



WWF

REPORT

2016

PROTECTING PEOPLE THROUGH NATURE

NATURAL WORLD HERITAGE SITES AS
DRIVERS OF SUSTAINABLE DEVELOPMENT

A REPORT FOR WWF BY

Dalberg

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WWF

WWF is one of the world's largest and most experienced independent conservation organizations, with over 5 million supporters and a global network active in more than 100 countries.

WWF's mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature, by conserving the world's biological diversity, ensuring that the use of renewable natural resources is sustainable, and promoting the reduction of pollution and wasteful consumption.

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CHALLENGING THE ANTI-DEVELOPMENT MYTH SURROUNDING CONSERVATION

FOREWORD FROM WWF INTERNATIONAL DIRECTOR GENERAL MARCO LAMBERTINI



Marco Lambertini,
Director General,
WWF International

For too long we have been told that conserving the environment removes economic opportunities for people. The adoption of the Sustainable Development Goals last year demonstrates that governments around the world are recognizing that social, economic and environmental agendas are intrinsically linked and inseparable. The impact of climate change perhaps is the most obvious demonstration of the link and ramifications. The same logic applies to deforestation, overfishing, species extinctions, and the list goes on.

Protecting natural areas and ecosystems is not anti-development. It is in the interest

of long-term, robust and sustainable development that benefits people and natural systems, including our social stability, economic prosperity, and individual well-being. We are not going to develop a just and prosperous future, nor defeat poverty and improve health, in a weakened or destroyed natural environment.

This report shows that by conserving large areas of habitat, natural World Heritage sites also increase resilience to natural and weather-related disasters, support livelihoods for communities, and provide communities with vital protection against the impacts of climate change.

Shockingly, almost half of all natural World Heritage sites are threatened by harmful industrial activities and operations, such as oil and gas exploration and extraction, mining, illegal logging, construction of large-scale infrastructure, overfishing, and unsustainable water use.

This should alarm all of us. More than eleven million people living in and near World Heritage sites depend on them for food, water, medicine and jobs—that's more than the entire population of Portugal. The well-being of communities is being put at risk by harmful industrial activities that degrade the environment, and that compromise the ability of these places to provide economic and non-economic benefits that are so fundamental to local populations, as well as to our global community.

Despite the obvious benefits of these natural areas, we still haven't managed to decouple economic development from environmental degradation. This is the deepest challenge, and the greatest imperative, of our time. Instead, too often, we grant concessions for exploration of oil, gas or minerals, and plan large-scale industrial projects without considering social and environmental risks. This approach favours short-term financial gain over long-term, sustainable and inclusive economic

development. The responsibility lies with the governments that allow these projects or concessions, the companies that take them up, and the financial institutions that fund them. It is time for governments to fulfil their commitments to preserving the *outstanding universal value* that led to the declaration of these natural World Heritage Sites, and for businesses to support their conservation.

Healthy natural World Heritage sites contribute to poverty reduction, help alleviate food insecurity, combat climate change, and restore and promote the sustainable use of ecosystems. Protecting these sites and investing in their future should be part of each government's national action for achieving its Sustainable Development Goals commitments.

This report, and the accompanying call to action, is just the first step in a broader dialogue in which we must all engage. Governments, civil society and the private sector must work together to achieve ecologically-sound development that empowers local people, supports responsible business, and provides long-term sustainable economic growth. This is the key driver to advance an integrated agenda that supports development in balance with environmental protection.

IF WE WORK TOGETHER TO SECURE THE FUTURE FOR WORLD HERITAGE SITES, WE TAKE A STEP TOWARD ENSURING THAT THE COMMITMENTS MADE TO SUSTAINABLE DEVELOPMENT AND CLIMATE ACTION ARE MORE THAN WORDS ON PAPER.



MAKE YOUR MARK

WWF'S CALL FOR COLLECTIVE GLOBAL ACTION

There are 229 natural and mixed World Heritage sites in 96 countries around the world. These places are often considered to be iconic symbols of conservation. Each site is nominated by a national government, and must demonstrate *outstanding universal value* in order for an international body established by UNESCO to add it to the World Heritage List.

Regardless of where they are located, "World Heritage sites belong to all the peoples of the world," according to UNESCO. They represent the shared heritage of present and future generations.

Unfortunately, this report shows that over half of these sites face significant threats to their unique values, putting the livelihoods and well-being of people who depend on them at risk.

BASED ON THE RECOMMENDATIONS HERITAGE SITES TO DELIVER LONG-

WWF CALLS ON NATIONAL GOVERNMENTS TO:

- Ensure that no harmful industrial activities, which involve significant impacts on the attributes of *outstanding universal value* and other natural, economic and cultural values, are permitted in World Heritage sites or in areas that could negatively affect them.
- Integrate a sustainable development perspective into the processes of the World Heritage Convention, as indicated by the policy recently adopted by states parties to the convention, as a first step to recognizing the potential of World Heritage sites to deliver outcomes in line with the Sustainable Development Goals.
- Incorporate the ecosystem and biodiversity value of World Heritage sites into national and local planning and development strategies as a way of advancing the 2030 Agenda for Sustainable Development, particularly goals 14 and 15.
- Guarantee that those who depend most on World Heritage sites for their livelihoods and well-being are informed and consulted adequately about proposed projects by applying the principle of free, prior and informed consent, as well as applicable international standards for community consultation and engagement.
- Define clear buffer zones that help maintain the *outstanding universal value* of World Heritage sites by providing an additional layer of protection to sites.
- Hold accountable multinational enterprises, operating in or from their territories to the highest standards of corporate accountability and stewardship.

OF THIS REPORT, AND ACKNOWLEDGING THE POTENTIAL FOR NATURAL WORLD TERM SUSTAINABLE DEVELOPMENT OUTCOMES FOR PEOPLE AND THE PLANET

WWF CALLS ON THE WORLD HERITAGE COMMITTEE TO:

- Utilize the ongoing process of developing the Policy Guidelines for the Implementation of the World Heritage Convention to define a formal policy against harmful industrial activities.
- Require governments, with the support of the UNESCO World Heritage Centre, advisory bodies, and organizations with practical experience of conservation of natural World Heritage sites, to report systematically on the social and economic contributions these sites make to communities.
- Explore ways to promote greater involvement of representatives of communities and indigenous groups into the processes of the World Heritage Convention, particularly in the evaluation of nominations of sites for inscription on the World Heritage List, and in relation to the management of sites and their resources.
- Grant enhanced access to the annual meetings of the World Heritage Committee to organizations with practical experience in the conservation and management of natural World Heritage sites in order to benefit from their perspectives on effective sustainable management of sites and their resources.

WWF CALLS ON CORPORATE AND FINANCE ENTITIES TO:

- Comply with the highest standards for responsible business conduct when adhering to national and international laws, as well as recognized international guidelines such as the OECD Guidelines for Multinational Enterprises.
- Act as responsible stewards of capital, in recognition of the potential for World Heritage sites to be drivers of inclusive growth, and comply when investing with International Finance Corporation Performance Standard 6, which relates to biodiversity conservation and sustainable management of living natural resources.
- Make public and formal *no go* commitments to refrain from activities that threaten to degrade the capacity for protected areas, and World Heritage sites in particular, to support the livelihoods and well-being of local communities.
- Develop and adhere to robust policies with regard to financing projects in protected areas, and refrain from financing projects involving harmful industrial activities in World Heritage sites or the companies conducting them.
- Conduct strategic environmental assessments, environmental impact assessments and human rights due diligence in full compliance with international norms and standards and industry best practice, including appropriate levels of community consultation and engagement on the basis of publicly available documents.
- Identify, in collaboration with non-governmental organizations and civil society groups, ways in which business activities can contribute positively to sustainable development outcomes for the communities in which businesses operate.

WWF CALLS ON CIVIL SOCIETY GROUPS AND NON-GOVERNMENTAL ORGANIZATIONS TO:

- Participate constructively in the management and conservation of protected areas at the local, national and international levels, and promote the potential of such places to deliver sustainable development outcomes for people and nature.
- Support the effective implementation of the World Heritage Convention, particularly in regard to integrating a sustainable development perspective into the processes of the convention.
- Work with businesses and financial institutions to help them develop and implement policies and practices that maximize the positive benefits for people, and minimize the potential negative impacts of their activities in protected areas, including World Heritage sites.
- Collaborate with communities and indigenous groups, and only promote activities, policies, projects and interventions that contribute positively toward their long-term prosperity and well-being.

EXECUTIVE SUMMARY

NATURAL WORLD HERITAGE¹ SITES PROVIDE IMPORTANT ECONOMIC, SOCIAL AND ENVIRONMENTAL BENEFITS TO PEOPLE. THESE SITES ARE RECOGNIZED INTERNATIONALLY FOR THEIR *OUTSTANDING UNIVERSAL VALUE* AS PLACES WITH “SIGNIFICANCE WHICH IS SO EXCEPTIONAL AS TO TRANSCEND NATIONAL BOUNDARIES AND TO BE OF COMMON IMPORTANCE FOR PRESENT AND FUTURE GENERATIONS OF ALL HUMANITY.”²

Natural World Heritage sites exemplify some of the world’s greatest areas of natural beauty, geology, ecology and biodiversity, and include many iconic natural landscapes such as the Galápagos Islands, Mount Kilimanjaro and the Grand Canyon. They provide vital resources for rural communities, including food and fuel. Further, two-thirds of natural World Heritage sites are considered important for the provision of water, and over half provide soil stabilization, flood prevention and carbon sequestration services.³ World Heritage sites also make a considerable contribution to national economies through tourism, recreation and the export of resources, and over 90 per cent of natural World Heritage sites provide jobs.⁴ As part of a broader network of protected areas, natural World Heritage sites support some of the most valuable ecosystems on the planet, and their challenges and successes are representative of these broader protected areas.

Almost half of all natural World Heritage sites, and their *outstanding universal value*, are threatened by harmful industrial activities.⁵

Because World Heritage sites are located within larger natural spaces, the health of broader ecosystems has a substantial impact on their integrity. The *outstanding universal value* of World Heritage sites and the benefits they provide are therefore dependent upon the areas surrounding them, particularly their buffer zones.⁶

When conducted at a large-scale in or surrounding protected areas, industrial activities can cause substantial, even permanent, damage to those sites, and can affect their ability to provide long-term support for local communities. These harmful activities are often, but not exclusively, conducted by multinational enterprises and their subsidiaries, and include oil and gas exploration and extraction, mining, illegal logging, construction of large-scale infrastructure, overfishing and unsustainable water use.

Eleven million people, equivalent to the population of Portugal, depend on these sites, and could be affected negatively by the impacts of harmful industrial activities.^{7,8} Over one million of these people live within the boundaries of World Heritage sites, and the remaining ten million people live in designated buffer zones or in nearby towns and villages.⁹ These residents depend on the sites for their homes, subsistence living, jobs, or ecosystem services including climate regulation and flood prevention.¹⁰ Harmful industrial activities, which degrade the environment, compromise the ability of World Heritage sites to provide economic, social and environmental benefits that are vital for the well-being of these people.

Avoiding these harmful industrial activities and focusing on sustainable, carefully managed alternatives will enhance World Heritage sites and the benefits they provide. In some cases, decision makers have chosen a sustainable development approach to managing World Heritage sites. Such an approach takes full account of a site’s current and future combined economic, social and environmental value and considers carefully the impacts that all activities could have on this value. This approach recognizes that the environment is a long-term provider of economic inputs, and it prioritizes sustainable development activities that generate value over a long period of time over harmful industrial

50%
ALMOST HALF
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INDUSTRIAL
ACTIVITIES

activities that focus on short-term revenue generation. In these cases, the World Heritage site has become a driver of economic development in the region. For example, sustainable management of the Tubbataha Reefs in the Philippines has led to increased fish stocks in surrounding fisheries,¹¹ increased tourism, and increased incomes for local communities.¹² Half of all revenues from Chitwan National Park in Nepal are distributed to communities each year for development and conservation activities,¹³ and locally-managed community forests in the buffer zone support over 200,000 people.¹⁴

11
MILLION
HARMFUL
INDUSTRIAL
ACTIVITIES PUT
AT RISK THE
WELL-BEING
OF 11 MILLION
PEOPLE

As the World Heritage Committee has recognized the potential for World Heritage sites to support sustainable development, it should be incorporated into the management of sites going forward. Following the adoption of the 2030 Agenda for Sustainable Development (2030 Agenda) in September 2015, all UN countries have committed to deliver on 17 Sustainable Development Goals that will frame their decisions on development for the next 15 years. In November 2015, the General Assembly of States Parties to the World Heritage Convention adopted a policy that deliberately aligns with the 2030 Agenda and aims to harness the potential of World Heritage sites to contribute to lasting peace and equitable, sustainable development.¹⁵ It calls for countries to manage sites in a way that simultaneously protects their *outstanding universal value* and pursues the sustainable development objectives of environmental sustainability, inclusive social development, and inclusive economic development.¹⁶

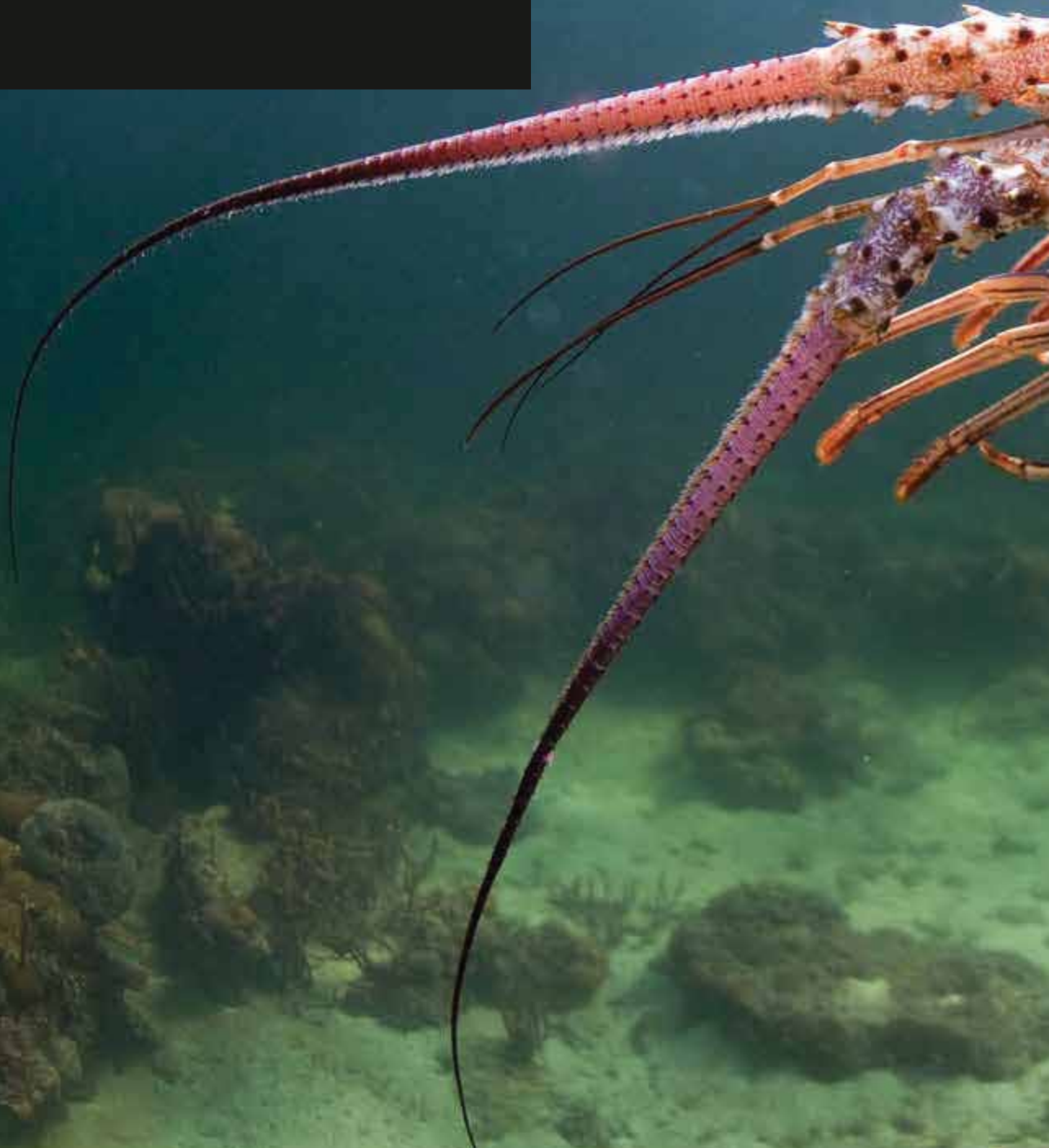
Five key principles are consistent across examples of well managed World Heritage sites, and can help decision makers achieve an appropriate and equitable balance between conservation, sustainability and development. These principles provide a high-level guide that can assist governments, the private sector and site managers in achieving sustainable development in and around World Heritage sites. These principles should be applied at the site level and in the wider area, and should be incorporated into conservation and management approaches.

FIVE KEY PRINCIPLES

<p>1.</p> <p>VALUATION THAT IS SOCIALY CONSCIOUS</p>	<p>2.</p> <p>INVESTMENT DECISIONS THAT FOCUS ON LONG- TERM VALUE</p>	<p>3.</p> <p>GOVERNANCE THAT IS REPRESENTATIVE OF ALL BENEFICIARIES</p>	<p>4.</p> <p>POLICYMAKING THAT IS EVIDENCE- BASED AND TRANSPARENT</p>	<p>5.</p> <p>REGULATIONS THAT ARE ENFORCED AND FOLLOWED</p>
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THE VALUE

ECONOMIC, SOCIAL
AND ENVIRONMENTAL
BENEFITS OF WORLD
HERITAGE SITES





229

THERE ARE
CURRENTLY
229 NATURAL
AND MIXED
WORLD HERITAGE
SITES

WORLD HERITAGE SITES ARE INTERNATIONALLY RECOGNIZED UNDER THE UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANIZATION (UNESCO) WORLD HERITAGE CONVENTION AS AREAS POSSESSING *OUTSTANDING UNIVERSAL VALUE*.

This means that they have “cultural and/or natural significance which is so exceptional as to transcend national boundaries and to be of common importance for present and future generations of all humanity.”¹⁷ For a site to be included on the World Heritage List, it must meet at least one of ten selection criteria, six of which apply to cultural sites and four of which apply to natural sites.¹⁸ Places that meet at least one natural criterion are inscribed as natural World Heritage sites and sites that meet both cultural and natural criteria are inscribed as mixed World Heritage sites.¹⁹ As an added layer of protection, a site may also have a buffer zone, which is a designated area surrounding it that has complementary restrictions placed on its use.²⁰ At the time of writing, there are 197 natural World Heritage sites and 32 mixed World Heritage sites.²¹

NATURAL WORLD HERITAGE SITES²² ARE THE PINNACLE OF PROTECTED AREAS, AND THE WORLD HERITAGE CONVENTION HAS BECOME ONE OF THE WORLD’S MOST INFLUENTIAL INSTRUMENTS IN HERITAGE CONSERVATION.²³

Under the World Heritage Convention, countries commit “not to take any deliberate measures which might damage directly or indirectly ... cultural and natural heritage.”²⁴ As a result of this treaty obligation, World Heritage properties warrant the highest level of national and international recognition, scrutiny and protection.²⁵ The sites exemplify some of the world’s greatest natural beauty, geology, ecology and biodiversity, including places such as the Galápagos Islands, Mount Kilimanjaro, and the Grand Canyon. They cover terrestrial, freshwater and marine ecosystems including rainforests, savannahs, mountains, lakes, wetlands and coral reefs. They are also home to many rare and threatened species.²⁶ For example, the Western Ghats in India supports the single largest population of endangered Asian elephants²⁷ and vulnerable Indian bison,^{28,29} and the Sichuan Giant Panda Sanctuaries in China is home to more than 30 per cent of the world’s endangered wild giant pandas.^{30,31}

Protected areas are the foundation of biodiversity conservation.

They form a large and diverse global network of natural landscapes that covers 13 per cent of the Earth’s land surface.³² Marine protected areas are also prevalent globally. These areas support some of the most valuable ecosystems on the planet, and are intended to protect and maintain biodiversity, as well as natural and cultural resources.³³ The purpose of protected areas extends far beyond conservation, and they serve as places for scientific research, tourism, recreation, and the maintenance of environmental services.³⁴ World Heritage sites represent around one per cent of the total number of protected areas globally³⁵ and cover more than 279 million hectares,^{36,37} or approximately 0.5 per cent of the Earth’s surface.³⁸ The values, challenges and successes of these sites are representative of those in the broader network.

IN ADDITION TO THEIR IMPORTANCE FOR CONSERVATION, PROTECTED AREAS, INCLUDING WORLD HERITAGE SITES OF *OUTSTANDING UNIVERSAL VALUE*, PROVIDE PEOPLE WITH ECONOMIC, SOCIAL AND ENVIRONMENTAL BENEFITS.

While decision makers sometimes perceive protected areas as a barrier to economic development,³⁹ this is not the case. There are strong, clear and established links between conservation and economic development.⁴⁰ Protected areas constitute an important stock of natural, cultural and social capital that can reduce poverty. They do this by supporting livelihoods, maintaining ecosystem services, attracting green investment, and supporting sustainably managed industries such as tourism, forestry and fisheries. These benefits extend far beyond the boundaries of the protected areas and, when managed carefully, will provide long-term gains for local people.

IN MANY CASES, COMMUNITIES LIVING IN AND AROUND PROTECTED AREAS DIRECTLY DEPEND ON THE SITES' NATURAL RESOURCES FOR FOOD, WOOD, FRESHWATER AND MEDICINE, WHICH CAN BE USED FOR INCOME GENERATING ACTIVITIES.⁴¹

For example, the Sundarbans in Bangladesh supports over 300,000 people who collect timber, firewood, honey, beeswax, meat and fish.⁴² Lake Turkana in Kenya directly supports over 300,000 people who rely on the lake for subsistence fishing and agriculture.⁴³ Similarly, 40,000 people directly depend on fishing in Lake Malawi for their livelihoods.⁴⁴ Even more people likely depend on these resources as a food source. Two-thirds of natural World Heritage sites are also considered important for the provision of water.⁴⁵ The Dong Phrayayen-Khao Forest Complex in Thailand, for example, is a vital watershed and drains into five of the country's major rivers. In the Caribbean island of Dominica, the Morne Trois Pitons National Park provides 60 per cent of the water consumed by local communities.⁴⁶

THE ECOSYSTEMS IN PROTECTED AREAS PROVIDE ENVIRONMENTAL BENEFITS FOR PEOPLE AT LOCAL, REGIONAL AND GLOBAL LEVELS.

Over half of all World Heritage sites provide important soil stabilization, flood prevention and carbon sequestration services.⁴⁷ It is estimated that 10.5 billion tonnes of carbon is contained within World Heritage forest sites,⁴⁸ and by ensuring that carbon stocks remain undisturbed, these sites contribute to climate regulation on a local and global scale. By conserving large areas of intact habitat, World Heritage sites also increase the resilience of surrounding areas to natural disasters, and provide protection against the physical impacts of climate change such as rising sea levels, storm damage and increasing temperatures.⁴⁹

OVER 90 PER CENT OF ALL NATURAL WORLD HERITAGE SITES PROVIDE JOBS.⁵⁰

This employment is typically locally based and long-term, providing local community members with secure and stable incomes.⁵¹ In Democratic Republic of the Congo, Virunga National Park's fisheries industry provides jobs for 27,000 people.⁵² Australia's Great Barrier Reef contributes to the employment of 69,000 people through tourism, recreation, fishing and research activities.⁵³

WORLD HERITAGE SITES, LIKE MANY OTHER PROTECTED AREAS, ALSO MAKE A CONSIDERABLE CONTRIBUTION TO NATIONAL ECONOMIES THROUGH TOURISM, RECREATION AND THE EXPORT OF RESOURCES, AND CAN BE A DRIVER OF ECONOMIC DEVELOPMENT WHEN MANAGED SUSTAINABLY.

Tourism, in particular, is critical to emerging economies, and well managed protected areas are a key asset for the sustainable tourism industry.⁵⁴ One study estimates that the world's natural protected areas receive eight billion visits per year, by people who spend a total of around US\$600 billion.⁵⁵ Although detailed data is not available, World Heritage sites likely account for a substantial portion of this revenue. One site alone, the Great Barrier Reef, has documented direct expenditures on tourism and recreational activities that total US\$6.9 billion⁵⁶ per year.⁵⁷

2/3
TWO-THIRDS
OF SITES ARE
IMPORTANT
SOURCES OF
FRESHWATER



THE THREATS

HARMFUL INDUSTRIAL
ACTIVITIES IN
AND AROUND WORLD
HERITAGE SITES



HARMFUL INDUSTRIAL ACTIVITIES CAN HAVE NEGATIVE IMPACTS ON SITES' VALUE

WHILE INDUSTRIAL ACTIVITIES CAN BE DRIVERS OF ECONOMIC DEVELOPMENT, WHEN CONDUCTED AT A LARGE-SCALE, IN A POORLY MANAGED MANNER, AND IN OR AROUND PROTECTED AREAS, THEY CAN HAVE SUBSTANTIAL, LONG-TERM NEGATIVE IMPACTS ON THE ECONOMIC, SOCIAL AND ENVIRONMENTAL VALUES OF THE AREA.

The larger natural ecosystem in which a World Heritage site is located has a substantial impact on the site's integrity. Therefore, the *outstanding universal value* and benefits provided by World Heritage sites are dependent upon the areas surrounding them, such as established buffer zones. When conducted in or around a World Heritage site, harmful industrial activities, which are operations that cause major negative disturbances or changes to the character of marine or terrestrial environments, can impact a site's *outstanding universal value*. This reduces the site's ability to support local livelihoods, and puts at risk the health and well-being of nearby communities. These activities are often, but not exclusively, conducted by multinational enterprises and their subsidiaries, and their impacts are often long-term or permanent. Examples of such operations include oil and gas extraction using large drills and platforms; large-scale mechanized mining; illegal logging; large-scale infrastructure projects; overfishing through the use of large vessels and machinery; and unsustainable water use, such as from the construction of poorly planned dams.

THE WORLD HERITAGE COMMITTEE HAS STATED REPEATEDLY THAT EXTRACTIVE ACTIVITIES, SUCH AS OIL, GAS AND MINERAL EXTRACTION, ARE INCOMPATIBLE WITH WORLD HERITAGE STATUS.

It has called on companies to consider these as *no go* places,^{58,59,60} yet the majority of companies in the extractive industries have not committed formally to this position. In 2003, members of the International Council on Mining and Metals, an organization of 23 mining and metals companies and 35 national and regional mining and commodity associations, committed not to explore or mine in World Heritage sites.^{61,62} More recently, some oil and gas firms, such as Shell, Total, SOCO and Tullow, have also committed not to explore for, or extract, hydrocarbons within World Heritage sites.^{63,64} However, to date, the majority of oil, gas and mineral extraction companies have yet to make such a *no go* commitment.⁶⁵

In addition, some governments are continuing to sell exploration rights within, or on the borders of, World Heritage sites and other protected areas, or have passed legislation that overrides protective policies in order to permit extractive activities.^{66,67}

ALMOST HALF OF ALL NATURAL WORLD HERITAGE SITES ARE THREATENED BY HARMFUL INDUSTRIAL ACTIVITIES.⁶⁸

Of the 229 natural and mixed World Heritage sites, 114 either have oil, gas or mining concessions overlapping them or are listed as being under "high threat" or "very high threat" from at least one harmful industrial activity by International Union for the Conservation of Nature (IUCN), the official advisory body to the World Heritage Committee for natural World Heritage sites.

AT LEAST ELEVEN MILLION PEOPLE DEPEND ON THESE PLACES FOR THEIR WELL-BEING, AND COULD BE AFFECTED NEGATIVELY BY THE IMPACTS OF HARMFUL INDUSTRIAL ACTIVITIES IN OR AROUND WORLD HERITAGE SITES.⁶⁹

Over one million of these people live within the boundaries of these sites, and an additional ten million people live in designated buffer zones or in nearby towns and villages.⁷⁰ In total, the number of people depending on threatened World Heritage sites for their livelihoods and well-being is equivalent to the entire population of Portugal.⁷¹ These people depend on the sites for their homes, subsistence living, jobs, or ecosystem services including climate regulation and flood prevention.⁷² Harmful industrial activities, which degrade the environment, compromise the ability of World Heritage sites to provide economic, social and environmental benefits that are vital for peoples' well-being.

Table 1:
Estimated the number of sites currently at threat from harmful industrial activities, and the number of people dependent on these sites.

Region	Total number of sites	Number of sites at threat	% of sites at threat	Total population dependent on sites
East Asia & Pacific	55	30	55%	7,000,968
Europe & Central Asia	54	16	30%	353,674
Latin America & Caribbean	41	22	54%	1,357,348
Middle East & North Africa	5	2	40%	47,530
North America	20	7	35%	37,478
South Asia	12	7	58%	714,205
Sub-Saharan Africa	42	30	71%	1,783,544
Total	229	114		11,294,748

A LARGE PROPORTION OF THESE PEOPLE LIVE IN THE BUFFER ZONES OF THE TROPICAL RAINFOREST HERITAGE OF SUMATRA.

This site comprises three national parks, Gunung Leuser, Kerinci Seblat and Bukit Barisan Selatan, which are surrounded by several major towns. Together, the World Heritage site and its buffer zones are home to approximately six million people. The three national parks contain large water catchment areas that are vital for sustaining the livelihoods of millions of people within and outside the site who depend on the water for consumption, irrigation, fish, soil fertility, flood control and climate regulation.⁷³ According to IUCN, the Tropical Rainforest Heritage of Sumatra is currently at “very high threat” from logging and wood harvesting, as well as from roads and railways.⁷⁴ WWF has also identified 27 mining concessions and three oil and gas concessions that overlap with this World Heritage site, which, if used, could cause severe damage to the site. All of these activities have the potential to result in the clearance of large areas of the forest.⁷⁵ This would reduce the ability of the forest to provide ecosystem services⁷⁶ to the six million people living in and around the site. As a result of these industrial activities, the site was inscribed on the List of World Heritage in Danger⁷⁷ in 2011.⁷⁸

Due to their nature and scale, some industrial activities can damage or degrade protected areas when conducted within or nearby them. The following section provides examples of harmful industrial activities that have damaged World Heritage sites.

OVERFISHING

More than 20 per cent of all natural World Heritage sites are marine-based, and overfishing can be catastrophic for their ecosystems. Overfishing occurs when more fish are caught than can be replaced through natural reproduction. The pressure on global fish stocks has increased in recent years as a result of growing demand for food. This has led to the commercialization and rapid expansion of the fishing industry, and a switch from predominantly artisanal fishing to industrial approaches.⁷⁹ Industrial fishing uses large vessels and machinery to maximize fishing capacity and catch size. The overfishing of commercially valuable species disturbs entire food chains and can have effects beyond those on the targeted fish species. For example, overfishing

20%
OIL AND GAS
CONCESSIONS
EXIST IN ALMOST
20 PER CENT
OF NATURAL
WORLD HERITAGE
SITES

of herbivorous fish in some parts of the Caribbean could lead to the collapse of the coral reefs there within the next 20 years⁸⁰ as the corals become covered in algae that is usually consumed by these fish.⁸¹ Forty seven natural World Heritage sites have been inscribed specifically in recognition of their exceptional marine value and, without effective regulations, these could be threatened by overfishing, now or in the future.⁸²

The ecological integrity of Banc d'Arguin National Park in Mauritania is threatened by unsustainable fishing practices, which is putting the livelihoods of local people at risk. Banc d'Arguin is the richest fishery on the West African coast.⁸³ Although commercial fishing is banned within the boundaries of the World Heritage site, the park has come under threat from encroachment by industrial trawlers. Overfishing by licensed international fleets just outside the park boundaries has exacerbated the threat. In 2001, 334 factory style foreign trawlers had permits to fish in Mauritanian waters and, collectively, they caught more than five hundred million kilograms of fish.⁸⁴ This is equivalent to the weight of more than 2,300 jumbo jets.⁸⁵ Due to the interconnected nature of marine ecosystems through ocean currents, illegal fishing within the site and unsustainable commercial fishing in the surrounding areas has distorted Banc d'Arguin's ecological balance. This has led to a depletion of marine stocks, the local extinction of some fish species, and a decline in the populations of nine fish-eating bird species.^{86,87} By 2002, the endangered sawfish had completely disappeared from Mauritanian waters.⁸⁸ Almost 1,500 *Imraguen* people living in Banc d'Arguin depend on fishing for their livelihoods, but with fish populations under severe threat, they will have no choice but to seek alternative sources of food and income if commercial overfishing in Mauritanian waters continues.⁸⁹

OIL AND GAS EXPLORATION AND EXTRACTION

Despite the World Heritage Committee's long-held position that oil and gas exploration and extraction is incompatible with World Heritage status,⁹⁰ oil and gas concessions exist in almost 20 per cent of natural World Heritage sites.⁹¹ When conducted in World Heritage sites, exploration activities, such as seismic surveys and drilling, often result in the clearance of vegetation for access. When conducted offshore, seismic surveys can affect the behaviour of marine animals by causing deafness, disturbing communications, and disrupting migration patterns.⁹² The resulting confusion can lead to the separation of whales and dolphins from their pods.⁹³ The construction of oil and gas infrastructure, such as roads and pipelines, exacerbates the destruction of vegetation and facilitates access to previously inaccessible areas. This leads to the introduction of invasive plants, fragmentation of habitats, disruption of nearby wildlife, and an increase in the likelihood of poaching.

Oil exploration in Oman's Arabian Oryx Sanctuary led it to become the first, and only, natural site to be removed from the World Heritage List.⁹⁴ The sanctuary was inscribed as a World Heritage site in 1994 to protect its herd of reintroduced Arabian oryx, which was the first free ranging herd since the animal's extinction in the wild in 1972.⁹⁵ Oil exploration in the area led to habitat destruction, and the construction of associated infrastructure increased access for poachers.⁹⁶ Despite these impacts, the government decided to expand oil drilling in the area, and in 2007, reduced the size of the property by 90 per cent to facilitate the expansion.⁹⁷ New exploratory wells were drilled within the site, along with new access roads.⁹⁸ The resulting increase in poaching led to a collapse of the Arabian oryx population, and by 2007, the population had fallen by 85 per cent compared to when the site was inscribed.⁹⁹ As a result, the World Heritage Committee removed the sanctuary from the World Heritage List citing that such activities had destroyed the *outstanding universal value* of the property.¹⁰⁰ To date, this is the only natural World Heritage site to be delisted by the committee.¹⁰¹ Oman's Arabian oryx population has continued to decline since the site's removal and now only males remain, leaving the future viability of the species in the country uncertain.¹⁰²

ILLEGAL LOGGING

The majority of logging in tropical rainforests is illegal and costs governments billions of dollars in lost revenue each year.¹⁰³ In some countries, up to 90 per cent of all logging is undertaken illegally.¹⁰⁴ Large-scale illegal logging practices include logging in prohibited areas, the absence of management plans, overharvesting, non-payment of fees and taxes, and not consulting or obtaining the consent of local communities when required.¹⁰⁵ This causes the loss and degradation of forests, depletes livelihoods, and contributes to social conflict and corruption.¹⁰⁶ Illegal logging is estimated to generate between US\$10 and 15 billion annually worldwide, very little of which is received by local people or national governments.¹⁰⁷ IUCN lists 25 of the 106 World Heritage forest sites¹⁰⁸ as facing “high” or “very high” threats from logging and wood harvesting, the majority of which is likely to be illegal.¹⁰⁹

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Illegal logging in the Rainforests of the Atsinanana in Madagascar destroys local livelihoods and has led to the site’s inclusion on the List of World Heritage in Danger.¹¹⁰ The Rainforests of the Atsinanana, which comprises six national parks, is critically important for maintaining both Madagascar’s unprecedented biodiversity and the livelihoods of local communities.¹¹¹ Since 2009, two of the parks within the World Heritage site have been subject to intense illegal logging of rosewood and ebony, despite a national ban on the exploitation and export of these species of timber.¹¹² This has led to widespread degradation of the forest, and an increase in poaching of endangered lemurs. Less than one per cent of profits from this illegal logging remains in Madagascar, and it is reported that a small group of international timber barons capture the vast majority of profits.¹¹³ Illegal logging also drives local communities further into poverty as they lose access to food and clean water, become more susceptible to flooding and mudslides, and receive less revenue from tourism. Madagascar has made several unsuccessful attempts to stop illegal logging in the past, and more effort is vital for protecting the site and the multimillion dollar ecotourism industry it generates.¹¹⁴

INFRASTRUCTURE

When built inside World Heritage sites, large-scale industrial infrastructure such as highways, railways and electricity grids can negatively alter ecosystems and their ability to support local populations of people and wildlife. While infrastructure is an essential component of modern life, it can have negative impacts on the biodiversity of World Heritage sites and other protected areas. Roads and railways fragment ecosystems, disrupt migration routes, and increase animal deaths due to collisions.¹¹⁵ They also facilitate access to protected areas for loggers, poachers and others who want to participate in the unsustainable, and often illegal, extraction of an area’s natural resources.¹¹⁶

The construction of infrastructure in Thailand’s Dong Phrayayen-Khao Yai Forest Complex has caused widespread deforestation and loss of wildlife.

The Dong Phrayayen-Khao Yai Forest Complex, which comprises four national parks and a wildlife sanctuary, is home to more than 2,500 plant species and 800 animal species, including endangered tigers, elephants and leopards.¹¹⁷ However, over the last 40 years, the park’s biodiversity and stability have suffered as a result of infrastructure construction. In 1969, Thailand completed the construction of Highway 304, a high traffic volume road running straight through the parks. The highway and its associated minor roads have fragmented the forest complex into smaller areas, resulting in the disruption of migration routes, habitat loss, and wildlife roadkill.¹¹⁸ The road also provides increased access for illegal loggers and poachers, which endangers the forests, their wildlife and national rangers. Poaching of high value mammal, bird and plant species, which used to happen only on a small scale, has become increasingly more sophisticated and violent with many poaching operations now armed. To date, seven rangers have been killed or injured while protecting the parks.¹¹⁹



In 2010, a ban on exporting precious timbers like rosewood was introduced in Madagascar, however illegal logging remains widespread across the island nation.

**€380
MILLION**
CLEANING UP THE
MINE DISASTER
NEAR DOÑANA
NATIONAL PARK
COST ABOUT
€380 MILLION

MINING AND EXTRACTION

One in five World Heritage sites has mines or mining concessions within its borders, and is vulnerable to the negative environmental effects of mining.¹²⁰

Some mineral extraction processes produce large quantities of hazardous waste containing heavy metals, acids and radioactive material.^{121,122} Disposal of this waste can be difficult and costly, and can result in the pollution and degradation of aquatic ecosystems through sedimentation, acidification and the deposition of metals. Water abstraction for mining activities also alters water systems. In addition, large-scale mining can lead to the clearance of vegetation for the construction of roads and pipelines, or for the construction of a dedicated fuel supply for the processing of minerals.¹²³ Despite a commitment from International Council on Mining and Metals members, a number of companies remain willing to take up mining concessions that overlap with World Heritage sites, which puts the 42 World Heritage sites that contain mines or mining concessions at high risk.¹²⁴

The Andalusian government is supporting the reopening of a mine near Doñana National Park that previously caused one of Spain's worst environmental disasters. Doñana National Park, which is also a Ramsar wetland of international importance,¹²⁵ provides shelter for up to six million migratory birds and half a million wintering birds, and supports threatened species such as the Iberian lynx and imperial eagle.¹²⁶ In 1998, the wetlands and its wildlife were severely damaged by a mining accident at the Los Frailes mine, located 50 kilometres north of the park.¹²⁷ A dam holding waste from the extraction process burst. This released five million cubic metres of toxic sludge and acidic water into the Guadiamar River, the main water source for Doñana National Park, which flowed downstream to the border of the park. The waste released from the dam was equivalent to the contents of 2,000 Olympic-sized swimming pools,¹²⁸ and after the spill around 30,000 kilograms of dead fish were found.¹²⁹ Efforts to clear up the spillage took three years and cost around €380 million.¹³⁰ The mine was reopened in mid-1999, but operated at a loss and was closed in 2001, despite receiving subsidies from the Spanish and Andalusian governments.^{131,132} Regardless of this, in February 2015, the Andalusian government awarded the extraction rights for the mine to a Mexican company, Grupo Mexico, which plans to reopen the mine.¹³³

UNSUSTAINABLE WATER USE

Poorly managed water use in and around World Heritage sites has severe consequences for their ecosystems. Industrial activities typically require large freshwater inputs, which are often taken from natural sources.¹³⁴ Water use for industrial purposes can affect the quality and pattern of natural water flows, damage aquatic habitats, poison aquatic life, and lead to desertification. These industrial activities include dam construction to create reservoirs, hydropower generation, and large-scale water extraction for commercial-scale agriculture and mining. The planning and approval process for these activities often overlooks their downstream impacts, making the threats difficult to regulate.

The integrity of Lake Turkana National Parks in Kenya is under threat due to unsustainable water use. Lake Turkana, the largest desert lake in the world, sources around 90 per cent of its water from the Omo River in neighbouring Ethiopia.¹³⁵ Recent construction of three hydroelectric dams along the Omo River has disrupted the flow of freshwater to the lake. Between 2015 and 2018, the annual flow into Lake Turkana is predicted to fall by up to 70 per cent as the reservoir created by the third dam is filled.¹³⁶ Ongoing water extraction upstream of Lake Turkana will disrupt water flow, reduce the number of aquatic habitats, and increase the salinity of the lake.¹³⁷





Spain's Guadiamar River after being contaminated with five million cubic metres of toxic sludge and acidic water. In 1998, a dam holding waste from a nearby mine burst leading to the deaths of 30,000 kilograms of fish. The same mine, located near Doñana National Park, could soon be reopened.

This construction could lead to the ecological collapse of Lake Turkana, causing a loss of income in the region and an increase in tension between tribal groups that depend on the lake for their livelihoods.¹³⁸ Lake Turkana is the second largest inland fishery in Kenya, and provides an important source of income to the region with an estimated annual fish catch value of US\$5 million.¹³⁹ Dams and the unsustainable extraction of water for commercial sugarcane plantations will affect the breeding patterns of fish species in the lake.¹⁴⁰ This could reduce the volume of biomass in the lake by 42 per cent, resulting in approximately US\$2 million in lost income for local fishers.¹⁴¹ A reduction in the size of Lake Turkana could also affect the livelihoods of the 300,000 people who rely on the lake for subsistence fishing and agriculture.¹⁴² The lake's resources are becoming more scarce, and rival ethnic groups are being forced to live in closer and closer proximity. Considering the groups' long history of conflict, this is likely to increase the risk of violence between them.^{143,144}

THREATS THAT CO-OCCUR

Over 20 per cent¹⁴⁵ of natural World Heritage sites, 46 properties, face threats from multiple harmful industrial activities.^{146,147} The interaction between activities that co-occur is likely to be complex and unpredictable, and the negative impacts generated by each activity are likely to be compounding.

Selous Game Reserve in Tanzania, for example, has experienced damage due to oil and mineral extraction as well as road construction, and now faces additional threats from hydropower construction. Selous once contained globally significant populations of African elephants, hippopotamuses and critically endangered black rhinoceroses.¹⁴⁸ However, the site faces continuing threats from oil and mineral extraction, which have been exacerbated since 2009 following the relaxation of the legal framework that protects Tanzanian game reserves.¹⁴⁹ The Tanzanian government has already awarded at least 50 concessions for oil, gas and mining extraction that overlap with the site,^{150,151} and new tenders for petroleum blocks in Selous are still being considered.¹⁵² In 2012, the boundary of the World Heritage site was modified to enable the construction of a large-scale uranium mine in the southern area of the reserve.^{153,154} These activities have damaged the site's biodiversity and caused a reduction in revenue from tourism activities. This resulted in local job losses for people who were affected by declining tourism and were not equipped with the right skills to work in oil exploration or mining.¹⁵⁵ The site also faces threats from the proposed construction of a hydropower plant, which would result in flooding of parts of the reserve and the loss of terrestrial habitats.¹⁵⁶

These harmful industrial activities, some of which have been undertaken within the same area, have increased access to the site and led to further damage from poaching. Access roads constructed by Shell in the 1980s for oil exploration,¹⁵⁷ and by ARMZ for uranium mineral extraction, have facilitated access to Selous for poachers.¹⁵⁸ The company responsible for operating the new uranium mine in the excised area of the property conceded that "poachers took advantage when we built a road to the deposit."¹⁵⁹ Since its inscription in 1982, the site's elephant population has fallen by almost 90 per cent,¹⁶⁰ and now just over 11,000 elephants remain within the reserve.¹⁶¹ Additionally, almost the entire population of critically endangered black rhinos has been lost since the site's inscription.¹⁶² Wildlife poaching has jeopardized the reserve's *outstanding universal value* and, as a result, the site was inscribed on the List of World Heritage in Danger in 2014.¹⁶³

The Belize Barrier Reef Reserve System has also been damaged by activities that co-occur. The Belize World Heritage site's diverse marine ecosystem is home to at least 1,400 species of flora and fauna, of which 17 are threatened with extinction.^{164,165} In addition, more than half of Belize's population,¹⁶⁶ or about 190,000 people,^{167,168,169}

50+

AT LEAST 50 OIL,
GAS AND MINING
CONCESSIONS
OVERLAP THE
SELOUS WORLD
HERITAGE SITE

190,000
THE BELIZE
BARRIER REEF
SUPPORTS ABOUT
190,000 PEOPLE

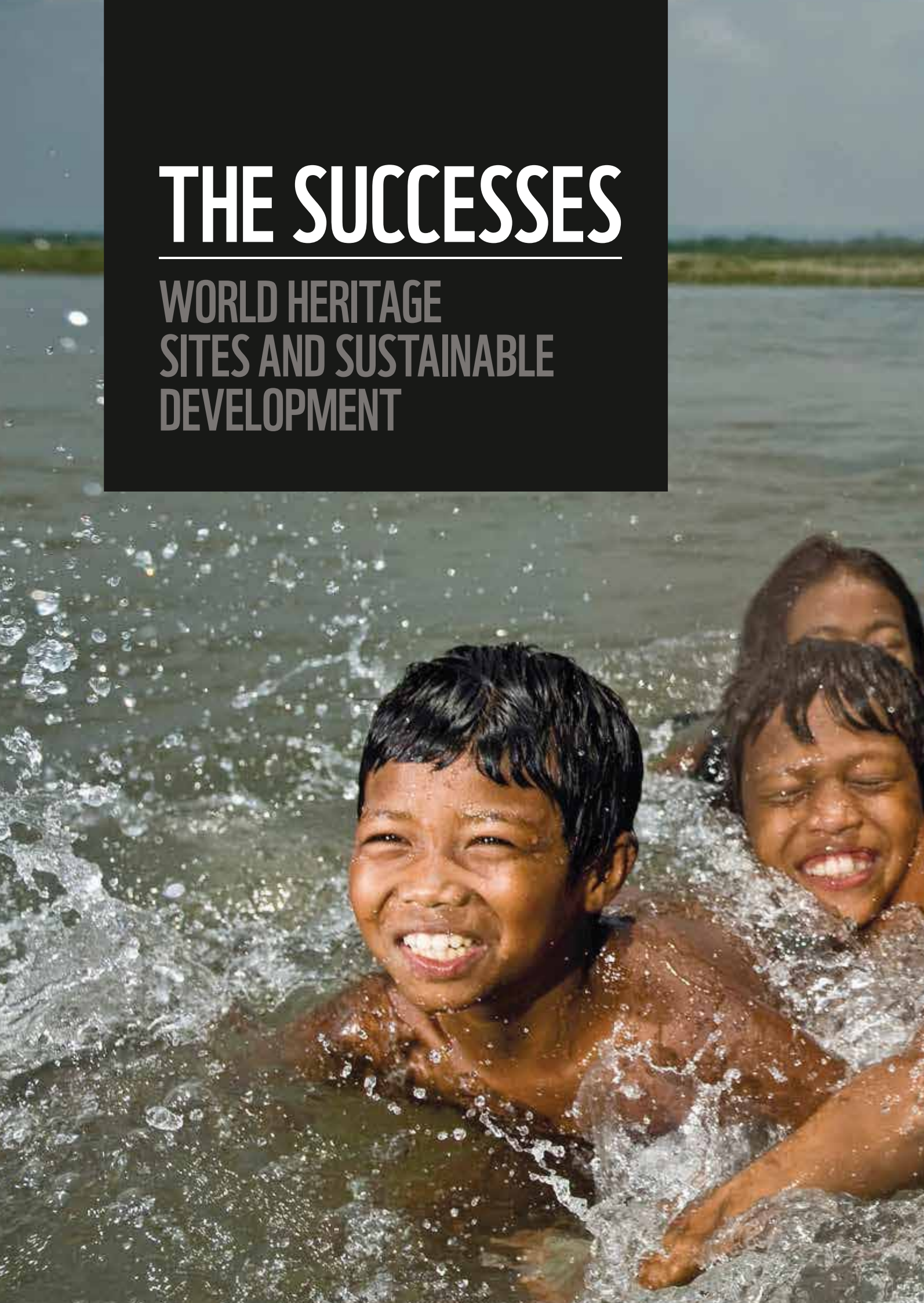
are supported by incomes generated through reef-related tourism and fisheries. Since 1998, however, 40 per cent of the reef has been damaged by activities including unsustainable coastal construction and agriculture that has produced harmful run-off.¹⁷⁰ Poorly managed construction on the Belizean coast and within the World Heritage property locations has led to extensive mangrove clearance and marine dredging. For example, unsustainable mega-resort construction in Pelican Cayes has resulted in the deforestation of 60 per cent of its mangroves.¹⁷¹ Similarly, the construction of a large cruise ship terminal at Harvest Caye has resulted in damage to nearby coral reefs due to the dredging and dumping of rocks.¹⁷² The damage to the reef has been exacerbated by pollution from agricultural run-off, which causes nutrient overloading in the water.¹⁷³ This can lead to algal blooms in the reef that block the sunlight needed by marine plants to photosynthesize. As a result of the continued destruction of its ecosystems, the Belize Barrier Reef Reserve System was added to the List of World Heritage in Danger in 2009.¹⁷⁴

The future of the site is threatened by offshore oil drilling and damaging coastal construction. Although, shortly before the time of writing, the Belizean government announced its intention to bring forward a policy to ban offshore oil exploration in the World Heritage site, the reef remains at risk from potential offshore drilling outside these areas.¹⁷⁵ Any ban on oil exploitation within the World Heritage property's boundaries would only cover 14 per cent of Belize's marine environment.¹⁷⁶ While Belize has a temporary moratorium on offshore drilling,¹⁷⁷ this could be lifted at any time, leaving the remaining ocean area open to potential exploitation.

As marine ecosystems are connected by ocean currents, their health is highly dependent on the conditions of the surrounding waters, and drilling anywhere in the remaining 86 per cent of Belize's marine environment could irreparably damage the reef. Offshore drilling will also increase the likelihood of oil spills in Belize's waters, in part due to increased oil tanker traffic. Ingestion of spilled oil can have fatal impacts on marine life,¹⁷⁸ and can increase the risk of cancer in people who consume contaminated seafood.¹⁷⁹ This could have immediate effects for the 17,000 people working in Belize's fisheries industry.¹⁸⁰ In addition, future construction projects along the reef could lead to additional marine damage if action is not taken to ensure the full application of sustainability principles. For example, the proposed Puerto Azul mega-resort includes a Formula 1-style racetrack and an airport, which would be built on sand dredged from the surrounding waters.^{181,182}

THE SUCCESSES

WORLD HERITAGE
SITES AND SUSTAINABLE
DEVELOPMENT





THE ENVIRONMENT IS A LONG-TERM PROVIDER OF ECONOMIC INPUTS

NUMEROUS WORLD HERITAGE SITES HAVE MITIGATED OR AVOIDED THE THREATS POSED BY HARMFUL INDUSTRIAL ACTIVITIES THROUGH EFFECTIVE MANAGEMENT AND DECISION-MAKING THAT PRIORITIZES SUSTAINABLE DEVELOPMENT.

In these cases, decision makers, such as site managers and governments, have chosen a sustainable development approach to managing their World Heritage sites that recognizes that the environment is a long-term provider of economic inputs. This approach encourages sustainable development activities that generate value over a long period of time, rather than harmful industrial activities that focus on short-term income generation.

Activities such as sustainable tourism, sustainable forestry and sustainable fisheries take account of current and future economic, social and environmental impacts, and address the needs of visitors, the industry, the environment and local communities. These activities can deliver returns to local communities and national economies, and importantly, can preserve sites and secure the benefits they provide for future generations. When conducted in and around a World Heritage site, these activities can deliver positive development outcomes for nearby residents, while also protecting the property's *outstanding universal value*.

Tubbataha Reefs Natural Park, Chitwan National Park and Ichkeul National Park are among a number of excellent examples of well managed World Heritage sites that illustrate the potential for protected areas to contribute to sustainable development. Through sustainable management, these sites advance both conservation and community-wide development. Further, they illustrate what is possible when the full potential of biodiversity is harnessed and nurtured, and highlight the necessary steps and policies that must be implemented to achieve such results.

The role of World Heritage sites in sustainable development

In 1987, the World Commission on Environment and Development defined sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”¹⁸³ The concept of sustainable development has evolved and grown in importance since its conception, and at the Rio+20 Conference in 2012, heads of state and government representatives renewed their commitment to sustainable development and to ensuring the promotion of an economically, socially and environmentally sustainable future for the planet.¹⁸⁴ UN member states established an intergovernmental process and, in 2015, adopted the 2030 Agenda for Sustainable Development (2030 Agenda). This includes a set of 17 Sustainable Development Goals summarizing 169 targets that apply to all countries equally. These goals and targets seek to balance the three dimensions of sustainable development: environmental sustainability, inclusive social development, and inclusive economic development.¹⁸⁵ All countries and stakeholders, acting in collaboration, are implementing the agenda with the aim of ending poverty, fighting inequality and injustice, and tackling climate change by 2030.¹⁸⁶

World Heritage sites, and protected areas more broadly, could play a key role in achieving the 2030 Agenda by supporting livelihoods through inclusive economic growth, providing sustainable resources, and mitigating climate change. World Heritage sites will only be able to realize their role in the 2030 Agenda if they are managed carefully. A sustainable development approach to managing World Heritage sites and surrounding areas involves maximizing the long-term economic, social and environmental benefits they provide. This means balancing improvements to socioeconomic outcomes, with conserving the world's natural resources and preserving sites' *outstanding universal value*.¹⁸⁷

TUBBATAHA REEFS NATURAL PARK

THE TUBBATAHA REEFS NATURAL PARK IN THE PHILIPPINES IS ONE OF THE WORLD'S MOST DIVERSE MARINE ECOSYSTEMS, BUT THE REEFS AND THE LIVELIHOODS THEY SUPPORT WERE THREATENED IN THE PAST BY OVERFISHING.

“The Tubbataha Reefs are a major source of larvae for the Sulu Sea, and are critical for enriching its fisheries. The site’s no-take policy has been the main contributor to increasing fish biomass and coral cover in the reefs and the surrounding area. As a result of the reef’s rebounding health, the site has become even more attractive to tourists.”

Angelique Songco,
Site Manager,
Tubbataha Reefs
Natural Park

The Tubbataha Reefs World Heritage site, which is also a Ramsar wetland of international importance,¹⁸⁸ supports more than 600 species of fish¹⁸⁹ and is an important spawning ground for fisheries in the Sulu Sea.¹⁹⁰ In past decades, the use of damaging fishing practices, including dynamite and cyanide,¹⁹¹ led to the depletion of fish stocks within the site and the surrounding region.¹⁹² This jeopardized the well-being of the one million people living in fishing households that rely on the Sulu Sea for food and income.¹⁹³

In response to unsustainable fishing practices, the Philippine government declared the site a no-take zone and stepped up efforts to prosecute illegal fishing. In 1998, the government established a new management structure comprising the Tubbataha Protected Area Management Board and the Tubbataha Management Office. In consultation with local fishers, civil society groups, commercial fishing operators and diving operators, the management board developed a multipronged approach to manage sustainably the site and the surrounding area. A no-take zone was introduced across the site, which served to protect the fish nurseries and support the recovery of fish stocks within the site and the surrounding area.¹⁹⁴ In recognition of these long-term benefits, local fishers endorsed the new management plan despite the immediate costs they faced from restricted access to the site.¹⁹⁵

These policies have enabled fish numbers to rebound, resulting in a quadrupling of fish stocks, and increased catches in fisheries surrounding the park. Since the establishment of the management board in 1998, total fish biomass in the Tubbataha Reefs has quadrupled from around 65 metric tons per square kilometre¹⁹⁶ to 278 metric tons per square kilometre in 2011.¹⁹⁷ This is the highest recorded level in the Philippines,¹⁹⁸ and is almost seven times the average fish biomass in other Philippine reefs.¹⁹⁹ The replenishment of fish stocks within the protected World Heritage site also led to increased catches in surrounding fisheries.²⁰⁰ Fishers in the nearby town of Cagayancillo have reported an increase in catch size from five kilograms to 13.5 kilograms between 2007 and 2015.²⁰¹

The successful management of Tubbataha Reefs has catalyzed support for sustainable fishing in the wider region. Having experienced the benefits of sustainable management in terms of increased catch size, the community in Cagayancillo has adopted sustainable practices in its own fisheries. These include using less damaging equipment, catching just enough fish to satisfy local demand, and establishing local marine protected areas.²⁰² In addition, the Tubbataha Reefs has catalyzed the formation of the six-country Coral Triangle Initiative²⁰³ which aims to safeguard the marine and coastal resources and improve the sustainability of fishing practices in Southeast Asia.²⁰⁴

The preservation of the site’s marine ecosystems has led to increased tourism and incomes for local communities. Between 2002 and 2013, the number of tourists visiting Tubbataha Reefs tripled to 1,500.²⁰⁵ As part of the no-take zone agreement, the management board agreed to compensate Cagayancillo fishers with a ten per cent share of revenues from tourist entry fees.²⁰⁶ The local Cagayancillo government has used these funds to invest in projects such as farm-to-market roads and a microcredit facility that has provided loans to local community members. Residents have used these loans to undertake new activities that diversify their income streams, including producing coconut vinegar and establishing seaweed farms.^{207,208} As a result,

average household income in Cagayancillo increased five-fold between 2007 and 2015.²⁰⁹ This has been accompanied by improvements in living standards, such as increased home ownership, greater access to electricity, and improved sanitation in the community.²¹⁰

Effective management, broad stakeholder engagement, and a clear vision for sustainable development have helped to secure the long-term prosperity of the Tubbataha Reefs and the livelihoods of local communities. The successful sustainable management of the park can be attributed to a number of factors, including balancing stakeholder interests, involving local communities, and considering the wider geographical area. The management board, which is responsible for developing the area's management plan, comprises a diverse set of locally-based stakeholders including representatives from government, civil society, academia and the private sector.²¹¹ From the outset, the board engaged local communities that would be affected by the new management plan to ensure that their concerns were addressed and to secure their buy-in. The revenue-sharing agreement, coupled with increased tourism as a result of the site's protection, has improved the living standards and long-term income security of local communities, and has provided them with additional incentives to further protect the park from threats like overfishing.²¹²

CHITWAN NATIONAL PARK

CHITWAN NATIONAL PARK IS THE LAST SURVIVING EXAMPLE OF THE UNIQUE NATURAL ECOSYSTEMS OF THE TERAI REGION, WHICH SPANS NEPAL AND NORTHERN INDIA.²¹³

Chitwan was the first area in Nepal to receive national park status,²¹⁴ and was inscribed as a World Heritage site in 1984.²¹⁵ The park is home to one of the few remaining populations of greater one-horned Asian rhinoceros,²¹⁶ and is also one of the last refuges of the endangered Bengal tiger outside of India.^{217,218}

Initially, restrictions around the use of Chitwan National Park created conflict with local people. Chitwan National Park was created in 1973 with a people-free approach under Nepal's National Parks and Wildlife Conservation Act. As a result, all communities were resettled outside of the park's boundaries, and local people's access rights were restricted. This created direct conflict with local communities due to their limited access to much-needed forest resources such as thatch, timber and fuelwood.²¹⁹ In addition, the nationalization of Nepal's forests established the government's ownership of all forested land in the country, and undermined community-level management practices, which accelerated deforestation across the country.²²⁰ Loss of crops and domestic livestock, and threats to human life from wild animals in the park further fuelled local people's hostile behaviour towards the park. People-park conflict increased further in the 1980s and early 1990s as Nepal's population grew rapidly.^{221,222}

In 1996, a 750 square kilometre buffer zone was declared around the park to ease tensions, protect natural resources, and involve local people in conservation.²²³ In order to minimize conflict, the Park People Programme was launched, and the buffer zone was legally established in 1996.²²⁴ The buffer zone is home to more than 300,000 people,²²⁵ many of whom depend on forest products for part of their subsistence livelihoods.²²⁶ The aim of the buffer zone, and the People Park Programme, was to reduce degradation of the park by local communities while protecting their livelihoods by giving them access to alternative resources.²²⁷ Park officials and local residents now work together to manage the natural resources in the buffer zone and to improve socioeconomic conditions for nearby communities.²²⁸

“Careful, co-management of the park and buffer zones with local communities has helped to create a feeling of ownership and responsibility for conservation which has led to better protection of the park, and stabilization of tiger and rhinoceros populations.

This has attracted more tourists, and local communities have been able to use their share of the tourism revenues to build schools and roads, provide veterinary support, renovate religious sites, create irrigation canals and create secure supplies of drinking water.”

Kamal Kunwar,
Chief Conservation Officer,
May 2013 – October 2015,
Chitwan National Park

Under this management system, the government of Nepal committed to provide half of park revenues for community development and conservation in the buffer zone. Chitwan National Park is one of the most popular tourist destinations in Nepal, and visitor numbers were over 178,000 in 2014.^{229,230} Since 1996, the government has distributed 50 per cent of Chitwan’s annual tourism revenues to local buffer zone communities, and almost US\$1 million was distributed in 2014 alone.²³¹ Buffer zone committees have allocated this budget in line with community requirements, and have invested in public projects, including schools, roads, sustainable dams and health facilities. Funds have also been spent on income generating activities, capacity building programmes, conservation work, and anti-poaching initiatives to ensure that long lasting sustainable development is achieved in communities.²³² As well as providing money for development activities, tourism in Chitwan National Park also indirectly employs over 30,000 people, further contributing to the livelihoods of local residents.²³³

As part of the management system, ownership of some buffer zone forests has been transferred to local communities for sustainable forestry activities, which has led to economic, environmental and sociocultural benefits.

More than 70 forests in the buffer zone have been handed over to local communities, benefiting over 200,000 people.²³⁴ Under the management system, communities design and implement their own operational plans with support from national park authorities. The benefits of community management are illustrated by the regenerated Baghmara Community Forest, which provides residents with all the forest products they require.²³⁵ The community forest was opened to tourism in 1995, and by 2013, annual tourism revenue had reached US\$660,000.²³⁶ Revenues have been used to hire forest guards, train local guides, build schools, and construct embankments to reduce flooding. The community has also used the revenue to invest in alternative energies to reduce pressure on forest resources, and over 100 biogas plants have been installed so far.²³⁷ Across Chitwan’s community forests, sustainable management has led to the conservation and rehabilitation of ecosystems. Forest cover in community forest areas has increased by 7.5 per cent between 2005 and 2013,²³⁸ which outperforms the national average.²³⁹

The reduced pressure on park resources has contributed to the regeneration of the site and its wildlife populations. The buffer zone has given a protective layer to the national park, and prevented the unsustainable extraction of resources from within the property’s boundary. This, combined with management efforts, has led to a regeneration of the park’s natural resources. In addition, conservation programmes, and the presence of the Nepalese army for security, have led to increases in rhino, tiger, crocodile and elephant populations in and around the park.²⁴⁰ Chitwan and its buffer zone now contain 60 per cent of Nepal’s adult tigers and almost 95 per cent of its greater one-horned rhinos.²⁴¹ In the past few years, animal poaching in the park has been incredibly low,²⁴² and on World Wildlife Day, 3 March 2014, the park, and Nepal more broadly, achieved 365 consecutive days of zero poaching of rhinos, tigers and elephants for the third time in the last five years.²⁴³





Community groups manage 70 forest areas in the buffer zone surrounding Nepal's Chitwan National Park and receive half of tourism revenues generated by the park. These funds have been invested in local public facilities and projects, including development of alternative energies. Biogas facilities like this one reduce the pressure put on forests by residents gathering fuelwood. They are also safer and cleaner for both the environment and for those that use them.



Nepal has reduced poaching of elephants, rhinos and tigers nationwide to extremely low levels, in contrast to the trend seen elsewhere in the world.

ICHKEUL NATIONAL PARK

ICHKEUL NATIONAL PARK IS A DIVERSE LAKE-WETLANDS SYSTEM, BUT UNSUSTAINABLE WATER ABSTRACTION UPSTREAM RESULTED IN ITS ADDITION TO THE LIST OF WORLD HERITAGE IN DANGER IN 1996.²⁴⁴

2006

RESTORATION AND REHABILITATION OF ICHKEUL ENABLED IT TO BE REMOVED FROM THE LIST OF WORLD HERITAGE IN DANGER IN 2006

Found in Tunisia, Lake Ichkeul is the last great freshwater lake in North Africa and is an essential resting site for up to 400,000 migratory birds in the winter.²⁴⁵ The World Heritage site, which is also a Ramsar wetland of international importance,²⁴⁶ benefits from seasonal inflows from the sea, giving the park a very specific hydrological ecosystem.²⁴⁷ However, the construction of three upstream dams in the 1980s and 1990s severely restricted the water flow into the lake.²⁴⁸ This reduced the average annual inflow by more than 20 per cent,²⁴⁹ which led to increased salinity in the lake, the death of many freshwater plants and fish, and a resulting decline in the presence of migratory birds.²⁵⁰ By 2000, the number of wintering waterfowls in the park had fallen by 75 per cent, and the number of greylag geese had declined by more than 95 per cent.²⁵¹

Implementation of a sustainable management plan led to the restoration and rehabilitation of the site, and its removal from the List of World Heritage in Danger in 2006.²⁵² Starting in 2003, a new management plan for the site was designed and implemented, with the aim of restoring the water balance in the lake, integrating local communities in the site's management, and supporting the growth of sustainable tourism.²⁵³ Increases in the release of water from upstream dams and the successful regulation of seawater inflows through automated gates²⁵⁴ has led to a 66 per cent reduction in lake salinity.²⁵⁵ The replenishment of water stocks led to improvements in the site's biodiversity, and by 2010, its ecosystem had been restored to a state comparable to that at the time of inscription.²⁵⁶

Promotion of the park as a sustainable tourism destination has increased the number of visitors, while minimizing environmental damage.

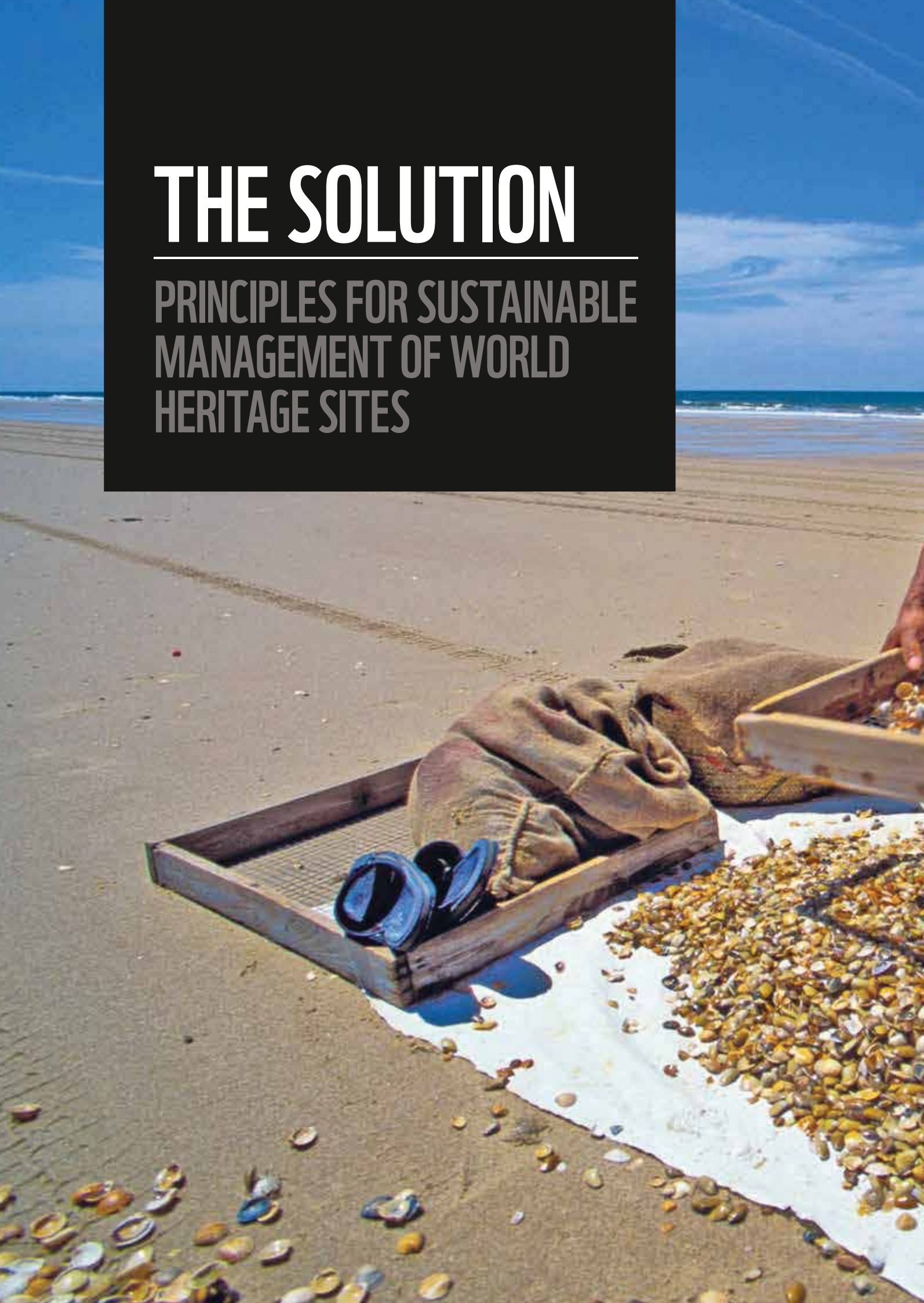
Construction of a new visitor centre has attracted a large number of visitors to the World Heritage site, and it is now a major attraction for birdwatching, mountain biking, hiking, horse riding, and camel trekking.²⁵⁷ Between 2005 and 2012, the number of tourists visiting Ichkeul National Park doubled to around 50,000 per year.²⁵⁸ The negative impacts of increased human presence have been minimized through the use of observation towers and by restricting access to an approved network of nature trails.²⁵⁹

Inclusion of local people in the park's management, and the growth of the tourism industry, has led to improved development outcomes for local communities.

The newly formed Ichkeul National Park Management Committee is composed of members from the local community, government authorities and other stakeholders.²⁶⁰ This has enabled nearby residents to capitalize on the rise in tourism to increase their incomes. For example, a dedicated scheme has been established to train local people as tour guides,²⁶¹ and residents have taken the opportunity to sell agricultural produce to visitors.²⁶² Engaging local communities has not only expanded employment and increased incomes, but it has increased awareness of the park and the importance of its conservation, making the long-term sustainable development of the World Heritage site a reality.²⁶³

THE SOLUTION

PRINCIPLES FOR SUSTAINABLE
MANAGEMENT OF WORLD
HERITAGE SITES





PRINCIPLES OF PROTECTION

When they are carefully and sustainably managed, World Heritage sites will support sustainable development, and can contribute to poverty alleviation and the conservation of natural ecosystems. Sustainable management will be crucial to prevent over-extraction and exploitation of resources from these areas, to protect and conserve their *outstanding universal value*, and to ensure that they can contribute to the 2030 Agenda.

Sustainable development and the World Heritage Convention

The potential for well managed World Heritage sites to support sustainable development and the 2030 Agenda is clear. Over the last decade, countries have increasingly acknowledged the growing relevance of the convention for the well-being and development of society.^{264,265,266} In November 2015, UNESCO adopted the Policy for the Integration of a Sustainable Development Perspective into the Processes of the World Heritage Convention.²⁶⁷ The policy calls for UN member states to recognize conservation and management strategies that incorporate a sustainable development perspective that embraces not only the protection of *outstanding universal value*, but also the well-being of present and future generations.²⁶⁸ In line with the 2030 Agenda, the policy focuses on the three dimensions of sustainable development: environmental sustainability, inclusive social development, and inclusive economic development. As such, sustainable management of World Heritage sites provides an opportunity to contribute to several of the goals.²⁶⁹

Countries will need support from a broad range of stakeholders to achieve the goals of sustainable development while simultaneously protecting the *outstanding universal value* of World Heritage sites. Engagement of the private sector will be vital to ensure that any activity proposed within or around World Heritage sites upholds the values outlined by UNESCO and the World Heritage Committee. The short-term drive for revenue should not override the need to preserve the long-term benefits provided by sites. Involvement of indigenous peoples and local communities will be important to build shared responsibility for protection of sites, and to ensure that the benefits are retained by those that need them most. Support from expert bodies including IUCN and non-governmental organizations with experience in conserving and sustainably managing World Heritage sites also will help to guide decision-making and lead to sustainable outcomes. Finally, financial support from countries in the Organisation for Economic and Co-operation and Development, commonly known as OECD, will be necessary to meet the funding gap for the conservation and protection of World Heritage sites in developing countries.

Achieving sustainable development and conservation will require acting at a scale that is larger than the sites themselves. Therefore, the potential of buffer zones to support sustainable development and to protect sites should be harnessed fully. World Heritage sites are often located within larger natural landscapes whose ecosystems have a substantial impact on their integrity. The *outstanding universal value* and benefits provided by World Heritage sites are therefore dependent upon the areas directly surrounding them. Buffer zones, therefore, should be utilized as added layers of protection and as tools that can enhance benefits for local communities, beyond those provided by the World Heritage sites themselves.²⁷⁰

The application of five key principles to activities in and around World Heritage sites can help decision makers to achieve an appropriate and equitable balance between conservation, sustainability and development.²⁷¹

These principles have been distilled through lessons learned from World Heritage sites that have successfully achieved sustainable development outcomes. The principles provide a high-level guide to assist governments, the private sector and site managers in achieving sustainable development in and around World Heritage sites. These principles should be applied to all activities permitted in and around World Heritage sites, and incorporated into conservation and management approaches at the site level and in the wider area.

5 PRINCIPLES SHOULD BE APPLIED TO ALL ACTIVITIES IN AND AROUND WORLD HERITAGE SITES

- 1. Valuation.** Governments should assess periodically the direct, indirect and non-use value of World Heritage sites. This value assessment should be used, along with a full assessment of the economic, environmental and social costs and benefits of all proposed activities in and around World Heritage sites, to inform decision-making.
- 2. Investment decisions.** When considering investment in activities that could affect World Heritage sites and the people that depend on them, decision makers should assess investments over a long time horizon, and value the needs and benefits of current and future generations fairly.
- 3. Governance.** Stakeholders at the local, regional, national and international level should be involved in the management of the sites. In particular, local communities and indigenous peoples who live in or around World Heritage sites, and are affected by the use of their resources, should be involved in the decision-making process. They should also receive a fair portion of the benefits generated by the use of those resources.²⁷²
- 4. Policymaking.** Policymakers, including governments and site managers, should consult civil society groups, international non-governmental organizations and technical experts in the policymaking process, and decisions should be based on all available information and data. The resulting policies should be effective, comprehensive and free of loopholes that allow these policies to be circumvented. The process and outcome of the decisions should be made publicly available, and be communicated clearly to the World Heritage Committee and other relevant parties.
- 5. Enforcement.** Effective measures should be implemented to ensure that existing and future regulations are upheld by stakeholders and enforced by the appropriate bodies. The regulations that protect World Heritage sites from harmful activities should be enforced in full, and without exception.

Principles in action: Belize Barrier Reef Reserve System

The Belizean government is currently at a decision point, and has the opportunity to take decisive action to ensure that all activities conducted in and around the Belize Barrier Reef Reserve System World Heritage site are consistent with the aims of sustainable development. Application of the principles in the following ways could help the World Heritage site to be removed from the List of World Heritage in Danger:

- **Investment that focuses on long-term value would favour sustainable tourism over offshore oil drilling.** Sustainable reef tourism could be a major driver of future economic development in Belize, as coastal and marine activities are responsible for 60 per cent of current tourism revenues.²⁷³ However, the reef's attractiveness as an international tourist destination depends on the long-term preservation of its marine ecosystems. The pursuit of short-term gains through offshore oil exploration would jeopardize the reef's biodiversity, whereas sustainably managed tourism could help to protect the reef and to secure stable income streams for both current and future generations.
- **Socially-conscious valuation would support a ban on all offshore oil exploration.** Exploiting oil in Belizean waters risks damaging the reef beyond repair, and could negatively affect the well-being of the 190,000 people who are supported by reef-related incomes.^{274,275,276} Moreover, the likelihood of finding large offshore oil reserves is small. Despite the drilling of 16 offshore exploratory wells, there are no indications of large oil fields.²⁷⁷ As a result of the high social and environmental risks associated with offshore oil exploration and extraction, as well as the uncertain economic benefits, the government should adopt a ban on oil exploration in all of Belize's offshore waters.
- **The inclusion of local people in the management of the site would further support a ban on all offshore oil exploration.** Belizeans have repeatedly expressed concerns over offshore oil exploration, yet these views have not always been reflected in government policy. In 2011, the Belizean government rejected a petition requesting a national referendum on offshore drilling, despite it having signatures from almost 20,000 people, or about 10 per cent of the electorate.²⁷⁸ In an unofficial "People's Referendum," held in 2012, more than 95 per cent of the 30,000 participants voted against offshore oil activity.²⁷⁹ Representation of local communities in the site's management would ensure that the views of those people who would be most affected by the negative impacts of offshore oil exploitation are fully considered.
- **The clear communication of government decisions to the World Heritage Committee and other relevant parties would help to clarify existing policies and regulations, and highlight the need for any improvements.** An announcement in December 2015 that the government had approved a policy to ban offshore oil exploration within the World Heritage property had not been confirmed, at the time of writing, with any publically-available official documentation. Moreover, despite requesting help from the conservation community to draft revised mangrove regulations that would strengthen the current system, and stating in its manifesto that it would implement such regulations,²⁸⁰ the incumbent government has yet to communicate any progress. Clear communication on the current status of

regulations that could affect the reef would enable stakeholders to provide input aimed at ensuring that the resulting policies are comprehensive and free of loopholes that could allow actors to circumvent them.

- **The enforcement and implementation of up-to-date coastal management guidelines would ensure that all future coastal construction is conducted in a sustainable manner.** In order to deter damaging coastal construction, the government should transform its current planning guidelines into formal legislation. Also, additional resources should be made available in order to improve enforcement. Existing regulations and systems, such as those for issuing permits for mangrove clearing and dredging, should be updated to provide sufficient protection against the negative impacts of increased construction. Finally, to ensure that the environmental impact of future coastal construction is minimized, the Belizean government should fully endorse and finance the forthcoming Integrated Coastal Zone Management Plan, which designates all coastal areas for either preservation, restoration or development, according to their habitat risk.^{281,282}

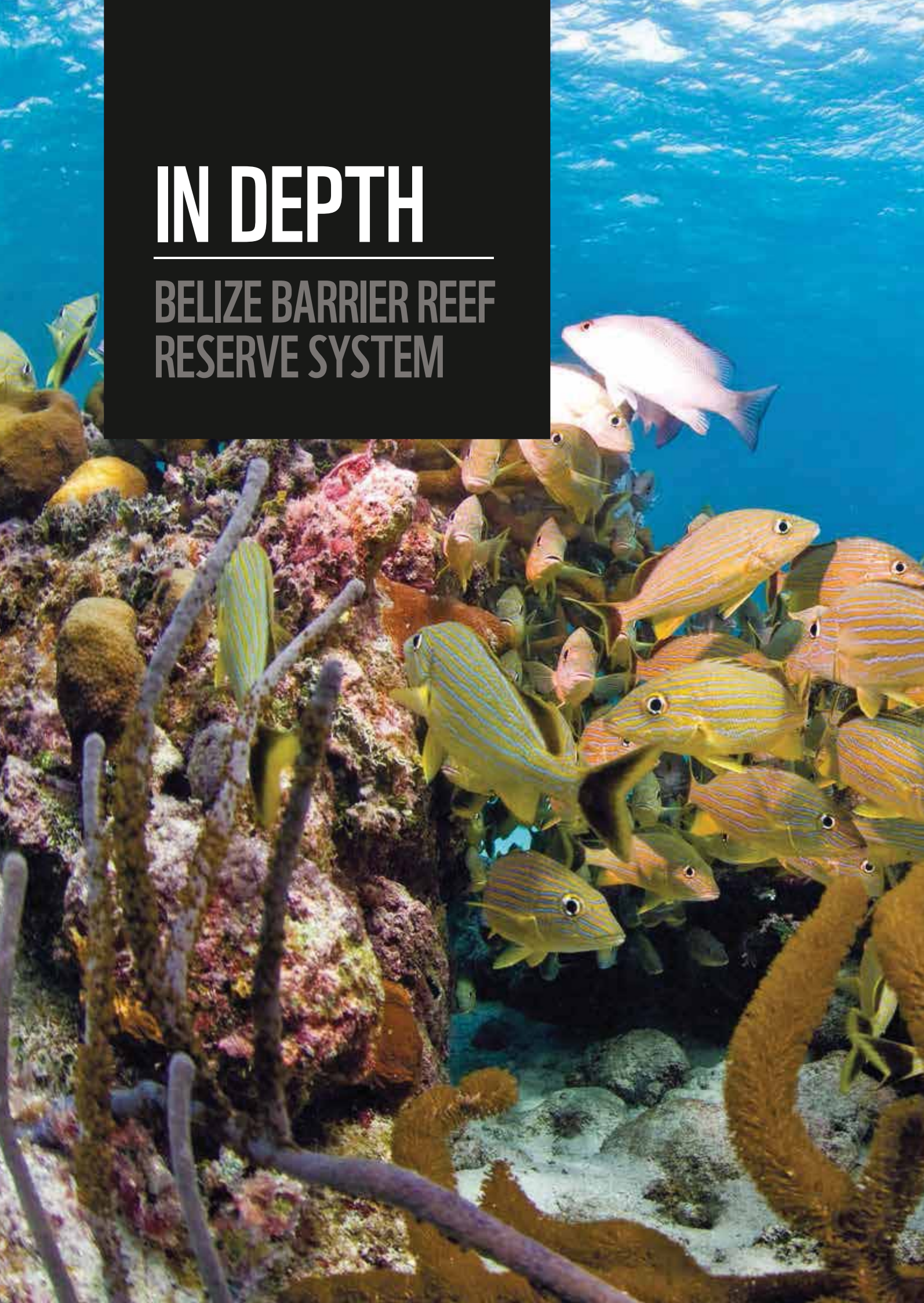
IN CONCLUSION

In conclusion, harmful industrial activities have inflicted substantial damage on a number of World Heritage sites.

These activities jeopardize the *outstanding universal value* and economic, social and environmental benefits provided by World Heritage sites, and can affect the millions of people who depend on them. Switching from, or avoiding, these harmful industrial activities in favour of sustainable, carefully-managed alternatives would enhance World Heritage sites and ensure that they support local communities both now, and in the future. This scenario could enable World Heritage sites to make a substantial contribution towards the goals and targets of the 2030 Agenda on Sustainable Development. By balancing conservation, sustainability and development in and around World Heritage sites, the long-term interests of those who depend on them for their livelihoods and well-being can be protected.

IN DEPTH

BELIZE BARRIER REEF RESERVE SYSTEM





THE VALUE

THE BELIZE
BARRIER REEF IS A
UNIQUE ECONOMIC,
SOCIAL AND
ENVIRONMENTAL
ASSET FOR
BELIZE AND THE
WIDER GLOBAL
COMMUNITY

THE BELIZE BARRIER REEF RESERVE SYSTEM WORLD HERITAGE PROPERTY COMPRISES SEVEN PROTECTED LOCATIONS AND IS PART OF THE LONGEST BARRIER REEF IN THE WESTERN HEMISPHERE.²⁸³

These seven protected locations are dispersed across 235 kilometres of the Belizean coast, and form part of a longer barrier reef system that extends beyond Belize into the waters of neighbouring countries.²⁸⁴ The site includes a variety of ecosystems including mangrove forests and sand cays, and contains the famous Blue Hole Natural Monument, which is a 144 metre sinkhole surrounded by coral reef.²⁸⁵ At the time of its inscription on the World Heritage List in 1996, UNESCO recognized the site as “one of the most pristine reef ecosystems in the Western hemisphere.”²⁸⁶ However, in 2009, the property was placed on the List of World Heritage in Danger.²⁸⁷

Due to the interconnected nature of marine ecosystems, this case study considers the Belize Barrier Reef Reserve System World Heritage locations in the wider geographical context of Belize’s reef. Marine ecosystems are highly interconnected as a result of ocean currents and the movement of marine wildlife. Due to the dispersed nature of the World Heritage site’s protected areas, their health is dependent on the conditions of the surrounding reef and waters. The World Heritage site, therefore, cannot be considered in isolation, and this case study will consider the benefits, and threats facing Belize’s entire reef area.

The diverse marine ecosystem is home to at least 1,400 species of flora and fauna, and at least 17 threatened species.^{288,289} This includes 500 species of fish, more than 400 species of plants, 250 species of mollusc and 100 species of coral. Belize’s reefs support the world’s largest population of the vulnerable West Indian manatees, as well as endangered hawksbill, loggerhead and green marine turtles.²⁹⁰ Belize’s waters are also home to six species of threatened sharks, including great and scalloped hammerheads and whale sharks.²⁹¹

More than 50 per cent of Belize’s population, or 190,000 people, are supported by incomes generated through tourism and fisheries.²⁹² Belize’s reef-related tourism sector supports 28,800 jobs.²⁹³ In addition, the fisheries sector employs 2,400 registered fishers and an additional 15,000 people in processing and exporting roles.²⁹⁴ Therefore, at least 46,000 people in Belize directly depend on the health of reef and mangrove ecosystems for their livelihoods. Assuming that each individual employed in a reef-related job uses the income to support his or her family, the total number of people who rely on reef-related income is almost 190,000.²⁹⁵

The annual economic contribution of reef-related tourism, fisheries and scientific research is estimated at around 15 per cent of Belize’s gross domestic product (GDP).²⁹⁶ Tourism revenue from reef-related activities, such as snorkelling and sport fishing, as well as accommodation, was estimated at between US\$182 and 237 million in 2014.²⁹⁷ The contribution of coral reefs and mangroves to Belize’s fishing industry, through the provision of habitats for almost all commercially caught species, is estimated at US\$14 to 16 million per year.²⁹⁸ In addition, the reef is home to several important research operations, such as the Smithsonian Institute field station and the Glover Reef Research Station, which contribute around US\$5 million to the economy.²⁹⁹ Combined, these activities contribute between US\$200 and 260 million per year to the Belizean economy, or around 15 per cent of the country’s entire GDP.³⁰⁰

Coral reefs and mangroves provide coastal protection for up to 40 per cent of Belize’s population, and these ecosystem services are valued at between US\$270 and 390 million per year. Coral reefs and mangrove forests provide vulnerable coastal populations with natural protection against storm surges, hurricanes and erosion by absorbing and dissipating the energy of incoming waves. Mangrove forests cover about half of Belize’s mainland coast, while coral reefs protect two-thirds of the

coastline.³⁰¹ This natural barrier provides protection for the 40 per cent of Belizeans who live and work in the coastal zone.³⁰² The combined value of this protection, in terms of avoided damage to coastal properties, is estimated at between US\$231 and 347 million per year.³⁰³ In addition, using the social cost of carbon, which estimates the economic damage associated with increased carbon dioxide emissions, the total annual value of carbon sequestration by coastal mangrove forests is over US\$39 million.³⁰⁴

THE THREATS

THE REEF IS BEING DAMAGED BY HARMFUL INDUSTRIAL ACTIVITIES AND THE EFFECTS OF CLIMATE CHANGE

IN 2009, THE BELIZE BARRIER REEF RESERVE SYSTEM WAS ADDED TO THE LIST OF WORLD HERITAGE SITES IN DANGER.

The site was included initially due to the destruction of its ecosystems as a result of resort and housing construction within the property, which was often accompanied by large-scale clearing of mangroves.³⁰⁵ Continued threats that are preventing the site from being removed from the list include land conversion and oil concessions designated within the area.³⁰⁶

Since 1998, scientists estimate that 40 per cent of the reef has been damaged by activities including overfishing, agricultural run-off and unsustainable coastal construction.^{307,308} Overfishing of predatory species in Belize's waters has led to the growth of herbivorous species and the subsequent overgrazing of the coral.³⁰⁹ Poorly-managed construction on the coast and within the World Heritage site has led to extensive mangrove clearance and marine dredging. To date, the loss of mangrove cover within the reef is around 12,500 acres,³¹⁰ or over 6,500 football fields. Further, dredging has increased in both frequency and magnitude during the last decade.³¹¹ Both of these activities increase sedimentation across the reef, which smothers corals and slows their growth rates by clouding the water and reducing the light available. These problems are exacerbated by pollution from agricultural run-off which can create nutrient overloading in the water. This can lead to algal blooms in the reef, which block the sunlight required by marine plants for photosynthesis. Once the algae dies, its decomposition uses up much of the available oxygen in the water, depriving other marine organisms.³¹² A 2004 study suggested that, in total, almost 30 per cent of Belize's reef is highly threatened by sediments or pollution from inland activities.³¹³

Climate change is adding to the stress caused by industrial activities.

Rising sea temperatures and natural disturbances have led to widespread coral bleaching events within the Belize reef system.³¹⁴ In parts of the reef, this has led to an 80 per cent reduction in live coral cover over the last 20 years.³¹⁵ Climate change, combined with industrial activities, is also threatening important marine turtle nesting sites.³¹⁶ The number of nests in principal nesting sites declined by over 35 per cent between 1992 and 2012.³¹⁷

The future of the reef, and the livelihoods it supports, is also threatened by offshore oil exploration. Although the Belizean government announced in December 2015 that it plans to introduce a policy to ban offshore oil exploration in the World Heritage property locations, the reef remains at risk from potential offshore drilling outside these areas.³¹⁸ If this policy is brought into effect through legislation,³¹⁹ the ban would only cover 14 per cent of Belize's marine environment.³²⁰ As marine ecosystems are connected by ocean currents, their health is highly dependent on the conditions of the surrounding reef and waters, and any drilling in the remaining 86 per cent of Belize's marine environment could irreparably damage the reef. An oil spill in Belizean waters would cause widespread environmental damage, and adversely affect the well-being of those who depend on the reef. Ingestion of spilled oil can have fatal impacts on marine life,³²¹ and can increase the risk of cancer in people who

consume contaminated seafood.³²² A decline in Belize's seafood market would have severe effects for the 17,000 people working in Belize's fisheries industry.³²³ The total economic and environmental cost of cleaning up an oil spill in Belizean waters is estimated at around US\$280 million,³²⁴ or more than 15 per cent of Belize's annual GDP.³²⁵ While the government has previously established a temporary moratorium on offshore oil drilling in Belize's waters,³²⁶ this could be lifted at any time, leaving the remaining ocean area outside of the World Heritage areas open to potential exploitation. The government's previous attempts to award offshore oil concessions were halted by the Belize Supreme Court,³²⁷ but government officials retain the ability to issue new leases in the future.

Oil exploration and extraction is incompatible with Belize's commitment to reduce its use of fossil fuels. In its contribution to the climate change targets set out by the Paris Agreement in 2015,³²⁸ Belize committed to shifting its "energy matrix away from fossil fuels (especially oil)."³²⁹ Investment in oil, rather than renewable energy, would undermine this commitment.

THE SOLUTION

SUSTAINABLE TOURISM PRESENTS AN OPPORTUNITY TO PROTECT THE FUTURE OF THE REEF AND TO DRIVE SUSTAINABLE DEVELOPMENT

SUSTAINABLE REEF TOURISM COULD BE A MAJOR DRIVER OF FUTURE ECONOMIC DEVELOPMENT IN BELIZE, BUT MAINTAINING THE COUNTRY'S ATTRACTIVENESS AS AN INTERNATIONAL TOURIST DESTINATION DEPENDS ON THE PROTECTION OF ITS MARINE ECOSYSTEM.

The tourism industry is already Belize's biggest source of foreign exchange,³³⁰ and its contribution to GDP is expected to grow by almost four per cent per year between 2015 and 2025.³³¹ The majority of tourists in Belize participate in marine activities such as snorkelling, diving and sport fishing,³³² and 60 per cent of tourism revenues derive directly from coastal and marine activities.³³³ However, degradation of the reef ecosystem and its marine life is likely to diminish Belize's international attractiveness, and jeopardize the incomes of those who rely on reef-related tourism. Protection of the reef will be vital, therefore, to ensure that reef tourism can drive long-term sustainable development in the region. Sustainably-managed tourism can help to achieve this by minimizing environmental degradation, encouraging conservation, and providing current and future generations with sustainable sources of income.

The Belize government has already created some guidelines to direct the sustainable growth of Belize's tourism sector. The government's National Sustainable Tourism Master Plan 2030, adopted in 2011, seeks to support the development of future sustainable tourism projects.³³⁴ The government has also introduced a permit requirement for mangrove clearing or dredging operations, which aims to prevent unsustainable activities by ensuring that all proposals are subject to a rigorous assessment and approval process.³³⁵ The Belizean government is looking to update this system to ensure that it keeps up with the growth in the tourism industry. Moreover, the government is in the final stages of passing the Integrated Coastal Zone Management Plan, which will designate all areas along the Belizean coast for either preservation, restoration or development, according to an analysis of each habitat's risk.^{336,337}

In some cases, these guidelines have resulted in the creation of coastal developments that have increased tourism to the reef, while conserving the fragile ecosystem. For example, the Coco Plum Island Resort is home to 15 tourist villas,³³⁸ yet its construction involved minimal dredging to fill the property and the extensive planting of new mangrove forests. Instead of constructing concrete seawalls to protect against coastal erosion, the developers planted thousands of mangrove seedlings along the coast to provide natural protection against erosion and flooding.³³⁹ This has resulted in substantial financial and environmental benefits. The owner has stated that the mangrove forests have "actually saved us money, provided better coastal protection, promoted increased wildlife presence, and proved aesthetically superior to the construction of seawalls."³⁴⁰ The resort also employs over 100 people from nearby

communities.³⁴¹ The environmental impacts of construction in Placencia Caye, a different island in the reef, have also been minimized through strict adherence to government guidelines. The developers submitted a rigorous environmental compliance plan to the Department of the Environment, which detailed the actions that would be taken to ensure the sustainability of the project.³⁴² These included commitments to treat all wastewater and sewage, to implement no wake zones around the cay to limit erosion and protect marine wildlife, and to design boardwalks in a way that minimizes the removal of mangroves. In addition, the developers legally designated two-thirds of the cay as a nature reserve, which ensures its long-term preservation by prohibiting any future construction.

However, across the coastal zone, implementation of the government’s sustainable development guidelines has been inconsistent and non-adherence has resulted in some damaging construction around the reef.

For example, Norwegian Cruise Line is currently building a large cruise ship terminal and recreational facilities for onshore passenger excursions at Harvest Caye. A recent site inspection by Belize’s Department of the Environment found that nearby coral reefs had been damaged by the dumping of rocks, as part of plans to construct an artificial beach.³⁴³ The Belize Tourism Industry Association has argued that this type of mass cruise tourism is inconsistent with the National Sustainable Tourism Master Plan guidelines, which suggest that only cruise ships carrying fewer than 300 passengers should be permitted on the south-eastern coast of Belize.³⁴⁴ Strict adherence to the guidelines could have improved the sustainability of the project. On 13 January 2016, the Supreme Court of Belize ruled in a case brought by the Belize Tourism Industry Association that Belize’s Ministry of the Environment had breached the environmental impact assessment regulations in its process of approving the Harvest Caye development, and had not allowed sufficient time for public consultation on the project.³⁴⁵

Construction in the Pelican Cayes, which are found within one of the World Heritage locations, has also come under criticism for not adhering to government legislation. Preparations for a resort have led to extensive mangrove cutting and dredging of nearby marine ecosystems in order to create new land suitable for construction. However, the relevant government departments report that no mangrove clearance permits, and only one dredging permit, have been issued in the area.^{346,347} Despite this, 60 per cent of the mangroves in Pelican Cayes have been deforested,³⁴⁸ which has resulted in the decline of local fish and lobster populations.³⁴⁹ In addition, future projects such as the proposed Puerto Azul resort could lead to additional marine damage if action is not taken to ensure the full application of sustainability principles. The current proposals there include a Formula 1-style racetrack and an airport, which would be built on sand dredged from the surrounding waters.^{350,351}

“ THE MOVE TO PERMANENTLY BAN OFFSHORE OIL ACTIVITY IN BELIZE’S WORLD HERITAGE SITES AND ALONG THE BELIZE BARRIER REEF REPRESENTS A STEP FORWARD IN THE MEANINGFUL PROTECTION OF THE COUNTRY’S MARINE RESOURCES. THIS DECISION REFLECTS WHAT THE PEOPLE OF BELIZE HAVE BEEN ASKING FOR YEARS: PROTECTION OF LIVELIHOODS, FOOD SECURITY AND CULTURAL IDENTITY. WE WILL ALWAYS SUPPORT THIS NATIONAL CALL AND WILL CONTINUE TO WORK TO ENSURE THAT BELIZE’S MARINE ENVIRONMENT WILL NEVER BE AT RISK FROM THE INHERENT HAZARDS OF OFFSHORE OIL ACTIVITY. ”

JANELLE CHANONA, VICE PRESIDENT, OCEANA BELIZE

THE PATH FORWARD

BELIZE MUST TAKE
ACTION TO ENSURE
THAT THE REEF
DRIVES SUSTAINABLE
DEVELOPMENT
FOR THE COUNTRY

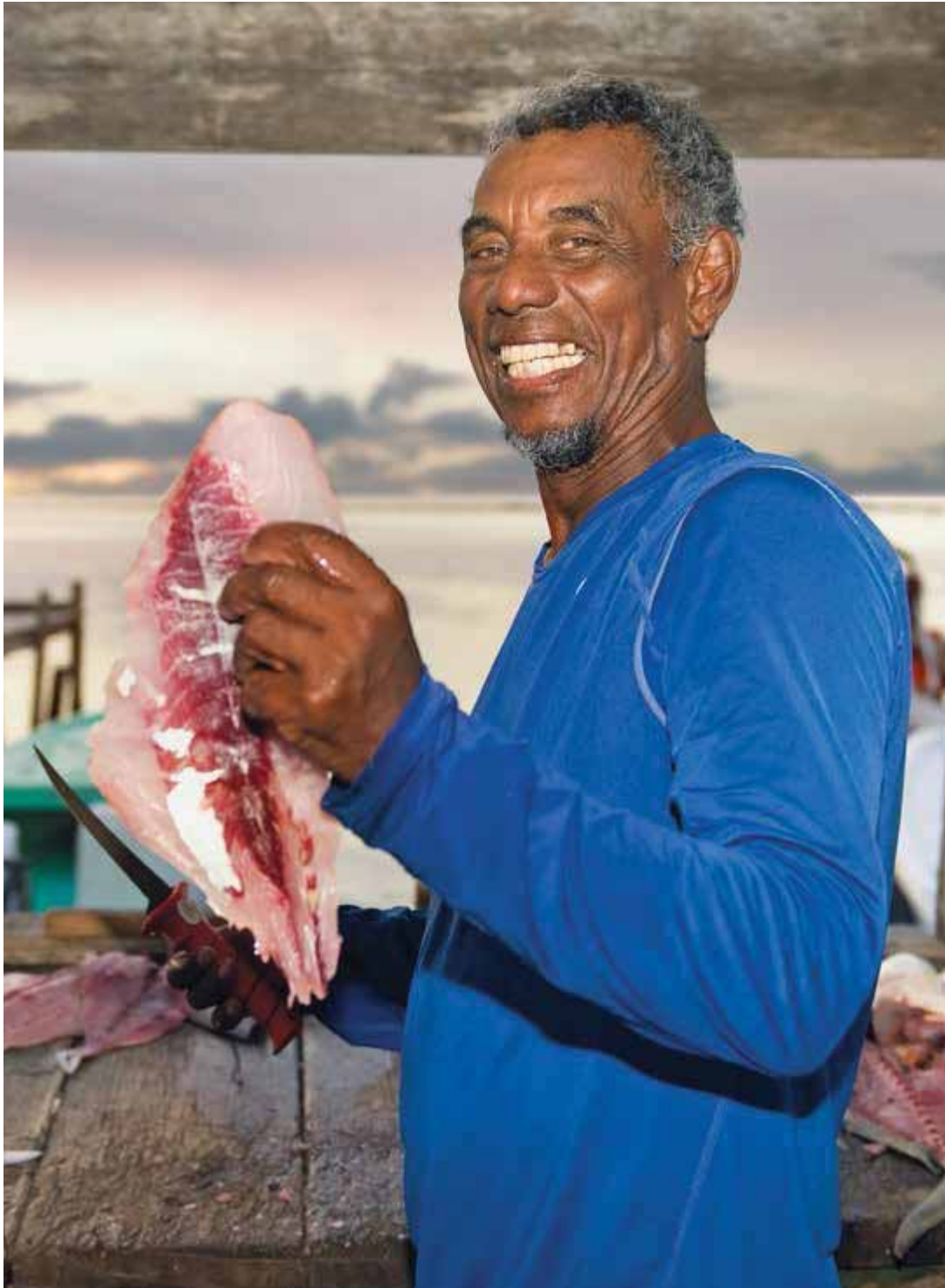
IN RECOGNITION OF THE HIGH RISKS POSED BY OIL EXPLORATION, AND BELIZE'S COMMITMENT TO RENEWABLE ENERGY PRODUCTION, THE BELIZEAN GOVERNMENT SHOULD ADOPT LEGISLATION BANNING OFFSHORE OIL DRILLING FROM ALL OF BELIZE'S OFFSHORE WATERS.

Given the interconnected nature of Belize's marine ecosystems, only a ban on all offshore oil exploration and extraction can ensure protection against the risks and costs associated with threats such as oil spills. This aligns with the World Heritage Committee's position that, in Belize's case, "oil exploration and exploitation within or affecting the property is incompatible with its World Heritage status."³⁵² Such a ban, combined with investment in renewable energy production, will also help Belize to achieve its commitment under the Paris Agreement to shift its energy mix away from fossil fuels.³⁵³ In order to facilitate this transition, the government should establish national-level renewable energy targets as part of a wider renewable energy policy.

To ensure that Belize achieves sustainable development, the government must ensure that all tourism, construction and planning guidelines are up-to-date, strictly enforced and adequate to prevent damage to the reef.

In particular, tourism regulations and the permit system for clearing mangroves and dredging operations, which have not kept up with the exponential growth in tourism in the last decade, both need updating. In 2009, the conservation community helped to draft a revised mangrove regulation, but this has yet to be endorsed by government officials. The government should also transform its planning guidelines into formal pieces of legislation, under the umbrella of a broader Sustainable Tourism Development Act, in order for the guidelines to provide an effective framework to deter damaging construction. To implement and enforce these, and existing, guidelines and laws, the government should increase the resources available for environmental monitoring. Finally, to ensure that the environmental impact of future construction is minimized, the Belizean government should give full legal backing to the forthcoming Integrated Coastal Zone Management Plan and commit sufficient resources to secure its effective implementation.

The Belizean government is currently at a crossroads. By choosing a sustainable development pathway focused on sustainable tourism, it can secure the long-term prosperity of the reef. Doing so would ensure that the reef can continue to support fisheries, provide coastal protection, and generate revenues for current and future generations. Further, such decisive action could help the Belize Barrier Reef Reserve System to be removed from the List of World Heritage in Danger.



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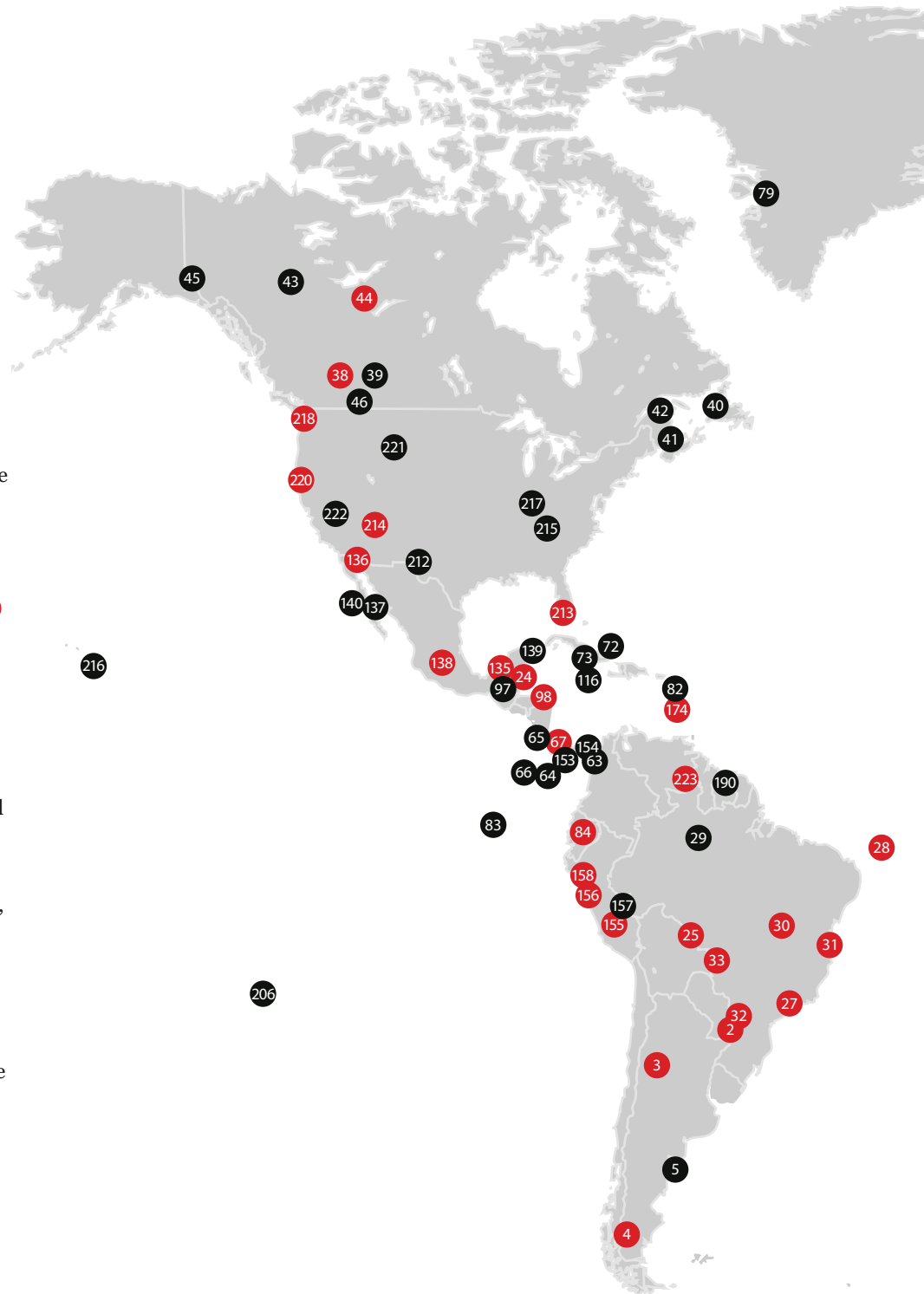
More than 17,000 people work in Belize's fisheries industry. They and their families directly depend on the health of the reef for their well-being.

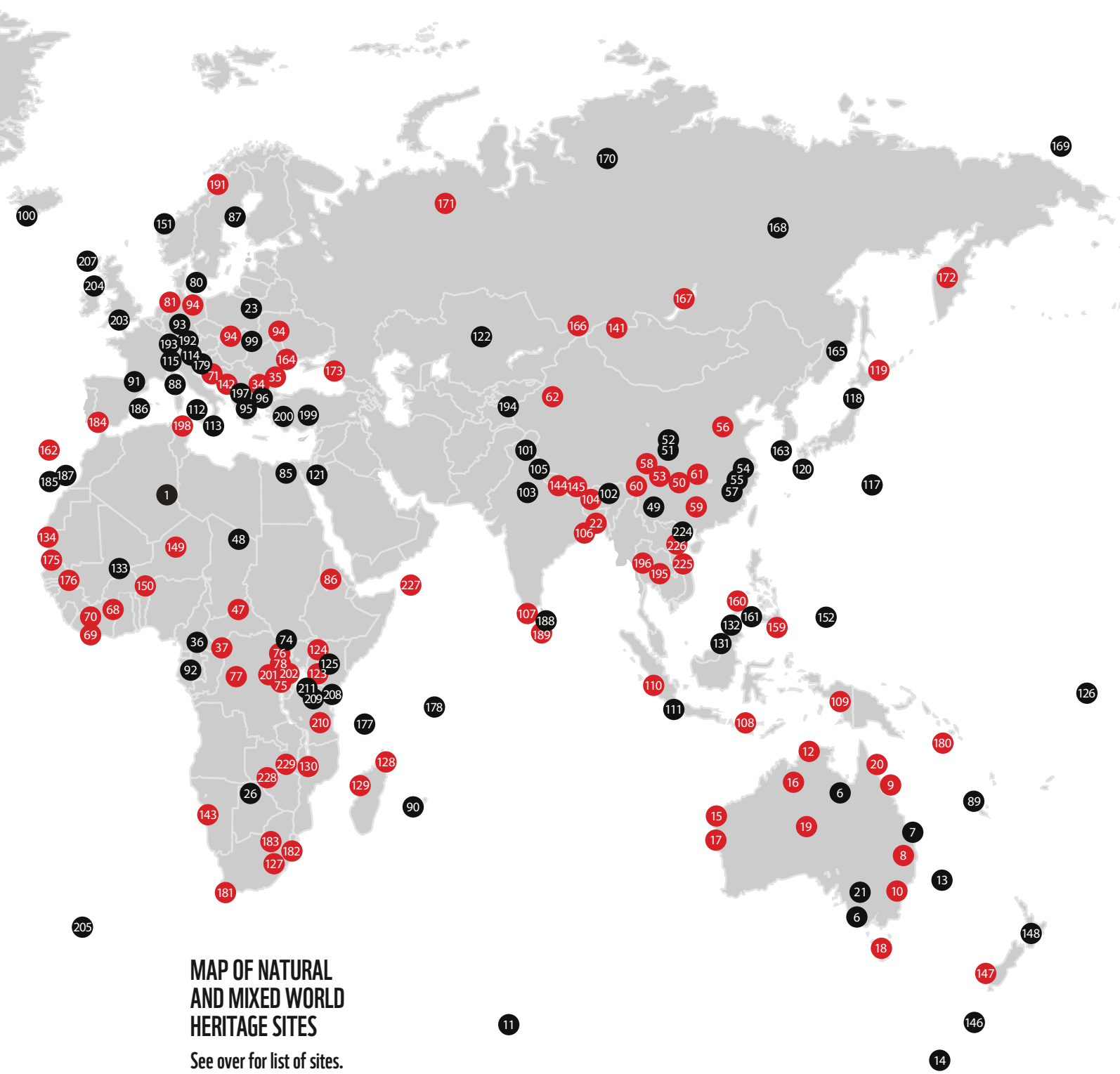
HARMFUL INDUSTRIAL ACTIVITIES

WWF DEFINES HARMFUL INDUSTRIAL ACTIVITIES AS:

Operations that cause major disturbances or changes to the character of marine or terrestrial environments. Such activities are of concern due to their potential to involve large impacts on the attributes of *outstanding universal value* and other natural, economic and cultural values. The impacts of these activities are often long-term or permanent. They can also be of concern due to their impacts on the sustainability of local livelihoods, and/or because they put at risk the health, safety or well-being of communities. Harmful industrial activities are often, but not exclusively, conducted by multinational enterprises and their subsidiaries.

Extractive operations, such as mining, quarrying, and oil and gas exploitation, and their related infrastructure, are currently recognized as one class of activity that is covered by this definition. Other activities are also to be considered, including dams, commercial ports, linear infrastructure (e.g. pipelines, roads and railroads), industrial farming and forestry, and other types of over-exploitation.





**MAP OF NATURAL
AND MIXED WORLD
HERITAGE SITES**

See over for list of sites.

KEY

- Site threatened by harmful industrial activities
- Other natural World Heritage sites

Table 2: List of natural and mixed World Heritage sites

Sites marked * are currently on the List of World Heritage in Danger. **(M)** indicates mixed (natural/cultural) World Heritage sites

No	Site	Country	Natural World Heritage sites threatened by harmful industrial activities (●)	Other Natural World Heritage sites (●)
1	Tassili n'Ajjer	Algeria		●
2	Iguazu National Park	Argentina	●	
3	Ischigualasto / Talampaya Natural Parks	Argentina	●	
4	Los Glaciares National Park	Argentina	●	
5	Península Valdés	Argentina		●
6	Australian Fossil Mammal Sites (Riversleigh / Naracoorte)	Australia		●
7	Fraser Island	Australia		●
8	Gondwana Rainforests of Australia	Australia	●	
9	Great Barrier Reef	Australia	●	
10	Greater Blue Mountains Area	Australia	●	
11	Heard and McDonald Islands	Australia		●
12	Kakadu National Park (M)	Australia	●	
13	Lord Howe Island Group	Australia		●
14	Macquarie Island	Australia		●
15	Ningaloo Coast	Australia	●	
16	Purnululu National Park	Australia	●	
17	Shark Bay, Western Australia	Australia	●	
18	Tasmanian Wilderness (M)	Australia	●	
19	Uluru-Kata Tjuta National Park (M)	Australia	●	
20	Wet Tropics of Queensland	Australia	●	
21	Willandra Lakes Region (M)	Australia		●
22	The Sundarbans	Bangladesh	●	
23	Białowieża Forest	Belarus, Poland		●
24	Belize Barrier Reef Reserve System *	Belize	●	
25	Noel Kempff Mercado National Park	Bolivia	●	
26	Okavango Delta	Botswana		●
27	Atlantic Forest South-East Reserves	Brazil	●	
28	Brazilian Atlantic Islands: Fernando de Noronha and Atol das Rocas Reserves	Brazil	●	
29	Central Amazon Conservation Complex	Brazil		●
30	Cerrado Protected Areas: Chapada dos Veadeiros and Emas National Parks	Brazil	●	
31	Discovery Coast Atlantic Forest Reserves	Brazil	●	
32	Iguaçu National Park	Brazil	●	
33	Pantanal Conservation Area	Brazil	●	
34	Pirin National Park	Bulgaria	●	
35	Srebarna Nature Reserve	Bulgaria	●	
36	Dja Faunal Reserve	Cameroon		●
37	Sangha Trinational	Cameroon, Central African Republic, Congo	●	
38	Canadian Rocky Mountain Parks	Canada	●	
39	Dinosaur Provincial Park	Canada		●
40	Gros Morne National Park	Canada		●
41	Joggins Fossil Cliffs	Canada		●
42	Miguasha National Park	Canada		●
43	Nahanni National Park	Canada		●
44	Wood Buffalo National Park	Canada	●	
45	Kluane / Wrangell-St. Elias / Glacier Bay / Tatshenshini-Alsek	Canada, United States of America		●
46	Waterton Glacier International Peace Park	Canada, United States of America		●
47	Manovo-Gounda St Floris National Park *	Central African Republic	●	
48	Lakes of Ounianga	Chad		●
49	Chengjiang Fossil Site	China		●
50	China Danxia	China	●	
51	Huanglong Scenic and Historic Interest Area	China		●
52	Jiuzhaigou Valley Scenic and Historic Interest Area	China		●
53	Mount Emei Scenic Area, including Leshan Giant Buddha Scenic Area (M)	China	●	
54	Mount Huangshan (M)	China		●
55	Mount Sanqingshan National Park	China		●
56	Mount Taishan (M)	China	●	
57	Mount Wuyi (M)	China		●

Sites marked * are currently on the List of World Heritage in Danger. (M) indicates mixed (natural/cultural) World Heritage sites			Natural World Heritage sites threatened by harmful industrial activities (●)	Other Natural World Heritage sites (●)
No	Site	Country		
58	Sichuan Giant Panda Sanctuaries - Wolong, Mt Siguniang and Jiayin Mountains	China	●	
59	South China Karst	China	●	
60	Three Parallel Rivers of Yunnan Protected Areas	China	●	
61	Wulingyuan Scenic and Historic Interest Area	China	●	
62	Xinjiang Tianshan	China	●	
63	Los Katios National Park	Colombia		●
64	Malpelo Fauna and Flora Sanctuary	Colombia		●
65	Area de Conservación Guanacaste	Costa Rica		●
66	Cocos Island National Park	Costa Rica		●
67	Talamanca Range-La Amistad Reserves / La Amistad National Park	Costa Rica, Panama	●	
68	Comoé National Park *	Côte d'Ivoire	●	
69	Taï National Park	Côte d'Ivoire	●	
70	Mount Nimba Strict Nature Reserve *	Côte d'Ivoire, Guinea	●	
71	Plitvice Lakes National Park	Croatia	●	
72	Alejandro de Humboldt National Park	Cuba		●
73	Desembarco del Granma National Park	Cuba		●
74	Garamba National Park *	Democratic Republic of the Congo		●
75	Kahuzi-Biega National Park *	Democratic Republic of the Congo	●	
76	Okapi Wildlife Reserve *	Democratic Republic of the Congo	●	
77	Salonga National Park *	Democratic Republic of the Congo	●	
78	Virunga National Park *	Democratic Republic of the Congo	●	
79	Ilulissat Icefjord	Denmark		●
80	Stevns Klint	Denmark		●
81	Wadden Sea	Denmark, Germany, Netherlands	●	
82	Morne Trois Pitons National Park	Dominica		●
83	Galápagos Islands	Ecuador		●
84	Sangay National Park	Ecuador	●	
85	Wadi Al-Hitan (Whale Valley)	Egypt		●
86	Simien National Park *	Ethiopia	●	
87	High Coast / Kvarken Archipelago	Finland, Sweden		●
88	Gulf of Porto: Calanche of Piana, Gulf of Girolata, Scandola Reserve	France		●
89	Lagoons of New Caledonia: Reef Diversity and Associated Ecosystems	France		●
90	Pitons, cirques and remparts of Reunion Island	France		●
91	Pyrénées – Mont Perdu (M)	France, Spain		●
92	Ecosystem and Relict Cultural Landscape of Lopé-Okanda (M)	Gabon		●
93	Messel Pit Fossil Site	Germany		●
94	Primeval Beech Forests of the Carpathians and the Ancient Beech Forests of Germany	Germany, Slovakia, Ukraine	●	
95	Meteora (M)	Greece		●
96	Mount Athos (M)	Greece		●
97	Tikal National Park (M)	Guatemala		●
98	Río Plátano Biosphere Reserve *	Honduras	●	
99	Caves of Aggtelek Karst and Slovak Karst	Hungary, Slovakia		●
100	Surtsey	Iceland		●
101	Great Himalayan National Park Conservation Area	India		●
102	Kaziranga National Park	India		●
103	Keoladeo National Park	India		●
104	Manas Wildlife Sanctuary	India	●	
105	Nanda Devi and Valley of Flowers National Parks	India		●
106	Sundarbans National Park	India	●	
107	Western Ghats	India	●	
108	Komodo National Park	Indonesia	●	
109	Lorentz National Park	Indonesia	●	
110	Tropical Rainforest Heritage of Sumatra *	Indonesia	●	
111	Ujung Kulon National Park	Indonesia		●
112	Isole Eolie (Aeolian Islands)	Italy		●
113	Mount Etna	Italy		●
114	The Dolomites	Italy		●

Sites marked * are currently on the List of World Heritage in Danger. (M) indicates mixed (natural/cultural) World Heritage sites			Natural World Heritage sites threatened by harmful industrial activities (●)	Other Natural World Heritage sites (●)
No	Site	Country		
115	Monte San Giogio	Italy, Switzerland		●
116	Blue and John Crow Mountains (M)	Jamaica		●
117	Ogasawara Islands	Japan		●
118	Shirakami-Sanchi	Japan		●
119	Shiretoko	Japan	●	
120	Yakushima	Japan		●
121	Wadi Rum Protected Area (M)	Jordan		●
122	Saryarka – Steppe and Lakes of Northern Kazakhstan	Kazakhstan		●
123	Kenya Lake System in the Great Rift Valley	Kenya	●	
124	Lake Turkana National Parks	Kenya	●	
125	Mount Kenya National Park/Natural Forest	Kenya		●
126	Phoenix Islands Protected Area	Kiribati		●
127	Maloti-Drakensberg Park (M)	Lesotho, South Africa	●	
128	Rainforests of the Atsinanana *	Madagascar	●	
129	Tsingy de Bemaraha Strict Nature Reserve	Madagascar	●	
130	Lake Malawi National Park	Malawi	●	
131	Gunung Mulu National Park	Malaysia		●
132	Kinabalu Park	Malaysia		●
133	Cliff of Bandiagara (Land of the Dogons) (M)	Mali		●
134	Banc d'Arguin National Park	Mauritania	●	
135	Ancient Maya City and Protected Tropical Forests of Calakmul, Campeche (M)	Mexico	●	
136	El Pinacate and Gran Desierto de Altar Biosphere Reserve	Mexico	●	
137	Islands and Protected Areas of the Gulf of California	Mexico		●
138	Monarch Butterfly Biosphere Reserve	Mexico	●	
139	Sian Ka'an	Mexico		●
140	Whale Sanctuary of El Vizcaino	Mexico		●
141	Uvs Nuur Basin	Mongolia, Russian Federation	●	
142	Durmitor National Park	Montenegro	●	
143	Namib Sand Sea	Namibia	●	
144	Chitwan National Park	Nepal	●	
145	Sagarmatha National Park	Nepal	●	
146	New Zealand Sub-Antarctic Islands	New Zealand		●
147	Te Wahipounamu – South West New Zealand	New Zealand	●	
148	Tongariro National Park (M)	New Zealand		●
149	Air and Ténéré Natural Reserves *	Niger	●	
150	W National Park of Niger	Niger	●	
151	West Norwegian Fjords – Geirangerfjord and Nærøyfjord	Norway		●
152	Rock Islands Southern Lagoon (M)	Palau		●
153	Coiba National Park and its Special Zone of Marine Protection	Panama		●
154	Darien National Park	Panama		●
155	Historic Sanctuary of Machu Picchu (M)	Peru	●	
156	Huascarán National Park	Peru	●	
157	Manú National Park	Peru		●
158	Río Abiseo National Park (M)	Peru	●	
159	Mount Hamiguitan Range Wildlife Sanctuary	Philippines	●	
160	Puerto-Princesa Subterranean River National Park	Philippines	●	
161	Tubbataha Reefs Natural Park	Philippines		●
162	Laurisilva of Madeira	Portugal	●	
163	Jeju Volcanic Island and Lava Tubes	Republic of Korea		●
164	Danube Delta	Romania	●	
165	Central Sikhote-Alin	Russian Federation		●
166	Golden Mountains of Altai	Russian Federation	●	
167	Lake Baikal	Russian Federation	●	
168	Lena Pillars Nature Park	Russian Federation		●
169	Natural System of Wrangel Island Reserve	Russian Federation		●
170	Putorana Plateau	Russian Federation		●
171	Virgin Komi Forests	Russian Federation	●	
172	Volcanoes of Kamchatka	Russian Federation	●	

Sites marked * are currently on the List of World Heritage in Danger. (M) indicates mixed (natural/cultural) World Heritage sites			Natural World Heritage sites threatened by harmful industrial activities (●)	Other Natural World Heritage sites (●)
No	Site	Country		
173	Western Caucasus	Russian Federation	●	
174	Pitons Management Area	Saint Lucia	●	
175	Djoudj National Bird Sanctuary	Senegal	●	
176	Niokolo-Koba National Park *	Senegal	●	
177	Aldabra Atoll	Seychelles		●
178	Vallée de Mai Nature Reserve	Seychelles		●
179	Škocjan Caves	Slovenia		●
180	East Rennell *	Solomon Islands	●	
181	Cape Floral Region Protected Areas	South Africa	●	
182	iSimangaliso Wetland Park	South Africa	●	
183	Vredefort Dome	South Africa	●	
184	Doñana National Park	Spain	●	
185	Garajonay National Park	Spain		●
186	Ibiza, Biodiversity and Culture (M)	Spain		●
187	Teide National Park	Spain		●
188	Central Highlands of Sri Lanka	Sri Lanka		●
189	Sinharaja Forest Reserve	Sri Lanka	●	
190	Central Suriname Nature Reserve	Suriname		●
191	Laponian Area (M)	Sweden	●	
192	Swiss Alps Jungfrau-Aletsch	Switzerland		●
193	Swiss Tectonic Arena Sardona	Switzerland		●
194	Tajik National Park (Mountains of the Pamirs)	Tajikistan		●
195	Dong Phrayayen-Khao Yai Forest Complex	Thailand	●	
196	Thungyai-Huai Kha Khaeng Wildlife Sanctuaries	Thailand	●	
197	Natural and Cultural Heritage of the Ohrid region (M)	The Former Yugoslav Republic of Macedonia		●
198	Ichkeul National Park	Tunisia	●	
199	Göreme National Park and the Rock Sites of Cappadocia (M)	Turkey		●
200	Hierapolis-Pamukkale (M)	Turkey		●
201	Bwindi Impenetrable National Park	Uganda	●	
202	Rwenzori Mountains National Park	Uganda	●	
203	Dorset and East Devon Coast	United Kingdom of Great Britain and Northern Ireland		●
204	Giant's Causeway and Causeway Coast	United Kingdom of Great Britain and Northern Ireland		●
205	Gough and Inaccessible Islands	United Kingdom of Great Britain and Northern Ireland		●
206	Henderson Island	United Kingdom of Great Britain and Northern Ireland		●
207	St Kilda (M)	United Kingdom of Great Britain and Northern Ireland		●
208	Kilimanjaro National Park	United Republic of Tanzania		●
209	Ngorongoro Conservation Area (M)	United Republic of Tanzania		●
210	Selous Game Reserve *	United Republic of Tanzania	●	
211	Serengeti National Park	United Republic of Tanzania		●
212	Carlsbad Caverns National Park	United States of America		●
213	Everglades National Park *	United States of America	●	
214	Grand Canyon National Park	United States of America	●	
215	Great Smoky Mountains National Park	United States of America		●
216	Hawaii Volcanoes National Park	United States of America		●
217	Mammoth Cave National Park	United States of America		●
218	Olympic National Park	United States of America	●	
219	Papahānaumokuākea (M)	United States of America	●	
220	Redwood National and State Parks	United States of America	●	
221	Yellowstone National Park	United States of America		●
222	Yosemite National Park	United States of America		●
223	Canaima National Park	Venezuela (Bolivarian Republic of)	●	
224	Ha Long Bay	Viet Nam		●
225	Phong Nha – Ke Bang National Park	Viet Nam	●	
226	Trang An Landscape Complex (M)	Viet Nam	●	
227	Socotra Archipelago	Yemen	●	
228	Mosi-oa-Tunya / Victoria Falls	Zambia, Zimbabwe	●	
229	Mana Pools National Park, Sapi and Chewore Safari Areas	Zimbabwe	●	

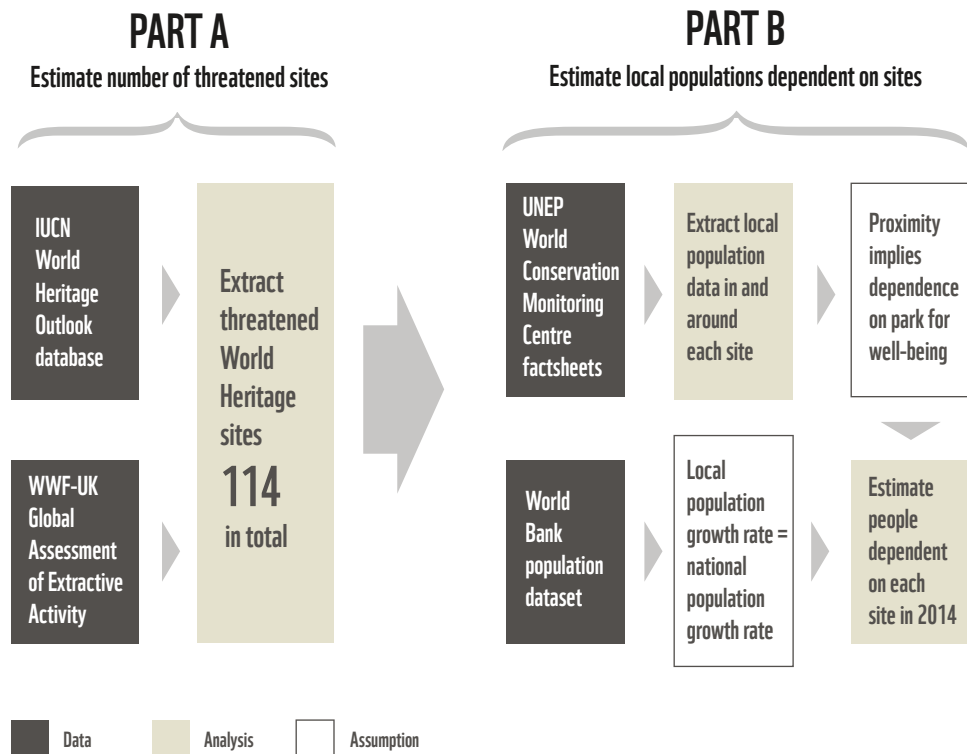
METHODOLOGY

PART A: ESTIMATE THE NUMBER OF WORLD HERITAGE SITES AT THREAT FROM HARMFUL INDUSTRIAL ACTIVITIES

The team used two sources to generate the list of natural and mixed World Heritage sites at threat from industrial activities.

Sites threatened by extractive industries (commercial mining, and oil and gas exploration and extraction) were identified using an existing WWF report on extractive activities.³⁵⁴ Sites currently threatened by non-extractive industrial activities were identified using the IUCN World Heritage Outlook database.³⁵⁵ The threats listed by IUCN that were considered to be industrial activities include dams, water management and water use; logging and wood harvesting; marine and freshwater aquaculture; roads and railways; shipping lanes; and utility and service lines. These threats were selected because they are most likely to be conducted at a large-scale by multinational enterprises and their subsidiaries.

The team considered sites to be currently at threat if they have commercial mining operations and concessions or oil and gas operations, infrastructure and concessions within their borders,³⁵⁶ or if they were classified as facing a “high” or “very high” threat from at least one non-extractive industrial activity using the IUCN classification system. This approach suggests that of the 229 natural and mixed World Heritage sites around the world, 114 are under threat from harmful industrial activities.



PART B: ESTIMATE THE LOCAL POPULATIONS THAT COULD BE AFFECTED BY HARMFUL INDUSTRIAL ACTIVITIES IN OR AROUND WORLD HERITAGE SITES

Local population estimates were taken from a single source: United Nations Environment Program World Conservation Monitoring Centre (UNEP-WCMC) World Heritage information sheets.

UNEP-WCMC and IUCN, with support from UNESCO, compile information sheets for all World Heritage sites. The information sheets are usually created following the inscription of a new site on the World Heritage List, and are updated when there is a major boundary modification or re-nomination. They are based on a variety of available sources at the time of compilation, including nominations, existing literature, committee decisions and reports, and peer reviewed papers.³⁵⁷ These sheets include local population data specific to each site, or within a buffer zone or surrounding conurbations. The team extracted this data for each site. If population ranges were given, the mid-point was used. If the population was quoted in terms of households, the team used data on national household size from national censuses or the UN to estimate the number of people living within or around a site.

The team assumed that individuals living within or around a site either depend on the park environment for subsistence living, resources or jobs, or rely at least partially on the ecosystem services generated by the site.³⁵⁸ The team defined “around” the site as within the designated buffer zone, or in “neighbouring” or “nearby” settlements, as stated in the UNEP-WCMC information sheets. It is likely that people outside of this area, including large metropolitan cities for example, depend on sites for ecosystem services. However, for the purpose of this study the population estimate has been limited to areas in, or immediately surrounding, the site due to the lack of data and the difficulties of defining the distance at which the benefits from each site stop.

Due to the age of the data in the information sheets, and the need to bring the estimate up-to-date, the team estimated the 2014 population size. This was calculated using average population growth for the host country between the year in which the population estimate was made and 2014, the year for which population growth data is most recently available.³⁵⁹ Where a specific data point was not quoted with the population estimate, the year of the most recent document update was used.

It should be noted that population data was not available for all sites. 32 per cent of sites did not have data on the population in the park, 46 per cent of sites did not have information on the population in the buffer zone or surrounding area, and 16 per cent of sites did not have either data points. To maintain the credibility of the data, and due to a lack of alternative sources, the team did not employ alternative approaches to estimate local population size. As a result, the estimate of local populations that could be affected by harmful industrial activities should be considered as a lower bound, and further research in this area is needed to obtain more accurate, exhaustive estimates.

Table 3: List of World Heritage sites threatened by harmful industrial activities and estimates of local populations that could be affected by harmful industrial activities in or around threatened World Heritage sites		Population data			Extractive threats		Non-extractive threats					
		Park	Buffer zone	Total	Oil/gas concessions	Mines/mining concessions	Dams/water management/water use (unsustainable water use)	Logging/wood Harvesting	Marine/freshwater Aquaculture (overfishing)	Roads/railways (infrastructure)	Shipping lanes (infrastructure)	Utility/service Lines (infrastructure)
Country	Site											
Argentina	Iguazu National Park	0	282,632	282,632			●					
Argentina	Ischigualasto / Talampaya Natural Parks	0	45	45	●							
Argentina	Los Glaciares National Park	408	no data	408		●						
Australia	Gondwana Rainforests of Australia	0	no data	0	●	●						
Australia	Great Barrier Reef	no data	no data	no data		●					●	
Australia	Greater Blue Mountains Area	0	83,909	83,909	●	●						
Australia	Kakadu National Park	2,373	no data	2,373	●	●						
Australia	Ningaloo Coast	41	7,564	7,605	●	●						
Australia	Purnululu National Park	no data	no data	no data	●	●						
Australia	Shark Bay, Western Australia	1,280	576	1,856		●						
Australia	Tasmanian Wilderness	77	no data	77				●				
Australia	Uluru-Kata Tjuta National Park	157	no data	157		●						
Australia	Wet Tropics of Queensland	no data	209,773	209,773		●						
Bangladesh	The Sundarbans	no data	310,938	310,938			●	●	●		●	
Belize	Belize Barrier Reef Reserve System	no data	no data	no data	●							
Bolivia	Noel Kempff Mercado National Park	38	3,872	3,910		●						
Brazil	Atlantic Forest South-East Reserves	3,112	271,336	274,447				●		●		
Brazil	Brazilian Atlantic Islands: Fernando de Noronha and Atol das Rocas Reserves	0	3,084	3,084		●						
Brazil	Cerrado Protected Areas: Chapada dos Veadeiros and Emas National Parks	0	6,751	6,751		●						
Brazil	Discovery Coast Atlantic Forest Reserves	no data	560,282	560,282	●	●				●		
Brazil	Iguaçu National Park	See Iguazu National Park in Argentina					●					
Brazil	Pantanal Conservation Area	0	no data	0		●						
Bulgaria	Pirin National Park	0	126,571	126,571				●				
Bulgaria	Srebarna Nature Reserve	no data	1,081	1,081			●					
Cameroon, Central African Republic, Congo	Sangha Trinational	53	21,873	21,925	●			●		●		
Canada	Canadian Rocky Mountain Parks	16,091	no data	16091			●					
Canada	Wood Buffalo National Park	388	3,867	4,256		●	●					
Central African Republic	Manovo-Gounda St Floris National Park	no data	no data	no data	●							

		Population data			Extractive threats		Non-extractive threats					
		Park	Buffer zone	Total	Oil/gas concessions	Mines/mining concessions	Dams/water management/ water use (unsustainable water use)	Logging/wood Harvesting	Marine/freshwater Aquaculture (overfishing)	Roads/railways (infrastructure)	Shipping lanes (Infrastructure)	Utility/service Lines (infrastructure)
Country	Site											
China	China Danxia	35,229	103,804	139,034	●							
China	Mount Emei Scenic Area, including Leshan Giant Buddha Scenic Area	2,273	no data	2,273	●							
China	Mount Taishan	no data	no data	no data			●					
China	Sichuan Giant Panda Sanctuaries - Wolong, Mt Siguniang and Jiayin Mountains	2,030	21,636	23,666	●							
China	South China Karst	11,219	56,214	67,433	●							
China	Three Parallel Rivers of Yunnan Protected Areas	236,137	no data	236,137		●	●		●			
China	Wulingyuan Scenic and Historic Interest Area	7,866	no data	7,866	●							
China	Xinjiang Tianshan	4,534	no data	4,534	●							
Costa Rica, Panama	Talamanca Range-La Amistad Reserves / La Amistad National Park	15,598	no data	15,598		●	●					
Côte d'Ivoire	Comoé National Park	no data	no data	no data		●						
Côte d'Ivoire	Taï National Park	100,538	no data	100,538		●						
Côte d'Ivoire, Guinea	Mount Nimba Strict Nature Reserve	no data	29,259	29,259		●		●				
Croatia	Plitvice Lakes National Park	no data	no data	no data			●					
Democratic Republic of the Congo (DRC)	Kahuzi-Biega National Park	298,828	no data	298,828		●		●				
DRC	Okapi Wildlife Reserve	33,114	no data	33,114		●						
DRC	Salonga National Park	5,498	no data	5,498	●							
DRC	Virunga National Park	66,572	no data	66,572	●	●		●				
Denmark, Germany, Netherlands	Wadden Sea	3	no data	3	●						●	
Ecuador	Sangay National Park	no data	2,157	2,157			●			●		
Ethiopia	Simien National Park	4,007	42,414	46,421				●		●		
Germany, Slovakia, Ukraine	Primeval Beech Forests of the Carpathians and the Ancient Beech Forests of Germany	no data	65,363	65,363	●							
Honduras	Río Plátano Biosphere Reserve	50,036	no data	50,036				●				
India	Manas Wildlife Sanctuary	no data	34,843	34,843				●				
India	Sundarbans National Park	See The Sundarbans in Bangladesh					●		●		●	
India	Western Ghats	41,891	no data	41,891	●	●						
Indonesia	Komodo National Park	3,721	19,153	22,874							●	
Indonesia	Lorentz National Park	6,548	no data	6,548	●	●				●		
Indonesia	Tropical Rainforest Heritage of Sumatra	no data	6,126,027	6,126,027	●	●		●		●		

		Population data			Extractive threats		Non-extractive threats					
		Park	Buffer zone	Total	Oil/gas concessions	Mines/mining concessions	Dams/water management/ water use (unsustainable water use)	Logging/wood Harvesting	Marine/freshwater Aquaculture (overfishing)	Roads/railways (infrastructure)	Shipping lanes (Infrastructure)	Utility/service Lines (infrastructure)
Country	Site											
Japan	Shiretoko	0	7	7			●					
Kenya	Kenya Lake System in the Great Rift Valley	0	no data	0	●		●					
Kenya	Lake Turkana National Parks	no data	333,259	333,259	●		●					
Lesotho, South Africa	Maloti-Drakensberg Park	14	8,366	8,380	●							
Madagascar	Rainforests of the Atsinanana	no data	no data	no data				●				
Madagascar	Tsingy de Bemaraha Strict Nature Reserve	no data	no data	no data	●							
Malawi	Lake Malawi National Park	no data	53,395	53,395	●							
Mauritania	Banc d'Arguin National Park	1,442	no data	1,442						●		
Mexico	Ancient Maya City and Protected Tropical Forests of Calakmul, Campeche	no data	no data	no data			●	●				
Mexico	El Pinacate and Gran Desierto de Altar Biosphere Reserve	0	56	56			●			●		
Mexico	Monarch Butterfly Biosphere Reserve	no data	104,220	104,220				●				
Mongolia, Russian Federation	Uvs Nuur Basin	35,715	no data	35,715	●	●						
Montenegro	Durmitor National Park	1,519	4,252	5,771			●	●				
Namibia	Namib Sand Sea	0	409	409	●	●						
Nepal	Chitwan National Park	no data	314,112	314,112	●		●			●		
Nepal	Sagarmatha National Park	3,918	no data	3,918				●				
New Zealand	Te Wahipounamu – South West New Zealand	no data	no data	no data		●						
Niger	Air and Ténéré Natural Reserves	8,728	no data	8,728	●			●				
Niger	W National Park of Niger	0	no data	0	●							
Peru	Historic Sanctuary of Machu Picchu	1,248	3,850	5,098				●				
Peru	Huascarán National Park	1,030	6,059	7,089		●	●					
Peru	Río Abiseo National Park	no data	26,410	26,410		●						
Philippines	Mount Hamiguitan Range Wildlife Sanctuary	no data	no data	no data		●						
Philippines	Puerto-Princesa Subterranean River National Park	54	no data	54				●				
Portugal	Laurisilva of Madeira	0	494	494						●		
Romania	Danube Delta	0	12,085	12,085	●					●		
Russian Federation	Golden Mountains of Altai	198	no data	198				●				
Russian Federation	Lake Baikal	0	98,751	98,751		●						
Russian Federation	Virgin Komi Forests	116	4,186	4,302		●						

		Population data			Extractive threats		Non-extractive threats					
		Park	Buffer zone	Total	Oil/gas concessions	Mines/mining concessions	Dams/water management/ water use (unsustainable water use)	Logging/wood Harvesting	Marine/freshwater Aquaculture (overfishing)	Roads/railways (infrastructure)	Shipping lanes (Infrastructure)	Utility/service Lines (infrastructure)
Country	Site											
Russian Federation	Volcanoes of Kamchatka	2,834	no data	2,834						●		
Russian Federation	Western Caucasus	0	179	179				●				
Saint Lucia	Pitons Management Area	0	1,539	1,539						●		
Senegal	Djoudj National Bird Sanctuary	no data	9,310	9,310	●		●					
Senegal	Niokolo-Koba National Park	no data	no data	no data				●				
Solomon Islands	East Rennell	2,137	no data	2,137				●				
South Africa	Cape Floral Region Protected Areas	no data	no data	no data	●							
South Africa	iSimangaliso Wetland Park	816	no data	816	●							
South Africa	Vredefort Dome	608	no data	608	●							
Spain	Doñana National Park	97	no data	97			●					
Sri Lanka	Sinharaja Forest Reserve	no data	8,504	8,504				●		●		
Sweden	Laponian Area	231	no data	231		●						
Thailand	Dong Phrayayen-Khao Yai Forest Complex	713	no data	713			●	●		●		
Thailand	Thungyai-Huai Kha Khaeng Wildlife Sanctuaries	0	no data	0		●						
Tunisia	Ichkeul National Park	no data	no data	no data	●		●					
Uganda	Bwindi Impenetrable National Park	no data	52,153	52,153		●						
Uganda	Rwenzori Mountains National Park	0	516,888	516,888		●						
United Republic of Tanzania	Selous Game Reserve	0	no data	0	●	●						
United States of America	Everglades National Park	118	no data	118			●					
United States of America	Grand Canyon National Park	no data	no data	no data			●					
United States of America	Olympic National Park	no data	16,878	16,878				●				
United States of America	Papahānaumokuākea	136	no data	136							●	
United States of America	Redwood National and State Parks	no data	no data	no data						●		
Venezuela (Bolivarian Republic of)	Canaima National Park	13,585	no data	13,585		●						●
Viet Nam	Phong Nha – Ke Bang National Park	506	55,409	55,915				●		●		
Viet Nam	Trang An Landscape Complex	no data	no data	no data			●					
Yemen	Socotra Archipelago	47,530	no data	47,530						●		
Zambia, Zimbabwe	Mosi-oa-Tunya / Victoria Falls	no data	196,000	196,000			●					
Zimbabwe	Mana Pools National Park, Sapi and Chewore Safari Areas	0	no data	0		●						
Total					40	42	28	28	2	20	6	1

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Protecting people through nature

11 MILLION

People who depend on threatened World Heritage sites.

114

Natural and mixed World Heritage sites under threat from harmful industrial activities.




90%

The percentage of natural World Heritage sites that provide jobs.

2/3

Two-thirds of natural World Heritage sites provide water.

	<p>Why we are here To stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature.</p> <hr/> <p>panda.org</p>
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