Methodology – Protected Areas and Extractive Concessions Assessment 2017

Data sources

- 'Protected Areas' were defined using polygons as defined in the publicly available dataset:
  - IUCN and UNEP-WCMC (2017), The World Database on Protected Areas (WDPA) [On-line], accessed February 2017, Cambridge, UK: UNEP-WCMC. Available at: www.protectedplanet.net.
- 'Mining Concessions' were defined using the data from:
  - SNL Metals & Mining, an offering of S&P Global Market Intelligence, accessed February 2017.
- 'Oil and Gas Concessions' were defined using:
  - Drilling Info, Inc dataset, accessed March 2017.

Methodology used to calculate 'True' Areas

True Area of Protected Areas (PAs) by Country:

1. The dataset 'Protected Areas' was filtered, removing only sites with:
   a. *Status = Adopted, Designated, Inscribed, and Not Reported.*

2. The PA polygon dataset (point locations were excluded from the dataset) was dissolved in ArcGIS for Desktop 10.5 aggregating features based on the ISO-3-character country code, generating a dataset with the total protected area by country as given by its ISO 3166-1 alpha-3 code, in order to remove double counting, where multiple sites occur in the same spatial area. Transboundary sites were provided with multiple country codes. They were not aggregated to single ISO codes and excluded from this assessment.

3. The areas were calculated using an equal area spatial projection, specifically Mollweide, to define the 'true' spatial area of protected areas per country.

4. The results, 'True Protected Area', were added into Power BI data model.

True Area of Mining Concessions by Country

1. The dataset 'Mining Concessions' was filtered removing only sites with the following attributes:
   a. *Expiry Date on or after the 01/04/2017.*
   Note: All oil and gas concessions with no expiry date listed remain included.
   b. *Status = Granted*

2. The dataset was dissolved in ArcGIS for Desktop 10.5 aggregating features based on the country name, to remove any double counting, where multiple concessions can exist in the same spatial area.

   The areas were calculated using an equal area spatial projection, specifically Mollweide, to define the 'true' spatial area of 'active' mining concessions per country.

3. The results, 'True Mining Concession', were added into the Power BI data model.

True Area of Oil and Gas Concessions by Country

1. The dataset 'Oil and Gas Concessions' was filtered removing only sites with the following attributes:
   a. *Expiry Date on or after the 01/04/2017.*
      Note: All oil and gas concessions with no expiry date listed remain included.
   b. *Status = Contract*
   c. *Ownership ≠ 'Not Operated'*

2. The dataset was dissolved in ArcGIS for Desktop 10.5 aggregating features based on the country name, to remove any double counting, where multiple concessions can exist in the same spatial area.

   The areas were calculated using an equal area spatial projection, specifically Mollweide, to define the 'true' spatial area of 'active' oil and gas concessions per country.

3. The results, 'True Oil and Gas Concession', were added into the Power BI data model.

True Area of Mining Concession Overlap with Protected Areas by Country

1. The dissolved output 'Mining Concessions' (as above) was intersected against the dissolved output 'Protected Areas' (as above). The areas were calculated using an equal area spatial projection, specifically Mollweide, to define the 'true' spatial area of 'active' mining concessions overlap with protected areas.

   Note: The true area of overlap statistics do not exclude individual mining concessions overlapping less than 1 Sq. km with a protected area as the layers are dissolved into one layer to enable the calculation. Subsequently marginal overlap may be included in the true area statistics.

2. The results, 'True Mining Concession Overlap with Protected Areas', was added into Power BI data model.

True Area of Oil and Gas Concession Overlap with Protected Areas by Country

1. The dissolved output 'Oil and Gas Concessions' (as above) was compared against the dissolved output 'Protected Areas' (as above). The areas were calculated using an equal area spatial projection, specifically Mollweide, to define the 'true' spatial area of 'active' oil and gas concessions overlap with protected areas.

   Note: The true area of overlap statistics do not exclude individual oil and gas concessions overlapping less than 5 Sq. km with a protected area as the layers are dissolved into one layer to enable the calculation. Subsequently marginal overlap may be included in the true area statistics.

2. The results, 'True Oil and Gas Concession Overlap with Protected Areas', was added into the Power BI data model.

Mining Concession Overlap with Protected Areas by Country

1. The dataset 'Protected Areas' was intersected against the 'Mining Concessions' dataset. Only protected areas defined by a polygon were considered; no attempt was made to consider protected areas defined by a point location. Spatial overlap between these layers was calculated using an equal area spatial projection, specifically Mollweide, to align to existing approaches to define the 'spatial area of mining concessions overlapped with protected areas'. The resulting overlaps were dissolved by mining concession block ID and amalgamated in a *.CSV file and added into the Power BI model.

2. The following results were filtered within the Power BI model:

   a. Protected Areas *Status* = Adopted, Designated, Inscribed, and Not Reported
   b. The following Transboundary sites were excluded:
      Pelagos Sanctuary For The Conservation Of Marine Mammals, Białowieża Forest, Caves of Aggtelek Karst and Slovak Karst, High Coast / Kvarken Archipelago, Kluane / Wrangell-St Elias / Glacier Bay / Tatshenshini-Alsek, Monte San Giorgio, Maloti-Drakensberg Park, Mosi-oa-Tunya / Victoria Falls, Mount Nimba Strict Nature Reserve, Pyrénées - Mont Perdu, Primeval Beech Forests of the Carpathians and the Ancient Beech Forests of Germany, Sangha Trinational, Talamanca Range-La Amistad Reserves / La Amistad National Park, The Wadden Sea, Uvs Nuur Basin, Waterton Glacier International Peace Park, Western Tien-shan, Geres – Xures, Agoa

   c. Mining concessions:
      i. *Expiry Date* ≥ 01/04/2017 - All mining concessions with no expiry date listed remain included.
      ii. *Overlap with Protected Area* ≥ 1.0 Sq. Km
      iii. *Concession Status* = 'Granted'
   d. Any mining concessions overlap with foreign protected area was excluded.

3. Results were then grouped to the county or territory level. No attempt has been made to amalgamate results to the parent or sovereign country level e.g. linking a country's overseas territories together with the sovereign country, such as Greenland's results within Denmark. This is because due to inconsistent mining concession coverage, it creates the potential to include the protected areas of territories without mining concession coverage, biasing results.

4. Any countries without any protected area polygons and mining concession coverage were excluded.

5. Results were displayed using the Power BI functionality.

Oil and Gas Concession Overlap with Protected Areas by Country

1. The dataset 'Protected Areas' was intersected against the 'Oil and Gas Concessions' dataset. Only protected areas defined by a polygon were considered; no attempt was made to consider protected areas defined by a point location. Spatial overlap between these layers was calculated using an equal area spatial projection, specifically Mollweide, to align to existing approaches to define the spatial area of oil and gas concessions overlap with protected areas. The resulting overlaps were dissolved by the oil and gas concession block ID and amalgamated in a *.CSV file and added into the Power BI model.

2. The following results were filtered within the Power BI model:

   a. Protected Areas *Status* = Adopted, Designated, Inscribed, and Not Reported
   b. The following Transboundary World Heritage Sites were excluded:
      Pelagos Sanctuary For The Conservation Of Marine Mammals, Białowieża Forest, Caves of Aggtelek Karst and Slovak Karst, High Coast / Kvarken Archipelago, Kluane / Wrangell-St Elias / Glacier Bay / Tatshenshini-Alsek, Monte San Giorgio, Maloti-Drakensberg Park, Mosi-oa-Tunya / Victoria Falls, Mount Nimba Strict Nature Reserve, Pyrénées - Mont Perdu, Primeval Beech Forests of the Carpathians and the Ancient Beech Forests of Germany, Sangha Trinational, Talamanca Range-La Amistad Reserves / La Amistad National Park, The Wadden Sea, Uvs Nuur Basin, Waterton Glacier International Peace Park, Western Tien-shan, Geres – Xures
   c. Oil and Gas concessions:
      i. *Expiry Date* ≥ 01/04/2017 - All Oil and Gas concessions with no expiry date listed remain included.
      ii. *Overlap with Protected Area* ≥ 5.0 Sq. Km
      iii. *Holder ≠ 'Not Operated'*
      iv. *Concession Status* = 'Contract'
   d. Any oil and gas concessions overlap with a foreign protected area was excluded.

3. Results were then grouped to the country or territory level. No attempt has been made to amalgamate results to the parent or sovereign country level e.g. linking a countries' overseas territories together with the sovereign country, such as Greenland's results within Denmark. This is because due to inconsistent oil and gas concession coverage, it creates the potential to include the protected areas of territories without oil and gas concession coverage, biasing results.

4. Any countries without any protected area polygons and oil and gas concession coverage were excluded.

5. Results were displayed using the Power BI functionality.

This is a simplified methodology; if you would like to learn more or have any specific questions about the assessment please contact us at wwf-sight@wwf.panda.org

Limitations of the Assessment

The assessment compares three global datasets of differing coverage and consistency. Subsequently, the assessment faces several key limitations, and any interpretation of the results must consider these limitations.

It is also important to note that whilst the reported overlap only considers 'active' concessions with significant overlap, the overlap does not necessarily mean extractive activity will occur or impact the protected area. It is also important to note that some protected areas may be designated as 'multiple use areas' potentially allowing extractive and other development activity. In general, however, overlap represents an indication of intent and arguably is a lower priority of the licensing state parties on the protection of their natural assets.

Protected Areas;

The World Database on Protected Areas includes protected areas defined by point locations. These protected areas were excluded from the assessment as no true spatial delineation could be made as to the overlap of extractive concessions with these assets. As a result, some specific countries, including Libya, Moldova and Syria, where all protected areas are defined by point location, have been excluded from the assessment. This issue leads to a wider biasing of the assessment; different countries define their protected area with a differing degree of polygons and points. Subsequently it is likely that countries with poorly defined protected areas may have an underrepresentation as to the extractive concession overlap with their protected area network.

The true area of 'Protected Areas' has been defined by individual territories and not by the 'parent' or sovereign country, i.e. considering Denmark separately from Greenland, a territory of Denmark. This creates potentially misleading figures where protected area data is excluded from a parent country, i.e. the exclusion of the Heard and McDonalds Islands from Australia. However, this approach was necessary to enable meaningful comparison with the extractive datasets, as extractive data coverage is inconsistently provided for the parent and its territories. Subsequently, summing results at the parent country level would inconsistently include protected areas for overseas territories with or without extractive coverage.

The 'true protected area' statistics reported may differ from those in other assessments. This is primarily due to the exclusion of protected areas defined by a point location, transboundary sites and the inclusion of all other protected areas, such as for example UNESCO Man and Biosphere Reserves (MAB), which are excluded in the World Database on Protected Areas Statistics.

Extractive Overlap Statistics

The 'true overlap of mining and oil and gas statistics' include mining concessions overlapping less than 1 Sq. km and oil and gas concessions overlapping less than 5 Sq. Km, as a necessity of the methodology applied. This is inconsistent with the overlap statistics reported which exclude this marginal overlap. However, this is not expected to have any major significance as the detailed results can be considered in combination.

Within the SNL S&P dataset, countries define their mining concessions differently. The term 'granted' appears consistent, however there are exceptions such as Ecuador where almost all mining concessions are listed as 'application'. Since the assessment excludes all concessions not granted, this potentially creating a misleading impression of the extent of overlap for a few specific countries. As a result, the filtering of the datasets, i.e. removing

expired concessions, those with minor overlap, and those under application, may in some instances bias the results, potentially creating an underrepresentation of the extent of extractive overlap.

Finally, the extractive datasets available to the assessment do not provide global coverage; as a result, only territories with coverage could be assessed.

References

DrillingInfo, 2017. Database. [online]. Available at: <www.drillinginfo.com/> [Accessed 06 March 2017].

IUCN and UNEP-WCMC, 2017. The World Database on Protected Areas (WDPA) [online]. Cambridge, UK: UNEP-WCMC. Available at: <www.protectedplanet.net> [Accessed 21 February 2017].

SNL, 2017. Metals and Mining Database [online]. Available at: <www.snl.com> [Accessed 21 February 2017].