
4	Warmer temperatures resulting in the Irish climate being perceived as more favourable for tourism, leading to increased tourist demand and facilitating diversification and extension of the season	Minimum, mean and maximum air temperature in all seasons Maximum air temperature # heatwaves Precipitation in summer Wind speed in summer Monthly TCI # ice days # frost days # warm nights # ‘summer days’	Tourist demand (overseas and domestic) Tourism seasonality Visitor participation in outdoor activities Displacement of competitor markets

No.	Impact statement	Climatological indicator	Impact indicator
5	Extreme rainfall causing damage to walking trails, increasing risk of contamination of bathing water, impacting beach tourism, and reducing opportunities for water-based activities	Annual # days with extreme precipitation	# trail closures due to damage # No Swim notices # records of disruption to water-based activities
6	Increased air temperature reducing comfort of tourists and staff in tourism sector, requiring adjustments by tourism businesses	Summer average and average maximum temperature Annual absolute maximum temperature Annual # heatwaves Mean wind speed	# complaints regarding temperature
7	Increased rainfall leading to damage to historic buildings, archaeological sites, and golf courses, and reducing tourist demand during rainy seasons	Annual precipitation Autumn, winter, and spring precipitation Annual # days with rainfall greater than 20 mm Annual # days with rainfall greater than 30 mm	# incidences of damage to interiors # incidences of structural damage to protected sites Seasonality of tourism
8	Continued disruption to travel and tourism operations from storms, and increased intensity of storms leading to damage to tourist destinations and visitor attractions	Annual # storms Wind speed during storms	Annual # recordings of storm damage to tourist destinations Annual # recordings of storm damage to tourist businesses, facilities, or events Annual loss of income due to storm damage Annual cost of repair due to storm damage Annual # permanent or long-term closures due to storm damage Insurance premiums Annual # storm-related insurance claims
9	Extreme cold resulting in icy conditions or snow, leading to closure of attractions and cancellations of flights and ferries, and disrupting road and rail travel	Winter minimum, average, and maximum temperatures Snowfall # frost days # ice days Heating degree days	Annual # closures of attractions Annual # cancellations to events # flight / ferry cancellations
10	Ocean warming and acidification leading to changes in marine species composition, impacting on sea swimming and marine nature tourism	Sea surface temperature Ocean heat content Ocean CO_2 content Offshore pH Deep water pH	# incidents of jellyfish warnings Reduced wildlife sightings

All the above climatological indicators are available – mostly from Met Éireann; indicators under No. 10 from the Marine Institute – with the exception of the calculated Tourism Climatic Index (TCI): an approach to

ensure this index is calculated routinely should be developed during research.

Impact indicators are not currently collated on a national scale, with the exception of those related to No. 4, for which relevant data are available from CSO, Eurostat, Fáilte Ireland, and Tourism Ireland. At least some of the impact indicators under No. 5 are available or partially available from e.g. Sport Ireland, EPA, and IFI. Regarding the other impacts, many accommodation providers and attractions record closures, visitor numbers etc. Such data will be collated and analysed in conjunction with climatological indicators as part of adaptation action 1.1. Research undertaken as part of that action should prioritise obtaining baselines and annual trends for the first three Priority Impacts, since these have the greatest consequence for the sector. Targets can be developed once these baselines are determined, with actions under Goal 3 narrowing the gap between baseline and target.

Implementation indicators (included in section 4.2 Adaptation Actions) will assist monitoring of implementation of the Plan. An **outcome indicator** from this Plan is reduced estimated sectoral consequences, particularly for Priority Impacts 1-3, as a result of improving resilience of the sector, as measured following repeating the same process as detailed in Appendix I Method Used for Climate Impact Screening after the five years of implementation of this Plan (adaptation action 1.5).

Abbreviations

CARO	Climate Action Regional Office
CCAC	Climate Change Advisory Council
CID	Climate impact driver
CO_2	Carbon dioxide
CSO	Central Statistics Office
DAFM	Department of Agriculture, Food and the Marine
DCCS	Department of Culture, Communications and Sport
DCHG	Department of Culture, Heritage and the Gaeltacht
DECC	Department of the Environment, Climate and Communications
DCEE	Department of Climate, Energy and the Environment
DEDP	Destination and Experience Development Plan
DETE	Department of Enterprise, Tourism and Employment
DHLGH	Department of Housing, Local Government and Heritage
DMC	Destination Management Company
DMURS	Design Manual for Urban Roads and Streets
DPENDR	Department of Public Expenditure, NDP Delivery and Reform
DRR	Disaster Risk Reduction
DTCAGSM	Department of Tourism, Culture, Arts, Gaeltacht, Sport and Media
EEA	European Environment Agency
EPA	Environmental Protection Agency
ETC	European Travel Commission
GHG	Greenhouse gas
GVA	Gross Value Added
HSE	Health Service Executive
IFI	Inland Fisheries Ireland

IPCC	Intergovernmental Panel on Climate Change
ITIC	Irish Tourism Industry Confederation
LACAP	Local Authority Climate Action Plan
L&D	Learning & Development
NAF	National Adaptation Framework
NASC	National Adaptation Steering Committee
NBAP	National Biodiversity Action Plan
NbS	Nature-based Solutions
NCCRA	National Climate Change Risk Assessment
NCI	National Cultural Institutes
NDCA	National Dialogue on Climate Action
NDP	National Development Plan
NPF	*National Planning Framework*
NPWS	National Parks and Wildlife Service
NSMC	North South Ministerial Council
NSO	National Strategic Outcome (in NDP)
NUTS	Nomenclature of Territorial Units for Statistics
OPW	Office of Public Works
OS	Opportunity Statement
RCM	Regional Climate Model
RCP	Representative Concentration Pathway
RS	Risk Statement
RTDS	Regional Tourism Development Strategy
SAP	Sectoral Adaptation Plan
SAT	Sectoral Adaptation Team
SDG	Sustainable Development Goal
SuDS	Sustainable Drainage Systems

TCI	Tourism Climatic Index
TDGVA	Tourism Direct Gross Value Added
UNWTO	United Nations World Tourism Organization

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Glossary

Adaptive Capacity	The ability of systems, institutions, humans, and other organisms to adjust to potential damage, to take advantage of opportunities, or to respond to impacts
CID	Physical conditions or factors in the climate system that can influence the occurrence and intensity of hazards. These conditions encompass means, events, and extremes e.g. mean sea level rise, increasing surface temperature, changes in precipitation patterns.
Climate Adaptation	The process of adjustment to actual or expected climate and its effects in order to moderate harm or take advantage of beneficial opportunities
Climate Change	A change in the state of the climate that can be identified (e.g. using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer
Climate Impacts	The consequences of realised risks on natural and human systems, where risks result from the interactions of climate-related hazards, exposure, and vulnerability. Impacts generally refer to effects on lives, livelihoods, health, and wellbeing, ecosystems, and species, economic, social, and cultural assets, services (including ecosystem services), and infrastructure.
Climate Projections	Simulations of Earth's climate for future decades (typically until 2100) based on assumed 'scenarios' for the concentrations of greenhouse gases, aerosols, and other atmospheric constituents that affect the planet's radiative balance
DMC	An enterprise that manages a range of products and services at a popular travel destination
Exposure	The presence of people; livelihoods; species or ecosystems; environmental functions, services, and resources; infrastructure; or economic, social, or cultural assets in places and settings that could be adversely affected by a hazard
Greenhouse gas	A number of gases whose presence in the atmosphere traps energy radiated by the Earth; this is called the greenhouse effect. These gases can be produced through natural or human processes. Carbon dioxide is the most important greenhouse gas. Methane, fluorinated gases, and nitrous oxide are also greenhouse gases.

GVA	The output (at basic prices) minus the intermediate consumption (at purchaser prices). The sum of GVA over all industries or sectors plus taxes on products minus subsidies on products gives Gross Domestic Product.
Hazard	The potential occurrence of a natural or human-induced physical event or trend that may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, ecosystems, and environmental resources
Holidaymaker	A tourist whose main reason for travelling is holiday / leisure / recreation
Hydrological drought	Reduced precipitation and/or increased evapotranspiration or evaporation affecting water supplies, resulting in decreased levels of water in reservoirs and lakes and reduced groundwater
Inbound operator	A specialised travel company or agency that focuses on organising and managing travel arrangements for visitors coming into a specific destination
Just resilience	The concept of just resilience looks at the uneven distribution of climate change impacts on people and places, the uneven prerequisites, and capabilities (social, economic, political, health-related etc.) to adapt and to partake in the benefits provided by adaptation actions. Just resilience addresses the need to scale up activities in support of people that withstand the worst of climate change impacts due to their geographical location or socioeconomic status.
Maladaptation	Actions that intend to reduce the impacts of climate change but inadvertently result in increased levels of vulnerability and exposure leading to increased risk. Such actions might increase greenhouse gas emissions, make certain groups more vulnerable to climate change, lead to unfair results, or reduce overall well-being. Often, these negative effects are unintended. They happen as a side effect of poor planning or lack of understanding of the wider implications of an action.
NbS	Actions to protect, conserve, restore, sustainably use, and manage natural or modified terrestrial, freshwater, coastal and marine ecosystems, which address social, economic and environmental challenges effectively and adaptively, while simultaneously providing human well-being, ecosystem services and resilience and biodiversity benefits

Radiative forcing	The change in balance between incoming and outgoing radiation caused mainly by changes in atmospheric composition, rather than being linked to any specific combination of socioeconomic and technological development scenarios
RCP	One of many possible trajectories of the full suite of greenhouse gases and aerosols and chemically active gases, as well as changes in land use and land use cover, resulting in a specific radiative forcing; used to develop climate projections
Resilience	The ability to absorb and respond to climate change by implementing effective adaptation actions and sustainable development to reduce negative climate impacts, while also taking advantage of any opportunities
Risk	Risk combines the chance that an event will occur with how large its impact could be – in social, economic, or environmental terms
Sensitivity	The degree to which a system or species is affected, either adversely or beneficially, by (in relation to climate) climate variability or change. The effect may be direct e.g. a change in crop yield in response to a change in the average temperature, or indirect e.g. damage caused by an increase in the frequency of coastal flooding due to sea level rise.
TDGVA	The component of output from a country's tourism industries that is directly driven by tourist spend
Tourist	A visitor whose trip includes an overnight stay
Visitor	A traveller taking a trip to a destination outside his/her usual environment, for less than a year, for any main purpose other than to be employed by a resident entity in the country or place visited
Vulnerability	The propensity or predisposition to be adversely affected by a hazard

Appendix I Method Used for Climate Impact Screening

Each climate hazard listed under Appendix 1 of the *Sectoral Planning Guidelines for Climate Change Adaptation: 2024* (DECC 2024a) was considered across the diversity of elements of the tourism sector.

TIMEFRAME

The past 30 years (1995-2024) were selected for analysis of 'current' climate. Following DECC (2024a), two future time-points, approximately 2050 and 2100, were considered with respect to the potential impacts of climate change on the tourism sector. As climate is usually measured over 30-year time periods, the relevant periods provided for projections for Ireland by the TRANSLATE project are 2041-2070 and 2071-2100. Projected *changes* in climate associated with climate change are measured relative to the reference period 1976-2005 ('historical').

PROJECTIONS

Following DECC (2024a) and EPA (2024a), projected climate under RCP 8.5 (see section 1.1. Climate Change) was assessed initially. Hazards causing risks / opportunities identified under the current climate were assessed in relation to whether they might increase, decrease, or stay the same under RCP 8.5. Later, projected climate under RCP 4.5, a more moderate emissions scenario more aligned with the current global temperature trajectory, was also assessed. At that stage, projections of socio-economic change were additionally considered. Climate Ireland (https://www.climateireland.ie/data-explorer/) presents means of the range of models used for projections, along with the 10th and 90th percentiles. These percentiles were used as an estimate of certainty in the direction of projection e.g. where the average is an increase, if the 10th and 90th percentiles also show an increase, then an increase is very likely; if one of these extremes of the range shows a decrease, then there is uncertainty in the average assumption of an increase.

Extraction and analysis of historic and projected Tourism Climatic Index (TCI)

TCI, which takes into account daytime thermal comfort, precipitation, hours of sunshine, and wind speed, is often used as an indicator of potential tourism demand in different locations at different times of year (e.g. Sweeney et al. 2013, Matei et al. 2023). However, projected TCI scores using current climate models have not been published for Ireland. Therefore, León et al.'s (2023) database was mined to determine historical and projected TCI for the three Nomenclature of Territorial Units for Statistics (NUTS) level 2 regions of Ireland: Northern & Western Region, Southern Region, and Eastern & Midland Region. For consistency with the 30-year climate approach used for other climate analysis, only the data from 1981-2010 from the 'TCI historical values (1981-2020)' database were used, as the closest possible 30-year period to the TRANSLATE historical baseline of 1976-2005. Average TCI over this 30-year period was then determined for each month, in each region. Next, TCI projections were

abstracted for the same three regions from the 'TCI projected values (2021-2100)' database, and averages were calculated for each month in each region over 2041-2070 and over 2071-2100 for RCP 8.5 and RCP 4.5 for each of the 10 climate models in the database. Averages across the 10 models were then calculated, and the minimum and maximum values across the 10 models used as an indication of uncertainty in the average projections.

INFORMATION SOURCES

Regarding 'current' hazards, national climatological and meteorological information was assessed in conjunction with tourism-relevant information. Additionally, newspaper articles and web sources for popular visitor attractions, accommodation, and destinations (determined mainly from the tourism datasets) were searched for weather-related disruption over the past 30 years; including by using the search function within the Irish Newspaper Archive.

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Introduction of weather-related questions into Tourism Barometer

To supplement understanding of the impact of weather and climate on tourism, and to increase awareness of the topic of climate change, Fáilte Ireland included the following questions in its *Tourism Barometer* survey at the end of 2024:

Do you believe that unusual weather conditions have affected the volume of your overall business in 2024?
e.g. prolonged periods of wet or dry weather, notably hot or cold temperatures, poor weather at the wrong time (e.g. summer), a storm or flood event etc.

- ❑ **Increase in volume as a result of unusual weather**
- ❑ **No impact**
- ❑ **Decrease in volume as a result of unusual weather**
- ❑ **Don't know**

Have any of the following environmental events affected the operation of your business in 2024?
Tick all that apply

- ❑ **River flooding**
- ❑ **Coastal flooding**
- ❑ **Groundwater flooding**
- ❑ **Heavy snowfall**
- ❑ **Drought**
- ❑ **Storm power surge**
- ❑ **Severe windstorm**

- ❑ **Heatwave**
- ❑ **Freezing temperatures**
- ❑ **Coastal erosion**
- ❑ **Heavy rainfall, leading to flooding**
- ❑ **None of the above**

Regarding future climate, national and international literature provided additional potential impacts associated with the risks / opportunities already identified for the current climate, as well as emerging hazards.

DEVELOPMENT OF CLIMATE IMPACT CHAINS

For each of the impacts identified, potential exposure (for example, that proportion of a particular element of the tourist system that is coastal) was estimated, along with vulnerability and existing adaptive capacity.

Adaptation actions can be proactive – measures to prevent the risk or reduce the hazard, exposure, or vulnerability – or reactive – measures to respond to the consequences of the risk e.g. emergency response (EPA 2024a). Proactive adaptation can address reliability or resistance, and reactive adaptation can address recovery and response or redundancy:

Proactive adaptation:

- Reliability: Ensure consistent performance under changing climate conditions e.g. using durable materials for infrastructure
- Resistance: Withstand climate impacts effectively e.g. constructing flood resistant buildings

Reactive adaptation:

- Recovery and response: Quickly bounce back after events e.g. having emergency response plans in place
- Redundancy: Include backups to enhance resilience e.g. utilising back-up energy sources

Adaptive measures currently in place were separated into the above four categories. These measures are in use within the tourism sector, or within other sectors and impact on tourism.

During initial climate screening, climate impact statements to summarise climate impact chains were developed for current climatic conditions and then modified for the projected future climate (RCP 8.5). Additionally, new basic climate impact chains were developed for emerging or future hazards. The initial Risk (R) and Opportunity (O) Statements (S), along with the element of the tourism sector impacted, were:

No.	Statement	Element
RS1	Unfavourable weather reducing tourist demand for caravan & camping parks	Tourism product
RS2	Increased rainfall leading to damp conditions in historic buildings, causing algal growth and damage to historic interiors	Tourism product
RS3	Unfavourable weather reducing income for activity providers, tour guides, and hospitality	Other trade Tourism product
RS4	Dry summers increasing likelihood of wildfires, endangering caravan & camping sites and damaging visitor attractions	Tourism product Walking trails

No.	Statement	Element
		Destinations
RS5	Extreme rainfall resulting in wastewater overflows and run-off from agricultural land and urban areas, causing short-term deterioration in bathing water quality or resulting in disruption to water service	Tourism product Other trade Destinations
RS6	Extreme rainfall impacting on angling and other water-based activities	Angling Other trade
RS7	Extreme rainfall damaging paths, resulting in closure of walking trails	Walking trails
RS8	River flooding impacting tourist trade	Tourism product Other trade
RS9	Pluvial flooding of tourist accommodation	Tourism product
RS10	Heavy rainfall leading to flooding and the cancellation or disruption of festivals & events	Festivals Events
RS11	Drought resulting in water restrictions impacting on tourism industry	Tourism product Other trade Destinations
RS12	Drought impacting on condition of golf courses and on visitor attractions	Tourism product Other trade
RS13	Drought and warmer temperatures impacting angling and other water-based activities	Angling Other trade
RS14	Drought and warmer temperatures leading to water shortages impacting festivals & events during high season	Festivals Events
RS15	Low wind speeds reducing surfing, windsurfing, and kitesurfing opportunities	Other trade
RS16	Storm disruption leading to cancellation of bookings in tourist accommodation or impacting on tourists' ability to reach Ireland and/or travel to specific destinations	Tourism product Other trade Destinations
RS17	High winds endangering visitors, resulting in temporary closure of visitor attractions and walking trails	Tourism product Walking trails
RS18	High winds resulting in danger to tourists participating in water-based or coastal activities or tours, and impacting insurability of tour operators	Other trade
RS19	Storm damage to tourist destinations and visitor attractions	Tourism product Destinations
RS20	Extreme cold resulting in icy conditions leading to closure of visitor attractions	Tourism product
RS21	Snow resulting in cancellations of flights and ferries, as well as disrupting road and rail networks, impacting on tourists' ability to reach Ireland and then specific destinations	Tourism product Other trade
RS22	Coastal flooding limiting access and causing damage to tourist destinations and their trade and walking and cycling trails	Tourism product Other trade Destinations Walking trails Cycling trails
RS23	Erosion of land causing damage to or submergence of visitor attractions	Tourism product
RS24	Erosion of golf courses	Other trade
RS25	Erosion resulting in loss of sand from beaches leading to deterioration in the quality of and/or access to beaches	Destinations
RS26	Coastal change resulting in increased risk of rockfalls or landslides and erosion of coast, leading to closure of coastal walks	Walking trails
RS27	Ocean warming resulting in changes in species composition, impacting on sea swimming	Destinations
RS28	Ocean warming and acidification resulting in changes in species composition, impacting on sea angling and marine nature tourism	Angling Other trade

No.	Statement	Element
RS29	Increased air temperature affecting comfort of tourists and staff and therefore requiring adjustments by tourism businesses	Tourism product Other trade
OS1	Increased air temperature, combined with a greater chance of dry weather, encouraging tourists to holiday in Ireland and participate in outdoor tourism	Other trade Destinations Walking trails Cycling trails
OS2	Increased air temperature making Ireland a more attractive tourist destination, particularly in comparison to increasingly hot southern European destinations	Tourism product Other trade
OS3	Increased air temperature allowing extension of the main tourism season	Tourism product Other trade

ASSESSING SECTORAL CONSEQUENCES

The basic climate impact chains produced were used to estimate relative consequences of a particular risk or opportunity for the tourism sector as a whole. At each time point and either RCP, the consequences for the sector as a whole of each identified risk or opportunity were judged to fall under one of the following categories: *Catastrophic*, *Critical*, *Substantial*, or *Limited* according to the extent of damage / loss for the sector, extent or pervasiveness, or effects beyond system boundaries (DECC 2024a, EPA 2024b):

Risk severity	Damage	System functionality	Extent and pervasiveness	Cascading effects
Catastrophic	Very large and frequent	Irreversible loss	Very large extent or very high pervasiveness	Irreversible cascading effects beyond system boundaries
Critical	Large and frequent	Long-term disturbance	Large extent and high pervasiveness	Long-term cascading effects beyond system boundaries
Substantial	Substantial losses	Temporary or moderate disturbance	Moderate extent or pervasiveness	Temporary cascading effects beyond the system
Limited	Limited or rare losses	No significant disturbance	Limited extent or pervasiveness	No cascading effects beyond system boundaries

Adapted from DECC (2024a).

Additionally, the magnitude of economic damage or numbers of employees potentially out of work as a result of a risk, where known, was considered, in proportion to economic value or numbers of employees in the sector as a whole (see section 2.2 The Tourism Sector in Ireland), following an approach used by EPA (2024a). Where appropriate, area of land lost or damaged, or loss or irreversible damage to iconic tourist assets was considered.

Confidence in each classification (ranging from very low to very high) was estimated. Better information is available for some risks and opportunities than for others. Confidence was higher for those risks / opportunities for which more information is available, and for which diverse information sources agree. For future time-points, confidence in the climate projection, as well as confidence in the consequences of the projected climate, had to be considered. This often had the result of reducing confidence for future, compared to current, time-points. Additional uncertainty was added where socio-economic projections were considered to alter the estimation of sectoral consequence, on account of uncertainty in the socio-economic projection.

ASSIGNING ORDER OF PRIORITY FOR ADDRESSING CLIMATE HAZARDS

Risk and opportunity statements were amended when future climate when socio-economic projections were considered. To better understand the consequences for the tourism sector of different risks and opportunities under the two RPCs and socio-economic change, some risks or opportunities relating to single hazards were grouped together at later stages of the screening process (while remaining cognisant of the different elements under consideration).

Compared to the initial screening, the detailed screening stage resulted in a reduced number of detailed climate impact chains. They were prioritised mainly on the basis of current and future projected sectoral consequence. Confidence in assignment to a particular sectoral consequences class was also taken into consideration during prioritisation: more investigation may be required where confidence is very low, before deciding to take any specific adaptation action.

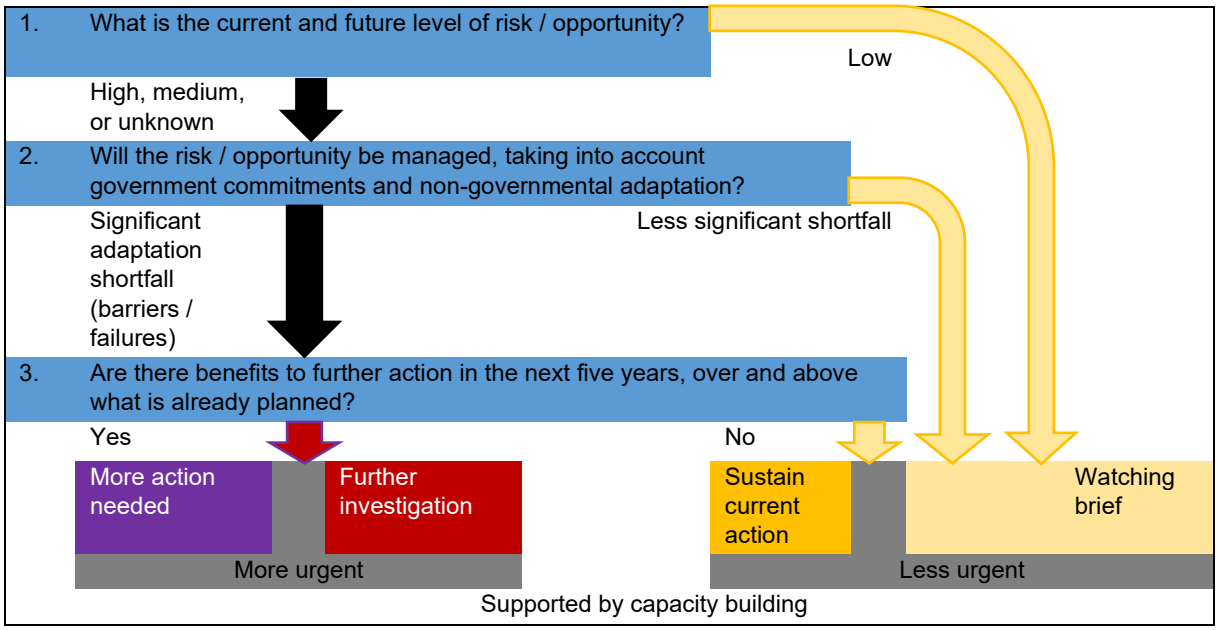
DETERMINING URGENCY FOR ADDRESSING CLIMATE HAZARDS

Following EPA (2024b), the aim was to allocate each climate impact to one of the following urgency classes:

Urgency criteria	Urgency category
New, stronger, or different government action, whether policies, implementation activities, capacity building or enabling environment for adaptation – over and above those already planned – are beneficial in the next five years to reduce climate risks or take advantage of opportunities. This will ensure different responses according to the nature of the risks and the type of adaptation: •Addressing current and near-term risks or opportunities with little or no regret options (implementing activities or building capacity) •Integrating climate change in near-term decisions with a long lifetime or lock-in •Early adaptation for decisions with long lead-times or where early planning is needed as part of adaptive management	More action needed
Based on available information, it is not known if more action is needed or not. More evidence is urgently needed to fill significant gaps or reduce the uncertainty in the current level of understanding in order to assess the need for additional action.	Further investigation
Current or planned levels of activity are appropriate, but continued implementation of these policies and plans is needed to ensure that the risk continues to be managed in the future.	Sustain current action
The evidence in these areas should be kept under review, with continuous monitoring of risk levels and adaptation activity (or the potential for opportunities and adaptation) so that further action can be taken if necessary.	Watching brief

Adapted from EPA (2024a).

To do this, we used the approach of the NCCRA (2024):



Adapted from NCCRA (2024).

Appendix II Detailed Climate Impact Chains

Detailed Climate Impact Chains for the Tourism Sector developed during Climate Impact Screening, in order of priority:

3.5.1. FLOODING

1. **Increased frequency of flooding of destinations and tourist businesses and facilities, resulting in damage, temporary to long-term closures, loss of income, insurance risk, and reduced tourism offering.**

Flood Risk (see the Flood Risk Management Adaptation Plan) cascades into many sectors, including Tourism. All regions of Ireland are already exposed to fluvial flooding. The region of Ireland currently with the greatest area of land exposed to a one in two years coastal flooding is the mid-west (National Climate Change Risk Assessment (NCCRA) 2024). Regarding pluvial flooding, the Eastern & Midland region is the region with the greatest degree of soil sealing, preventing infiltration of water.

Vulnerability:

***Sensitivity**:*

Very high, because of widespread coincidence of popular tourist destinations with coastal location or proximity to rivers, as well as the magnitude of the impact: damage to buildings and operations from flooding can take weeks or even months to repair (see Case Study 3.2).

People who live in coastal and flood risk areas are amongst the most vulnerable to climate change; those whose livelihoods are also based in such areas are particularly vulnerable. Hence, communities that rely on tourism in coastal and flood risk areas are in particular need of adaptation action to ensure a just resilience.

***Adaptive capacity**:*

Low, because flood defence is largely outside of the control of tourism businesses.

Climate Impact Drivers and Hazard:

The occurrence of inland flooding is now quite widespread. River and groundwater flooding is particularly prominent in the west of Ireland e.g. the Shannon estuary. Coastal flooding is now a common hazard in e.g. County Cork; Dublin and Galway have recorded notable wave overtopping events because of wave and storm surges. Currently, coastal flood risk is highest in low-lying areas along the east coast from Dundalk to Dublin and along the Wicklow to Wexford coast, while on the south coast, coastal flood risk is also evident in the low-lying

areas of Waterford, Dungarvan, Youghal and Cork City. On the west coast, Galway city and the Shannon estuary are also at risk.

There are ample records of flooding in popular tourist destinations in recent years, such as Galway (including popular Quay Street), Carrick-on-Shannon, and Bantry, with specific references to flooding of restaurants, accommodation, debris on beaches after flooding etc.

With climate change, precipitation is projected to increase in all seasons except summer. Numbers of days with rainfall of over 20 mm and over 30 mm (extreme rainfall) are projected to increase under both RCP 4.5 and RCP 8.5, with mid-century increases under RCP 8.5 projected to be similar to late century increases under RCP 4.5.

An increase in the magnitude of fluvial flooding is expected, particularly in winter, because of increased rainfall. Flood events that currently have a return period of once in a hundred years will occur once every 10 years under RCP 4.5; current 1 in 200-year floods are projected to occur every 10 years under RCP 8.5 (EPA 2024a). A more notable continued increase as the century progresses is projected under RCP 8.5 compared to RCP 4.5.

Sea level rise is projected to continue. Projected increases in Mean Sea Level Rise are moderately greater under RCP 8.5 compared to RCP 4.5 by mid-century; the difference between the two RCPs is greatly accentuated by end of century. With climate change, projections indicate a decrease in the numbers of less intense storms for Ireland with an increase in more intense storms, which are rare events. Projected changes in sea level in combination with expected more intense storm activity will result in increased risk of coastal flooding by the end of the century, particularly under RCP 8.5. This increased risk extends to not only those areas already at risk of coastal flooding but also to new areas that are currently not considered at risk. Thus, the total area of land at risk of a one in two years coastal floods is projected to increase by 13% under either RCP 4.5 or RCP 8.5 by 2050, but by 30% or 38% by 2100 under RCP 4.5 and RCP 8.5 respectively.

Projected changes in sea levels are expected to enlarge the horizontal and vertical extent of estuaries. This will result in tides moving further upstream and would impede the flow of rivers and result in estuarine flooding. An increase in the number of intense cyclones and associated strong winds, particularly over the North Atlantic, is also likely, with direct impact on storm surges.

Increased precipitation and particularly flooding increase the risk of mobilisation and transport of pollutants, in turn increasing the risk of contaminated sediment or water reaching freshwaters (river, lakes and groundwater), transitional and coastal water, and water supplies.

Impacts:

Accommodation:

- Requirement to evacuate guests

- Danger to tourists in camping & caravanning sites
- Closures to repair flood damage
- Cancelled bookings
- Access / parking impaired
- Mobilisation of pollutants leading to Do Not Use / Boil Notices
- Cost if alternative water supplies need to be provided for visitors
- Risk to supply chain where local food sources are impacted by flooding
- Cost of adaptation and / or repair and renovation
- Increased insurance costs

Visitor attractions / National Parks:

- Closures for public safety and / or repairs
- Damage to assets directly from flood water or as the result of pest infestation or degradation of assets (structural and natural) in damp environment after the flood *(partially a cascading risk from Built & Archaeological Heritage / Biodiversity sectors)*
- Parking or access to parts of site impaired
- Structural damage to buildings *(partially a cascading risk from Built & Archaeological Heritage sector)*
- Debris: e.g. in lakes / on trails
- Trails inaccessible due to flooding
- Mobilisation of pollutants leading to Do Not Use / Boil Notices *(cascading risk from Water Quality and Water Services Infrastructure sectors)*
- Displacement of sediment and vegetation and mobilisation of pollutants affecting ecosystem balance in lakes *(cascading risk from Biodiversity sector)*
- Cost if alternative water supplies need to be provided for visitors *(cascading risk from Water Quality and Water Services Infrastructure sectors)*
- Risk to supply chain where local food sources are impacted by flooding *(cascading risk from Agriculture sector)*
- Cost of adaptation and / or repair and renovation *(partially a cascading risk from Built & Archaeological Heritage sector)*
- Increased insurance costs

Hospitality & retail:

- Damage to assets (buildings, furniture and other contents, and stock) *(partially a cascading risk from Built & Archaeological Heritage sector)*
- Loss of food stock
- Mobilisation of pollutants leading to Do Not Use / Boil Notices *(cascading risk from Water Quality and Water Services Infrastructure sectors)*
- Cost if alternative water supplies need to be provided for visitors *(cascading risk from Water Quality and Water Services Infrastructure sectors)*
- Risk to supply chain where local food sources are impacted by flooding *(cascading risk from Agriculture sector)*

- Cost of adaptation and / or repair and renovation *(partially a cascading risk from Built & Archaeological Heritage sector)*
- Increased insurance costs or impossibility of obtaining insurance due to repeated flooding

Golf clubs:

- Closure of golf courses due to flooding
- Damage to golf courses from waterlogging

Festivals and events:

- Cancellation or disruption
- Restrictions on use of drinking water supplies *(cascading risk from Water Services Infrastructure sector)*
- Risk to supply chain where local food sources are impacted by flooding *(cascading risk from Agriculture sector)*
- Cost of adaptation
- Increased insurance costs

Destinations:

- Flood debris impacting appearance
- Access / parking impacted *(partially a cascading risk from Transport Infrastructure sector)*
- Infrastructure and amenities including mooring & angling infrastructure damaged
- Pollution
- Damaged reputation
- Coastal ecosystem degradation due to flooding *(partially a cascading risk from Biodiversity sector)*
- Temporary closure or degradation of known scenic / tourist routes
- Substantial cost associated with investment in flood defences, particularly for coastal resorts

Walking & cycling trails:

- Flooding of trails along riverbanks and at the coast
- Damage to riverbanks creating hazard for tourists
- Damage to upland trails creating hazard for tourists

Tours:

- Inability to run tours along usual routes, due to flooding, risk of flooding, or damage / access impaired following flooding, resulting in loss of income and reputational damage
- Increased insurance costs

Beaches:

- Flooding may lead to contamination
- Disruption to access roads *(partially a cascading risk from Transport Infrastructure sector)*
- Flooding can accelerate erosion and sediment displacement – see Priority Impact No. 2, below

Sectoral Consequence:

Service provision and business continuity: Disruption in service to tourists to avoid endangering them and/or while repairing flood damage.

Loss of jobs and income: Loss of jobs while flood damage repaired, which can take years, leading to loss of livelihood, potentially for a considerable portion of a community at the same time, increasing the economic vulnerability of the community. This represents an unequal distribution of the burden of climate change. Businesses with lower profits are more vulnerable to short-term shocks, and therefore at greater risk of permanent closure following a flood.

Damaged assets: Irreversible damage to buildings; loss of or damage to collections; deterioration or loss of natural habitats.

Increased costs: Repair costs and costs of replacement of stock. Increased insurance premiums or difficulties securing insurance in flood-prone areas. Less profitable businesses may not be able to afford increasing insurance premiums, leaving some businesses behind in at-risk areas. Cost of providing alternative water supplies to visitor if mains supply contaminated. Cost of adapting for potential future flooding events.

Infrastructural damage: e.g. to promenades, fencing, sea walls, mooring facilities.

Public health: Risk of transferring pollution from sewage and agricultural runoff *(cascading risk from Agriculture sector)* to beaches, camping & caravanning sites *(risk cascades to Health sector)*, and to drinking water supplies. Risk of transfer of pollutants to flood waters on streets. Children, the elderly, and those with reduced mobility may be more at risk than other visitors may during a flood. Staff with reduced mobility should also be considered during risk assessment. People with underlying health conditions are most at risk from contaminated water.

Environmental pollution: Mobilisation of pollutants leading to freshwater, transitional, and / or coastal waters.

Reputational damage: Negative public image where destination seen as unprepared or not resilient to climate change, leading to reduced return visits / reduced interest amongst tourists more generally, and eventually decline of destination.

Access inhibited: Access to e.g. islands, National Parks curtailed, due to damaged *transport infrastructure*, limiting travel of tourists and supplies. This in turn may reduce income for some areas most reliant on tourism for income and employment, resulting in an unequal distribution of the burden of climate change. While temporary structures are used to allow access in the short-term, these may be more challenging for those with limited mobility. Supply shortages may have greater impact on smaller businesses with less capacity to stockpile. Supply chain issues may also delay repair work.

Temporary to long-term closures: While repairing and resorting. Less profitable businesses may not survive.

Market changes: Tourists who have been impacted by flooding may not wish to holiday near coast or rivers.

Increase in GHG emissions: Associated with building flood defences.

Key Adaptive Measures:

Adaptive Measures currently in use:

Reliability:

- Follow planning law and guidance – new developments avoid flood plains, utilise Sustainable Drainage Systems (SuDS)
- Follow Design Manual for Urban Roads and Streets (DMURS)
- Undertake site-specific flood risk assessment
- Utilise risk assessment approach in *Adapting to the reality of climate change: A guide for Ireland's Hospitality and Tourism Sector*
- Utilise guidance in *Living near Watercourses: A guide to the Rights and Responsibilities of Landowners*
- Utilise *Guidelines for Organising Outdoor Activity Events*
- Licensing to limit wastewater discharge
- Include commitment to assess climate risk in site management plans
- Include assessment of climate impacts of projects in grant applications e.g. Heritage Council / Department of Housing, Local Government and Heritage (DHLGH) conservation grants

Resistance:

- Office of Public Works (OPW) flood defence schemes
- Raise level of roads
- In coastal areas and vicinity of rivers, build at higher elevation
- Locate assets above ground level
- Monitor weather forecasts
- Utilise permeable reinforced grass or gravel options for planned parking, to allow rainwater percolation
- Develop rain gardens and swales along road and path networks to slow water down, reducing flooding impacts[12]
- Undertake structural repairs and adjustments to buildings to prevent rainwater ingress

Recovery & response:

- Early warning flood alert – community liaison notified
- Build and organise so that valuables can be moved easily

[12] For example, four rain gardens are being developed in the car park of Ormond Castle, Carrick-on-Suir. Denis Burke Park, located along the River Suir in Clonmel, on the Suir Blueway and the Butler Walking Trail, designed to store excess water as part of Clonmel's flood defence scheme (Department of Culture, Heritage and the Gaeltacht (DCHG) 2019).

- Train staff in preparation for floods and in salvaging assets
- Develop an Emergency Response Plan
- Ensure 24 h service to allow reporting of emergencies, so that relevant teams can be alerted
- Utilise water detection and alert systems
- Follow *Heritage and Climate Adaptation Guidelines for Local Authorities*
- Utilise disaster response scheme for galleries, archives, libraries, museums
- Follow guidance on how to respond before, during and after a flood on www.floodinfo.ie

Redundancy:

- Have back up energy and other essential supplies, alternative access options, …

Are current adaptive measures sufficient?

Greater engagement and training is required to ensure that all stakeholders are aware of and responding appropriately to a risk of this magnitude.

Potential Adaptive measures:

Increase awareness of the risk and of solutions. Ensure flood risk assessments undertaken and acted on across the tourist system. Ensure tourism businesses have effective emergency response plans. Training of tourism businesses[13] in climate adaptation. Increase awareness in other sectors / communities regarding risks of environmental pollution if flooding occurs and pollutants were not carefully controlled at source.

Structural repairs e.g. repairing roofs to prevent rainwater from entering buildings.

Improving drainage: Mapping the location and condition of drainage systems e.g. in historic sites and undertaking hydrological studies to understand how quickly and where the drainage system floods. Installation of new drains, and cleaning and repair of existing systems. Maintain and repair dry stonewalls, which are free draining because of abundant crevices.

NbS: Stream restoration; development of reedbeds, woodlands, restoration of peatland upstream of most sensitive parts of property, to slow flow of water and absorb and hold water, reducing flooding downstream. Application of DMURS Advice Note 5: *Road and Street Drainage using Nature Based Solutions*. Creation of riparian buffers along rivers and rakes to reduce sediments, nutrients, and pesticides from surface runoff entering the water and affecting water quality (however, implementation of NbS requires rigorous evaluation and evidence of long-term sustainability under site-specific circumstances).

[13] The *Tourism Policy Framework 2025-2030* states that 'The tourism sector and local communities will be supported through education and training opportunities to adapt their tourism offerings to respond and adapt to climate change and biodiversity loss'.

Flood plain restoration: Remove the constraints around rivers to allow a more meandering course, slowing the flow of water and creating new wetland habitats.

Restrict developments in coastal flood-prone areas.

Construction / temporary installation of covered venues or shelters: To reduce risk to festivals & events and ensure shelter at attractions.

Inform visitors and develop tourism in-low risk areas: Tourism providers should deliver adequate information and communication for visitors, to inform them about flooding risks; it should be ensured that this information is designed to be accessible to all users, and in multiple languages or in a format allowing instant translation. Guide visitor flows by directing them to low-risk areas; identify new tour routes at less risk of being impacted by flooding.

Retrofit more rain gardens into urban spaces: e.g. Rain gardens in Carlow Town replaced old concrete.

Use low carbon construction methods and low carbon cement in building of flood defences.

Innovative funding solutions: Provide finance to lower profit businesses to help them protect the business.

Move significant heritage to less at-risk zones: For example, move key structures to museums; key types of architecture to heritage parks.

Develop site-specific flood risk maps: Following a similar approach as undertaken for example in Northern Ireland for Giant's Causeway and Carrick-a-Rede bridge.

Improved warning system: For tourism businesses.

Case Study 3.2 How has flooding impacted tourism in County Cork?

Flooding has occurred frequently in Cork city in recent years. In 2009, extreme rainfall sent water crashing through the Inniscarra Dam, causing the River Lee to flood. A number of hotels in the city had to close as a result, or turn away tourists, and one was so badly damaged by flooding that it only reopened 4.5 years later, with 100 people losing their jobs at the time of closure. Flooding also caused damage at a popular gallery and at a museum in the city. Flooding occurred in the city again in February 2014 and winter 2015/2016.

Following nationwide heavy rainfall, the popular tourist destinations of Bantry and Youghal were badly affected by coastal flooding in October 2020. Bantry had also experienced flooding during storms in January to March 2018, and during the summer of 2020.

In October 2023, County Cork was struck by two days of extreme rainfall from Storm Babet that fell on already saturated soils. Swollen rivers led to severe flooding in Midleton. Such extreme rainfall events have been made more likely and more intense by climate change[14]. At least 400 homes and 300 businesses were flooded, with damage totalling about €200 million. The event led to cancellations for at least one hotel, and the visitor centre at Jameson Distillery closed for repairs for several months, with some seasonal employees losing their jobs. Other businesses impacted include restaurants and cafés, with stock being lost and damage in kitchen and dining areas.

Storm Babet was followed by Storms Ciarán, which led to flooding in Cork city – at the same time as 100,000 visitors arrived for Cork Jazz Festival, providing an extra challenge for coordination of the flood response.

3.5.2. COASTAL EROSION

2. **More rapid coastal change and erosion resulting in difficulty accessing or damage or submergence or deterioration in quality of visitor amenities.**

Vulnerability:

Sensitivity:

High, as many popular tourist destinations have a coastal location; recent significant investment in coastal tourism e.g. Wild Atlantic Way.

As detailed under Priority Impact No. 1 (flooding), people who live in coastal areas are amongst the most vulnerable to climate change.

[14] https://www.worldweatherattribution.org/climate-change-made-the-extreme-rainfall-associated-with-flooding-in-midleton-ireland-more-likely-and-more-intense/

The Northern & Western region has greater vulnerability to climate change than the country as a whole[15]. Therefore, communities in this region that are reliant on tourism and exposed to coastal erosion e.g. in Donegal may be a priority for adaptation action.

Adaptive capacity:

Low, because erosion is irreversible.

Climate Impact Drivers and Hazard:

The soft sediment coasts of the east and south-east as well as isolated sedimentary bays on the west and northern coasts, for example the Shannon Estuary, Donegal, Clew, Tralee, and Dingle Bays) are most susceptible to coastal erosion. Of Ireland's 5,800 km of coastline, 39% is beach. Twelve km of coast in Dublin, 91 km in Co. Cork, 108 km in Co. Kerry, 170 km in Co. Galway, and 652 km in Co. Mayo (more than half of Co. Mayo's total coastline) is at risk: these are all areas popular with overseas tourists. Domestic tourism will be impacted by coastal erosion in Co. Wexford, where 100 km of the Co. Wexford coast (out of a 264 km long coastline) is considered to be at risk of coastal erosion, and another 22 km of coast is at risk in Co. Waterford.

For the rocky shores of the south and west of Ireland, land loss is generally slower than for soft sediment coasts, but impacts can be dangerous: rockfalls or landslides. Wet weather can accentuate damage to the rockface.

As detailed under Priority Impact No. 1, sea level rise is projected to continue. As sea level rise is a major driver of coastal erosion, coastal erosion can be expected to be less severe under RCP 8.5 than under RCP 4.5 by end of century, with little difference between the two RCPs by mid-century. Projections also indicate an increase in more intense storms, and in rainfall, including in extreme rainfall. Storms and extreme rainfall will accentuate coastal change.

Erosion will be accentuated by greater trampling by an increased population, increasing vulnerability to the climate hazard. Rock armour to protect vulnerable areas has itself been eroded. Rock armour can also result in an increase in erosion elsewhere.

Impacts:

Visitor attractions:

[15] Vulnerability | EEA Adaptation Dashboard

- Erosion damaging or leading to collapse of historic buildings and monuments *(cascading risk from Built & Archaeological Heritage sector)* (see Case Study 3.3)
- Parts of historic sites washed into the sea *(cascading risk from Built & Archaeological Heritage sector)*
- Erosion leading to submergence of natural attractions, including important habitats such as salt marsh and shingle beaches *(cascading risk from Biodiversity sector)*
- Loss of habitat for seabird colonies, leading reduction in seabird numbers or loss of species, impacting nature tourism *(cascading risk from Biodiversity sector)*
- Closures for public safety and / or repairs
- Access cut off or unsafe *(cascading risk from Transport Infrastructure sector)*

Beaches

- Road impassible due to sand blowing onto the road, cutting off access *(cascading risk from Transport Infrastructure sector)*
- Entry to beach eroded and dangerous or impassible, cutting off access *(partially a cascading risk from Transport Infrastructure sector)*
- Erosion of cliffs endangering visitors and requiring closure of the beach
- Loss of sand from beaches causing deterioration in quality of beaches
- Displacement of sediment, vegetation, and habitats for marine life *(cascading risk from Biodiversity sector)*
- Damaged reputation
- Loss of Blue Flag *(cascading risk from Water Quality sector)*
- Debris reducing attractiveness of beaches
- Narrowing of beaches
- Submergence of some beaches, resulting in increased numbers and greater pressures at other, less impacted, beaches

Golf

- Erosion causing loss of sections of golf courses and damage to infrastructure and coastal defences. About 80 of Ireland's 420 golf courses are close to the coast.

Destinations

- Rock armour installed to protect vulnerable areas may be considered unattractive by tourists and may result in greater erosion in other parts of the destination
- Access / parking impacted *(cascading risk from Transport Infrastructure sector)*
- Infrastructure and amenities damaged
- Coastal ecosystem degradation due to erosion *(cascading risk from Biodiversity sector)*
- Requirement to re-route scenic roads e.g. road from Waterford and Tramore towards the Copper Coast

- Requirement to undertake remedial works on coast roads e.g. Ring of Kerry and road near Kilmore Quay, Co. Wexford.
- Damaged reputation

Walking trails

- Erosion and extreme precipitation leading to landslides, risking safety of walkers, either directly or through destabilisation of the terrain *(cascades to Health sector)*
- Erosion damaging or submerging walks, or causing parts of walks to be washed out to sea, resulting in closures of trails

Sectoral Consequence:

Service provision and business continuity: Disruption in service to tourists to avoid endangering them and/or while repairing erosion damage.

Loss of jobs and income: Loss of jobs in tourist trade in areas where attractions, beaches, golf courses etc. lost or damaged, leading to loss of livelihood, potentially eventually for a considerable portion of specific coastal communities, increasing the economic vulnerability of these communities. This represents an unequal distribution of the burden of climate change.

Damaged or lost assets: Irreversible damage to or loss of historic, archaeological, and natural attractions.

Infrastructural damage: e.g. to roads, access ramps, fencing, rock armour, reducing its life span.

Public health: Danger to walkers and visitors from landslides and fragile terrain.

Reputational damage: Where iconic assets are lost, or where sufficient coast is eroded or degraded, leading to reduced return visits / reduced interest amongst tourists more generally, and eventually decline of destination.

Access inhibited: Access to attractions and beaches curtailed or becomes dangerous.

Increased costs: Costs of repairs, restoration, or adaptation to withstand future sea level rise, storm surges etc.

Construction of hard defences: increasing GHG emissions through use of concrete, potentially leading to greater erosion elsewhere along the coast, and potentially unsightly – all adding to reputational damage. Adaptation that leads to negative impacts elsewhere is maladaptation.

Key Adaptive Measures:

Adaptive Measure currently in use:

Reliability:

- Use fencing to protect dunes and to keep visitors away from dangerous areas[16]
- Utilise NbS: appropriate planting to stabilise dunes; remove inappropriate planting and top layers of soil where e.g. tree planting was found to be deleterious to the dunes
- Utilise signage to encourage visitors to avoid vulnerable areas
- Control visitor numbers
- Shift the tourism focus to areas less at risk of erosion e.g. nearby woodland walks rather than beaches
- Ensure compliance with planning restrictions – build further inland
- Increase awareness through #ProtectOurDunes: the public are being advised of activities than can damage sand dunes, such as trampling, sliding down the dune face, camping and campfires, sports training, and letting dogs' roam
- Utilise information resource Beaches & Dunes - For Climate Action
- Develop alternative, less vulnerable, walking trails
- Follow *Heritage and Climate Adaptation Guidelines for Local Authorities*
- Utilise risk assessment approach in *Adapting to the reality of climate change: A guide for Ireland's Hospitality and Tourism Sector*
- Protection of coastal transport infrastructure[17]
- Include assessment of climate impacts of projects in grant applications e.g. Heritage Council / DHLGH conservation grants

Resistance:

- Monitor coastal change e.g. through aerial mapping[18] / repeat photography[19], and relating change to weather events such as storms
- Monitor rockfall potential[20]
- Install improved drainage to reduce risk of damaging, furthering erosion
- Undertake contingency planning for altered coastline e.g. new golf greens
- Monitor weather forecasts
- Train coastal communities in coastal management[21]

[16] To stabilise the dunes along the coastal edge of the Burren and Cliffs of Moher UNESCO Global Geopark, a series of wire mesh fences were successfully installed in Fanore Beach, allowing re-establishment of marram grass and promoting the stability of its coastal side. A comprehensive monitoring system is in place to ensure further restoration continues to improve degraded dune systems.

[17] e.g. East Coast Railway Infrastructure Protection Projects

[18] https://cherishproject.eu/en/

[19] Home - CoastSnap- Citizen Science App

[20] e.g. inspection in August 2022 at Sceilg Mhichíl allowed for the identification of most, moderate, and least rockfall potential zones

[21] e.g. Leave No Trace Ireland, CARO, Clean Coasts, the University of Galway, and Mayo, Sligo and Leitrim Education and Training Board held a 'Beaches & Dunes for Climate Adaptation' course from April to June 2024

- Workshops with stakeholders[22]

Recovery & response:

- Undertake managed realignment of coast
- Manage or reconstruct dunes
- Undertake beach re-nourishment
- Construct temporary paths where trails on soft coastline temporarily submerged or damaged

Redundancy:

- Ensure alternative access

Are current adaptive measures sufficient?

Further measures are required to ensure consistent application of appropriate responses to this risk.

Potential Adaptive measures:

Increase awareness: in the risk and in measures to address it. Ensure coastal change risk assessments undertaken and acted on across the tourist system. Training of tourism businesses in climate adaptation.

Move most interesting elements e.g. move most interesting archaeological stones to a museum or reconstruct vernacular or industrial architecture in folk park.

Move visitor facilities to higher ground: to give sand dunes 'more space to move'.

Install alert systems: Cameras or sensors to detect risk of imminent collapse.

Integrated Coastal Zone Management strategy: e.g. sophisticated green management on golf courses, including development of an integrated pest management plan, nutrient monitoring, change in grass seed etc., with acceptance of some level of coastal erosion and consideration of managed retreat.

Land reclamation with beach re-nourishment to push the shoreline seawards. Redesign of wetlands using ecohydrology.

Climate proofing of investments in coastal walks: Require erosion risk assessment before providing any finance.

Case Study 3.3 Coastal erosion along the Wild Atlantic Way

[22] e.g. Bertra 2050 Stewardship Plan | ACT

Part of the appeal of the Wild Atlantic Way is the force of the ocean. However, sea level rise and storm surges are accentuating erosion of the coast, threatening beaches, habitats, historical structures, golf courses, and coastal walks.

A number of heritage sites along the Atlantic coast have been damaged by coastal erosion. For example, since part of the cliff collapsed at Dún Beag Fort on the Dingle Peninsula during a storm in 2017, it has been necessary to keep visitors away from dangerous parts of the site.

Also in the Dingle Peninsula, the Maharees tombolo ecosystem offers tourists the opportunity to explore nature and wildlife, walk, swim, kayak, fish, surf, or pony trek. However, erosion of the beach has led to sanding of the road, with the road becoming impassable on several occasions. The Maharees Conservation Association has undertaken sand dune recovery and protection of wildlife habitat. Visitors are welcome to participate in wildlife walks, marram grass planting, beach cleaning and other regenerative tourism activities such as learning about placenames, stonewall building, or currach making.

Creative Ireland's Ignite project, *Neart na Machairí*, aims to harness the strength of the Maharees community to build resilience to climate change[23].

Pictured: planting marram grass to help stabilise sand dunes.

Access to other beaches along the Wild Atlantic Way has also been impeded as the result of erosion, and erosion is causing narrowing of beaches or reduction of or inward movement of sand dunes. Some of the areas impacted are very reliant on tourism for employment.

Golf courses along the coast have suffered loss of land, and opportunities for coastal walking been reduced as chunks of cliff are lost to the sea.

3.5.3. WARMER, DRIER SUMMERS

3. Warmer temperatures and greater evapotranspiration, combined with drier summers, resulting in increased challenges for

[23] https://www.mahareesconservation.com/creative-coastal-resilience.html

management of vegetation and risk of fire, reduced river flows, and reduced availability of water resources.

Vulnerability:

Sensitivity:

Moderate, because impacts tend to be localised.

Adaptive capacity:

High, because improvements in water use efficiency and good practices and storage can reduce much of the risk. To date, the water exploitation index, a measure of the share of water used across all sectors as compared to the total availability of water within a region, has been low for Ireland, even in the most exposed Eastern & Midland region[24], indicating capacity to cope with changes in precipitation.

Climate Impact Drivers and Hazard:

Mean and maximum air temperature is projected to increase with climate change, in all seasons. The length of the growing season is projected to increase with climate change, with the season starting earlier.

Greater growth of vegetation could increase fire hazard, particularly if vegetation dries out in summer due to the combination of higher air temperature, reduced summer rainfall, and higher evapotranspiration. Projected reduced summer wind speeds, however, may help mitigate the risk, by reducing spreading of fires. On the other hand, more recreation in the countryside will increase the risk of gorse and forest fires and increase exposure to the fires.

Average annual evapotranspiration is projected to increase. A decrease in summer precipitation by mid-century, with a further decrease by late century, is projected under both RCP 8.5 and RCP 4.5 (uncertain). Combined with greater growth, this means more frequent requirement for irrigation, and greater demand for water. However, the average decrease in precipitation will be relatively small (less than 2% even by end of century) under RCP 4.5, compared to over 7% by end of century under RCP 8.5. Additionally, the geographic area exposed to a decrease in summer precipitation is less under RCP 4.5 compared to RCP 8.5: for Dublin, Wicklow, Wexford, and some of Donegal, the projection for mid-century is for an *increase* in summer precipitation, and for large parts of the country, the projection is for little or no change in summer precipitation under RCP 4.5. Even under RCP 8.5, rather than any areas becoming drier in summer than some parts of the country currently (for example, Dublin and south-east County Wexford), larger parts of the country will experience the drier summers currently experienced by a very limited geographic area.

Warmer temperatures may also increase tourists' demand for water consumption. Concomitantly, reduced rainfall in summer and greater

[24] Exposure | EEA Adaptation Dashboard

evapotranspiration reducing river flows and reservoir recharge may curtail water resources. These conditions could lead to water shortages and imposition of water restrictions from mains supplies. The risk will be accentuated by increased demand for water resources by an increased population. Freshwater resources in the Wicklow Mountains largely supply the large population living in the east of Ireland, and there is little excess capacity in the system, meaning that water restrictions are more likely in the east.

The risk of drought leading to low river flows is increasing with climate change.

Impacts:

Golf clubs:

- Poor condition including reduction in uniformity and in surface quality of greens due to dry summer conditions
- Requirement for irrigation due to dry summer conditions *(risk cascades to Water Services Infrastructure sector)*
- More wear on golf courses due to extended interest due to mild summers and winters; more thatch formation and greater variety of pests and diseases and elongated mowing season due to milder autumns and winters

Gardens, parks

- Extended grass cutting season
- Increased requirement for watering *(cascades to Water Services Infrastructure sector)*
- Loss of plants from drought
- Excessive vegetative growth, including of invasive species

Accommodation, hospitality, visitor attractions

- Increased risk of restrictions on water use / reduced water availability *(cascading risk from Water Services Infrastructure sector)*
- Risk to supply chain where local food sources are impacted by drought *(cascading risk from Agriculture sector)*

Camping & caravanning

- Increased risk of wildfire encroaching on camping & caravanning sites *(partially a cascading risk from Agriculture sector; cascades to Health sector)*

Historic sites

- Burning of vegetation can lead to increased erosion over time and destabilisation of monuments *(partially a cascading risk from Agriculture sector and Built & Archaeological Heritage sectors)*
- Desiccation, damaging archaeological remains or sites and monuments *(cascading risk from Built & Archaeological Heritage sector)*
- Risk of structural damage, biological growth, and subsidence of structures *(cascading risk from Built & Archaeological Heritage sector)*

National Parks

- Increased risk of wildfire having a negative impact on flora, directly, by burning vegetation, and fauna directly e.g. destroying nests, or indirectly be reducing habitats and shelter *(cascading risk from Biodiversity sector)*
- Danger from fires to visitors *(cascading risk from Agriculture and Biodiversity sectors; cascades to Health sector)*
- Increased requirement for management of visitors due to fire risk and patrolling e.g. around picnic sites *(cascading risk from Agriculture and Biodiversity sectors; cascades to Health sector)*
- Risk of degradation and loss of natural habitats due to heat and drought conditions *(cascading risk from Agriculture and Biodiversity sectors)*

Destinations

- Increased risk of water shortages e.g. on islands *(cascading risk from Water Services Infrastructure sector)*
- Increased risk of wildfire damaging sites of beauty and forests *(cascading risk from Agriculture and Forestry sectors)*
- Impact from fire on destination's wildlife (for example destroying nests and their eggs) and sites of beauty *(cascading risk from Agriculture and Biodiversity sectors)*
- Heat-related / drought-related degradation of natural landscapes e.g. through drying of peatlands *(cascading risk from Biodiversity sector)*
- Phenological changes leading to loss of species with e.g. emergence of pollinators and flowering of their host plants ceasing to coincide; loss of marine ecosystems and habitats *(cascading risk from Biodiversity sector)*

Festivals & events

- Increased risk of restrictions on water use / reduced water availability *(cascading risk from Water Services Infrastructure sector)*
- Mobilisation of pollutants leading to Do Not Use / Boil Notices *(cascading risk from Water Quality and Water Services Infrastructure sectors)*
- Cost if alternative water supplies need to be provided for visitors *(cascading risk from Water Services Infrastructure sector)*
- Deterioration in quality of sports pitches impacting major international sports events of tourist interest

Walking trails

- Increased risk of wildfire endangering visitors or limiting access *(partially a cascading risk from Agriculture sector)*

Angling

- Water levels too low for angling
- Reduction in fish stock; fish unable to move from estuary to river / migrate
- Increased vulnerability of fish to pollution, leading to fish kills *(partially a cascading risk from Agriculture sector)*
- Reduced dilution of pollution; reduced dissolved oxygen in the water; reduced habitats due to low river flows
- Changed structure of fish populations due to higher water temperatures

- Increased risk of invasive species *(cascading risk from Biodiversity sector)*

Water sports

- Low water in inland waterways leading to risk of cruise boats grounding
- Deteriorated conditions for freshwater kayakers
- Increased risk of weed growth impairing navigation
- Low river flows / lake levels limiting water sports possibilities

Sectoral Consequence:

Service provision and business continuity: Disruption in service to tourists due to water restrictions and Do Not Use / Boil Notices.

Increased costs:

- Installation costs – water storage or more water-efficient systems, irrigation, sensors
- Labour costs associated with increased watering in gardens / golf courses, removal of droughted plants, longer growing season; also weed removal, including in inland waterways, especially if use of chemical control is avoided

Reduced profits: from e.g. golf courses where greens suffer drought.

Damaged assets:

- Irreversible damage to historic, archaeological, and natural attractions
- Droughted plants in gardens; deteriorated condition (due to drought / plant pathogens associated with soil moisture deficit) of e.g. golf greens
- Increased susceptibility of trees in forests and forest parks to pest and disease as a result of changing climate conditions

Increased greenhouse gas emissions: Associated with increased energy use due to longer mowing season.

Public health: Danger to walkers and campers from wildfires; contamination of water supply; contamination of river bathing water if river flow insufficient to dilute wastewater. Children, the elderly, and those with mobility challenges may find it more difficult to evade fire. Those with underlying health conditions may be more vulnerable after drinking polluted water. These vulnerable groups in particular should be protected from public health dangers, to avoid unequal burden of climate change.

Reputational damage: Deterioration in quality of scenery and landscape, or of golf courses, parks, and other attractions, or angling or water sports possibilities, leading to reduced return visits / reduced interest amongst tourists more generally.

Key Adaptive Measures:

Adaptive Measure currently in use:

Reliability:

- The Water Supply Project for Eastern & Midlands Region (at planning stage)

- Rewetting of blanket bogs to increase water storage[25]
- Include assessment of climate impacts of projects in grant applications e.g. Heritage Council / DHLGH conservation grants

Resistance:

- Follow advice on 'Be Firewise' in *Be Summer-Ready*
- Follow advice in *Heritage and Climate Adaptation Guidelines for Local Authorities*
- Follow advice in Fáilte Ireland's *Water Management Climate Action Guide* (see Case Study 3.4)
- Undertake Uisce Éireann's Water Stewardship Accelerator Programme[26]
- Follow advice on water conservation in Fáilte Ireland's *Sustainable Festival Guidelines*
- *In situ* control of environment at historic sites
- Monitoring fish stocks for signs of stress
- River restoration projects (Inland Fisheries Ireland (IFI) Habitats & Conservation Funding)
- Use of sustainable irrigation systems for golf greens
- Rainwater harvesting
- Building Management System to monitor water and electricity use, in combination with their review
- On-site polytunnels for food production, reducing reliance on supply chain
- Conduct monthly leak detection / commission leak survey
- Install data logger on water meter to monitor water use; sub-meters for water-intensive facilities or equipment within business e.g. swimming pool, kitchen
- Water savings through installing aerators (flow regulators) on taps and showerheads, sensor-operated showers & toilets, hippo-bags in cisterns, push-taps, highly insulated swimming pools
- Create awareness e.g. the Burren and Cliffs of Moher UNESCO Global Geopark is promoting awareness on water resources through the Aille Engaged project, and at the same time using the data to then inform any climate change adaptation measures that may be required for the villages along the route of the Aille River

Recovery & response:

- Pause use of 'keep nets' / 'catch and release' to avoid adding to fish stress by moving them in and out of water
- Use electric mowers to reduce emissions associated with grass-cutting
- Reduce frequency of grass-cutting, allowing meadow or micro-meadows to develop, with the co-benefit of enhancing pollinator populations

Redundancy:

[25] e.g. gov.ie - National Parks and Wildlife Service and Intel launch bog restoration project to increase water storage by millions of litres

[26] Businesses with annual water consumption of 20,000 m^3 or more i.e. larger hotels / attractions

- Maintain back-up water supplies in case of water restrictions. This is particularly important where there are vulnerable guests / visitors, to ensure just resilience.

Are current adaptive measures sufficient?

Further measures are required to ensure all stakeholders are fully aware of this risk and of how to respond appropriately.

Potential Adaptive Measures:

Increase awareness:

- Of visitors regarding appropriate behaviour in areas of gorse or forest, including what to do if they see a wildfire
- Of industry and visitors regarding reducing water use
- Of public to the sources of river pollution that leads to fish kills (accentuated during low flows)
- Amongst agricultural community of need to reduce diffuse pollution and avoid burning gorse
- Of tourists regarding how they can reduce water use associated with their holiday e.g. requesting less frequent washing of towels
- Of tourists regarding health impact of heatwaves[27]

Training of tourism businesses in climate adaptation.

Contingency planning: plan ahead, maintaining water stores / private wells and encouraging clients to reduce water use. Unregulated drilling of wells, however, could pose a risk of over abstraction.

Monitoring & modelling: Land use mapping to aid estimation of fire risk; develop projections for fire index.

Greater use of *in situ* protection such as shelters and soil water control to preserve monuments and archaeological features: Shelters for protection from sun / rain.

Install alert systems: Sensors to detect heat / smoke (fire early warning).

Improved irrigation management: Automated precision irrigation and use of sensors to irrigate only when and where required; apply deficit irrigation techniques; reduce watering to only the most vulnerable or special plants. As irrigation water is pumped, these techniques have a co-benefit of minimising the increased energy consumption and associated costs and emissions associated with the increased need to irrigate.

Use of recycled water: For irrigation, toilet flushing. Greater use of rainwater collection and storage in order to limit use of mains water (and reserve it for human consumption).

[27] https://www.hse.ie/eng/services/list/5/publichealth/publichealthdepts/extreme/key-public-health-messages-during-heatwaves.pdf

Plant less water-demanding species or cultivars: species / cultivars adapted to warmer, drier climates, such as drought tolerant grasses, or native species adapted to dry periods e.g. turlough species, exposed heathland species.

Improve soil management: Invest in better composting facilities to allow for more frequent mulching of soils to reduce moisture loss from new plantings and improve the moisture-holding capacity of soils.

Analyse water-saving opportunities in business: Improve plumbing, install half-flushes, low flow showers.

Redirect angling focus to different locations or different species during drought.

Visitor management, signage: Encourage visitors to gardens to stay to set paths to reduce wear where drought has increased vulnerability of grass areas. Ensure visitors to bogs and wetland forests stay to set paths to reduce wear where drought may increase vulnerability of sensitive habitats.

Rewetting of peatlands to reduce sensitivity to drought and heat.

Ensure breaks in forests / shrub ecosystems: to act as barriers to spread of fire; ensure trails kept clear of dead vegetation; maintain and repair dry stone walls, which provide heterogeneity in the landscape.

More regular dredging of canals to increase the storage capacity of the system. While pumping in of water from rivers into canals might benefit cruising, this may deleteriously affect the rivers.

Case Study 3.4 Improving water management in Ireland's tourism sector

Fáilte Ireland's guide to *Water Management* provides advice on managing and monitoring water consumption.

Noting that climate change is likely to lead to more frequent water shortages, the guide advises minimising consumption of water, eliminating leaks, and utilising alternative sources such as rainwater.

The guide takes businesses through four steps, from understanding their water consumption to implementing strategies to reduce their water consumption. It

also provides examples of hotels that have reduced their water use (and their bills) through good water management.

Uisce Éireann runs a water stewardship programme, with suitable courses for both small businesses and medium / large businesses.

3.5.4. MORE ATTRACTIVE CLIMATE FOR TOURISM

4. Warmer temperatures resulting in the Irish climate being perceived as more favourable for tourism, leading to increased tourist demand and facilitating diversification and extension of the season

Vulnerability:

Sensitivity:

Moderate.

Adaptive capacity:

This emerging opportunity requires further investigation. Adaptations to specifically benefit from this opportunity have not yet been implemented, but if appropriately addressed, capacity is expected to become High.

Climate Impact Drivers and Hazard:

Mean and maximum air temperature is projected to increase with climate change, in all seasons. The average increase in summer maximum temperature by end of century under RCP 4.5 is less than (but close to) that by mid-century under RCP 8.5. Warmer weather may attract more visitors, or visitors may choose certain destinations or activities considered more attractive in warm weather. This will be enhanced by reduced likelihood of rain in summer: summer precipitation is projected to decrease, particularly under RCP 8.5 by end of century.

Projected changes in Tourism Climatic Index (TCI) scores suggest that tourist demand may fall in traditional major competitors in Europe, and increase in northern countries, such as Ireland. Matei et al. (2023) projected increases of over 2% in tourist numbers in some European countries, including Ireland under a 2°C global warming scenario, corresponding approximately to mid-century under RCP 4.5, including Ireland. This increase is only about one-third of that projected for Ireland at 3°C global warming (corresponding approximately to mid-century under RCP 8.5). Risks of extreme weather, forest fires, drought, and erosion of beaches in e.g. Mediterranean destinations could lead to a further shift in tourism demand within Europe.

Projected improvement in TCI scores is not confined to the summer. Under RCP 8.5, by mid-century, only December to February in Southern and Eastern & Midlands regions and November to March in Northern & Western region are projected to remain 'unfavourable' for tourism. By late-century, 'acceptable' or better weather is projected from May to October throughout Ireland, with a

reduction in the 'unfavourable' season, most notably to only January in the Eastern & Midlands region (see Case Study 3.5). These changes might facilitate extension of the tourism season.

Although TCI improvements are less marked under RCP 4.5 than RCP 8.5, improvements in TCI scores by mid-century are expected under both scenarios for every month in the Eastern & Midland region and Northern & Western region compared to the baseline. Improvements in TCI scores by mid-century are expected under both scenarios for February to November in the Southern region compared to the baseline. Either scenario shows improvements in summer and a reduction in the unfavourable season in every region as soon as mid-century. Under either scenario, acceptable or better conditions are expected at least June-September everywhere in the country by mid-century, which is a notable improvement from only July-August in two out of three regions in the baseline years.

Investment in greenways, blueways, walking trails, active travel routes, and various outdoors activities will further add to potential visitors' perception of Ireland as having a beneficial climate for outdoor tourism. Promotion of a longer tourism season might further add to potential visitors' perception of Ireland as having pleasant weather for much of the year.

It should be noted however, that projected decreases in summer precipitation are uncertain and relatively limited under more moderate global warming. Precipitation is projected to increase in all seasons other than summer. Current climate-demand models for tourism neglect the possibility of an overriding influence of physical climate parameters such as wind or rain, with an over-emphasis on thermal comfort.

Currently popular sunny summer tourism destinations could adapt to increasingly warm summers, and countries such as Spain could refocus tourists to milder destinations, such as Asturias, or milder times of year. The expected rise in tourist climate favourability in France and Germany to mirror that in the Mediterranean might encourage an increase in domestic tourism in those countries and provide an alternative for other potential markets for Ireland.

To date, concern amongst tourists regarding extreme weather is less than that regarding rising costs, personal finances, war, booking and cancellation policies, and overcrowding. There has been little shift in demand within Europe to date, and Eurocontrol (2021) does not expect that climate favourability will act as a key driver for changes in summer holiday location by 2050.

Regarding the potential to extend the season, many tourists are limited by e.g. school holidays as to when they take their main holiday, though the proportion of tourists travelling with children is projected to decline. While Ireland will not experience the extreme heat and wildfires that occur in southern Europe, severe flooding has affected southern, central, and northern European countries in recent years, and could occur in Ireland, meaning that choosing to

holiday in Ireland does not necessarily mean avoiding all forms of extreme weather.

Impacts:

National Parks and other parks and gardens

- Increased interest in visiting National Parks
- Extended season for visitors might facilitate visitor management, reducing overcrowding and damage to vulnerable habitats at key stages in the growing season / wildlife cycle
- Increased opportunity for e.g. walking might disperse tourists away from vulnerable built and archaeological heritage

Activity providers

- Increased interest in outdoor activities, watersports, and adventure tourism

Walking and cycling trails:

- Increased interest in use of walking and cycling trails, resulting in increased trade for communities along these trails

Destinations

- Extension of the tourism season, reducing pressures during current peak season

Hospitality:

- Increased interest in outdoor café culture / outdoor dining

Sectoral Consequence:

Increased income for tourism businesses: Due to increased visitor numbers.

Increased opportunity to diversify, potentially increasing sustainability by dispersing tourism and benefitting communities who have gained relatively little from tourism to date

Possible **increased interest in slow travel** e.g. by boat – to or within Ireland – and by bicycle within Ireland.

Extension of the tourism season: Benefitting staff and communities through providing more stable incomes.

Reputational benefit: Satisfaction with weather, leading to increased return visits and word of mouth advertising.

Increased staff morale: Opportunities in particular for staff with outdoor interests.

Opportunity for tourism to contribute to population's health: Improved physical and mental health by increasing time outdoors. Decreased risk of spread of influenza and colds amongst tourists during warmer winter.

Reduced energy costs: Reduced requirement for heating in winter; increased opportunity for solar power in summers with less rainfall / cloud cover.

However, increased numbers of tourists would lead to increased demand for various resources – energy, water, waste management, supplies, and transport.

Just Transition: Improved climate in the Eastern & Midlands Region in particular may facilitate efforts to develop regenerative tourism as an alternative to peat-based energy production to support livelihoods in the Midlands.

Shared Island opportunities: through development of active transport and other tourism networks.

Visitor management challenges: Although extension of the season can help manage numbers, increased visitor numbers during summer could add to challenges associated with over-tourism, unless well managed. Increased outdoor recreation could accentuate risks to terrestrial ecosystems and habitats, *with cascading risks for the Biodiversity sector*. Increased visitor numbers could also add to pressure on water services infrastructure, with *cascading risks for Water Services Infrastructure*.

Challenge to reduce the carbon footprint of the tourism sector if visitor numbers increase. While beneficial in terms of total emissions if holidays in Ireland that do not require flying (domestic and nearby markets) displace holidays that require flying, emissions associated with tourism *within* Ireland could still be increased by growth in numbers. This will add to the difficulty for Ireland in meeting emissions reduction targets.

Increased exposure of population to heat and UV radiation are discussed in Priority Impact No. 6.

Key Adaptive Measures:

Adaptive Measures currently in use:

Reliability:

- Fáilte Ireland / Tourism Ireland strategic & business planning
- Outdoor recreational facilities such as greenways, walking trails, picnic tables, and controlled barbeque areas
- Improved swimming facilities
- Outdoor dining areas
- Campsites
- Delivery of walking and cycling infrastructure over 2025[28]

Recovery & response:

- Visitor management to reduce challenges associated with increased tourist numbers[29].

[28] *Climate Action Plan 2025*

[29] e.g. visitor numbers to Sceilg Mhichíl are capped and only 15 licensed boat operators are permitted to land visitors on the island during the season

Are current adaptive measures sufficient?

This opportunity is not currently being addressed specifically from an adaptation perspective, but marketing is already well placed to ensure the sector could benefit – and marketing can be rapidly refocused. Current policies already address potential challenges associated with increased tourist numbers (see section 2.2.2 Tourism Demand, section 2.3.2 National Tourism Policy, section 2.3.4 Regional and Local Tourism Strategies and Policies, and section 2.3.5 Other Relevant Regional Strategies).

Potential Adaptive Measures:

Investment and reorganisation: Opening for longer season; develop active transport and facilities for outdoors activities, such as outdoor swimming pools; develop wildlife corridors between outdoors attractions; install outdoor seating, drinking water fonts, rubbish bins; install solar panels; ensure crucial infrastructure including water and wastewater services are in place and adequate in newly developing areas and along trails and networks.

Improve visitor management to avoid deleterious consequences of increased visitor numbers.

Develop Habitat Management Plans to safeguard vulnerable habitats.

Greater dispersion of tourism offering through e.g. developing alternative walking trails; directing tourists to less visited areas.

Improve monitoring, surveying, and modelling: Monitor seasonality of visitors and impacts of visitors as well as climate change at key destinations; monitor tourist sentiment regarding Irish climate *vis à vis* climate in competitor destinations; develop / improve tourism demand models for Ireland.

Extend season for relevant services: Bathing water monitoring, lifeguards...

Address climate risks that would otherwise minimise opportunity to benefit from warmer climate.

Promote Leave No Trace principles amongst visitors.

Targeted marketing could address increased potential for tourism in Ireland, particularly as an alternative to travelling abroad amongst the domestic market.

Reduce the carbon footprint per tourist: By

- Increasing energy efficiency (further rollout of Fáilte Ireland Climate Action Programme to more tourism businesses)
- Targetting specific markets:
  - Substituting holidays abroad with domestic holidays would greatly reduce overall emissions of Irish tourists who normally fly for their annual holiday

    - Targetting nearby neighbouring markets (who could travel by public transport or drive (Northern Ireland) or take the ferry[30] (UK, France, northern Spain) would also ensure no increase in aviation emissions
    - Define clear growth targets and clear emissions thresholds ('triggers'), and switch response if they are reached e.g. reduce promotional efforts
- Targetting specific type of holidays: use of active travel infrastructure on holidays reduces transport emissions

Case Study 3.5 Diversifying tourism in Ireland's Hidden Heartlands

Development of tourism in Ireland's Hidden Heartlands is focused on being active in nature, utilising assets such as waterways, greenways, and walking trails. The region is still an emerging destination with fewer visitors than the rest of Ireland. The sustainable development of tourism in the region, following the cessation of commercial peat harvesting, presents an opportunity to diversify the regional economy, to create a model of ecotourism, and to explore the potential of regenerative tourism.

Warmer weather and drier summers as a result of climate change may increase interest in outdoor activities in the region. The Midlands of Ireland coincides with the region projected to see the greatest improvement in

[30] Proposal 3.4.1. in the *Tourism Policy Framework 2025-2030* states that the tourism agencies and Department will work to promote tourist travel to Ireland by ferry and rail / sail initiatives

weather, and the longest summer season. In addition to appealing to the domestic and international visitor interest in outdoor activities that emerged during and post-COVID, warmer summers could help to support the development of a Midlands Trails Network and the implementation of the *Shannon Tourism Masterplan 2020-2030*. The *Programme for Government 2025: Securing Ireland's Future* also commits to continuing the development of greenways, cycle routes, and blueways across Ireland, expanding our scenic and water-based options for tourists.

Developing the Hidden Heartlands as a centre for peatland and biodiversity tours will attract eco-conscious travellers and birdwatchers, further highlighting the region's peatlands, wetlands, and protected wildlife.

A longer tourism season is a goal for sustainable destination development – and is especially important in regions such as the Hidden Heartlands with less-developed tourism infrastructure. Milder springs and autumns could extend the tourism season in the region.

3.5.5. EXTREME RAINFALL

5. Extreme rainfall causing damage to walking trails, increasing risk of contamination of bathing water, impacting beach tourism, and reducing opportunities for water-based activities.

The region within Ireland most exposed to poor bathing water quality is the Eastern & Midlands region, where 64% of bathing sites monitored under the EU Bathing Water Directive in 2022 had excellent water quality. In comparison, 86% of bathing sites in the Southern region had excellent quality.

Vulnerability:

Sensitivity:

Moderate: impacts are often localised.

Adaptive capacity:

Moderate: improvements in planning, monitoring, and communications could reduce the risk.

Climate Impact Drivers and Hazard:

Numbers of days with rainfall of over 20 mm and over 30 mm (extreme rainfall) are projected to increase under both RCP 4.5 and RCP 8.5, with mid-century increases under RCP 8.5 projected to be similar to late century increases under RCP 4.5. Even under RCP 8.5, the number of days with rainfall of over 20 mm is only projected to increase by 1.7 and 3.2 days by mid and late century, respectively, on average across Ireland. However, as with seasonal precipitation, there is variation across the country in the projected increase. The number of days with rainfall over 30 mm is projected to increase by 1.4 days on average under RCP 8.5 by late century, but up to 12 days in

some parts of the country. Notable increases are projected for north-west Co. Cork, south Co. Kerry, and parts of Connemara and Co. Donegal.

Heavy rainfall resulting in wastewater overflows and run-off from agricultural land and urban areas can cause short-term deterioration in bathing water quality – affecting the safety of coastal and inland swimming and water sports. Swimming restrictions are applied at the beach when pollution occurs, until sampling shows the water quality is safe. Local authorities also erect 'Prior Warning' notices at beaches to warn swimmers that short-term pollution (lasting no more than a few days) may occur due to heavy rainfall; these warnings are removed when sampling shows the water quality is safe. Summer rainfall is projected to decrease with climate change, but rainfall in other seasons is projected to increase. Warmer weather throughout the year as well as policy to extend the tourist season may result in increased numbers of visitors swimming and participating in water sports during the shoulder season. Currently, inland waters are less monitored (spatially) than coastal beaches. Warmer weather and an increased population might encourage greater use of inland waters, with those with little opportunity to reach the coast becoming unjustly exposed to risk from unmonitored water. Storms occur more frequently in autumn / winter / spring, leading to greater frequency of wastewater overflows. This will be accentuated by climate change, with more intense storms and greater precipitation in these seasons.

Warmer weather and promotion of active tourism over a longer season may also increase the numbers of visitors exposed to impacts of high river / canal flows on water sports.

Driving rain, determined from annual average rainfall and annual average wind speed at a given point, is projected to decrease with climate change. This might reduce the pressure on uphill trails on average over a year. However, more intense storms are also projected, suggesting that trails may be subjected to infrequent but intense pressure from more extreme rainstorms. With an increasing population, as well as warmer weather and drier summers and promotion of active tourism, increased trampling accentuates the risk of damage to paths from extreme rainfall events.

Impacts:

Walking trails:

- Damage to paths, resulting in danger to tourists *(cascading risk from Health sector)*
- Closures for repair
- Costs of repair
- Reduced accessibility

Beaches

- Short-term deterioration in water quality, resulting in beach closures to safeguard public health *(cascading risk from Water Quality sector)*
- Staff time required to notify public, close off beach

- Beach closures may deter domestic visitors who had not yet booked their holiday accommodation etc.

Water sports

- Flooding of rivers and canals may impair navigation and prevent their use
- Canal siltration and sewage overspill
- Unsafe water quality for swimming and any water sports where contaminated water could be ingested *(cascading risk from Water Quality sector)*
- Closure of water bodies for public health reasons *(cascading risk from Health sector)*

Destinations

- Damage to recreational amenities due to extreme precipitation and driving rain

Sectoral Consequence:

Reduced income for local businesses: Disruption to use of beaches or waterways may reduce custom for local businesses reliant on tourist trade.

Increased administration: Issuing and enforcing notifications regarding bathing or drinking water quality, or closure of trails; monitoring.

Increased costs: Repairing walking trails and developing alternative routes; dredging and cleaning canals; increased laboratory analysis.

Damaged assets: Damage to parts of walking trails, requiring repair, disrupting tourism.

Environmental damage: Damage to vulnerable ecosystems at affected walking trails or through need to destroy habitat to build alternative routes; impact of transit of machinery to site to repair trails or install new ones – damage to habitat plus emissions. Risk of walkers trampling new routes through sensitive habitats because the trail is closed *(cascades to Biodiversity sector)*. Damage to aquatic ecosystems from pollution.

Public health: Danger to walkers, swimmers, and those involved in water sports or cruising. Some segments of the population may be more vulnerable to the effects of pollution, creating injustice in the impacts of climate change.

Reputational damage: Dissatisfaction with swimming or water sports offering, leading to reduced return visits / reduced interest amongst tourists more generally.

Key Adaptive Measures:

Adaptive Measure currently in use:

Reliability:

- Construction of hard-wearing walking trails and raised boardwalks
- Licensing to limit wastewater discharge

Resistance:

- Monitoring of water quality by the EPA and local authorities

Recovery & response:

- Direct tourist to follow advice on www.beaches.ie
- Use of signage to dissuade visitors from swimming
- Direct visitors to alternative water bodies for water sports
- Notify visitors of Do Not Use / Boil notices

Are current adaptive measures sufficient?

It is unclear whether existing measures are consistently applied, and whether further measures are needed to fully address this risk.

Potential Adaptive Measures:

Improved information: Regarding:

- Walking trail closures and when they have reopened, and alternative trails
- Beach closures and when they are reopened for swimming, as holidaymakers will not necessarily visit www.beaches.ie
- Tourists' responsibilities to protect the environment e.g. not to ignore trail closures, not to trample off-trails across sensitive habitats; manage waste and dogs at beaches

Greater monitoring & modelling: To aid prediction of impact and take precautionary measures. Monitoring of coastal bathing water quality outside of the bathing water season. Monitoring of bathing water in inland waters used for swimming and water sports. To ensure just resilience, monitoring is particularly important where people with underlying health conditions making them more vulnerable to impacts of pollution use the water resource.

Improved waterway management: More dredging of canals to their design depth; more automated facilities to permit faster barrage and lock gate reaction times to low and high flow situations; warning system for boaters providing information on velocities at critical points and traffic and mooring management to allow boats to negotiate difficult areas safely.

Greater dispersion of tourism offering: Away from locations where there are considerable pressures on wastewater infrastructure – to avoid adding to the pressure from tourist accommodation and other tourist facilities.

Visitor management, signage: To reduce damage to trails and surrounding habitats and reduce localised pollution.

Increased awareness:

- In the tourism sector: training of tourism businesses in climate adaptation
- In the agricultural and water services sectors regarding sources of diffuse pollution

3.5.6. HEATWAVES

6. Increased air temperature reducing comfort of tourists and staff in the tourism sector, requiring adjustments by tourism businesses.

The presence of trees and surface waters can have a cooling effect, and high-quality bathing sites offer an opportunity to cool down. The Eastern & Midlands region has the lowest percentage of high-quality bathing sites, equally low percentage of urban blue infrastructure to the Southern region, and a lower percentage of urban trees than the Southern region. The south-east will see the greatest increases in temperature, indicating relatively greater exposure of this region to aspects of this hazard.

Vulnerability:

Sensitivity:

Low, overall, because temperatures are not projected to reach those already experienced in major competitor destinations prior to any detectable impact of climate change. However, some visitors and staff will be more vulnerable, and an increased population will accentuate discomfort due to overcrowding.

Adaptive capacity:

High: improvements in shading and ventilation, scheduling, provision of water etc.

Climate Impact Drivers and Hazard:

Mean and maximum air temperature is projected to increase with climate change, in all seasons, with greater increases generally towards the south-east of the country. The number of heatwaves per year is projected to increase, although this is only certain for RCP 8.5, and the numbers of heatwaves per year will remain low (approximately one heatwave every two years under RCP 8.5 by late-century). The *absolute maximum* temperature in a year is projected to reach 29°C on average under RCP 8.5 by late-century. This masks variation within the country – maximum temperatures above 30°C are projected for parts of Counties Offaly and Laois under this scenario and time-point. However, nowhere in the country is projected to see absolute temperatures above 31°C. *Average* summer maximum temperature is projected to stay under 20°C by mid-century under RCP 4.5 (certain).

Warmer weather may attract more visitors, or visitors may choose certain destinations considered more attractive in warm weather: crowding will add to the risk of uncomfortable temperatures. For outdoor activities, projected decreases in wind speed might suggest less breeze, increasing people's discomfort. Higher relative humidity increases discomfort at high temperatures, but summer relative humidity is not projected to increase.

Warmer weather may encourage more time outdoors, thus increasing exposure of tourists to sunburn and increasing their risk of skin cancer.

Vulnerability to increasing temperatures will increase in the population as the population ages. As the older proportion of the population of the domestic market and Ireland's main overseas markets is projected to increase substantially, this may result in a higher proportion of older, and hence more vulnerable, visitors *(cascading risk from Health sector)*.

As summer temperatures become extreme in other parts of Europe, Ireland's mild climate may encourage a false sense of security amongst visitors, leading to behaviour that increases their exposure.

Impacts:

Accommodation, hospitality

- Need to keep both staff and visitors sufficiently cool – potentially may require substantial investment and reorganisation

Activity providers

- Reduced custom from more vulnerable visitors
- Increased requirements regarding health & safety
- Requirement for reorganisation to benefit from cooler times of day or year or shaded locations

Tours

- Buses may be uncomfortably hot *(cascading risk from Transport Infrastructure sector)*

Walking and cycling trails:

- Need to ensure shading, places to stop for breaks, water fonts
- Reduced accessibility for more heat-vulnerable visitors *(cascading risk from Health sector)*

Beaches / urban water bodies / water sports

- Increased need for lifeguards and monitoring to ensure safety of visitors trying to cool down *(cascading risk from Health sector)*

Sectoral Consequence:

Reduced income for some businesses: Some indoor venues considered too hot may lose custom. Venues where outdoor space is limited / unavailable may be at a disadvantage. Public transport may become uncomfortably hot, reducing visitor numbers at some destinations.

Increased costs:

- Installation of drinking water fonts, fountains, public spray showers, outdoor seating, planting of shading trees etc. in outdoor areas
- Increased demand for water
- Increased energy costs – showers, air conditioning, pumping water supplies

Risk of increased greenhouse gas emissions as a result of increased energy use for air conditioning – but this could be mitigated by using solar panels with, if necessary, battery storage.

Public and staff health: Danger to visitors and tourists within the sector from over-heating. Young, elderly, and those with underlying conditions will be most vulnerable.

Reputational damage: Dissatisfaction with discomfort, leading to reduced return visits / reduced interest amongst tourists more generally.

Reduced staff morale: Dissatisfaction with discomfort, leading to absenteeism and high turnover.

Key Adaptive Measures:

Adaptive Measures currently in use:

Resistance:

- Follow advice in *Be Summer-Ready*
- Action 5 in *National Skin Cancer Prevention Plan 2023-2026* relates to sport, recreation, and tourism, and includes:
  - Promote evidence informed messages on skin cancer prevention for those who participate in, or spectate at, outdoor sport, physical activity or leisure activities including tourism
  - Work with groups responsible for management of outdoor recreation areas to identify means of maximising skin protection including shade structures
  - Engage with local authorities to increase opportunities for sun protection in outdoor settings

Reliability:

- Outdoor recreational facilities such as greenways and walking trails and picnic tables and controlled barbeque areas
- Water bottle refill stations at visitor attractions
- Development of green walls / rooves, parks
- Improved swimming facilities
- Outdoor dining areas

Are current adaptive measures sufficient?

This is an emerging risk, and therefore little targeted adaptation has taken place to date.

Potential Adaptive Measures:

Investment and reorganisation, following risk assessment: Install outdoor seating and blinds / screens / shading plants. Reorganise rooms to avoid direct sunlight. To avoid maladaptation, energy use must be considered before installing air conditioning, with options to provide the energy from local e.g. solar power thoroughly assessed; smart sensors can also minimise energy use. For new builds or retrofits, thicker walls, cooler construction materials,

and orientation to reduce heat load can be considered, along with retractable rooves. Ventilation. Use of reflective paints.

Training of tourism businesses in climate adaptation. To ensure just resilience, training and addressing this issue is particularly important where there will be vulnerable guests such as older guests, young children, and pregnant women. Action plans could be put in place to protect such guests or visitors in the event of a heatwave, including ensuring reduced physical activity, increased liquid intake, appropriate dietary options, access to cool, shaded, areas, and regular phone check-ups. Underlying health conditions, including unseen health conditions such as cardiovascular disease, amongst staff, should also be considered.

Greater use of green walls, parks, vegetated corridors through towns and cities in particular, to reduce urban heat island effect.

Establish health & safety protocols for staff and customers engaged in hospitality and tour activities in higher temperatures.

Diversify tourist activities and schedule activities appropriately: To ensure that less strenuous or shaded activities are available at the hottest part of the day; hold strenuous activities at cooler times.

Greater dispersion of tourism offering: To reduce overcrowding.

Redirect tourism to cooler parts of the country: Mountain areas and the north-west of Ireland are projected to be cooler than other parts of Ireland.

Visitor management, signage: To reduce risk of visitors putting themselves at risk in dangerous water bodies in order to cool down.

Avail of Sustainable Energy Authority of Ireland Business Energy Upgrade grants to reduce costs associated with any increase in energy use.

Promote safety in the sun.

3.5.7. INCREASED RAINFALL IN AUTUMN, WINTER, AND SPRING

7. Increased rainfall leading to damage to historic buildings, archaeological sites, and golf courses, and reducing tourist demand

Vulnerability:

Sensitivity:

Moderate.

Adaptive capacity:

Moderate: Good management of historic buildings and sites can alleviate this risk. Increasing tourist demand for outdoors activities or camping during unfavourable weather is more challenging to address, but tourism businesses can refocus on the drier summer season.

Climate Impact Drivers and Hazard:

Annual rainfall is projected to increase by mid-century (uncertain) and increase further by late century (high confidence in an increase from baseline to late century) under RCP 4.5 or RCP 8.5. The increases are less marked at RCP 4.5 than RCP 8.5. Frequency of days with rainfall of more than 20 mm and more than 30 mm (extreme rainfall) is projected to increase. Storms are projected to become more intense.

Regarding impacts to built and archaeological heritage *(cascading risk from Built and Archaeological Heritage sector)*, impacts could be alleviated to some extent by the projected decrease in driving rain, which may reduce the chance of water ingress into buildings. The projected increase in evapotranspiration may provide more opportunity for buildings to dry out. Additionally, the total number of wet days is projected to decrease (uncertain), again potentially allowing drying out in between wet days. On the other hand, increased air temperature and evapotranspiration, and a longer growing season, will enhance growth of weeds and algae, exacerbating the problem.

Fluctuating conditions – wetter winters followed by drier summers – may increase the risk of structural damage to buildings and monuments.

Regarding impacts of unfavourable weather to exposed aspects of tourism-relevant trade such as camping and caravanning parks and activity providers, the reduction in numbers of wet days could bring some relief, though possibly this is inconsequential compared to increased autumn, winter, and spring rainfall, which will create a perception of conditions unfavourable to outdoor activities. For some outdoor activities, where the combination of rain and wind is problematic, lower average wind speeds may alleviate some of the impact of increased rainfall. Warmer and drier summers combined with wetter autumn, winter, and spring may lead to a greater focus of outdoor activities and camping on the summer months.

Impacts:

Historic buildings:

- Damage to historic interiors
- Unattractive algal growth
- Structural damage
- Deterioration in building condition, increasing its vulnerability to extreme weather

Archaeological sites:

- Structural damage
- Deterioration in appearance of e.g. carvings
- Erosion of monuments

Camping & caravanning, outdoor activities, and tours:

- Reduced interest from tourists in the shoulder season

Hospitality and retail:

- Reduced footfall, with tourists either not visiting or confining themselves to a limited range of indoor activities

Golf clubs:

- Softer surfaces, green closures, muddy conditions, poorer spring conditions, more turf disease, and a delay in greens reaching summer condition; more non-playing days

Visitor gardens and parks:

- Waterlogging, damaging plant roots

Sectoral Consequence:

Increased costs: For maintenance, monitoring, and repair.

Reputational damage: Dissatisfaction with visitor experience, leading to reduced return visits and word of mouth advertising.

Increased energy costs: For humidity control inside historic buildings – also resulting in increased GHG emissions.

Closures: For maintenance and repair, or because of reduced tourist demand.

Increased seasonality: For outdoors activities, tours, camping & caravanning, hospitality outside of main indoor attractions.

Key Adaptive Measures:

Adaptive Measures currently in use:

Reliability:

- Promote weather-independent tourism e.g. 'Winter in Dublin'
- Offer alternatives to weather-dependent tourism[31]
- Include assessment of climate impacts of projects in grant applications e.g. Heritage Council / DHLGH conservation grants

Resistance:

- Utilise *Heritage and Climate Adaptation Guidelines for Local Authorities*

Are current adaptive measures sufficient?

It is unclear to what extent adaptive measures are in place. As substantial consequences are not expected until late in the century under RCP 4.5, there is time to investigate this risk further before deciding on a course of action. Visitor numbers and numbers of participants in activities should be analysed in

[31] e.g. the mainland interpretive centre for Sceilg Mhichíl in Portmagee offers opportunities to experience Sceilg when weather does not allow landing

conjunction with meteorological records to determine the extent of the relationship between weather and tourist activities.

Potential Adaptive Measures:

Regular programme of inspection, maintenance, and conservation: of historic buildings and sites.

Improved climate risk assessment for built heritage.

Greater use of *in situ* protection such as shelters and soil water control to preserve monuments and archaeological features: Shelters for protection from sun / rain.

Increase promotion of appropriate activities for rainy days: e.g. separate sets of activities for sunny days and rainy days.

Develop all-weather routes: covered walkways that allow tourists walk around destinations and reach attractions and hospitality providers without getting wet.

Increased awareness: Training of tourism businesses in climate adaptation.

3.5.8. STORMS

8. **Continued disruption to travel and tourism operations from storms, and increased intensity of storms leading to damage to tourist destinations and visitor attractions**

Vulnerability:

Sensitivity:

Mountains and hills, mainly located near the coasts, provide shelter further inland from strong winds. Hills and mountains near the south coast protect the centre of the country from southerly gales. Currently, on average more than 50 days with gales are registered per year at northern coastal locations such as Malin Head, whereas fewer than 2 days with gales each year are registered at inland locations such as Carlow. Therefore, inland destinations are generally less exposed to direct impacts such as damage or the need to close for visitor safety. This, however, also depends on the specifics of site exposure and hazards at particular sites. For example, St. Enda's Park, Rathfarnham, near the Dublin Mountains, is closed more frequently (at lower-level warnings) than the National Botanic Gardens, Glasnevin, also in Dublin. However, all locations can be impacted by disruption to travel *(cascading risk from Transport Infrastructure sector)* at other locations in Ireland or overseas.

Moderate: Some impacts of storms are only temporary, and sensitivity to these is low. Sensitivity to damage to infrastructure and amenities, however, is much greater.

Adaptive capacity:

Moderate. Increasing the resilience of entire destinations is challenging, but Local Authority Climate Action Plans can help address this challenge. Many tourism businesses are already well adjusted to a hazard that has been regularly experienced in Ireland.

Climate Impact Drivers and Hazard:

Climate projections indicate a decrease in wind speeds for summer and increases for winter. Damage caused by storms is of significance whenever it occurs, as damage requires costly repair. Other impacts of storms are of a temporary nature, and these projections suggest they will become less problematic in summer, but more problematic in winter. Significant wave heights around Ireland are projected to decrease, with largest decreases projected for the summer and winter, and the magnitudes of these decreases are higher for higher emission scenarios. This may reduce risks for marine tourism activities.

Projections indicate a decrease in the numbers of less intense storms for Ireland with an increase in more intense storms (currently rare events). These more intense storms are likely to cause more damage. However, reduced frequency of storms may reduce the frequency with which sites need to close, and activities are cancelled to ensure visitor safety.

Impacts:

Destinations:

- Damage to infrastructure and appearance of destinations
- Damage to recreational assets
- Safety of tourists endangered, particularly in coastal destinations or forests or forest parks *(cascading risk from Health sector)*
- Reduced custom for hospitality and retail, particularly in coastal destinations
- Need to close exposed walking and cycling trails and access to exposed locations
- Damage to forests and forest parks *(cascading risk from Forestry sector)*
- Reduced access on account of disruption to port operations and facilities *(cascading risk from Transport Infrastructure sector)*
- Reduced access on account of disruption to flights, shipping, and road and rail networks *(cascading risk from Transport Infrastructure sector)*
- Power outages *(cascading risk from Electrical & Gas Networks sector)*

Visitor attractions:

- Closures to ensure safety of visitors and staff
- Damage to trees, sometimes leading to their loss, or necessitating further closure for safety of visitors[32].

[32] e.g. Storm Darragh in December 2024 resulted in the loss of over 120 trees and temporary closures at the National Botanic Gardens Kilmacurragh and Mount Usher, both in Co. Wicklow.

- Structural damage and deterioration of built and archaeological structures and sites *(cascading risk from Built & Archaeological Heritage sector)*
- Risk to supply chain where deliveries impossible due to storm or storm damage to transport routes *(cascading risk from Transport Infrastructure sector)*
- Difficulty accessing site for maintenance e.g. Sceilg Mhichíl
- Shortened season due to storms in September e.g. Sceilg Mhichíl
- Increased maintenance and conservation costs

Accommodation:

- Cancellations due to difficulty travelling, on account of cancelled flights, sailings, and disruption to rail and road networks *(cascading risk from Transport Infrastructure sector)*
- Risk to supply chain where deliveries impossible due to storm or storm damage to transport routes *(cascading risk from Transport Infrastructure sector)*

Hospitality

- Disrupted trade due to loss of electricity and blocked access roads *(cascading risk from Electrical & Gas Networks and Transport Infrastructure sectors)*

Activity providers & tour guides:

- Need to cancel activities / tours to ensure safety of visitors – particularly sea and coastal activities
- Difficulty obtaining insurance for vehicles for operation during storms

National Parks:

- Structural changes to vegetation and wildlife habitats *(cascading risk from Biodiversity sector)*

Beaches & coastline:

- Storms can accelerate erosion and sediment displacement – see Priority Impact No. 2

Festivals & events:

- Structural damage to stadia

Sectoral Consequence:

Deterioration in the quality of destinations: Infrastructural and aesthetic damage leading to reduced tourist demand, discouraging investment from the private sector.

Increased costs: For repair of infrastructure and facilities, and their maintenance and monitoring.

Increased administrative burden associated with notifying tourists of risks, organising repairs, re-booking guests etc.

Reduced income: Loss of revenue due to cancellations of bookings and reduced tourist demand or due to a shortened season. Loss of stock.

Reputational damage: Dissatisfaction with visitor experience, leading to reduced return visits and word of mouth advertising.

Closures: Temporary closures of visitor attractions, tour companies etc., but potentially sufficient disruption could lead some activity providers and tour companies to withdraw from the market permanently.

Public health: Risk to safety of tourists participating in coastal walks or sea swimming and other water-based activities; risk of injury to tourists from storm debris or destabilised buildings and trees, particularly in urban or afforested areas. Visitors with reduced mobility may be more vulnerable.

Reduced potential to extend the tourism season: Increased wind speeds in winter might limit the tourism season to summer, when wind speeds are projected to decrease, particularly in coastal and exposed destinations. Marine water sports and boat tours may become limited to summer. The potential to improve working conditions in the sector by offering longer seasons of employment could thus be impaired. Access to Ireland may be impacted by storms outside of Ireland[33].

Reduced diversification potential: The potential for development of outdoors tourism activities may be limited by the possibility that such activities may frequently be impossible, particularly in winter. This in turn could limit the potential to assist more economically challenged communities to obtain tourism income via diversification of the tourism offering.

Increased GHG emissions from flights: As extra distance may be flown to avoid a major storm, this adds to the GHG emissions from the flight.

Key Adaptive Measures:

Adaptive Measures currently in use:

Resistance:

- Local Authority Climate Action Plans address climate risks across whole county
- Flexibility
- Monitoring of Met Éireann forecasts
- Revised National Ports policy expected to prioritise measures to strengthen the climate resilience of Irish Ports

[33] e.g. closure of Holyhead port in Wales following Storm Darragh impacted Christmas 2024 travel to Ireland

- Include assessment of climate impacts of projects in grant applications e.g. Heritage Council / DHLGH conservation grants

Recovery & response:

- Good communication options between accommodation and guests e.g. through booking site, allowing guests to alert accommodation to delayed arrivals or cancelled travel
- Coast Guard alerts
- *Be Summer-Ready* includes guidance on water safety and water-based activities
- The Marine Safety Working Group *Safety on the Water* guidelines booklets provide advice regarding strong wind speeds
- Temporary closures of visitor attractions and walking trails to ensure safety
- Travel insurance for tourists

Are current adaptive measures sufficient?

Given the expected decrease in frequency of less severe storms but expected increase in frequency of more intense storms, adaptation efforts should focus on design and planning to minimise damage to tourism when the intense storms occur. Where flooding is also a risk, building resilience to storms should be considered alongside building resilience to flooding (Priority Impact No. 1). In some cases, the major impact of storms will be to enhance erosion, and storm risk should be assessed in that context (Priority Impact No. 2). Where storms bring extreme rainfall, risks associated with the extreme wind should be assessed in conjunction with the impact of the extreme rainfall (Priority Impact No. 5).

Some attractions such as forests with walking and cycling trails, arboreta, forest parks, and coastal attractions may need to produce specific storm risk assessments to ensure safety of visitors and resilience of the attraction. Given that storms are not a new challenge for such attractions, adaptive measures already in place may be sufficient in the next five years but must be sustained.

Potential Adaptive Measures:

Improved risk assessments: Climate risk assessments by tourism businesses and for whole destinations. Training of tourism businesses in climate adaptation.

Improved monitoring & modelling: Monitoring of infrastructure to detect early signs of vulnerability during a storm; modelling of impact of different gale forces on different types of infrastructure and activities.

Improved access to warning systems for tourists: Tourists are unlikely to access the same sources of information as the resident population. Warnings from diverse sources e.g. the Coast Guard and Met Éireann could be integrated into a tourist app or destination apps.

Improved information regarding closures: Rapidly updated websites, or all information in one point e.g. in a destination app.

Backup power generator for when mains supply cut.

Tree surgery: Including non-invasive tree surgery to help the trees become more wind resistant.

Storm itineraries e.g. for boat tours.

Alternative transport arrangements e.g. shuttle bus to collect guests if local public transport not running.

3.5.9. EXTREME COLD

9. Extreme cold resulting in icy conditions or snow, leading to closure of attractions and cancellations of flights and ferries, and disrupting road and rail travel.

Vulnerability:

Sensitivity:

Low: Disruption due to this hazard is temporary and infrequent.

Adaptive capacity:

High. Many tourism businesses in more exposed locations such as mountains are already well adjusted to this hazard. All businesses should allow for disruptions and temporary closures due to a wide range of circumstances in their business planning.

Climate Impact Drivers and Hazard:

Annual frost days and ice days are expected to decrease by mid-century and decrease further by late century under either RCP 4.5 or RCP 8.5 (certain) – therefore the frequency of icy conditions can be expected to decrease. Annual snowfall is projected to decrease by more than 50% under RCP 4.5 and by more than 60% under RCP 8.5 by 2041-2060.

Numbers of ice days per year are already infrequent (0.37 days a year in the baseline years 1976-2005 or one every two to three years). This will fall to only 0.12 days a year (one day every nine to 10 years) by mid-century under RCP 4.5. By the end of the century under RCP 8.5, ice days could be as infrequent as one day every 100 years.

Frost days are currently much more frequent than ice days in Ireland: on average across the country 41 days a year (baseline). Frequency is far greater in some areas such as the Wicklow mountains. Frequency of frost days is projected to fall to an average of 24 days across the country by mid-century under RCP 4.5 and will fall further by the end of the century.

Impacts:

Visitor attractions:

- Closures to ensure safety of visitors and staff

- Requirement to cancel outdoors events at attractions, such as Christmas markets
- Damage to trees, sometimes leading to their loss, or necessitating further closure for safety of visitors
- Structural damage to built heritage *(cascading risk from Built & Archaeological Heritage sector)*
- Risk to supply chain where deliveries impossible due to snow or ice *(cascading risk from Transport Infrastructure sector)*

Accommodation:

- Cancellations due to difficulty travelling, on account of cancelled flights, sailings, and disruption to rail and road networks *(cascading risk from Transport Infrastructure sector)*
- Risk to supply chain where deliveries impossible due to snow or ice *(cascading risk from Transport Infrastructure sector)*

Destinations:

- Safety of tourists endangered *(cascading risk from Health sector)*
- Reduced custom for hospitality and retail
- Need to close potentially dangerous walking and cycling trails and access to icy locations
- Closure of local amenities that may be used by tourists e.g. leisure centres, swimming pools
- Reduced access on account of disruption to flights, shipping, and road and rail networks *(cascading risk from Transport Infrastructure sector)*

Boating:

- Sinking of boats if not properly winterised

Sectoral Consequence:

Reduced income: Loss of revenue due to cancellations of bookings and reduced tourist demand.

Public health: Risk to safety of tourists from falling on icy paths and roads, from driving accidents, and from falling trees and other materials weakened by heavy snow. A risk of reduced frequency of frost and ice days might be increased complacency during extreme cold, leading to greater chance of accidents.

Increased energy costs: During cold spells, energy costs for tourism-related businesses increase. However, heating degree days are projected to decline by on average 15% across the country by mid-century under RCP 4.5, resulting in an expected overall decline in energy costs for heating.

Reduced accessibility: Snow and ice can be particularly challenging for visitors with mobility concerns.

Key Adaptive Measures:

Adaptive Measures currently in use:

Resistance:

- Visitor attractions can follow Met Éireann weather alerts to allow early decisions as to when to close
- The *Be Winter Ready* campaign provides advice for businesses on preparation for winter conditions
- Operational responses to limit impact of weather events on road network, following exceedance of winter thresholds
- Advice from Inland Waterways Association of Ireland on checking and preparation of boats for winter conditions
- Include assessment of climate impacts of projects in grant applications e.g. Heritage Council / DHLGH conservation grants

Recovery & response:

- Temporary closures of visitor attractions and walking trails to ensure safety
- Flexibility regarding delayed arrivals at accommodation, rescheduling of events

Are current adaptive measures sufficient?

Yes: snow, ice, and icy fog sufficient to cause disruption are infrequent, relative to other hazards such as storms and flooding.

Potential Adaptive Measures:

Improved risk assessments: Climate risk assessments by tourism businesses and for whole destinations.

Diversification: Destinations can be very attractive on snowy days. Safe walks through attractive areas could be promoted to visitors.

Improve accessibility: Ensure that e.g. wheelchair accessible paths and ramps are cleared of snow and ice.

3.5.10. OCEAN WARMING

10. Ocean warming and acidification leading to changes in marine species composition, impacting on sea swimming and marine nature tourism

Vulnerability:

Sensitivity:

Low: Swimming restrictions are likely to be only temporary, and jellyfish and algal blooms are localised, so tourists can choose alternative beaches from which to swim. Nature tourism is not mature in Ireland.

Adaptive capacity:

Moderate. Since nature tourism is still to mature in Ireland, it is still possible to focus on resilient nature, and it is possible to refocus on different species and habitats over time, with relative ease.

Climate Impact Drivers and Hazard:

Sea Surface Temperatures in Irish waters are now 0.4°C warmer than in 1960-1990, and the seas around Ireland are expected to continue warming.

Ocean acidification is a result of ocean chemistry changing in response to increasing atmospheric carbon dioxide (CO_2) concentrations. Irish offshore surface waters have become more acidic with an overall reduction in pH of 0.02 units per decade. A reduction in pH is also evident in deeper waters (1,500 – 2,000 m). The average surface pH of the ocean will continue to see an unprecedented rate of change, potentially a doubling of acidity by 2100 under RCP 8.5. Ocean acidification and warming could potentially lead to catastrophic ecosystem collapse. Changes in salinity will vary with region.

Impacts:

Beaches:

- Increased risk of harmful jellyfish *(cascading risk from Health sector)*

Activity providers:

- Reduced opportunity for boat tours for tourists interested in coastal ecology, including sea bird populations *(cascading risk from Biodiversity sector)*

Angling:

- Reduced numbers of currently abundant marine fish *(cascading risk from Biodiversity sector)*
- Reduced numbers of Atlantic salmon returning from the sea impacting on freshwater angling

Destinations:

- Reduced natural attractiveness of destinations due to altered habitats, changes in biodiversity *(cascading risk from Biodiversity sector)*
- Reduced attraction of coastal destinations for tourists interested in birdwatching or for whom sea birds are an important component of the destination's appeal *(cascading risk from Biodiversity sector)*

Sectoral Consequence:

Public health: Risk to human health (illness) from algal blooms and pathogens in marine bathing waters. People with underlying health conditions will be more vulnerable to such illness.

Reduced income: Directly for tour guides and eco-tourism activity providers, and potentially indirectly for e.g. hospitality, retail, or accommodation in destinations previously attractive for marine tourism and sea swimming and angling.

Reputational damage: Dissatisfaction with visitor experience, leading to reduced return visits and word of mouth advertising.

Closures: e.g. of eco-tour companies.

Key Adaptive Measures:

Adaptive Measures currently in use:

Resistance:

- Monitor changes in sea bird populations[34]

Recovery & response:

- Utilise information about jellyfish at www.beaches.ie and the Health Service Executive (HSE) website

Are current adaptive measures sufficient?

Currently, yes.

Potential Adaptive Measures:

Improved management to reduce pollution: In response to eutrophication with the co-occurrence of climate change, harmful algal blooms have increased since 1980 in coastal areas in Europe and globally (EEA 2024, IPCC 2022). Reducing pollution at source can reduce the risk associated with warmer growing seasons for algae.

Reduce terrestrial pressures on migratory fish: to counteract the impact of changes in the marine ecosystem leading to reduced numbers of vulnerable Atlantic salmon returning from the sea.

[34] e.g. at Cliffs of Moher

Appendix III SEA & AA screening

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