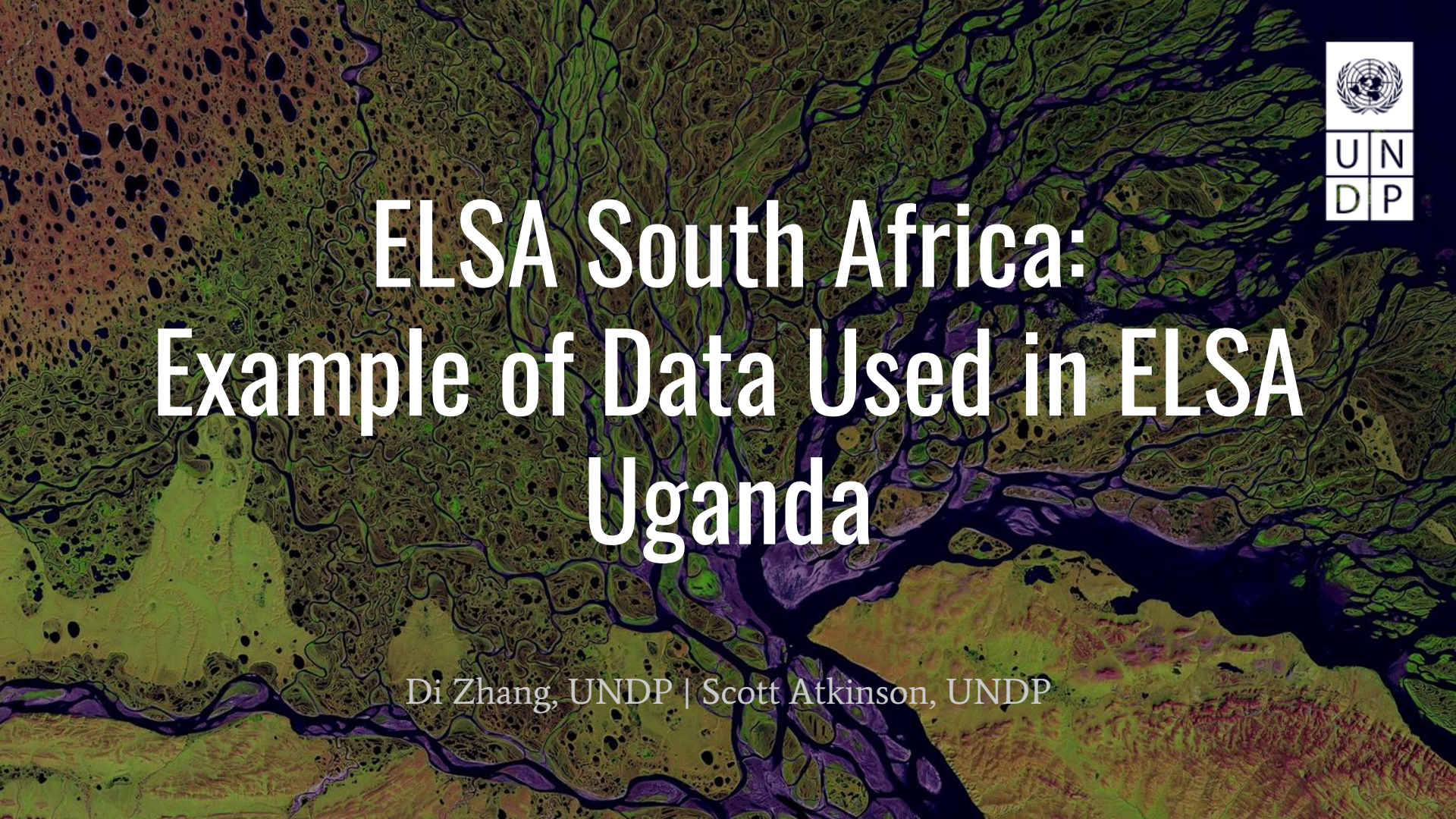


ELSA South Africa: Example of Data Used in ELSA Uganda

Di Zhang, UNDP | Scott Atkinson, UNDP

Data Inputs to the ELSA Tool

Basemap

National Boundary/Planning Units

Features

Forest Structural Integrity Index

Intact Non-forest Ecosystems

Key Biodiversity Areas

Rarity-Weighted Richness (NatureMap)

Threatened Ecosystems

Threatened Species Richness (Nature Map)

Underprotected Ecosystems

Carbon (Biomass)

Carbon (Soil)

Carbon Sequestration

Agro-Forestation Potential

Cattle Corridors

Crop Suitability

Future Crop Suitability

Potential Clean Water Provision

Realised Water Provisioning Services

Wetlands

Zones

Protected Areas

Commercial Farmland

Forest and Tree'd Biomes

Forest Plantations

Human Footprint (2013)

Open Water

Subsistence Farmland

Tropical Forest - Fully stocked

Urban Areas

Data Groups and Themes

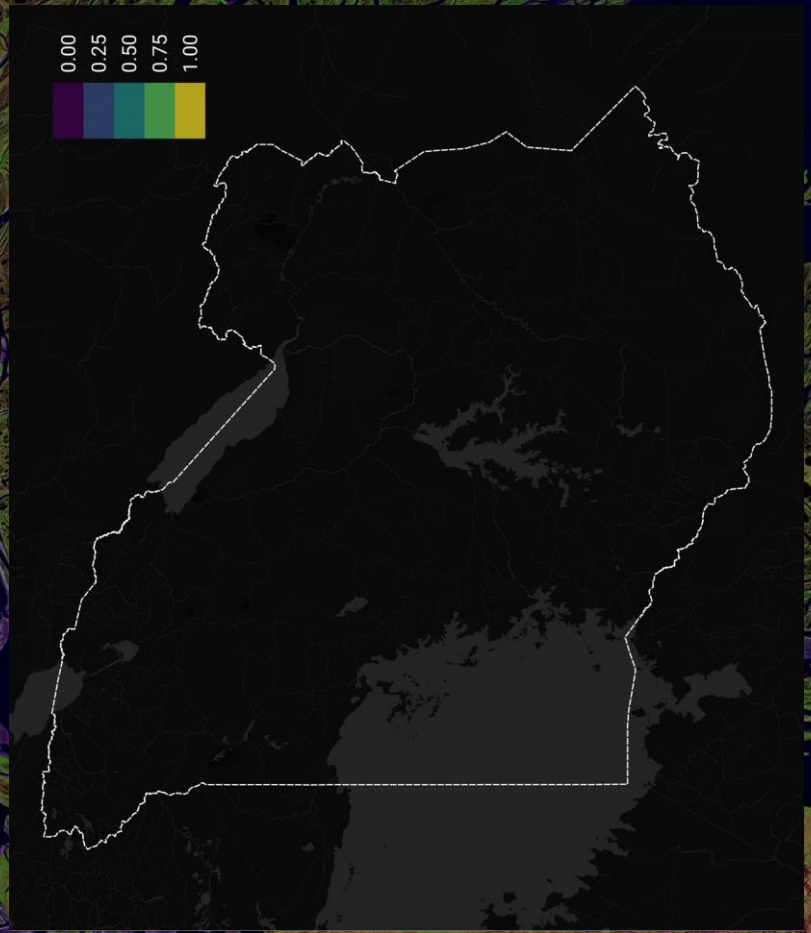
Groups	Main Theme
Basemap	National Boundary
	Planning Units
Features	Biodiversity
	Human Well-being
	Climate Change Mitigation
Zones	Protect | Manage | Restore

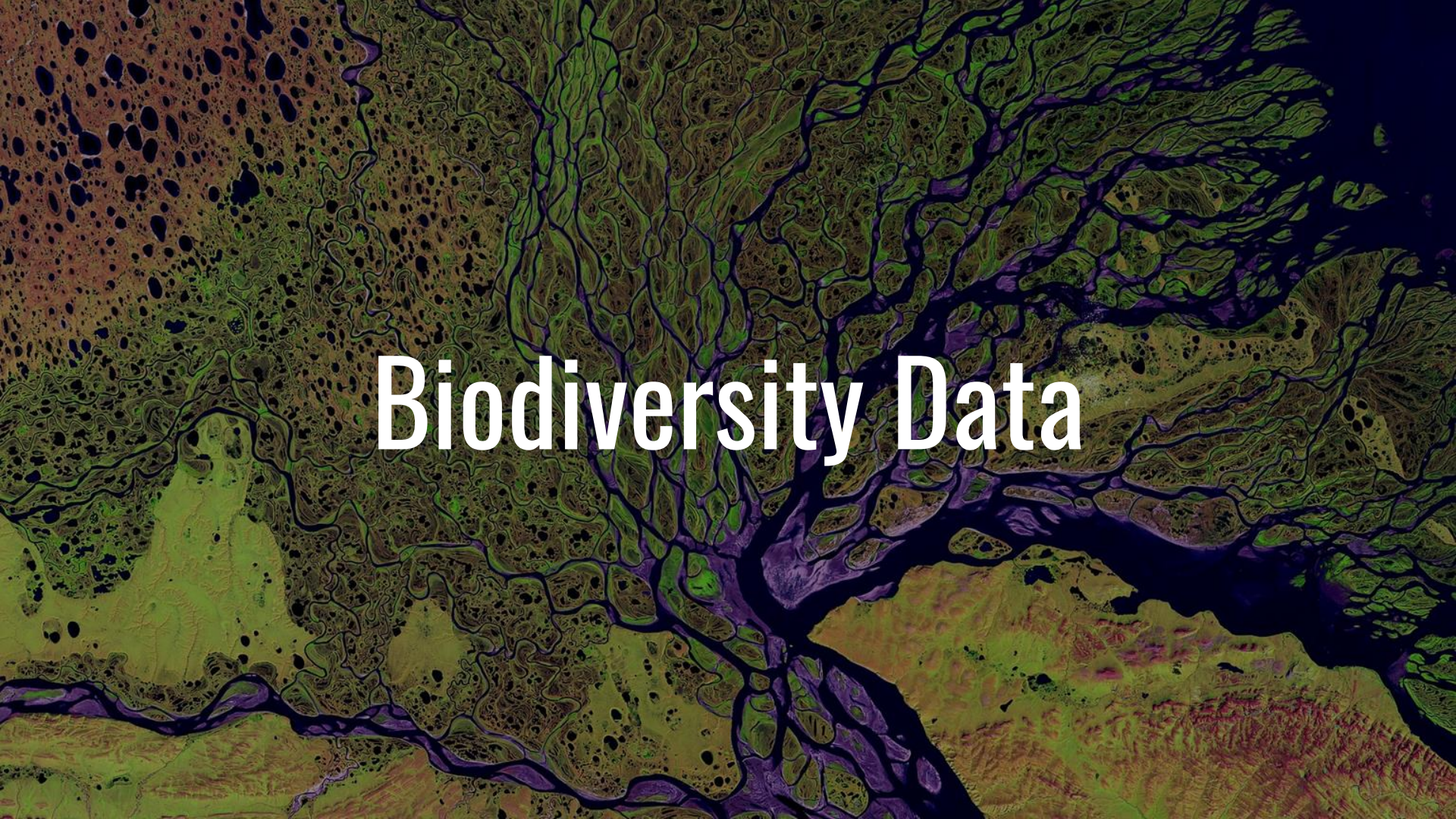
Group: Basemap
Theme: National Boundary
Data Name: Planning Units (1x1km)

Details: Nationally provided boundary layer. Projected in UTM zone 36N.

Why? It's official! ~ 242,968 planning units

Data Source: National Data.

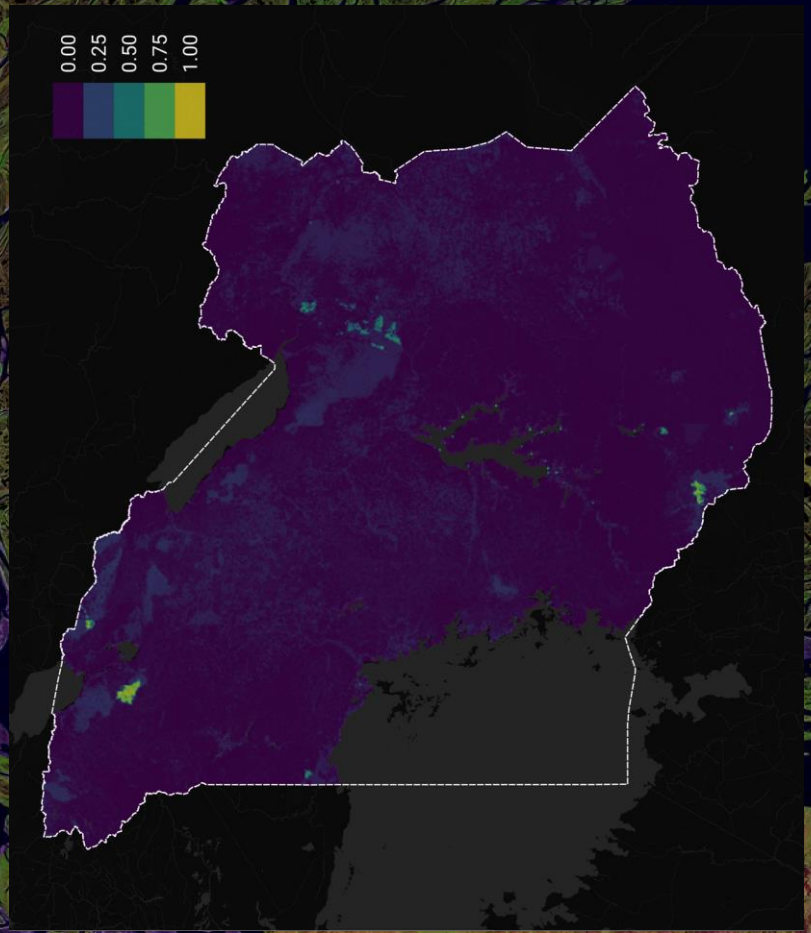



Biodiversity Data

Group: Features
Theme: Biodiversity
Data Name: Forest Structural Integrity Index

Details: Index of Moist Tropical Broadleaf forest integrity

Why? Identify where the most intact forests are ~ like Bwindi.

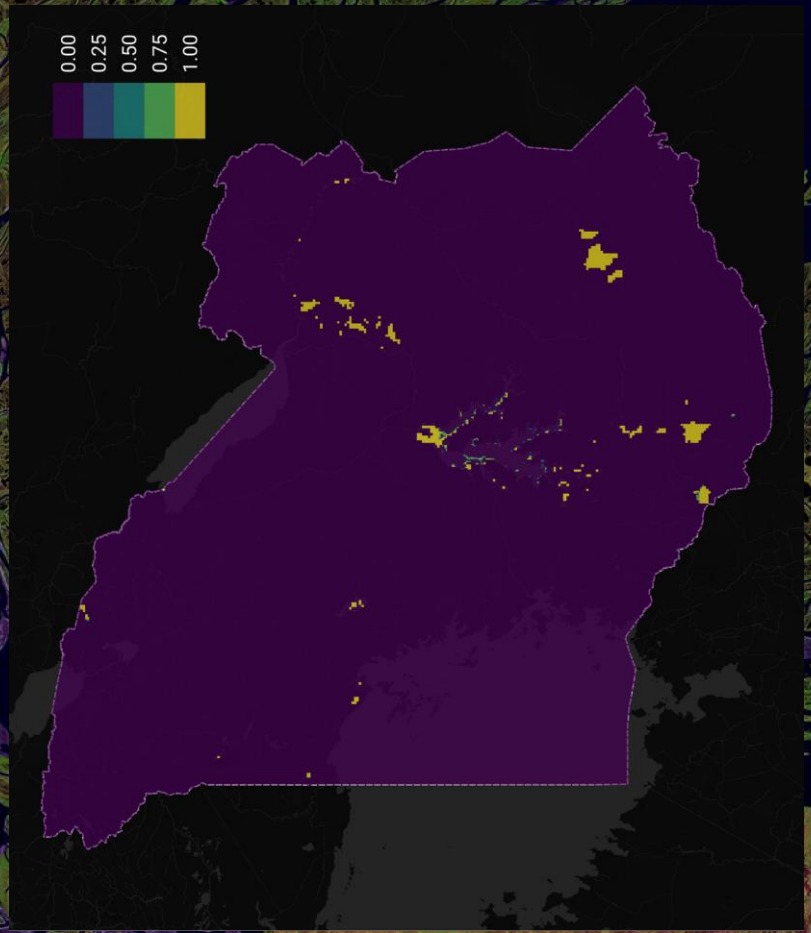


Data Sources: Hansen, A., et al., 2019. Global humid tropics forest structural condition and forest structural integrity maps. Sci Data 6, 1–12.

Group: Features
Theme: Biodiversity
Data Name: Intact Non-forest Ecosystems

Details: Non-Forest Biomes with HFP < 4.

Why? Intact portions of biomes.

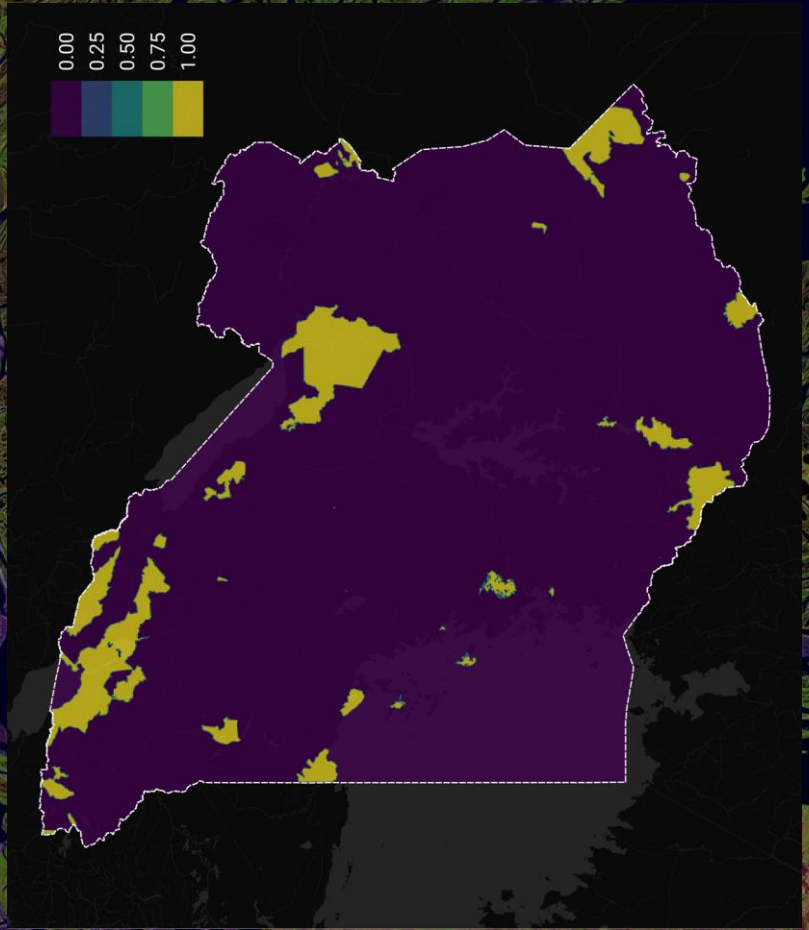


Data Sources: Dinerstein, E. et al. (2017) 'An Ecoregion-Based Approach to Protecting Half the Terrestrial Realm', BioScience, 67(6), pp. 534–545; Venter, O. et al. (2016) 'Global terrestrial Human Footprint maps for 1993 and 2009', Scientific Data, 3, p. 160067.

Group: Features
Theme: Biodiversity
Data Name: Key Biodiversity Areas

Details:
KBA Partnership

Why? Important areas for biodiversity.



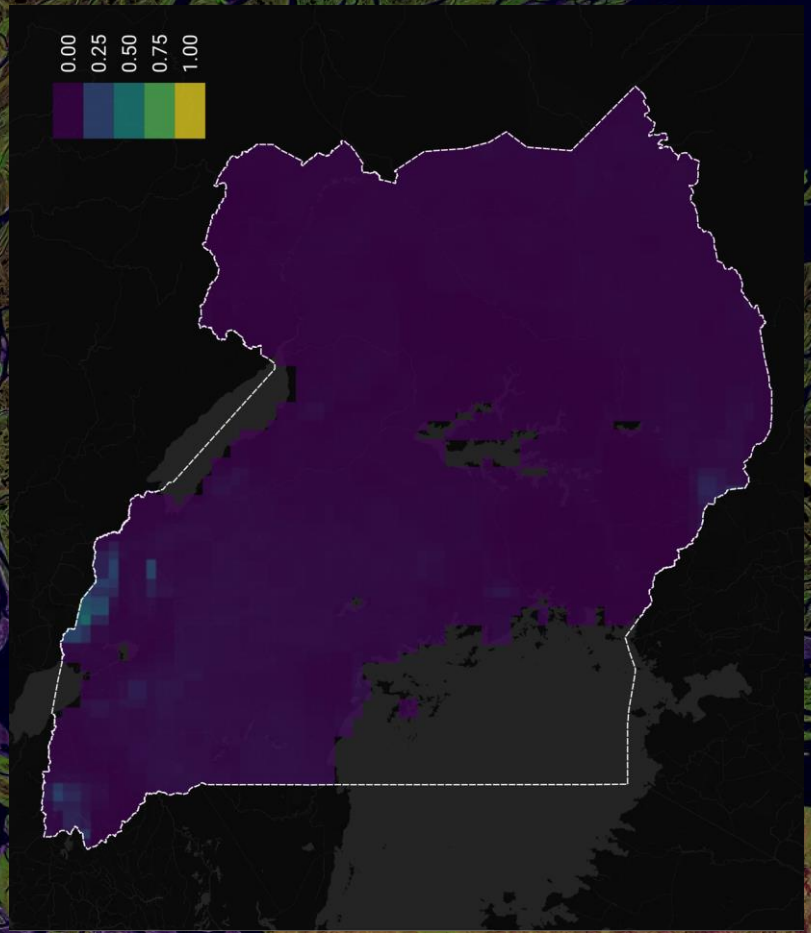
Data Source: BirdLife International (2020) World Database of Key Biodiversity Areas, Encyclopedia of the Anthropocene.

Group: Features
Theme: Biodiversity
Data Name: Rarity-Weighted Richness (NatureMap)

Details: Derived from IUCN & Birdlife range data. NatureMap

Why? Are particular taxa indicated in national legislation?

Data Source: Derived from IUCN, 2020. The IUCN Red List of Threatened Species. Version 2020-1.

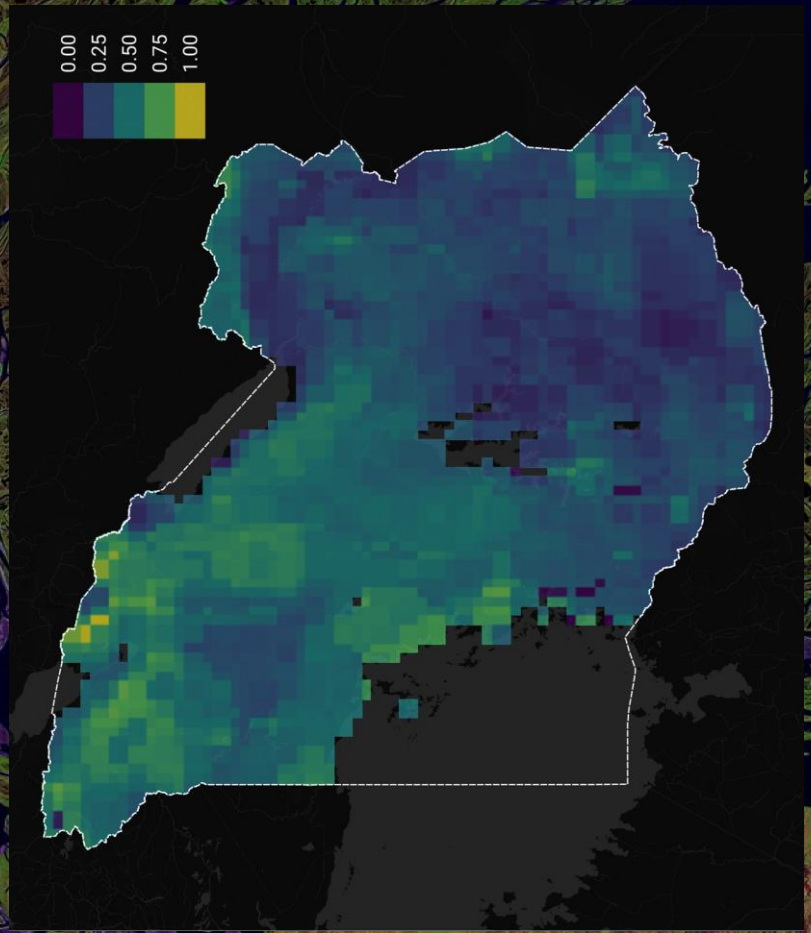


Group: Features
Theme: Biodiversity
Data Name: Threatened Species Richness (Nature Map)

Details: Derived from IUCN & Birdlife range data. NatureMap

Why? Are particular taxa indicated in national legislation?

Data Source: Derived from IUCN, 2020. The IUCN Red List of Threatened Species. Version 2020-1.

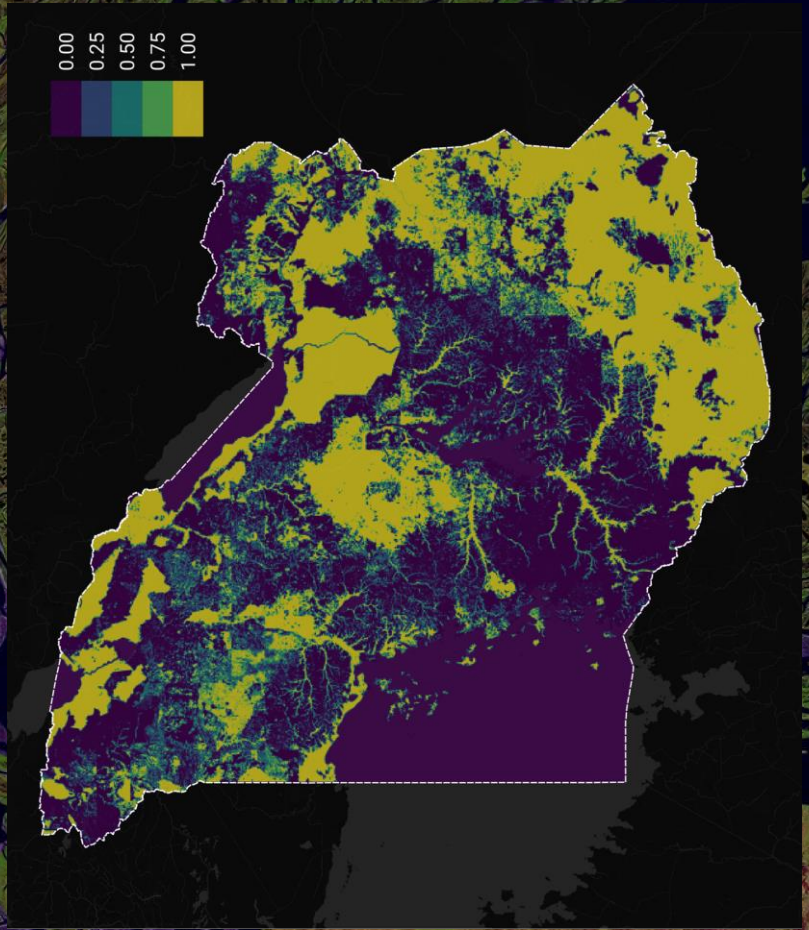


Group: Features
Theme: Biodiversity
Data Name: Threatened Habitats

Details: National data - threatened habitats.

Why? Applies to national legislation better than global equivalents.

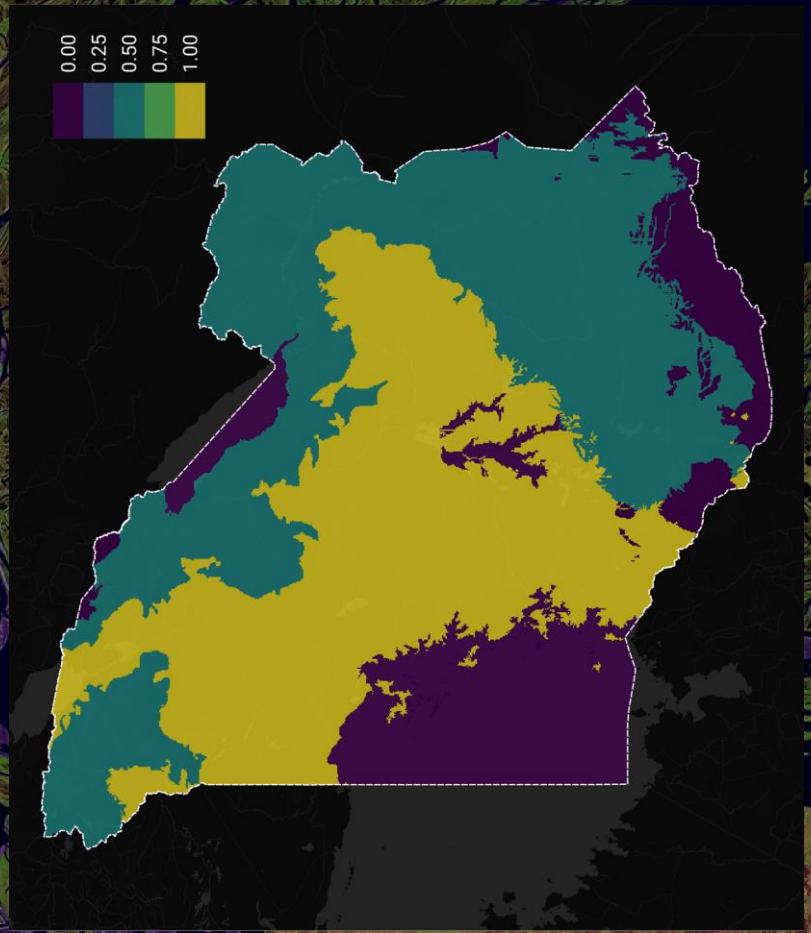
Data Source: National Data.



Group: Features
Theme: Biodiversity
Data Name: Underprotected Ecosystems

Details: Which ecoregions that are < 30% protection?

Why? National targets.



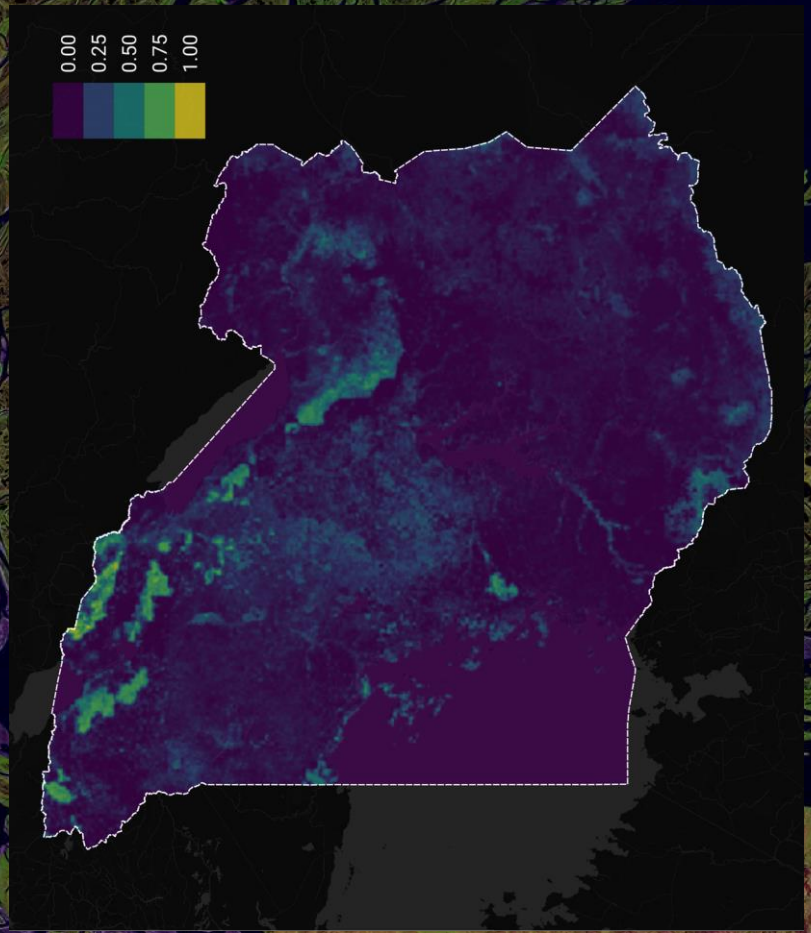
Data Source: Dinerstein, E. et al., 2017. An Ecoregion-Based Approach to Protecting Half the Terrestrial Realm. BioScience, 67(6), pp. 534–545.

Climate Change Mitigation

Group: Features
Theme: Climate Change Mitigation
Data Name: Carbon (Biomass)

Details: Aboveground Biomass carbon - NatureMap

Why? National and international carbon agreements?



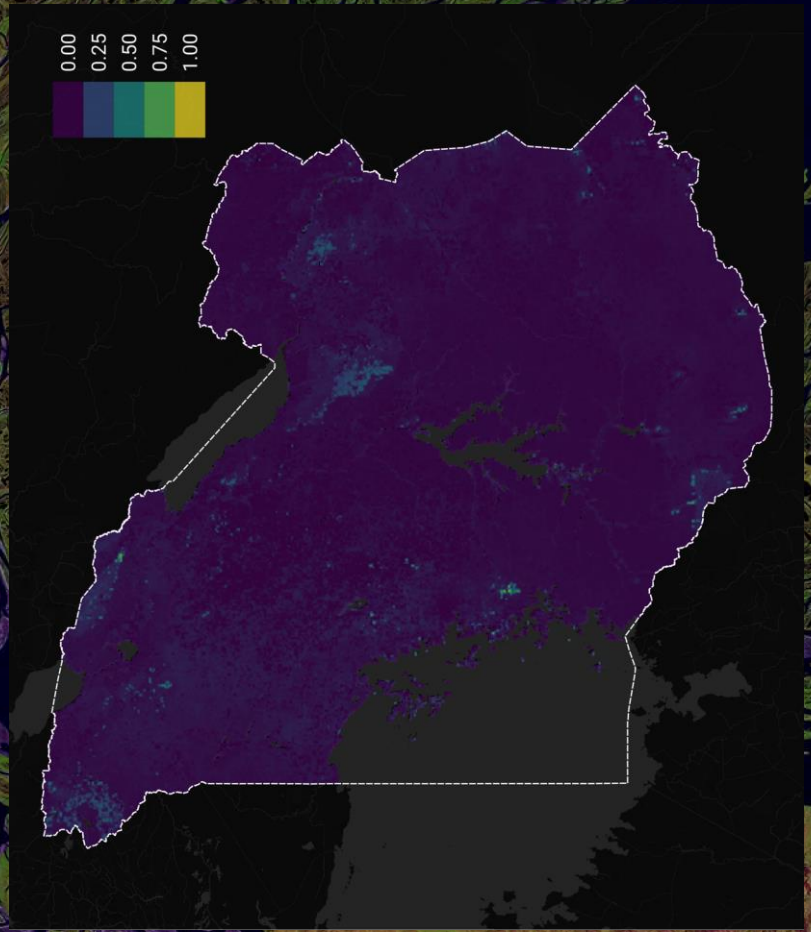
Data Source: García-Rangel, S. et al. (In prep) Global distribution of natural carbon stocks potentially vulnerable to land use changes.

Group: Features
Theme: Climate Change Mitigation
Data Name: Carbon (Soil)

Details:
NatureMap. Soil Organic Carbon.

Why?
National and international carbon agreements?

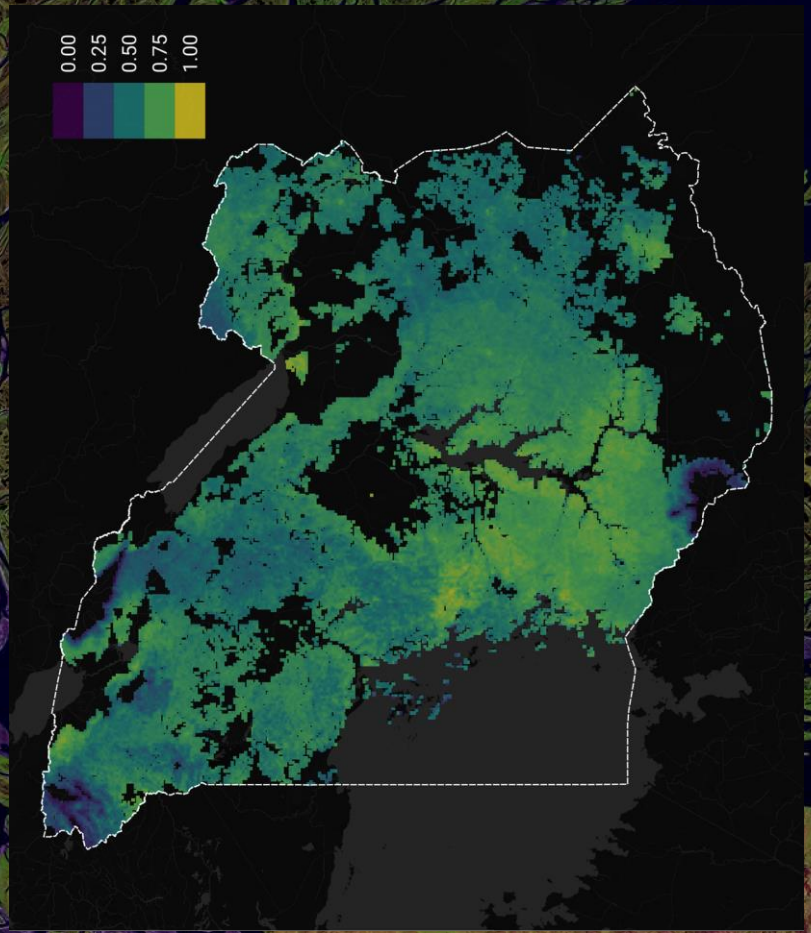
Data Source: García-Rangel, S. et al. (In prep) Global distribution of natural carbon stocks potentially vulnerable to land use changes.



Group: Features
Theme: Climate Change Mitigation
Data Name: Carbon Sequestration

Details: Potential Carbon sequestration in croplands with improved farming practices (high scenario)

Why? Carbon agreements?



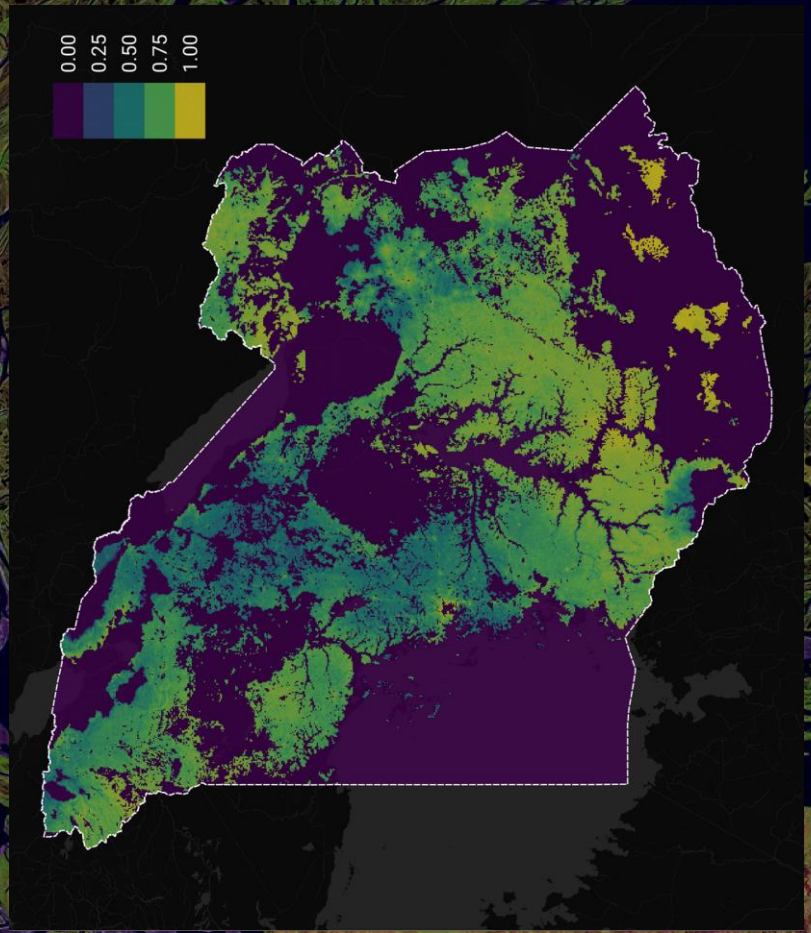
Data Source: Zomer, R. J. et al. (2017) 'Global Sequestration Potential of Increased Organic Carbon in Cropland Soils', Scientific Reports, 7(1), p. 15554.

Human Well-being

Group: Features
Theme: Human Well-being
Data Name: Agro-Forestation Potential

Details: Areas with Subsistence farming >>> Available Tree Canopy Cover (e.g. 100 - Current % Forest)

Why? Re/Afforestion identified as a national target.

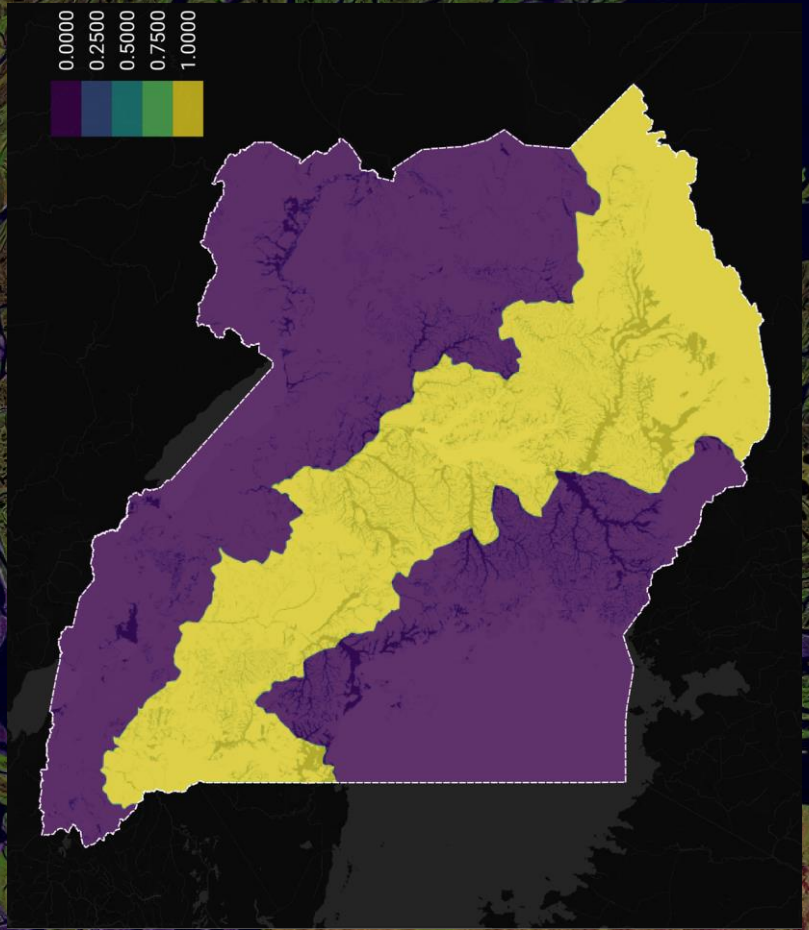


Data Source: National Data; Hansen, M.C., et al., 2013. High-Resolution Global Maps of 21st-Century Forest Cover Change. Science 342, 850–853.

Group: Features
Theme: Human Well-being
Data Name: Cattle Corridors

Details: A key, traditional, multi-use area.

Why? Vital for many human uses.

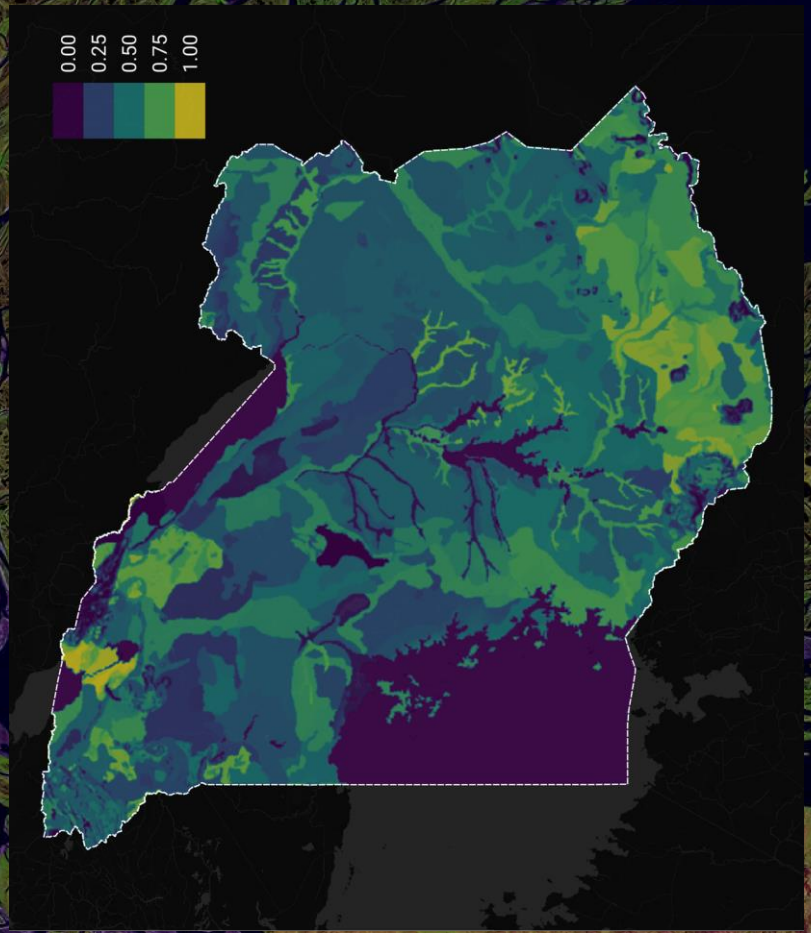


Data Source: Digitised from: Mubiru, D.N., Namakula, J., Lwasa, J., Otim, G.A., Kashagama, J., Nakafeero, M., Nanyeenya, W., Coyne, M.S., 2017. Conservation Farming and Changing Climate: More Beneficial than Conventional Methods for Degraded Ugandan Soils. Sustainability 9, 1084.

Group: Features
Theme: Human Well-being
Data Name: Crop Suitability

Details: Current crop suitability (2011-2040)

Why? This may impact on how we manage for expected changes for land use demand?

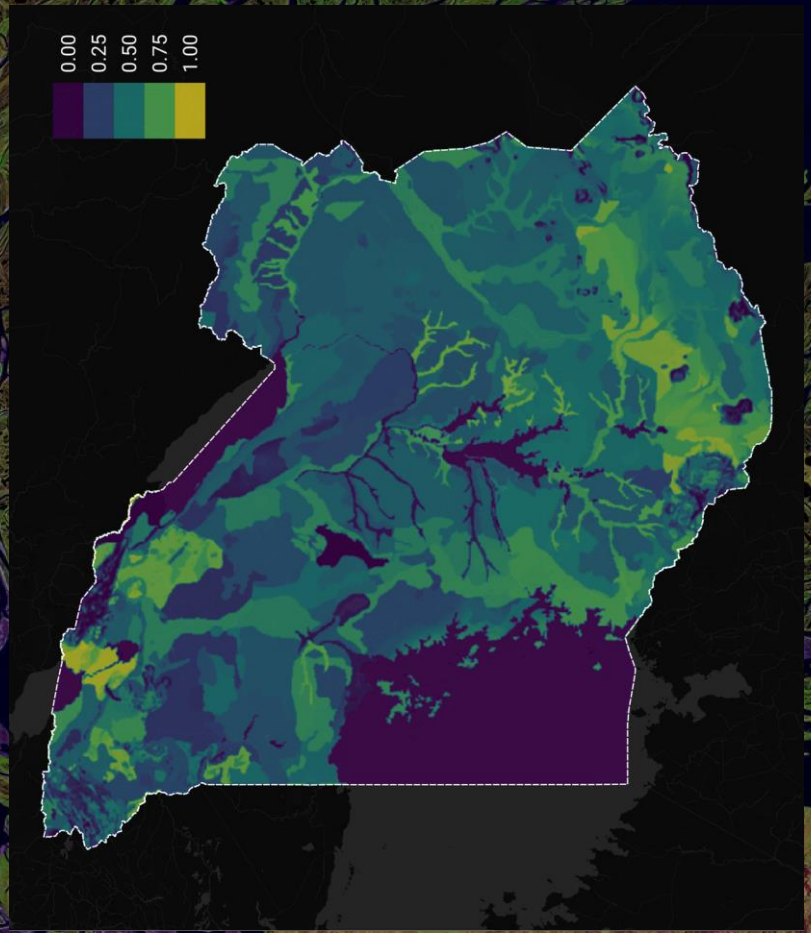


Data Source: Zabel, F., Putzenlechner, B. and Mauser, W. (2014) 'Global Agricultural Land Resources – A High Resolution Suitability Evaluation and Its Perspectives until 2100 under Climate Change Conditions', PLOS ONE, 9(9), p. e107522.

Group: Features
Theme: Human Well-being
Data Name: Future Crop Suitability

Details: Future crop suitability (2071-2100).

Why? This may impact on how we manage for expected changes for land use demand?

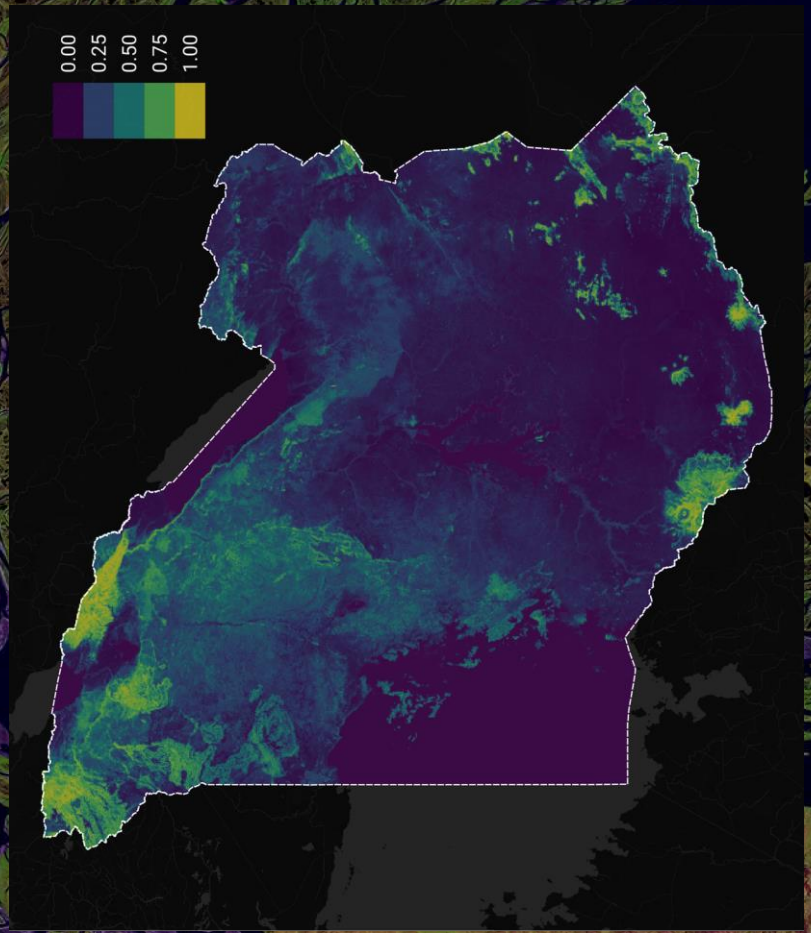


Data Source: Zabel, F., Putzenlechner, B. and Mauser, W. (2014) 'Global Agricultural Land Resources – A High Resolution Suitability Evaluation and Its Perspectives until 2100 under Climate Change Conditions', PLOS ONE, 9(9), p. e107522.

Group: Features
Theme: Human Well-being
Data Name: Landslide Risk

Details: Modelled landslide risk using 30m DEM, forest cover, and fatal landslide data.

Why? Where are important areas to focus revegetation efforts to stabilise hillsides?

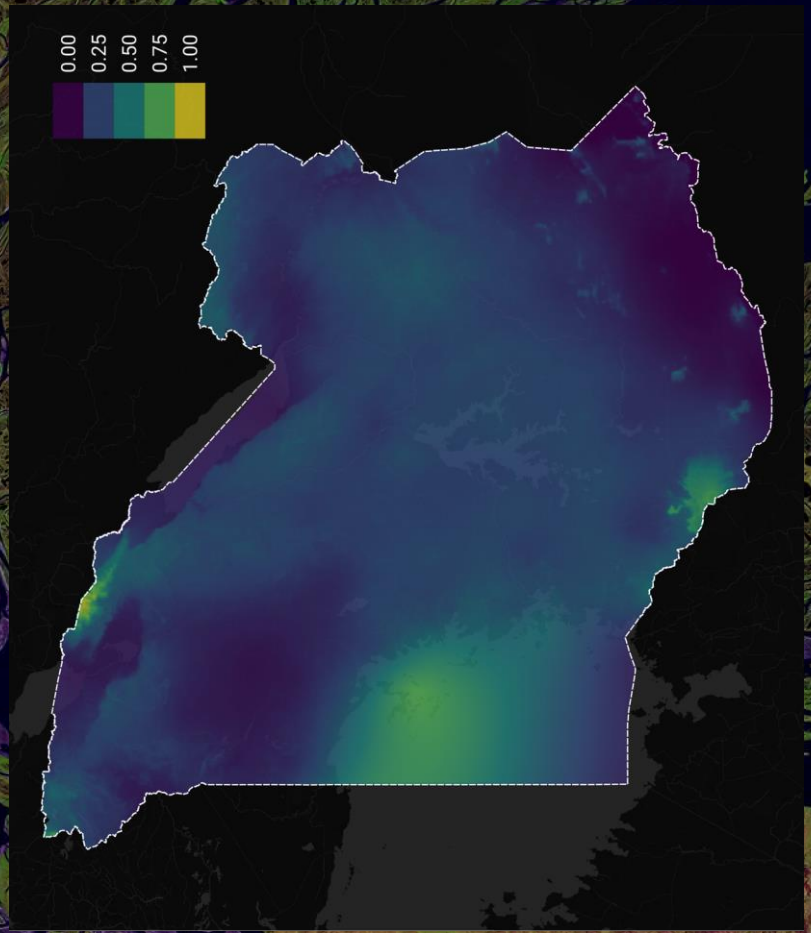


Data Source: NASA, JAXA, Hansen, M.C., et al., 2013. High-Resolution Global Maps of 21st-Century Forest Cover Change. Science 342, 850–853.

Group: Features
Theme: Human Well-being
Data Name: Potential Clean Water

Details: Costing$Nature Model.

Why? Identifying vital water source areas.

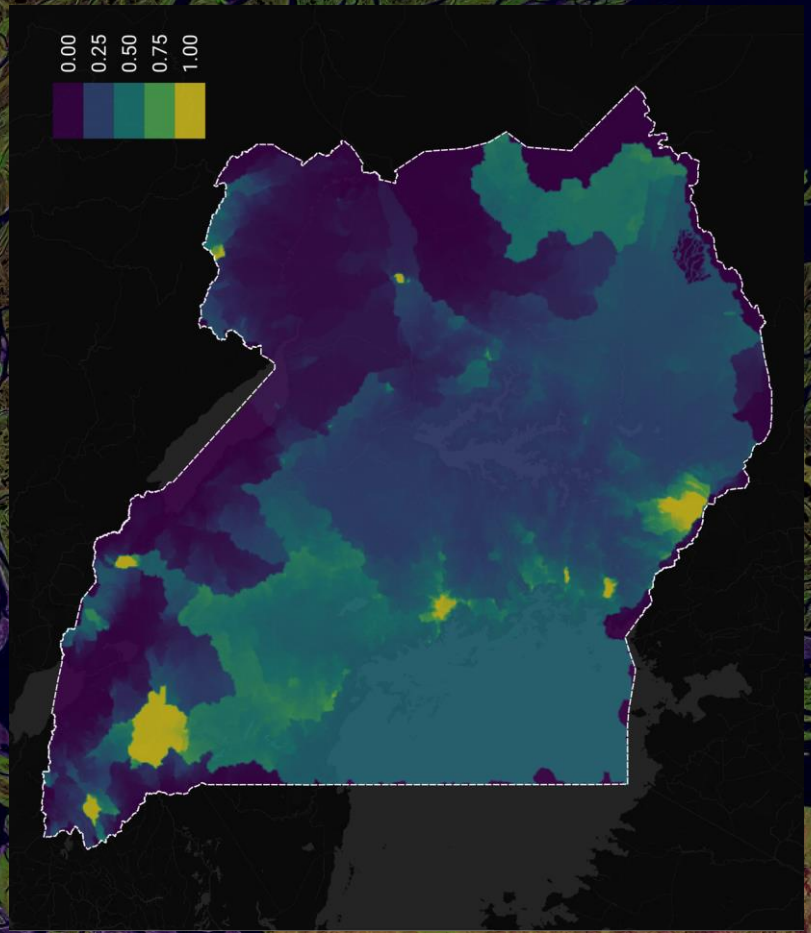


Data Source: Mulligan, M. (2013) WaterWorld: a self-parameterising, physically based model for application in data-poor but problem-rich environments globally. Hydrology research 44, 5; 748-769.

Group: Features
Theme: Human Well-being
Data Name: Realised Water Provision

Details: Realised value of water supply. Costing$Nature

Why? Identifying vital water usage areas.



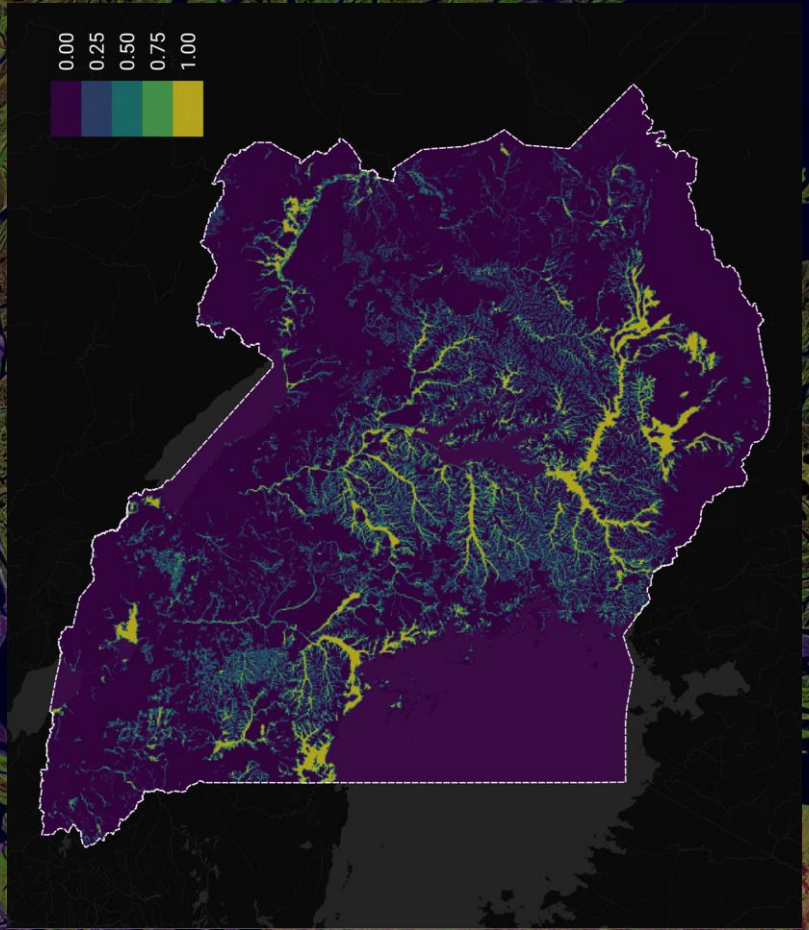
Data Source: Mulligan, M. (2013) WaterWorld: a self-parameterising, physically based model for application in data-poor but problem-rich environments globally. Hydrology research 44, 5; 748-769.

Group: Features
Theme: Human Well-being
Data Name: Wetlands

Details: National Wetlands data.

Why? Protecting, managing, and restraining wetlands was a KEY national priority.

Data Source: National Data



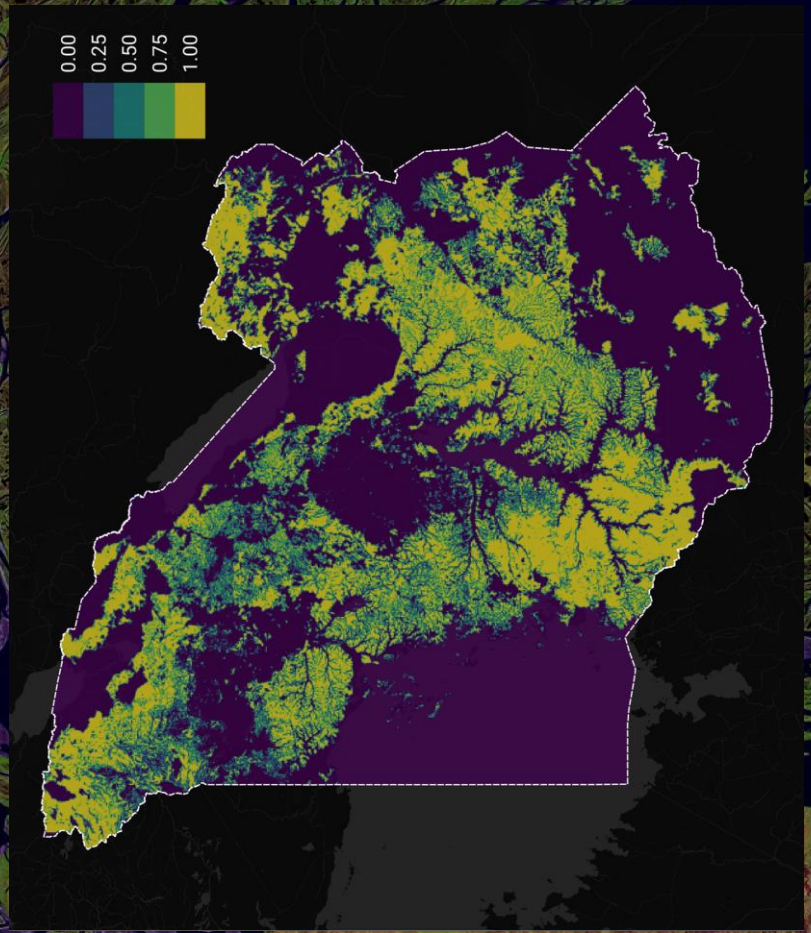
Zones

Group: Zones
Theme: Protect | Manage | Restore
Data Name: Subsistence Farmland

Details: National data on the proportion of each cell allocated to subsistence farming.

Why? Important to ensure certain actions are not carried out here - such as Protection.

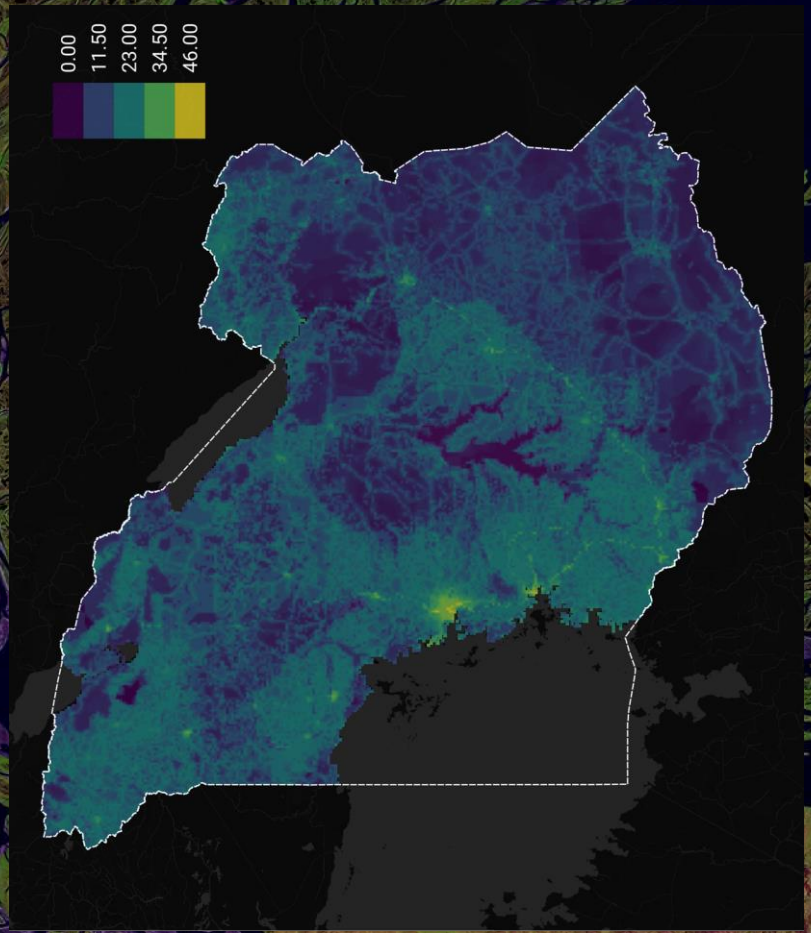
Data Source: National Data.



Group: Zones
Theme: Protect | Manage | Restore
Data Name: Human Footprint (2013)

Details: Cumulative map of human impacts on the planet.

Why? Useful to zone areas as suitable for protected, or restoration, or management.



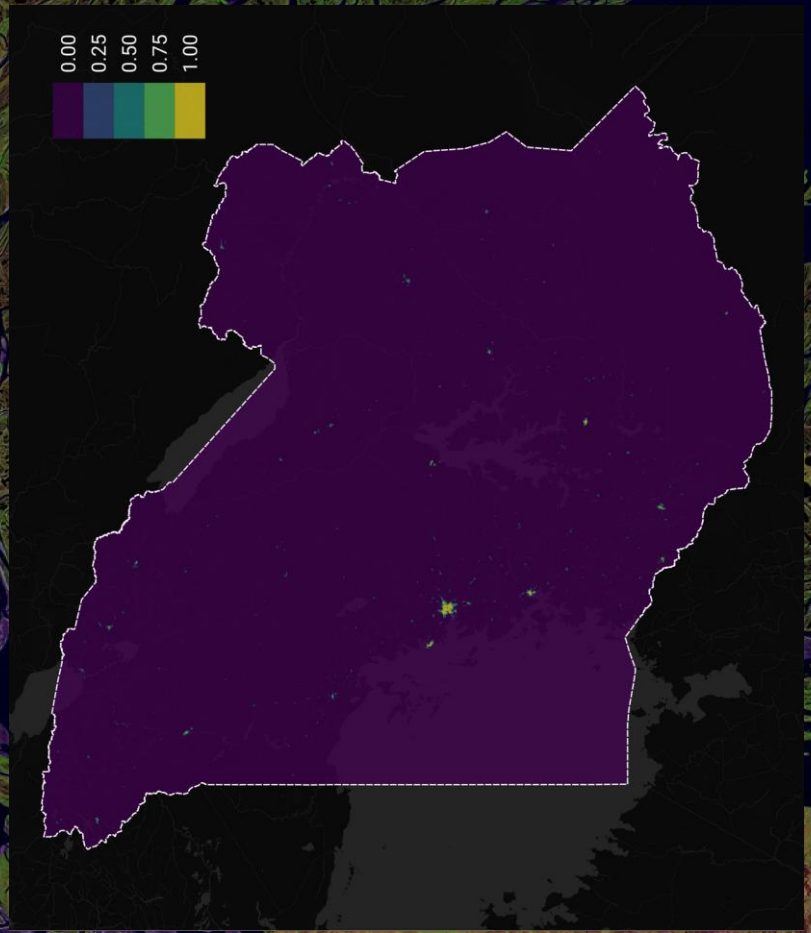
Data Source: Venter, O. et al. (2016) 'Global terrestrial Human Footprint maps for 1993 and 2009', Scientific Data, 3, p. 160067.

Group: Zones
Theme: Protect | Manage | Restore
Data Name: Urban Areas

Details: Proportion of each cell that is Built/Urban.

Why? Useful for zoning along the protect/manage/restore spectrum.

Data Source: National Data.

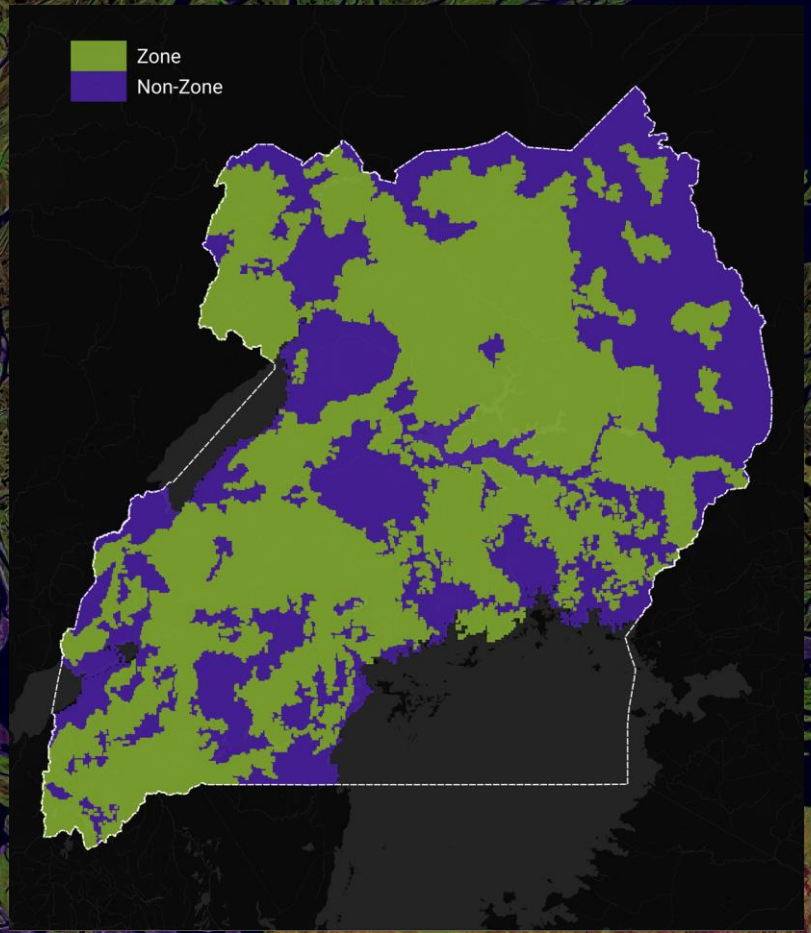


Group: Zones
Theme: Protect | Manage | Restore
Data Name: Manage Zone

Details:

- Agriculture Frontier >= 0.5
- Current Agricultural areas > 0.1
- Urban areas < 0.5

Percent of Country Covered:
59.86%

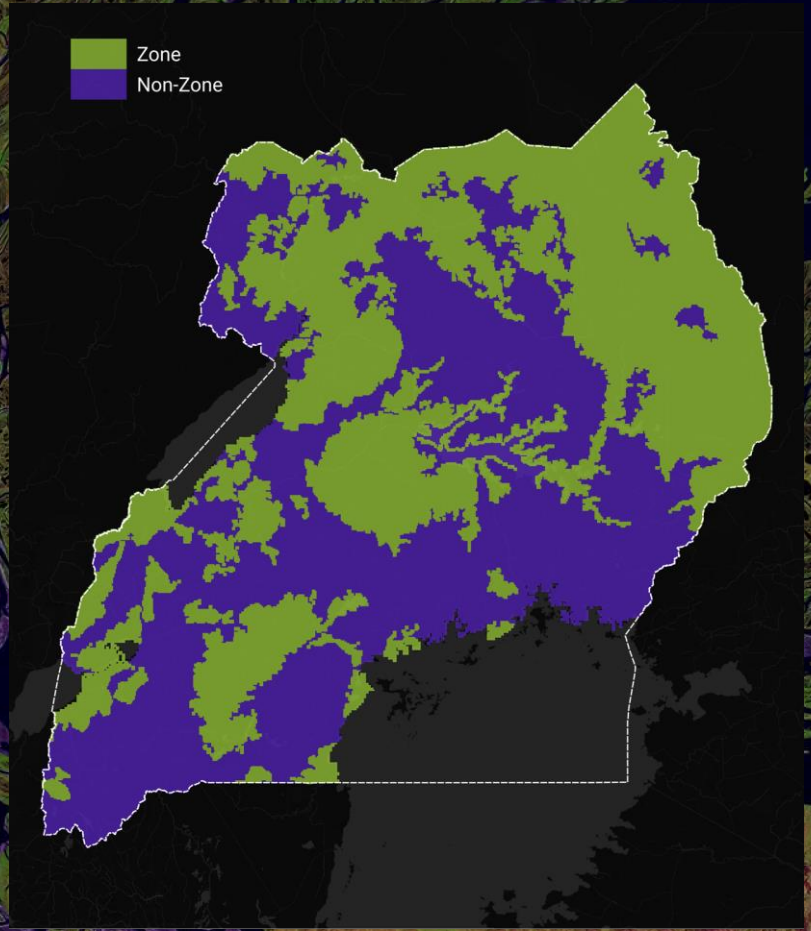


Group: Zones
Theme: Protect | Manage | Restore
Data Name: Protect Zone

Details:

- Agriculture Frontier < 0.5
- Human Footprint <=21
- Urban areas < 0.5

Percent of Country Covered:
50.31%

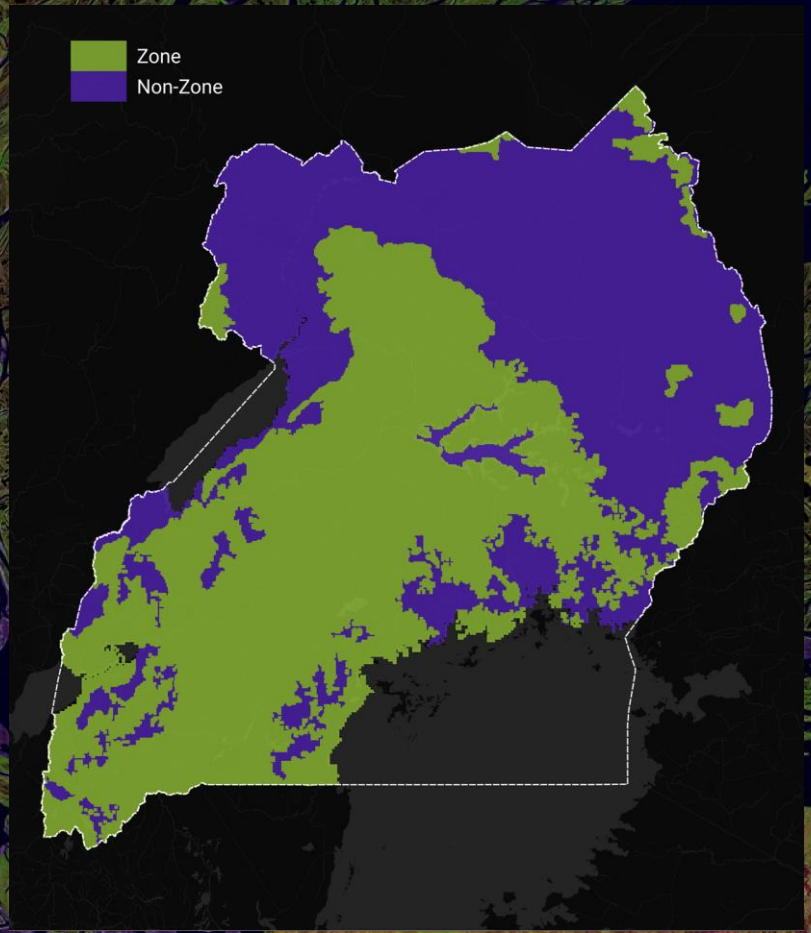


Group: Zones
Theme: Protect | Manage | Restore
Data Name: Restore Zone

Details:

- Agriculture Frontier < 0.5
- Human Footprint >=5 & <=21
- Urban areas < 0.5

Percent of Country Covered:
53.40%



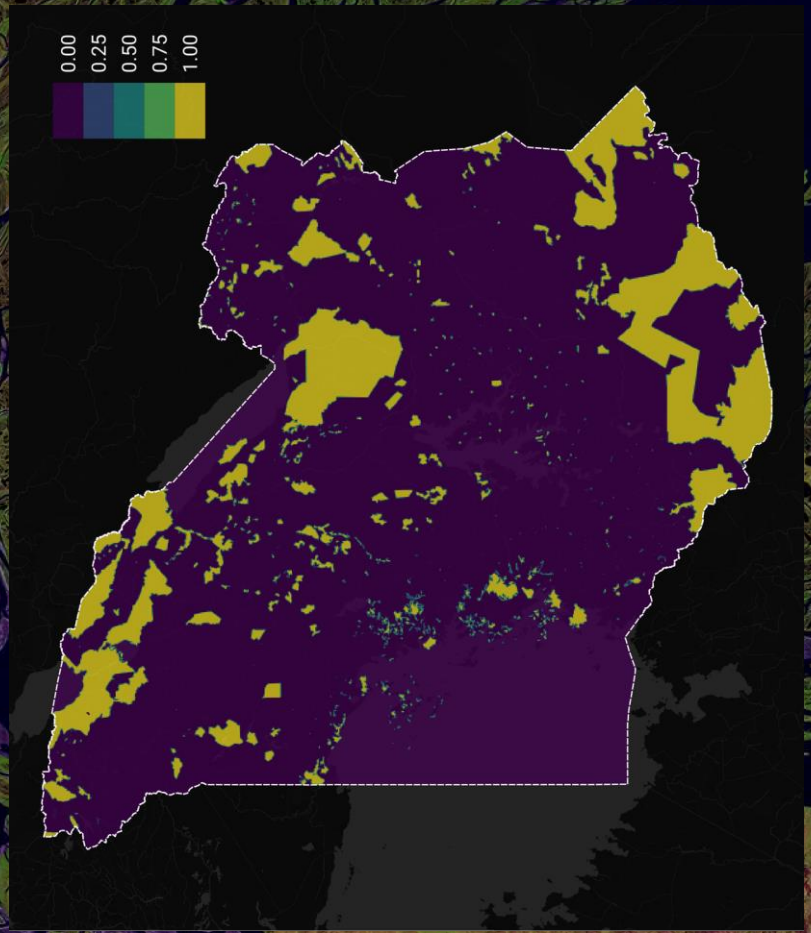
Lock-in Constraints

Group: Features / Lock-in?
Theme: Protect | Manage | Restore
Data Name: Protected Areas

Details: National data on Protected Areas (note: not from WDPA, as it may not be up to date).

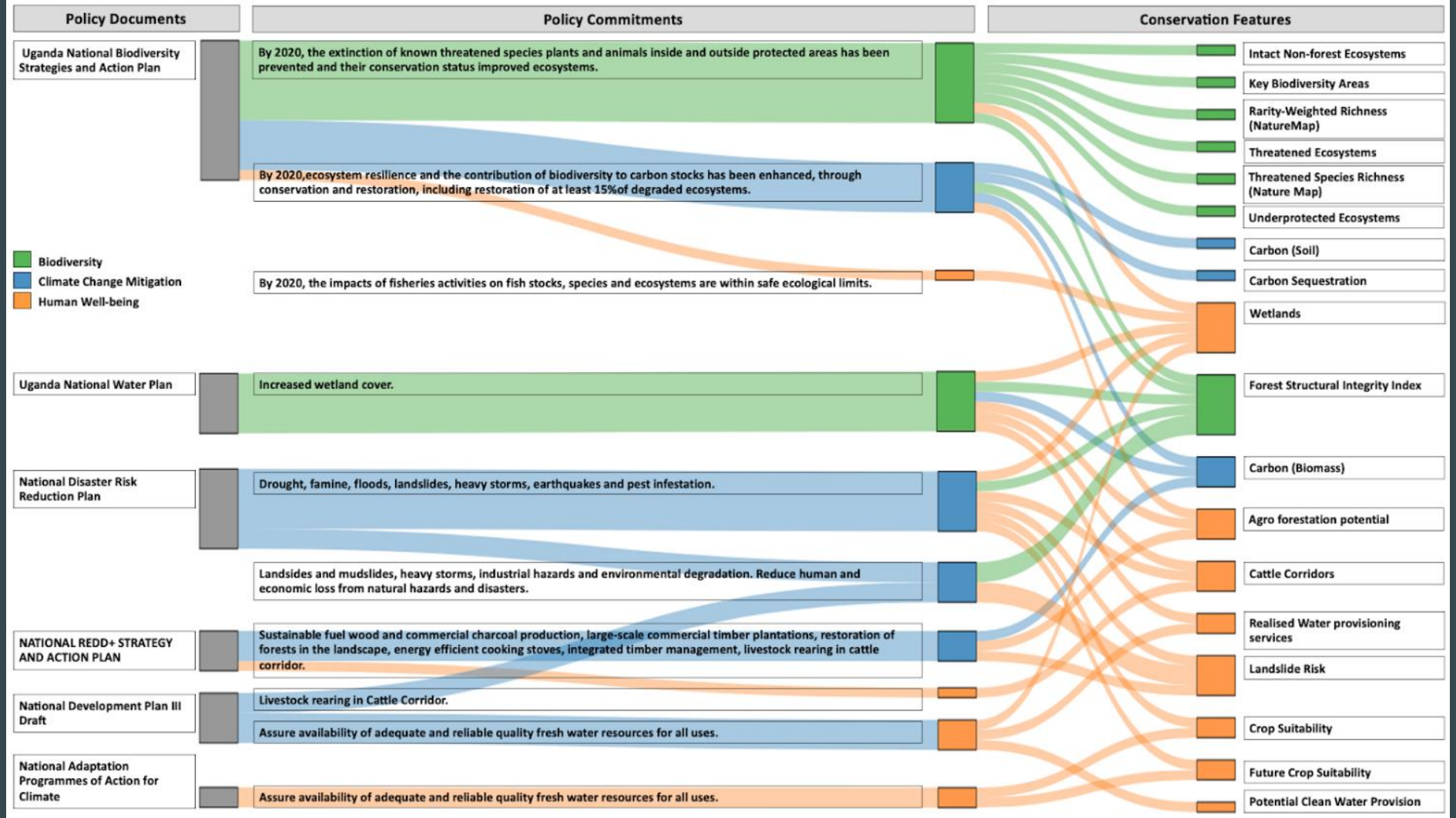
Why? PAs are normally ‘locked-in’ and are not available for other uses.

Data Source: National Data.



Comments or Questions?

Di Zhang: di.zhang@undp.org
Scott Atkinson: scott.atkinson@undp.org


Policy Documents
Policy Commitments
Conservation Features
Uganda National Biodiversity Strategies and Action Plan
By 2020, the extinction of known threatened species plants and animals inside and outside protected areas has been prevented and their conservation status improved ecosystems.
By 2020,ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15%of degraded ecosystems.
By 2020, the impacts of fisheries activities on fish stocks, species and ecosystems are within safe ecological limits.
Biodiversity
Climate Change Mitigation
Human Well-being
Uganda National Water Plan
Increased wetland cover.
National Disaster Risk Reduction Plan
Drought, famine, floods, landslides, heavy storms, earthquakes and pest infestation.
Landsides and mudslides, heavy storms, industrial hazards and environmental degradation. Reduce human and economic loss from natural hazards and disasters.
NATIONAL REDD+ STRATEGY AND ACTION PLAN
Sustainable fuel wood and commercial charcoal production, large-scale commercial timber plantations, restoration of forests in the landscape, energy efficient cooking stoves, integrated timber management, livestock rearing in cattle corridor.
National Development Plan III Draft
Livestock rearing in Cattle Corridor.
Assure availability of adequate and reliable quality fresh water resources for all uses.
National Adaptation Programmes of Action for Climate
Assure availability of adequate and reliable quality fresh water resources for all uses.
Intact Non-forest Ecosystems
Key Biodiversity Areas
Rarity-Weighted Richness (NatureMap)
Threatened Ecosystems
Threatened Species Richness (Nature Map)
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Carbon (Soil)
Carbon Sequestration
Wetlands
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Carbon (Biomass)
Agro forestation potential
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Realised Water provisioning services
Landslide Risk
Crop Suitability
Future Crop Suitability
Potential Clean Water Provision