

of a PA's biological resources, with respect to those resources found in other PA's. We define vulnerability as the extent to which a PA's biological resources are threatened to the point of extinction. The aim of this study, as described in the conceptual framework of Brooks et al, is reactive: to prioritize protected areas which are highly irreplaceable in terms of biological diversity, which are also highly vulnerable to extinctions.

4. Data

Unless otherwise stated, all vector data has a nominal scale of 1:1,000,000 and all raster data has a pixel size of 30 arc-seconds or approximately 1km. All data are in Geographic projection.

4.1. Base layers

4.1.1. Country boundaries

Vector data for international borders were extracted from the 1:100,000 Vector Smart Map Level 0 (VMap0) data library (2005).

4.1.2. Protected areas

We used the World Database on Protected Areas (UNEP-WCMC 2005), as the basis for our analysis. All IUCN PAs between categories I-IV were included in the study, as well as International PAs (World heritage sites, and Ramsar sites), and those national PAs which were known to us to have previously received conservation or development aid (effectively PAs which have been, or still are, funded by the European Commission). By focusing on PAs which are recognised internationally, and therefore more likely to have a management plan in place, we hope to avoid the inclusion of so-called "paper parks", and focus on PAs with an existing infrastructure that could benefit quickly from an increase in revenue. We removed PAs from the analysis with an area smaller than 2000 ha, because the datasets available to us with continental coverage are mapped to scales of 1:1million, or 1km pixel resolution. Finally, we excluded from the analysis PAs with a large offshore water component, due to their incompatibility with our land based data. In total, we included 741 African PAs in the analysis (Figure 2).

4.1.3. Eco-regions

We used White's Vegetation Map of Africa (White 1983) which is essentially a vegetation classification and map for continental Africa, consisting of 17 major vegetation types which we will refer to as eco-regions. This map was used to assign an eco-region to each PA (Figure 3).

4.2. Species data

There are several sources for species data, all of which refer to the extent of occurrence (EOO) of a recorded species. The EOO is defined by the IUCN as the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred or projected sites of present occurrence of a taxon, excluding cases of vagrancy (see Figure 4).