PARCC West Africa
News & Updates

The newsletter of the project *"Protected Areas Resilient to Climate Change in West Africa (PARCC)"* provides information on latest updates on project's and related initiatives' activities and results.

This newsletter is prepared with funding from the GEF (through UNEP) and it does not necessarily express its views or the views of contributory organizations.

Issue 5 – August 2014

Kobs, Shai Hills Resource Reserve, Ghana © Forestry Commission, Ghana

In this issue:

This issue focuses on the latest scientific/technical work that has been conducted by the project's partners to support the next phase of the project, which will concentrate on translating this work into actions in the field, and developing regional and national policy recommendations.

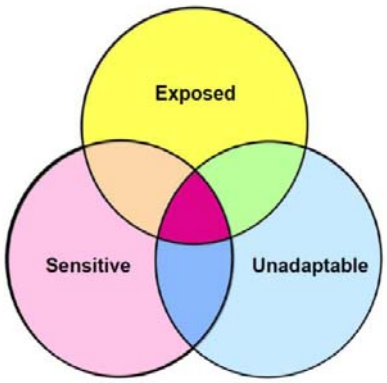
A climate change vulnerability assessment of West African species

Introduction & methods

As part of the PARCC project, **a climate change vulnerability assessment of West African species** was conducted by the IUCN Global Species Programme (IUCN GSP), one of the project's technical partners. The objective was to assess the vulnerability to climate change of almost all terrestrial and freshwater vertebrates of West Africa. This information will help conservation actors better understand how climate change may impact individual species from each taxonomic group in the region, and to develop suitable responses to improve their climate change resilience.

The report was compiled on the basis of an expert workshop, and the re-analysis of an existing global dataset, wherein the available biological and ecological trait data were compiled for 183 amphibians, 1,172 birds, 517

freshwater fish, 405 mammals and 307 reptiles.
For each individual species, their 'sensitivity' and 'adaptive capacity' to climate change and its impacts was assessed using the Climate Change Vulnerability Assessment Framework, developed by IUCN (see below).



The IUCN Climate Change Vulnerability Assessment Framework

- **Sensitivity:** the lack of potential for a species to persist
- **Poor adaptability:** inability to avoid the negative impacts of climate change through dispersal and/or micro-evolutionary change, and
- **Exposure:** the extent to which each species' physical environment will change

Species that are both sensitive and poorly able to adapt to climate change, **and** are among the most severely exposed to climatic changes are described as **'climate change vulnerable'**.

Climate projections were provided by the UK Met Office Hadley Centre. Extinction risk for each taxonomic group was assessed according to the IUCN Red List of Threatened Species.

Species that are both globally threatened and vulnerable to climate change should be seen as top priorities for conservation action.

Climate Change Vulnerability Assessments

➢ *Amphibians*

7%, 10% and 25% of West African amphibians are considered vulnerable to climate change by the years 2025, 2055 and 2085, respectively. Some amphibians indeed have a high sensitivity to climate change particularly due to their dependence on specific habitats (fresh waters for larval development). Many amphibian species of the region are believed to be poorly able to disperse as a response to climate change, typically due to their intrinsic biological characteristics, which render them poorly equipped to move large distances over short timeframes.

➢ *Birds*

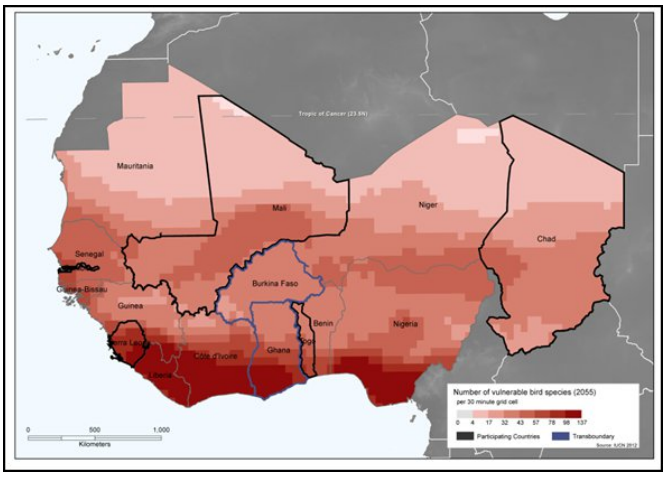
1.5%, 21% and 26% of West African bird species are considered vulnerable to climate change by the years 2025, 2055 and 2085, respectively. Bird species show a lower level of vulnerability to climate change compared with other groups, however, there are some uncertainties about bird sensitivity traits notably due to a lack of knowledge of species' population sizes. Some bird species will not have the ability to adapt to climatic changes, mainly due to a low reproductive output over time and/or intrinsically low dispersal abilities.

➢ *Freshwater fish*

19%, 39% and 60% of West African freshwater fish are considered vulnerable to climate change by the years 2025, 2055 and 2085, respectively. Some freshwater fish species show a high sensitivity to climate change and its impacts, particularly due to their specific habitat and microhabitat associations, which may be affected under a changing climate. Although uncertainty is high for certain traits and/or species, the high prevalence of sensitivity in species with sufficient data suggests that other species may be similarly sensitive.

➢ *Mammals*

5%, 16% and 28% of West African mammals are considered vulnerable to climate change by the years 2025, 2055 and 2085, respectively. The specific biological traits that render mammal species sensitive to climate change vary widely within the group, due to the large variety among the species concerned in terms of their biology, ecology and life-history. Some West African mammals appear poorly able to adapt to climate change because of their limited dispersal abilities.



Distribution (total number of species per grid) of climate change vulnerable West African mammals by 2055

➢ *Reptiles*

7%, 21% and 34% of West African reptile species are considered vulnerable to climate change by the years 2025, 2055 and 2085, respectively. Reptile species show a high sensitivity to climate change particularly due to their specific habitat and microhabitat dependencies, and specific feeding habits. Some West African reptiles also appear poorly able to adapt to climate change because of their low intrinsic capacity to disperse.

Examples of ways in which vulnerability assessments species traits may be used to inform conservation actions

- For species assessed as **poorly able to disperse** as a response to climate change: facilitate their dispersal, through ensuring connectivity (i.e. removing barriers) or manually relocate populations to areas with a more suitable climate (although this option should be considered very carefully).

- For species assessed as **possessing a narrow tolerance range to some environmental variables** (e.g. fire, flooding, temperatures etc.): manually manipulate the environment if possible (e.g. fire regime management) to ensure that suitable conditions persist within the species range.

- For species with **known interspecific dependencies** (e.g. specific prey species): monitor the species upon which the focal species depends, and where necessary manage this species to ensure that climate change does not negatively impact their populations.

These are only some of the options available. We hope that practitioners will consider the findings of this study on a species-by-species basis, and use them to modify existing, or develop new, conservation approaches, which explicitly address climate change impacts upon species.

The study also describes knowledge gaps, and recommends actions to fill these gaps. Assessments of the distribution and extinction risk of species for which this has not yet been completed are also suggested.

The full report is available at: www.parcc-web.org

Hippopotamus in the Biosphere Reserve of *Mare aux hippopotames*, Burkina Faso © Arsène Sanon

Assessment of Protected Area Connectivity in West Africa

Introduction

An assessment of connectivity of the West Africa protected area network was carried out as part of the PARCC project and conducted by the Science Programme of UNEP-WCMC.

This connectivity assessment was conducted in order to highlight transboundary areas of particular importance to enhance protected area connectivity. This report helped inform the choice of pilot sites for the project, transboundary initiatives being one of the most effective solutions to help PAs improve their resilience to climate change. This was

achieved through the identification of: (i) The existing PAs most important for connectivity, and (ii) the links between PAs which would be the most important to enhance connectivity if created or improved.

The connectivity between PAs was assessed by calculating a connectivity index for a set of generic focal species, which were defined by the combination of three broad habitat preferences and three dispersal abilities:

- *Species habitat preferences:* forest specialists, grassland specialists, and generalists
- *Species dispersal abilities:* short range (≤1km), medium range (≤10km), and long range (≤100km)

PAs identified as important connectors for the PA network

For short range dispersal generic species:

The most important connector PAs identified are the Gola Rainforest National Park in Sierra Leone and the Niokolo-Koba National Park in Senegal.

The most important links that could enhance connectivity between PAs appear to be the ones between Foya national Park in Liberia and Gola Rainforest National Park in Sierra Leone, and between Grebo National Park in Liberia and Taï National Park in Cote d'Ivoire.

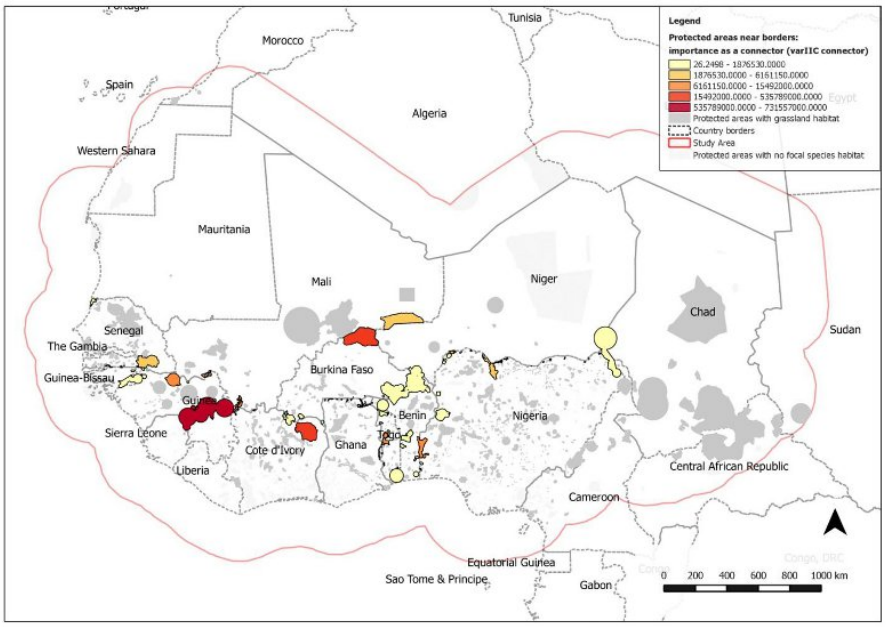
For medium range dispersal generic species:

The most important connector PAs identified are the Grebo National Park in Liberia and the PAs found along the Ghana-Cote d'Ivoire border, as well as Niokolo-Koba National Park in Senegal and Badiar National Park in Guinea.

The most important link that could enhance connectivity between PAs appears to be the one linking the Pendjari Hunting Zone in Benin (part of the WAP complex) to the *Bassin Versant* Oti-Mandouri and Oti-Kéran National Park in Togo.

For long range dispersal generic species:

The large PA complex in Guinea, Comoé National Park in Cote d'Ivoire, Sahel Partial Faunal Reserve in Burkina Faso (adjacent to Mali's Gourma Partial Elephant Reserve), and PAs which are part of, or adjacent to, the WAP complex in Benin, Niger and Burkina Faso appear to be the most important connector PAs.



Importance of PAs as connectors for generic focal species: grassland specialists with long range maximum dispersal abilities

The links to the WAP complex in Benin, Niger and Burkina Faso appear to be the most important to enhance connectivity for these species.

Conclusion

By using a modeling approach with generic focal species, this study highlighted West African transboundary protected areas, as well as links between them, where practical conservation efforts, such as habitat restoration or corridor creation could help enhance connectivity for species with the same habitat preferences and dispersal abilities.

The full report is available at: www.parcc-web.org

Analysing links between climate change, PAs and communities in West Africa

This study conducted by the IUCN PACO built on the outcomes of national level studies on the issue and provided a wider regional perspective. It analyzed the complex connections between protected areas, their riparian populations and climate change, and contributed to improving knowledge on these interrelations.

Protected areas in West Africa, especially in the five countries of the project, are facing several pressures mainly due to human activities (illegal hunting, over-exploitation, fire etc.). Their habitats are degrading and changing, often leading to a gradual decrease in the fauna populations. In this context, protected areas, including the ecosystems around them, are becoming more and more vulnerable, particularly to climate change effects.

According to the study, these ecosystems are exploited by populations living around the protected areas. Indeed, the most important activities identified around the protected areas include agriculture, livestock, fisheries and forest exploitation (wood and non-timber forest products). The optimal development of such activities depends on the climate. The main climate changes reported by the local populations and the literature (drought, flooding, storms, irregular rainfall) affect both their livelihood and well-being. A loss of the faunal and floral biodiversity is observed, as well as a reduction of livestock, and a decrease in agricultural and livestock production, resulting in a decrease in household incomes, food insecurity, degraded health conditions, and a general increase of poverty.

The study shows that, considering these impacts, the natural resources found in conservation areas become increasingly attractive to the local populations, since resources outside the protected areas no longer satisfy the livelihood needs of the populations, which in turn can negatively affect the protected areas. Indeed, many protected areas are suffering from poaching, and the search for new pasture and farming areas, as well as forest products.

Beekeeping at the periphery of Togodo sud park, Togo © Arsène Sanon

The link between climate change, protected areas and the population living around them is not yet clearly understood, and considerable efforts in research, awareness raising and information are still required. Action plans and programs are already underway in some countries and at the regional level to help communities adapt to climate change. However, these plans do not cover the interrelations between these tree elements; and the same is true for existing national policies on climate change. Five recommendations were made for different stakeholders regarding the management of protected areas to help better understand these connections and take appropriate actions:

1. **Researchers** should develop appropriate tools to collect and analyze data to highlight the links between protected areas, the populations living around them and climate change;
2. **Protected areas managers** should establish a comprehensive system to monitor biodiversity in protected areas in relation to climate change;
3. **Protected areas managers** should raise awareness of the populations living around the protected areas on the direct and indirect effects of climate change;
4. **Technical and financial partners** should build capacity of protected area managers

and community representatives to use existing tools for planning and monitoring-evaluation of adaptive capacities to climate change, ;

5. **Public authorities** should develop integrated policies of adaptation to climate change and protected areas management.

The full report will soon be available on the project web site: www.parcc-web.org

Projected impacts of climate change on West African protected areas

This study was conducted by Durham University, one of the project's technical partners, to provide multi taxa (birds, mammals and amphibians) assessments of climate change impacts to biodiversity within West Africa's existing protected area network. Correlative species distribution models and regional climate data were used to evaluate potential climate change impacts on West African protected areas for these taxa. Impacts of climate change at both community of species and individual species levels between the baseline period (1971-2000) and three future time periods (2011-2040; 2041-2070; 2071-2100) were calculated from estimates of modelled climate suitability and dispersal potential. Uncertainty was calculated, and used to assess confidence in projected impacts and to identify robust 'high impact' sites for conservation prioritisation. Regional climate data for this study were produced by the Met Office Hadley Centre (UK) for the period 1949 to 2100. Species distributions models were run, using four modelling methodologies, for 1,286 species (150 amphibians, 768 birds, and 368 mammals). Protected area polygons for almost 2,000 protected areas were obtained from the World Database on Protected Areas.

Amphibian species turnover across the region's PA network is projected to increase over the next century, with a median projected turnover of 45.7% by 2100. Among the 150 amphibian species included in this analysis, 30 are currently classified as threatened (Critical 'CR', endangered 'EN', or vulnerable 'VU') (CR = 1; EN = 13; VU = 13), and 3 are classified as Data Deficient 'DD' in the IUCN Red List of Threatened species. The climate suitability across the PA network is projected to decline for all 30 species based on the median estimate in all time periods.

Bird species turnover across the region's PAs is projected to increase, with a median projected turnover of 14.0% by 2040, to 32.4% by 2100. The median climate suitability across the region's PA network for bird species suggests that 12.5% (100) of species will experience increased climate suitability by 2040 and 80, 5% (668) of species will experience declining suitability; by 2100, only 9.9% (82) of species are projected to have improved climate suitability. Among the 768 bird species included in this analysis, 29 are currently classified as threatened (CR = 0; EN = 3; VU = 20) and 6 are classified as 'DD'. Based on the median estimates, climate suitability across the PA network is projected to decline for the majority of these species over all time periods (2040 = 86.2% (25); 2070 = 79.3% (23); 75.9% (22)).

Shai hills resource reserve, Ghana © N'Dri Kouame

Mammal species turnover across the region's PA network is projected to increase with median species turnover increasing from 15.7% to 34.9% between 2040 and 2100, respectively. The highest losses of species richness are projected to occur, once again, across the western Guinea Forests. Among the 368 mammal species included in this analysis, 61 are currently classified as threatened, including the Addax (CR), the African Wild dog (EN)), and the Elephant (VU) (CR = 5; EN = 12; VU = 17) and 27 are classified as 'DD' in the IUCN Red List of Threatened species. Based on

the median estimates, climate suitability across the PA network is projected to decline for the majority of these species over all time periods (2040 = 93.4% (57); 2070 = 90.2% (55); 90.2% (55)).

The study identified **protected areas as being consistently 'high priority' for conservation**; they are measured as sites with projected species turnovers in the upper quartile (≥95% certainty level):
26 PAs are identified as consistently projected to experience high levels of species turnover for all three taxa for the period up to 2040, including Amou-Mono in Togo, Lakes of Ounianga World heritage site in Chad, Tiwai island Sanctuary in Sierra leone. 80 PAs are identified for two or more taxa over this same period. By 2070, seven PAs are consistently projected to have a high species turnover for all three taxa, including Mount Nimba Reserve in Cote d'Ivoire and the Lakes of Ounianga World heritage site in Chad. By 2100 only a single PA is consistently projected to have a high species turner for all three taxa (Banie classified forest in Guinea).

Systematic conservation planning for West African protected areas in the face of climate change

In the last phase of the project, systematic conservation planning systems will be designed for each project country, as well as a regional planning system. In order to prepare countries for helping in developing these systems, a regional workshop was held in July in Accra, Ghana. The main objective was to build capacity on: understanding systematic conservation planning; undertaking gap analysis and setting protection targets; and using the systematic conservation planning software that will be used.

Protected area gap analysis is the best way to identify gaps in a protected area network, and **systematic conservation planning** is the best way to identify where new protected areas should be located. The workshop addressed the following question: Where should countries consider designating new PAs in the light of climate change and given global commitments to reach 17% terrestrial coverage? This involved looking at: (1) what are the current PA systems protecting and which species are missing now, and possibly in the future, under climate change? and (2) What is the best way to fill those protection gaps?

Elephants, Sena Oura national park, Chad © Bemadjim Ngakoutou Etienne

The workshop taught participants the theory of gap analysis and systematic conservation planning for identifying where to locate new PAs, and how to use the systematic conservation planning software (CLUZ and Marxan software packages) to identify priority areas for conservation.

The workshop also started the process of data collection by documenting how the different countries of the project developed their PA networks and what are the current protection gaps. It developed a data collection plan that the countries can use to ensure the relevant information is collected to be included in the national conservation planning systems.

The regional workshop will be followed by national level workshops, which will develop national systematic conservation planning systems for each country based on the available data and additional data collected in each country.

Implementation of transboundary pilot sites and way forward

As reported in the previous issue of the newsletter (Issue 4), the project will implement transboundary pilot activities in

each of the five project countries. The pilot sites selected are:

- Chad - Cameroon: Sena Oura National Park - Boubba Ndjidda
- Mali – Burkina Faso: Réserve des éléphants du Gourma-Réserve partielle de faune du Sahel
- Sierra Leone - Liberia: Gola Rainforest National Park- Gola Forest
- The Gambia -Senegal: Niumi National Park - Delta du Saloum National Park
- Togo – Benin, Burkina Faso, Niger: Oti-Kéran-mandouri – WAP complex

Activities for each pilot site have been identified in collaboration with each country's partners and are directed towards a better understanding of the impacts of climate change on protected areas and communities surrounding them, and enhancing the cooperation between the bordering countries for the management of their shared resources, especially in the face of climate change. Three main categories of activities will be carried out during the last phase of the project:

1. Finalization and/or signing of transboundary collaboration agreements for the management of transboundary protected areas.
2. Elaboration or updating of a joint management plan for the transboundary protected area, integrating climate change aspects. This activity will also include the application of the revised METT (Management Effectiveness Tracking Tool) by the park managers of the protected areas.
3. Information and awareness raising of local communities about the existence of the transboundary protected area and climate changes potential impacts.

In addition, other activities, which will be conducted by UNEP-WCMC, will contribute to enhancing the effectiveness of the transboundary protected area management, especially in the face of climate change, and will feed into the activities above. They include:

- ✓ A brief synthesis of the results of the technical studies relevant to the transboundary protected area, highlighting which species are the most likely to be affected by climate change,
- ✓ The design of a long-term monitoring system of the effects of climate change on the transboundary protected area, and
- ✓ Recommendations for a transboundary management plan.

The next issue of the newsletter will provide details on the work in progress within the different pilot sites.

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We welcome any contribution relevant to the subject in the form of articles, news, announcements, photos, events, etc.

Thanks in advance for contributing.

Download project-related documents at:
www.parcc-web.org