

Extract from:

BUILDING ON NATURE

Area-based conservation
as a key tool for
delivering SDGs



SDG 3: Good health and wellbeing

Summary for policy makers

Low environmental standards linked to air and water quality are common causes of death around the world. A large proportion of non-communicable diseases and related deaths are attributable to risks related to physical inactivity and obesity. At the same time, millions of people globally suffer from depression, including depression being a leading cause of disability.

- Access to nature and green spaces is known to have a significant role in supporting health and wellbeing, contributing to both physical and mental aspects of health. As such, effective area-based conservation can, and has in many cases already proven to, provide a valuable and cost-effective tool for reducing and managing health risks as part of local to national strategies.
- Protected and conserved areas can be used as tools to improve water and air quality and mitigate heat stress in urban areas.
- Area-based conservation plays a central role in encouraging and supporting physical activity and mental health, with protected area networks around the world providing easy access and infrastructure for recreation, sports and relaxation.
- Natural ecosystems protected by area-based conservation are significant sources of both local medicines and the raw materials for commercial pharmaceuticals.
- Intact and biodiverse ecosystems can slow the transmission of some vector-borne diseases and reduce the risks of zoonotic disease transmission from wildlife and livestock to people.

Building on the health benefits associated with nature, there is a case for authorities to integrate networks of conserved areas as part of overarching approaches to maintaining the health of citizens.

What is the challenge?

The contemporary global challenges to health and wellbeing are manifold, several directly linked to environmental parameters, and access to nature and green spaces.

Unsafe environmental standards:

Poor air and water quality are common causes of death around the world. According to global statistics, air pollution increases the risk of cardiovascular and respiratory disease with an estimated annual death rate of around 7-8 million globally, with highest death rates occurring in Sub-Saharan Africa and Asia and Oceania.^{1,2} Around half of these deaths are due to air pollution outdoors, mainly caused by non-communicable diseases (NCDs) (see below).³ Similarly, inadequate and unsafe drinking water, sanitation and hygiene is associated with 60 per cent of the disease burden from diarrhoea, 100 per cent from infections with soil-transmitted helminths and 16 per cent from protein-energy malnutrition, altogether leading to 870,000 deaths in 2016.⁴

Non-communicable diseases:

According to WHO, 71 per cent of global mortality, about 41 million deaths per year, is due to non-communicable diseases.⁵ A large proportion of these deaths are attributable to risks related to physical inactivity and obesity, diseases linked to outdoor and indoor air pollution (see above), and heat-related strokes and illnesses. According to the UN SDG progress report for 2019, the probability of dying from any of the four main non-communicable diseases (cardiovascular diseases, cancers, chronic respiratory diseases and diabetes) between the ages of 30 and 70 was 18 per cent in 2016.⁶

Mental health: Globally, more than 260 million people of all ages suffer from depression with WHO identifying depression as one of the leading causes of disability.⁷ People with severe mental health conditions are known to die prematurely, even as much as two decades early, due to preventable physical conditions. In the worst case, depression can lead to suicide with – despite the global progress in curbing the trend – close to 800,000 people annually reported as

dying due to suicide. Furthermore, suicide is identified as the second leading cause of death for the young (15-29-year-olds).⁸

Scarcity of medicines: A large proportion of the world's population still relies on medicinal plants collected from the wild, particularly in rural districts with poor access to healthcare but also in cities in many developing countries.⁹ Many medicinal plants are now in short supply, others are subject to large-scale domestic and export markets. More generally, pharmaceutical companies are constantly searching for new drugs to manufacture and still rely to a large extent on genetic material sourced originally from the wild.

Risk of zoonosis: Finally, while the evidence of nature's health and wellbeing related benefits is clear, it also needs to be acknowledged that ecosystems, especially when degraded and fragmented (see following section), can also act as origins of zoonoses (i.e. diseases that can be transmitted from animals to people), with the 2019-2020 COVID-19 pandemic being the most recent reminder of this. Wildlife serve as the origin for over 70 per cent of all zoonotic diseases.¹⁰ Wildlife, like humans, have thousands of naturally occurring microbes, most of which do not cause disease in either wildlife or humans, but a small number of diseases of wildlife "jump" to humans. Lack of immunity or resistance means that when this happens the results can be particularly serious.

Increased contact rates between humans and animals, either in the wild or through trading and eating wild animals, increases the probability of potential pathogens jumping from wildlife to livestock and humans (and in some circumstances, humans to wildlife). Some of these spillover events spread in epidemic or pandemic proportions, such as HIV, Ebola, SARS, MERS, avian flu and most recently COVID-19, etc. In nature, the ecological condition of an area may either buffer or facilitate pathogen shedding within reservoir host species as well as pathogen spreading between hosts. So, for example, unsustainable and frequently illegal levels or types of human actions within and around protected and other conserved areas that

disturb wildlife species and their ecology may lead to amplified pathogen shedding and contact spreading.¹¹

Finally, the above challenges are generally underpinned by overall socio-economic wellbeing, with poverty being a major contributor to health and wellbeing related vulnerabilities around the world. For example, 76 per cent of suicides are found in low- and middle-income countries.¹²

SDG 3 aims to address the above challenges through multiple goals, a number of which can directly benefit from nature and area-based conservation. In particular, SDG 3 foresees by 2030 reducing premature mortality from non-communicable diseases by one third through prevention and treatment (Target 3.4). This includes explicitly cardiovascular disease, cancer, diabetes and chronic respiratory disease. Furthermore, it strives to promote mental health and wellbeing, including reducing suicide mortality rate. The goal is also to reduce child mortality (Target 3.2) and substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination across all age groups (Target 3.9). Finally, as a prerequisite to the above, the goal aims to strengthen the capacity of all countries, in particular developing countries, for early warning, risk reduction and management of national and global health risks (Target 3.D).

How can effective area-based conservation help?

Access to nature and green spaces is known to have a significant role in supporting health and wellbeing, supporting both physical and mental aspects of health. As such, conserved areas can, and in many cases have already proven to, provide a valuable and cost-effective tool for reducing and managing health risks as part of local to national strategies. The ways conserved areas support the delivery of SDG 3 are underpinned or interlinked with the delivery of several other SDGs, including in particular provisioning of food, clean water and sanitation (SDG 2 and SDG 6), guaranteeing the wellbeing of

sustainable cities and communities (SDG 11) and supporting sustainable livelihoods to address poverty (SDG 1).

Improving water quality: Natural ecosystems play an important role in maintaining water supply and regulating water quality, thereby contributing to safeguarding human health.¹³ As highlighted in the chapter on SDG 6, the quality of water flowing from natural forest catchments and wetlands – often protected under different area-based conservation schemes – is generally higher than water flowing through agricultural land, industrial areas or urban settlements.¹⁴ This includes the ability of natural ecosystems to remove nutrient and chemical pollutants and also to reduce microbial contamination in water.¹⁵ The removal of nutrients is of key importance, preventing eutrophication and increased frequency of algal blooms, several of which are toxic. In recognition of this, a variety of actors – from cities and municipalities to businesses – around the world use effective area-based conservation as a means to support safe water supply, reducing the need for artificial treatment.¹⁶

Improving air quality: Conserved areas within and in the vicinity of urban centres function as “clean air oases” for city inhabitants. This is because green spaces have markedly cleaner air than other urban areas. Furthermore, green spaces with tree cover are known to help to remove significant amounts of air pollution, with the amount of leaf area as one of the key characteristics supporting effective removal of airborne pollutants.^{17,18} While any urban green infrastructure can support air quality, larger areas such as urban parks and protected areas around cities are able to offer this benefit at scale.

Reducing heat effects: Increased air temperature in urban areas can lead to increased heat-related stress and illness. Urban vegetation, particularly tree cover, cools the air through evaporation while simultaneously providing shade. Studies show that vegetated areas can cool the surroundings by several degrees, with higher tree and shrub cover resulting in cooler air temperatures.¹⁹ Furthermore, pollutant emissions are often related to air temperatures and consequently

cooler temperatures can also help to lower emission of pollutants. Building on this knowledge, several cities use conserved areas as part of their strategy to manage the impact of heat waves on inhabitants. For example, the cities of Vitoria-Gasteiz in Spain and Zagreb in Croatia use their green infrastructure – including protected areas – as a strategy to manage the urban heat island effects in the area.^{20, 21} The cooling effect of urban vegetation will become increasingly important as climate change causes average temperatures to rise and the incidence of heat waves to increase.

Improving access to both local and global medicines: More species of medicinal plants are harvested than any other natural product²² and over a quarter of known plants have been used medicinally.²³ Many are now obtained from protected areas, having disappeared from the wider landscape, and collection is often subject to particular management agreements with local communities.²⁴

Furthermore, medical drugs from natural products support an industry worth billions of dollars which unfortunately often does not return to conservation. One of the most famous examples of beneficial microorganisms collected from national parks is the thermophile *Thermus aquaticus*, collected from a hot spring at Yellowstone National Park in 1966, it helped in the development of the Polymerase Chain Reaction process widely used in medicinal applications.²⁵ As natural ecosystems come under pressure, the importance of protected areas as sites where researchers can find new genetic material is being recognised. In some cases, this is helping to pay for protected area establishment and management, for instance in Costa Rica where local and international pharmaceutical companies have paid royalties to the protected area system.²⁶ Forests²⁷ and oceans²⁸ are important sources, with both plants²⁹ and animals³⁰ serving as sources for commercially produced medicines. A significant number come from studying Indigenous peoples' medicines,³¹ and there is an important role for local control of resources and local land tenure in ensuring sustainable collection of medicinal plants, perhaps within OECMs.

Improving physical and mental health

Physical health: The role of nature and green spaces in encouraging and supporting physical activity is universally acknowledged. This is known to reduce various risks linked to inactive lifestyles such as obesity, cardiovascular diseases and type 2 diabetes.³² For example, the Lake Hévíz protection area in Hungary protects Lake Hévíz, a waterbody known for its sulphur content and related curative effects and used by the local rheumatism hospital to help to treat its patients.³³ In addition to benefits to physical health, nature and green spaces are also increasingly recognised as vital for relaxation and emotional wellbeing.³⁴

Mental wellbeing benefits linked to nature include improved attention, cognition, sleep and stress recovery, with all these benefits applying across all demographic and socio-economic sectors of population.³⁵ The mental health related benefits provided by protected areas have been estimated as US\$6 trillion per year globally, exceeding the global value of protected area tourism.³⁶ Recognising these benefits, authorities in several countries including Australia, Canada, Finland and Scotland have taken the decision to recognise green spaces – and the network of conserved areas in particular – as part of the country's overarching approach to maintaining the health of their citizens.³⁷

A global study looking at the wellbeing benefits associated with protected areas in over 30 developing countries found out that welfare and, in particular, the health of children were positively impacted by the vicinity of protected areas.³⁸ This was concluded to be associated with households near protected areas having higher wealth levels (e.g. due to tourism) and a lower likelihood of poverty – by 17 per cent and 16 per cent, respectively – than similar households situated away from protected areas, with positive knock-on effects on child health and development. According to the study, children under five years old living near protected areas with tourism had higher height-for-age scores (by 10 per cent) and were less likely to be stunted (by 13 per cent) than similar children living far from protected areas.

While all green spaces can be a source for physical and mental benefits, protected and conserved areas have a number of characteristics that explicitly support this. Firstly, protected areas commonly have infrastructure and services in place that both encourage and facilitate visitation, including a network of trails, and information, accommodation and catering services.

Infrastructure and services are often also the determining factors for tourism and related revenue that can yield positive impacts on the local health levels as shown above. Secondly, some studies also point to areas with higher biodiversity providing greater restorative benefits across different age, gender or ethnic groups.³⁹

Ecosystem management to mitigate health risks: There is abundant evidence that zoonotic occurrences cannot be viewed in isolation from the human activity that alters natural ecosystems. For example, outbreaks of schistosomiasis – a waterborne disease caused by parasitic worms – are known to be associated with unsustainable use and degradation of ecosystems, with activities such as overfishing, deforestation and alteration of water courses leading to an increase in the parasite's host populations and related increase in the risk of contracting the disease in countries such as Malawi, Cameroon, Kenya and Egypt.⁴⁰

Consequently, protecting the integrity of natural ecosystems through effective area-based conservation can also be seen as a tool to help to reduce the risk of zoonosis in the future.⁴¹ In particular, protecting remaining natural habitats, such as primary forests, can help to reduce the chances of zoonotic disease transmission by preventing the displacement of species and thereby decreasing their contact with people.⁴² For example, avoiding deforestation can reduce risk of malaria and certain other vector-spread diseases.⁴³ In Indonesia, Ruteng Park on Flores protects the most intact submontane and montane forests on the island. Communities living nearby were found to have fewer cases of malaria and dysentery than communities without intact forests.⁴⁴ Furthermore, research has shown that fragmented habitats may stimulate more rapid evolutionary processes and

diversification of diseases.⁴⁵ By safeguarding ecosystem integrity and species diversity, protected and conserved areas can help to bring back stability to natural environments, in this way helping to prevent outbreaks of pathogens.

Approaches that support SDG 3

Almost all types of effective area-based conservation can provide opportunities for supporting health and wellbeing and the delivery of SDG 3. However, some areas are particularly suited for this purpose. As nature's health related impacts are commonly associated with close vicinity to human populations, including easy everyday access to use green areas for exercise, the types of protected and conserved areas most relevant to SDG 3 tend to be those linked to human settlements, in particular in the urban context.

Protected areas

- **Urban nature reserves:** Urban nature reserves provide easy access to green areas and support the delivery of SDG 3 goals ranging from increased air quality and reduced heat stress to physical and mental health. Inevitably, the conservation objective in these cases is less on protecting intact and highly biodiverse ecosystems and more on maintaining or restoring semi-natural areas that provide both some biodiversity conservation and space for people.

- **Protected areas established adjacent to / near cities and other communities:** Urban centres around the world – from Nairobi to Helsinki and Cape Town to Paris – have protected areas nearby, with considerable benefits to the health and wellbeing of urban inhabitants. As in the case of urban parks, these benefits are related to both improving the quality of environmental parameters (air, temperature and also water) and providing opportunities for exercise and relaxation that benefit physical and mental health. One of the key roles performed by this type of area-based conservation is the maintenance of water quality (see SDG 6 for further examples).

Case study

- **Protected areas supporting community health and medicines:** Health and wellbeing benefits associated with protected and conserved areas are not limited to urban centres but apply to smaller communities as well. Such self-governed areas can supply many different kinds of health benefits to their residents, from medicinal plants to clean water supplies, spiritual values and good nutrition, supporting both physical and mental health.
- **Protected areas supplying raw materials to pharmaceutical companies:** A small number of companies have set up commercial licensing deals with protected areas to pay for access to genetic resources for research into new medical drugs. More generally, the pharmaceutical industry continues to rely on the existence of species secured in protected and conserved areas as a resource for medical research.

OECMs

- **Urban green areas with significant biodiversity values:** Urban centres also contain green spaces of varying naturalness, including for example different private and public parks, and botanical gardens where these contain natural areas, and areas protecting watersheds. Those with extensive areas of natural ecosystems and significant biodiversity may also be OECMs. Examples include Hampstead Heath in London and Kirstenbosch Botanical Garden in Cape Town. These areas are important for many of the health-related benefits

and are increasingly also managed for wider biodiversity values (e.g. species diversity), in this way also often increasing the enjoyment of users. The IUCN guidance on OECMs recognises: “*Urban or municipal parks managed primarily for public recreation but which are large enough and sufficiently natural to also effectively achieve the in-situ conservation of biodiversity (e.g. wild grassland, wetlands) and which are managed to maintain these biodiversity values.*”⁴⁶

Key complementary approaches

These may be applied in protected areas, or OECMs, or in other effective area-based strategies:

- **Corridors:** Many urban areas retain habitat corridors along rivers, streams, coastline, mangroves and rocky outcrops. These corridors are important for a range of wildlife and support the environmental quality of the city while simultaneously making the urban environment more appealing for physical exercise. Designing urban corridors to be also used as pedestrian or cycling pathways increases their contribution to both physical and mental health.

Promotion of national health benefits as a part of protected area governance

The network of national, provincial and territorial parks, Canada

© ONTARIO PARKS



Introduction

The Canadian Parks Council (CPC)⁴⁷ is an intergovernmental leadership forum of national, provincial and territorial park organisations. Since 1962, the heads of Canada's park agencies have served as CPC board members and together they represent the interests of 14 governments, over 2,700 parks, and a shared mandate to enhance the environmental, social and economic values of parks throughout Canada. Each park agency within the CPC network contributes significantly to the health and wellbeing of Canadians and the millions of visitors who experience the powerful benefits of nature. Nurturing and establishing partnerships to help Canada's park systems increase their contributions to the physical and mental health of Canadians is a strategic priority for the CPC. In fact, in 2018 all federal, provincial and territorial park ministers responsible for parks endorsed a vision for "connected Canadian park lands and waters that support healthy nature and healthy people in harmony for generations" in a pan-Canadian Action Plan called *Parks for All*.^{48, 49} This collaborative plan produced by representatives in all levels of government

(Indigenous, federal, municipal, provincial and territorial) and allied sectors includes direct actions to advance the interconnectivity between health and nature.

At present, Canadians spend more time indoors than at any other point in history – 90 per cent of each day, with 69 per cent of waking time sitting. This indoor, sedentary life that is disconnected from nature comes with significant costs. In Canada, the total spending on health has grown from 7 per cent of Gross Domestic Product (GDP) in 1975 to 11 per cent in 2016. This amounts to a staggering 226 billion CAD or over 6,000 CAD per person (around US\$170 billion and US\$4,480, respectively). This is due in part to an aging population, but the increase in chronic disease plays a major role. The rate of chronic disease in Canada is rising by 14 per cent per year and our lifestyle choices are driving this epidemic—inactivity and poor eating choices leading to obesity, the major cause of chronic disease. This comes with a big price tag given the treatment of chronic disease consumes 67 per cent of all direct healthcare costs.⁵⁰



Co-benefit
SDGs



Dawn Carr
(Canadian Parks Council), **Mike Wong** (World Commission on Protected Areas – North America), **Pascale van der Leest** (Parks Canada), **Anne Craig** (Ontario Parks), **Catherine Grenier** (Sépaq), **Karine Ménard** (Sépaq).



Case study

Anxiety and mood disorders are also on the rise; 12 per cent of adult Canadians have a diagnosed anxiety or mood disorder. Along with mental health challenges come stigma, social isolation and lost productivity. Evidence is emerging that connecting with nature can be both preventative and restorative for mood disorders, as humans need exposure to green space for optimal cognitive function. Indeed, it has been documented that when Indigenous communities lost their connection to the land from displacement, particularly in the early establishment and later management of Canadian protected areas, their interconnectedness with the land was disrupted causing harm to their health, wellbeing and sustainable way of life.⁵¹

The most important cause for action is to reverse the current health trend that shows Canadian children may not live as long as their parents. Only 9 per cent of Canadian kids aged 5 to 17 get the 60 minutes of heart-pumping activity they need each day. Seventy-six per cent are getting more daily screen time than what is recommended. Play, and play outside in nature in particular, have been identified as a key solution to this health challenge.⁵²

Canadian Park Sector Actions to Enhance Health and Wellbeing

- **Enhance** initiatives and partnerships with the health sector taking into account that Nature has a positive impact on mental and physical health.
- **Support** efforts that connect Canadians with Nature to garner long-term public support for conservation including sharing knowledge about how Nature can bolster individual and community health and wellbeing.
- **Champion** the economic, social, cultural and environmental benefits provided by healthy ecosystems. Ensure these are accounted for in decision-making as contributing to stronger economies.
- **Nurture** healthy and positive communities through connections to land and water, and help to share their stories widely.

- **Continue forging** research partnerships with universities and other knowledge institutions.
- **Parks for all** provides a framework that encourages parks at all levels to strengthen relationships with Indigenous people, leading to actions built on the basic and effective principles of reciprocity: gratitude, respect and generosity – all of which contribute to our collective health and wellbeing.

The following examples showcase how three member agencies of the CPC are actively working to promote the health benefits of parks in uniquely different ways.

Parks Canada Agency: National Parks fostering connections between health and culture

The parks and protected areas within Canada's system of national parks conserve biological diversity, while representing cultural and spiritual significance that deeply influence the health and wellbeing of communities, notably Indigenous communities from coast to coast. In the current era of reconciliation and relationship building, partnerships that more fully recognise the longstanding and ongoing contributions of First Nations, Inuit and Métis in conserving the country's lands and waters are being established and the results are uplifting and important. Two recent initiatives underscore the nature–culture connection and how they contribute to health and wellbeing.

The Return of Bison to Banff National Park: In 2017, 16 bison were reintroduced to Banff National Park, more than 100 years after the species' borderline extinction.⁵³ Today the bison now number 36 and are roaming free in a 1,200 km² reintroduction zone – the herd population is expected to surpass 300 by 2031. Bison are a keystone species and play a huge role in the maintenance of the ecological integrity of the ecosystem. They are also a vital part of the lives of Indigenous people and restoring bison to the landscape has been an important opportunity to renew cultural and historical connections. The Bison reintroduction



programme is restoring and renewing the health and wellbeing of the ecosystem and the communities who live interconnectedly in Canada's first national park.

Thaidene Nënë National Park Reserve: Thaidene Nënë is the homeland of the people whose ancestors here laid down the sacred, ethical and practical foundations of their way of life. Located in the Northwest Territories, Thaidene Nënë National Park Reserve is a culturally rich area, where Indigenous traditions and harvesting are practised.⁵⁴ It also hosts spiritual areas used by Indigenous people for generations. The establishment of Thaidene Nënë in 2019 protects the rights of Indigenous people to live their way of life on the land which is essential to their health and wellbeing. The cooperative management arrangement also acknowledges the critical role of Indigenous-led conservation practices and knowledge that support the long-term sustainability of the region.

Ontario Parks – A Canadian leader in Healthy Parks Healthy People

Ontario Parks has been actively promoting the links between health and nature since 2013, creating an opportunity for the organisation to be a leader of the IUCN's Healthy Parks Healthy People (HPHP) initiative in Canada.⁵⁵ Ontario Parks' commitment to health is entrenched in its *Strategic Direction: 2017 Forward*. The direction includes health as

one of six core values of the organisation: "We believe there is a critical link between the health of parks and human health, and we will sustain and enhance this connection."

In the initial years of the HPHP initiative, Ontario Parks focused on a series of special events that challenged visitors and local citizens to get outside and that engaged health and community partners. These include an annual HPHP Celebration Day on the third Friday in July, a 30x30 Challenge in August, challenging Ontarians to spend 30 minutes a day in nature for 30 consecutive dates, and First Day Hikes on New Year's Day.

Ontario Parks is now entering the next phase of the HPHP programme. In 2019, the Ontario government conducted a large-scale public consultation seeking input on how to advance the role of green space in health and wellbeing. Health professionals, researchers, educators, environmental organisations and the general public were invited to provide input. Responses were positive and constructive. There was overwhelming support for the role of parks in providing health benefits. Ontario Parks will be developing a strategic plan for Healthy Parks Healthy People from the wealth of data collected during this process.

Case study

Sépaq – Quebec's Park Agency's linkage between health and nature

In order to deepen knowledge about the social benefits of the natural areas it manages, the Société des établissements du Québec (Sépaq) commissioned a study in 2019. One of the components covered focused on the impacts of natural areas on overall health, a subject that has been little documented so far in the province of Quebec.

The study has discovered that visitors who attend Sépaq sites several times a year visit health establishments less, feel less pain and take less medication. Furthermore, after visiting a Sépaq site, 87 per cent of participants feel calm and peaceful, while 85 per cent say they are happier and more positive.

These results corroborate international scientific studies which reveal in particular that time spent in nature decreases stress, strengthens the immune system, promotes concentration and encourages social interactions.

Being the largest outdoor network in Quebec and managing vast public territories, Sépaq wanted to be associated with projects related to the health benefits of nature, and more specifically with the intervention by the nature sector.

Reconnecting with nature can play a significant part in a rehabilitation process. Sépaq has established a new partnership this year with Le Grand Chemin, a centre where teenagers from 12 to 17 years old are being treated for drug addiction, alcoholism, pathological gambling or cyber addiction, to offer a novelty in their therapy programme: outdoor and adventure therapy. In the form of a forest expedition of three to five days in one of Sépaq's national parks, social workers accompany a group of young people to live a meaningful experience with great healing and transformative potential and to push themselves beyond their mental and physical limits. The context of nature being soothing for young people, this addition to the intervention programme increases their motivation by providing a context that goes beyond the paths of traditional therapy. When they return, the participants share a great feeling of pride and accomplishment.

For a third consecutive year, Sépaq also continues to work with the province's Education Ministry to get young people moving on a daily basis. In 2019, more than 18,600 primary school students visited a Québec national park where they were welcomed into a day full of healthy outdoor activity and enjoyment.



© SÉPAQ

Protected areas as a source of health for all

The network of protected areas, State of Victoria, Australia



Co-benefit
SDGs



**Tony Varcoe,
Shauna Jones,
John Kenwright
and Jo Hopkins,**
(Parks Victoria).

© PARKS VICTORIA



Background

Parks Victoria manages 18 per cent of the State of Victoria's land mass (4.3 Mha), and manages this estate in partnership with Traditional Owners, government and non-government organisations and the broader community. The estate Parks Victoria manages includes national and state parks, wilderness areas, and regional, metropolitan and marine parks, and it attracts a broad diverse range of visitors that include visitors of all abilities and ages.⁵⁶

Created in 2000, Parks Victoria developed the "Healthy Parks Healthy People" (HPHP) initiative to recognise the importance of contact with nature as essential for human emotional, physical and spiritual health and wellbeing that also reinforces the crucial role that parks and protected areas play in nurturing healthy ecosystems. The Healthy Parks Healthy People approach informs Parks Victoria's approach to the management of Victoria's national, state and regional parks and reserves, and waterways, piers and marine parks #healthyparkshealthypeople.

The Healthy Parks Healthy People initiative has spread to places as diverse as Europe, the United States, Korea, Finland, Canada,

Colombia, the United Kingdom and New Zealand. While different countries and states are at different stages of implementation, a common HPHP approach is being developed. It reinforces the need for stronger partnerships between the environment, health and community sectors in creating integrated policies, communications, research and on-ground programme partnerships.

The Victorian Memorandum for Health and Nature

The Victorian Memorandum for Health and Nature (the Memorandum)⁵⁷ was launched at the 15th World Congress on Public Health, Melbourne, April 2017. The Memorandum, signed by both The Hon Lily D'Ambrosio, Minister for Energy, Environment and Climate Change and the then Hon Jill Hennessy, Minister for Health, recognises that there is a strong connection between the health of the natural environment and human health and wellbeing – and that there are diverse benefits for all Victorians from being in the outdoors including physical, psychological, cultural and social health and wellbeing.

The Memorandum provides a platform to support and enable an integrated, whole of



Park visitors on
an all abilities
walk at Yarra
Bend Park

Case study

Children playing in the all abilities playscape at Brimbank Park



© PARKS VICTORIA

government approach that recognises the benefits of healthy parks and other natural assets for the health and wellbeing of all Victorians. Central to the intent of The Memorandum is to "...ensure that we can maximise the physical and mental health benefits to all Victorians of spending time in, enjoying and actively caring for the environment."

To implement the Memorandum, a cross-government Working Group was established to identify and coordinate opportunities to promote whole of government responses, shared communications and engagement strategies relating to health and nature. The Working Group consists of core members, the Victorian Departments of Environment, Land, Water and Planning (DELWP), Department of Health and Human Services, and Sport and Recreation Victoria and Parks Victoria (PV), with other agencies, including the Environment Protection Agency, Department of Education and Training (DET), the Victorian Health Promotion Foundation (VicHealth) and Local Governments represented by Municipal Association of Victoria (MAV) invited to participate in Working Group meetings as required.

Examples of the organisational and collective achievements and work-in-progress under the Memorandum are identified below.⁵⁸

Integrated policy: A key objective of the integrated policy approach is in cross-referencing between public health and biodiversity conservation policy that seeks to enshrine intersectoral policy collaboration as "business as usual". It includes a focus on implementing common goals of the Victorian Public Health and Wellbeing Plan and the State Biodiversity Strategy 2037, including "Victorians Value Nature" goal and "Nature is Good Medicine" objectives. It also includes influencing the update of the Victorian Public Health and Wellbeing Plan 2019-2023 – priorities include Climate Change and Health, Active Living and Healthy Eating and settings include parks, nature and public open space and enabling cross-sector implementation of the new Parks Victoria "Healthy Parks Healthy People" Framework by 2020.

Advocacy and leadership: A number of common focus projects are supported between represented government organisations and sectors within the MOU, such as enabling cross-sector promotion of walking (as a subset of State-wide priority area Active Living), including growing *walking in nature* opportunities. The establishment of the Victorian Active Living Alliance (VALA) 2019 initiative is led by the Department of Health and Human Services and Sport and Recreation Victoria, it provides a coordinating and collaborating platform for state-wide and local community organisations working towards a common goal of increasing the opportunities for community members to become and stay physically active. Active membership includes hundreds of organisations across Victoria.

Collaboration and funding opportunities: Finding opportunities are in place for improved integration of new policy platforms, programmes and strategies. For this purpose, Parks Victoria has established partnerships with a number of relevant organisations including, for example, YMCA Camping, headspace Youth Mental Health services, Australia Refugee and Migrant Education and Settlement Service (AMES) and Dementia Australia (Victoria) and WorkSafe Victoria.

One of the key initiatives supporting the establishment of such opportunities was

convening an inaugural Nature Is Good Medicine Summit 2018, led by Parks Victoria. The summit attracted over one hundred people from eighty health and non-health organisations and services, universities and research entities, inviting cross collaboration on joined-up health and nature initiatives, and has resulted in a range of collaborations between attendees and organisations at the summit.

Sharing information and priorities of previous and existing initiatives is also a key for furthering collaboration, including initiatives such as the Victorian Government's Victoria's Great Outdoors (VGO) initiative 2019–2023 and the Suburban Parks project, to encourage people to take recreation outdoors and connect to nature. Parks Victoria has developed a new VGO Volunteering Innovation Fund that commenced in July 2020. Efforts are also made to promote nature-related health initiatives and campaigns such as Active Victoria events, Seniors Week events and Victorian Nature Festival September 2020.

Finally, a key focus is also to leverage funding to support health professionals to 'socially prescribe nature' including capacity building and training tools for volunteers and sector development to deliver on the various health and nature initiatives.

Opportunities and challenges:

Influencing health and wellbeing goals through protected areas and other green spaces covers many aspects of government and non-government policy and practice; from urban and regional planning to provision of park settings and services, to education policy and programmes and to climate change and health promotion. In implementing the Victorian Memorandum for Health and Nature, Parks Victoria has initially sought to focus on sharing information across government and creating realistic and achievable cross-sector opportunities that can be scaled up over time.

Likewise, the cross-government Working Group (WG) has initially been a relatively small and focused group looking to identify short to medium-term collaboration opportunities. Organisational membership from the participating government departments has, in large part, remained

consistent, but has also seen a step back from one organisation and a step forward by one or two others as focus areas of the group evolve. Additionally, many of the original representatives from each organisation have continued while also regularly inviting additional personnel to join the WG. The structure of the WG is flexible enough to accommodate these permeable boundaries around the membership. The WG has used the opportunity to include a range of other relevant stakeholders that can represent complementary agendas and policy directions.

The annual review of the partnership status has been relatively informal but has allowed the WG to also consider whether it currently has the "right people and organisations" around the table; to question whether its Terms of Reference still reflect the original intentions of The Memorandum, current government policy and strategic directions, and to undertake a review and stocktake of its common achievements.

The future and sustainability of The Memorandum for Health and Nature is flexible and adaptable to the machinery of government changes, changing and emerging high-level policies and strategic directions, and personnel and as such could survive successive iterations of itself. It is dependent upon planned actions being evidence-based and informed, collaboration across multiple sectors and stakeholders, and it being embedded in the "business as usual" model of those organisations leading an integrated action approach to ensuring sustainable environments and ecosystems and communities that are supportive of human and environmental health and wellbeing.

Access for all initiative by Parks Victoria

One in five of the population in Victoria live with a disability, and they experience a wide range of impairments and impacts on their everyday lives. Their disability may be present from birth or occur at some stage during their lifetime.

The health status of people with disabilities is poorer than that of the general population in ways that are not always directly related

Case study

to their disability. Discrimination and lack of inclusion have a negative impact on their health. Contending with barriers, discrimination and negative attitudes contributes to anxiety, stress and ill health.

Over recent years, Parks Victoria has engaged with the disability community and relevant community organisations to better understand the barriers to park visitation and participation commonly experienced by visitors with disability. Some of the barriers identified during the community engagement were already known by Parks Victoria, and some barriers were newly identified.

The recommendations from this community engagement included:⁵⁹

- More park access information was required, and the information needed to be more comprehensive to help visitors plan their park visit.
- There was a need for more visitor facilities, amenities and walking trails to be universally designed.
- Some visitors required physical/personal assistance to visit and explore parks.
- Some visitors with mobility issues required recreation mobility equipment to explore parks and could not afford this equipment (e.g. all terrain wheelchairs, beach wheelchairs).
- Online park resources were needed for visitors with autism to help them prepare for their park visit.

As a result of the community engagement, and through partnering with disability and community organisations, a range of programme initiatives have been undertaken by Parks Victoria to eliminate or minimise the barriers identified.

All terrain wheelchairs

programme: Park Victoria has introduced all terrain TrailRider wheelchairs, which visitors can borrow for free in selected parks. Visitors, with the assistance of their friends/family members can explore more rugged walking trails in nature not accessible by visitors in conventional wheelchairs. As a direct result of visitor feedback, the chairs have been customised with electric motors to make it easier for the visitors and the chair

operators to explore longer and steeper trails. A volunteer programme has also been established in selected parks to provide trained volunteers to assist visitors in operating the chairs on the many walking trails. A TrailRider trail assessment manual was developed to assist park rangers to identify suitable trails in parks for use of this equipment and assess their level of difficulty for chair users. TrailRider advisory signs and trail information were also developed for visitors to plan their trek using the TrailRider chairs.

Guided sensory walks: Parks Victoria, in partnership with community organisation Blind Sports & Recreation Victoria, co-designed a bush walking programme for visitors who were blind or vision impaired. These guided walks provide one-to-one assistance to participants, through the provision of trained volunteers. The volunteers assist participants with trail orientation, describing the natural environment around them, reading trail interpretive signage and providing opportunities for participants to connect with nature using their other senses such as touch, hearing and taste. The programme also provides opportunities for social interaction around a common interest and led to the formation of many new and long-lasting friendships between participants and volunteers.

Resources linked to autism: With the professional assistance of Amaze autism services, Parks Victoria has developed online park resources for parents, carers and teachers who have young children with autism. These resources, called social scripts, are designed to help prepare children for their park visit, helping them feel less overwhelmed and stressed when visiting a park for the first time. Through the provision of simple text and park images, the scripts allow parents, carers and teachers to rehearse in advance with the child what they may see, hear, touch and smell while in the park. Parents, carers and teachers can download these scripts from the Parks Victoria website, and adapt these resources according to the child's needs and their planned activities in the park.



© PARKS VICTORIA

A park visitor using a Parks Victoria TrailRider™ all-terrain wheelchair and being assisted by Parks Victoria TrailRider™ volunteers at Dandenong Ranges National park

These three project initiatives are just some examples of the work Parks Victoria has undertaken to help create more accessible and inclusive parks for people with disabilities. Other examples include all abilities accommodation, all abilities fishing platforms and boating access and partnership programmes for all abilities camping. They have assisted visitors to access and enjoy parks and to gain the many health and social inclusion benefits of spending time in nature. This work has been recognised nationally through winning numerous specialist tourism awards.

Opportunities and challenges: Due to the success of the project initiatives and Parks Victoria's willingness to engage with the community, there has been growing interest from community organisations to work with Parks Victoria.⁶⁰ These community partnerships have led to increased innovative practice and enabled more people with disabilities to visit parks and gain the many health benefits.

The work undertaken aligns with State and Federal government policy directions of creating equity of access, increasing public and community health, social inclusion and changing negative societal attitudes towards people with disabilities. In doing so, it has created greater access to new preventative health and other funding grants, supporting more accessible and inclusive parks.

In addition to meeting equity goals, accessible tourism is a multi-billion-dollar global industry. The work undertaken to make Victoria's parks accessible for all has contributed significantly to creating accessible tourism destinations in parks, a growing market both in Australia and internationally. Regional tourism operators are now seeing the many benefits and opportunities of creating accessible opportunities in parks.

Making parks more inclusive for all visitors does pose some challenges including how to decide which visitor groups should be the focus, which organisations we should strategically partner, and sourcing the necessary resources to implement, evaluate and expand successful pilot initiatives.

Parks Victoria's goal is that over time, implementation of universal access principles will be "business as usual" in which accessibility and inclusion in parks will be integrated into park management, to ensure all communities have equitable access to the natural environment and to its many health benefits.

Information linked to this case study can also be found through the PANORAMA initiative.

Endnotes

- 1** UN. 2019. Progress towards Sustainable Development Goals / SDG 3 in 2019, <https://sustainabledevelopment.un.org/sdg3>, accessed 1 May 2020.
- 2** WHO. 2019. Air pollution statistics, https://www.who.int/health-topics/air-pollution#tab=tab_1, accessed 1 May 2020.
- 3** WHO. 2019. Air pollution statistics, https://www.who.int/health-topics/air-pollution#tab=tab_1, accessed 1 May 2020.
- 4** UN. 2018. *Sustainable Development Goals Report 2018*. United Nations, New York.
- 5** WHO. 2019. Preventing non-communicable diseases, <https://www.who.int/activities/preventing-noncommunicable-diseases>, accessed 1 May 2020.
- 6** UN. 2019. Progress towards Sustainable Development Goals / SDG 3 in 2019, <https://sustainabledevelopment.un.org/sdg3>, accessed 1 May 2020.
- 7** WHO. 2019. Mental health statistics. <https://www.who.int/news-room/fact-sheets/detail/depression>, accessed 1 May 2020.
- 8** World Health Organization. 2014. *Preventing suicide: A global imperative*. WHO, Geneva.
- 9** Mollee, E., McDonald, M. and Pouliot, M. 2017. Into the Urban Wild: Collection of wild urban plants for food and medicine in Kampala, Uganda. *Land Use Policy* **63**: 67-77.
- 10** Daszak, P., Olival, K.J. and Li, H. 2020. A strategy to prevent future epidemics similar to the 2019-nCoV outbreak. *Biosafety and Health* **2** (1).
- 11** Johnson, C.K., Hitchens, P.L., Pandit, P.S., Rushmore, J., Evans, T.S., Young, C.C.W. and Doyle, M.M. 2020. Global shifts in mammalian population trends reveal key predictors of virus spillover risk. *Proceedings of the Royal Society B: Biological Sciences* **287**: 20192736.
- 12** Duleeka Knipe, A., Williams, J., Hannam-Swain, S., Upton, S., Brown, K., Bandara, P., Chang, S.-S. and Kapur, N. 2019. Psychiatric morbidity and suicidal behaviour in low- and middle-income countries: A systematic review and meta-analysis. *PLOS Medicine* **16** (10): e1002905 DOI: 10.1371/journal.pmed.1002905
- 13** WHO and CBD. 2015. *Connecting Global Priorities: Biodiversity and Human Health - A State of Knowledge Review*. WHO, Geneva.
- 14** Hamilton, L. 2008. *Forests and water*. FAO Forestry paper 155, FAO, Rome.
- 15** WHO and CBD. 2015. Op cit.
- 16** Dudley, N. and Stolton, S. (eds.) 2003. *Running Pure: The importance of forest protected areas to drinking water*. WWF International and The World Bank, Gland, Switzerland and Washington, DC.
- 17** Janhäll, S. 2015. Review on urban vegetation and particle air pollution - deposition and dispersion. *Atmospheric Environment* **105**: 130-137.
- 18** Leung, D.Y.C., Tsui, J.K.Y., Chen, F., Yip, W.K., Vrijmoed, L.P. and Liu, C.H. 2011. Effects of urban vegetation on urban air quality. *Landscape Research* **36** (2): 173-188.
- 19** Chang et al. 2007 in WHO and CBD 2015. Op cit.
- 20** Schweitzer, J.-P., Mutafoglu, K., ten Brink, P., Paquel, K., Illes, A., Gitti, G., Kettunen, M., TwiggerRoss, C., Baker, J., Kuipers, Y., Emonts, M., Tyrväinen, L., Hujala, T. and Ojala, A. 2016. *The Health and Social Benefits of Nature and Biodiversity Protection: Annex 1: 20 Cases. A report for the European Commission (ENV.B.3/ETU/2014/0039)*. Institute for European Environmental Policy, London/Brussels.
- 21** European Commission. 2019. *Green urban infrastructure strategy for Vitoria-Gasteiz, Spain*, in Commission Staff Working Document on EU guidance on integrating ecosystems and their services into decision-making (SWD(2019) 305 final).
- 22** Hamilton, A., Dürbeck, K. and Lawrence, A. 2006. Towards a Sustainable Herbal Harvest: A Work in Hand. *Plant Talk* **43**: January 2006.
- 23** Farnsworth, N.R. and Soejarto, D.D. 1988. *Global Importance of Medicinal Plants*, Proceedings of an International Consultation, Chiang Mai, Thailand, Cambridge University Press.
- 24** Stolton, S. and Dudley, N. 2009. *Vital Sites: The contribution of protected areas to human health*. WWF International, Gland, Switzerland.
- 25** Brock, T.D. 1997. The value of basic research: The discovery of *Thermus aquaticus* and other extreme thermophiles. *Genetics* **146**: 1207-1210.
- 26** Ibid.
- 27** Colfer, C.J., Sheil, D. and Kishi, M. 2006. *Forests and human health: assessing the evidence*, CIFOR Occasional Paper; No. 45, Center for International Forestry Research, Bogor, Indonesia.
- 28** Tibbetts, J. 2004. The state of the oceans, part 2: delving deeper into the sea's bounty, *Environmental Health Perspectives* **112**: 8.
- 29** Colfer, C.J., Sheil, D., Kaimowitz, D. and Kish, M. 2006. Forests and human health in the tropics: some important connections. *Unasylva*, **57**: 224.
- 30** Grifo, F., Newman, D., Fairfield, A.S., Bhattacharya, B. and Grupenhoff, J.T. 1997. The Origins of Prescription Drugs. In: F. Grifo and J. Rosenthal (eds.) *Biodiversity and Human Health*, Island Press, Washington, DC.
- 31** Beattie, A.J. 2003. New Products and Industries from Biodiversity. In: R. Hassan, R. Scholes and N. Ash (eds.), *Ecosystems and human well-being: current state and trends. Findings of the Condition and Trends Working Group*. Island Press, Covelo, California.
- 32** Richardson, E.A., Pearce, J., Mitchell, R. and Kingham, S. 2013. Role of physical activity in the relationship between urban green space and health. *Public Health* **127** (4): 318-324.
- 33** Schweitzer et al. 2016. Op cit.
- 34** Jennings, V., Larson, L. and Yun, J. 2016. Advancing sustainability through urban green space: cultural ecosystem services, equity and social determinants of health. *International Journal of Environmental Research and Public Health* **13**: 196. doi:10.3390/ijerph13020196
- 35** Buckley, R., Brough, P., Hague, L., Chauvenet, A., Fleming, C., Roche, E., Sofija, E. and Harris, N. 2019. Economic value of protected areas via visitor mental health. *Nature Communications* **10** / 5005. <https://doi.org/10.1038/s41467-019-12631-6>
- 36** Ibid.
- 37** World Health Organization Regional Office for Europe. 2017. *Urban Green Space Interventions and Health*. WHO, Copenhagen.
- 38** Naidoo, R., Gerkey, D., Hole, D., Pfaff, A., Ellis, A.M., Golden, C.D., Herrera, D., Johnson, K., Mulligan, M., Ricketts, T.H. and Fisher, B. 2019. Evaluating the impacts of protected areas on human well-being across the developing world. *Science Advances* **5** (4). DOI: 10.1126/sciadv.aav3006
- 39** Wood, E., Harsant, A., Dallimer, M., Cronin de Chavez, A., McEachan, R.R.C. and Hassall, C. 2018. Not all green space is created equal: biodiversity predicts psychological restorative benefits from urban green space. *Frontiers in Psychology* **9**: 2320.
- 40** WHO and CBD. 2015. *Connecting Global Priorities: Biodiversity and Human Health - A State of Knowledge Review*. WHO, Geneva.
- 41** IUCN WCMC. 2019. Six ways conserving and sustainably using nature could prevent future pandemics, <https://www.unep-wcmc.org/news/six-ways-conserving-and-sustainably-using-nature-could-prevent-future-pandemics>, , accessed in 6 May 2020.
- 42** Walsh, J.F., Molyneux, D.H. and Birley, M.H. 1993. Deforestation: effects on vector-borne disease, *Parasitology* **106** Supplement S55-75.
- 43** Oglethorpe, J., Honzak, C. and Margoluis, C. 2008. *Healthy people, healthy ecosystems: A manual for integrating health and family planning into conservation projects*. World Wildlife Fund, Washington, DC.
- 44** Pattenayak, S.K., Corey, C.G., Lau, Y.F. and Kramer, R.A. 2003. *Forest malaria: A microeconomic study of forest protection and child malaria in Flores*. Indonesia, Duke University, USA.
- 45** Patz, J.A., Daszak, P., Tabor, G.M., Aguirre, A.A., Pearl, M., Epstein, J., Wolfe, N.D., Kilpatrick, A.M., Foufopoulos, J., Molyneux, D., Bradley, D.J. et al. 2004. Unhealthy landscapes: policy recommendation on land use change and infectious disease emergence. *Environmental Health Perspectives* **110** (10): 1092-1098.
- 46** IUCN-WCPA Task Force on OECMs. (2019). Op cit.
- 47** <http://www.parks-parcs.ca/english/>
- 48** Parks Canada. 2017. *Parks for All: An Action Plan for Canada's Parks Community*. Parks Canada, Ottawa, Ontario.
- 49** Parks Canada, on behalf of the Canadian Parks Council and Canadian Parks and Recreation Association. 2018. *Parks for All: An Action Plan for Canada's Parks Community*. Ottawa, Ontario
- 50** Parks Canada, on behalf of the Canadian Parks Council. 2014. *Connecting Canadians with Nature - An Investment in the Well-being of our Citizens*. Ottawa, Ontario.



© EQUILIBRIUM RESEARCH

51 Environment Canada and Climate Change. 2018. *One with Nature: A Renewed Approach to Land and Freshwater Conservation in Canada*. Ottawa, Ontario.

52 Parks Canada, on behalf of the Canadian Parks Council. 2016. *The Nature Playbook: Take Action to Connect a New Generation of Canadians with Nature*. Ottawa, Ontario.

53 <https://www.pc.gc.ca/en/pn-np/ab/banff/info/gestion-management/bison> accessed 9 May 2020.

54 <https://www.pc.gc.ca/en/pn-np/nt/thaidene-nene> accessed 9 May 2020.

55 Ontario Parks. 2019. *Healthy Parks Healthy People: Our Nature Our Health*. Available at: OntarioParks.com/hphp

56 Victoria State Government - Environment, Land, Water and Planning. 2020. *Protecting Victoria's Environment - Biodiversity 2037*. Available at: <https://www.environment.vic.gov.au/biodiversity/biodiversity-plan> accessed June 2020.

57 Victoria State Government - Environment, Land, Water and Planning. 2019. Victorian Memorandum for Health and Nature. Available at: <https://www.environment.vic.gov.au/biodiversity/victorian-memorandum-for-health-and-nature> accessed June 2020.

58 Victoria State Government - Victoria Health. 2019. *Public health and wellbeing planning*. Available at: <https://www2.health.vic.gov.au/about/health-strategies/public-health-wellbeing-plan> accessed June 2020.

59 Victoria State Government - *Health and Human Services. Absolutely Everyone - State Disability Plan 2017-2020*. Available at <https://www.dhhs.vic.gov.au/publications/absolutely-everyone-state-disability-plan-2017-2020> accessed June 2020.

60 *Healthy Parks Healthy People: the state of the evidence report*. 2015. <https://www.iucn.org/sites/dev/files/content/documents/hphpsstate-evidence2015.pdf>

CITATION

For the publication: Kettunen, M., Dudley, N., Gorracho, J., Hickey, V., Krueger, L., MacKinnon, K., Oglethorpe, J., Paxton, M., Robinson, J.G., and Sekhran, N. 2021. *Building on Nature: Area-based conservation as a key tool for delivering SDGs*. IEEP, IUCN WCPA, The Nature Conservancy, The World Bank, UNDP, Wildlife Conservation Society and WWF.

For individual case studies: Case study authors. 2021. Case study name. In: Kettunen, M., Dudley, N., Gorracho, J., Hickey, V., Krueger, L., MacKinnon, K., Oglethorpe, J., Paxton, M., Robinson, J.G., and Sekhran, N. 2021. *Building on Nature: Area-based conservation as a key tool for delivering SDGs*. IEEP, IUCN WCPA, The Nature Conservancy, The World Bank, UNDP, Wildlife Conservation Society and WWF.

CORRESPONDING AUTHORS

Nigel Dudley (nigel@equilibriumresearch.com) and Marianne Kettunen (mkettunen@ieep.eu)

PARTNERS

Institute for European Environmental Policy (IEEP)
IUCN World Commission on Protected Areas (WCPA)
The Nature Conservancy (TNC)
The World Bank Group
UN Development Programme (UNDP)
Wildlife Conservation Society (WCS)
WWF



DISCLAIMER

The information and views set out in this publication are those of the authors and do not necessarily reflect official opinions of the institutions involved.

ACKNOWLEDGEMENTS

This report and the work underpinning it has benefitted from the support of the following people: Sophia Burke (AmbioTEK CIC), Andrea Egan (UNDP), Marie Fischborn (PANORAMA), Barney Long (Re-Wild), Melanie McField (Healthy Reefs), Mark Mulligan (King's College, London), Caroline Snow (proofreading), Sue Stolton (Equilibrium Research), Lauren Wenzel (NOAA), and from the many case study authors named individually throughout the publication.

Design and layout: Miller Design

INSTITUTE FOR EUROPEAN ENVIRONMENTAL POLICY (IEEP)

IEEP Main Office
Rue Joseph II 36-38
1000 Bruxelles, Belgium
Tel: +32 (0) 2738 7482
Fax: +32 (0) 2732 4004

London Office
25EP, 25 Eccleston Place
Belgravia SW1W 9NF London, the UK
Tel: + 44 (0)204 524 9900
@IEEP_eu

The Institute for European Environmental Policy (IEEP) is a sustainability think tank with offices in Brussels and London. As a not-for-profit research organisation with over 40-years of experience, we are committed to advancing evidence-based and impact-driven sustainability policy across the EU and the world.