CREATION OF A COMMON GEOSPATIAL DATABASE MODEL FOR PROTECTED AREAS OF THE AFRICAN CONTINENT: PRACTICAL CASE OF THE REPUBLIC OF CAMEROON

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Abstract

This article is devoted to the study of the creation of a relational database model for protected areas of the African continent based on the Republic of Cameroon, whose representation of protected areas has been updated on a map. The main problem here is to create a space for classification and updating of protected areas and recognized by each State of the African continent, in a system that is open and accessible to the stakeholders concerned.

Key words: Geospatial database; protected areas.

Introduction

The idea of creating a common geospatial database of Protected Areas of the African continent, comes after a reflection that allowed us to carry out an update of the map of protected areas of the Republic of Cameroon [Fig. 1]. Knowing that the last map was developed in 2011 and new areas were created and or added which changed its status. In this study, it was a question of classifying protected areas (PA) by category and showing their ratio according to the area of each region of the Republic of Cameroon and the ratio of these areas with the population density of each region.

In this project, it is a question for us to identify all the protected areas of the African continent, classify them according to specific characteristics common to all these areas, and put them in a computerized geospatial database, which will be updated periodically to allow users of the continent and foreign users, different African governments and the various organizations in charge and active in this field, (also known as the stakeholders) to have automatic information, not only reliable, but in real time on each of the protected areas of the African continent.

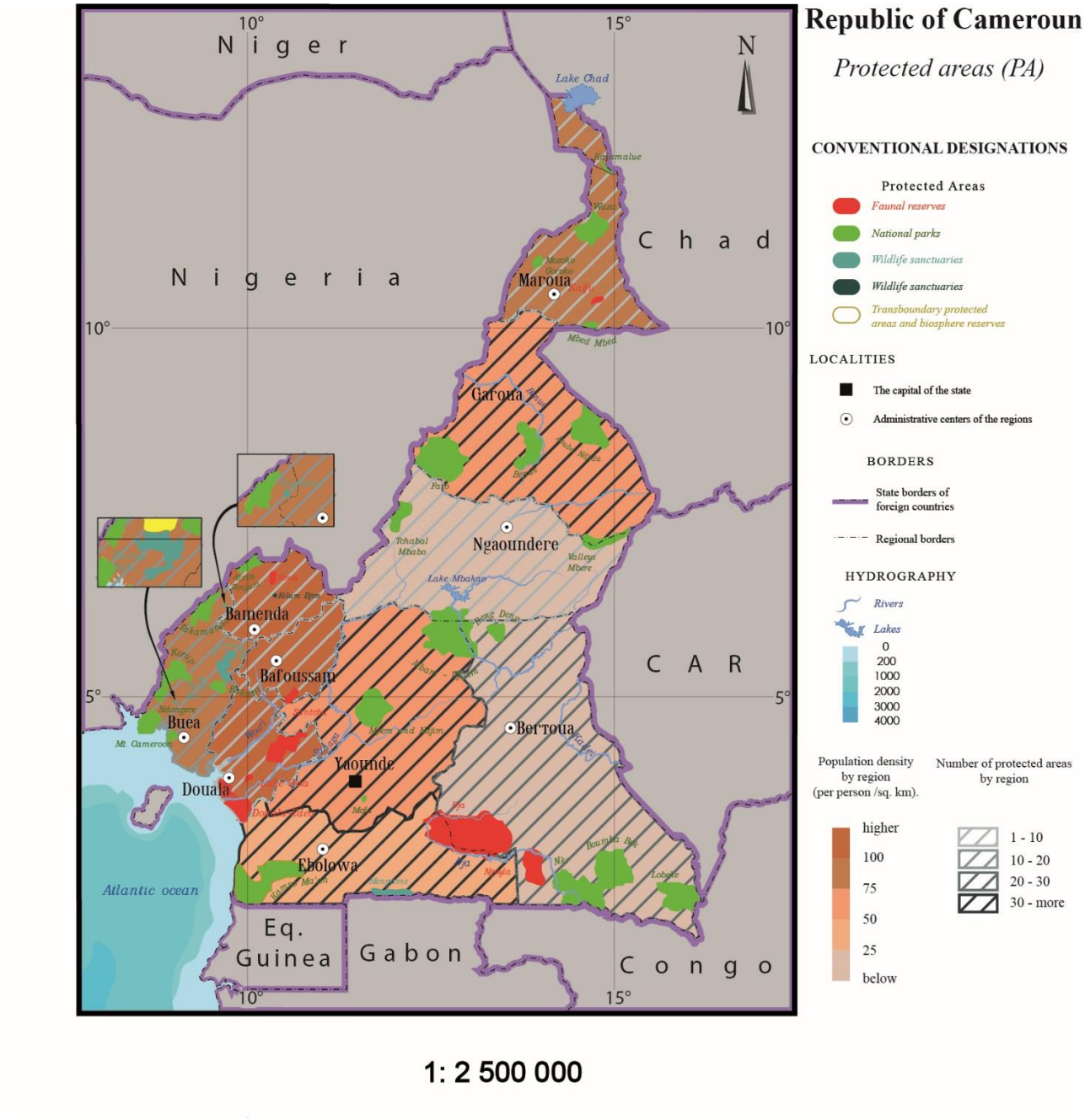


Fig. 1 Updated map of protected areas of the Republic of Cameroon

Understanding of the concepts: "protected area" and "database".

According to the International Union for Conservation of Nature (IUCN), one of the world's leading non-governmental organizations dedicated to nature conservation, a protected area is "a clearly defined, recognized, dedicated and managed geographical area, by any effective legal or other means, in order to ensure the long-term conservation of nature and the ecosystem services and cultural values associated with it".

A geospatial database is a geographic and computerized tool, which will be utilized to classify, organize and modify source information or data, according to attributes in an organized, accessible and coherent system, represented on an interface or a web channel, allowing users to access information in real time.

Database structure

By definition, our ambition is to create a database to classify the different protected areas of the African continent through various accurate parameters, as we did for the Republic of Cameroon in an Excel workbook [fig. 2]. Our goal is above all to do it in a user-friendly, structured, simplified and accessible way so that this database is accessible and understood by the majority of users.

	E	F	G	H	I	J	K	L
1	**ID**	**Code**	**Name**	**Type of PA**	**Region**	**Area (ha)**	**Date of creation**	**Date of establishment**
2	1	BENP	Benue National Park	National Park	North	180000	1932	1968
3	2	DAFS	Dja Faunal Reserve	Faunal Reserve	South-East	526000	1987	/
4	3	BONP	Boumba Bek National park	National Park	East	210000	1995	2005
5	4	DENP	Douala Edea National Park	National Park	Littoral	160000	1932	2018
6	5	FANP	Faro National Park	National Park	North	330000	1980	2008
7	6	KLIM	Kilum Ljim, Mont oku Flora Sanctuary	Wildlife sanctuary	North-West	1000	2004	/
8	7	LOBP	Lobeke National Park	National Park	East	217854	2001	/
9	8	NINP	Nki National Park	National Park	East	309362	2005	/
10	9	WAZA	Waza National Park	National Park	Far Noth	170000	1968	/
11	10	BOBA	Bouba Ndjida National Park	National Park	Noth	220000	1968	/
12	11	CAMN	Campo Ma'an National Park	National Park	South	264064	2000	/
13	12	KORN	Korup National Park	National Park	South West	125900	1986	/
14								

Fig. 2 Model of Relational Database of protected areas of the Republic of Cameroon.

To make it easier to understand this Database, it is a good idea to define the fields that will characterize it.

Database field descriptions

A field is the elementary information of a database, a computer file, and more generally of a computer resource where indexed terms exist.

A field (or attribute) being a property of an object, has a name, a data type and a value.

Thus, as for the workbook of the Database of Protected areas of the Republic of Cameroon, the workbook that we propose for the database of protected areas of the African continent will contain the following fields:

№	Name of the field	Value of the field
1	ID	Decimal_1,2,3
2	Code	Text_ABC
3	Name	Text
4	Type of PA	Text
5	Country	Text
6	Region	Text
7	Area (ha)	Double
8	Date of creation	ShortDate
9	Date of establishment	ShortDate
10	Organization in charge of management	LongText

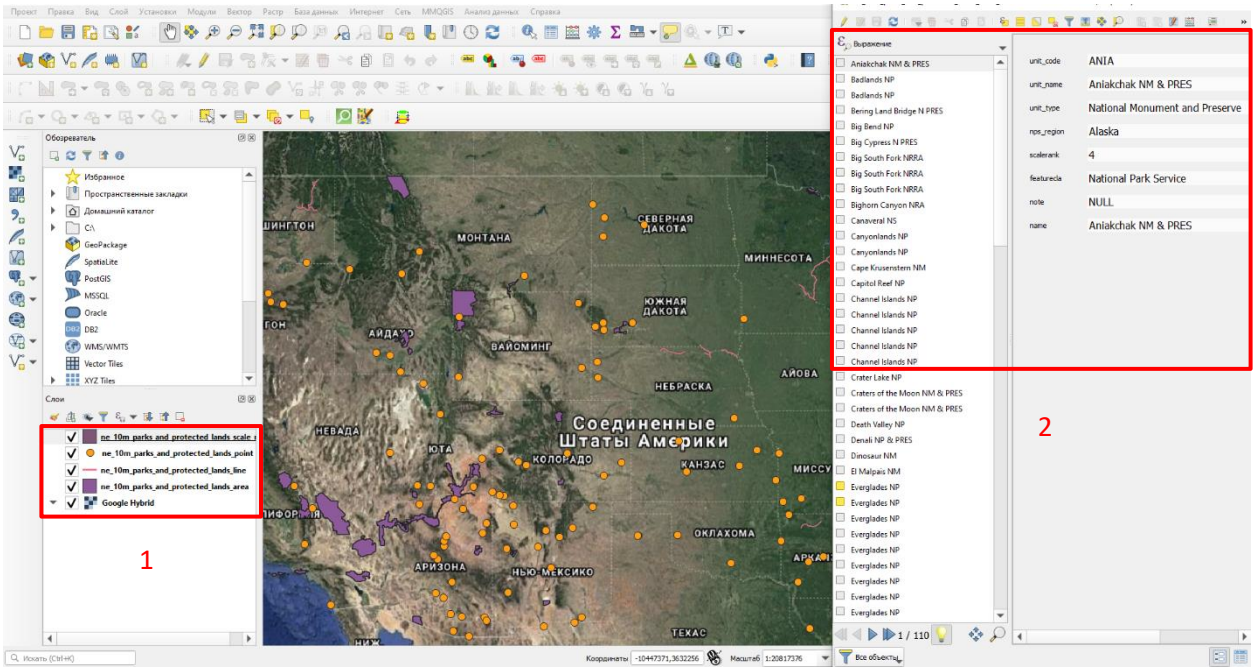
Fig. 3 Fields with the proposed values for the Database.

Collection and acquisition of data and information necessary for the creation of the Database

Protected areas, as the name suggests, are spaces that enjoy a status that makes their accessibility, or the accessibility to their information not always open to the general public. Some advanced countries benefit from easier access to the necessary information on these areas. Thus, the international organizations in charge of these areas, such as the IUCN (International Union for Conservation of Nature), the WWF (World Wide Fund for Nature), the WCS (Wildlife Conservation Society), provide updated protected areas data. We also have the African governments, which are the first stakeholder in charge of these protected areas, as a reliable provider of information, because it is the latter that create these spaces in their countries. These stakeholders, public and private, often put information on the internet informing people about protected areas online.

Database visualization

Using computational tools like GIS, we want to represent our geospatial database. With the help of a map, we want to visualize the protected areas and the workbook where the attributes of the fields will be represented.



1 – Vector layers.

2 – Array of attributes.

Fig. 4 Representation of an example of a geospatial database, with a map of protected areas and a table presenting fields with their attributes for the protected area layer, using a GIS (QGIS in this example).

Conclusion

In summary, our reflection based on the creation of a geospatial database model of protected areas for the African continent, was inspired by a previous work where we updated the map of protected areas of the Republic of Cameroon. Thus, this proposal to create a geospatial database of protected areas on the African continent is a necessity, not only to conserve and protect this heritage and natural potential for development, but also to unify it and make it more accessible.

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