**Indicator 15.4.1. for mountain ranges**

Aim: explore in more detail at the mountain range level the spatial patterns of KBA PA coverage

**Mountain extent used with GMBA Mountain Inventory v2**

Here a decision needs to be made which mountain extent we use. Official calculations use the Kapos et al. definition, which we could use and is more generous than either of the GMBA extents. It is just a matter of clipping the mountain inventory to the Kapos extent. Of course here we must make sure we have the official Kapos layer, or to recalculate it which is easy because well documented. We can also do the calculations for both definitions (as we do now with the population manuscript)

**WDPA**

1. How to handle the layers: ArcMap 10.8 crashes when importing polygon layer 0. Any useful tips?
2. Designation date: why regenerate the missing designation date each time and not assign a designation date once and for all for all missing values?

**Topography**

Area calculations in mountain areas are strongly influenced by topography. Location of KBAs and especially PAs are likely to be influenced by topography (favouring rugged steep slopes with little economic value above lower gentler slopes).

c

C'

d

b

a

Even though the indicator is based on a percentage of overlapping coverage, the results are influenced by the relative topographic position of the KBA and PA. In the figure, the line abc represents the actual topography, the red line (ad) represents the planimetric area of the KBA polygon, and the green line (ab) the planimetric area of the protected area (only in the valley floor). The calculated overlap based on planimetric area is 50%, while when based on surface area (dashed line, ac) it is 30%. In reality the differences will probably be smaller, but still they are real and worth exploring / quantifying.

If we have time we would like to explore the effect of the inclusion of topography (surface to area ratio) on the PA coverage calculations. A possible source layer to do so would be the GMTED 2010 7.5 arcsecond DEM (median value). Including elevation and topography in the analysis would also allow us to explore the effect of elevation on the PA coverage.

**Raster based analysis**

The elevation / topographic approach could be combined with the exploration of a raster based method to calculate the indicator and compare the results with the vector based approach. Here the choice of the raster resolution is of course essential, as the rasterization of the vector data will include some loss of detail and result in errors (the larger, the smaller the polygons and the more complex their geometry)

Any ideas on this? Is it something you have discussed, explored?