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Nature and Environment to Attain and Restore Health (NEAR Health)

Authors: Caitriona Carlin, Gesche Kindermann, Easkey Britton, Martin Cormican, Christine Domegan, Mike Gormally and Diarmuid O'Donovan

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ENVIRONMENTAL PROTECTION AGENCY

The Environmental Protection Agency (EPA) is responsible for protecting and improving the environment as a valuable asset for the people of Ireland. We are committed to protecting people and the environment from the harmful effects of radiation and pollution.

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- Office of Environmental Sustainability
- Office of Environmental Enforcement
- Office of Evidence and Assessment
- Office of Radiation Protection and Environmental Monitoring
- Office of Communications and Corporate Services

The EPA is assisted by an Advisory Committee of twelve members who meet regularly to discuss issues of concern and provide advice to the Board.

EPA RESEARCH PROGRAMME 2014–2020

Nature and Environment to Attain and Restore Health (NEAR Health)

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EPA Research Report

A copy of the Nature-based Activities (NBA) Report is available on request from the EPA

Prepared for the Environmental Protection Agency

by

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DISCLAIMER

This report is based on research carried out/data from 2016 to 2019. More recent data may have become available since the research was completed.

The EPA Research Programme addresses the need for research in Ireland to inform policymakers and other stakeholders on a range of questions in relation to environmental protection. These reports are intended as contributions to the necessary debate on the protection of the environment.

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Executive Summary

The NEAR Health project was jointly funded by the Environmental Protection Agency and the Health Service Executive to investigate how nature and environment can help society attain and restore health. The team combined its expertise in the environmental, health, social innovation and medical fields to develop and transform knowledge for communities, policymakers and practitioners. We categorised stakeholders as promoters and providers of blue and green spaces, educators, decision influencers and policymakers, active and potential blue/green space users, and health practitioners.

We investigated (1) how people value and experience nature, health and wellbeing, (2) the barriers and bridges to connecting with nature, (3) what people want from their healthy future environment and (4) nature-based activities that benefit people's health and wellbeing. We collaborated with communities to co-create the outcomes of this research, including a toolkit, Connecting with Nature to Benefit Health and Wellbeing, which is available from the funders.

Valuing blue and green spaces is important for people's social, spiritual, emotional and environmental wellbeing, as well as providing economic benefits to all stakeholders. People hold a variety of values and perceptions about nature, health and wellbeing. People strongly agreed that nature should be accessible to all, but they also highlighted that it was not available to everyone equally.

People's connections with nature are related to environmental quality, as they strongly agreed that litter and neglected facilities were disincentives. Therefore, the quality of blue and green spaces and how they are managed strongly influence people's choices to spend time in them. People most strongly agreed that showing them what nature surrounds them motivates them to conserve it.

Participatory processes increase social cohesion and facilitate community connectedness. Communities identified six key themes that were necessary to create an action plan for a healthy future environment: awareness, active citizenship, political processes and participation, creating an enabling environment, access to space, services and resources, and transformative changes. These actions promote sustainable living.

Ireland's blue and green spaces have high potential for providing activities that nurture connectedness (with self, others and nature), reduce stress and anxiety, and enhance wellbeing, as well as promoting an ethic of care.

Nature and nature-based activities in local, easily accessible blue and green spaces offer important health and wellbeing benefits.

Recommendations

- Invest in and plan for greater access to and responsible use of biodiverse outdoor public spaces, especially coastal and urban blue spaces.
- Focus attention on walking and outdoor swimming, especially for less able-bodied cohorts and to enable people to manage stress. There are minimal, low or no costs related to these activities.
- Nurture, support and fund partnership building across sports, recreation, health and nature conservation organisations, outdoor promoters, providers and practitioners. This provides cross-sectoral value from health, social and environmental perspectives.
- Initiate nature-based activities to build social connection and wellbeing benefits, as well as pro-environmental behaviours. Shared experiences embed a sense of community and care for the environment.
- Adopt citizen science approaches within existing outdoor activities; for example, connect the National Physical Activity Plan with monitoring schemes run by the National Biodiversity Data Centre.
- Research understudied cohorts, such as the elderly, young people and minority groups, and habitats associated with inland waterways and wetlands. Determine cultural components of nature connections and intersections with other determinants of health, such as socio-economic factors, gender, race and ethnicity.

Conclusion

When transformative changes are required, for example to meet the United Nations Sustainable Development Goals or to respond to a biodiversity and climate emergency, we can work across boundaries and beyond disciplines to make healthy futures a reality.

Connecting with nature helps us to make sense of the world in changing times. Being in nature benefits our health and wellbeing, makes us feel more connected to one another and helps us to care for the environment, but not everyone has an equal opportunity to connect with nature. Shared public spaces and environments must address the needs of the greatest possible number of people and the most vulnerable, and promote greater diversity and inclusion. Nature-based activities provide multiple points of connection relevant to different needs and lead to greater care for the environment. Shared spaces must be designed, managed and promoted, from an ecosystem perspective, for multifunctional use, including consideration of the ecological requirements of wildlife, which often influence why we care about nature.

1 Introduction

1.1 Background

Transformative and systemic change is needed to respond to the biodiversity and climate crisis, to meet the United Nations (UN) Sustainable Development Goals (SDGs) and to live fairly within the resources of One Planet, "to leave no-one behind" (UNDP, 2018). In its first voluntary review of the UN SDGs, the Irish government pledged to do its utmost for those most disadvantaged first, and to improve the quality of life throughout Ireland (Government of Ireland, 2018a). Two core principles underpin this pledge: dignity and determinants. First is the value of living a life to its full potential – echoing the cross-sectoral goal of Healthy Ireland to create an environment where all individuals can live their lives to the full, reach their full potential and contribute to society. Second, the quality of this life is determined by interdependent and interlinked environmental, social and economic factors. This interrelationship has been recognised by the Environmental Protection Agency (EPA) and Health Service Executive (HSE) and in Ireland's current national sustainable development strategy, "Our Sustainable Future" (DCCAE, 2012). Challenges exist in achieving this quality of life at environmental and societal levels that go beyond pressures on healthcare: achieving the balance between using our natural resources sustainably, and valuing and protecting our natural capital.

A functioning environment can sustain healthy human populations (Sandifer *et al*., 2015) directly through provisioning, regulating and supporting services, and indirectly through cultural services (Mace *et al*., 2012; Andersson *et al*., 2019). Direct services have also been termed passive pathways, e.g. climate regulation, whereas recreation and other activities in nature are active pathways (Lin *et al*., 2018). This means that the ecosystem–health relationship is complex (Keune *et al*., 2013; Romanelli *et al*., 2015; Oosterbroek *et al*., 2016; Andersson *et al*., 2019) and knowledge gaps can pose challenges to policymakers and practitioners (Guerry *et al*., 2015; Phelps *et al*., 2015; Polaskya *et al*., 2015; Maes and Jacobs, 2017).

Given that a healthy environment has multiple benefits for our health and wellbeing, managing and valuing our environmental assets have strategic importance for human health (Wolch *et al*., 2014). Health has been defined by the World Health Organization (WHO) since 1948 as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (WHO, 1958), yet public and political discourse is preoccupied with disease. The HSE Health Promotion Strategic Framework applies a salutogenic model to reorient health and other public services away from managing individual responses to disease and ill-health to "enable and empower communities and individuals to have greater influence over factors that affect their health" (HSE, 2011). Early confusion over what is the prevention, detection and treatment of disease and what is health promotion (Tengland, 2010) has lessened, with an emerging understanding of stewardship (Mackie and Sim, 2014). Stewardship is useful in combining a whole-of-government approach to healthcare (Brinkerhoff *et al*., 2019). Successful stewardship is supported by effective frameworks, coordinated implementation and government–societal collaboration (Brinkerhoff *et al*., 2019), but there are knowledge gaps relating to the role of politics, incentives and societal agency. These knowledge gaps, couple with the capacity to respond, limit how effective stewardship can be. It is a major challenge to create space to affirm health and wellbeing as a state of being and functioning (Stucki and Bickenback, 2019) that can be achieved by most people, most of the time, in a supportive and sustainable community and environment. Furthermore, many initiatives to promote health tend to rely on a model based on individual lifestyle choices, which undervalues the force of environment and community norms in shaping how people live.

As people age in the current physical, social and cultural environment in Ireland, they often do so in built environments whose features mean that less physical activity is needed, and they lead lifestyles where unhealthy food choices are facilitated (Department of Health, 2016). Chronic illnesses are linked, among other things, to obesity (approximately 60% of Irish adults are diagnosed as obese), inactivity and depression (Department of Health, 2013; Department of Health and Ipsos MRBI, 2019). Earlier in life,

people in Ireland suffer a high rate of mental illness, with Ireland having the fourth highest rate of suicide among teenagers among Organisation for Economic Co-operation and Development (OECD) countries (Unicef, 2017). The demands for support services related to these health problems generate serious economic and socio-political pressures (Department of Health, 2013). Systemic approaches to embed the essential role that protecting the environment plays in improving the health of the population are needed (WHO, 2016, 2019a), including social agency (Brinkerhoff *et al*., 2019), although exactly how "systemic" is interpreted can itself be a challenge (Scoones *et al*., 2020). Social agency is linked to awareness, and the challenge posed by the need for increased awareness of the benefits to health and wellbeing from a good quality environment was recognised in the EPA's 2016 state of the environment report (EPA, 2016). The EPA's current environmental strategy, 2020 Vision: Protecting and Improving Ireland's Environment (EPA, 2000), outlines the need to protect and improve the environment to ensure a healthy society and economy. While protecting and improving biodiversity is one of the six broad environmental goals for Ireland, this strategy emphasises better integration of environmental (blue and green spaces) and natural resource considerations into the policies, plans and actions of the health and economic sectors. From a stewardship perspective, greater cross-sectoral engagement is needed between health and the environment to ensure that the perceptions of the burden and opportunity costs of protecting the environment are balanced with an appreciation of the fundamental dependency of humankind on the environment for health and wellbeing (DAHG, 2011; EPA, 2012).

A functioning environment can sustain healthy human populations (Sandifer *et al*., 2015), but a business-as-usual approach has resulted in competing and cumulative land use challenges in terms of both sustaining environmental resources and delivering social and economic benefits (Wolch *et al*., 2014; Plieninger *et al*., 2016). Models that address feeding the human population and safeguarding nature (Cazalis *et al*., 2018) have highlighted the burden on an increasingly degraded environment to support an increasing population (Myers, 2017; Baillie and Zhang, 2018). Previous models did not sufficiently consider that development has unsustainably utilised resources (Acunzo *et al*., 2018) and needs rethinking (Poppy and Baverstock, 2019). Coupled with this accelerating demand for resources (Acunzo *et al*., 2018) is the growing awareness of an "extinction of experience" in relation to urban biodiversity and urbanised human populations (Soga and Gaston, 2016; Soga *et al*., 2016), and the implications that this has for ecology and conservation, as there is a wider intrinsic value to all green and blue spaces (Hausmann *et al*., 2016) and to nature (Simaika and Samways, 2018). Abiotic and biotic factors, as well as land management practice, shape the surrounding landscape that forms the backdrop to most human and lifetime experiences in urban and rural environments (Tost *et al*., 2015).

Human and community experiences (Hoffman, 2019) are shaped by the nearby environment, as well as by available services and opportunities (Carmona, 2019; Satariano, 2019; Säumel *et al*., 2019). Disadvantaged communities are a growing concern owing to links between ecological value, and social and health inequities (Mitchell and Popham, 2008; Wolch *et al*., 2014; Kabisch and van den Bosch, 2017). The incorporation of ecosystem services, environmental justice and green spaces in community and health planning has been recommended (Summers *et al*., 2014), but this joined-up approach has emerged only recently in the literature (Jennings *et al*., 2016a,b, 2017; WHO, 2019a,b) and inconclusive results may slow down its implementation. One example of this is linked to a global review of air quality (Hajat *et al*., 2015), which highlighted environmental and health inequalities in North America, New Zealand and Africa but found mixed results in terms of air quality and disadvantaged areas in Europe. In 2018, the European Environment Agency (EEA) annual report on the National Emission Ceilings (NEC) Directive (2016/2284/EU) showed that, although all Member States met key air pollution limits set in 2010, five countries, including Ireland, exceeded targets for ammonia, which is linked to ecosystem and human health, with another report confirming that poorer air quality has unequal impacts on different sectors of society, particularly those who are in no position to move, such as the very young or very old, or people who are homeless (EEA, 2018). There are concerns that insufficient progress has been made to meet targets set for 2020 and 2030 (EEA, 2019). Connections between environmental equity and climate justice have also been evaluated in relation

to social equity and determinants of health (Jennings *et al*., 2016a,b; Kabisch and van den Bosch, 2017). There is a disparity in environmental burdens and environmental benefits in some countries such as the USA (Schlosberg, 2013; Hajat *et al*., 2015) and the UK (Mullin *et al*., 2018).

Recent studies suggest that people accrue greater benefits to their health and wellbeing from areas that are more diverse and perceived to be more natural, regardless of the setting (urban, peri-urban, rural) (Marselle *et al*., 2015). This seems to be especially the case for coastal areas in England, where living near the coast is associated with greater overall health (Wheeler *et al*., 2012), including physical health (Pasanen *et al*., 2019) and mental health, although this relationship was strongest for lower earning and deprived factors households (Garrett *et al*., 2019). The European Sea for Society health report found that, for participants, the sea represents the very notion of wellbeing, and it identified the need for a better understanding of marine environment and human health and wellbeing interactions (Mazzonetto *et al*., 2014). Furthermore, new research has emphasised that the influence of oceans on human health is an important emerging field (Fleming *et al*., 2014; Britton *et al*., 2018, 2020; Britton, 2019; Britton and Foley, 2020). This report builds on such research by investigating the interconnectedness of ocean health and human wellbeing to better implement policies and programmes that will capitalise on opportunities to partner and improve public health and wellbeing, as well as natural environments (Britton *et al*., 2018).

At an international level, the Millennium Ecosystem Assessment highlighted the difficulty in assigning a value to biodiversity for human health and wellbeing. Ireland (and other European Member States) is required to map and assess ecosystem services by 2020. In 2015, the WHO, the Convention on Biological Diversity (CBD) and the United Nations Environment Programme (UNEP) published a state of knowledge report on biodiversity and human health, advocating for an integrated approach to biodiversity conservation and the promotion of human health (Romanelli *et al.,* 2015). The connection between biodiversity and health has since been reaffirmed in the Aichi Biodiversity Target 14, which highlighted the need for coordinated action to integrate health and biodiversity (http://www.cbd.int/sp/targets/rationale/target-14). This was translated as a key goal to "protect and restore nature*"* in the 2019 European Union (EU) Green Deal (EC, 2019a) and the EU Biodiversity Strategy 2030 (EC, 2020a) and is a priority action under the 8th Environmental Action Programme – Turning the Trends Together (Council of the European Union, 2019). This articulates the need for integrated work on sustainability, targeted to harness synergies between, and co-benefits of, policies to address climate and environmental challenges (https://www.consilium.europa.eu/media/40927/st12795-2019.pdf). In a factsheet published by the European Commission (EC) in 2020 (EC, 2020b), on "making nature healthy again", Ursula von der Leyen, President of the EC, said: "Making nature healthy again is key to our physical and mental wellbeing and is an ally in the fight against climate change and disease outbreaks. It is at the heart of our growth strategy, the European Green Deal, and is part of a European recovery that gives more back to the planet than it takes away" (EC, 2020c).

In 2014, the EPA funded a desk study to assess the evidence for health benefits from biodiversity (Carlin *et al*., 2016). The study showed that, while decision-makers all agreed that contact with nature benefited their health and wellbeing, they differed in their perception of the potential to integrate biodiversity into playgrounds, sports grounds and amenity areas. This report builds on and extends the findings of that desk study. A growing body of international literature is exploring how engagement with the natural environment can assist in both sustaining health and responding to illness through a "dose of nature" or a green prescription-based approach to health and wellbeing (Barton and Pretty, 2010; Cox *et al*., 2017; Bell *et al*., 2018a,b, 2019). The concept of nature-based solutions is emerging and evolving, and encompasses any activity or intervention that uses or learns from nature (blue and green spaces), for example to safeguard human health and wellbeing, to mitigate climate change or address climate change adaptation, to address flood risk management and to maximise biodiversity gains. The European Green Capital Network Future Vision Toolkit states: "These [nature-based solutions] are cost-effective and simultaneously provide environmental, social and economic benefits and help build resilience" (EU, 2019). A key research and innovation recommendation of the Horizon 2020 Expert Group was the need for nature-based solutions to promote wellbeing in

(and beyond) urban areas (EC, 2015a). Since then, the focus on wellbeing has been expanded to rural, coastal, peri-urban and urban environments, specifying the health and wellbeing of individuals, living and working environments, and biodiverse ecosystems, and this has been elaborated on in *Orientations towards the First Strategic Plan for Horizon Europe* (EC, 2019b). In this report, the use of nature-based solutions is focused on health and wellbeing.

Gaps in our knowledge still exist; for example, much of the research in the past was not inclusive in relation to gender, age and socio-economic conditions (Shanahan *et al*., 2019). We still do not fully understand the mechanisms that drive our health and wellbeing responses when we notice nature or take part in activities based in and around blue and green spaces or other aspects of the natural environment (Shanahan *et al*., 2019). Perhaps because of these knowledge gaps, the opportunity to integrate healthy living and connectedness to nature has, to date, not been fully explored by nature conservationists, planners, policymakers and health promotion professionals, and even in some aspects of the media, in Ireland. The Nature and Environment to Attain and Restore Health (NEAR Health) project was one of the first to work with communities to reach across disciplines to find out what people valued in terms of the natural environment, health and wellbeing. Emerging research in Ireland has shown that health policies can be integrated in the planning of responsive environments (Scott *et al*., 2018, 2019). Evidence of connections between blue and green spaces and the socio-economic determinants of health and wellbeing exists in Ireland (Foley *et al*., 2018, 2019). Such associations between blue and green infrastructures and health are reflected in national planning frameworks (Scott *et al*., 2018) but spaces allocated for amenity use and recreation may not always be biodiverse (Carlin *et al*., 2016). Complementing these studies, NEAR Health examined what communities want from blue and green spaces in their natural environment in relation to health, wellbeing and valuing nature (Shanahan *et al*., 2019). It is likely that very clear differences exist between communities and between individuals with respect to their perceptions of what is natural, restorative and accessible in terms of shared public spaces and environments. Approaches to explore and respond to this expected diversity of perceptions must ensure that environments address the needs of the greatest possible number of people. A particular challenge is exploring the types of environments that may appeal to those sectors of the community that at present are most sedentary and isolated and which support people in forming and achieving personal goals in relation to physical activity, community engagement and wellbeing (Lovell *et al*., 2014; Husk *et al*., 2016). Engaging people's interest in nature-based activities (NBAs) can help overcome inertia and lack of confidence and provide motivation to pursue a more active outdoors lifestyle (Carlin *et al*., 2016). A critical aspect of this engagement is to provide multiple stepped points of departure relevant to different needs (Bell *et al*., 2019). Some will need access to wilderness, some to seashore, but for others it may need to start at the balcony or front door. The following sections set out the aims and objectives of this project, commencing with a review of the literature, to synthesise the evidence in relation to blue and green spaces (objective 1).

1.2 Aims and Objectives

The aims of this study were to connect people with nature to benefit health and wellbeing. This project aimed to collaborate with communities to co-create inclusive, nature-based solutions that promote and restore health and wellbeing, helping us value and care for a healthy environment.

In addition to assessing the evidence base (objective 1), this study aimed to address the gap in knowledge of values regarding nature, and blue and green spaces (objective 2). There is a need for interconnected mechanisms to combine biodiversity engagement with health and wellbeing practices (objective 3). Owing to the lack of knowledge across society and sectors, there is a research and innovation need in relation to nature-based solutions to promote health and wellbeing (objective 4) and a lack of accessible "how to" guides (objective 5).

The specific objectives of this study were therefore to:

1. collate and synthesise evidence relating to health and wellbeing benefits from blue and green spaces;
2. investigate and collate values and perceived barriers to the use of open space to engage with nature and promote healthy practices;

3. determine what the public want from their nearby environment in terms of health and wellbeing;
4. use experts to assess the potential effectiveness of mobilising the use of environments perceived as natural and restorative as part of the response to restore health and wellbeing;
5. create a guide to raise awareness of nature-based solutions in daily lives.

1.3 Key Concepts and Terminology

This section details key concepts and terms to help set the scene. As such, they are set out alphabetically and not in the order in which they occur in the text.

Actively engaged blue and green space users engage in activities in blue and/or green spaces, either on their own or with others. This includes both those physically active, e.g. those who exercise, and those not physically active, e.g. those involved in passive engagement, such as sitting on a bench watching nature or painting.

Backcasting is a special type of scenario storytelling used to present a complex problem to others to engage them actively in helping to address the problem. By thinking about how the world might develop (your ideal future) you start with an ideal future scenario and, using collective intelligence and action planning, work backwards to identify the timeline, actions, roles and responsibilities to solve the problem and achieve your ideal future.

Biodiversity is the variety of all living things, including plants, animals, fungi, habitats and ecosystems, and genetic diversity. It includes diversity within species, between species and of ecosystems. It also includes people!

Blue space is used in this report to refer to all visible, outdoor, natural surface waters (e.g. rivers, lakes, coasts, seas) with the potential for the promotion of human health and wellbeing. We found that there is much blending of the colour palette of outdoor, natural spaces in Ireland, with a lot of green spaces on the edges of water.

The term "**blue care**" is used in this report to refer to blue space interventions (BSIs) – pre-designed activities or programmes (typically physical) in a natural water setting that target individuals to promote or restore health and/or wellbeing.

Co-designing/co-creating is when different individuals and groups of people come together to shape joined-up ideas, concepts and outputs.

A **community** is a group of people who interact with each other because they are located in the same residence, workplace or locality, or they are connected because they are interested in the same thing and want to engage with each other and learn from each other about this shared interest.

An **enabling environment** is a space or place that people find welcoming and nurturing. The environment around you is supportive and facilitates a sense of belonging.

Green space is used in this report to refer to all terrestrial outdoor, natural or semi-natural surfaces or settings or features (e.g. forests, woodlands, parks, gardens and farms) with the potential for the promotion of human health and wellbeing.

Health is defined by the WHO as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity", yet there is a preoccupation within existing healthcare systems with disease (WHO, 1948).

A **logic model** is a way to show the resources (inputs) needed to implement an activity or programme, the key components of the activity, and the indicative or desired outcomes. Graphs or diagrams are often used to illustrate the process. They have been used in education, public health promotion and planning.

Learning journey refers to the learning, growth or development that happens to someone as they experience an activity, programme or study. While it has been a term associated with early years education and development, it has also been applied to adult learning. We use the term to refer to the holistic way that we learn, gain new perspectives or insights and develop skills as we move through life experiences.

Nature-based activities are any activities or interventions that use or learn from nature (blue and green spaces) to promote or improve health and wellbeing or manage illness.

Nature-based interventions "are programmes, activities or strategies that aim to engage people in nature-based experiences with the specific goal of achieving improved health and wellbeing" (Shanahan *et al*., 2019, p. 3). The authors elaborate how "NBIs

can facilitate behavioural change through a somewhat structured promotion of nature-based experiences and, in doing so, promote improved physical, mental and social health and wellbeing" (p. 1).

Nature-based solutions are any activities or interventions that use or learn from nature (blue and green spaces), for example to safeguard human health and wellbeing, to mitigate climate change or address climate change adaptation, to address flood risk management and to maximise biodiversity gains (EC, 2015a). The European Green Capital Network Future Vision Toolkit states: "These [nature-based solutions] are cost-effective and simultaneously provide environmental, social and economic benefits and help build resilience" (EC, 2019b).

Nature-based therapy is a concept defined by the Green Care Coalition in the UK as "nature-based therapy or treatment interventions specifically designed, structured and facilitated for individuals with a defined need" (Sempik and Bragg, 2016, p. 100).

Nature connectedness relates to an individual's subjective sense of their relationship with the natural world (Pritchard *et al*., 2020). Studies have shown that nature connectedness tends to be higher in people who have previous (childhood) experience of nature (Hinds and Sparks, 2008) and in those who experience nature more frequently (Mayer and Frantz, 2004).

Potential blue and green space users do not currently engage in any activities in blue and/or green spaces, i.e. they do not engage in physical or passive activities in blue and green spaces.

A **stakeholder** in Freeman's (2010) classic definition, used here, is "any group or individual who can affect or is affected by the achievement of the organisation's objectives".

A **system (non-linear)** is a set of elements (e.g. people, organisations) interconnected in such a way that they produce their own pattern of behaviour over time (Meadows, 2008; Domegan *et al*., 2016). It assumes multi-causality at work between the diversity of blue–green forces and health, with dynamic interactions and feedback muddying the waters. In contrast, linear interventions within the epistemology of classical science are not sensitive enough to the dynamics and complexities of nature-based messy or ill-structured problems. In this non-linear setting, stakeholders and their engagement are central to the success of nature-based strategies.

Wellbeing is often viewed in terms of taking a positive approach to living well and fully and contributing to society. This approach has been taken by Healthy Ireland and is based on the approach set down in the Ottawa Charter in 1986. Proxy measures for the ability to live well, such as basic human needs and rights, including enough food, water and shelter, having good physical health, having access to education and being safe, can be measured as objective wellbeing. In addition, we used self-reported or personal wellbeing measures such as life satisfaction, meaning and quality of life, happiness and other positive emotions. This relates to two different aspects of wellbeing – eudaemonic wellbeing (EWB) and hedonic wellbeing (HWB). EWB can be considered as "functioning well", whereas HWB is more about "feeling good". EWB has been found to relate more strongly than HWB to experiences that enable personal growth and development, and to being challenged and striving to achieve something (Waterman, 1993, 2008; Waterman *et al*., 2010). (While we did not include measures for EWB, open-ended questions allowed for aspects of EWB to be self-identified.)

2 Literature Review

2.1 Introduction

"We can only be healthy if the environment in which we live is also healthy" (Schnoor, 2011). The value of a functioning natural environment in sustaining healthy human populations has been embedded across sectors in the UK; examples include Valuing Nature (the UK government's White Paper on the natural environment; Defra, 2011), the Commission for Architecture and the Built Environment (CABE) and the NHS. In Ireland, Our Sustainable Future (DECLG, 2012) acknowledges the ambition and challenges ahead in appropriately valuing Ireland's natural capital. Concomitant with its direct role in sustaining human health, a healthy environment sustains the Irish economy and is the basis for food security and "green growth" (EPA, 2016). Concepts of nature and natural environments recur in much of the literature and policy documents on environment and health. However, these terms have, until recently (Sandifer *et al*., 2015), been poorly defined and are likely to be understood in very subjective ways based on culture and life experience (Romanelli *et al*., 2015). To maximise the reach and inclusiveness of initiatives to sustain and restore health through engagement with the environment it is important to explore and accommodate different concepts and perceptions of "nature" and "natural".

Healthy communities need healthy environments (Buse *et al*., 2018) but the connective tissue to bring these together needs to include agency and power dynamics as well as definitions (Oestreicher *et al*., 2018). A common definition of environment is "the surroundings or conditions in which a person, animal, or plant lives or operates" (*Oxford English Dictionary*, 1976). If the environment is where people live, where they work, play and rest (McCreary, 2009), it is also what people breathe, eat and drink. Another way to define it, as "the natural world, as a whole or in a particular geographical area, especially as affected by human activity" (*Oxford English Dictionary*, 1976), attempts to include the interdependencies (and associated interactions) of people, and all forms of life, and the environment. Few definitions of the environment refer to provisioning ecosystem services, such as food, fuel, materials and medicines; to regulating services, such as maintaining air and water quality; or to supporting services, for example pollination, and cultural ecosystem services, which are often intangible, aesthetic, recreational or psychological benefits. Biodiversity is our life-support system, and changes to and losses in biodiversity destabilise the ecosystem services on which we, and all life, depend (McCann, 2000).

The value of biodiversity, ecosystems and ecosystem services is at the heart of the UN SDGs and embedded in the 7th Environment Action Programme vision that "in 2050 we live well, within the planet's ecological limits" (EC, 2013; EU, 2013). Within the last 5–10 years, publications have moved from suggesting how to manage key natural resources to safeguard biodiverse spaces, benefit human health (Wolch *et al*., 2014) and contribute to the European and Irish economies (Bullock *et al*., 2008; EPA, 2012, 2016) to highlighting significant declines in biodiversity and the impact of this for all life forms (Addison *et al*., 2019). The natural resources of the planet are finite and recent declarations at global and national levels of a biodiversity and climate crisis demonstrate the growing call for "transformative change" (Díaz *et al*., 2020) to safeguard a functioning environment.

The challenges are global and interlinked and range from climate change to food security and biodiversity loss (Jepsen *et al*., 2015; Díaz *et al*., 2020). In its state of the environment report, the EEA (2019) stated that European policies have been more effective in reducing environmental pressures than safeguarding biodiversity and ecosystems, including human health and wellbeing (https://www.eea.europa.eu/publications/soer-2020). In previous assessments, the EEA highlighted that the challenges differ depending on the intensity of use of land and resources (EEA, 2015). For example, in marginal and rural areas, the EEA emphasised the need to promote extensive practices that maintain biodiversity and are profitable. By contrast, in productive areas, the priority is to retain patches of high-nature-value farmland and reduce pressures on air, water, soil and natural habitats, and in urban areas the priority is to minimise and

mitigate habitat loss and fragmentation (EEA, 2015 – see Map 3.1). Recent assessments confirm that these challenges persist and pertain in the context of unprecedented global change (EEA, 2019). An additional challenge exists because land use is often multifunctional, but this multiplicity of uses is rarely reflected in definitions of land use and categories of land, which themselves vary in and between different sectors, e.g. green spaces (Taylor and Hochuli, 2017). The growing focus on green spaces over the last 40 years (Taylor and Hochuli, 2017) reflects competition for access to land, when one type of land use (i.e. development) has dominated an area over food production or recreational or other purposes. Although co-benefits from health and wellbeing and conservation are likely, green spaces are rarely designed for these purposes (Davies *et al*., 2019).

Since 2010 (Bowler *et al*., 2010), systematic reviews have appraised the published evidence base on the benefits of nature and green infrastructure for health and wellbeing (summarised in Carlin *et al*., 2016). One of the first critical learning points from these reviews was the lack of common definitions, such as for health, nature, biodiversity and green space, among others (Lovell *et al*., 2014). “Green space” and “green infrastructure” are terms that have emerged in recent planning and land use documents but there is not yet one single agreed definition, and in many cases they have been interpreted within very specific contexts (WHO, 2016). For example, a report to the EC on the design and implementation of green infrastructure highlighted the broad application of the term to include a network of natural and semi-natural and man-made areas, features and green spaces in rural and urban, terrestrial, freshwater, coastal and marine areas (Naumann *et al*., 2011). The authors included restored and intact wetlands, and marine areas, as well as parks, forest reserves, hedgerows and man-made features, such as green bridges (ecoducts) and cycle paths, within their definition.

The need for definitions in research areas or in applications that draw attention from multiple disciplines and different sectors has been well articulated (Lovell *et al*., 2014; Sandifer *et al*., 2015; Pett *et al*., 2016; Taylor and Hochuli, 2017). Clarity in definitions provides meaning and context for the reader and often the decision-maker (Sandifer *et al*., 2015). However, one aspect of a definition is that it is often context and discipline specific (Taylor and Hochuli, 2017). If a definition is tailored to a specific context, it is less likely that it will have broad consensus and widescale use. An example is the emerging use of blue space in research, policy and practice. Recent reviews (Britton *et al*., 2018) have highlighted the ambiguity in the use of terms such as “blue space” and “green space”, noting that in some cases blue space was defined as a component within green space (Bell *et al*., 2014), and in other situations it was excluded as “non-green” space (Nichani *et al*., 2017). This may have been historical in that most focus has been on green spaces, with blue space as a recent, emerging focus (Foley and Kistemann, 2015; Britton *et al*., 2018).

2.2 Nature, Health and Wellbeing Literature Review Methods

A systematic review of the literature was carried out to investigate the use of blue spaces to promote health and wellbeing (section 2.3). As several systematic reviews of green spaces have already been published, a gap analysis of publications was undertaken to investigate the degree to which the research had included rural and urban environments (section 2.4).

2.3 Blue Care: A Systematic Review of Blue Space Interventions for Health and Wellbeing

There is increasing interest in the potential use of outdoor water environments, or blue space, in the promotion of human health and wellbeing. The recognition of the value of nature and place as a determinant of wellbeing presents an opportunity to struggling healthcare systems seeking new, alternative and cost-effective services. However, global evidence of disconnect and detachment from our natural surroundings is growing as the world’s ecosystems increasingly come under threat from human pressures, in particular waterways, coasts and oceans. This in turn poses human health risks and diminishes access to a wide range of human health and wellbeing benefits associated with healthy blue spaces. Emerging research initiatives are building an evidence base to begin to qualify how important blue space is for human health and wellbeing (see NEAR Health, SOPHIE, Blue Health). We carried out a systematic review of the health and wellbeing benefits of therapeutic interventions within blue space. BSIs

were included that were specifically designed and structured with a therapeutic purpose for individuals with a defined need. The review highlighted the need to improve our understanding of complex NBIs for health.

2.3.1 Key findings

This is the first systematic review of the literature on therapeutic BSIs and it showed that interventions are diverse in terms of study populations, settings and activities. The risk of bias was moderate to high for all studies and limits the transferability of the findings. To some extent, as most of this research has emerged only in the last decade, this is to be expected. Thirty-three studies were included, with a combined total of 2031 participants. Most studies included adults with multiple disorders, predominantly psychological. Very few studies included participants aged over 65 years. The studies were primarily carried out in developed countries in North America (USA and Canada) and Europe, as well as in Israel, New Zealand and Australasia. Very few studies included ethnic minority groups or people of colour, with the notable exception of studies by Stephen Ritchie and colleagues with Aboriginal adolescents from a First Nations community in Canada. Their intervention was delivered through a community-based participatory research design, integrating an indigenous and holistic worldview of what it means to be well, i.e. the "Good Life" or Anishinaabe Bimaadziwin (Ritchie *et al*., 2014, 2015). In this context, health is understood as a multi-dimensional and interconnected experience deeply linked to cultural heritage.

Active rather than passive activities dominated, with marine or coastal settings favoured, in particular surfing (Britton, 2018). The duration of interventions varied greatly and this is a knowledge gap in relation to sustained health outcomes. The findings emphasise a multi-dimensional view of health, with participants experiencing positive changes to sense of self, health and wellbeing in the short term. Many of the interventions resulted in significant positive effects on health, especially psycho-social wellbeing benefits, with only 15% of studies considering physical health outcomes. However, the studies that did assess physical outcomes found significant improvements for various physical health indicators such as heart rate and blood pressure and a dramatic reduction in the use of pain medication (opioids), suggesting the important interconnection between physical and psychological health outcomes in blue care. Some interpersonal as well as individual effects were evident, with several studies placing a strong emphasis on social connection, sense of belonging and interaction with others who have shared life experiences, as well as the connective properties of water environments. Although several studies suggested that there are specific qualities of the natural "blue space" environment that are particularly life enhancing (e.g. the feeling of weightlessness in salt water), this aspect was under-investigated.

Barriers to participation and adverse effects highlighted the complexity of blue care design and delivery. Some studies indicated discrepancies between personal experience during an intervention and the social requirements or demands of daily life after an intervention. The mechanisms or processes of change remain unknown, although these are beginning to be addressed (Marshall *et al*., 2019) and would aid evaluation and optimisation of BSIs.

2.3.2 Policy implications

Blue care has the potential to improve mental health for diverse groups, but more research is required, and we call for further investigations into BSIs. With a lack of longitudinal studies, it remains untested whether the benefits associated with participation in blue space are sustained, as well as how this relationship to blue space could vary across the life course, in particular for elderly cohorts.

2.3.3 Blue care set and setting

A key area of consideration for researchers, practitioners and policymakers is the potential for nearby blue space environments to offer blue care, rather than an emphasis on adventure or wilderness therapy, which dominates the literature and typically requires greater funding and resources associated with transport, training, equipment, etc. Passive activities or those requiring few technical skills or little equipment, such as walking or swimming, were notably absent and deserve greater attention, especially for less able-bodied cohorts and in response to an increasingly "stressed-out" society. The therapeutic benefits of wetlands and inland and urban waterways also

deserve further investigation, with the potential to extend the benefits of blue care to communities that do not have access to the coast.

2.3.4 Intervention (co-)design and measurement of outcomes

Nature-based health interventions need to address local contexts in order to assess the circumstances in which outcomes are achieved and the transferability of such findings. This would help optimise BSIs to deliver sustained outcomes by considering the role of intervening factors such as changes in family life and other life stressors. In particular, the cultural component of nature connection and how this might intersect with other determinants of health such as gender, race and ethnicity need further study and consideration in research and public health policy. Interventions designed without clear aims or objectives hinder the ability to understand or evaluate their impact. More rigorous pilot interventions co-designed in collaboration with population groups, professionals, policymakers and researchers are needed to evaluate outcomes, as well as an understanding of how participant expectations and individual needs measure against actual outcomes. There is an argument in support of the historical and recent precedent for the inclusion of a common set of cognitive and experiential components of subjective wellbeing (Linton *et al*., 2016). This would allow comparability and harmonisation of findings, and as a consequence have greater relevance for policymakers. However, wellbeing measures are often highly individualised and fail to account for the socio-ecological factors of disadvantage and social inequality or indigenous models of wellbeing (Ritchie *et al*., 2015; Mansfield *et al*., 2018).

2.3.5 Embracing blue care complexities

There is a tendency to count only the "good interactions"; however, this review also highlighted the potential for negative experiences and a need to unpack potential risks and trade-offs for vulnerable groups. Limiting factors in terms of accessing and engaging with blue space for wellbeing by diverse groups need further consideration. In response to the rapidly growing trend for nature-based and social prescribing, the findings suggest the need for training to facilitate nature encounters for health and wellbeing across sectors in outdoor public spaces, especially in blue space. Our blue care review recommends a systems approach to evaluations, measuring not just "what" worked well, but also evaluating "how" and "why" success or indeed failure happened. In contrast, linear interventions within the epistemology of classical science are not sensitive enough to the dynamics and complexities of nature-based problems. In this non-linear setting, stakeholders and their engagement are central to the success of blue care.

2.4 Green Space Urban and Rural Gap Analysis

2.4.1 Introduction

Rural areas are often contextualised in relation to urban places and people (Heley and Jones, 2012; Woods, 2004). They have been described as "places in which health and illness occur and also with which such experiences are negotiated in a dynamic, ongoing process; these environments are simultaneously material, symbolic and social spaces" (Kingstone *et al*., 2020). In Ireland, the impact of urban areas on their surrounding regions is taken into account when categorising places as urban or rural; for example, rural areas are either highly rural/remote areas, or rural areas with a moderate or a high level of urban influence (CSO, 2019).This rural to urban gradient of evolving settlement patterns has created a diversity of structural scales of urbanisation (Russo *et al*., 2017) and elsewhere practitioners make clear distinctions between remote and rural populations (Wakerman *et al*., 2017). There is also a recognised urban/rural inequality in relation to health, e.g. in terms of access to cancer treatment in rural Ireland (Thomas *et al*., 2017). Other examples include the USA, where women in rural areas have both poorer health outcomes and less access to healthcare (Radcliff *et al*., 2018), and spinal injury in Canada (Goodridge *et al*., 2015), with some countries acknowledging a rural health knowledge gap, such as New Zealand (Fearnley *et al*., 2016).

2.4.2 Urban and rural areas and ecosystem services

Urban and rural areas need to take account of ecosystem services in their spatial planning (Grêt-Regamey *et al*., 2017). Recommendations

to incorporate ecosystem services, environmental justice and green spaces in community and health planning have existed for some time (Summers *et al*., 2014; Wolch *et al*., 2014) but a joined-up approach has emerged only recently in the literature (Jennings *et al*., 2016a,b, 2017; WHO, 2019b). With growing recognition of an urban–rural aspect (Kelly-Reif and Wing, 2016), urban–rural disparities should be framed in an environmental justice perspective (Pan *et al*., 2016; Mullin *et al*., 2018; Cronin-de-Chavez *et al*., 2019). In a Chinese study (Pan *et al*., 2016), the rural community used more freshwater ecosystem services than the urban community and also attributed a greater value to them. The authors warned that a lower value and a low priority for ecosystem services will have negative implications for people and nature in rural and urban areas (Pan *et al*., 2016). In the UK, ecosystem service inequalities were most common in urban, coastal and rural upland communities, with agricultural areas and areas with extensive woodland having good-quality ecosystem services (Mullin *et al*., 2018). Given the varying quality of and access to ecosystem services, action is needed at a local level (Mullin *et al*., 2018). In urban affluent areas, health inequalities can be mitigated where people have access to private green spaces, e.g. gardens (Dennis and James, 2017), but several studies have shown that increasing urbanisation often changes the extent of publicly available green spaces (Mullin *et al*., 2018), which has consequences for environmental and social justice, including climate justice (Schlosberg, 2013).

Climate regulation is one of the ecosystem services that has received much attention from researchers, community organisations, industry and governmental decision-makers (Agyeman *et al*., 2016; Jennings *et al*., 2016a; Kabisch *et al*., 2016). Between 2015 and 2019, 208 papers were published about green spaces, air quality, heat islands and the built environment in Europe. The vast majority of those (190) were on urban environments. Only five were on rural landscapes, with another 11 on rural–urban gradients and two not specifying a type of landscape or land use. While trees and other green space features directly contribute to human health and wellbeing, another benefit of green space is that it facilitates social cohesion, often through community gardens, organisations or allotments (Soga *et al*., 2017). In a review of 60 papers published on green space, ecosystem services and social cohesion since 2015, 50 were based in urban areas and nine included urban and peri-urban locations with some rural aspects (Garcia-Llorente *et al*., 2016). Only one study was carried out in a rural location (Garcia-Llorente *et al*., 2015). In literature on social cohesion in rural areas, much of the focus has been on digital services (Roberts *et al*., 2017), social entrepreneurs (Mottiar *et al*., 2018) and rural resilience (Knickel *et al*., 2018).

2.4.3 Gap analysis of research on green spaces, health and lifespan

Proximity to or views of green space have been linked to better birth outcomes (Markevych *et al*., 2017; Nieuwenhuijsen *et al*., 2017). A systematic review and meta-analysis of residential environment and birth weight outcomes in the USA demonstrated an association between disadvantaged neighbourhoods and higher risk of pre-term birth and low birth weight (Ncube *et al*., 2016). Of 15 papers reviewed in detail, while none highlighted the potential of green space as a beneficial factor, only three referred to the urban–rural gradient, and none referred to birth outcomes in rural areas alone. In other studies on birth outcomes in urban environments, research has shown that higher birth weight is associated with increasing amounts of green space in close proximity to home (Spain, Dadvand *et al*., 2014; Vancouver, Hystad *et al*., 2014), but a systematic review (Kabisch, 2019) indicated that socio-economic status had a greater impact on birth outcomes. Some studies suggest that greenness may moderate the impact of deprivation (Kabisch, 2019). A recent study of six European cities (Tamayo-Uria *et al*., 2019) considered multiple exposures, including land use, air quality, and proximity to (100 m, 300 m, 500 m) and features of green spaces such as trees, but no rural areas were considered. While 11 papers describe relative greenness (Dzhambov *et al*., 2014; Triguero-Mas *et al*., 2015; Ebisu *et al*., 2016; Nieuwenhuijsen *et al*., 2019), or proximity to trees (Dadvand *et al*., 2014; Abelt and McLafferty, 2017), or describe the nearest green spaces (Tamayo-Uria *et al*., 2019), using proximity measures in urban areas, none provide a comparison with rural areas, or a rural–urban gradient. Residential factors, socio-economic status and level of education appear to play a role in healthy birth outcomes (e.g. New Zealand, Nichani *et al*., 2017). Of recent studies that did look at birth outcomes and green space on a rural–urban gradient, a Californian study suggested that urban residential greenness

benefits air quality and healthier birth weight outcomes but acknowledged that only one-tenth of the population were from rural areas (Laurent *et al*., 2019). Other findings, on the other hand, are inconclusive (New Zealand, Nichani *et al*., 2017; UK, Twohig-Bennet and Jones, 2018). Few studies looked at birth weight, green space and time spent in green spaces and, of those, fewer again differentiated between diverse green spaces, with structural diversity and abundant wildlife. Despite recommendations from medical and health researchers, there are, to date, no studies on attitudes to nature, use of green spaces and birth weight (Dzhambov *et al*., 2014), although there are regular assessments of attitudes to biodiversity taken across the EU (EC, 2015b).

Studies worldwide have followed children as they grow up, but few have had the opportunity to carry out comparisons of environmental factors in urban and rural areas. For example, in New Zealand, 96% of pregnant mothers reside in urban areas (Morton *et al*., 2015) and, in Denmark, most people live within 25 km of a city with at least 30,000 inhabitants and with a psychiatric hospital (Engemann *et al*., 2019). A large-scale Danish study into children's mental health risks and the presence of green space included rural and urban populations and investigated all children born between 1985 and 2003 who were still living in the same place 10 years later (Pedersen, 2015; Engemann *et al*., 2019). The findings showed that mental health risks were higher for children with a prolonged presence in urban environments (Engemann *et al*., 2019). Satellite images were used to determine the extent of green space around people's homes; this appears to demonstrate the benefits of the long-term presence of natural rather than built environments (Engemann *et al*., 2019), although it would be useful to include perceptions of green space (Cleary *et al*., 2019). Although the study did not go into detail on the levels of vegetation changes with urbanisation, the authors stated that more dense vegetation levels were associated with rural areas, which they linked to lower risks of mental health conditions, with vegetation levels becoming more sparse in more urbanised areas and the risks of poor mental health being higher (Engemann *et al*., 2019). Other European studies seem to support this relationship, e.g. the Phenotype project (Preuß *et al*., 2019). The Phenotype project drew participants from four European cities, with no participants from rural areas. Adults who as children had experienced greater exposure to more natural areas had better mental health than adults who had had less exposure to natural environments.

Children's health and wellbeing in relation to their proximity to green spaces has also been reviewed (e.g. Markevych *et al*., 2014). In Munich and surrounding areas, children who lived within 500 m of green space were less likely to have behavioural/inattention issues than those living farther away. In particular, the lack of access to green spaces was associated with hyperactivity/inattention in 10-year-old boys. However, there was no comparison with children aged 10 years in rural areas, who would live closer to green spaces. A key question is whether living closer to green spaces also means having greater access to and use of green spaces. Spending about 2 hours a week in nature has recently been recommended as a "nature dose" (White *et al*., 2019) but this may be possible only if spaces are available and accessible. This can be achieved if planners take account of older people's needs (Finlay *et al*., 2015) and consider subjective perceptions (Cleary *et al*., 2019), although neither study focused on rural populations.

In a systematic review of health and green space, van den Berg *et al*. (2015) identified moderate evidence of a relationship between the quantity and the quality of green spaces and perceived general health, noting knowledge gaps relating to features of green spaces. A Korean study demonstrated physical and psychological health benefits when urban men spent time in rural environments, linking outcomes to air quality and green space features (Lee *et al*., 2015). In a global review of 28 studies on built environments and physical activity (Smith *et al*., 2017), all but one took place in urban areas. The reviewers considered access to and features of recreational spaces and included different intensities of exercise, such as "recreational walking, habitual physical activity, moderate-to-vigorous physical activity". Several systematic reviews have examined the relationship between green space and physical activity in the USA (Lachowycz and Jones, 2011) and in Australia (Astell-Burt *et al*., 2014a). Some studies indicate positive benefits to physical health, but the results are not consistent, possibly owing to the variation in green space quality and features (Lachowycz and Jones, 2011).

Greener spaces have been associated with better mental health throughout the lifespan (van den Berg

et al., 2015), but results have been mixed (Gascon *et al*., 2015; van den Berg *et al*., 2015). A systematic review of 28 studies confirmed the relationship between surrounding greenness and mental health in adults but stated it was limited (Gascon *et al*., 2015). Of the 28 studies in this systematic review, only one was undertaken in a rural area. Most of the research on green spaces and mental health and wellbeing has been carried out in the Netherlands, the UK and Australia (van den Berg *et al*., 2015). In the Netherlands, for example, the rate of anti-depressant prescriptions declined in areas that were associated with a good availability of green spaces (Helbich *et al*., 2018). In Bradford, pregnant women with green space access within 100 m of their homes were less depressed than those without this resource, but there was no comparison with pregnant women in rural northern England (McEachan *et al*., 2016).

While systematic reviews have considered how older people engage with the natural world (Orr *et al*., 2016) or spend time outdoors (Levasseur *et al*., 2015; Orr *et al*., 2016; Levy-Storms *et al*., 2017; Wen *et al*., 2018), the paucity of research on older people in rural areas has been highlighted by van Cauwenberg *et al*. (2015). In one systematic review, 27 studies were included that examined the relationship that older people had with nature, with one that dealt with older people in rural areas (Orr *et al*., 2015). Focusing on parks specifically, another systematic review of 48 studies included only one study that solely addressed the needs of older people in rural areas (Levy-Storms *et al*., 2017). Another systematic review of 44 studies on green spaces and older people stated that most studies focused on urban parks, recreational activities and older people (Wen *et al*., 2018). A subset of 23 publications focusing on older people and green space revealed that 16 were related to urban settings, while seven included urban and rural aspects. A study in nine urban areas throughout the UK found that the uses and benefits of green space differed from an age and gender perspective (Astell-Burt *et al*., 2014b), but there seems to be no corresponding study of older people in rural areas. Proximity appears to be a factor in several reviews, with potential implications for people living in rural or semi-rural areas. In fact, the need to drive or to have access to a car was one point highlighted by rural (Orr *et al*., 2015) and semi-rural (Milton *et al*., 2015) participants. As people are living longer, research needs to take account of ageing and elderly men and women living in different rural areas from a quality-of-life perspective, and to fill in the gaps from a social justice and sustainable lens.

2.4.5 Reasons for the focus on urban areas

Much of the existing knowledge is based on research undertaken in urban areas (Dzhambov and Dimitrova, 2014; Wolch *et al*., 2014; Kabisch *et al*., 2015; Kondo *et al*., 2018; WHO, 2019b). Urbanisation is one of the main drivers of landscape change (Plieninger *et al*., 2016). More people now live in urban areas (Nieuwenhuijsen, 2016), and, under most economic scenarios, urban areas are projected to expand in size (Terama *et al*., 2017). Urbanisation is the process by which a rural area becomes an urban one (Kuemmerle *et al*., 2016). In their review of urban woodlands, Miller *et al*. (2015) point out that human history has been characterised as a slow yet accelerating shift from rural to urban areas, with both positive and negative consequences; urban areas now hold 54% of the global population and are projected to grow to 66% by 2050 (2.5 billion extra people) (UN, 2014). This projection holds for most EU countries, but, while more than half of the OECD population lives in urban areas, the urban experience differs in each country (OECD and EC, 2020). The application of the term “urban” varies greatly between different countries, referring to cities, towns, villages, conurbations or localities (Buettner, 2015; OECD/EC, 2020). In addition, “territories in between” now exist that comprise almost 25% of Europe’s population (Russo *et al*., 2017); in these “territories” the character of the area and the perceptions of residents feel neither urban nor rural (Wandl *et al*., 2014). In Ireland, a greater proportion of the population (between 31% and 57%) lives in rural areas, compared with 27% of the European population, but a similar pattern of urbanisation is emerging (CSO, 2016a,b, 2019; OECD, 2018). Recent reports show that the proportion of the Irish population living in highly rural/remote areas has declined, coupled with an increasing population in all other areas, with the greatest increases in independent urban towns such as Drogheda or Wexford (CSO, 2016b). In 2016, the Central Statistics Office carried out population projections to 2030 that show that between one-third and two-thirds of growth will occur in the Greater Dublin Area and the east of the country (CSO, 2016a). Under some scenarios, population increases occur in all regions, but, in some situations, population

declines are projected in the west of Ireland and in the border region. By 2040, the national population will have grown by 1 million people. The National Planning Framework 2040 highlights the need to plan and act, as, without any checks, this growth will take place in the east and in the Greater Dublin Area. The plan allocates 250,000 people to Dublin, with another 250,000 intended across Cork, Limerick, Galway and Waterford, and the remaining 500,000 spread across key urban towns (Government of Ireland, 2018b). Even with the checks outlined by the National Planning Framework, there is still concern about social isolation and a lack of social cohesion among rural communities in Ireland (Royal Irish Academy and Dundalk Institute of Technology, 2019). A stakeholder event recognised that there are positive and negative elements of many of the factors that influence cohesion, among which is care for the environment. At this event, stakeholders acknowledged that environmental campaigns can unify communities but they associated negative perceptions with (1) abandoned, unused or neglected buildings and land and (2) the impact of complying with environmental legislation for small farmers/businesses (Royal Irish Academy and Dundalk Institute of Technology, 2019).

Urban areas reflect growing numbers of people in a much more modified and built environment. They have been described as "complex socio-ecological systems" (Baró *et al*., 2017) with multiple exposures, underlying pathways and determinants (Nieuwenhuijsen *et al*., 2017). Urban areas have rarely developed because of an integrated, multidisciplinary cohesive plan. As a result, they are often not well served by ecosystem services, are often associated with poorer air quality (WHO, 2013) and greater noise (Mueller *et al*., 2018; Dreger *et al*., 2019) and are more vulnerable to a changing climate (Kabisch and van den Bosch, 2017), and inhabitants generally tend to have poorer health and wellbeing (Gruebner *et al*., 2017). There is a social justice element in terms of social and environmental inequality, the demand on resources and need for services (Schüle *et al*., 2019), as urban areas require complex decision-making regarding their future sustainability (Summers *et al*., 2014).

In Ireland, proposed actions under the National Planning Framework reference the intrinsic value of our built, cultural and natural heritage in defining the character of urban and rural areas (Government of Ireland, 2018b). Emerging new spaces on the edge of urban and rural areas have already taken a dynamic approach. One example of this is Clonburris in South County Dublin, which is committed to the overarching principle "to deliver a network of high quality green and blue infrastructure spaces and public parks while protecting, enhancing and sensitively upgrading the natural, built and cultural assets of Clonburris lands" (Clonburris, 2019). This is described in terms of multifunctional urban, peri-urban and rural spaces, is related to ecosystem services, and emphasises the need to create, enhance and protect green and blue spaces. The planning document outlines that 30% of the sustainable development zone will be a "network of parks, open spaces, hedgerows, grasslands, protected areas, rivers and streams for amenity and recreation, biodiversity protection, flood management and adaptation to climate change", and that these features form the landscape and add to the appeal of the area.

Global projections indicate the development of more urban areas, which will continue to grow and scale (Roseland and Spiliotopoulou, 2016), but, as this happens, some areas will become depopulated. The focus on urban environments overshadows the needs of people living in depopulated areas. In a systematic review of 125 studies on rural populations in the USA, Australia and Canada (Gessert *et al*., 2015), only 34 included an interpretation of health from a rural perspective: that of being able to contribute to society and to be self-reliant. While few studies directly compared urban and rural definitions of health, six of those 34 studies included an urban comparison group. Most respondents in the studies were aged 60 years or older, although at least one study included people aged 40 years or older. Often, being healthy in rural settings was closely associated with being able and continuing to work. The ability to contribute to community relationships was also linked with health. As farming practices framed most of the work carried out by the participants within the studies, this suggests that many participants may have felt very close to nature and the environment, but this engagement was not explicitly referenced or considered in any of the studies and should be an important aspect of future work. Some studies, although not all, indicated a reluctance in people in rural areas to seek help, which was not reflected in any of the comparisons with people in urban areas.

In addition, people travel between rural and urban areas for work and rest and for social reasons. The

ambiguity about what constitutes urban suggests that the current emphasis on urban areas is less helpful for the ways in which people now live their lives. In addition to changing and migrating populations, there are also varying levels of biodiversity and vegetation. As urban areas grow, vegetation is replaced with built surfaces. Some semi-natural areas may become enclosed by development and thus become urban green spaces. This means that habitats become fragmented or lost with each new development. While the proximity of green spaces is a useful construct as it can provide a measurement of protection against air pollution, noise and heat within urban areas, there are additional benefits of green spaces that are associated with time spent within them playing or socialising, exercising or relaxing and destressing or problem solving (Carlin *et al*., 2016) and how these spaces are perceived (Cleary *et al*., 2019). A crucial factor in urban green spaces is that they are often open to the public and accessible. This is less likely to be the case in rural areas, where much land is owned privately and there is no legislation to provide access (as is the case in Ireland). This gap indicates a different aspect of environmental justice (Schlosberg, 2013).

In thinking about how and where people live, work and rest, decision-makers and delivery organisations should relate cultural and other ecosystem services to inter-, intra- and multi-sectoral decision-making in health, planning, development and environment to ensure equal access to environmental resources and sharing of environmental burdens along a rural–urban gradient (Dennis and James, 2017). Using the SDGs can help refocus awareness and decision-making on the fact that the environment, dynamic and functioning, is what supports society, development and the economy. A useful tool for communities has been developed by the US Environmental Protection Agency (Bolgrien *et al*., 2018). Decision-makers must, however, also take on board that there will be competition for access to resources and ecosystem services (Andersson *et al*., 2019).

Second, the sustainable use and protection of green spaces must integrate ecological functioning with human experiences in urban and rural areas. Accessibility and convenience are important factors in people's commitment to physical activity (Dallimer *et al*., 2014; Zhang and Tan, 2019), confirmed by SHEER (Socioeconomic Health and Environmental Research), a research project that examined the relationship between water quality and access to and use of blue/green spaces in Ireland. The findings of this project indicated that time and commitment to home activities were the greatest barriers to enhanced use of outdoor spaces (Domegan *et al*., 2020). Enhancing green space features in recreational spaces and connecting them with accessible, attractive walking routes and cycle paths will promote use (Smith *et al*., 2017) but will not fully succeed without including a community aspect (Cronin-de Chavez *et al*., 2019). A multifaceted approach can persuade individuals to prioritise time and activities in outdoor space, including better work–life balance supports, and empowerment (Roseland and Spiliotopoulou, 2016; Cronin-de Chavez *et al*., 2019). The value of providing social supports, connecting communities, raising awareness and co-creating NBAs is a research gap that has not fully been assessed (Cronin-de Chavez *et al*., 2019). The NEAR Health research aims to address some of these knowledge gaps.

2.4.6 Conclusions

This scoping review sets out the current state of knowledge with respect to green spaces and urban and rural areas and health and wellbeing. While there is evidence of health disparities from a rural–urban perspective, the same focus has not been applied to rural needs and ecosystem services. Health and wellbeing benefits and burdens from a rural environment rarely receive the research focus that urban areas receive. Given the focus on urban areas, there are gaps in our knowledge of the situation in rural areas, which means that the needs of people in rural areas may be overlooked in policymaking and decision-making. Few studies have addressed perceptions in both urban and rural or transitional populations such as that in Ireland. One of the first objectives of the NEAR Health project was to determine what people value in relation to nature, blue and green spaces and their health and wellbeing.

3 Values and Perceptions of, Motivations for, and Barriers to Using Nature for Health and Wellbeing

3.1 Introduction

There is a lack of information on how people value elements of nature in relation to their health and wellbeing and what it is that motivates individuals and communities to engage, and prevents them from engaging, with open blue and green spaces for their health and wellbeing (Boyd *et al*., 2018; Davies *et al*, 2019; Pitt, 2019). Yet this information is vital if we are to provide appropriate and accessible spaces for all those who want to engage with nature. It is very likely that there are significant differences between different individuals and between communities in terms of how they perceive the natural environment and what they perceive to be of benefit to their health and wellbeing (Cleary *et al*., 2019). Different individuals also have different needs in terms of access to and facilities in blue and green spaces (Masterton *et al*., 2020). To investigate these differences and respond to the expected diversity of needs and perceptions to ultimately ensure that natural spaces meet the needs of as many individuals and communities as possible, people's perceptions need to be explored further. A particular focus should be on those who are not yet fully using blue and green spaces to determine how and why they are not yet engaging with natural spaces, explore their particular needs and determine how they can be enabled to engage with such spaces. This chapter aims to investigate what the values of and motivations for using natural blue and green spaces for health and wellbeing are, and to determine the barriers to such engagement and how these can be overcome.

3.2 Methodology

Q methodology, following Visser *et al*. (2007), was used to gain insights into the value of engaging with natural spaces and to determine what barriers to using such spaces exist and how such barriers could be overcome. Q methodology was originally developed to reveal the degree of subjectivity involved in any given situation and combines both qualitative and quantitative research methods, providing insights into attitudes while also affording statistical rigour (McKeown and Thomas, 1988; Brown, 1996; Addams and Proops, 2000; Ellis *et al*., 2007). Following the methodology outlined in Kindermann and Gormally (2013), five steps were carried out in this study:

1. *Theme and stakeholder identification*. In this study the values of natural blue and green spaces, the barriers to their use and ways of enabling engagement with such spaces were identified as the relevant themes to be explored. To investigate this, stakeholder types relevant to the themes were identified. The following stakeholders were selected to be representative of all types of users of blue and/or green spaces (Figure 3.1):
   - Actively engaged blue/green space user: engages in activities in blue and green spaces, either on their own or with others. This includes both those physically active, e.g. those who exercise, and those not physically active, i.e. those involved in passive engagement such as sitting on a bench watching nature or painting.
   - Potential blue/green space user: does not currently engage in any activities in blue and green spaces, i.e. does not engage in physically active or passive activities in blue and green spaces.
   - Promoter: promotes the use of blue and green spaces in general or specifically for health and wellbeing, or promotes conservation activities.
   - Provider: designs and/or provides/maintains blue and green spaces and/or organises events in these spaces.
   - Educator: involved in formal or informal education about blue and green spaces and/or the use of such spaces for health and wellbeing.
   - Health practitioner: involved in mental and/or physical health, from both the public and the private sectors.
   - Decision/policy influencer: provides advice, influences the decision-making process and influences policies and practice.
   - Decision-maker/policymaker: makes decisions and signs off on policies relating to green and blue spaces.

Figure 3.1. NEAR Health stakeholders.

2. *Statement collection*. To explore what nature and health mean in everyday lives and how people perceive the links between nature and their own health and wellbeing, a diverse mix of stakeholders was interviewed. In total, 98 stakeholders were interviewed to gather statements.

3. *Statement selection*. The advantage of Q-methodology statements is that they are framed in everyday language and therefore embed awareness and ownership on the stakeholders. From the interviews an initial 1006 statements were selected, from which 60 statements were finally chosen to represent the full range of opinions regarding the values of natural blue and green spaces, the barriers to their use and ways of enabling engagement with such spaces.

4. *Q-sort*. After an initial Q-sort trial, the 60 selected statements were amended and the total statement number was reduced to 50 statements. These statements were then used in the final Q-sort, where participants were asked to rank the remaining statements according to their own opinion along a seven-point scale ranging from "most strongly agree" (+3) to "most strongly disagree" (–3), with 0 representing "neutral/ do not know". This involved 45 stakeholders, including active and potential blue/green space users, promoters, providers, educators, decision/ policy influencers and decision-makers and policymakers. The Q-sorts were carried using Q-sorTouch (www.qsortouch.com). The final rankings were recorded and participants were asked to elaborate on their statement ratings to help interpret the results and for use in the discussion.

5. *Analysis*. Principal components analysis (PCA) was then carried out on the results using Minitab (version 19). The resulting correlation matrix indicated the similarities between the different Q-sorts. Following this the scores for each individual statement were analysed and stakeholder results were grouped to compare (1) stakeholder groups with each other and (2) urban versus rural stakeholders. This analysis was carried out using the Mann–Whitney *U*-test on non-transformed ratings.

3.3 Results

The initial results from the Q-sort analysis can be divided into three broad categories: values of nature, barriers to engagement with nature and bridges to overcoming barriers to engagement.

3.3.1 Values of nature

There were nine statements relating to recognised values of nature and access to nature that all stakeholders agreed with to a greater or lesser extent (Figure 3.2). The highest level of agreement was with the statement that "nature should be accessible to everyone", with an average score of +2.7, which was followed by the recognition of the value of nature for both physical and mental health ("not being able to go outside affects my mood and wellbeing", with an average score of +2.4, and "being outside improves my physical health", with an average score of +2.3). Mixed responses were received for "nature is accessible to everyone" (+0.8 average score) and "I spend enough time outdoors and in nature", which had a negative average score (–0.03).

3.3.2 Barriers to engagement with nature

There were four statements relating to recognised barriers to engagement with nature that all stakeholders agreed with to a greater or lesser extent (Figure 3.3). The highest level of common agreement was with the statement "when there is litter everywhere or facilities are neglected, that can turn people off" (average score +2.2), followed by "people's perceptions hold them back – they think they cannot go out because it is raining or outdoor exercise is only for fit people" (+2.1), "people have become disconnected from nature" (+1.8) and "a lack of understanding what nature is can stop people from engaging with it" (+1.7). Two barriers that most stakeholders disagreed with are "we do have enough events that show different ways of engaging with nature" and "in Ireland, we do cater for people with physical disabilities who want to access nature". Further barrier statements that, on average, stakeholders agreed with relate, among other things, to dangers in nature, lack of access and lack of time.

3.3.3 Bridges to engagement with nature

There were four statements relating to recognised bridges to engagement with nature that all stakeholders agreed with to a greater or lesser extent (Figure 3.4). The highest level of agreement was with "by showing people what nature is around them they are more likely to want to keep it", with an average score of +2. There was agreement with "if outdoor spaces are easy to access, people will use them more" (+1.8), "awareness of the benefits for health from nature encourages people to go outdoors" (+1.8) and "community events are key to engaging people in nature" (+1.6). Further statements that, on average, stakeholders agreed with relate to the need to encourage children to engage with the outdoors, and having group leaders and peer support.

3.3.4 Actively engaged blue/green space users and potential blue/green space users

The results from the PCA divide the Q-scores into distinct groups, differentiating roughly between different categories of blue/green space users. The most prominent separation was between actively

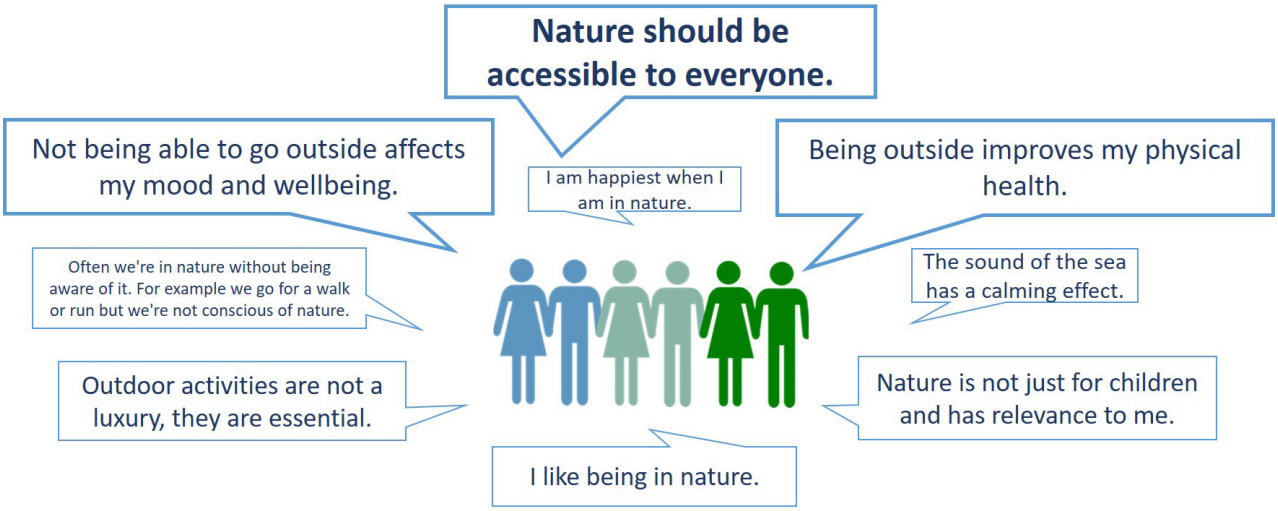

Figure 3.2. Agreed values of nature and access to nature based on the average Q-sort scores from all stakeholders.

Figure 3.3. Recognised barriers to engagement with nature based on the average Q-sort scores from all stakeholders.

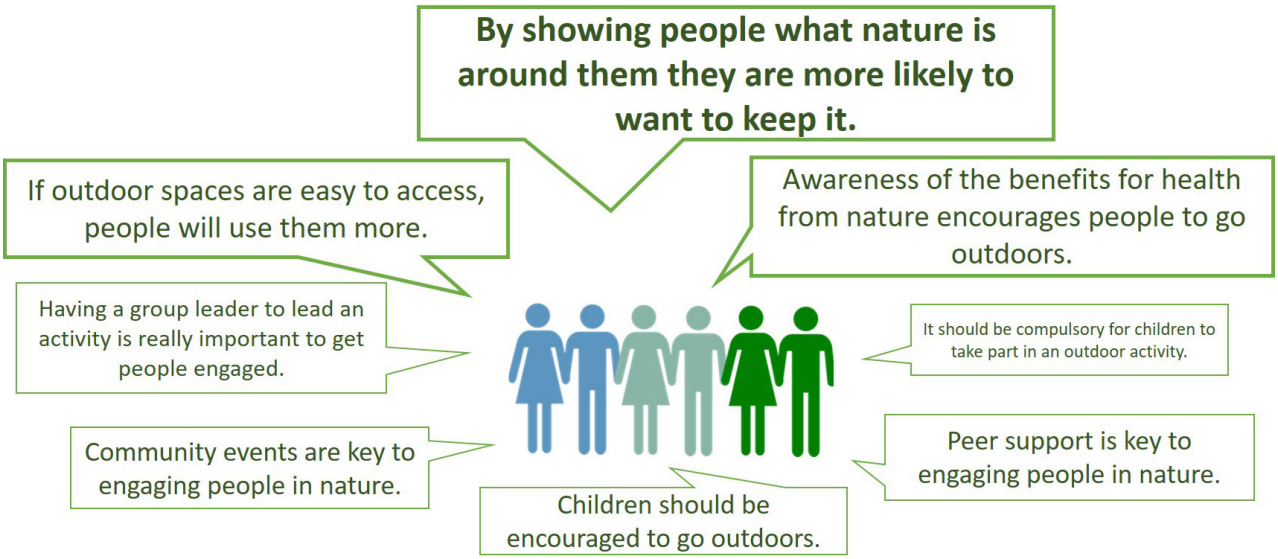

Figure 3.4. Recognised bridges to engagement with nature based on the average Q-sort scores from all stakeholders.

engaged blue/green space users and potential blue/ green space users. Statistically significant differences between potential and actively engaged users were observed for statements relating to being in nature and being happy outside, knowing how to incorporate nature into their daily lives, nature engagement being natural to them and outdoor activities being viewed as a luxury (Figure 3.5). Statements that showed non-significant differences between overall scores, with scores differing between positive and negative, related to feeling safe in nature and things to do in nature.

3.3.5 Urban and rural stakeholders

An investigation of the potential differences between urban and rural stakeholders showed no statistically significant differences between statement scores; however, there were three statements for which there were opposing scores (Figure 3.6). These statements related to the amount of time spent outdoors, people wanting to be indoors and the engagement we offer to older people.

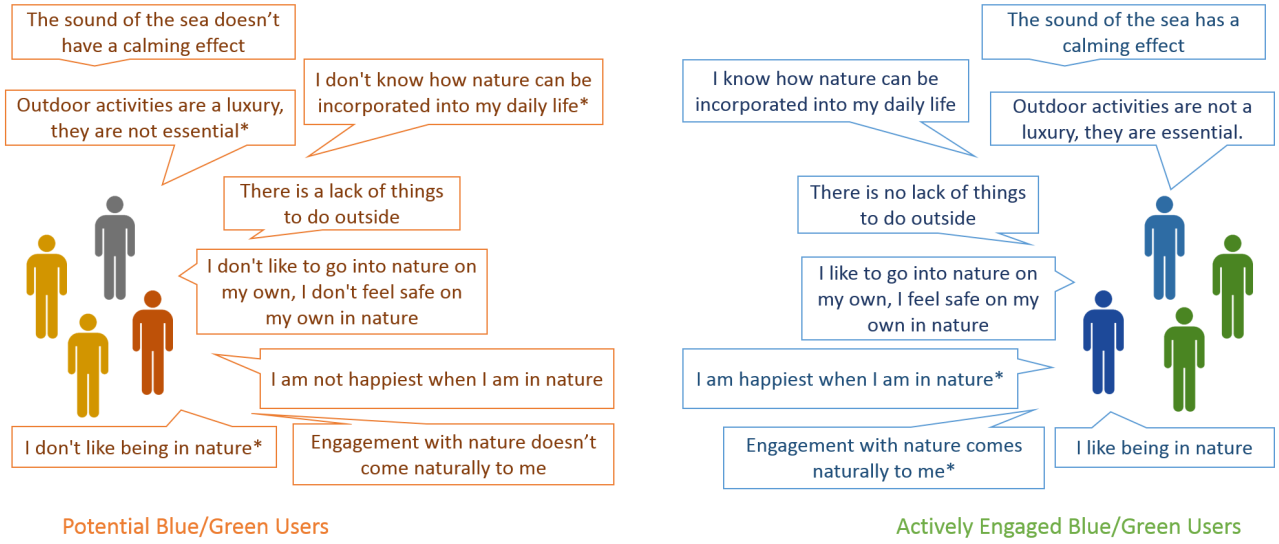

Figure 3.5. Differences in responses between potential blue/green space users and actively engaged blue/green space users (*denotes statistically significant differences).

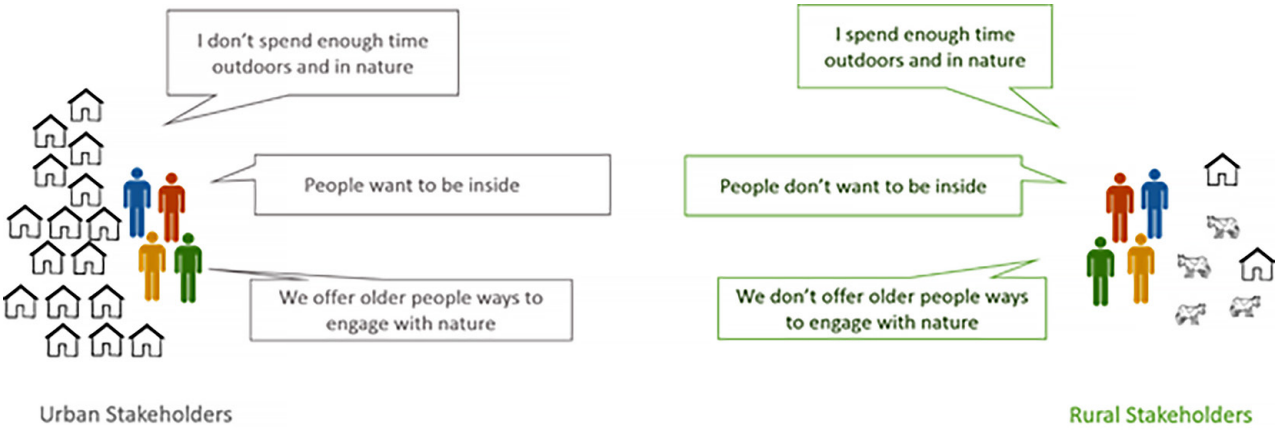

Figure 3.6. Differences in responses between urban and rural stakeholders.

3.4 Discussion

While there is overall acknowledgement of the value of nature and the environment for human health and wellbeing, there are also recognised barriers that prevent people from engaging with blue and green spaces in Ireland. Being able to explain and explore meanings of nature and its values, together with increased accessibility to blue and green spaces, can be effective ways to overcome the identified barriers.

Agreement among all stakeholders was found on issues such as recognised overall values of nature; however, there were significant differences between active and potential users, and the scores for some statements indicated a difference in perceptions between urban and rural stakeholders.

3.4.1 Values and barriers

By asking what the values and motivations to engage with nature for health and wellbeing are, stakeholders helped build a very clear overview of how they felt about nature and what they valued about it. Stakeholders recognised that participation and engagement in outdoor activities and spaces delivers physical and mental health and wellbeing benefits. In the Q-sort comments, these benefits were often cited as reasons for engaging with blue and green spaces, and the recognition of these benefits motivates individuals to continue using outdoor spaces. When the value of these spaces is recognised, individuals, groups and communities use these spaces more. Research shows that, if relevant local authorities, policymakers, health promoters, etc. also recognise

these values and appreciate the benefits of outdoor spaces for their users, such spaces are invested in, increasing the amount and quality of these spaces (Carlin *et al*., 2016; Domegan *et al*., 2020). This in turn increases access to and use of blue and green spaces, further promoting health and wellbeing.

Stakeholder recognition of the need to invest in blue and green spaces is evident in the very high ranking for “nature should be accessible to everyone” versus the low ranking for “nature is accessible to everyone”. This indicates that stakeholders recognise barriers to engagement for some, and that nature is not yet accessible to everyone. Nature should be accessible for all, but certain groups are often excluded, such as those with disabilities or older people, as evidenced by the scores for relevant statements. Increased accessibility for such groups is required, which can be addressed by investment in suitable facilities.

The need for investment in facilities and spaces is further emphasised in the recognition by stakeholders that, where facilities are provided, there is a requirement for these to be maintained, as otherwise they are not seen as a tool to facilitate access, but rather as a further barrier. Stakeholders very strongly agreed that littered/polluted or degraded environments and/or facilities are some of the main barriers to engaging with nature. This echoes the perspective of rural stakeholders in Ireland who associated abandoned/neglected/disused land and buildings with a lack of care for the environment (Royal Irish Academy and Dundalk Institute of Technology, 2019). The strong recognition of these major barriers to connecting with nature for health and wellbeing show that the investment in and maintenance of the quality of blue and green spaces is essential. The adoption of “leave no trace” principles (www.leavenotraceireland.org) can serve to reduce people’s impact on the environment and promotes a sense of stewardship and appreciation for the natural world. The promotion of these principles, together with investment in facilities, can be an enabler to engaging with nature for health and wellbeing.

There is a recognition that perceived and actual lack of time limits the use of outdoor spaces, and the less an outdoor space is used, the less time is made for its use in our daily lives. Weather conditions can also be perceived as adverse, which can limit the use of outdoor spaces. When different users are restricted in their use of outdoor spaces, user perceptions of adverse weather constraints increase, further decreasing engagement with nature and the outdoors.

Stakeholders note a prevalent disconnection from nature and, for some, nature is a place of fear or risk, decreasing nature engagement. There is also a lack of understanding of what nature is and how to engage with it. Technology is seen by some as playing a role in this disconnect; however, others recognise the opportunities for social and community participation and shared experiences that technology offers. These promote engagement, social and community interactions, networking, and social and community cohesion.

3.4.2 Actively engaged blue/green space users and potential blue/green space users

The statement rankings show differences in how non-users and users perceive blue and green spaces and engagement with them. Responses show that non-users do not like being in nature and that engagement with nature does not come naturally to them; hence, incorporating nature into their daily lives is not easy. This is likely to be related to their lack of use of such spaces, making them non-users in the first place. These perceptions probably also contribute to the attitude of non-users that outdoor activities are not essential, as they are not something that is part of their own daily lives, and that there is a lack of things to do outside.

The happiness that active users associate with being in nature, liking being in nature and the perceived calming effect of the sea are not perceived in the same way by non-users of blue and green spaces. It is likely that the sense of safety influences these. Blue spaces can be associated with danger (Foley *et al*., 2019) and related sounds may hence not have a calming effect. The perceived lack of safety in blue and green spaces by non-users is a recognised barrier to the use of such spaces, which diminishes the health and wellbeing benefits these spaces can provide (Jones *et al*., 2009; Pitt, 2019; Williams *et al*., 2020).

Recognising and addressing all of the barriers that prevent current non-users, who would be potential active users, from engaging with blue and green outdoor spaces is essential if we are to engage them

with such spaces for their health and wellbeing. Forthcoming research on structural barriers to blue and green spaces aims to address their accessibility in the context of mental and physical health (Nejade *et al*., 2020).

3.4.3 Urban and rural stakeholders

The results indicate that there are no considerable differences between urban and rural stakeholders, as there is common dis/agreement from urban and rural stakeholders on all but three statements. However, three statements point towards possible differences in the perceived amount of time spent in nature, the desire to spend time indoors rather than outdoors and the differences in opportunities for engagement that are offered to older people in urban versus rural areas.

That urban stakeholders felt that they do not spend enough time in nature while rural stakeholders felt that they do may be linked to the perceived pace of life in urban areas or the recognition of what nature is and what it is valued for (Pan *et al*., 2016) or the relationship between rural roles and societal contribution (Gessert *et al*., 2015). A perceived lack of time was recognised across all stakeholder groups as a barrier to engagement with nature. When asked to define nature, the concept of it being something remote and a wilderness area, often outside the urban environment, was repeatedly expressed, indicating that it was seen as something that takes time to get to if you are in an urban area and, hence, not something that is frequently accessible. Here, recognising that there are different definitions of nature can be an enabler.

The perceived desire indicated by urban stakeholders to spend time indoors is likely to reflect the recognised disconnect that stakeholders noted overall between people in urban areas and nature (Colléony *et al*., 2019). Increased urbanisation is associated with a decrease in the frequency and amount of time spent in nature, leading to an increased disconnect from nature (Louv, 2005; Soga *et al*., 2016; Cox *et al*., 2018). There is a perception among rural stakeholders that insufficient forms of engagement are offered to older people. The literature review (Chapter 2) points to a general paucity of research on the engagement of older people with nature in rural areas, so it may well be the case that there are fewer opportunities for engagement with nature in rural areas for older age groups; however, further research is required (Husk *et al*., 2018). Levy-Storms *et al*. (2018) conclude that open spaces and physical activity in or near parks provide older adults with sources of recreation and also a means to sustain or improve their health and wellbeing. There seems to be an urban/rural divide in Ireland in relation to the availability of blue and green spaces (Domegan *et al*., 2020), which means that there may be negative implications for the health and wellbeing of older people living in rural areas, but more research on this is required.

3.5 Summary and Conclusion

Among policy, practice and academia there is increasing interest in the use of outdoor blue and green spaces to promote human health and wellbeing and there is ever-growing scientific evidence of a positive association between them. This chapter adds to this body of evidence as it reports an investigation of the values of and motivations for using natural blue and green spaces in Ireland for health and wellbeing and the barriers to such engagement. Stakeholders were asked how people could be engaged with blue and green spaces and how identified barriers could be overcome.

The findings show that there is clear recognition of the value of nature and the environment for human health and wellbeing; however, there are also several barriers to the use of blue and green spaces that respondents noted. There is evidence of a growing disconnect and detachment from natural blue and green spaces in Ireland as our ecosystems increasingly come under threat from human pressures. This is particularly evident among those not currently engaged with blue and green spaces. This disconnect from natural environments poses risks to human health and wellbeing.

The results showed that an understanding of nature and its values, together with increased accessibility, are effective ways to overcome the identified barriers. Opportunities for social and community participation, shared experiences and peer support were also identified as important ways to encourage engagement with blue and green spaces and promote health and wellbeing.

Understanding their values and perceptions is important in identifying what individuals and

communities want from nature and how this can benefit their health and wellbeing. To overcome the disconnect and lack of confidence, and to provide motivation for the use of blue and green outdoor spaces, engaging people through organised nature-based group activities can help. The following chapters build on this knowledge to address how some of these perceived barriers can be overcome to create bridges and enable engagement with blue and green natural spaces.

4 Healthy Future Spaces: What Do Communities Want from Their Nearby Environment in Terms of Health and Wellbeing?

4.1 Introduction

"Changing our behaviour is one of the greatest challenges we face in making the transition to a low carbon and resource efficient future. We are often unaware that many of our everyday activities damage the environment". So said Laura Burke, EPA Director, commenting on research published in 2017 showing that, in relation to sustainability, targeted actions and segmented approaches are needed to reach different sectors of the community (CONSENSUS II; Davies *et al*., 2017). Society in Ireland is living in, contributing to and attempting to find ways to minimise the biodiversity and climate crisis (e.g. in May 2019, the Irish government declared that there was a biodiversity and climate crisis; Government of Ireland, 2019a). For some, there is a feeling of helplessness as people bear witness to increasing evidence of climate change and no slowing down of the rate of biodiversity loss. Added to this there is a global call to act (UN SDGs), to change how people live their lives, "to ensure … no-one is left behind" (Weitz *et al*., 2019; Ganzleben and Kazmierczak, 2020).

Decision-makers in Ireland and throughout Europe need to reconsider their approach to achieving a healthy sustainable environment and healthy thriving communities (EEA, 2019). Linking health and environment is a radically different approach that builds on salutogenic principles (Sandifer *et al*., 2015; Bell *et al*., 2018; Reeves *et al*., 2019) in relation to a healthy integrated and sustained physical and social environment. A greater connection with the natural environment could instil greater awareness of biodiversity and lead to better protection of its natural resources, in the form of a virtuous cycle.

4.2 Context

Attempts to solve complex problems can involve scenario analysis techniques, where people map out different approaches to a changing and unpredictable future (Durham *et al*., 2014). Scenario storylines can present uncertain and complex relationships better than predictive techniques and they encourage people to think about how the world might develop (Kok *et al*., 2017). The two most frequently used scenario techniques are backcasting and forecasting (Kok *et al*., 2017); these have been employed in predictive biodiversity and ecosystem scenarios (Sitas *et al*., 2019) ranging from, for example, business as usual, to a world where resources are guarded as in a "fortress", to a world benefiting from climate and biodiversity policy reform (Kubiszewski *et al*., 2017). Although scenario storytelling techniques enable multiple stakeholders to synthesise large amounts of material to co-create "idealised" responses, they have also been criticised as being too simplified or subjective (Sitas *et al*., 2019). Clear communications regarding these challenges and providing greater opportunities to tailor scenarios at linked local and global scales could overcome some of the limitations (Kok *et al*., 2017; Sitas *et al*., 2019). Backcasting is an action-planning process that starts with an ideal future scenario and works backwards to see what actions need to take place in a particular time frame to solve a current problem and can incorporate tailored spatial scales (Sitas *et al*., 2019). It is the opposite of forecasting, which starts with the current issues and how things are now. A weakness of forecasting is that people tend to stay focused on the current issues, and this becomes a barrier to developing feasible solutions. The advantage of backcasting is that, because it starts in the future, those barriers are not the immediate focus, and it facilitates collaborative creativity and results in an actual action plan.

Participatory workshops have been used successfully when behavioural changes or transitions are required, for example sustainable consumption practices (Davies *et al*., 2014, 2017). Backcasting has been used around the world to create sustainable scenarios for heating (Doyle and Davies, 2013), food (Davies, 2014), water (Vojinović and Maksimović, 2019), energy (Kishita *et al*., 2017), mobility (Nogués *et al*., 2020)

and climate resilience (Hoolahan *et al*., 2019; Schröder *et al*., 2019; van der Voorn *et al*., 2020). Backcasting is very participative as it asks participants to visualise and share their ideal scenario with each other. It is democratic as participants can voice their wishes and listen to others and, through the co-creation of an action plan, decide how to mobilise the healthy future use of nature and the environment for health and wellbeing (Davies *et al*., 2012).

4.3 Workshops and Participants

Six interactive workshops were held in rural and urban locations, from Sligo to Cork in the west of Ireland. Participants whose role or experience could contribute to the creation and implementation of a healthy futures action plan were invited from all areas of society. In the case of healthy future spaces, this meant that stakeholders included representatives from community groups, public participation networks (PPNs), voluntary environmental and conservation organisations, non-governmental health organisations and charities, government agencies, recreational interest groups, educators, health professionals and local authorities. This diverse range of stakeholders (Figure 4.1) applied inclusive backcasting techniques to identify their ideal healthy future space.

4.4. Backcasting Process

Backcasting involves several steps: problem identification, visioning, evaluation (voting), timeline and action planning (Figure 4.2).

The first step, problem identification, was broadly the same for each workshop. During an open discussion, participants suggested that there were insufficient attractive spaces that are healthy, full of nature and widely accessible to communities. Participants articulated that access and the ability to wander in open, wide-ranging space in Ireland is not enshrined in legislation, policy and practice. Although the National Planning Framework will "facilitate a National Greenways, Blueways and Peatways Strategy" (National Policy Objective 22), safeguard "natural assets, upland and lakeland landscapes" (National Policy Objective 48), integrate planning for green infrastructure and ecosystem services into the preparation of statutory land use plans (National Policy Objective 58) and "protect and restore biodiversity in statutory development plans" (National Policy Objective 59), there is still no fully integrated health, nature and environment policy objective at local, community or national level to ensure that these spaces are created, maintained and promoted for biodiversity value and for people's health and

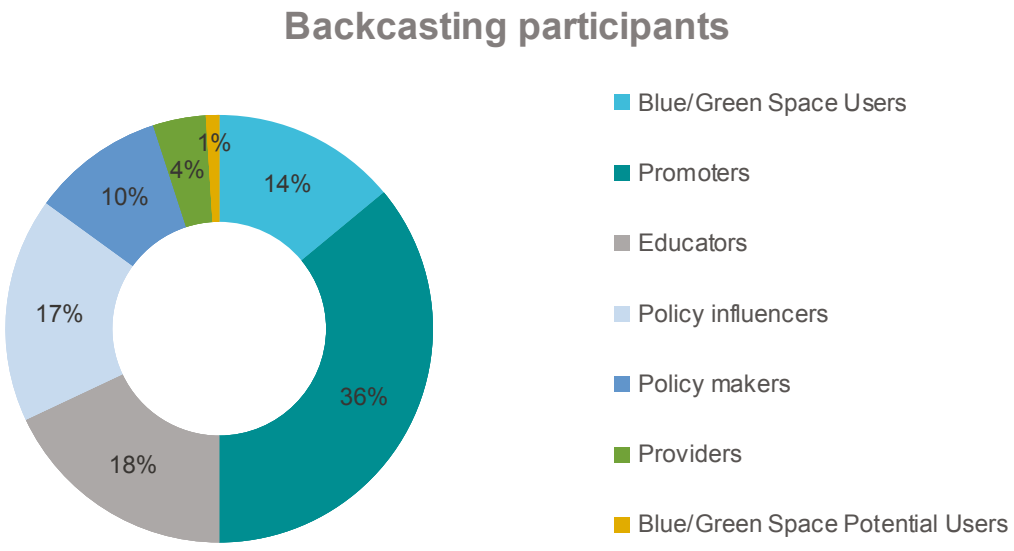

Figure 4.1. Percentage breakdown of NEAR Health backcasting participants by role (*n* = 112). Most participants were people whose role promoted access to and use of blue and green spaces or whose role involved education. Some participants fulfilled more than one role and so have been included in all relevant categories. In the following section the views, perceptions and actions are those of the participants, with the inclusion of supporting literature.

Figure 4.2. Summary of the backcasting process (represented by images from some of the workshops).

wellbeing. People living in an increasingly urbanised world perceive that there is a disconnect between how they live their lives and nature (Colléony *et al*., 2019). As a result, participants perceived that many people are not fully aware of the value of nature. Participants voiced concerns that this lack of connection means that not everyone can participate in decision-making regarding the use, management and conservation of nature. People can face physical and mental health issues in relation to the stresses of modern-day living, which may be influenced by a lack of engagement with nature. A lack of nature connection means that insufficient numbers of people are motivated to conserve nature. There is inadequate compliance with legislation to protect nature and the environment at local levels. This cycle maintains the "wicked problem" surrounding nature illiteracy, disconnectedness and poor conservation condition (Clayton *et al*., 2017; Klaniecki *et al*., 2018).

The participants were then asked to address the identified problems and create an action plan to deliver a desirable, healthy future. The healthy future comprises people who value nature, are aware of the nature connection as a driver of their health and wellbeing, and actively conserve nature (Hoolahan *et al*., 2019; Schröder *et al*., 2019; van der Voorn *et al*., 2020); land use/management decisions or planning take account of the value to human health and wellbeing by making space for nature as part of their day-to-day roles; and spaces are connected, multifunctional, full of nature and cherished (Prévot *et al*., 2018).

Participants discussed key actors who contribute to the problem and the solution. They acknowledged how important it is to ensure that all sectors and all ages establish, retain or enhance the connection to nature and promote it to others (Klaniecki *et al*., 2018). Every sector has the capacity to change, with participants noting that wellbeing roles are now included in engineering and architecture. When there are many stakeholders, participatory processes are crucial in decision-making around nature and outdoor spaces (Toomey *et al*., 2020).

The second step required participants to "time travel" into the future and use all their senses to visualise their ideal space (Myers, 2020). Participants wrote their visions down on Post-it notes, which they shared with their group. Within groups, they agreed on a common factor or theme that would best enable their collective ideas (visions) to come to fruition. This theme or factor was termed a "motivator" during the second workshop and was used in the remaining five workshops. Each group identified the most fitting motivator to enable their ideas to flourish. Some used a phrase to represent their ideas. These were shared with all participants at the workshop. Participants had time to reflect and consider the motivators before allocating their ideas to the most relevant motivator. In this way, participants co-created the scenarios of their healthy future space. The themes were reviewed by the workshop organisers, who grouped similar ideas and visions (e.g. cycleways/greenways, birdsong, water quality, no litter) within each motivator.

During the third step, participants familiarised themselves with the motivators and the features of their healthy future space. Participants used coloured stickers to identify the features they rated as most important for priority action. This was another modification, proposed by the participants. Usually backcasting requires participants to vote for features or scenarios based on appeal. At the first workshop it was evident that participants had not used all of the stickers to indicate scenarios that did not appeal to them. Participants struggled to allocate all of the voting stickers as they liked all ideas and were not comfortable with such a negative action. From the second workshop on, participants used the voting stickers to indicate priority actions.

The fourth step consisted of scenario review by each group. The groups confirmed the timeline for key events, decisions and features, and discussed strengths, weaknesses, opportunities and threats, barriers, enablers and actors. Participants then categorised the decisions and events into short-, medium- and long-term stages. Timelines were chosen by the participants and ranged from 10 to 20 years.

During the fifth and final step, participants identified the key actions and actors involved at each stage of the timeline and put this together to form an action plan. Some groups completed more of the action plan than others. Each group presented their action plan to the entire workshop; this was followed by a constructive and useful discussion. Most workshops recognised that much of what they need to create their healthy future is already there, and they have the potential to achieve their healthy future spaces.

4.5. Action Plan: The Vision for a Healthy Future Environment

Common visions of a healthy future emerged from all workshops. Participants desire a clean, unpolluted (and plastic-free) world, with healthy spaces and clean water. They hear nature more than man-made sounds (especially traffic noise). They note birdsong and an abundance of bees and other insects, as well as general biodiversity, and express it in terms of vitality, passion and relationships. Nature is cherished. People are physically and emotionally connected to these places and recognise that they are also part of nature. These places are welcoming and open to all ages and all abilities. They provide space for nature and space for dreams, learning, contemplation and action; space to be, to wander and to explore. Another essential aspect of the healthy visions was the desire to maintain environmental features, and that any future built or infrastructural development is sensitive, in balance with nature, and connected to the landscape (Prevot *et al*., 2018; Giusti and Samuelsson, 2020; Giusti *et al*., 2020).

There are strong linkages between the healthy future desired by backcasting participants in Chapter 4 and the values and bridges identified by NEAR Health stakeholders in Chapter 3. In Chapter 3, stakeholders agreed that nature *should* be accessible to everyone, but they did not perceive that this was the reality. They also agreed that being outside and spending time in nature, whether people were aware of the fact or not, benefited their health and wellbeing. This value supports the vision that participants had that nature is part of daily life and that people are part of nature. Stakeholders in Chapter 3 agreed that showing people what is around them makes them more likely to want to keep it. Awareness (linked to formal and informal learning) played a large part in the visions and was linked by participants to awakening and self-development. They recognised that this underpinned actions to conserve nature, but they also emphasised that it was important to conserve nature for health and wellbeing purposes. Stakeholders in Chapter 3 agreed that awareness of the benefits for health from nature encourages people to go outdoors. As identified in Chapter 3, people recognise that accessibility plays a large role in promoting use of outdoor spaces. This was reflected in the vision of welcoming accessible spaces, and was also linked with critical actions, as discussed further.

Some groups took the action planning stage further. At the start of each workshop, when the NEAR Health team talked about the features of the nearby environment, they specifically focused on physical features of shared open spaces. Workshop participants, however, often moved beyond that initial step to make connections with policies, actors, barriers and enablers at an early stage in the workshop. For some workshops, this meant that some participants delved deeper into the barriers (Figure 4.3, left-hand side) and the mechanisms to overcome them (Figure 4.3, right-hand side) to enact their healthy future.

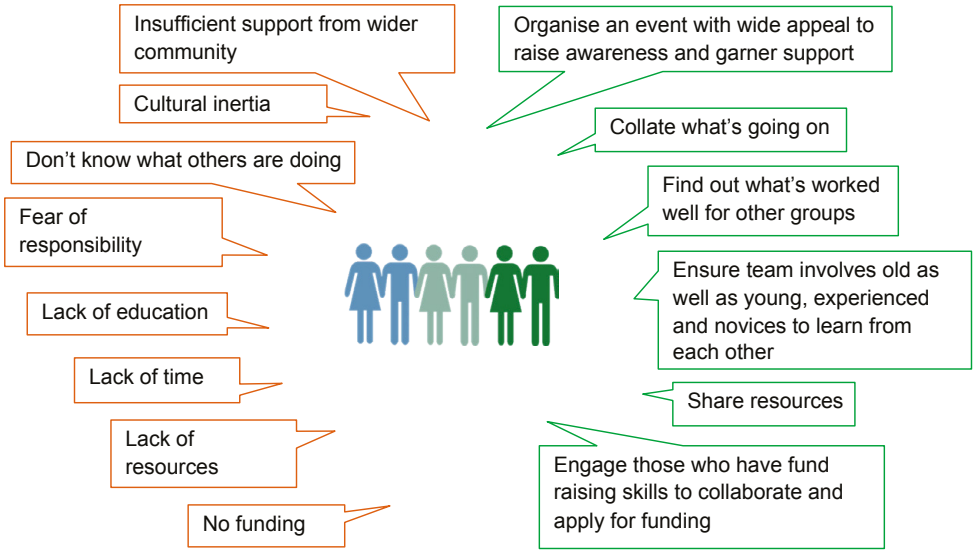

Figure 4.3. Barriers identified at workshops (left) with mechanisms and actions ("bridges") to overcome them (right) and achieve a healthy future space.

Critical motivators to deliver healthy future spaces emerged from the workshops. These are awareness, active citizenship and community action, political processes and participation, enabling environment, access (to resources, space, services) and behaviour and cultural change. The action plans proposed at individual workshops coalesced to form an over-arching framework (Figure 4.4). This summarises the most frequently prioritised actions from all workshops, as allocated in time (short-, medium- or long-term timescale). Overall, participants selected 202 priority actions, which have been grouped into a transition framework of 58 actions. The actions relate to the strongest motivators the groups selected to achieve their healthy future (Figure 4.4).

The action to plant seeds and grow food also cuts across all motivators. Growing food for people and pollinators at individual and community levels links with the All-Ireland Pollinator Plan (www.pollinators.ie). This is a shared action plan to safeguard pollinators and ecosystem services into the future. Households, communities and businesses across the island of Ireland can sign up to act for pollinators. Incentives could be provided to encourage businesses and cafes to source/grow/sell/use locally grown produce. Signing up to the All-Ireland Pollinator Plan also connects with biodiversity and sustainability projects. As people plant and use herbs, salads and fruits they create edible landscapes for people and pollinators and enhance workplace and community wellbeing. This also provides informal and formal outdoor learning opportunities where people can skill-share, learn how to undertake practical experiential actions and create caring connections. Short-term actions include creating pop-up green spaces (e.g. Wood Quay in Galway) or vigilante planting or guerrilla gardening-style creative protests to raise awareness about climate impacts (e.g. the Extinction Rebellion Festival in London in 2019). In the long term, urban orchards and community planting can help offset carbon footprints and enhance urban greenways (sustainable transport opportunities) in areas where there are no high nature value habitats. This adds to resources and facilities and helps to create an enabling environment.

The framework presents individual actions with a timeline. Most actions are accessible, popular and easily undertaken. Many are useful taster events before people move on to more specialist actions. For example, getting rid of litter was prioritised at each backcasting workshop. One of the greatest barriers to connecting with nature and blue spaces is litter (Pitt, 2019). NEAR Health stakeholders agreed that the presence of litter everywhere or neglected facilities can turn people off (Chapter 3). Community clean-ups were identified as direct actions under all motivators, apart from "access", which was more focused on access to legislation and resources. Clean-ups are also linked to wider actions to decrease litter through increased awareness (including addressing a drinking culture which facilitates littering), more incentives for resource recovery and recycling, and strategic placement of bins.

Time frame	***Short-term actions*** (within 1–2 years)	***Medium-term actions*** (within 3–5 years)	***Long-term actions*** (longer than 5 years)
Awareness	Practical experiences	Support informal learning	Strengthen and support research and community links
	Hold fun activities	Grow space to swap skills, resources and knowledge	Overhaul curricula
	Visit sites of success		Create guidelines for teachers
	Share stories	Mobilise technology	Apply co-governance for health and environment
	Fund and review sustainable community transport		
Active citizenship and community action	Use purchase power	Sow seeds and grow plants for pollinators	Build on political will and resources to protect, support and promote healthy communities
	Sign up to All-Ireland Pollinator Plan		
	Source local supplies	Decision-makers to mobilise accessible routes	
	Hold clean-ups	Use accessible routes to walk and move more	
	Use social media	Include diverse forms of community knowledge	Investigate clean energy, technology and other tools for sustainable communities
	Engage politically		
Political processes and participation	Share success stories	Plan for managed and responsible access	Community contributes and participates in resource management and legislation
	Implement Biodiversity Action Plan	Reroute fines to fund green schemes and green start-ups.	
	Provide resources and incentives for partnerships		Cross-sectoral engagement in governance processes
Creating an enabling environment	Run litter awareness campaign	Launch initiatives to address drinking culture and associated littering	
	Hold clean-up events	Run climate campaign	Incentivise material reuse
	Select sites for bins	Create local green and blue ways	Instigate maintenance by community initiatives
	Celebrate spaces with a festival	Apply organic measures	Support creative industry
		Engage and employ communities in active contributions to flood mitigation measures	
Access to space, services and resources	Landowners and government to work together to identify barriers to enabling access and to tackle issues	Convene a citizen's assembly to develop options regarding access	
		Promote sustainable use of the environment	Enshrine "right to roam" in legislation
	Support use of local materials	Incentivise green partnerships	Ensure statutory planning documents retain existing nature spaces and create new ones such as planting woodlands and digging ponds
Behaviour and cultural change	Increase access to a subsidised bus pass	Utilise and promote practical examples to show how health and biodiversity are at the heart of responsible governance	Use materials more sustainably and showcase this as a good example
	Enquire into energy citizenship	Develop, support and promote places that use low or no fossil fuel sources	Use alternative transport to transition to low carbon
	Produce materials to show that links between health, sustainability and biodiversity apply to everyone	Fix leaky or ageing pipes	Install tertiary water treatment technology in catchments

Figure 4.4. Transition framework diagram showing priority actions and most common motivators, allocated by time frame (short, medium and long term). Some actions cut across two time frames as some workshops identified the same actions but, reflecting community knowledge, allocated them to different timelines.

These two examples show how actions can deliver progress across several priority areas for action. In fact, there is overlap between the action plan (Figure 4.4) and the priority areas for action, which deliver according to the greatest motivating themes (Figure 4.5). When we look at the overlap, we can also see the presence of interconnections that span boundaries (de Leeuw *et al.*, 2018). Focusing on these

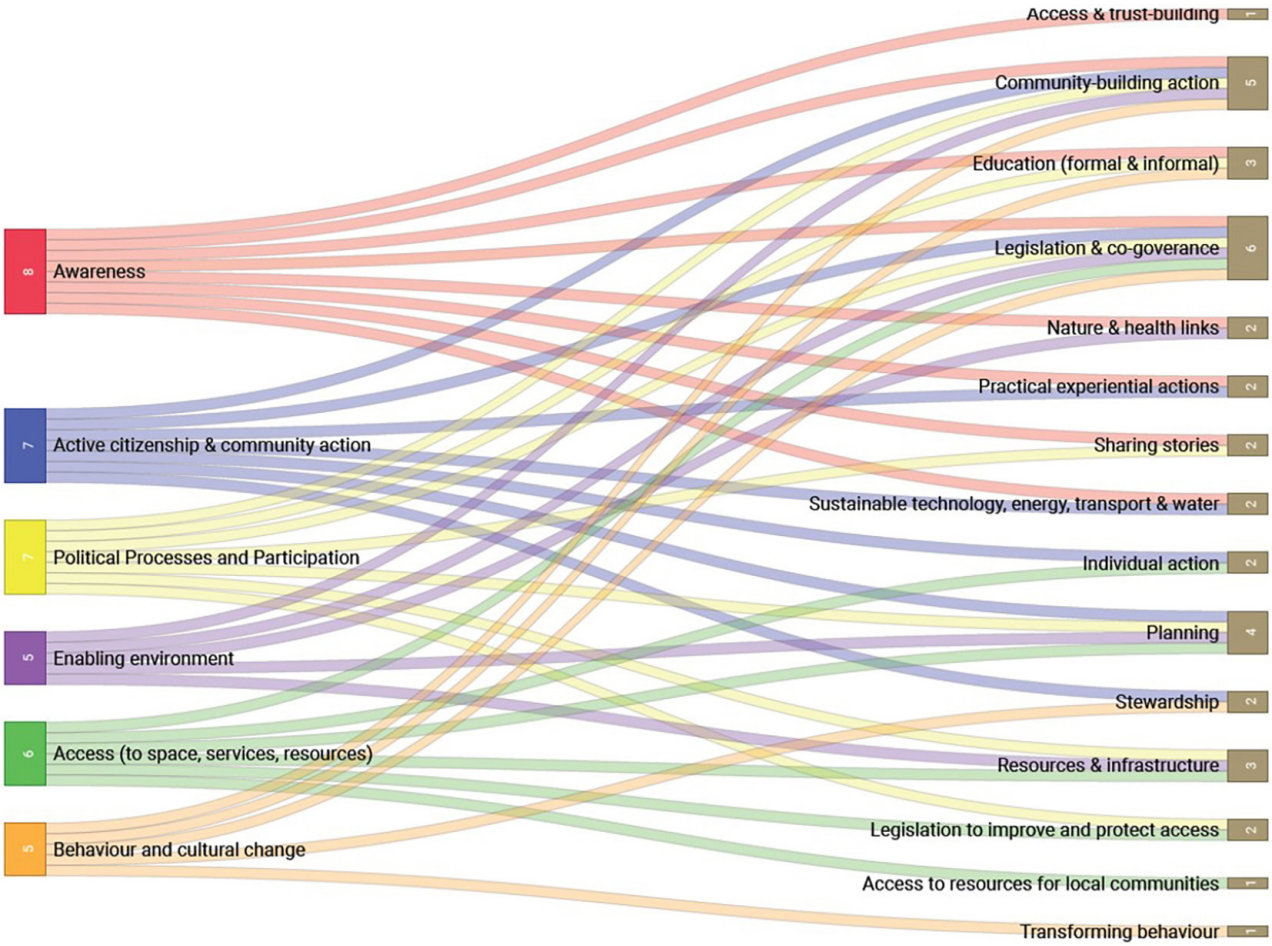

Figure 4.5. Sankey diagram showing connections between the most common motivators (left) and the priority areas for action (right), as emerging from the workshops. The colour coding is the same as that used in Figure 4.4.

pivotal points in the system will be useful for planners, developers and architects when planning to develop new areas or reinvigorate existing areas.

Figure 4.5 shows the degree of interaction between themes and priority areas for action. While most themes feed into at least two priority actions, legislation and co-governance is a priority area that cuts across all six motivating themes. Tensions exist within this priority area for action. Greater political will and action is needed to fully implement environmental policies and enforce existing environmental legislation. There is also "tension" between promoting individual/community-based actions, the need to support existing PPNs and the need for increased opportunities for co-governance, following the success of citizen assemblies. Community-building actions contribute to five of the six motivators and planning contributes to four of the motivators. Despite the Aarhus Convention, which, among other things, sets out how people can access information and participate in decision-making, and promotes their contribution in environmental matters, opportunities at local levels to participate and influence the planning process have not been fully explored. There is much to be learned from some examples of good practice, or "bright stars", which are summarised below.

One such example is the National Healthy Cities and Counties of Ireland Network, which, in working with key partners such as local community development committees and others, seeks to "improve health and wellbeing by creating and continually improving its physical and social environments, develop community resources that help people to support each other and achieve their potential" and deliver the objectives of the network. Established in cities since 1986, the initiative has expanded to form national networks. The National Healthy Cities and Counties of Ireland Network was accredited by the WHO in 2016. An

example of this collaborative working can be seen in Cork Healthy Cities, which is working with the local community development committee in the South Parish area of Cork City to develop a Green Spaces for Health initiative. Healthy Ireland provided funding to support a Volunteer Gardening and Green Spaces Group and, among other things, to create a greenway and heritage walking trail leaflet for the South Parish.

Another bright star example of change in relation to planning is the collaboration between researchers and the local community to co-create the Moycullen Village Plan, which, as it will be community engaged and led, will act as a guide for rural communities (https://moycullen2030.org/haveyoursay).

Stakeholders in Chapter 3 agreed that "community events are key to engaging people in nature". Taking Figures 4.4 and 4.5 together, this indicates that communities have much of what they need to create an enabling environment, but this very much relies on local champions to show leadership, motivate others in their community and make actions happen. With greater awareness, they can adapt and transform behaviour, but they need to be supported to do so. This cultural change also contributes to active citizenship. By sharing stories and carrying out site visits, people can learn from each other. People and nature flourish (Giusti and Samuelsson, 2020).

4.6 Discussion

The benefit of the practice-oriented participatory workshops is that people at the workshop co-created the action plan to design and implement a new way of living, in terms of policies, education and attitudes, to achieve an "ideal future" (Doyle and Davies, 2013; van den Bosch and Sang, 2017; Giusti *et al*., 2020). As the workshop participants worked backwards from the ideal future of a restorative environment to the present situation (Doyle and Davies, 2013), they outlined the steps needed to design, promote and use the natural environment as a proactive tool to maintain health and wellbeing (Davies *et al*., 2012). They collectively identified barriers to implementing the steps, suggested solutions to overcoming all implementation-related barriers and identified the key actors involved. This formed the action plan to determine and actualise what appeals to communities in relation to restorativeness, health and wellbeing from their nearby environments (Giusti and Samuelsson, 2020; Pritchard *et al*., 2020).

Participants recognised that many of the resources that they need are already available, but there are actions from both a top-down and bottom-up aspect that would help to ensure that nearby shared open spaces are vibrant, welcoming and accessible spaces for all aspects of life (humans included). Participants connected what this natural space would be like with how it would make people feel, for example that healthy future places, because they were full of nature and in good condition, were places to be inspired in and to be filled with hope in. Hope in this context was related to the healthy co-existence of people and wild nature in this welcoming natural space. They linked this with joy and celebration, and this deepened connection between people and the environment would inculcate a wealth of kindness.

Engaging stakeholders in backcasting enables them to participate in developing scenarios in their own words. The scenarios become tangible and they can relate to them. As they share this process with others, they build trust. One of the benefits of the workshops identified by the participants was that it brought them together and gave them time to co-create their vision of a healthy future. An unexpected outcome was the recognition that the challenge of accommodating diverse views can be minimised with the perspective of empathy (Cialdini *et al*.,1997). The participants talked about how their own perspectives shifted with wellness. The participants envisaged that, in their healthy future space, they would be more open and better attuned to taking on board differing views. This "shifting perspective*"* also developed their sense of stewardship and responsibility, which the participants agreed would encourage consideration for others, and included other aspects in this, for example "what's the healthy future for an animal such as a fox?". The emphasis on empathy is revealing, as literature searches indicate that this is an underappreciated aspect of a healthy relationship with nature, with some researchers suggesting that people who view themselves as part of nature are more likely to also be concerned about the environment (Cialdini *et al*., 1997; Schultz, 2000). Lumber *et al*. (2017) highlighted how empathy, compassion and other emotions were pathways to nature connection, which is the focus of Chapter 5. Empathy can be useful in building a

community of practice and can assist individuals in coping with day-to-day trials (Lesser and Storck, 2001), for example coming together to overcome the barriers that the participants had noted to implement a healthy future action plan. A separate unexpected outcome was the need for greater acceptance and awareness of risk, and the learning that can come with the management of risk. Some examples of this are trekking over rough or boggy terrain, going out at night on a bat walk, or climbing trees. Each activity has associated, but manageable, risks, once you are prepared for them. Much of this also reflects a common-sense approach. To paraphrase Alfred Wainwright (1973), “there is no such thing as bad weather, there is only unsuitable clothing”.

4.7 Summary

While some actions are clearly attainable by communities, some are top down or require actions by decision-makers such as national government (e.g. legislation on access), national organisations (increased collaboration for implementation of policies and plans, such as the National Biodiversity Action Plan or the National Planning Framework, at a local level) and local authorities (increased opportunities for communities and members of the public to comment on, inform and shape local plans). The value in including those actions here gives communities the opportunity to articulate their vision to decision-makers and to advocate for services and resources, and to participate in political processes. The framework (Figure 4.4) and the flow of relationships in Figure 4.5 show how communities themselves identified that they have the potential to be change-makers by showing leadership; for example, participants discussed actions they could take to reduce their use of single-use plastic, to make their voice heard in their shopping choices and to be more aware of the impact that their day-to-day choices have. Participants also recognised that they have the potential at an individual level to ensure that their actions can contribute to achieving their healthy future spaces, and that they themselves can influence others. The framework (Figure 4.4) can be used as a template for individuals, communities, and organisations. The actions listed in the template can be applied to their own circumstances, to enable them to undertake relevant sustainability actions and connect with nature in their own locality to achieve their healthy future space.

4.8 Recommendations

- Communities can link in with local festivals and cultural and family events to raise greater awareness of the benefits of nature for health and wellbeing.
- Multidisciplinary groups can connect across sectors to make change happen (bring together creative and conservation groups to meet and activate this for their area – the NEAR Health workshops are a good example of this).
- Decision-makers must ensure that participatory processes include diverse stakeholders from varied backgrounds to contribute to appropriate implementation of existing policies in this area.

5 Connecting with Blue and Green Spaces: Nature-based Solutions for Health and Wellbeing

5.1 Introduction

From climate change to biodiversity loss, and from shelter and support to creative inspiration, humans' multifaceted relationship with nature comprises benefits, impacts and trade-offs (Wilson, 1984; van den Bosch and Bird, 2018). There is growing evidence of the contribution that these benefits have for human health and wellbeing throughout the lifecourse, as summarised in Chapter 2. This knowledge needs to be applied to "designing, creating and mainstreaming opportunities for nature contact in ways that demonstrably make people healthier, happier and more self-actualised" (Frumkin, 2018). In Chapter 3, NEAR Health stakeholders agreed that "a lack of understanding what nature is can stop people from engaging with it". They also agreed that a bridge to overcoming this barrier was "awareness of the benefits for health from nature encourages people to go outdoors". In relation to the NBAs presented here, overall effectiveness is about both the workability and the appropriateness of those activities if they are to be implemented as a health-promoting or health-restoring programme.

5.2 Context

Ireland's current healthcare model is predominantly disease centred and faces increasing challenges, like those elsewhere, for example in the UK (Iacobucci, 2014). Nowadays, people are living longer, but not necessarily healthier, lives. Currently, people spend large parts of their day sitting down indoors, in what are recognised as obesogenic environments (Dee *et al.*, 2015; Department of Health, 2016; Dempsey *et al*., 2018). As people age, they face increasing risks from chronic illnesses associated with obesity (60% of Irish adults are diagnosed as obese), inactivity and poor mental health (Whiteford *et al*., 2015; Vos *et al*., 2016). To address this, health professionals have advocated a move towards upstream health promotion (De Leeuw and Webster, 2018) and bottom-up approaches such as that applied by Healthy Ireland, whereby, in addition to conventional treatments, medical practitioners utilise non-medical, community-based supports to benefit health and wellbeing, often termed "social prescribing" or "community referral" (Iacobucci, 2014; Bragg and Leck, 2017).

The concept of nature-based solutions is emerging and evolving and is increasingly used in environmental policy and management (Raymond *et al*., 2017). Defined by the EC as "instruments inspired by nature and using the properties and functions of ecosystems to enhance ecosystem services and multiple health benefits" (Haase *et al*., 2017), there are synergies with climate change mitigation, green infrastructure and valuing natural capital. In this report, the use of nature-based solutions is focused on health and wellbeing. Although this chapter does not use the word intervention, recent literature attests to the growing emphasis on nature-based interventions (Shanahan *et al*., 2019), which described "programmes, activities or strategies that aim to engage people in nature-based experiences with the specific goal of achieving improved health and wellbeing". The authors elaborate how nature-based experiences can be delivered in a variety of different ways and, in doing so, can take the form of therapy by stealth. In transforming people's behaviour and attitudes, nature-based interventions promote improved physical, mental and social health and wellbeing (Bragg and Atkins, 2016; Shanahan *et al*., 2019). Being outdoors is increasingly advocated as a form of therapy for a range of physical and mental health issues. Bragg and Atkins (2016) highlight the importance of nature and place as a determinant of individuals' mental health. Nature-based therapy is defined by the Green Care Coalition in the UK as "nature-based therapy or treatment interventions specifically designed, structured and facilitated for individuals with a defined need" (Sempik and Bragg, 2016), although they are often implemented using slightly different referral mechanisms, funding arrangements and ways of working (Bragg and Leck, 2017).

5.3 NBAs and Before–After Assessments

There were two parts to the NBA assessment. The first part entailed piloting the assessments and analysis of the survey; in the second part an expert group evaluated the potential of the NBAs from a salutogenic and restorative health perspective.

The NEAR Health team and collaborators co-designed, developed and assessed a range of NBAs. The activities included beach clean-ups, sea swims, surfing, sailing, nature walks, Hike to Yoga, and bat-box making and monitoring, as these were representative of different types of activities available in different natural settings and had an implicit or explicit emphasis on nature and/or health. The NEAR Health team drew on validated, widely used health and wellbeing and nature connection scales to populate their evaluation forms, e.g. the Nature Connectedness Index (Richardson *et al*., 2019), the Inclusion of Nature in Self scale (Schultz, 2002) and Office for National Statistics measures of subjective wellbeing. These scales and indices reflected cognitive, emotional, meaningful and quality-of-life measures associated with being connected to nature (Richardson *et al*., 2016; Richardson and McEwan, 2018). To better understand different aspects of people's lives we included some domain-specific questions, for example relating to sleep, physical activity, time spent outdoors and distance travelled to the activity. This can help provide a baseline understanding of where people are now and how best to target an NBA. We included a mix of open-ended and validated measures adapted from the Monitor of Engagement with the Natural Environment (MENE) survey (Hunt *et al*., 2017). We co-designed, piloted and verified our surveys with community groups, which is why some surveys were tailored for specific activities or groups and may have had different or additional questions/measures; for example, the Substances and Attitudes scale (Miller and Plant, 2003), the Teamwork Scale for Youth (Lower *et al*., 2017), the Strengths and Difficulties Questionnaire (Goodman *et al*., 2010) and the Connor–Davidson Resilience Scale: 10-item version (Campbell-Sills and Stein, 2007), among other official statistics, were used only for the sailing NBA (Windle *et al*., 2011). For each activity, participants completed a pre- and post-evaluation form. The evaluation form was also discussed with other academic experts and the people delivering and participating in the pilot activities, and subsequently modified based on their feedback.

The NEAR Health team exchanged introductory emails and met with the organisers/leaders of each NBA to propose the co-design and piloting of an evaluation of their programmes. It was not necessary for the NEAR Health team to recruit participants in all situations, as participants had already signed up for the programme with each NBA provider/organiser. Participants were informed about the NBA and the opportunity to contribute to the NEAR Health study and were given time to decide whether or not to take part. At the start of each NBA, participants were again briefed about the research project (and the ethical aspect of the project) and any questions were answered. Refusal to take part in the survey did not impact on participants' ability to take part fully in the NBA. A second report, available on request from the funders, sets out in depth the findings from these survey evaluations for each NBA, alongside the results of the Delphi methods workshop. This chapter presents the summary findings, an illustrated overview of the links between NBAs and quality-of-life outcomes and the NEAR Health "process of change", which outlines the core enabling mechanisms that were identified in common across all NBAs. Table 5.1 presents an overview of all of the NBAs and their key characteristics.

5.4 Use of an Expert Group and Delphi Methods

One way to measure effectiveness is to use experts to evaluate key features (see below) that are essential for a nature-based health promotion strategy to be sustainable and feasible. When the qualitative and quantitative feedback of experts is used in a structured way to make decisions, this is called the Delphi method (Finn *et al*., 2008, 2009; Blaschke *et al*., 2017; Shanahan *et al*., 2019). This is an iterative process in which the experts first individually use the best available information to answer specific questions with reasoned scores and then take on board the responses of other experts in qualifying their original answer. This means that there are qualitative and quantitative results from the process. Through this use of collective intelligence, the experts' responses initially outline the diversity of opinions on a topic and then indicate the level of consensus achieved. Delphi methods have been much modified and widely used in health (Blaschke *et al*., 2017), agri-environment (Finn *et al*., 2008, 2009) and nature conservation (Shanahan *et al*., 2019) decision-making. A modified form of the Delphi process includes a participatory element by

Table 5.1. Profile of NBAs and their features and numbers of participants in green and blue spaces (*n* = 305) in locations around the east and west coasts of Ireland

Pilot study	Duration	Green space	Blue space	Urban	Rural	Preventative	Restorative	Citizen science element	Number of participants
Beach cleans	One-off		■	■	■	■		■	77
Surfing	Interval[a]		■		■		■		22
Sea swimming	Interval[b]		■	■	■		■		28
Sailing therapy	2- to 3-day interval		■	■	■		■		37
Climbing	One-off	■			■				16
Nature walks (Croí)	Interval[c]	■		■			■		36
Bat-box monitoring	Interval[d]	■		■		■		■	30
Hiking	One-off	■			■	■			18
Running	One-off	■			■	■			20
Mindful nature walks	One-off	■			■	■			21

Note: grey shading indicates that the NBA meets that criterion.

[a]Programmes varying from 1 day to 8 weeks in duration.

[b]Interval of 16 weeks.

[c]Interval of 8 weeks.

[d]Interval of 12 weeks.

bringing the experts together to discuss their views and seek consensus. The NEAR Health project used this modification.

5.5 Selection of the Expert Group

Use of an expert group can be cost-effective and efficient in estimating the effectiveness of a programme. A pool of experts with different experiences and backgrounds was brought together; they represented the diversity of stakeholders and could contribute complementary perspectives. The experts included policymakers, practitioners, and health promoters and representatives from relevant community/environmental organisations. The selection of experts was based on several criteria: knowledge of and direct experience of NBAs, health and wellbeing policy and applied research, and experience of interpreting Healthy Ireland policy in advising people and communities. In addition, an ability to listen to others and express a balanced view was crucial. Some of those participating had been involved in the design and implementation of specific NBAs and could provide extra information on the detail of the NBA, while others were able to highlight strengths and weaknesses associated with the feasibility potential of implementing NBAs similar to those presented here. Experts were provided with information and scoring criteria, which they used to individually assess each feature to determine the effectiveness of NBAs for health and wellbeing. The group also engaged in a structured discussion and assessment of elements of NBAs, indicating likely opportunities for application or expansion, as well as areas that may require further consideration before they reached consensus. The NEAR Health team acknowledges with gratitude the contribution, critical thinking and support from the expert group in this process.

5.6 Features of Feasible Activities

The features that are important for health-promoting programmes were identified in the literature, in the health evaluation framework RE-AIM: Reach, Efficacy, Adoption, Implementation, and Maintenance (Glasgow *et al*., 1999, 2002; Gaglio *et al*., 2013) (Figure 5.1), but the order has been changed for scoring purposes. Each feature was scored on its own terms; while one was being scored, experts were asked not to consider any of the other features. The overall feasibility score is a product of each of the individually scored features.

- Evidence base: this is often considered to be the ability to produce a desired or intended result. Often, such trials take place in idealised circumstances, not in actual circumstances. In this situation, this feature is specifically about the evidence base. This includes physical activity outcomes, behavioural outcomes, quality-of-life

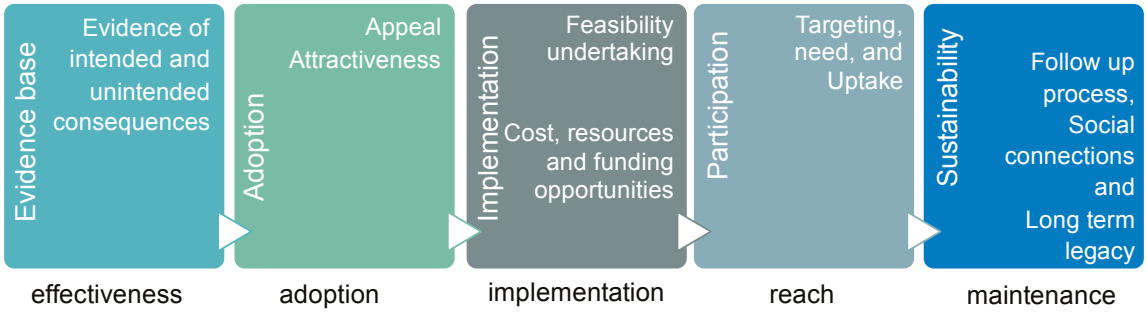

Figure 5.1. Features scored for NBAs, based on the RE-AIM framework (Glasgow *et al*., 1999, 2002; Gaglio *et al*., 2013).

outcomes and participant satisfaction outcomes. Experts were asked to consider the information provided about each activity, including summary findings from NEAR Health pre and post evaluations. The use of the word significant always refers to statistical significance.

- Adoption: this feature is about the appeal or attractiveness of an activity for the group, organisation or individuals who deliver it. Experts were advised to consider that delivery may be by an institution or a community. Experts were asked to consider what barriers the organisers had to overcome to be persuaded to run the activity and what barriers might arise if this activity was promoted at a wider level.
- Implementation: this includes implementation at both an organisational and an individual level. It is the extent to which a programme is delivered as intended and how well the participants adhere to or comply with the programme. It includes the organisation and resources in relation to promotion, recruitment, set-up and cost, incentives and funding. Experts were asked to consider how feasible it was to implement and for participants to do.
- Participation: this includes uptake and participation. Uptake is about how many people signed up for the activity. Participation is about the numbers who took part in the activity. Was the activity fully subscribed? Did the numbers stay the same over the duration of the activity? Next, experts were asked to consider the proportion of the target population that participated in the intervention and if the participants were representative. Experts were asked to decide how well this activity could reach those who need it most, and if it needed to be a targeted programme.
- Sustainability (termed maintenance in the RE-AIM framework): this relates to the extent to which a health promotion practice or policy could become routine and part of the everyday culture and norms of an organisation or society. It took account of the follow-up process, the sustainability of the activity, including social connections, and the long-term legacy. It also considered policies or practices that it can help to meet, or that can help drive implementation.

While this section deals with the feasibility of rolling out the NBAs presented here in other locations, with greatest possible reach, there are two points that need emphasising here.

The first relates to the assessment forms. Although the research team noted shortcomings with the assessment format, some experts also noted that it is evidence based, using international best practice indicators, but the length and paper format were not always appropriate considering the environment, weather or time people had available. Second, it is important to note that although some NBAs may not be as feasible as others to roll out with widespread reach, this may be intentional, as they were designed for, and tailored to target, a specific and vulnerable group with specific needs (e.g. surf therapy for a youth with autism spectrum disorder). There is no one size fits all; rather, this report presents the potential of a range of NBAs that can be used from a preventative and/or a restorative perspective.

5.7 Nature-based Activities

This section provides key findings relating to the assessment of NBAs and expert group evaluation. Further details are contained within the NBAs report, available on request from the EPA.

5.7.1 Ebb and Flow and NEAR Health: sea swim programme

Although swimming is a popular and accessible activity, it is not well documented within the literature (Britton *et al*., 2018). Adults who can swim in indoor pools but lack confidence to swim in the sea are supported by Ebb and Flow, an open water summer swimming programme run by Swim Buddies in Galway. After completing the programme, there were significant increases in participants' perceptions of mood, health and wellbeing. Their connectedness to nature and the sea significantly increased. They were more ocean literate and more environmentally aware.

Experts judged that, with some minor tweaks to all features (Table 5.2), this NBA could readily be implemented elsewhere. Overall, this activity has high health intervention potential in Ireland. It can help overcome the underlying culture of fear of the sea.

5.7.2 Liquid Therapy and NEAR Health: surf therapy programme

Surfing was the most frequently studied blue space activity reported in a systematic review of therapeutic BSIs carried out by the NEAR Health team (Britton *et al*., 2018) and, with growing participation rates in Ireland, is one of the most popular water-based activities (Hynes *et al*., 2020). Evidence suggests that health benefits are linked to the challenging nature of surfing – including the constant need to adapt and respond to nature in the moment. Liquid Therapy is a non-profit organisation that is tapping into the sea and surfing to tackle mental health issues for young people, and the surrounding stigma, by providing surf therapy programmes for young people with disabilities. One-to-one instruction allows the experience to be adapted for each child and their goals. After completing the programme, there were significant increases in youths' perceptions of their mood, health and wellbeing. Their awareness of the ocean increased. Parents felt socially supported and acknowledged a sense of respite/escape while at the beach.

Experts judged that this NBA would have medium to moderate effectiveness in a broad sense (Table 5.3), owing to the organisational requirement and the need to consider what happens with young people when the programme ends. Overall, they acknowledged the value of this NBA to the particular group it is targeted at. They recommended that it would be worthwhile to find ways to review aspects of implementation and sustainability.

5.7.3 Clean Coasts and NEAR Health: beach cleans

Evidence suggests that organised beach clean-ups can turn the negative impact of a poor-quality environment into the positive benefits of a potentially restorative environment, promoting pro-environmental awareness (Loizidou *et al*., 2018), as well as creating a strong sense of community through shared values and actions (Wyles *et al*., 2017). Clean Coasts, a marine environmental education non-profit programme funded by An Taisce, mobilises and supports more than 800 "coastal care" community groups, covering every 5.5 km stretch of coastline in Ireland. These voluntary, self-organised groups undertake beach cleans. Afterwards, participants reported significant increases

Table 5.2. Effectiveness features (sea swimming) and feedback from the expert group (utilising the RE-AIM framework)

Effectiveness	Feedback
Evidence base	Experts noted excellent outcomes relating to wellbeing measures and nature connectedness
Adoption	High level of uptake but this is limited by seasonality
Implementation	Well organised, well attended. Investment in wetsuit, time, trained swim instructors/volunteers, etc. and distance to travel may be limiting factors and create unintended exclusion. Implementation could occur with support and funding made available. Experts praised the post-event structure
Participation	The experts noted potential for wide reach, creating social cohesion and overcoming fear by turning a perceived "risky" environment into an enabling one, if given funding and support
Sustainability	This programme has incredible community-building potential in terms of the provision of skills, tools and ocean literacy to sustain ongoing social practices in open water. There is high potential to create a pressure group to lobby for clean water and biodiverse environments and promote an ethic of care, i.e. "custodians of the sea" (EPA, Irish Water, An Taisce). Connections with blueways, inland waterways and blue communities and the National Planning Framework were noted

Table 5.3. Effectiveness features (surf therapy) and feedback from the expert group (utilising the RE-AIM framework)

Effectiveness	Feedback
Evidence base	Good evidence, specifically around younger people and emotional health
Adoption	This NBA is place focused and specialist in terms of programme delivery. Barriers to wider adoption are equipment and instructor availability. Potential to be highly transferrable if a more mainstream uptake of this approach across surf schools could be supported
Implementation	Implementation is impressive. The conditions and locations may be restrictive for those with limited mobility and the long distances parents travelled to avail of the service was noted
Participation	This is a scalable programme as it can be extended to different surf spots, with input from other subgroups of participants and with support/oversight from other surf programmes
Sustainability	Specialised therapeutic intervention targeted and tailored to the needs of particular groups, often excluded from mainstream activities. Concern expressed regarding supports for young people aged 18–20 years. The group also discussed the potential for governing sports bodies to include training in therapeutic best practices and the potential to work with occupational therapists to broaden inclusivity within surfing

in mood, health and wellbeing and connectedness. Men readily undertook this activity, suggesting it was a stigma-free opportunity to engage in activities that benefited health and wellbeing.

Experts judged that this NBA gave people meaning and purpose, with additional measurable levels of "place care", and could readily be implemented elsewhere (Table 5.4). Overall, it has high potential as a health and wellbeing intervention that could be rolled out with minimal costs to other settings throughout Ireland, including inland waterways, urban areas and rural localities.

5.7.4 Havin' a Laugh and NEAR Health: Hike to Yoga

There is a growing body of research providing high levels of support for social prescribing around mental health and nature, although there has been limited research in Ireland until recently. Activities such as Parkruns reflect the appeal that these activities have. Havin' a Laugh promotes participation in all forms of life-enhancing and outdoor activities to improve personal mental health. It provides activity vouchers to people who are in therapy for mental health-related reasons. Participants reported significant increases in perceptions of mood, health and wellbeing and connectedness after completing the Hike to Yoga programme.

Experts agreed that there needs to be a greater relationship between social innovation funding and refining the evidence base in eco-adventure therapy. Applying a NBA like this elsewhere could have a moderate to high level of effectiveness (Table 5.5). Overall, the group emphasised the uniqueness and inclusivity of this NBA.

5.7.5 Sailing Into Wellness, Coolmine Therapeutic Community and NEAR Health: Voyage to Recovery sailing programme

Sailing interventions showed that young people developed self-esteem (Scarf *et al*., 2018), resilience (Hayhurst *et al*., 2015) and social confidence, and recognised their capacity to work in a team with others (McCulloch *et al*., 2010; Capurso and Borsci, 2013). Sailing can also improve the quality of life for adults who are recovering from drug and alcohol addiction (White *et al*., 2016). Sailing Into Wellness is a not-for-profit social enterprise that utilises the unique setting of the sea to help communities and individuals. The experiences of freedom and self-sufficiency that are gained during the voyages are an integral part of Sailing Into Wellness. Coolmine Therapeutic Community is a drug and alcohol treatment centre empowering people to end their dependence on drugs and alcohol. A sailing intervention was codesigned by Sailing into Wellness and Coolmine Therapeutic Community, with input from NEAR Health. Coolmine residents would participate, with some residents taking part in a sailing voyage and some residents not. After the voyage, participants reported significant increases in mood, wellbeing, and aspects of social and nature connectedness.

Experts judged that this NBA has the potential to have moderate to major effectiveness if applied elsewhere (Table 5.6). This NBA is a once-in-a-lifetime

Table 5.4. Effectiveness features (beach cleans) and feedback from the expert group (utilising the RE-AIM framework)

Effectiveness	Feedback
Evidence base	Clear evidence in support of positive health and wellbeing benefits. A group activity that promoted place and social connectedness, physical activity and positive community-based actions
Adoption	Widespread appeal across the life course and genders at multiple sites. Accessibility could be an issue for older people and people with disabilities, depending on the location
Implementation	Feasible and easily implemented and replicated, with high levels of participation
Participation	Scope to reach diverse community groups, because the focus is not on health. Some people may feel that the activity requires physical fitness and so exclude themselves. Beaches are not disability-friendly environments so modifications may be required to ensure accessibility
Sustainability	Well-established network. Clean Coasts programmes, actions and activities are identified in the Marine Strategy Framework Directive (MSFD; Directive 2008/56/EC) plan for Ireland. Clean Coasts supports actions highlighted in the Waste Management Act 1998 and the Convention for the Protection of the Marine Environment of the North-East Atlantic 1992 (OSPAR)

Table 5.5. Effectiveness features (Hike to Yoga) and feedback from the expert group (utilising the RE-AIM framework)

Effectiveness	Feedback
Evidence base	This NBA demonstrated excellent outcomes, especially enhanced connectedness
Adoption	Appealing activity building on the interest in hiking and yoga in Ireland. The approach that Havin' a Laugh take is a great leveller. Valued partnerships between mental health services and outdoor companies
Implementation	Well-structured and well-organised NBA (e.g. requiring a lead/guide, transport/resources/vouchers), which is both positive and limiting. Experts praised the innovation of the "eco-adventure" concept from a funding perspective
Participation	This approach enables those with few supports (early adulthood) or who may not usually be able to afford/access such initiatives to try these activities. Drawbacks are the need to have a qualified yoga instructor/mountain guide available in a local region. Duration may limit participation
Sustainability	High potential to be adopted by mainstream health services. It has relevance for mental health, outdoor recreation, Healthy Ireland, etc.

Table 5.6. Effectiveness features (sailing) and feedback from the expert group (utilising the RE-AIM framework)

Effectiveness	Feedback
Evidence base	Experts highlighted the value of comparing a group who had sailed (test group) with a group who did not sail (control group). Qualitative and quantitative findings were rich and insightful
Adoption	Appealing, accessible programme. Given the addiction recovery focus, most felt that it was feasible, but it has complex resource requirements such as equipment, qualified instructors, sailing vessels and time. Sailing is perceived to be an elite experience, which could limit widespread uptake
Implementation	This NBA was developed closely with health services and with active participation by those who had been through their own journey of recovery, and the organisation is well established. The NBA is well structured and delivered by a skilled team committed to this learning experience
Participation	Owing to the specialised nature of this programme, only a small number of people could participate (limited by space on boat) and therefore the reach may be limited. However, there is potential to expand the reach if there is "buy-in" from other services/organisations. Scalable to other locations and to similar addiction therapy services around the country, on inland waterways and in coastal areas
Sustainability	Important community integration aspects for an under-regarded group being provided with something that is not accessible to most people. Good links with marine spatial planning, Healthy Ireland, HSE policies in social inclusion, mental health, and drug and alcohol policy – National Drugs and Alcohol Strategy 2017–2025: Reducing Harm and Supporting Recovery

experience for people, with evidence in support of significant transformational personal development skills and enhanced connection with nature.

5.7.6 Croí, the National Institute for Prevention and Cardiovascular Health and NEAR Health: restorative walk-in nature programme

There is a strong body of evidence supporting this NBA, with increased evidence for walking in nature (Marselle *et al*., 2015; Pasanen *et al*., 2019). Croí is the Irish heart and stroke charity. One of its key goals is to build healthy communities through support, education and empowerment. It established the National Institute for Prevention and Cardiovascular Health in 2014 to train and educate healthcare professionals in cardiovascular disease. NEAR Health and Croí devised a walking programme that resulted in significant benefits to participants' physical and mental health and wellbeing and connectedness.

Experts judged that this NBA could readily be implemented elsewhere (Table 5.7). Overall, this activity has very high health intervention potential in Ireland.

5.7.7 Promoting bats, promoting health

Undertaking nature conservation activities has demonstrated benefits to health and wellbeing (O'Brien *et al*., 2010, 2011; Husk *et al*., 2018; Shanahan *et al*., 2019). NEAR Health, Galway Bat Group, Terryland Conservation Volunteers, Ballinfoile Men's Shed, residents of the Eglinton Direct Provision Centre in Salthill and NUI Galway implemented a nature conservation programme in an urban woodland, Terryland Forest Park, in Galway City in 2017. Bat boxes can be an effective nature conservation tool. Making bat boxes (and other places of shelter for wildlife) is an activity that men's sheds can get involved with. Having completed the programme, participants perceived significant increases in their mood and wellbeing and connectedness to the woods, and had significantly greater respect for nature.

Experts judged this NBA to have medium to moderate effectiveness potential (Table 5.8). By addressing issues relating to the evidence base, sustainability and policy connections, this NBA could be implemented elsewhere. The hook of bat watching and monitoring engaged men and others within the community to participate without the stigma of mental or physical health issues. Expansion to butterflies and birds, and other citizen science projects, had relevance for long-term monitoring and, like Clean Coasts, the potential was noted to integrate all groups and individuals within a community.

5.8 Workshop Discussion

All activities demonstrated a variety of ways to engage with nature. There is potential to link NBAs across the seasons, creating a sea to land connection and a winter to summer series of NBAs. In addition, all NBAs showed the value of self-empowerment, a sense of purpose and mental health engagement. The group recommended that there is value in bringing diverse perspectives together and in having less emphasis on physical activity solely. The examples presented also revealed a wealth of sharing across research, policy and practice.

Table 5.7. Effectiveness features (walking in nature) and feedback from the expert group (utilising the RE-AIM framework)

Effectiveness	Feedback
Evidence base	Excellent outcomes relating to health and wellbeing measures and connectedness
Adoption	Easily adopted with few skills or resources required. Organisations were prepared, qualified and capable, and communicated well. Nature walks are attractive and have broad appeal
Implementation	Well structured, easily coordinated, delivered and managed, and very cost-effective. Unpaved roads may pose a hazard, especially in rural areas, and may need to be adapted for people with disability or mobility issues
Participation	Great scope to reach the people who will benefit but need to consider how to reach and encourage minority groups and those who are disengaged or do not want to go outdoors
Sustainability	Supports are in place at the national level, i.e. Get Ireland Walking. Maintenance and sustainability are evident and materials (e.g. pedometer) can be reused. High relevance for Get Ireland Walking and A Healthy Weight for Ireland: Obesity Policy and Action Plan 2016–2025

Table 5.8. Effectiveness features (promoting bats) and feedback from the expert group (utilising the RE-AIM framework)

Effectiveness	Feedback
Evidence base	Good results from outcome measures, NBA combined a strong craft aspect with physical activity
Adoption	Easy to adopt, with few resources required. Diverse mix of groups collaborated to make the boxes, locate suitable trees to put the boxes up and monitor the boxes
Implementation	Well structured and executed, this could act as a template for other environmental and community projects. Need to find ways to overcome literacy issue for some asylum seekers
Participation	Wide reach in terms of age, gender and social background; could be extended across Ireland
Sustainability	Good scope and structure to continue, while being extremely sustainable and cost-effective, but training of volunteers is required. Opportunity to bring night environments to life as a highly sensory experience for those who are visually impaired. Added value to citizen science through recording and identifying bats by sound. Relevant to local or county biodiversity action plans and All-Ireland Pollinator Plan, as well as other plans related to sustainable communities, good health, social inclusion, volunteering and the SDG for Life on Land

The group acknowledged the need for guidance for frontline agencies. There are existing resources, and organisations that are working together within community and health sectors to engage people and raise awareness of the value of nature for health. The NBAs presented demonstrate some of that partnership and diversity. The NBAs demonstrate potential scalability, but there is a greater need for more cross-pollination. For decision-makers it is important to profile the policies and strategies that are connected to each NBA. The group also discussed the need for stories and storytelling (possibly using podcasts and short films) to engage other HSE practitioners, including prescribers. The importance of sharing information and resources was discussed. If prescribers do not know what is available, they are not able to prescribe these resources for people. Health practitioners need an opportunities toolbox, and references that evidence the benefits of individual activities and demonstrate benefits for individuals. It is often a matter of asking the right question.

The use of NBAs shows how deeply wellbeing can be embedded within the environment. The activities can also be used within communities to build, strengthen and support community and environmental resilience. The combination of nature and health is emerging and could be integrated within a social prescribing model (Bragg and Leck, 2017; Norwood *et al*., 2019). There is undoubtedly a need for more research, greater use of control groups and longer term follow-up of NBAs. Crucially, we need to think about the questions being asked and why, potentially involving participants to determine what assessment tools and techniques work for them to evaluate outcomes.

An important aspect of this workshop was the generosity and sharing between participants from a diverse range of backgrounds and expertise. The NEAR Health team is profoundly grateful to the people who took part in the NBAs, from organising to participating and assessing them. The group of experts recommended that they act and work together to promote wider inter- and intra-disciplinary sharing of knowledge and awareness raising.

5.9 Summary of Health and Wellbeing Outcomes of NBAs

We have mapped the ways that the different NBAs can be associated with different “quality-of-life” outcomes and connectedness (Tables 5.2–5.8 and Figures 5.2 and 5.3). NBAs are not directly comparable, as each cohort had diverse needs, ages and abilities, etc., was of a different size (from 14 to 75 participants) and had different motivations for engagement (e.g. promotion/restoration/pro-environmental behaviour).

5.10 The NEAR Health Process of Change

In Ireland, groups and organisations are tapping into the restorative power of green and blue space to tackle issues such as mental health and environmental degradation/biodiversity loss in novel ways and reverse the trend in declining nature experiences.

A major gap in the literature is the lack of understanding of the mechanisms of change within NBAs and interventions. By drawing on a rich evidence base from survey evaluations of NBAs,

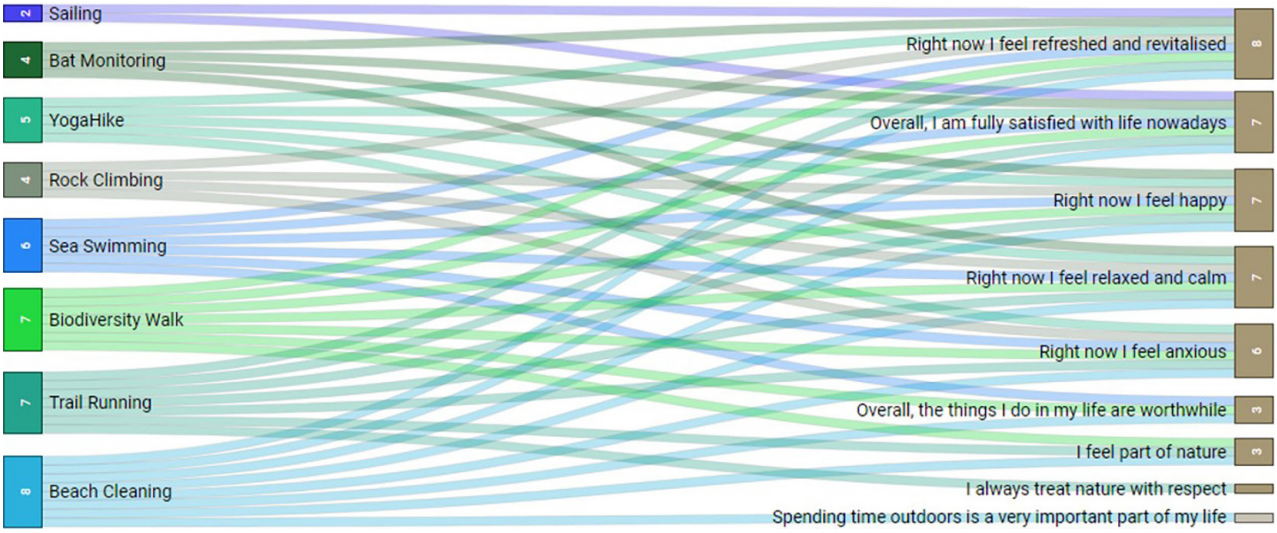

Figure 5.2. Sankey diagram of impacts of NBAs based on before–after surveys.

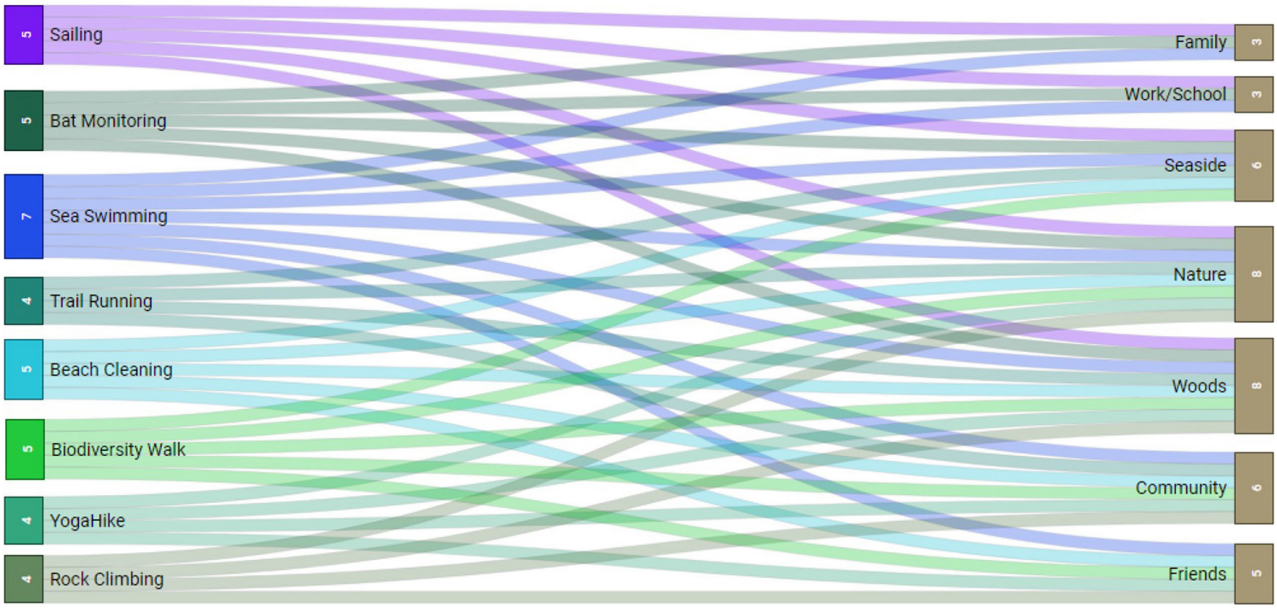

Figure 5.3. Sankey diagram demonstrating connectedness outcomes of NBAs based on before–after surveys.

interviews with participants, volunteers and instructors, and the expert workshop reviewing the feasibility and sustainability of NBAs, we have highlighted some of the core enabling mechanisms that drive a “process of change”. This process (Figure 5.4) spotlights some of the key features and mechanisms that were common across all NBAs regardless of participants, activity or setting, and illustrates some of the complexity of the health-promoting and restorative benefits of engaging with nature. It identifies key “inputs” or resources and tools necessary to deliver an NBA, the key pathways that participants might follow on their “learning journey” that enable health and wellbeing outcomes to be realised, and the associated health and wellbeing outcomes. This is a dynamic process. Outcomes may vary depending on, for example, the type of activity or weather conditions on a given day, which may present varying degrees of challenge. Although the model highlights specific pathways it does not mean that all participants will experience every element. Diverse pathways are available to each participant depending on factors such as their personal goals, motivations and needs. That said, the following enabling factors at the heart of the system are essential:

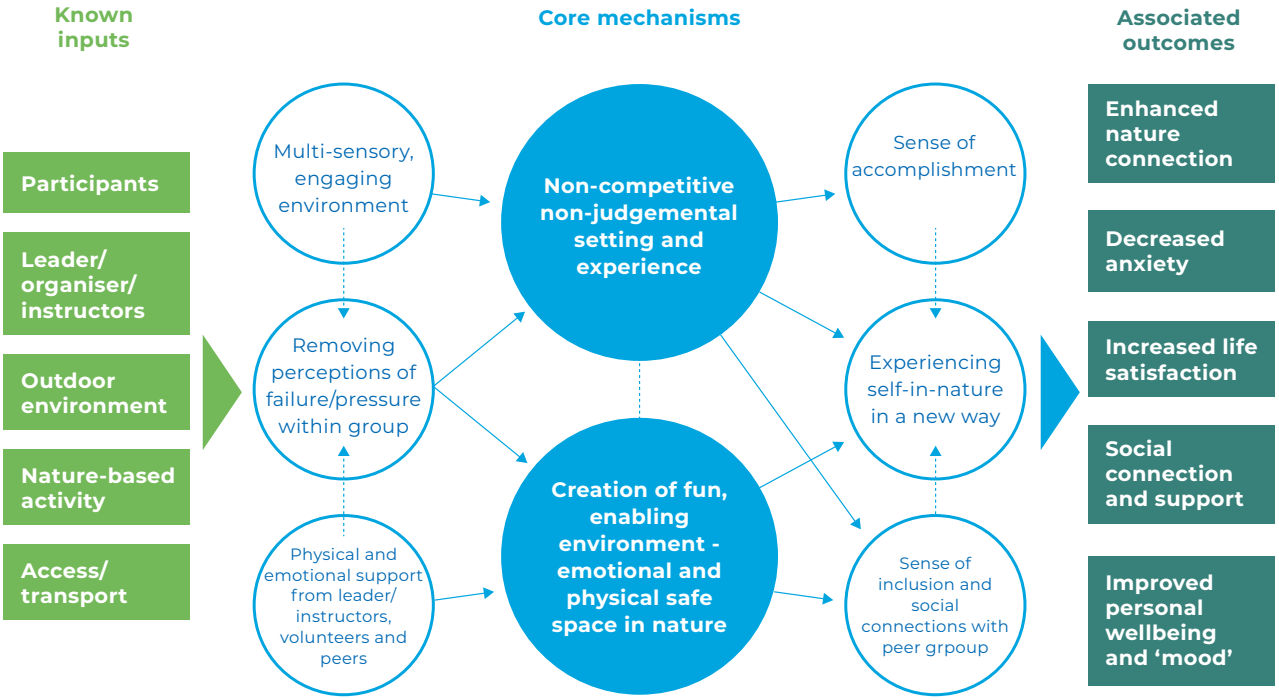

Figure 5.4. NBAs "logic model" (map) defining inputs, core enabling mechanisms and associated outcomes based on NBAs assessed as part of the NEAR Health project (adapted from Marshall *et al.*, 2019).

- fostering a non-judgemental and non-competitive setting and experience, which means each individual feels that their needs are met where they are;
- creating a fun and enabling environment that is physically and emotionally safe.

These elements reinforce and support the core aim of the NBAs to encourage and support positive experiences and active engagement with nature.

5.11 Discussion

This section first discusses the general health and wellbeing outcomes of NBAs, followed by domains of connectedness; we then discuss some ethical aspects. Public health promotions often focus on recognised attributes of wellbeing: connect, be active, take notice, keep learning and give (Michaelson *et al.*, 2009). These aspects of wellbeing did occur in the NBAs. Specific themes associated with wellbeing, such as self-esteem, autonomy or self-determination, and vitality and engagement, were identified as important aspects of people's experiences of NBAs in their responses to open questions and in other qualitative findings from interviews, group discussions and participant observations. We then go on to discuss the implications of these findings.

5.11.1 Assessing the health and wellbeing outcomes of NBAs

We applied a co-creative, systems-based approach to evaluations where stakeholders and their engagement are central to the success of NBAs, measuring not only "what" worked well, but also evaluating "how" and "why" success or indeed failure happened (Gordon and Gurrieri, 2014). We recommend reviewing the assessment process itself (McHugh and Domegan, 2017). Indeed, this process benefited from and evolved with the contribution of and collaboration with practitioners and participants by helping us to review and revise how we measured before and after responses, including revising the format and length of the survey (Domegan and McHugh, 2019; Domegan *et al.*, 2019).

Most of our activities were of short duration and therefore they can show only short-term changes. Studies in which we were able to evaluate longer term changes (e.g. surf therapy, sailing, biodiversity walk) showed sustained impacts in areas such as increased nature and social connectedness, enhanced life satisfaction or reduced anxiety. Some of the NBAs we assessed are ongoing activities, or could be rolled out with minimum costs on an ongoing basis (e.g. the biodiversity walk, beach cleans). Findings from shorter term NBAs, such as the increased participation of men

in beach clean-ups, could help inform the longer term planning of coastal programmes, or transfer insights to other NBAs to enable greater uptake and inclusion.

We have mapped the ways that the different NBAs can be associated with various "quality-of-life" outcomes. NBAs are not directly comparable, as each cohort had diverse needs, ages, abilities, etc., with differing sample sizes (from 14 to 75 participants) and differing motivations for engagement (e.g. health promotion/restoration/pro-environmental behaviour). Some NBAs were targeted therapeutic interventions (i.e. restorative). For example, the biodiversity walk with Croí was targeted at people recovering from heart-related issues and disease, and Sailing into Wellness was targeted at people in recovery from drug and alcohol addiction, where there was more of an emphasis on the "inner journey" and less on social connection/community building. Other NBAs were more generally health promoting, although some (i.e. beach cleans, bat boxes) were pro-environmental activities and not framed as an outdoor physical activity, but rather "health by stealth".

All NBAs significantly reduced feelings of anxiety, apart from sailing (which resulted in a decline in anxiety that was not significant). Of all the NBAs, participating in beach cleans enhanced wellbeing indicators across all domains. The biodiversity walk and beach cleans are the most accessible activities (i.e. low level of inputs required/less resource intensive) and have the greatest impact on wellbeing outcomes. These are also activities that have a clear environmental aim and the intention to connect and engage with nature directly. Passive activities or those requiring few technical skills or little equipment, such as walking or swimming, were notably under-represented in the literature and deserve greater attention (Christie *et al*., 2017), especially for less able-bodied cohorts and in response to an increasingly "stressed-out" society.

A key area of consideration for researchers, practitioners and policymakers is the potential for nearby environments to offer NBAs, rather than an emphasis on adventure or wilderness therapy, which dominates the literature and typically requires greater funding and resources associated with transport, training, equipment, etc. Nature-based health interventions need to address local contexts to assess the circumstances in which outcomes are achieved and the transferability of such findings.

The cultural component of nature connection, and how this might intersect with other determinants of health such as gender, race and ethnicity, need further study and consideration in public health policy. In addition, we need more collaborations across sectors and communities to robustly co-design and evaluate outcomes; this will also benefit our knowledge of participant expectations and individual needs measured against actual outcomes.

5.11.2 Outcomes for connectedness

All NBAs enhance a sense of connectedness to nature. Sea swimming enhanced connectedness across all dimensions of life assessed. This may be linked to it being the most immersive and multi-sensory stimulating activity, but this needs further investigation as sea swimming is also one of the most under-researched blue space NBAs in the literature. Of those activities that evaluated connectedness to work, it was the only activity that significantly enhanced this aspect of wellbeing. This may suggest that the timing of the activity is important; swim groups swam in the early morning before work and frequent comments included "I'm ready to start my day" and "it's cleared my head".

Green activities can also enhance a sense of awareness and connection to the sea. Trail running took place in the sand dunes by the coast and the biodiversity walk was by the River Corrib, and participants showed awareness of the connection between the sea and inland waterways. This highlights the importance of the introduction of blueways in Ireland to foster greater connection with inland waterways.

5.12 Implications for Policies and Practices of Inclusion

> With outdoor activities there can be a sense of separateness or feeling "I'm not one of those people". (Promoter/provider)

Although these NBAs highlighted the health and wellbeing benefits for diverse groups, we acknowledge that the NBAs are limited in time and place to specific groups and that a number of groups were under-represented, especially those from immigrant communities or ethnic minorities (with the exception of the bat walk). As outlined in the literature review

(Chapter 2), experiences of green and blue spaces are differentiated, and major inequalities persist that determine how people can access these spaces and whether or not people can actively engage. Although what prevents people from accessing blue and green spaces (Pitt, 2019) is not fully understood, a recent EPA-funded study highlighted the socio-economic determinants of access and use of blue and green space (Domegan et al., 2020).

Why does equal access for all matter? Those who do not engage with nature might not do it from a personal choice and, if they do, that choice is often constrained by vulnerability, inequalities or lack of awareness of the opportunities. Pitt (2019) argues that pursuing equal access "might help meet unmet needs, especially mental health". The barriers that under-represented groups might face are often multiple and complex, and differ across gender, race, ethnicity and the life course, so there is no one way to enhance greater inclusion and diversity. Our NBA process of change (Figure 5.4) highlighted how a non-competitive and non-judgemental experience and the creation of a fun, safe and enabling setting were key mechanisms for a successful NBA. This also suggests that greater emphasis on the value of non-competitive forms of engagement are as important as the dominance of fitness and weight loss as motivators within public health discourse, if not even more so.

> Nature doesn't judge. (Promoter/provider)

The NBAs address some of the barriers to participation in different ways. Havin' a Laugh's "taster sessions", using nature prescribing in an understated way, or "mental health by stealth", is a great example of creating a space for social mixing and supporting more vulnerable individuals (e.g. those on low incomes, those recovering from mental illness) to participate by making NBAs accessible and affordable. Our findings highlight the value of facilitated introductions, in examples such as the biodiversity and bat walks, to spaces that some people might not be interested in (walking outdoors), find undesirable (bats) or perceive as risky (night-time environments) in terms of helping to change perceptions and foster new and healthy connections with blue and green spaces for those who might have felt previously excluded or disinterested.

> The impact of overcoming fear and being immersed in a new environment, discovering sensations never experienced before. The sense of empowerment and "yes, I can do it" spills over into other aspects of life. (Swim instructor)

Addressing diversity and inclusion in how outdoor, tourism and recreation activities are marketed and promoted was suggested by the expert group (Chapter 5) as another important way to help break down and address the stereotypes that persist regarding outdoor recreation. Although some NBAs strive to overcome barriers for those with physical disabilities, the lack of facilities remains a limiting factor for differently abled bodies, especially at public bathing sites (e.g. provision of beach wheelchairs), and there is a lack of inclusion training. To make these changes requires greater support and allocation of resources, not just at a community level but nationally. NBAs and the adoption of "nature prescribing", such as voucher schemes, are limited by traditional funding mechanisms. There needs to be greater financial support for and awareness of nature-based social enterprises. Findings highlight the value of investing in and planning for greater access to and use of outdoor public spaces, especially coastal and urban blue spaces, in a responsible way.

5.13 Implications for Bridging the Health–Environment Gap

Recognising the importance and value of nature and place as determinants of wellbeing presents an opportunity to healthcare systems that seek new, alternative and cost-effective services. Evidence shows that there is high potential to enhance recovery rates (e.g. recovery from various mental health issues, addiction and heart failure). However, this requires buy-in from and coordination with healthcare professionals. There is a need to create more awareness of what is available and how to access it, as well as evidencing the effectiveness of NBAs, e.g. Havin' a Laugh's model, which effectively works in partnership with various outdoor activity providers, mental health services and the HSE within a region. We recommend building partnerships within other regions between outdoor activity providers and local health services.

The findings show that NBAs provide a valuable service where there are often little or no existing supports. This also highlights those who are most at risk/vulnerable and harder-to-reach groups such as young adults with disabilities or mental health issues who lose access to any (state) supports once they reach 18 years of age, the result being, as one of the parents of a surf therapy participant told us, "parents are in crisis management, with little or no respite". Elderly cohorts are another group that may be vulnerable, stigmatised and often not included or considered in the design and use of outdoor public spaces (Mason *et al*., 2017).

As evidenced by surf therapy, NBAs could redefine how we consider sport, physical activity and "able bodies." Opportunities to mainstream an "access for all" approach was emphasised during the expert workshop. Governing sports bodies should work to include and implement training in therapeutic best practices, with the potential to work with occupational therapists to broaden inclusivity. This would require training for practitioners that would actualise and build on existing inclusion policies. Havin' a Laugh highlighted the power and potential of integrating NBAs with mental health services. A "for all" focus helps to break down stigma associated with mental health. It is important that available mental health supports are identified and made known to outdoor activity providers. This was echoed by participants in Chapter 3:

> People open up more after physical exercise outdoors and there is a need for mental health skills and training for fitness and personal trainers. (Educator)

Participants in the biodiversity walk perceived direct physical and mental health benefits and noted additional wellbeing benefits such as the opportunity to learn more, which is linked to identity, passion and memory. This has the potential to benefit people living with dementia. Walking in nature can increase people's motivations to exercise and to keep exercising (Carlin *et al*., 2016). There should be greater promotion of and public access to more urban nature spaces and outdoor walking routes within existing initiatives. For example, park or nature walks should be encouraged and promoted to meet growing interest in and demand for more social/group and organised outdoor activities in Ireland, such as the Parkrun Ireland and Get Ireland Walking initiatives. There is great potential to introduce education and training in nature/biodiversity knowledge and communication skills for group leaders as an added value to physical health-promoting activities/ community walking groups.

5.14 The Importance of an Ethic of Care

> The Wild Atlantic Way has encouraged communities to set up a new type of outdoor tourism … The danger is if we over-develop outdoor tourism we have an Amazonian jungle effect where we have people ruining the boglands and coasts. (Decision/policy influencer)

Active engagement in blue and green space does not necessarily lead to a greater awakening of environmental concern and engagement with environmental issues (Atkinson, 2019). Indeed, overuse of outdoor spaces and an influx of visitor numbers to certain sites can impair the quality of the environment and result in a reduction in health benefits. These NBAs have, however, illustrated the opportunities to facilitate a greater connection to nature that incorporates skills, tools and awareness of how to engage with nature in a meaningful, sustainable and responsible way. There is tremendous potential to adopt citizen science approaches into existing outdoor activities. For example, beach cleans can also complement other NBAs and extend to include street cleans, river cleans and lake cleans. Pro-environmental actions and activities (e.g. biodiversity surveys, pollinator actions, clean-ups, bat walks) could be included in the whole-of-government National Physical Activity Plan led by Healthy Ireland, as well as the co-benefits of community and environment outlined in the National Biodiversity Action Plan 2017–2021 (DCHG, 2017). These findings, particularly the outcomes for social cohesion, have wider implications for the implementation of similar initiatives, such as Tidy Towns, the All-Ireland Pollinator Plan, Green Campus/Green Schools and Workplace Wellbeing. Interest is growing in direct actions for biodiversity and climate change and in citizen science. For example, the Backyard Nature initiative in the UK and Go Wild in Galway recognise the importance of engaging with nearby, local nature in the everyday spaces and places we use, especially

for children. Many other examples create greater access to and awareness of nature in urban settings through community building and social events, such as "Evenings to Explore" hosted by This Way, and Adventure Uncovered in London, which organises mindful walks in local parks for the general public.

> There is also wildness in everyday environments. (Educator)

Barriers can also provide opportunities to create a bridge. One of the most effective NBAs evaluated was the beach cleans and their potential to turn a disabling environment into an enabling one (Wyles *et al*., 2017). The community-building aspect of sea swimming at Salthill in Galway led to the improvement of facilities such as the addition of the swim buoys, further encouraging participation. As well as beach cleans, NBAs like those run by Ebb and Flow, Sailing Into Wellness and Liquid Therapy instil a sense of ocean awareness and essential water safety skills, contributing to an enabling environment.

5.15 Implications for Access to and Use of Healthy Public Spaces

The evaluation of NBAs has highlighted their cross-sectoral value in addressing individual health, social and environmental issues. NBAs should be considered within the National Physical Activity Plan as well as the co-benefits of community and environment outlined in the National Biodiversity Action Plan 2017–2021. Like Natural England's Outdoors for All programme in the UK, there is potential through Healthy Ireland to encourage cross-departmental government policies that ensure that "everyone should have fair access to a good quality natural environment" (Bragg and Atkins, 2016). Findings emphasise the important social cohesion benefits as well as individual wellbeing outcomes of NBAs. This has wider implications for initiatives such as Tidy Towns, Green Campus/Green Schools and Workplace Wellbeing.

Private land ownership and lack of public spaces is an issue for the delivery of NBAs and was identified, across all areas of work, as a barrier. Current land use and planning limits where and how organised group NBAs, especially hiking/walking, can take place. This can limit innovation and the ability to roll out important community-based initiatives such as forest schools, as an educator told us: "forest school practitioners struggle to gain access to woodlands". Access to clean, safe and healthy environments is also an issue, especially for blue space. Ireland is celebrated for its unique coastal and inland waters, with the word "pristine" frequently used in advertising and tourism brochures. Unfortunately, there is a mismatch between these values and the quality of service provision when it comes to blue space. Bathing water quality (BWQ) is identified as a major barrier, especially in urban areas. In 2019 the EPA surveyed 147 bathing water locations, finding nine that were of sufficient quality, and five that failed to meet the minimum standard required under the Bathing Water Regulations (EPA, 2020). Four of these are at major urban centres, including Dublin and Galway, with the fifth site at Lilliput, Lough Ennell, a known site for recreational activities including boating, swimming and watching starling murmurations. Many of these are locations that have been classed as poor bathing waters previously, with several issues resulting in the "poor" classification. Merrion Strand and Portrane remained in poor condition for another consecutive year (Merrion Strand 5 years; Portrane 4 years). In 2019 Dublin City Council set up a taskforce to address the issues underpinning the poor water quality, and Merrion Strand will be declassified as a bathing location. This diminishes access to the wide range of health benefits blue space has to offer and turns health-enabling environments into risky environments for humans and the rich diversity of other species that inhabit these places.

There must be greater attention to how risk, especially pollution and the effects of climate change (increasingly unpredictable weather, rising sea levels, flooding, etc.), might affect therapeutic use of blue and green spaces (Pitt, 2019). Pitt (2019) found that degraded or polluted urban waterways were associated with unpleasant feelings and negative sensory aesthetics (dirty, smelly, rubbish everywhere). In this study, all stakeholders agreed a major barrier to engaging with nature was "when there is litter everywhere, or facilities are neglected, that can turn people off". The restoration of safe access to all bathing sites and strict requirements to ensure excellent BWQ standards is urgent and essential.

The growing use of blue space year-round, especially for open water swimming, highlights the inadequacy of current monitoring of BWQ, which is limited to summer months. Year-round, real-time monitoring by local authorities is needed. Opportunities exist for

citizen science initiatives and use of smart technology, whereby those actively engaged in blue space can monitor and collect data, or infrastructure such as the swim buoys in Galway could act as sensors, collecting environmental data (this is currently being explored by a community group in Galway).

We encourage a “Leave No Trace” approach to all NBAs, as our stakeholders identified litter, pollution and disturbance to the natural environment as a major barrier to connecting with nature for health and wellbeing. The adoption of “Leave No Trace” reduces our impact on the environment and promotes a sense of stewardship and appreciation for the natural world. For more, visit leavenotraceireland.org.

5.16 NBA Conclusions/Summary

This area of work acted as a “living lab” as it utilised an expert group to assess the potential benefit of mobilising NBAs as part of a response to maintain or restore health and wellbeing. It was not a medical intervention, but it adds to the literature on nature-based solutions described in Chapter 2, and builds on the values, barriers and bridges identified in Chapter 3 and the healthy future spaces envisaged in Chapter 4.

This is the first study to assess the effects of engaging with nature for our health and wellbeing in Ireland. Findings highlight the need for and importance of greater engagement with health services and outdoor providers about opportunities to participate in NBAs locally to promote and restore health and wellbeing, as well as the need for greater monitoring and evaluation of NBAs. The Delphi process provided inclusive insight from a range of experts across the multidisciplinary field of NBAs. Experts had the opportunity to make individual evaluations and then come together to discuss and challenge bias and reframe their own perspective. This participatory aspect is a modified version of Delphi methods. The expert group suggested that the creation of an “opportunities toolbox” with reference to indicators and the benefits for individuals and activities, as well as the opportunity for outdoor practitioners and volunteers to share their experiences, might be useful for providers and health professionals in addition to other storytelling mediums such as podcasts and short films. If prescribers do not know what is available, they will not be able to offer it for people who might benefit most. With this in mind, we designed a toolkit to highlight the benefits and outcomes of some NBAs (see Chapter 6). The toolkit is available from the funding organisations.

Alongside in-depth survey evaluations of various NBAs in blue and green spaces, we sought to illustrate the stories behind the figures, and to include the voices of those actively engaged in creating health-enabling places and experiences in nature. Stories are what give meaning to place and our connection to places. The need for stories and storytelling was identified in the expert workshop (Chapter 5), the backcasting workshops (Chapter 4) and in interviews (Chapter 3) as one way to engage health professionals and HSE practitioners, including those who might be in a position to offer social or nature prescribing as an alternative or complementary treatment and/or health-promoting measure. This could help address the need to shift from acute, primary care to prevention and community-based models of health. These findings have relevance for policies seeking to address social isolation, and present NBAs as one way to enhance social connection through engaging with nature, as well as offering other benefits such as deepening appreciation, awareness and protection of the natural world around us.

6 Natural Environment and Health Engagement Toolkit

6.1 Introduction

A variety of toolkits exist within the health, planning and architectural, and ecology professions. They range from valuing nature to stakeholder engagement toolkits. There is no single toolkit for practitioners, community groups and individuals on ways to connect with nature and the environment to benefit health and wellbeing that combines aspects of all of the sectors listed above. By integrating user-based information with activities the general public can relate to, in accessible language, this element of work builds on the summary of evidence (Chapter 2) to provide practitioners and the general public with a toolkit that emphasises the opportunities to use nature and the environment to benefit health. Throughout the toolkit there are tips and suggestions that could be helpful for planners, architects, engineers, local authority staff, and health promotion and other health professionals. The NEAR Health team identified that, as there is a lack of accessible how-to guides for a range of stakeholders, there is a need for user-based accessible guides and pathways to engagement. The aim of this chapter was to review the material from the previous chapters, and existing toolkits, to create a guide to raise awareness of nature-based solutions in daily lives.

6.2 Methods

An internet-based search for toolkits relating to healthy environments and healthy communities and incorporating nature engagement and community action was undertaken. A spreadsheet was designed to capture key features, such as summary details and format, the context, need for or application of the toolkit, and whether or not it explicitly referred to the evidence base. Use of and reference to the toolkits in published literature and in practice was determined. Evaluation criteria were collated, such as the structure and whether or not information was provided on who a toolkit was intended for, why it had been created and how to use it. Accessibility was a key requirement, so the use of language, images and case studies within the toolkits was ascertained. The NEAR Health team held a workshop to evaluate the toolkits and critically review and synthesise the features that worked best. During the workshop, the team incorporated learning points in the NEAR Health toolkit relating to the experiences of stakeholder engagement, participative co-creation and collaboration that have been key features of the NEAR Health project.

6.3 Results

Sixteen toolkits were found; these ranged from toolkits for community engagement and stakeholder engagement to toolkits on workplace wellbeing through nature, community resilience and health promoting places (Table 6.1). This list is not exhaustive; it represents the toolkits that were found during the searches. Many toolkits had similar features. Having reviewed the characteristics and features of each, there was no single toolkit available that included all of the aspects shown to be desirable by the NEAR Health project and its stakeholders. The evaluation criteria were useful to show commonalities and differences, and provided an easy way to compare the different toolkits.

6.4 Discussion

This chapter aimed to review the process and the results of each element of work to create an accessible guide. The team identified the need to find, collate and review existing toolkits. NEAR Health staff and an intern devised the criteria for evaluation. The evaluation criteria were essential, as they enabled the team to quickly compare different toolkits. Other sources of support were available. The website What Works Wellbeing (https://whatworkswellbeing.org/) was used extensively in terms of ways to summarise and present key points, as the contributors have carefully considered what works and how to explain this in accessible language. The initiative aims to improve the way government and other public sector organisations create, share and use (or “generate, translate and adopt”) high-quality evidence in decision-making. They also recommend effective strategies to create, share

Table 6.1. Identified toolkits and where they can be accessed on the internet

Title	Source
Building Healthy Places Toolkit	http://bhptoolkit.uli.org/ (accessed 7 September 2020)
Are We Ready? A Toolkit for Academic–Community Partnerships	https://engageforequity.org/tool_kit/other-cbpr-community-engagement-resources/ (accessed 7 September 2020)
VicHealth Partnerships Analysis Tool	https://www.vichealth.vic.gov.au/media-and-resources/publications/the-partnerships-analysis-tool (accessed 7 September 2020)
BiodivERsA Stakeholder Engagement Handbook	http://www.biodiversa.org/stakeholderengagement (accessed 7 September 2020)
Common Cause Communication: A Toolkit for Charities.	https://valuesandframes.org/resources/CCF_communications_toolkit.pdf (accessed 7 September 2020)
30x30 Nature Challenge. Workplace Toolkit	https://davidsuzuki.org/take-action/act-locally/one-nature-challenge/ (accessed 7 September 2020; general); https://www.usgbc.org/event/2018-usgbc-community-nature-challenge#work (accessed 7 September 2020; for workplaces)
Framing Nature Toolkit	https://publicinterest.org.uk/nature-toolkit/ (accessed 7 September 2020)
#NatureForAll Social Media Toolkit	http://natureforall-campaign.squarespace.com/s/Social-Media-Toolkit-_FINAL.pptx (accessed 7 September 2020)
A practical guide to values and frames in conservation	https://publicinterest.org.uk/download/framing_nature/Common%20Cause%20for%20Nature%20-%20Practitioners%20Guide.pdf (accessed 7 September 2020)
Engaging Young People in Conservation: A Toolkit for Site Support Groups	https://www.birdlife.org/sites/default/files/BL_Education-toolkit.pdf (accessed 7 September 2020)
Developing a checklist for intersectoral partnerships for health promotion	https://www.researchgate.net/publication/280573639_Developing_a_Checklist_for_Intersectoral_Partnerships_for_Health_Promotion (accessed 7 September 2020)
Dose of Nature Evidence Report	https://nhsforest.org/sites/default/files/Dose_of_Nature_evidence_report_0.pdf (accessed 7 September 2020)
Heritage Engagement Toolkit for Waterway Communities	Currently not available online. Contact Waterways Ireland for further information
Assessing Strategic Partnership: The Partnership Assessment Tool	http://www.who.int/management/partnerships/overall/Partnership%20tools-en.doc (accessed 7 September 2020)

and use high-quality evidence in decision-making, including take-home messages, depending on the amount of time or budget available. The NEAR Health team co-created the toolkit based on the key questions that underpinned the research project and that had been used to engage with stakeholders throughout the project. The toolkit was influenced by learning from stakeholders and the experiences gained during the NEAR Health project. Boundary spanning is increasingly used to find ways of linking evidence, policy and practice (de Leeuw *et al*., 2018; Posner and Cvitanovic, 2019; Goodrich *et al*., 2020).

6.5 Summary

The NEAR Health toolkit (available from the EPA and HSE) has been devised to assist communities and individuals to identify:

- the relationship between nature, health and wellbeing;
- how people experience the link between nature and health;
- how to co-create healthy future communities and health-enabling environments;
- how to connect people with nature (including tools to capture outcomes).

7 Implications for Policymakers, Practitioners and Researchers, and Recommendations

7.1 Introduction

In this chapter we review the findings about how people value nature and blue and green spaces, what they envision as healthy future environments, and how NBAs benefit health and wellbeing, and relate them to recommendations for policymakers, practitioners and researchers. We consider how these findings are relevant for existing policies and practice in Ireland (Table 7.1).

7.2 Implications for Policy Integration and Partnership Building

Throughout each element of work, we have highlighted where there are opportunities to build on or to explore partnership opportunities, as a collaborative approach often brings diverse people together. Here, we summarise where, across the main research questions, these aspects are directly relevant to existing policies and other instruments in Ireland, thus offering additional opportunities to connect nature, health and wellbeing in Ireland (see Table 7.1). Working from left to right, the table details key intersections between relevant instruments in Ireland and the questions that we asked. The first column indicates the relevant instrument; the second column summarises relevant views, values and perceptions that stakeholders voiced to us; the third column outlines relevant aspects of the healthy futures co-created by communities; the fourth column outlines relevant NBA benefits; and the final column highlights additional opportunities. In some cases, where there is overlap, the details have been merged.

Table 7.1. Relationship between the questions investigated by the NEAR Health team (how to engage people with their blue and green spaces for health and wellbeing, how communities can co-create a healthy future environment around them, and how to connect people to nature for health and wellbeing) and relevant policies, plans and frameworks in Ireland

Plans, policies, frameworks and strategies	Engaging people with their blue and green spaces for health and wellbeing (values)	Co-creating a vision for your blue and green spaces in terms of health and wellbeing	Connecting with blue and green spaces: nature-based solutions for health and wellbeing	Additional synergies
National Biodiversity Action Plan	People want to know more about biodiversity. Taking part in locally led NBAs could be an accessible way to deepen people's understanding of biodiversity nearby and meet NBP Target 3.1.	Co-created visions using collective intelligence are opportunities to build support for and mainstream biodiversity across decision-making actions (NBP Target 1.1).	NBP Target 3.1 is closely related to NBAs (e.g. nature walk, bat monitoring). Added value if links are established with clean-ups and other activities through, for example, the National Physical Activity Plan (Healthy Ireland, 2016), Get Ireland Walking (2020), A Healthy Weight for Ireland: Obesity Policy and Action Plan 2016–2025 (Department of Health, 2016), Connecting for Life (national suicide strategy; Department of Health, 2015).	Potential to expand swim programmes for beginners with aquatic nature experiences. Opportunity to create a custodian of care lobby around Objective 5 (NPWS, 2017).

Table 7.1. Continued

Plans, policies, frameworks and strategies	Engaging people with their blue and green spaces for health and wellbeing (values)	Co-creating a vision for your blue and green spaces in terms of health and wellbeing	Connecting with blue and green spaces: nature-based solutions for health and wellbeing	Additional synergies
A Healthy Weight for Ireland: Obesity Policy and Action Plan 2016–2025[a]	Participants told us that emphasising the benefits for health is a good way to get people out, while many recognised the physical and mental health benefits from being out in nature.	In the visions of their healthy future environments, people saw themselves growing their own food or sharing a communal plot, which they would walk or cycle to.	NBAs can deliver health benefits, especially for those who dislike walking and other physical activities, without the potential stigma associated with some health issues. Social cohesion benefits, as people connected with others while walking, as well as the motivation to keep walking once they started. Noticing nature was an effective motivator. People gained a sense of fulfilment, a feeling of worth, as well as a connection to themselves and others. NBAs helped people to feel connected in many ways to nature, to people, to the wider community.	Many activities that can engage people to move more are not primarily health activities but they have physical health benefits. People may be motivated to contribute to clean coasts or survey wildlife and be more active without feeling stigmatised.
National Physical Activity Plan[b]	People emphasised that nature amplified the mental and physical health benefits. Others perceive that they are not fit enough to take part in activities.	Walking, cycling, swimming and gardening were the activities that most people described, linking it to a sustainable way of living.		
Sharing the Vision: A Mental Health Policy for Everyone[c]	People recognised that they were driven to go out, to be in nature, as their mental health suffered without it.	Healthy futures were empathic communities that embodied natural spaces, with social and physical supports such as a helping hand or a place to sit and talk and be.		Collaborations have already been instigated by Mental Health Ireland and Coillte but this could be extended to other groups and organisations.
Connecting for Life (national suicide strategy)[d]	People valued the mental health benefits from connecting with nature.	Healthy futures saw people connected to each other and to nature.		Taking part in NBAs deepened people's awareness of their ability to contribute to society.
Reducing Harm, Supporting Recovery: A Health-led Response to Drug and Alcohol use in Ireland 2017–2025[e]	Some of the people in recovery from addiction emphasised how nature helped them feel calm and in control, and helped their head to stop racing.	Connectedness and empathy are features of healthy communities. These would support and empower a health-led/social justice response.	Sailing programmes have been shown to develop personal skills including leadership. Other NBAs could also help contribute to actions listed within this policy.	
National Planning Framework (NPF)[f] (shaping sustainable communities)	Individuals and communities need to be supported to ask for walking and cycling trails, in balance with nature and the sense of place.	Healthy futures included social and communal nature spaces and gardens, as well as perennials planted for pollinators, and less need to rely on a car to drive to a shop. Communities can use template (see Figure 4.4) as a discussion starter to decide what they want from nature for their community.	NBAs can facilitate social cohesion and so contribute to the society idealised within the NPF. Planning needs to incorporate spaces for nature and people that are accessible in each town and city so that people can live healthier lives and connect with nature near to their home.	Template for a healthy future environment could be applied in collaboration with the Social Inclusion and Community Activation Programme. Opportunities to connect communities with their healthy blueways/ greenways, cultural spaces with cross-cutting programmes, e.g. swimming programmes connected to water literacy, Irish Water, Leave No Trace and aquatic biodiversity.

Table 7.1. Continued

Plans, policies, frameworks and strategies	Engaging people with their blue and green spaces for health and wellbeing (values)	Co-creating a vision for your blue and green spaces in terms of health and wellbeing	Connecting with blue and green spaces: nature-based solutions for health and wellbeing	Additional synergies
Marine Strategy Framework Directive (MSFD) plan for Ireland[g]	People hold a range of values in relation to the marine environment. People expressed these in relation to cultural, environmental, aesthetic, emotional and spiritual benefits, as well as economic benefits.	Healthy futures recognise that diverse stakeholders can play their part at national and local levels, linking this to an opportunity for greater partnership working, and full implementation of all environmental legislation.	Effective programme run by Clean Coasts/An Taisce with demonstrable health and wellbeing outcomes for participants. Clean Coasts/An Taisce and Tidy Towns could work with Healthy Ireland, Get Ireland Walking and the National Biodiversity Data Centre to provide additional opportunities for citizen science and health and wellbeing benefits.	
Healthy Workplace Framework[h]	Nature helps people manage work-related stress. Recognise the restorative value of nearby nature for those who work in high-stress environments.	Healthy futures saw workplaces and schools being connected by pollinator planting, community orchards and cafes. These spaces were accessible and within easy reach and were connected.	The expert group recognised the value of NBAs in the workplace for their health and wellbeing benefits, including personal development and connectedness to others.	Added social cohesion, citizen science and place-based benefits if organisations and workplaces carried out NBAs.
Social Inclusion and Community Activation Programme (SICAP)[i]	"Nature doesn't judge." People new to Ireland felt that nature helped give them a place.	Healthy futures are inclusive and empathic and service led. Some action plans included trade banks and offers of skill swaps.	Connectedness to self, to others, to the community and to nature were outcomes for many NBAs. People had feelings of worth after taking part in NBAs.	Opportunity to collaborate with local community development committees and other PPNs to apply the healthy visions framework.
National Countryside Recreation Strategy;[j] Leave No Trace[k]	"Recreation doesn't have to be high energy, you can go for a walk with the dog." Facilities, if provided, need to be maintained, as people were deterred by dumping, litter and vandalism.	Healthy futures included nature-based trails and festivals to celebrate nature and community. Leave No Trace principles were embedded.	NBAs provide people with health and wellbeing benefits as well as the opportunity to connect with others, a deeper connection with nature and a greater awareness of the environment.	Recreation needs to be doable at home, as well as there being the option to travel. NBAs could be developed within communities as part of recreation and tourism initiatives.

[a]**Department of Health, 2016.**

[b]**Department of Health and Department of Transport, Tourism and Sport, 2015.**

[c]**Department of Health, 2020.**

[d]**Department of Health, 2015.**

[e]**Department of Health, 2017.**

[f]**Government of Ireland, 2018b.**

[g]**Marine Institute, 2017.**

[h]**Department of Health, 2019.**

[i]**Department of Health, 2018.**

[j]**Department of Community, Rural and Gaeltacht Affairs, 2018.**

[k]**Available online: https://www.leavenotraceireland.org/ (accessed 9 September 2020).**

8 Conclusions and Overall Recommendations

8.1 Conclusions

The NEAR Health team set out to determine people's values (including barriers and bridges) in relation to nature, health and wellbeing. People told us how much they value nature and the environment for their health and wellbeing; however, they highlighted barriers to the use of blue and green spaces. There is evidence of a growing disconnect and detachment from natural blue and green spaces in Ireland as our ecosystems increasingly come under threat from human pressures. This is particularly evident among those not currently engaged with blue and green spaces. This disconnect from natural environments poses risks to human health and wellbeing.

Stakeholders were asked what would help to engage people with blue and green spaces and how any identified barriers could be overcome. They confirmed that an understanding of nature and its values, together with increased accessibility, are effective ways to overcome the identified barriers. We need to prioritise, protect and promote access to blue and green spaces. Communities in rural and urban areas need a more dynamic approach to the sustainable use and protection of blue and green spaces that integrates ecological functioning with their experiences.

Connecting with nature helps us to make sense of the world. Being in or carrying out activities in nature benefits our health and wellbeing, makes us feel more connected to one another and helps us to care for the environment, but not everyone has an equal opportunity to connect with nature. Shared public spaces and environments must consider the needs of the greatest possible number of people and the most vulnerable. A multifaceted approach is required to persuade individuals to prioritise time and activities in outdoor space, ranging from a better work–life balance to supports and empowerment. NBAs provide several ways to connect with nature, relevant to different needs, and offer people an accessible way to care for the environment.

8.2 What Works Well

In this section, we summarise what worked well. We outline the main findings and key messages under the following headings: valuing our blue and green spaces, individual health and wellbeing, social connection and wellbeing, accessibility and feasibility of NBAs, and opportunity for citizen science initiatives.

8.2.1 Valuing our blue and green spaces

- We need to prioritise, protect and promote access to blue and green spaces.
- The findings highlight the importance of valuing blue and green spaces for their social, spiritual, emotional and environmental benefits, as well as economic benefits.
- Nature pathways and walking routes are not just about physical fitness but are also about responding to and being inspired by the beauty in nature and scenic landscapes, and expressing emotion.
- Nature and NBAs in local, easily accessible blue and green spaces offer important health and wellbeing benefits, reducing the need for resources associated with transport, etc.

8.2.2 Individual health and wellbeing

- Time spent in nature is restorative and can complement existing therapies and healthcare treatments to enhance health and wellbeing. In the words of an educator: "There is also wildness in everyday recovery environments."
- Evidence shows that direct experiences of nature can enhance our sense of wellbeing and benefit our physical and mental health, especially by reducing anxiety.

8.2.3 Social connection and wellbeing

- Interpersonal as well as individual effects were evident, with a strong emphasis on social connection, sense of belonging and interaction with others who have shared experiences.

- Shared experiences in nature can lead to greater social connection and empathy.
- Small simple actions for the environment, such as beach cleans, can help to foster a greater sense of social wellbeing and community.
- Blue and green spaces in Ireland have high potential for nature-based interventions that can help foster a greater sense of connectedness (with self, others and nature), as well as promote an ethic of care.

8.2.4 Accessibility and feasibility of nature-based activities

- Evaluation of NBAs has highlighted their cross-sectoral value in addressing individual health, social and environmental issues.
- Planning NBAs must consider people's expectations and take into account how people's perceptions might hold them back, "People's perceptions hold them back – they think they can't go out because it is raining or outdoor exercise is only for fit people." One way is to focus on creating an inclusive and enabling safe space when introducing people to new nature-based experiences.
- Passive activities or those requiring few technical skills or little equipment, such as observing nature, walking or outdoor swimming, deserve greater attention, especially for less able-bodied cohorts and in response to an increasingly stressed-out society. There are minimal, low or no costs involved in many of these activities.
- We have begun to identify some of the mechanisms or pathways from NBA inputs to outputs (health outcomes), which aids evaluation and optimisation of nature-based interventions and solutions. NBAs or other forms of nature prescribing are not a single intervention but a pathway and series of relationships, all of which need to function to meet diverse needs.

8.2.5 Opportunity for citizen science initiatives

- These experiences can be enhanced through group activities in nature and by participating in community-based and citizen science initiatives. This can also help to establish or deepen a connection to place, as people get to know their local area and find wonder in the wildlife around their homes, at work or around schools, hospitals and other places. The National Biodiversity Data Centre (https://www.biodiversityireland.ie) runs several recording schemes.
- There is tremendous potential to adopt citizen science approaches within existing outdoor activities. For example, beach cleans can complement other NBAs and be extended to include street cleans, and clean-ups can take place in woodlands, rivers and lakes.

8.3 Recommendations for Future Action

We grouped our recommendations for future action into (1) partnership building, (2) participatory processes and inclusive practices, (3) funding, (4) promotion, awareness and education, (5) access, training and service provision, (6) policy integration, (7) impact evaluations and (8) research gaps.

8.3.1 Partnership building

- Recognise the importance and value of nature and place as a determinant of wellbeing (Government of Ireland, 2016, 2018b). This presents an opportunity for struggling healthcare systems to seek and incorporate new, alternative and cost-effective services.
- Enhance the awareness of healthcare providers regarding the availability, opportunity and potential benefits of NBAs for their clients/patients.
- Integrate mental health models, such as Havin' A Laugh, that promote mental health and nature engagement with outdoor activities, as they have high potential to enhance recovery rates. However, this will require buy-in from health professionals/general practitioners to create more awareness of what is available and how to access it, as well as evidence of the effectiveness of NBAs.
- Build partnerships within regions between outdoor activity providers and local health services.
- Create networks of support for outdoor practitioners and volunteers to be able to share their experiences, etc., at a community level.
- Consider pro-environmental actions and activities (e.g. biodiversity, pollinator plan, clean-ups, bat walks) within the National Physical Activity Plan,

as well as the co-benefits of community and environment outlined in the National Biodiversity Action Plan 2017–2021.

8.3.2 Participatory processes and inclusive practices

> Peer support and social events are key to engaging people in nature. (Provider)

- Engage people across the life course in NBAs and in efforts to connect people and communities with nearby blue and green spaces. Prioritise potential opportunities for young adults (18–25 years), who are poorly considered when it comes to mental health support and services, as well as elderly individuals and other marginalised or overlooked groups.
- Encourage and support greater diversity and inclusion of minority groups in NBAs in the use of blue and green spaces, in particular those with diverse needs and abilities, as NEAR Health stakeholders told us that "in Ireland, we do not cater for people with physical disabilities who want to access nature".
- Include pro-environmental actions and activities (e.g. biodiversity surveys, pollinator planting, clean-ups, bat walks) within Get Ireland Active, the government's National Physical Activity Plan, as well as the co-benefits of community and environment outlined in the National Biodiversity Action Plan 2017–2021.
- Health professionals, researchers, local community development committees and PPNs should advocate for NBAs delivered through a community-based participatory research design. Participants and their engagement are central to the success of NBAs.
- Support the co-creation of community-based NBAs that highlight different ways of engaging with nature in a responsible way, locally and in different environments. Stakeholders told us that "we do not have enough events that show different ways of engaging with nature".

8.3.3 Funding

- Increase financial support for and awareness of nature-based social enterprises, as NBAs are limited by traditional funding mechanisms.
- Make NBAs accessible and affordable. Funding for the adoption of "nature prescribing", such as voucher schemes, enables participation by those who might not otherwise be able to access NBAs (e.g. unemployed) or those who might benefit most from NBAs (e.g. those with mental health issues, those who are socially isolated).

8.3.4 Promotion, awareness and education

> Education outdoors, in situ, on the shore has the best effect on kids because the natural environment provides the content and inspiration. (Educator)

- Take account of diversity and inclusion strategies when promoting outdoor recreation and tourism activities and how these experiences are marketed to ensure that they are accessible.
- Promote non-competitive forms of engagement – these are as important as the dominance of fitness and weight loss as motivators for health, if not even more so.
- Make information on local health services and supports available to outdoor practitioners.
- Provide and communicate audio-visual water safety information and signage for those with sight/hearing difficulties or those whose first language is not English.
- Create, collate and celebrate stories and experiences to show why nature matters across sectors in Ireland, and overcome a siloed approach to health, the environment, communities, tourism and recreation, and the outdoors.
- Consider varied approaches to increase the use of outdoor blue and green spaces and the acceptability of NBAs. There are gender differences in how NBAs are experienced and a lower uptake by men of some NBAs, apart from beach cleans and bat monitoring. A "health by stealth" approach could be one way to overcome the persistent stigma that surrounds mental health in Ireland.
- Monitor the use of and protect outdoor blue and green spaces to ensure that they do not suffer degradation and apply sustainable innovations and best practices.

8.3.5 Access, training and service provision

> There are not enough certified trainers for people with disabilities in aquatic sports. (Policymaker)

- Support and provide transport and local links to ensure the ability to access and experience nature for all. This positive experience can be limited by lack of transport links, especially in rural areas. The continued support for and provision of local transport are vital.
- Address access issues, as private land ownership and a lack of public spaces impede the delivery of NBAs.
- Monitor bathing sites in real time and throughout the year. Access to bathing sites and requirements to ensure excellent BWQ standards are essential and require year-round, real-time monitoring by local authorities. Currently, monitoring is not carried out in real time and is limited to the summer months.
- Provide facilities and develop approaches to respond to a diversity of needs and differently abled bodies at popular public spaces nationwide, e.g. beach wheelchair facilities at watersports locations and bathing sites.
- Make information on local health services and supports available to outdoor practitioners.
- Increase the provision of training by governing sporting and recreational bodies – as demands increase for NBAs and nature prescribing, it will be necessary to mainstream inclusion practices and training to facilitate nature encounters for health and wellbeing.
- Training in biodiversity and cultural heritage (e.g. for outdoor walking groups) enhances a sense of place.

8.3.6 Policy integration

- Plan for and invest in greater access to and responsible use of outdoor public spaces. The National Planning Framework aims to enhance the wellbeing of everyone who lives in Ireland, and to build a fairer, more equal society where everyone can realise their potential, but it does not explicitly refer to planning sustainable access to nature and NBAs.
- The reference within the National Planning Framework to a general network of green spaces in Dublin, including the Phoenix Park and other parks, Dublin Bay and the canals, is welcome, but this is also a missed opportunity to do likewise for many towns and cities. Committing to provide segregated cycling and walking facilities and networks in cities and towns is welcome, but rural areas need these facilities too.
- Initiate, and increase the use of, NBAs, as they have cross-sectoral value in addressing individual health, social and environmental issues.
- Consider NBAs within Healthy Ireland's Get Ireland Active! The National Physical Activity Plan for Ireland, as well as the co-benefits of community and environment outlined in the Biodiversity Action Plan.
- Harness the potential of Healthy Ireland to encourage cross-departmental government policies that ensure that "everyone should have fair access to a good quality natural environment", similar to Natural England's Outdoors for All Programme in the UK.
- Include the value of connecting with nature to benefit our health and wellbeing in the National Policy Objective 59 on biodiversity, and other such policies within the National Planning Framework.
- Outcomes for social cohesion have wider implications for the implementation of similar initiatives, such as Tidy Towns, An Taisce Green Communities/Green Campus/Green Schools and Workplace Wellbeing.

8.3.7 Impact evaluations

> We need to share diverse perspectives of our experiences of nature. (Participant)

- Address local contexts within nature-based health interventions to assess the circumstances in which outcomes are achieved and the transferability of such findings.
- Measure more than "what" worked well; also evaluate "how" and "why" success or failure happened.
- Include holistic and indigenous models of wellbeing in assessments, as wellbeing measures are often highly individualised and may fail to account for the socio-ecological factors of

disadvantage and social inequality (Brownett, 2018; Mansfield *et al*., 2018).
- Follow-up evaluations and more longitudinal studies could assess whether or not the benefits associated with participation in blue and green spaces are sustained, as well as how this relationship to outdoor spaces could vary across the life course, particularly for elderly cohorts.

8.3.8 Research gaps

- What are the specific qualities of blue and green spaces that are particularly life enhancing (e.g. the feeling of weightlessness in salt water and the connective properties of blue space); why do we gain these benefits and what are the mechanisms at play?
- What are the pathways and mechanisms needed to access and participate in NBAs that may appeal to those who are at present most excluded and which support people in forming and achieving personal goals in relation to NBAs, community engagement and wellbeing?
- What are the cultural components and values of nature connection and how might these intersect with other determinants of health such as gender, race and ethnicity?
- What are the socio-economic determinants of access to and use of blue and green space and how do we ensure equitable access year round and throughout the life course (Domegan, 2020)?
- What are the therapeutic benefits of wetlands and inland and urban waterways, and what is their potential to extend the benefits of blue care to communities that do not have access to the coast?
- Blue space, blue health and blue care are in the early stages of development as serious treatments and deserve greater research attention, especially given Ireland's aquatic potential.
- How do we balance ensuring access to nature with increasing and diverse pressures on natural ecosystems?

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Abbreviations

BSI	Blue space intervention
BWQ	Bathing water quality
EC	European Commission
EEA	European Environment Agency
EPA	Environmental Protection Agency
EU	European Union
EWB	Eudaemonic wellbeing
HSE	Health Service Executive
HWB	Hedonic wellbeing
NBA	Nature-based activity
NEAR Health	Nature and Environment to Attain and Restore Health
OECD	Organisation for Economic Cooperation and Development
PCA	Principal components analysis
PPN	Public participation network
SDG	Sustainable Development Goal
UN	United Nations
WHO	World Health Organization

AN GHNÍOMHAIREACHT UM CHAOMHNÚ COMHSHAOIL
Tá an Ghníomhaireacht um Chaomhnú Comhshaoil (GCC) freagrach as an gcomhshaol a chaomhnú agus a fheabhsú mar shócmhainn luachmhar do mhuintir na hÉireann. Táimid tiomanta do dhaoine agus don chomhshaol a chosaint ó éifeachtaí díobhálacha na radaíochta agus an truaillithe.

Is féidir obair na Gníomhaireachta a roinnt ina trí phríomhréimse:

Rialú: *Déanaimid córais éifeachtacha rialaithe agus comhlíonta comhshaoil a chur i bhfeidhm chun torthaí maithe comhshaoil a sholáthar agus chun díriú orthu siúd nach gcloíonn leis na córais sin.*

Eolas: *Soláthraímid sonraí, faisnéis agus measúnú comhshaoil atá ar ardchaighdeán, spriocdhírithe agus tráthúil chun bonn eolais a chur faoin gcinnteoireacht ar gach leibhéal.*

Tacaíocht: *Bímid ag saothrú i gcomhar le grúpaí eile chun tacú le comhshaol atá glan, táirgiúil agus cosanta go maith, agus le hiompar a chuirfidh le comhshaol inbhuanaithe.*

Ár bhFreagrachtaí

Ceadúnú
Déanaimid na gníomhaíochtaí seo a leanas a rialú ionas nach ndéanann siad dochar do shláinte an phobail ná don chomhshaol:
- saoráidí dramhaíola *(m.sh. láithreáin líonta talún, loisceoirí, stáisiúin aistrithe dramhaíola)*;
- gníomhaíochtaí tionsclaíocha ar scála mór *(m.sh. déantúsaíocht cógaisíochta, déantúsaíocht stroighne, stáisiúin chumhachta)*;
- an diantalmhaíocht *(m.sh. muca, éanlaith)*;
- úsáid shrianta agus scaoileadh rialaithe Orgánach Géinmhodhnaithe *(OGM)*;
- foinsí radaíochta ianúcháin *(m.sh. trealamh x-gha agus radaiteiripe, foinsí tionsclaíocha)*;
- áiseanna móra stórála peitril;
- scardadh dramhuisce;
- gníomhaíochtaí dumpála ar farraige.

Forfheidhmiú Náisiúnta i leith Cúrsaí Comhshaoil
- Clár náisiúnta iniúchtaí agus cigireachtaí a dhéanamh gach bliain ar shaoráidí a bhfuil ceadúnas ón nGníomhaireacht acu.
- Maoirseacht a dhéanamh ar fhreagrachtaí cosanta comhshaoil na n-údarás áitiúil.
- Caighdeán an uisce óil, arna sholáthar ag soláthraithe uisce phoiblí, a mhaoirsiú.
- Obair le húdaráis áitiúla agus le gníomhaireachtaí eile chun dul i ngleic le coireanna comhshaoil trí chomhordú a dhéanamh ar líonra forfheidhmiúcháin náisiúnta, trí dhíriú ar chiontóirí, agus trí mhaoirsiú a dhéanamh ar leasúchán.
- Cur i bhfeidhm rialachán ar nós na Rialachán um Dhramhthrealamh Leictreach agus Leictreonach (DTLL), um Shrian ar Shubstaintí Guaiseacha agus na Rialachán um rialú ar shubstaintí a ídíonn an ciseal ózóin.
- An dlí a chur orthu siúd a bhriseann dlí an chomhshaoil agus a dhéanann dochar don chomhshaol.

Bainistíocht Uisce
- Monatóireacht agus tuairisciú a dhéanamh ar cháilíocht aibhneacha, lochanna, uiscí idirchriosacha agus cósta na hÉireann, agus screamhuiscí; leibhéil uisce agus sruthanna aibhneacha a thomhas.
- Comhordú náisiúnta agus maoirsiú a dhéanamh ar an gCreat-Treoir Uisce.
- Monatóireacht agus tuairisciú a dhéanamh ar Cháilíocht an Uisce Snámha.

Monatóireacht, Anailís agus Tuairisciú ar an gComhshaol
- Monatóireacht a dhéanamh ar cháilíocht an aeir agus Treoir an AE maidir le hAer Glan don Eoraip (CAFÉ) a chur chun feidhme.
- Tuairisciú neamhspleách le cabhrú le cinnteoireacht an rialtais náisiúnta agus na n-údarás áitiúil *(m.sh. tuairisciú tréimhsiúil ar staid Chomhshaol na hÉireann agus Tuarascálacha ar Tháscairí)*.

Rialú Astaíochtaí na nGás Ceaptha Teasa in Éirinn
- Fardail agus réamh-mheastacháin na hÉireann maidir le gáis cheaptha teasa a ullmhú.
- An Treoir maidir le Trádáil Astaíochtaí a chur chun feidhme i gcomhair breis agus 100 de na táirgeoirí dé-ocsaíde carbóin is mó in Éirinn.

Taighde agus Forbairt Comhshaoil
- Taighde comhshaoil a chistiú chun brúnna a shainaithint, bonn eolais a chur faoi bheartais, agus réitigh a sholáthar i réimsí na haeráide, an uisce agus na hinbhuanaitheachta.

Measúnacht Straitéiseach Timpeallachta
- Measúnacht a dhéanamh ar thionchar pleananna agus clár beartaithe ar an gcomhshaol in Éirinn *(m.sh. mórphleananna forbartha)*.

Cosaint Raideolaíoch
- Monatóireacht a dhéanamh ar leibhéil radaíochta, measúnacht a dhéanamh ar nochtadh mhuintir na hÉireann don radaíocht ianúcháin.
- Cabhrú le pleananna náisiúnta a fhorbairt le haghaidh éigeandálaí ag eascairt as taismí núicléacha.
- Monatóireacht a dhéanamh ar fhorbairtí thar lear a bhaineann le saoráidí núicléacha agus leis an tsábháilteacht raideolaíochta.
- Sainseirbhísí cosanta ar an radaíocht a sholáthar, nó maoirsiú a dhéanamh ar sholáthar na seirbhísí sin.

Treoir, Faisnéis Inrochtana agus Oideachas
- Comhairle agus treoir a chur ar fáil d'earnáil na tionsclaíochta agus don phobal maidir le hábhair a bhaineann le caomhnú an chomhshaoil agus leis an gcosaint raideolaíoch.
- Faisnéis thráthúil ar an gcomhshaol ar a bhfuil fáil éasca a chur ar fáil chun rannpháirtíocht an phobail a spreagadh sa chinnteoireacht i ndáil leis an gcomhshaol *(m.sh. Timpeall an Tí, léarscáileanna radóin)*.
- Comhairle a chur ar fáil don Rialtas maidir le hábhair a bhaineann leis an tsábháilteacht raideolaíoch agus le cúrsaí práinnfhreagartha.
- Plean Náisiúnta Bainistíochta Dramhaíola Guaisí a fhorbairt chun dramhaíl ghuaiseach a chosc agus a bhainistiú.

Múscailt Feasachta agus Athrú Iompraíochta
- Feasacht chomhshaoil níos fearr a ghiniúint agus dul i bhfeidhm ar athrú iompraíochta dearfach trí thacú le gnóthais, le pobail agus le teaghlaigh a bheith níos éifeachtúla ar acmhainní.
- Tástáil le haghaidh radóin a chur chun cinn i dtithe agus in ionaid oibre, agus gníomhartha leasúcháin a spreagadh nuair is gá.

Bainistíocht agus struchtúr na Gníomhaireachta um Chaomhnú Comhshaoil
Tá an ghníomhaíocht á bainistiú ag Bord lánaimseartha, ar a bhfuil Ard-Stiúrthóir agus cúigear Stiúrthóirí. Déantar an obair ar fud cúig cinn d'Oifigí:
- An Oifig um Inmharthanacht Comhshaoil
- An Oifig Forfheidhmithe i leith cúrsaí Comhshaoil
- An Oifig um Fianaise is Measúnú
- Oifig um Chosaint Radaíochta agus Monatóireachta Comhshaoil
- An Oifig Cumarsáide agus Seirbhísí Corparáideacha

Tá Coiste Comhairleach ag an nGníomhaireacht le cabhrú léi. Tá dáréag comhaltaí air agus tagann siad le chéile go rialta le plé a dhéanamh ar ábhair imní agus le comhairle a chur ar an mBord.

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Nature and Environment to Attain and Restore Health (NEAR Health)

Authors: Caitriona Carlin, Gesche Kindermann, Easkey Britton, Martin Cormican, Christine Domegan, Mike Gormally and Diarmuid O'Donovan

The Nature and Environment to Attain and Restore Health (NEAR Health) project was jointly funded by the Environmental Protection Agency and Health Service Executive to investigate how nature and the environment can help society to attain and restore health. The NEAR Health project team combined environmental, health, social innovation and medical fields to build capacity and develop and transform knowledge for communities, policymakers and practitioners. This project investigated (1) how people value and experience nature, health and wellbeing, (2) the barriers and bridges to nature connection, (3) what people want from their healthy future environment and (4) nature-based activities to benefit people's health and wellbeing. In doing so, the team collaborated with communities to co-create the outcomes of this research.

Identifying pressures

There is a global biodiversity and climate crisis, and we are witnessing unprecedented declines in species and habitats, many of which inhabit or shape what we perceive the natural environment to be. Building on this, NEAR Health, working with communities of place and practice, identified a "wicked problem" in relation to nature connections, sustainable use and care for nature. People's connections with nature are related to environmental quality, as litter and neglected facilities were recognised as barriers or disincentives. Therefore, the quality of blue and green spaces and how they are managed strongly influences people's choices to spend time in them. Aligned with this, although people may recognise that "we are part of nature and we need nature to be healthy," not everyone has equal access and opportunity to engage with healthy, outdoor environments or blue (water) and green (land) spaces. The research highlights the value of investing in and planning for greater access and use of biodiverse outdoor public spaces, especially coastal and urban spaces, in a responsible, ethical and sustainable way.

Informing policy

The NEAR Health project demonstrates to state agencies, regulators and policymakers the role of blue and green spaces to enhance ecosystem and human health and resilience. While some of this is now embedded within the National Planning Framework, NEAR Health findings can further assist the implementation of its Sustainable Communities theme. Communities can use the healthy future framework, which includes action plans that are closely linked to sustainable living. This will also support communities to make transformative changes following the COVID-19 pandemic and adapt to climate change. The findings have direct relevance for Target 3.1 of the National Biodiversity Action Plan. Nature-based activities also contribute to policies such as A Healthy Weight for Ireland: Obesity Policy and Action Plan 2016–2025, the National Physical Activity Plan, Sharing the Vision: A Mental Health Policy for Everyone, Connecting for Life (national suicide strategy), Social Inclusion and Community Activation Programme and the National Countryside Recreation Strategy, including Leave No Trace. Opportunities exist to include citizen science approaches within existing outdoor activities (e.g. to connect the National Physical Activity Plan with monitoring schemes run by the National Biodiversity Data Centre).

Developing solutions

The NEAR Health project identified solutions regarding people's values and perceptions about nature and blue and green spaces. Valuing blue and green spaces for their multiple benefits (i.e. social, spiritual, emotional and environmental, as well as economic benefits) is of critical importance. A solution to the "wicked problem" related to nature connections, sustainable use and care for nature lies in participatory practice, whereby participants codesign their solution through backcasting processes. This cultivates community connectedness and promotes sustainable living. Recognising the lack of accessible "how to" guides, a toolkit was created to share ideas and insights, tools, processes and practices for how we might connect individuals and communities with nature to benefit their health and wellbeing. The toolkit highlights (1) how people value and experience nature, health and wellbeing, (2) the barriers and bridges to nature connection, (3) what people want from their healthy future environment and (4) how nature-based activities can benefit people's health and wellbeing and enable them to develop a deeper connection with their wider community and with nature. Connecting with nature helps people to care more for the environment and promotes positive wellbeing.

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