ENHANCING NATIONALLY DETERMINED CONTRIBUTIONS THROUGH PROTECTED AREAS

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EXECUTIVE SUMMARY

Nationally Determined Commitments (NDCs) to the United Nations Framework Convention on Climate Change (UNFCCC) 2015 Paris Agreement underscore the role protected areas and other conserved areas play in reaching global mitigation and adaptation targets. With financial support from the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU), WWF US reviewed 151 currently available NDCs to determine how Parties intend to utilize protected areas to contribute to their adaptation and mitigation commitments. Results show that of the 179 countries included in this analysis, 67—more than one-third—identified protected areas as a means of attaining their adaptation and mitigation goals. Of these, almost half (32) expressed an intention to add new protected areas or expand coverage of those already in place. While these numbers are encouraging, there is ample room for improvement.

36
COUNTRIES
indicated plans to increase forest cover, plant trees or expand natural areas

21
COUNTRIES
specifically mentioned the carbon sequestration benefits that protected areas can provide

For example, 36 countries indicated plans to increase forest cover, plant trees or expand natural areas, but did not clearly state if or how these areas might be protected or managed. Nature-based solutions to climate change adaptation and mitigation using protected areas were largely absent. Only 21 countries (12%) specifically mentioned the carbon sequestration benefits that protected areas can provide, while just 8 (4%) acknowledged the role that ecosystem services from protected areas can play in helping vulnerable people adapt to climate change. Finally, only 10 NDCs pledged to manage protected areas for current or anticipated climate change risks to ecosystems and biodiversity.

While Nationally Determined Contributions are a communications tool and not a comprehensive inventory of all national and subnational plans for climate change adaptation and mitigation targets, they are a good indicator of the status national governments give to protected areas in achieving climate change goals. WWF acknowledges the likelihood of extensive under-reporting of strategies and activities involving protected and other conserved areas as a component of national contributions. Yet including these in NDCs would be a simple way to demonstrate increased ambition and call attention to the need for critical ecosystem services and biodiversity for future prosperity.

The socioeconomic and ecological benefits of protected areas have been well-documented. Success in achieving climate change goals by conserving biodiversity and safeguarding ecosystem services will largely depend on Parties' willingness and ability to adhere to the commitments they make to global conventions, and how well protected and conserved areas are managed. Further research will be needed to track progress and evaluate impact.

Recommendations

To enhance climate ambition through protected and conserved areas, WWF encourages Parties revising their NDCs for 2020 and beyond to consider the following five recommendations based on this analysis:

1. Acknowledge the role that protected and other conserved areas play in achieving climate change adaptation and mitigation goals and include them in NDCs and related climate change policies.

2. Increase coverage of protected and conserved areas and set specific, measurable and time-bound targets (hectares conserved, percentage increase in coverage by 2030, etc.)

3. Clearly articulate the role of protected and conserved areas in helping people adapt to climate change, and link specific climate hazards and vulnerable populations with the appropriate ecosystem services needed for adaptation.

4. Integrate the carbon sequestration benefits of protected and other conserved areas into climate change mitigation targets.

5. Commit to managing protected and other conserved areas for current and anticipated climate risks to ecosystems and biodiversity while calling attention to the need for increased technical and financial support to improve protected area management in the face of rapid change.

Protected areas and other conserved areas, such as indigenous and community conserved areas, sacred natural sites and military lands can contribute to much needed climate change adaptation and mitigation goals, yet they have not been comprehensively addressed in Nationally Determined Contributions submitted to the UNFCCC. Protected and other conserved areas are also important components of national commitments to the United Nations Sustainable Development Goals and the Convention on Biological Diversity. WWF strongly encourages Parties to consider the myriad benefits that nature provides and emphasize the importance of ecosystem conservation and biodiversity in their revised NDCs.

BACKGROUND

Protected areas and other conserved areas, such as indigenous and community conserved lands and sacred natural areas, have played a critical role in biodiversity conservation for the past century. Beyond providing a haven for species, these areas also provide vital ecosystem services that sustain livelihoods, connect landscapes, capture and store carbon, and inspire people to value the natural world. Healthy, well-managed protected areas are critical to the 2015 Paris Agreement's ambitions of creating a low-carbon global economy and a climate-resilient world. The role of forests and other natural systems in sequestering carbon has been well-documented. Similarly, protected areas provide a suite of ecosystem services that help vulnerable communities during extreme weather events. These include protection from soil erosion due to heavy rainfall, coastal storm surge and wave attenuation, and flooding. National governments would benefit from acknowledging the benefits that nature provides by placing protected and other conserved areas at the center of their commitments to addressing climate-related challenges.

However, almost all protected areas were designed, and continue to be managed, with the assumption of a stationary climate. Climate change is already causing shifts in species composition, habitat types, and ecosystem function, challenging their ability to meet goals and objectives they were designed for. As the climate continues to change, protected areas will be further impacted as people shift agricultural production, build new infrastructure, and move away from coasts and floodplains. To ensure these natural areas continue to deliver benefits, we must increase efforts to protect them from further degradation and climate change itself. By including conserved areas in Nationally Determined Contributions to the UNFCCC, Parties can demonstrate commitment to nature-based solutions and emphasize the importance of protected natural areas to human well-being.

With financial support from the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU), WWF US conducted a review of currently available Nationally Determined Contributions to assess the extent of Parties' use of protected and other conserved areas for adaptation and mitigation benefits, to identify promising approaches and gaps. Findings were used to develop recommendations for Parties to enhance the role of protected areas in their revised NDCs for submission to the UNFCCC in 2020 and beyond.

A second objective of this study was to learn whether governments consider climate change risks to nature to better inform protected area management. Governments, protected area managers and conservation groups alike often neglect the increasing risk that climate change poses to protected areas and the ecosystem services they provide. Most planners and managers of the world's protected areas do not consider climate risks, instead relying on traditional approaches to conservation that are rapidly becoming obsolete with increased warming and climate variability. WWF believes that a viable future for people and nature mandates that conservation efforts and strategies—including the management of protected and other conserved areas—are

continuously updated to account for unavoidable climate change risks to biodiversity, ecosystems and ecosystem services. National governments have a vested interest in doing so to ensure that protected areas continue to deliver on commitments to their citizens and to the UNFCCC, the Convention on Biological Diversity (CBD), and the UN Sustainable Development Goals.

METHODOLOGY

For this analysis WWF reviewed 151 NDCs representing 179 countries submitted to the UNFCCC NDC Registry by December 31st 2018. The 151 NDCs reviewed include 49 from Africa, 38 from Asia, 43 from Europe, 31 from Latin America and the Caribbean, two from North America (Canada and the United States), and 17 from Oceania.

Sixteen Parties to the UNFCCC either did not ratify the 2015 Paris Agreement or ratified but did not submit an NDC by December 31, 2018, and therefore were not included in the analysis. These countries are Angola, Brunei Darussalam, Ecuador, Iran, Iraq, Kyrgyzstan, Lebanon, Libya, Oman, Philippines, Russia, Senegal, South Sudan, Suriname, Turkey, and Yemen.

NDCs varied greatly in both length and level of detail. WWF reviewers read each in full for this analysis. For NDCs submitted in Spanish (9) or French (10), WWF used Google Translate (translate.google.com) to convert text to English and then the English translation was read in full. Each non-English NDC document was scanned using a keyword search for protected areas along with related French and Spanish language terms listed below to ensure that nothing was overlooked due to translation errors.

To determine if Parties included protected areas in their NDCs and how the protected areas are being used to achieve climate change adaptation and mitigation targets, WWF reviewed each NDC document to answer the following five questions:

- Does the NDC mention protected areas explicitly?
- Does the NDC call for establishing new or expanding existing protected areas?
- Does the NDC mention utilizing protected areas to help people adapt to climate change (also known as ecosystem-based adaptation or EbA).
- Does the NDC mention utilizing protected areas to achieve carbon sequestration or avoided emissions benefits?
- Does the NDC indicate plans to use climate risk information and climate adaptive measures to manage protected areas?

Countries received credit for each affirmative answer, indicated by a "●" in the country results table in Appendix 1. For questions 2 and 5, if a country did not reference protected or other conserved areas explicitly in its NDC but mentioned nature or equivalent terms when addressing these topics, it received partial credit, indicated by a "○" in the country results table. Thus, "conserve forests by increasing the number of protected areas" would receive full credit (or one point) for question 2, while "increase forest cover on degraded lands" would receive partial credit (or one-half point). Similarly, for questions 3 and 4, countries that mentioned or implied using nature-based solutions for climate change mitigation and adaptation outside the context of protected areas received partial credit, indicated by a "○" in the country results table. The rationale and methods used to provide full or partial credit for each of the five questions are provided below.

5 criteria used for evaluating NDCs and Protected Areas:

1. Explicit mention of protected or other conserved areas

2. Establishment or expansion of protected areas

3. Use of protected areas to help people adapt (EbA)

4. Mitigation benefits from carbon sequestration and avoided emissions

5. Managing protected areas for climate change risks

1. Does the NDC mention protected areas explicitly?

There are currently more than 238,000 protected areas across the globe, and this number is expected to increase[1]. Terrestrial protected areas cover more than 20 million km2—almost 15% of the earth's land surface, while marine protected areas cover more than 6 million km2—more than 7% of the world's oceans[1]. The Convention on Biological Diversity's Aichi Biodiversity Targets call for the protection of at least 17% of the earth's terrestrial areas by 2020[2]. As global population numbers and their associated human footprint increase, many scientists and activists are calling to conserve 30% of the worlds surface by 2030[3] as a stepping stone towards the goal of conserving half the planet by 2050[4]. Protected areas will play a critical role in achieving these ambitious targets.

Increasingly, new protected areas are established not only to protect iconic species and landscapes, but also to serve a range of other functions such as enhancing local livelihoods, improving fishery stocks, increasing carbon sequestration, and helping people adapt to the impacts of climate change[5]. Because protected areas serve conservation and climate action objectives simultaneously, national governments should consider the role of protected and conserved areas in their NDCs to help to align technical and financial support for these areas within government legislation and policies.

238k
PROTECTED AREAS
across the globe, and this number is expected to increase[1]

For the purposes of this study, "protected areas" include those areas that are actively managed to achieve clear biodiversity conservation (but not necessarily other) goals. Parties received credit for question 1 if one or more of the following terms appeared in its NDC:

- Protected area
- Natural protected area
- Protected area system
- Protected lands
- Protected zones
- Protected natural spaces
- Wildlife refuge
- Wildlife sanctuary
- Protected forest
- Forest reserve
- Conservation areas
- Biodiversity conservation areas
- Indigenous areas (when used in the context of conservation)
- Indigenous lands (when used in the context of conservation)
- Nature reserve
- Biosphere reserve
- Área protegida (Spanish)
- Reserva natural (Spanish)
- Refugio de vida silvestre (Spanish)
- Parque nacional (Spanish)
- Aires protégées (French)

The following terms were not included in this analysis because of ambiguity about whether these areas had been established, or were actively managed, for the purpose of biodiversity conservation:

- Managed forest
- Protection forestry strip
- Forest managed areas
- Native forest

Many NDCs use the verb "protect" or "protected" without using the phrase "protected area." WWF determined that for the purpose of this analysis, all forms of the verb "protect" in conjunction with nature and natural systems convey an explicit intention to preserve and protect nature and therefore phrases using this word when referring to natural systems could be considered as "protected areas." For example, Antigua and Barbuda declares that "by 2030, all waterways are protected to reduce the risks of flooding and health impacts." Belize mentions "protecting and restoring mangrove forests" for climate change mitigation. In both these cases, these countries received credit for this question.*

**In cases where language around nature and protected areas was vague or ambiguous, WWF used its best judgement to determine the meaning and intent of the statements. WWF acknowledges that it may not have interpreted every statement correctly and is open to feedback and comments that may lead to revisions.*

2. Does the NDC call for the establishment of new, or expansion of existing, protected areas?

Protected areas already help to mitigate greenhouse gas emissions and provide services that help vulnerable people adapt to climate change. Managing natural resources specifically for these purposes is increasingly seen as an important part of achieving climate change goals. Protected areas help buffer communities from extreme events like cyclones and flooding. Many protected areas also sequester carbon in vegetation and soil, including so called "blue carbon", the carbon stored in coastal and marine protected ecosystems[6]. National governments should consider establishing new protected areas, or expanding those already in place, as the existing scope of protected areas is not enough to achieve these goals[7]. For ecosystems to adapt to climate change, land use needs to be carefully managed so plants and animals can relocate to newly climatically suitable areas, and those areas where the future climate will remain suitable are protected[8]. This indicates a need for considerable expansion of protected area networks[9].

Parties received full credit for this question if they indicated a clear intent to establish new protected or other conserved areas or to expand the coverage of existing areas to achieve climate change goals. They received partial credit if they indicated intent to increase coverage of natural areas but did not refer to protection or management for conservation purposes explicitly. Examples of phrases that received partial credit include "increase forest cover," "plant trees," "establish biological corridors," "afforestation," "reforestation or restoration of mangroves and forests" and "wetland or coral reef rehabilitation."

3. Does the NDC mention utilizing protected areas to help people adapt to climate change (also known as ecosystem-based adaptation or EbA)?

Ecosystem-based adaptation or EbA, uses nature to help people adapt to the impacts of climate change. EbA often focuses on protecting or restoring ecosystems to safeguard ecosystem provisioning and regulating services to reduce people's climate vulnerability. Examples of EbA include planting mangroves on vulnerable coastlines to protect people from increased storm surges or restoring forests to prevent soil erosion from increasingly frequent rainfall events. As extreme weather events grow more

frequent, well managed protected areas are increasingly necessary to buffer vulnerable populations from the impacts of droughts, floods, storms and other hazards[6].

Parties that showed a clear intent to harness ecosystem services from protected and other conserved areas to help safeguard people and their livelihoods from the adverse impacts of climate change received full credit for this question, even if the term "ecosystem-based adaptation" was not used. Parties received partial credit if their NDCs referred to using nature, ecosystems, biodiversity, or ecosystem services to help people adapt to climate change but did not mention the role of protected areas specifically. A number of countries used the term "ecosystem-based adaptation" in ways that do not conform to the accepted definition of using nature to help *people* adapt, sometimes conflating the concept of EbA with improved conservation to help nature itself. In these cases, Parties received no credit for this question.

4. Does the NDC mention utilizing protected areas to deliver carbon sequestration or avoided emissions benefits?

It is estimated that protected areas account for about one fifth of all the carbon sequestered by terrestrial ecosystems each year[7]. Protected areas in North and South America and Africa account for the highest percentage of protected area carbon stocks, about 60% of the total[6]. Although different ecosystems store different amounts of carbon, most protected areas serve as carbon reservoirs[6]. Tropical forests store the most terrestrial carbon, followed by boreal forests. However, carbon sequestration in both of these ecosystems is at risk due to climate change. Drying in tropical forests such as the Amazon, and increased fires and pests in boreal forests undermine their sequestration potential[6].

1/5

Protected areas account for about one fifth of all the carbon sequestered by terrestrial ecosystems each year[7]

Inland wetlands, specifically peatlands, only cover about 3% of the earth's land surface but are estimated to store as much carbon as all other terrestrial ecosystems combined. Protecting wetlands and peatlands is vital to ensure that these ecosystems remain intact, as drainage or mismanagement would result in a massive increase in carbon emissions[6]. Salt marshes, mangroves and seagrass beds are also important carbon sinks[6]. Nations can combat degradation of ecosystems within protected areas to capitalize on their carbon sequestration capacity. They can also expand existing protected areas or establish new ones for the same purpose.

Parties received credit for this question if their NDCs mentioned protected or other conserved areas for the purpose of carbon sequestration or avoided emissions to help achieve their climate change mitigation targets. Parties received partial credit for referring to nature-based solutions to climate change mitigation without mentioning the role of protected areas specifically. NDCs received partial credit for terms including "REDD+ (reducing emissions from deforestation and degradation)", "mitigation-friendly forest management systems" and "agroforestry."

5. Does the NDC indicate plans to use climate risk information and climate adaptive measures to manage protected areas?

Protected areas established to conserve biodiversity in the face of anthropogenic threats are unlikely to serve as safe havens from projected climate impacts[10]. Protected areas within biodiversity hotspots will likely experience the same climate impacts as non-protected areas[10], and therefore managers must plan for and manage these changes. In some cases, this might mean fundamentally reexamining the intended purpose of a protected area and whether it will be able to continue to serve that role as the climate changes. How long can the area remain a suitable habitat for the species it was established to protect? What new species may colonize the area? Can the protected area serve a new purpose under a changing climate even if key species are lost? Many conserved places may need to manage for ecosystem functionality rather than ecosystem composition. Managing protected and other conserved areas for change and not just persistence will become increasingly urgent as the climate continues to change—even if temperature stabilization goals are achieved.

In spite of the need for continued ecosystem services, most countries do not yet take climate risks on biodiversity and ecosystems into consideration when it comes to managing their existing protected areas or selecting and designing sites for new protected areas. If nations intend to rely on ecosystem services from protected and other natural areas to achieve climate change adaptation and mitigation goals—while

conserving biodiversity and providing other important ecosystem services to their citizens and economies—conservationists and protected area managers must ensure that natural systems can adapt to safeguard functionality under a changing climate.

WWF reviewed NDCs to learn which Parties, if any, intend to go beyond traditional conservation measures to manage protected and other conserved areas for known or anticipated climate change risks. To receive full credit for this question, an NDC must have demonstrated clear intent to adapt, improve, or revise protected area management plans and strategies, to incorporate climate change, and manage risks on biodiversity and ecosystems. Climate adaptive measures for biodiversity include facilitating change within a protected area to ensure sustained functionality, establishing movement corridors to help species migrate to protected areas with more favorable climates, establishing new protected areas identified as climate refugia (places that will remain climatically suitable for species), and using species resilient to increased climate variability for ecosystem restoration within a conserved area.

Parties received partial credit for this question if their NDCs displayed intent to manage nature, ecosystems, or biodiversity for climate risks without mentioning protected or other conserved areas specifically. Countries that used ambiguous terms such as "building resilience" of protected areas, species or ecosystems, without explicitly mentioning adapting conservation management, received no credit. Statements that did not include specific actions to build resilience to known or anticipated climate change impacts, were interpreted as traditional conservation strategies rather than forward looking "climate-smart" adaptation actions and therefore did not receive credit.

RESULTS

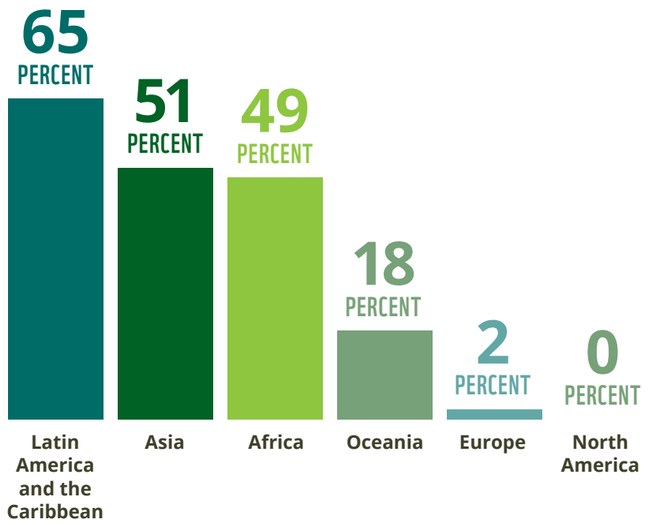
1. Explicit mention of protected areas

The 2015 Paris Agreement requires all Parties outline and communicate their post-2020 climate change actions. These Nationally Determined Contributions (NDCs) represent each country's commitment to reduce their greenhouse gas emissions and adapt to the adverse impacts of climate change. There were no instructions by the UNFCCC to include biodiversity, natural resource management, or the role of protected areas in NDCs. Nonetheless, 67 countries (37%) explicitly mentioned protected areas or other conserved areas.

Although the majority of Parties did not specifically mention protected or other conserved areas in the NDCs, many did include terms synonymous with nature and biodiversity. A recent analysis by WWF-UK[11], examined the alignment between the NDCs and the Aichi Biodiversity Targets and found that many countries are integrating biodiversity and climate change into their sustainable development planning and are reporting this in their NDCs.

There was significant regional variance among countries that explicitly mention protected areas in their NDC and those that do not. Nearly two-thirds (65%) of countries in **Latin America and the Caribbean** referred to protected areas, while **North America** and the **European Union** did not. **Belarus** and **Georgia** were the only European nations to explicitly mention protected areas in their NDCs. Half of all submissions from Parties in **Africa** and **Asia** mention protected areas (49% and 51% respectively), while only one in five (18%) countries from **Oceania** did so.

EXPLICIT MENTION OF PROTECTED AREAS



There were also significant disparities among countries when grouped by economic development, with developing countries citing protected areas much more frequently than more advanced economies. Protected and conserved areas were mentioned by 41% of **Small Island Developing States (SIDs)** and 60% of **Least Developed Countries (LDCs)**. Of the 33 **Organization for Economic Co-operation and Development (OECD)** countries that submitted NDCs by the end of 2018, only **Mexico** referenced protected or other conserved areas. Parties that included protected areas or terms for other conserved areas received full credit for this question, indicated by a "●" in the country results table in Appendix 1.

2. Establishing new or expanding existing protected areas

Of the countries that specifically mention protected areas, almost half demonstrated plans to establish new or expand existing protected or other conserved areas, equaling nearly one in five (18%) of the all countries evaluated. Some countries included specific time-bound and measurable targets. For example, **Guyana** indicated plans to conserve "an additional 2 million hectares of land through the country's National Protected Area System." **Tonga** stated plans "to double the number of Marine Protected Areas by 2030."

Other NDCs cite more general ambitions. **Mauritius** vows to "improve the management of marine and terrestrial protected areas and expand protected area networks" but does not include details about the scope of the expansion or the expected time frame. Countries that explicitly mentioned establishing new or expanding existing protected or other conserved areas in their NDCs received full credit for this question, indicated by a "●" in the country results table in Appendix 1.

One in five countries stated commitments to increase natural areas—such as increasing forest cover or planting mangroves—but did not specify whether these areas would be protected or managed for conservation purposes. For example, **Liberia** plans to "increase the amount of forested land through reforestation of degraded lands." **Thailand** states it intends to "increase national forest cover to 40% through local community participation." **Bangladesh** has committed to "provide support to scale up afforestation and reforestation" and notes that "about 195,000 hectares of mangrove plantations have been raised so far." However, none of these countries mention protected areas explicitly and received only half credit for question 2, indicated by a "○" in the country results table in Appendix 1.

3. Utilizing protected areas to help people adapt to climate change (ecosystem-based adaptation)

Very few NDCs included explicit plans to use current or future protected areas to help people adapt to climate change. Only eight countries—**Antigua and Barbuda**, **Belize**, **Guinea Bissau**, **Jordan**, **Kuwait**, **Mongolia**, **Saudi Arabia**, and **St. Vincent and the Grenadines**—stated or implied that ecosystem services provided by protected areas could reduce the vulnerability of people to climate change impacts (4%). **Guinea Bissau** states that "with an increase in…protected areas from 15% to 26%…coastal protection against the rising sea level and other types of erosion [will be enhanced]." **Belize** declares that "protecting and restoring mangrove forests…[is] expected to protect the coastline against storm surges and erosion; which are increasing in frequency as a result of climate change." These countries received full credit for question 3, indicated by a "●" in the table of country results in Appendix 1.

Twenty-nine countries (16%) use language that implies ecosystem-based adaptation but not in the context of protected areas. Some countries use the phrase EbA explicitly, while others describe ways in which they will use nature to help people adapt, without characterizing these measures as EbA.

Twenty-nine percent of Latin **America and Caribbean** countries, 19% of **Asian** countries, 18% of **Oceania** countries and 14% of **African** countries reference EbA but stop short of referring to protected areas specifically. For example, **Morocco** "commits to restoring ecosystems and strengthening their resilience, to combat soil erosion and prevent flooding." **Grenada** is "undertaking several community ecosystem-based adaptation actions including coral restoration, mangrove rehabilitation." **Timor-Leste** plans to "maintain mangrove plantations and promote awareness-raising to protect coastal ecosystems from impacts of sea level rise." The **Marshall Islands** are undertaking "efforts such as mangrove and agriculture rehabilitation programs likely to enhance carbon sinks as well as assist with protection of water resources and the health of the RMI people." These countries received half-credit for this question, indicated by a "○" in the country results of Appendix 1. Countries of **Europe** and **North America** make no reference to EbA in any context.

As with other questions in this review, countries may have under-reported their ecosystem-based adaptation activities. Many nations have already received significant funds for EbA and so have an opportunity to report on their efforts in revised NDCs. For example, in 2016, the Green Climate Fund approved a $20.5 million grant for the **Gambia's** "Large-scale Ecosystem-based Adaptation in the Gambia River Basin: developing a climate resilient, natural resource-based economy."[12] Now that it has secured financing for EbA, the Gambia can inspire other nations by including this work in a revised NDC.

BY THE NUMBERS

Of 179 countries represented in this analysis:

37%
mention protected areas or related terms explicitly

18%
explicitly mention adding new protected areas or expanding current protected areas

20%
include plans to increase forest cover, plant trees, or expand natural areas but do not go as far as designating new protected areas

4%
have plans to utilize protected areas to help people adapt to climate change, known as ecosystem-based adaptation (EbA)

16%
plan to use nature to help people adapt to climate change (EbA), but don't specifically mention using protected areas

12%
specifically mention the mitigation benefits that protected areas can provide, in the form of carbon sequestration or avoided emissions

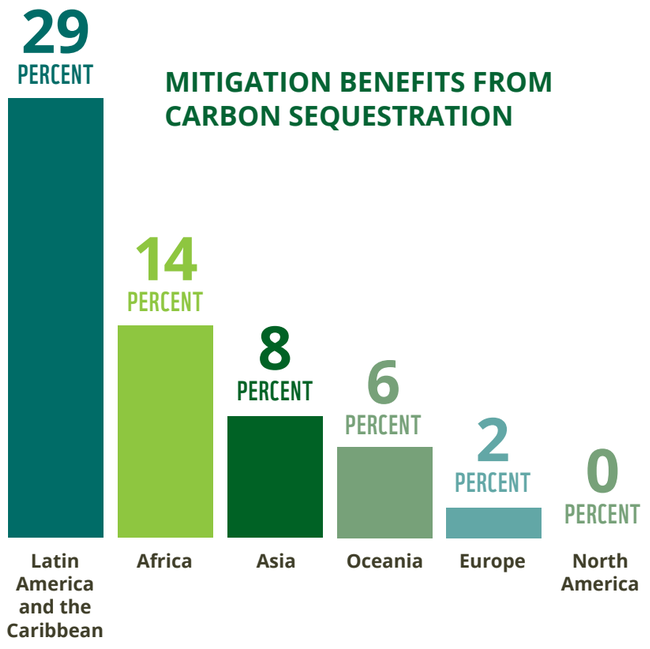
37%
mention carbon sequestration benefits from nature or natural areas, but not in the context of protected areas

6%
intend to use climate risk information to inform protected area management

11%
intend to use climate risk information to inform the management of natural systems, but do not specify protected areas

4. Mitigation benefits from carbon sequestration and avoided emissions

Twenty countries (12%) explicitly refer to the mitigation benefits that protected areas provide through carbon sequestration and received full credit for this question, indicated by a "●" in the table of country results in Appendix 1. **Latin America and Caribbean** countries stand out for their efforts to utilize protected areas to help achieve climate change mitigation targets, with more than a quarter (29%) of countries in the region intending to do so. In contrast only 14% of **African** countries refer to protected areas for carbon sequestration, while few countries in **Europe** (2%), **Oceania** (6%) and **Asia** (8%) do. Neither Canada nor the United States includes protected areas in climate change mitigation plans.



Antigua and Barbuda demonstrates a strong commitment by pledging that "by 2030, all remaining wetlands and watershed areas with carbon sequestration potential are protected as carbon sinks." This is the only NDC that plans to specifically designate new conserved areas for climate change mitigation. (According to the *CIA World Factbook*, as of 2016, 22% of Antigua and Barbuda's 443 square kilometers were forested[13])

Some countries recognize the dual conservation and climate benefits that new protected areas can provide. **Mongolia** states that "increasing protected areas up to 25-30% of the total territory will help maintain natural ecosystems and preserve water resources with…synergy effects for emission reduction."

Other countries plan to increase the carbon sequestration capacity of their protected areas through REDD+ projects or other restoration efforts. **Nepal** plans to "pilot a sub-national project on REDD+ to reduce about 14 million tons of CO2(eq) by 2020 by addressing the drivers of deforestation and forest degradation…in all types of forests and protected areas." **Panama** will increase the carbon storage capacity of protected areas by 10% through reforestation and restoration.

Some 37% of countries mention mitigation benefits from natural areas (mangroves and seagrass in **Kiribati**, forests in **India**, wetlands in **China**, for example) but do not explicitly mention the carbon sequestration benefits from protected areas. These countries received partial credit for question 4, indicated by a "○" in the table of country results in Appendix 1.

5. Managing Protected Areas for Climate Change Risks

While some countries have started to incorporate protected areas into their climate change solutions, very few have begun to consider the threat that climate change poses to their protected areas and adapt management accordingly. Ideally, countries should use climate risk information to adapt conservation plans to manage known and anticipated impacts on species and ecosystems, particularly if Parties intend to use nature-based climate solutions in their commitments to the Paris Agreement.

Just 10 countries mention using climate risk information or climate adaptive measures to revise protected area management plans. **Uruguay** provides an example, stating, "the management plans of at least six protected areas will include climate change and variability considerations by 2025."

Colombia's NDC, while somewhat vague, is perhaps more comprehensive. It states "100% of the national territory [will be] covered by climate change plans" which ostensibly includes its protected and other conserved areas. In addition, according to the NDC, "water resource management tools, which include climate change and variability considerations will be in place for the country's top priority water basins," areas that include extensive natural systems.

Sri Lanka mentions specific climate-adaptive measures it will take with plans to "allocate special attention concerning climate adaptation related initiatives to biodiversity and ecosystems." This includes the "restoration of degraded areas inside and outside the Protected Area (PA) network to enhance resilience, increase connectivity through corridors, [as well as] landscape/matrix improvement and management." Sri Lanka also intentions to "improve management, and consider increasing the extent of protected areas, buffer zones and create new areas in vulnerable zones."

16.9
KILOMETERS

Terrestrial species have shifted to higher latitudes at a rate of 16.9 kilometers per decade as a result of increased temperatures[14]

72
KILOMETERS

Marine species are moving poleward at an average rate of 72 kilometers per decade[15]

These countries and others demonstrating similar activities received full credit for this question, indicated by a "●" in the country results table in Appendix 1.

Notably, a few countries that do mention protected areas also discuss the need for biological corridors, an important climate-risk management strategy for biodiversity. Although range shifts due to climate change vary greatly by species, a recent study found that on average, terrestrial species have shifted to higher latitudes at a rate of 16.9 kilometers per decade as a result of increased temperatures[14]. Marine species are moving poleward at an average rate of 72 kilometers per decade[15]. Species will need space to freely migrate to new locations as they seek suitable climates.

Ethiopia provides an example for corridors that other countries might replicate. Its NDC states the intention to "create biodiversity movement corridors, especially up towards higher terrain, in areas where most of the land is under cultivation. This will minimize biodiversity loss through enabling the re-establishment and movement of plant and animal species and varieties to areas suitable for their survival when temperature rises." Facilitating the movement of species through protected or managed biological corridors will be crucial to minimizing biodiversity loss and ensuring ecosystem services—including those needed for climate change adaptation and mitigation.

Nearly 11% of countries state or imply that they will use climate-adaptive measures to increase the resilience of natural areas but do not mention protected areas specifically. For example, **Tonga** is "promoting reforestation and rehabilitation of cleared and degraded forests with climate change resilient, and ecologically and socially appropriate tree species." **Tajikistan** plans to address "the impacts of climate change by means of full-scale integration of climate resilience and adaptation measures… [including] promotion of adaptation of globally significant biological species and natural ecosystems to climate change." Countries with similar commitments that do not mention protected or conserved areas received partial credit for this question, indicated by a "●" in the country results in Appendix 1.

DISCUSSION AND RECOMMENDATIONS

This review of 151 NDCs covering 179 countries identified Parties' strengths in utilizing protected and other conserved areas to support their adaptation and mitigation goals. Some of the geographically smallest and least developed countries (with the smallest contributions to global emissions) demonstrated the greatest leadership by providing the most comprehensive commitments. **Antigua and Barbuda**, the **Bahamas**, **Cambodia**, **Republic of Congo**, **Grenada**, **Guinea Bissau**, **Haiti**, **Jordan**, **Madagascar**, **Mali**, **Mongolia**, **Sri Lanka**, **St. Vincent and the Grenadines**, **Uganda** and **Uruguay** each received 3.5 or more credits across the five criteria examined in the review.

The analysis also revealed significant gaps. Eighty-four NDCs made no reference to protected or conserved areas whatsoever. Fifty-four countries did not include nature-based solutions to climate challenges even outside conserved areas. In stark contrast to the leadership provided by developing nations, many of the world's most developed economies with the greatest resources to protect and manage natural areas failed to consider the utilization of protected areas in their NDCs. **European Union** member states, **Norway**, **Switzerland**, **United States**, **Israel**, **Australia**, **Japan** and the **Republic of Korea** failed to receive credits for any the five questions examined in the study. Among developed nations, only **Canada** received a single full credit for "protecting and enhancing carbon sinks including in forests, wetlands and agricultural lands," while **New Zealand** received two partial credits for committing to establish new forests to serve as carbon sinks. **Iceland** and **Japan** received a half credit each for recognizing the value of nature for climate change mitigation*.

** Parties that received no credits for any of the five questions in this review are not necessarily neglecting the importance of protected areas for their contributions to climate change adaptation and mitigation goals nor are they necessarily failing to update management plans to accommodate climate change considerations. It simply means that these efforts are not included in their NDCs.*

2.5
MILLION HECTARES

Colombia, plans to add "more than 2.5 million hectares in coverage of newly protected areas in the National System of Protected Areas (SINAP), in coordination with local and regional stakeholders.

To increase ambition and highlight the role of protected areas while inspiring others to action, WWF developed five recommendations for Parties as they work to revise their NDCs for 2020 or in 5-year cycles as agreed in the 2015 Paris Agreement.

1. Acknowledge the role that protected and other conserved areas can play in achieving climate change adaptation and mitigation goals and include them in NDCs and related climate change policies.

Although more than one third of Parties included the role of protected and other conserved areas in their NDCs, 83 countries and the European Union (representing 28 countries), did not. Clearly there are opportunities to strengthen the role of conserved areas in supporting the 2015 Paris Agreement. Among NDCs that did include protected areas, most of the commitments were short and vague—often in the form of generalized bullet points with little or no background or context. Interpreting the intentions and rationale behind such vague statements was a challenge for this study. Countries currently revising their NDCs should consider including the specific role of protected areas for either adaptation, mitigation, or both.

2. Increase coverage of protected and conserved areas and set specific, measurable and time-bound targets.

WWF encourages Parties to enhance adaptation and mitigation ambition by increasing the coverage of areas under protection or managed for ecosystem services. Countries should set specific and measurable targets when designating new or expanding existing conserved areas that are critical to carbon sequestration and ecosystem-based adaptation (EbA). Many countries have committed to adding or expanding protected areas, but NDCs could be strengthened to include specific, measurable and time-bound targets. For example, rather than simply stating that protected areas will be expanded, Parties could provide specifics about the scope of the expansion and a specific time frame. This echoes a previous WWF analysis of NDC commitments across the forest sector that found most NDCs lacked concrete measurable targets[16].

A strong example of setting clear and measurable targets comes from Colombia, which plans to add "more than 2.5 million hectares in coverage of newly protected areas in the National System of Protected Areas (SINAP), in coordination with local and regional stakeholders." These clear and measurable targets make it easier for countries to track progress.

Other countries have included targets for expanding natural areas yet fail to include details on whether these areas will be given legal protection status. **Lao People's Democratic Republic** lays out the ambitious plan of "increasing forest cover to a total of 70% of land area by 2020," but does not mention whether these forests will be protected or managed. Similarly, **Honduras** has committed to "afforestation/reforestation of 1 million hectares of forest before 2030" without stating if this newly forested land will be granted any formal protection or be sustainably managed.

Increasing the extent of lands, freshwater bodies and oceans managed for climate change adaptation and mitigation goals can create synergies with other global conventions, but there is also potential for adverse social impacts. It will be very important to ensure that any expansion of conserved areas does not displace communities or undermine the rights or wellbeing of people. As the international community rallies behind the New Deal for Nature and People with its target of conserving at least 30% of terrestrial land and inland water areas and 30% of oceans by 2030, national governments should recognize that increasing protected and managed forests, peatlands, mangroves and seagrasses can not only help meet biodiversity conservation and sustainable development goals, but also climate change targets.

745
MILLION TONS

Bolivia's protected areas currently store about 745 million tons of carbon dioxide—the equivalent of $3.7-14.9 billion US dollars at international carbon market prices[6]

3. Clearly articulate the role of protected and conserved areas in helping people adapt to climate change and link specific climate hazards and vulnerable populations with the appropriate ecosystem services needed for adaptation.

Very few countries have recognized the value of nature in helping vulnerable people adapt to climate change and fewer still recognize the role that protected and conserved areas can play in nature-based approaches to adaptation. Of the NDCs reviewed in this study, 142 Parties did not include nature and ecosystem services as a critical component of their adaptation plans. Parties are strongly encouraged to incorporate ecosystem-based adaptation into their revised NDCs and consider how protected and conserved areas can help to reduce the vulnerability of people exposed to extreme weather and the impact of chronic stressors associated with climate change.

As mentioned, the brevity, ambiguity and lack of context was a barrier to interpreting goals, intentions and rationales behind many statements on protected and conserved areas. This was especially true when it came to evidence of "ecosystem-based adaptation" plans. Even when countries used this term explicitly, it was often used incorrectly, conflating it with adaptation that benefits nature rather than using nature to benefit people. Many statements did not provide sufficient context to confirm that actions constitute ecosystem-based adaptation.

For example, the **Seychelles** NDC states that the country plans a "shift toward ecosystem-based adaptation approaches to biodiversity conservation." However, according to the accepted definition of EbA by the Convention on Biological Diversity, ecosystem-based adaptation is not an approach to conserving biodiversity. Rather it uses biodiversity and conservation measures as part of an overall strategy to help people adapt to the adverse effects of climate change. The **Vietnam** NDC states that it plans to "implement ecosystem-based adaptation through the development of ecosystem services and biodiversity conservation, with a focus on the preservation of genetic resources, species at risk of extinction, and important ecosystems." Preserving genetic diversity and safeguarding species at risk of extinction are worthy goals, however neither is an example of ecosystem-based adaptation without any reference to reducing human vulnerability.

Other commitments could be interpreted as ecosystem-based adaptation, but without additional information, it was impossible to be certain. For example, as one of its many adaptation contributions, **Sao Tome and Principe** plans to "increase the resilience to erosion and maritime, river and storm flooding of coastal areas through improved Coastal Protection for vulnerable communities." There is no additional information about whether the country plans to use hard engineering, such as sea walls or other barriers, or ecosystem-based approaches to protect coastal communities.

Argentina states that its "priority activities to reduce vulnerability [include] strengthening of initiatives that support the recovery and rehabilitation of lands, including ecosystem-based adaptation." Without additional information, is it difficult to determine whether Argentina plans to use ecosystem-based adaptation measures to help people or intends to help ecosystems themselves adapt.

Overall, Parties could strengthen their NDCs with more specifics on why they are taking particular actions and for whom. Which groups are at risk? What sorts of climate

hazards do they face? How can protected areas help these groups adapt? Adaptation actions and nature-based approaches can be better articulated by answering four guiding climate resilience questions.

- Resilience **of** what (water supplies, cattle, a species, crops, property)?
- Resilience **to** what (specific climate change hazards such as increased drought, heat waves, storms, shifting seasons)?
- Resilience **for whom** (farmers, women, property owners)?
- Resilience **through what** (ecosystems services from protected areas, rainwater harvesting, migration corridors)?

Jordan is an example of a country whose commitment would be strengthened with greater specificity. Its NDC states Jordan's intention to enhance "the resilience of local communities impacted by climate change in areas within and surrounding PAs (including community-based pilot adaptation projects)." This statement includes specific target populations (people in and around protected areas), but it does not mention the climate change hazards these people are facing, nor how ecosystem services from protected areas can help them to adapt.

2°c
WARMING

Approximately 13% of the planet's land area is projected to undergo biome shifts at 2°C of warming and about 7% at 1.5°C.

4. Integrate the carbon sequestration benefits of protected and other conserved areas into climate change mitigation targets.

The world's protected areas store vast amounts of carbon that are critical to climate change mitigation. While 67 countries include protected areas in their NDCs, very few referenced the value they can play in sequestering carbon and avoiding emissions. Furthermore, a previous WWF analysis of forest sector commitments in NDCs found insufficient accounting of emissions removals via the land use, land-use change, and forestry[16].

Estimates for **Bolivia** show that the country's protected areas currently store about 745 million tons of carbon dioxide—the equivalent of $3.7-14.9 billion US dollars at international carbon market prices[6]. While the country's NDC briefly refers to the carbon capture potential of ecosystems, it does not mention protected areas explicitly. Similarly, **Mexico's** protected areas store an estimated 2.2 billion tons of carbon dioxide (worth more than $34 billion US dollars)6. While its NDC states an intent to "increase carbon capture [through the] conservation and recovery of coastal and marine ecosystems such as coral reefs, mangroves, sea grass, and dunes," Mexico makes no mention of carbon sequestration by the country's protected areas.

Given the potential that protected and other conserved areas can play in sequestering carbon and avoiding emissions, Parties are encouraged to enhance their climate change mitigation ambition by incorporating the role of protected areas in their revised NDCs, with specific areas and targets justified by rigorous data analysis.

5. Commit to managing protected and other conserved areas for current and anticipated climate risks to ecosystems and biodiversity while calling attention to the need for increased technical and financial support to improve protected area management in the face of rapid change.

Key conservation strategies such as those involving protected areas—which were designed to reduce the extent of anthropogenic threats to biodiversity—are unlikely to provide refuge from the expected effects of climate change. Protected areas within biodiversity hotspots will experience unprecedented climates along with unprotected hotspot areas.

As Parties increase climate change ambition by using important ecosystem services provided by protected and other conserved areas, governments should acknowledge known and anticipated climate change risks to biodiversity and manage them to ensure continued delivery of carbon sequestration and adaptation services. Every country should update their protected area management plans to include consideration of climate change risk. Management plans should reference specific climate change risks and hazards and climate-adaptive measures should be informed by the best available science. Climate-informed protected area management, a new frontier for conservationists, will require increased financial and technical support, particularly in in the developing world[10].

This review of current NDCs shows that climate change risks to nature are not being fully considered. Although many NDCs include actions that claim to "increase the adaptive capacity" or "increase the resilience" of protected areas, many actions described are traditional conservation approaches, and are not specifically designed to facilitate necessary and unavoidable change as species and ecosystems adapt to the changing climate. For example, **Ethiopia** plans to "enhance the adaptive capacity of ecosystems through an ecosystem rehabilitation approach in the highlands." Although

there may be instances where a traditional approach to restoration or rehabilitation may increase ecological resilience, adaptation strategies must be based on climate risk information. Countries must adopt a forward-looking perspective that moves beyond restoring past conditions and actively manages protected areas for change.

An illustration of climate-informed conservation comes from Kutai National Park, **Indonesia**, where climate change projections indicate a high likelihood of increased temperatures, which are likely to exacerbate drought conditions and lead to more frequent wildfires[17]. To help manage this risk, researchers in Kutai National Park evaluated 250 different tree species to determine those most resilient to changes in climate. Reforestation efforts are now underway using two tree species identified as most resilient to fire events[17].

There are examples where countries are managing climate risks to nature but do not mention this in their NDCs. **Pakistan's** National Biodiversity Strategy and Action Plan states that "with respect to forestry, the National Climate Change Policy outlines the need to restore and enhance Pakistan's forest cover under sustainable forest management to *withstand present and probable future impacts of climate change*"[18]. While this statement does not mention protected areas specifically, actively managing forests for future climate risks could easily be expanded to include protected areas. Pakistan does not include this language in its NDC.

Planning for change to ecosystems is vital for the success of nature-based climate change mitigation solutions. Although some countries mention the mitigation benefits that protected areas can provide, no NDC considers or proposes managing the risk that climate change itself may undermine the sequestration potential of natural systems due to the increasing severity and frequency of fires, droughts, pest outbreaks and other hazards. Although impacts on forests and other ecosystems important for carbon sequestration can be significantly reduced if the Paris Agreement's temperature stabilization target is achieved, these impacts cannot be eliminated entirely.

Approximately 13% of the planet's land area is projected to undergo biome shifts at 2°C of warming and about 7% at 1.5°C. At 2°C warming, 16% of plant species are projected to lose more than half of their climatically determined geographic range, while 8% will meet this fate at 1.5°C warming[8]. Changes to ecosystems that provide climate change mitigation benefits must be considered in management of natural areas and in how nature-based mitigation benefits are incorporated into NDC targets.

The same is true for ecosystem-based adaptation. One challenge facing EbA is identifying limits and thresholds for EbA's delivery of adaptation benefits, and the extent to which ecosystems can provide services in a changing climate[19]. If climate change risks on ecosystems are not considered and managed, the benefits ecosystems provide in reducing people's vulnerability may be short-lived.

Given these challenges, Parties are encouraged to consider climate change risks to nature and adopt climate-adaptive measures to manage them. These measures should be included in revised NDCs as well as national commitments to other global conventions.

CONCLUSION

For the past century, protected areas and other conserved areas such as indigenous and community conserved areas and natural sacred areas have been the primary vehicle for biodiversity conservation. In the era of climate change, protected areas take on new roles by helping the world mitigate the pace and extent of global warming and reducing vulnerability to the adverse effects of increased climate variability and longer-term stressors. Revisions to Nationally Determined Contributions to the UNFCCC Paris Agreement, provide an important opportunity to increase climate ambitions while highlighting the role of protected and other conserved areas in contributing to global mitigation and adaptation targets.

This review of 151 NDCs covering 179 countries identified Parties' strengths in utilizing protected and other conserved areas to contribute to their own adaptation and mitigation goals—even as it revealed significant gaps. Developing countries have taken the lead in recognizing the value of protected and conserved areas when it comes to meeting the climate change commitments within their NDCs. Developed nations can assist these countries by providing technical and financial support, even as they strengthen their own NDCs by communicating existing efforts or plans to incorporate protected and conserved areas in achieving climate change targets. All nations must acknowledge and manage the threats that climate change poses to nature and protected areas to ensure continued delivery of critical carbon sequestration and adaptation benefits.

By adopting any or all of the five recommendations emerging from this analysis, Parties can not only strengthen their contributions to the UNFCCC but also create synergies in meeting commitments to the United Nations Sustainable Development Goals and the Convention on Biological Diversity. By doing so, we can help people and nature find a safer, more resilient path forward in a rapidly changing world.

GLOSSARY

Adaptation: In human systems, the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities. In natural systems, the process of adjustment to actual climate and its effects; human intervention may facilitate adjustment to expected climate. (Intergovernmental Panel on Climate Change)

Adaptive capacity: The combination of the strengths, attributes, and resources available to an individual, community, society, or organization that can be used to prepare for and undertake actions to reduce adverse impacts, moderate harm, or exploit beneficial opportunities. (Intergovernmental Panel on Climate Change)

Carbon sequestration: The process of capturing and storing atmospheric carbon dioxide. It is one method of reducing the amount of carbon dioxide in the atmosphere with the goal of reducing global climate change. (USGS)

Convention on Biological Diversity (CBD): The Convention on Biological Diversity (CBD) entered into force on 29 December 1993. It has 3 main objectives: The conservation of biological diversity; The sustainable use of the components of biological diversity; The fair and equitable sharing of the benefits arising out of the utilization of genetic resources. The CBD was inspired by the world community's growing commitment to sustainable development. It represents a dramatic step forward in the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of benefits arising from the use of genetic resources. (CBD)

Ecosystem-based adaptation (EbA): Incorporates biodiversity and ecosystem services into an overall adaptation strategy to help people to adapt to the adverse effects of climate change. (Convention on Biological Diversity)

Ecosystem services: The benefits people obtain from ecosystems, which have been classified by the Millennium Ecosystem Assessment as: Supporting services, such as seed dispersal and soil formation; regulating services, such as carbon sequestration, climate regulation, water regulation and filtration, and pest control; provisioning services, such as supply of food, fiber, timber and water; and cultural services, such as recreational experiences, education and spiritual enrichment (Millennium Ecosystem Assessment 2005)

Least developed country (LDC): A country that exhibits the lowest indicators of socioeconomic development, with the lowest Human Development Index ratings of all countries in the world. (United Nations Economic Analysis & Policy Division)

Mitigation (of climate change): A human intervention to reduce the sources or enhance the sinks of greenhouse gases. (Intergovernmental Panel on Climate Change)

Nationally Determined Contributions (NDCs): The Paris Agreement requests each country to outline and communicate their post-2020 climate actions, known as their NDCs. NDCs are submitted every five years to the UNFCCC secretariat. In order to enhance the ambition over time the Paris Agreement provide that successive NDCs will represent a progression compared to the previous NDC and reflect its highest possible ambition. All Parties are requested to submit the next round of NDCs (new NDCs or updated NDCs) by 2020 and every five years thereafter (e.g. by 2020, 2025, 2030), regardless of their respective implementation time frames. (UNFCCC)

Nature-based solutions: Actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits. (IUCN)

Other conserved areas: In this report "other conserved areas" is used as a proxy for "Other Effective Area-based Conservation Measures" which is defined as "a geographically defined area other than a Protected Area, which is governed and managed in ways that achieve positive and sustained long-term outcomes for the in situ conservation of biodiversity, with associated ecosystem functions and services and where applicable, cultural, spiritual, socio—economic, and other locally relevant values." (CBD)

Paris Agreement: At COP 21 in Paris, on 12 December 2015, Parties to the UNFCCC reached a landmark agreement to combat climate change and to accelerate and intensify the actions and investments needed for a sustainable low carbon future. The Paris Agreement's central aim is to strengthen the global response to the threat of climate change by keeping a global temperature rise this century well below 2 degrees Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius. The Paris Agreement requires all Parties to put forward their best efforts through "nationally determined contributions" (NDCs) and to strengthen these efforts in the years ahead. (UNFCCC)

Protected area: A clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values. (IUCN)

REDD+: Reducing emissions from deforestation and forest degradation in developing countries (REDD+) is a climate change mitigation solution developed by the Parties to the UNFCCC. REDD+ incentivizes developing countries to keep their forests standing by offering results-based payments for actions to reduce or remove forest carbon emissions. (UNFCCC)

Resilience: The ability of a social-ecological system to absorb and recover from shocks and disturbances, maintain functionality and services by adapting to chronic stressors, and transform when necessary (WWF)

Small Island Developing States (SIDS): A distinct group of developing countries facing specific social, economic and environmental vulnerabilities. SIDS tend to confront similar constraints in their sustainable development efforts, such as a narrow resource base depriving them of the benefits of economies of scale; small domestic markets and heavy dependence on a few external and remote markets; high costs for energy, infrastructure, transportation, communication and servicing; long distances from export markets and import resources; low and irregular international traffic volumes; little resilience to natural disasters; growing populations; high volatility of economic growth; limited opportunities for the private sector and a proportionately large reliance of their economies on their public sector; and fragile natural environments. (United Nations)

United Nations Sustainable Development Goals (SDGs): The Sustainable Development Goals are the blueprint to achieve a better and more sustainable future for all. They address the global challenges we face, including those related to poverty, inequality, climate, environmental degradation, prosperity, and peace and justice. The Goals interconnect and in order to leave no one behind, it is important that we achieve each Goal and target by 2030. (United Nations)

United Nations Framework Convention on Climate Change (UNFCCC): The UNFCCC entered into force on 21 March 1994. Today, it has near-universal membership. The 197 countries that have ratified the Convention are called Parties to the Convention. The ultimate objective of the Convention is to stabilize greenhouse gas concentrations "at a level that would prevent dangerous anthropogenic (human induced) interference with the climate system." It states that "such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened, and to enable economic development to proceed in a sustainable manner." (United Nations)

APPENDICES

Appendix 1: Results by Country

The following table provides a summary of results of this analysis by country. Only countries with NDCs reviewed in this study are included. Closed circles (●) indicate that the response includes a specific reference to protected areas or other conserved areas and that the country received full credit for a question. Open circles (○) indicate that the entry includes a reference to nature or ecosystems, but not to protected areas, and that the country received partial (half) credit for the question. The total number of credits earned for all five questions appears in last column in the table. Data on the percentage of national territory under protection comes from the United Nations Environment World Conservation Monitoring Centre (as of February 2019), www.protectedplanet.net ([20]).

KEY:

1. Does the NDC mention protected areas explicitly?

● = explicitly mentions protected or other conserved areas (full credit)

2. Does NDC call for the establishment of new or expansion of existing protected or other conserved areas?

● = explicitly mentions adding new protected areas or expanding current protected areas (full credit)

○ = includes plans to increase forest cover, plant trees, or expand natural areas but does not go as far as designating new protected areas (partial credit)

3. Does the NDC mention utilizing protected areas to help people adapt to climate change (also known as ecosystem-based adaptation or EbA).

● = includes explicit plans to utilize protected and other conserved areas to help people adapt to climate change (full credit)

○ = includes plans to use nature to help people adapt to climate change (EbA), but doesn't specifically mention using protected areas (partial credit)

4. Does the NDC mention utilizing protected areas to deliver carbon sequestration or avoided emissions benefits?

● = specifically mentions the mitigation benefits that protected areas and other conserved areas can provide through carbon sequestration and/or avoided emissions (full credit)

○ = mentions mitigation benefits from nature or natural areas, but not in the context of protected areas (partial credit)

5. Does the NDC indicate plans to use climate risk information and climate adaptive measures to manage protected and other conserved areas?

● = specifically mentions plans to use climate risk information and climate adaptive measures to manage protected areas and other conserved areas (full credit)

○ = mentions plans to use climate risk information and other climate adaptive measures to manage natural systems, but does not specify protected areas (partial credit)

	percentage of national territory under protection (% terrestrial | % marine)	1. explicit reference to protected areas	2. new or expanded protected areas	3. adaptation benefits for people from protected areas	4. climate change mitigation benefits from protected areas	5. managing protected areas for climate change risks	Total number of credits earned
Afghanistan	0.0 | n/a	●			○		1.5
Albania	18.0 | 3.0						0
Algeria	7.0 | 0.0			○			0.5
Andorra	27.0 | n/a						0
Antigua and Barbuda	19.0 | 0.0	●	●	●	●		4
Argentina	8.0 | 4.0			○			0.5
Armenia	25.0 | n/a				○		0.5
Australia	19.0 | 41.0						0
Austria (EU)	28.0 | n/a						0
Azerbaijan	10.0 | n/a		○		○		1
Bahamas	37.0 | 8.0	●	●		●	●	4
Bahrain	7.0 | 1.0				○		0.5
Bangladesh	5.0 | 5.0	●	○	○	○		2.5
Barbados	1.0 | 0.0						0
Belarus	9.0 | n.a.	●	●		●		3
Belgium (EU)	25.0 | 37.0						0
Belize	38.0 | 10.0	●		●	●		3
Benin	30.0 | 0.0	●	○		○		2
Bhutan	48.0 | n.a.	●			○		1.5
Bolivia	31.0 | n.a.	●	○	○	○		2.5
Bosnia and Herzegovina	1.0 | 0.0				○		0.5
Botswana	29.0 | n.a.						0
Brazil	29.0 | 27.0	●	○		●		2.5
Bulgaria (EU)	41.0 | 8.0						0
Burkina Faso	15.0 | n.a.	●	●				2
Burundi	8.0 | n.a.		○		○		1
Cabo Verde	3.0 | 0.0		○		○		1

	percentage of national territory under protection (% terrestrial | % marine)	1. explicit reference to protected areas	2. new or expanded protected areas	3. adaptation benefits for people from protected areas	4. climate change mitigation benefits from protected areas	5. managing protected areas for climate change risks	Total number of credits earned
Cambodia	26.0 | 0.0	●	●	○		●	3.5
Cameroon	11.0 | 3.0	●			○	○	2
Canada	10.0 | 3.0				●		1
Central African Republic	18.0 | n.a.	●			○		1.5
Chad	22.0 | 0.0		○		○		1
Chile	18.0 | 29.0					○	0.5
China	16.0 | 5.0		○		○		1
Colombia	15.0 | 17.0	●	●			●	3
Comoros	10.0 | 0.0	●	●		●		3
Congo, Republic of	41.0 | 3.0	●	●	○	●		3.5
Cook Islands	26.0 | 100.0						0
Costa Rica	28.0 | 1.0	●	○	○	○		2.5
Croatia (EU)	38.0 | 9.0						0
Cuba	17.0 | 4.0						0
Cyprus (EU)	37.0 | 0.0						0
Czech Republic (EU)	22.0 | n.a.						0
Cote D'Ivoire	23.0 | 0.0	●			○		1.5
Democratic People's Republic of Korea	2.0 | 0.0	●				○	1.5
Democratic Republic of the Congo	14.0 | 0.0		○		○		1
Denmark (EU)	18.0 | 18.0						0
Djibouti	2.0 | 0.0			○			0.5
Dominica	22.0 | 0.0	●			●		2
Dominican Republic	26.0 | 18.0	●		○			1.5
Egypt	13.0 | 5.0						0

	percentage of national territory under protection (% terrestrial | % marine)	1. explicit reference to protected areas	2. new or expanded protected areas	3. adaptation benefits for people from protected areas	4. climate change mitigation benefits from protected areas	5. managing protected areas for climate change risks	Total number of credits earned
El Salvador	9.0 | 1.0		●		○		1.5
Eritrea	5.0 | 0.0	●	●				2
Estonia (EU)	20.0 | 19.0						0
Eswatini	4.0 | n.a.						0
Ethiopia	18.0 | 0.0		○	○	○	○	2
Equatorial Guinea	19.0 | 0.0				○		0.5
Fiji	5.0 | 1.0						0
Finland (EU)	15.0 | 11.0						0
France (EU)	26.0 | 45.0						0
Gabon	22.0 | 29.0	●		○	●		2.5
Gambia	4.0 | 0.0				○		0.5
Georgia	8.0 | 1.0	●	●		○		2.5
Germany (EU)	38.0 | 45.0						0
Ghana	15.0 | 0.0		○		○		1
Greece (EU)	35.0 | 5.0						0
Grenada	10.0 | 0.0	●	●	○	●		3.5
Guatemala	20.0 | 1.0	●	○			○	2
Guinea	36.0 | 1.0	●	○				1.5
Guinea Bissau	17.0 | 10.0	●	●	●	○		3.5
Guyana	9.0 | 0.0	●	●		○		2.5
Haiti	2.0 | 0.0	●	●		●	○	3.5
Honduras	24.0 | 4.0		○				0.5
Hungary (EU)	23.0 | n.a.						0
Iceland	18.0 | 0.0				○		0.5
India	6.0 | 0.0	●		○	○		2
Indonesia	12.0 | 3.0			○	○		1
Ireland (EU)	14.0 | 2.0						0

	percentage of national territory under protection (% terrestrial | % marine)	1. explicit reference to protected areas	2. new or expanded protected areas	3. adaptation benefits for people from protected areas	4. climate change mitigation benefits from protected areas	5. managing protected areas for climate change risks	Total number of credits earned
Israel	20.0 | 0.0						0
Italy (EU)	22.0 | 9.0						0
Jamaica	16.0 | 1.0			○			0.5
Japan	29.0 / 8.0				○		0.5
Jordan	2.0 | 36.0	●	●	●	○	●	3.5
Kazakhstan	3.0 | 1.0						0
Kenya	12.0 | 1.0					○	0.5
Kiribati	22.0 | 12.0				○		0.5
Kuwait	18.0 | 1.0	●	●	●			3
Lao People's Democratic Republic	17.0 | n.a.	●	○	○	○	○	2.5
Latvia (EU)	18.0 | 16.0						0
Lesotho	0.0 | n.a.	●	○		○		2
Liberia	4.0 | 0.0		○				0.5
Liechtenstein	12.0 | n.a.						0
Lithuania (EU)	17.0 | 26.0						0
Luxembourg (EU)	41.0 | n.a.						0
Madagascar	6.0 | 1.0	●	●	○		●	3.5
Malawi	23.0 | n.a.	●	●		●		3
Malaysia	19.0 | 2.0						0
Maldives	1.0 | 0.0					○	0.5
Mali	8.0 | n.a.	●	●		●	●	4
Malta (EU)	36.0 | 6.0						0
Marshall Islands	12.0 | 0.0			○	○		1
Mauritania	1.0 | 4.0					○	0.5
Mauritius	5.0 | 0.0	●	●				2
Mexico	14.0 | 22.0	●	○		○	●	3

	percentage of national territory under protection (% terrestrial | % marine)	1. explicit reference to protected areas	2. new or expanded protected areas	3. adaptation benefits for people from protected areas	4. climate change mitigation benefits from protected areas	5. managing protected areas for climate change risks	Total number of credits earned
Micronesia	37.0 | 3.0						0
Monaco	33.0 | 100.0						0
Mongolia	18.0 | n.a.	●	●	●	●	○	4.5
Montenegro	6.0 | 0.0						0
Morocco	31.0 | 0.0	●	●	○	○		3
Mozambique	22.0 | 2.0						0
Myanmar	6.0 | 2.0	●	●		●		3
Namibia	38.0 | 2.0	●	○		○		2
Nauru	0.0 | 0.0						0
Nepal	24.0 | n.a.	●		○	●	○	3
Netherlands (EU)	11.0 | 27.0						
New Zealand	33.0 | 30.0		○		○		1
Nicaragua	37.0 | 3.0	●	○	○	●		2
Niger	17.0 | n.a.				○		0.5
Nigeria	14.0 | 0.0	●			○		1.5
Niue	20.0 | 0.0				○		0.5
Norway	0.0 | 0.0						0
Pakistan	12.0 | 1.0	●	○		○		2
Palau	28.0 | 83.0						0
Panama	21.0 | 2.0	●	●		●		3
Papua New Guinea	3.0 | 0.0				○		0.5
Paraguay	14.0 | n.a.	●	○				1.5
Peru	21.0 | 0.0			○	○	○	1.5
Poland (EU)	40.0 | 23.0						0
Portugal (EU)	23.0 | 17.0						0
Qatar	13.0 | 2.0						0

	percentage of national territory under protection (% terrestrial | % marine)	1. explicit reference to protected areas	2. new or expanded protected areas	3. adaptation benefits for people from protected areas	4. climate change mitigation benefits from protected areas	5. managing protected areas for climate change risks	Total number of credits earned
Republic of Korea	12.0 | 2.0						0
Republic of Moldova	0.0 | 0.0		○		○	○	1.5
Romania (EU)	24.0 | 23.0						0
Rwanda	9.0 | n.a.	●	○		○		2
Saint Kitts and Nevis	3.0 | 0.0		○				0.5
Saint Lucia	19.0 | 0.0				○		0.5
Samoa	7.0 | 0.0						0
San Marino	0.0 | n.a.						0
Sao Tome and Principe	29.0 | 0.0				○	○	1
Saudi Arabia	5.0 | 2.0	●	○	●	○		2
Serbia	7.0 | n.a.						0
Seychelles	42.0 | 0.0	●		○			1.5
Sierra Leone	9.0 | 1.0						0
Singapore	6.0 | 0.0						0
Slovakia (EU)	38.0 | n.a.						0
Slovenia (EU)	54.0 | 100.0						0
Solomon Islands	2.0 | 0.0						0
Somalia	0.0 | 0.0						0
South Africa	8.0 | 12.0				○		0.5
Spain (EU)	28.0 | 8.0						0
Sri Lanka	30.0 | 0.0	●	●		○	●	3.5
St Vincent and the Grenadines	22.0 | 0.0	●	●	●	○		3.5
Palestine, State of	8.0 | n.a.	●	○		○		2
Sudan	2.0 | 16.0	●	●	○	○		3
Sweden (EU)	15.0 | 15.0						0

	percentage of national territory under protection (% terrestrial | % marine)	1. explicit reference to protected areas	2. new or expanded protected areas	3. adaptation benefits for people from protected areas	4. climate change mitigation benefits from protected areas	5. managing protected areas for climate change risks	Total number of credits earned
Switzerland	10.0 | n.a.						0
Tajikistan	22.0 | n.a.					○	0.5
Thailand	19.0 | 2.0	●	○		○		2
Macedonia, Former Yugoslav Republic of	10.0 | n.a.						0
Tanzania	38.0 | 3.0				○		0.5
Timor-Leste	13.0 | 1.0	●	○	○	○		2.5
Togo	28.0 | 0.0	●	●		●		3
Tonga	16.0 | 2.0	●	●		○		2.5
Trinidad and Tobago	31.0 | 0.0						0
Tunisia	8.0 | 1.0				○		0.5
Turkmenistan	3.0 | 3.0						0
Tuvalu	2.0 | 0.0						0
Uganda	16.0 | 0.0	●	●	○	●		3.5
Ukraine	4.0 | 3.0						0
United Arab Emirates	18.0 | 11.0		○	○	○		1.5
United Kingdom (EU)	29.0 | 29.0						0
United States of America	13.0 | 42.0						0
Uruguay	3.0 | 1.0	●	●	○	○	●	4
Uzbekistan	3.0 | n.a.		○		○		1
Vanuatu	4.0 | 0.0	●		○	●		2.5
Venezuela	54.0 | 3.0	●			○	●	2.5
Viet Nam	8.0 | 1.0		○		○		1
Zambia	38.0 | n.a.	●	●			○	2.5
Zimbabwe	27.0 | n.a				○	○	1

Appendix 2:

Countries Ranked by Credits Earned for the 5 Criteria Examined

4.5 CREDITS
(1 COUNTRY)

Mongolia

4 CREDITS
(4 COUNTRIES)

Antigua and Barbuda
Bahamas
Mali
Uruguay

3.5 CREDITS
(10 COUNTRIES)

Cambodia
Congo, Republic of
Grenada
Guinea Bissau
Haiti
Jordan
Madagascar
Sri Lanka
St Vincent and the Grenadines
Uganda

3 CREDITS
(13 COUNTRIES)

Belarus
Belize
Colombia
Comoros
Kuwait
Malawi
Mexico
Morocco
Myanmar
Nepal
Panama
Sudan
Togo

2.5 CREDITS
(13 COUNTRIES)

Bangladesh
Bolivia
Brazil
Costa Rica
Gabon
Georgia
Guyana
Lao People's Democratic Republic
Timor-Leste
Tonga
Vanuatu
Venezuela
Zambia

2 CREDITS
(17 COUNTRIES)

Benin
Burkina Faso
Cameroon
Dominica
Eritrea
Ethiopia
Guatemala
India
Lesotho
Mauritius
Namibia
Nicaragua
Pakistan
Rwanda
Saudi Arabia
Palestine, State of
Thailand

1.5 CREDITS
(14 COUNTRIES)

Afghanistan
Bhutan
Central African Republic
Cote D'Ivoire
Democratic People's Republic of Korea
Dominican Republic
El Salvador
Guinea
Nigeria
Paraguay
Peru
Republic of Moldova
Seychelles
United Arab Emirates

1 CREDIT
(15 COUNTRIES)

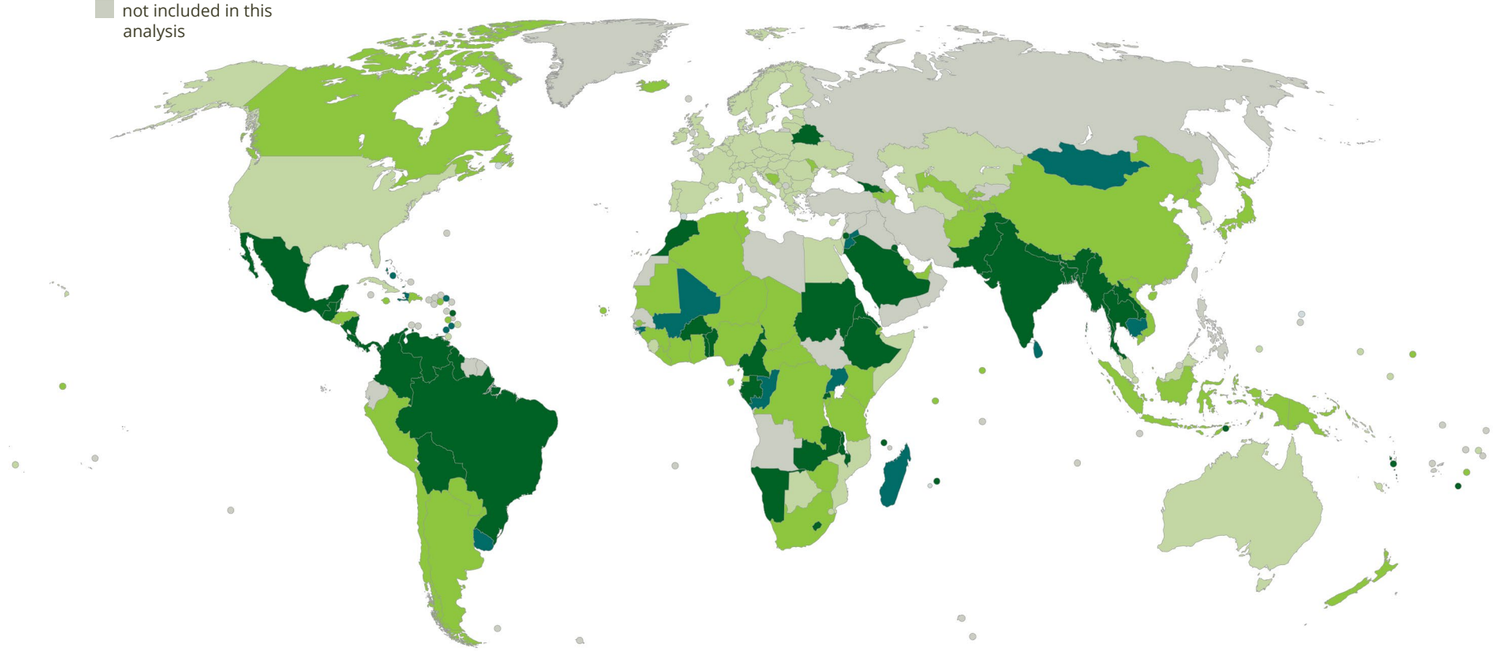
Azerbaijan
Burundi
Cabo Verde
Canada
Chad
China
Democratic Republic of the Congo
Ghana
Indonesia
Marshall Islands
New Zealand
Sao Tome and Principe
Uzbekistan
Viet Nam
Zimbabwe

0.5 CREDITS
(27 COUNTRIES)

Algeria
Argentina
Armenia
Bahrain
Bosnia and Herzegovina
Chile
Djibouti
Equatorial Guinea
Gambia
Honduras
Iceland
Jamaica
Japan
Kenya
Kiribati
Liberia
Maldives
Mauritania
Niger
Niue

CREDITS RECEIVED FOR INCLUDING PROTECTED AREAS OR NATURE-BASED SOLUTIONS IN NDCS BY COUNTRY

- 3.5 – 4.5 credits
- 2.0 – 3.0 credits
- 0.5 – 1.5 credits
- 0 credits
- not included in this analysis



Papua New Guinea
Saint Kitts and Nevis
Saint Lucia
South Africa
Tajikistan
Tanzania
Tunisia

0 CREDITS
(65 COUNTRIES)

Albania
Andorra
Australia
Austria (EU)
Barbados
Belgium (EU)
Botswana
Bulgaria (EU)
Cook Islands
Croatia (EU)
Cuba
Cyprus (EU)
Czech Republic (EU)
Denmark (EU)
Egypt
Estonia (EU)
Eswatini
Fiji
Finland (EU)
France (EU)
Germany (EU)
Greece (EU)
Hungary (EU)
Ireland (EU)
Israel
Italy (EU)
Kazakhstan
Latvia (EU)
Liechtenstein
Lithuania (EU)
Luxembourg (EU)
Malaysia
Malta (EU)
Micronesia
Monaco
Montenegro
Mozambique
Nauru
Netherlands (EU)
Norway
Palau
Poland (EU)
Portugal (EU)
Qatar
Republic of Korea
Romania (EU)
Samoa
San Marino
Serbia
Sierra Leone
Singapore
Slovakia (EU)
Slovenia (EU)
Solomon Islands
Somalia
Spain (EU)
Sweden (EU)
Switzerland
Macedonia, Former Yugoslav Republic of
Trinidad and Tobago
Turkmenistan
Tuvalu
Ukraine
United Kingdom (EU)
United States of America

Appendix 3: Countries Referenced in this Report, Listed by Region

AFRICA
(49 COUNTRIES TOTAL)

Algeria
Benin
Botswana
Burkina Faso
Burundi
Cabo Verde
Cameroon
Central African Republic
Chad
Comoros
Congo
Cote D'Ivoire
Democratic People's Republic of the Congo
Djibouti
Egypt
Eritrea
Eswatini
Ethiopia
Equatorial Guinea
Gabon
Gambia
Ghana
Guinea
Kenya
Lesotho
Liberia
Madagascar
Malawi
Mali
Mauritania
Mauritius
Morocco
Mozambique
Namibia
Niger
Nigeria
Rwanda
Sao Tome and Principe
Seychelles
Sierra Leone
Somalia
South Africa
Sudan
The United Republic of Tanzania
Togo
Tunisia
Uganda
Zambia
Zimbabwe

ASIA
(38 COUNTRIES TOTAL)

Afghanistan
Armenia
Azerbaijan
Bahrain
Bangladesh
Bhutan
Cambodia
China
Cyprus
Democratic People's Republic of Korea
Georgia
Guinea Bissau
India
Indonesia
Israel
Japan
Jordan
Kazakhstan
Kuwait
Lao People's Democratic Republic
Malaysia
Maldives
Mongolia
Myanmar
Nepal
Pakistan
Qatar
Republic of Korea
Saudi Arabia
Singapore
Sri Lanka
State of Palestine
Tajikistan
Thailand
Turkmenistan
United Arab Emirates
Uzbekistan
Viet Nam

EUROPE
(41 COUNTRIES TOTAL)

Albania
Andorra
Austria
Belarus
Belgium
Bosnia and Herzegovina
Bulgaria
Croatia
Czech Republic
Denmark
Estonia
Finland
France
Germany
Greece
Hungary
Iceland
Ireland
Italy
Latvia
Liechtenstein
Lithuania
Luxembourg
Malta
Monaco
Montenegro
Netherlands
Norway
Poland
Portugal
Republic of Moldova
Romania
San Marino
Serbia
Slovakia
Slovenia
Spain
Sweden
Switzerland
The Former Yugoslav Republic of Macedonia
Ukraine
United Kingdom of Great Britain and Northern Ireland

LATIN AMERICA AND THE CARIBBEAN
(31 COUNTRIES TOTAL)

Antigua and Barbuda
Argentina
Bahamas
Barbados
Belize
Bolivia (Plurinational State of)
Brazil
Chile
Colombia
Costa Rica
Cuba
Dominica
Dominican Republic
El Salvador
Grenada
Guatemala
Guyana
Haiti
Honduras
Jamaica
Mexico
Nicaragua
Panama
Paraguay
Peru
Saint Kitts and Nevis
Saint Lucia
St Vincent and the Grenadines
Trinidad and Tobago
Uruguay
Venezuela

NORTH AMERICA
(2 COUNTRIES TOTAL)

Canada
United States of America

OCEANIA
(17 COUNTRIES TOTAL)

Australia
Cook Islands
Fiji
Kiribati
Marshall Islands
Micronesia
Nauru
New Zealand
Niue
Palau
Papua New Guinea
Samoa
Solomon Islands
Timor-Leste
Tonga
Tuvalu
Vanuatu

COUNTRIES NOT INCLUDED IN THE REPORT

Angola
Brunei Darussalam
Ecuador
Iran
Iraq
Kyrgyzstan
Lebanon
Libya
Oman
Philippines
Republic of Moldova
Russia
Senegal
South Sudan
Suriname
Syria
Turkey
Yemen

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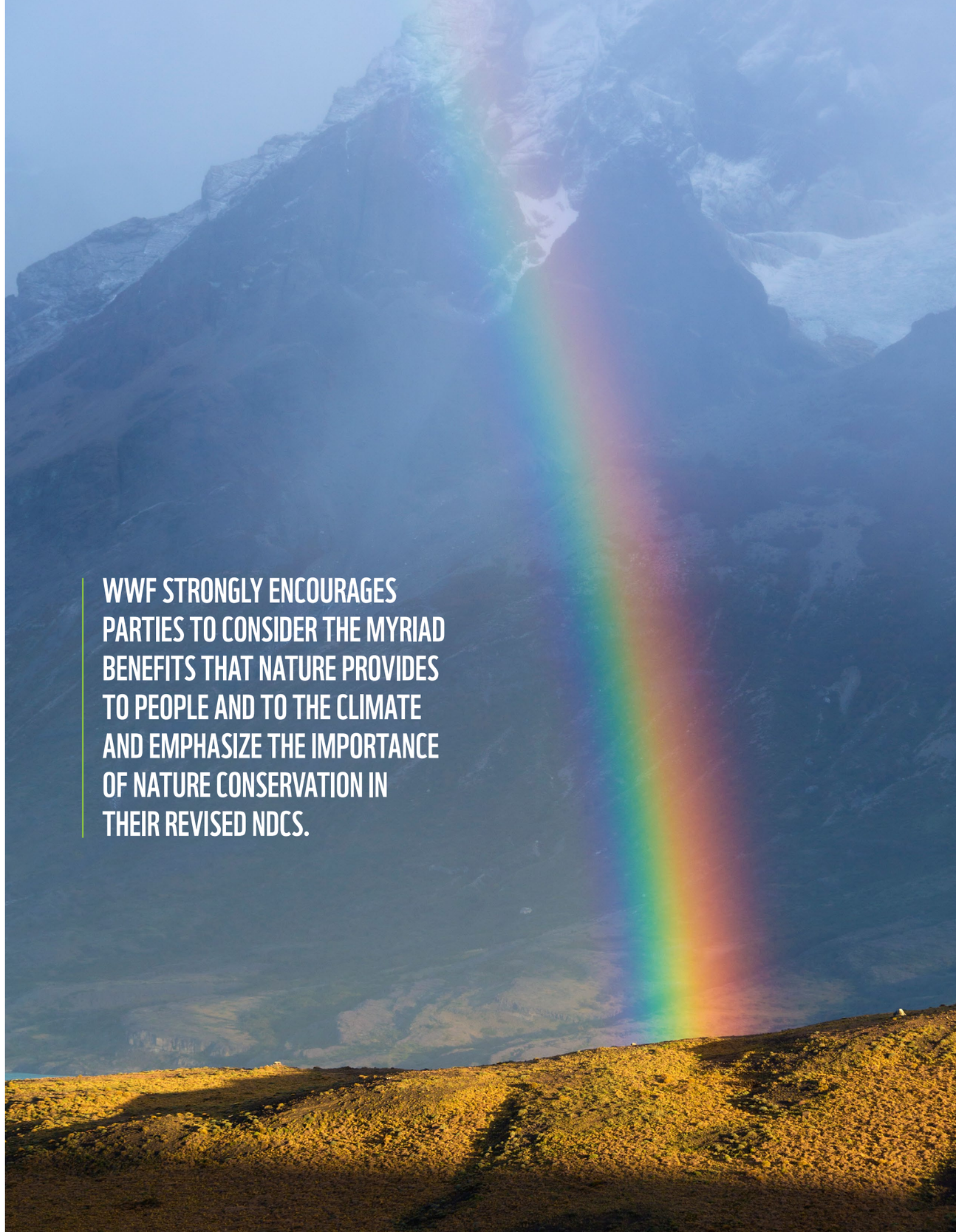

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