Using sensitivity mapping to avoid conflict between birds and renewable energy

Tris Allinson, BirdLife International

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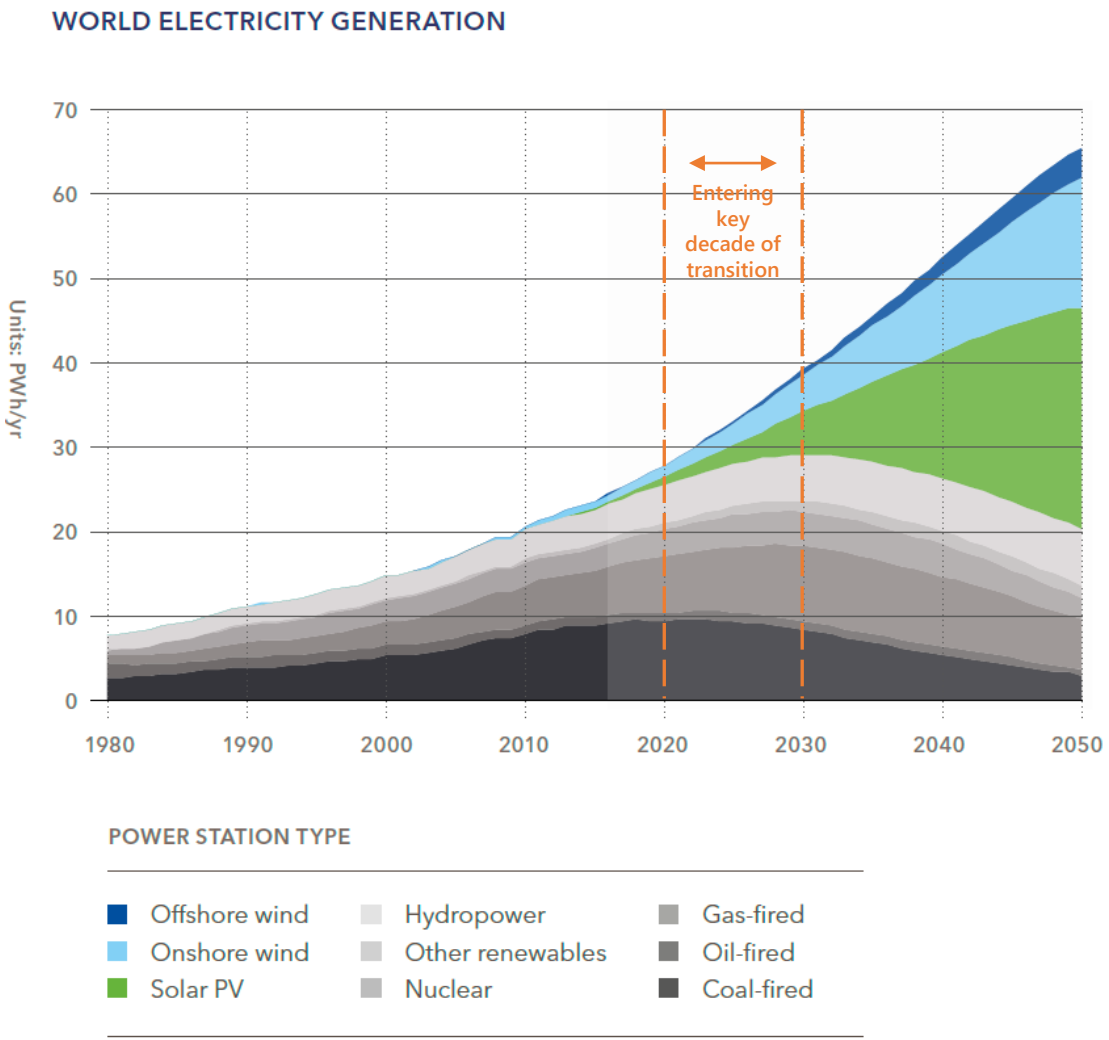
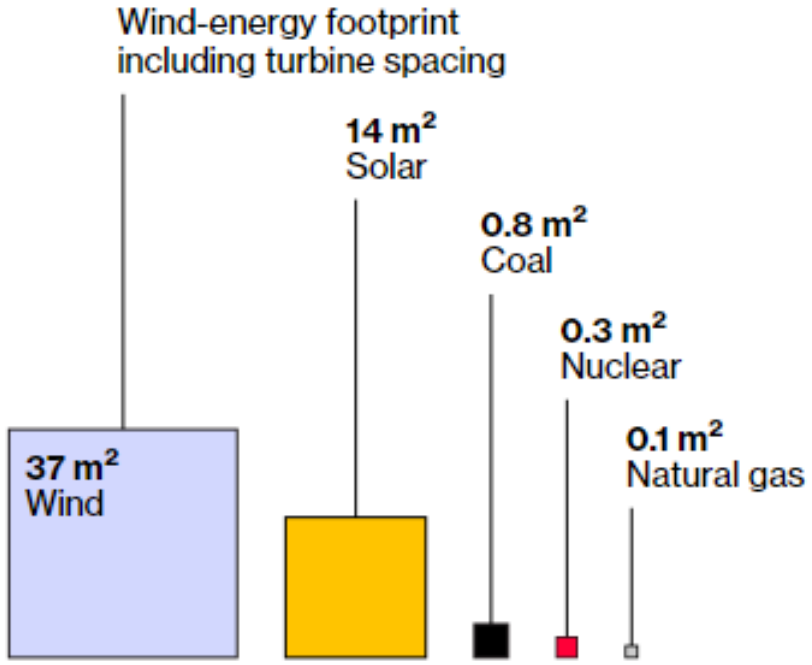
Partnership for nature and people

Entering key decade of global transition



Renewables are space-intensive

- Wind and solar will require many millions of hectares of land and sea globally and require us to more than double the amount of power lines.



Land area needed to power a flat-screen TV, by energy source

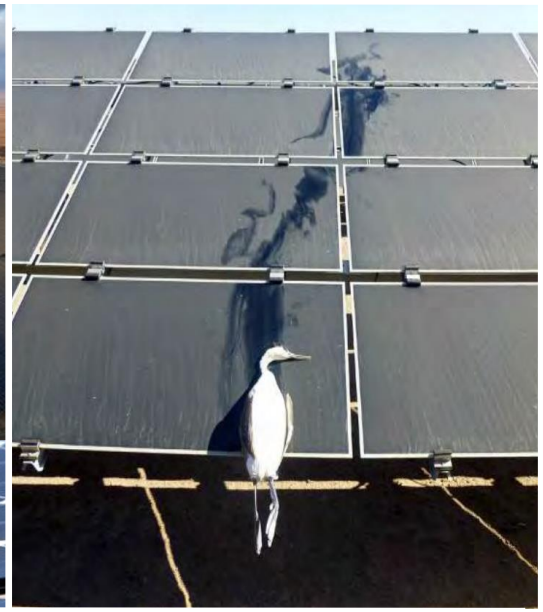
Note: Assumes 100-watt television operating year-round
Source: van Zalk, John, Behrens, Paul, 2018, The Spatial Extent of Renewable and Non-Renewable Power Generation

Poorly sited renewable energy infrastructure undermines green credentials

- If renewable energy developments are sited purely to maximise wind and solar resources, then this could jeopardise over 11 million ha of natural lands globally, including over 3 million ha of Key Biodiversity Areas (KBAs), and the ranges of over 1,500 globally threatened species.

- This loss of natural habitat could release over 400 million tons of stored carbon, undermining climate change targets.

SOURCE: Kiesecker, J., Baruch-Mordo, S., Kennedy, C. M., Oakleaf, J. R., Baccini, A. and Griscom, B. W. (2019) Hitting the Target but Missing the Mark: Unintended Environmental Consequences of the Paris Climate Agreement. *Front. Environ. Sci.* 7:151.doi: 10.3389/fenvs.2019.00151



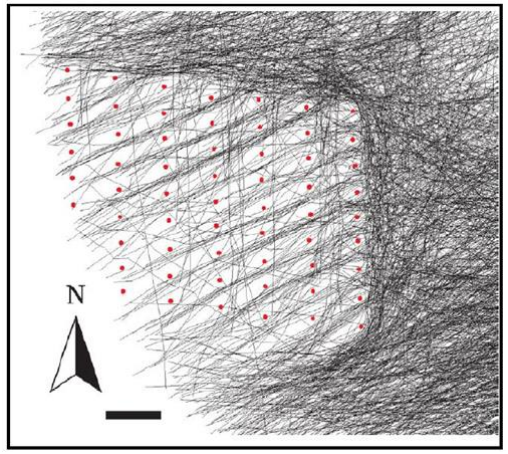
Griffon Vulture *Gyps fulvus* Crete

White-tailed Sea-eagle *Haliaeetus albicilla* Hokkaido, Japan, © MoEJ

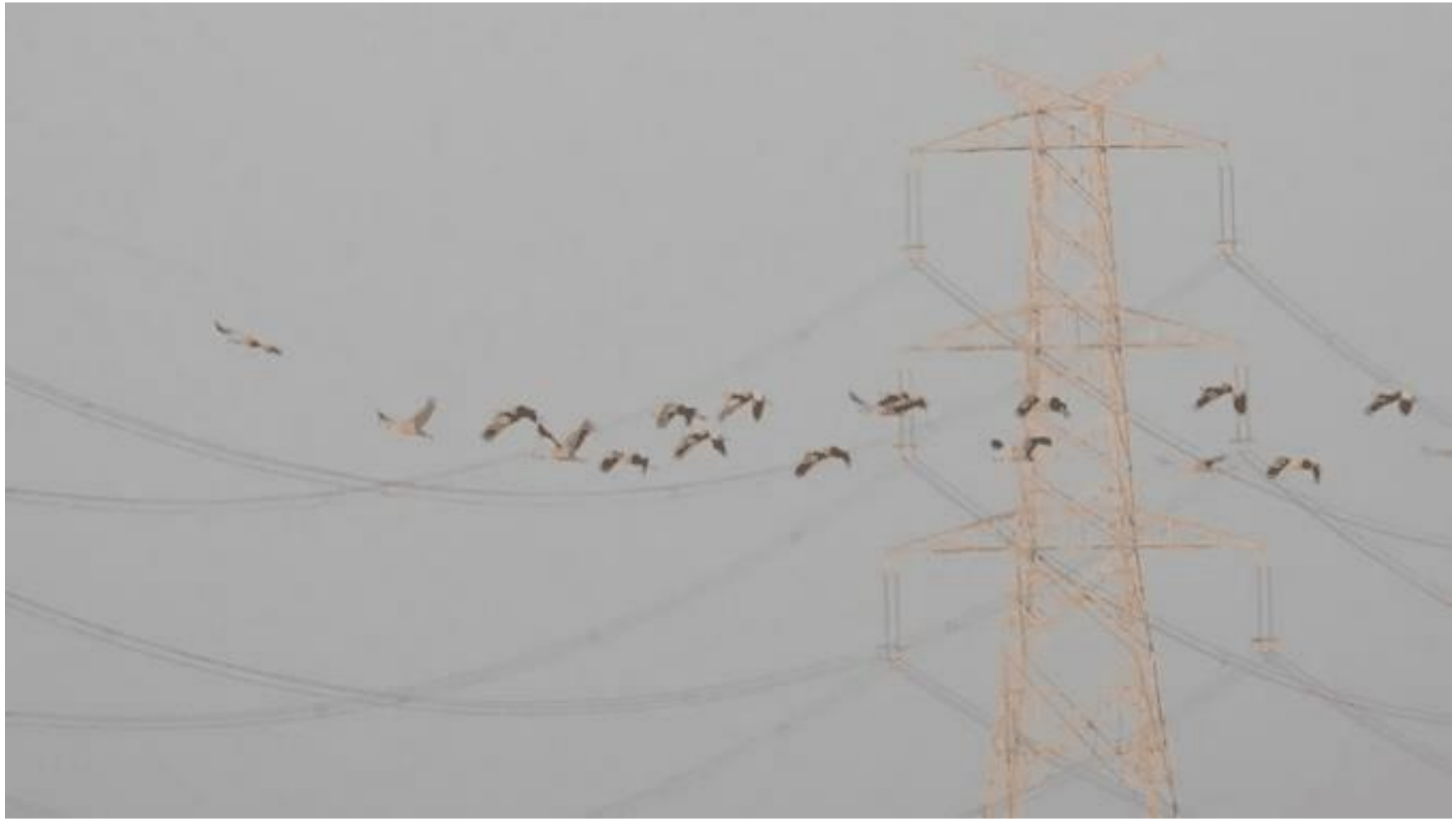
Avoidance, displacement and barrier effects

- Another factor affecting collision risk is avoidance behaviour—some species show high wariness around turbines and avoid turbine arrays.

- However, this itself can have a negative impact if it results in displacement from a favoured habitat or creates a barrier to daily movements or migration.



Mute Swan *Cygnus olor*, Slovakia, © LIFE Energia



Common Crane *Grus grus* Rajasthan, India, © WII

The Great Indian Bustard is on course to go extinct due to badly planned renewable energy

- The single greatest threat is collision with power lines associated with wind and solar development.
- Their rapid flight, weight (they are the heaviest flying bird in the world), and the fact that they have a restricted visual field make this species uniquely susceptible to power line collision.
- The Wildlife Institute of India (WII) estimate that there are on average 18 fatal collision events each year. With a population of less than a hundred, extinction is inevitable and imminent.

There is ample scope to avoid sensitive locations

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- Wind farms and solar facilities can be readily integrated into landscapes of low ecological value, such as agricultural and industrial sites.

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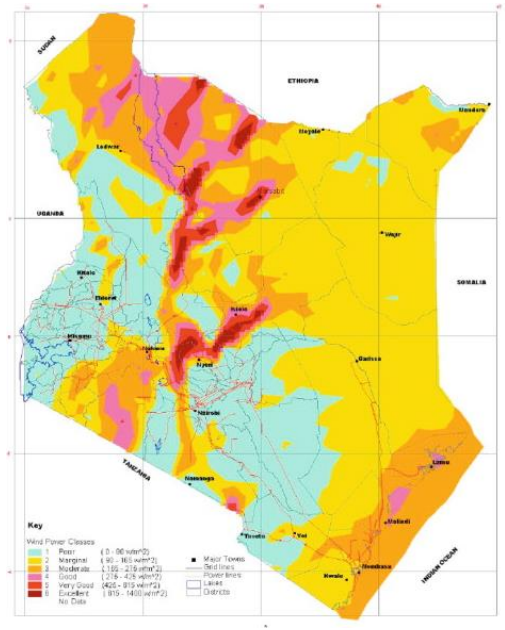
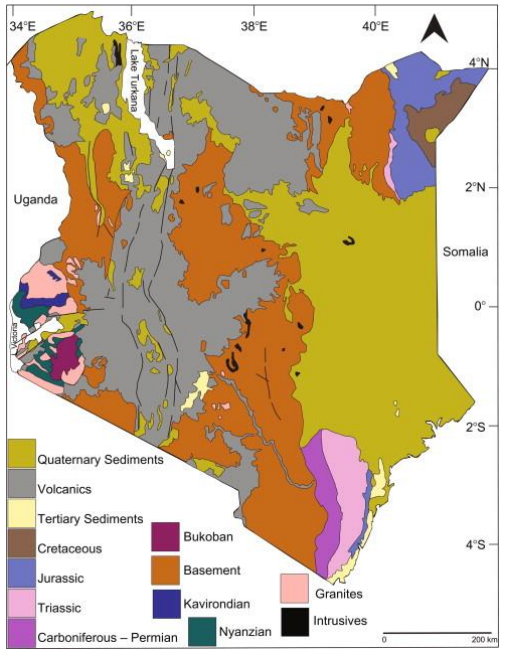
- Wind farms and solar facilities can be readily integrated into landscapes of low ecological value, such as agricultural and industrial sites.
- Even in India, which has ambitious targets for renewables and numerous competing land use demands, analysis shows that there is 12 times the land needed to achieve the country's solar and wind goals simple by using degraded lands with low social and ecological value.

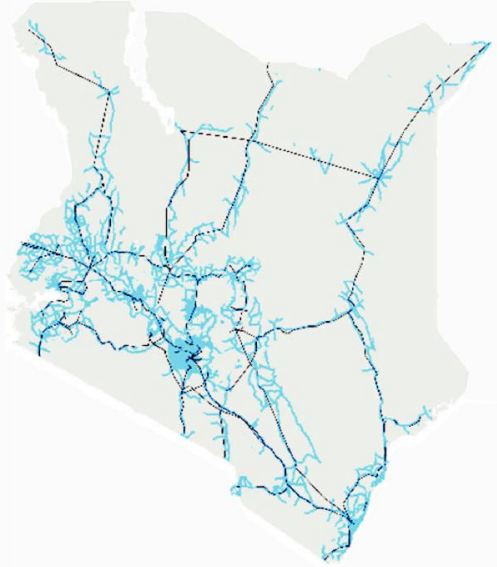
Need to ensure that spatial data on birds and biodiversity is considered alongside other routinely used sources of spatial information.



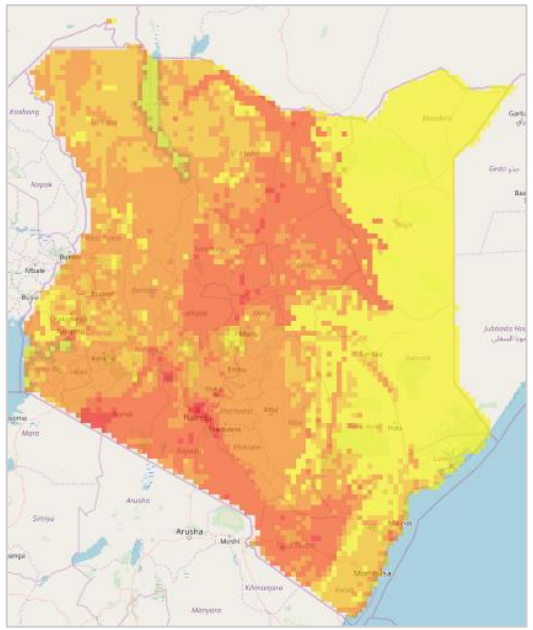
Wind Resource



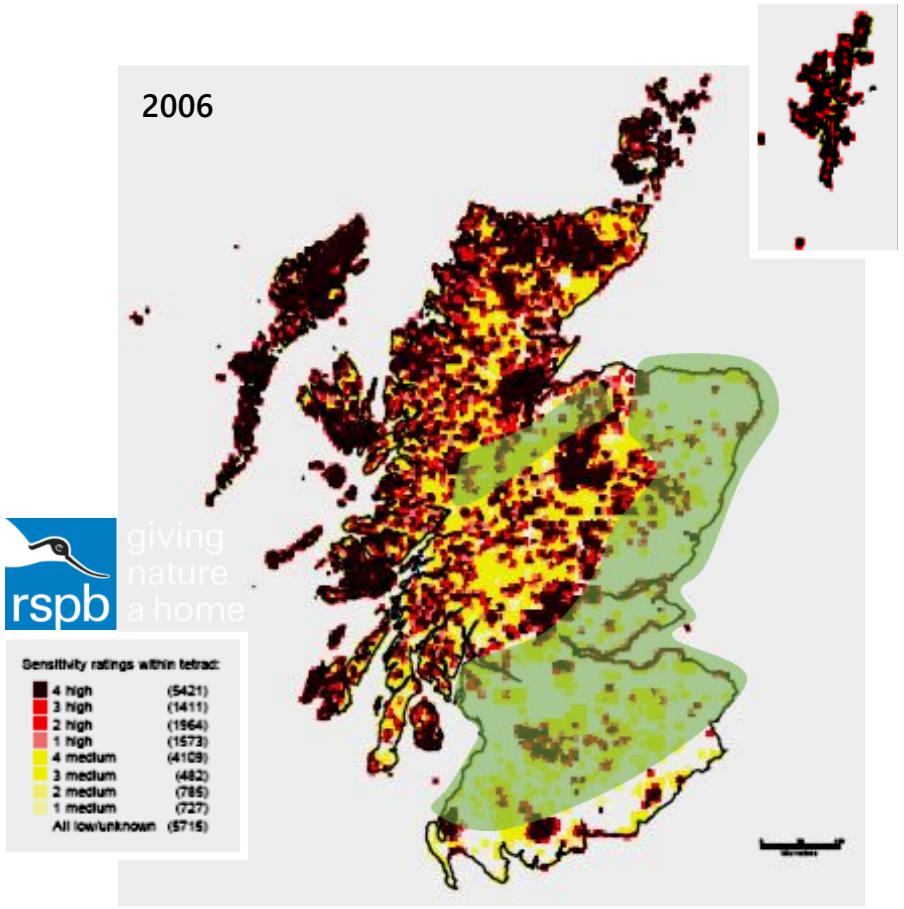
Geology



Grid network

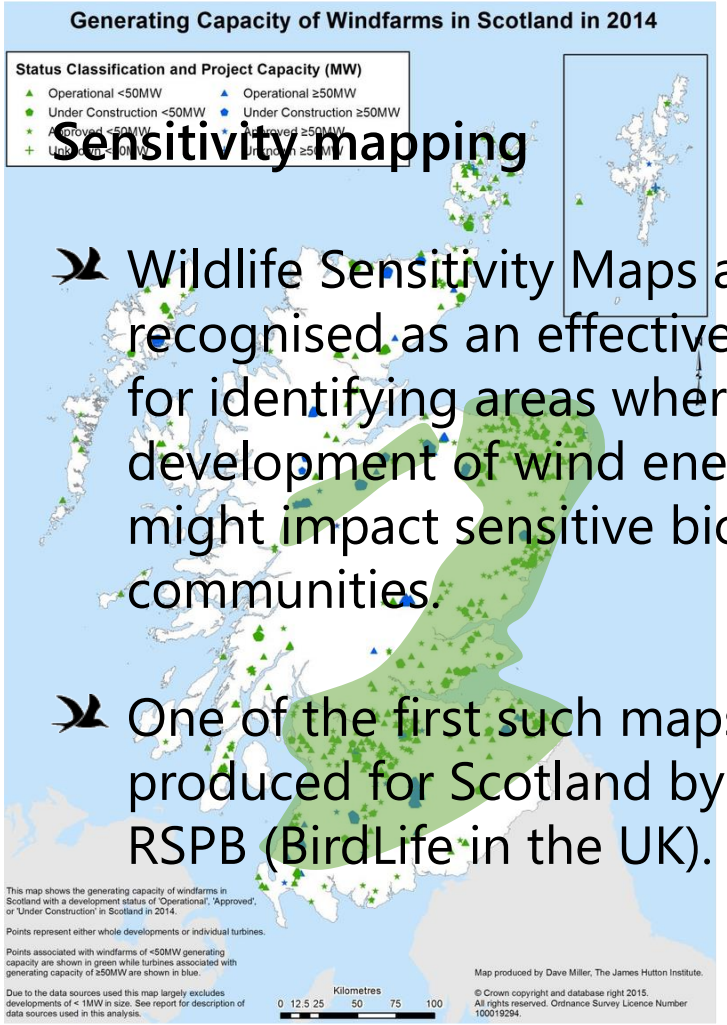


Avian Sensitivity



Sensitivity mapping

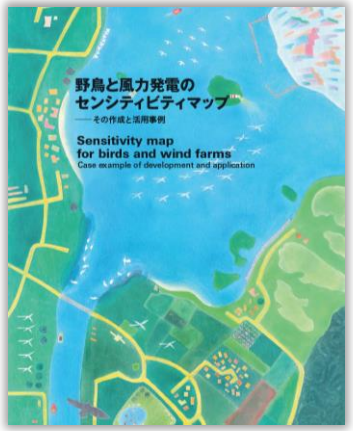
- Wildlife Sensitivity Maps are recognised as an effective tool for identifying areas where the development of wind energy might impact sensitive biological communities.
- One of the first such maps was produced for Scotland by the RSPB (BirdLife in the UK).

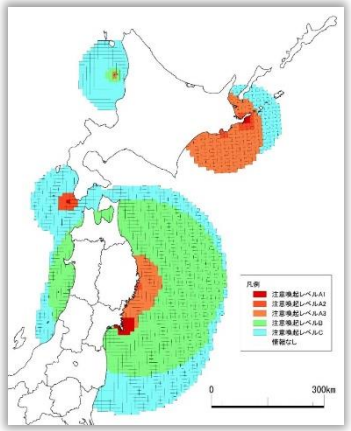


BirdLife is a world authority on developing maps of avian sensitivity

- BirdLife's *Soaring Bird Sensitivity Mapping Tool* tinyurl.com/MSBmap covers the Mediterranean, the Middle East and Northeast Africa.

- BirdLife works with governments, International Financial Institutions, consultancies and developers to promote sensitvity mapping.





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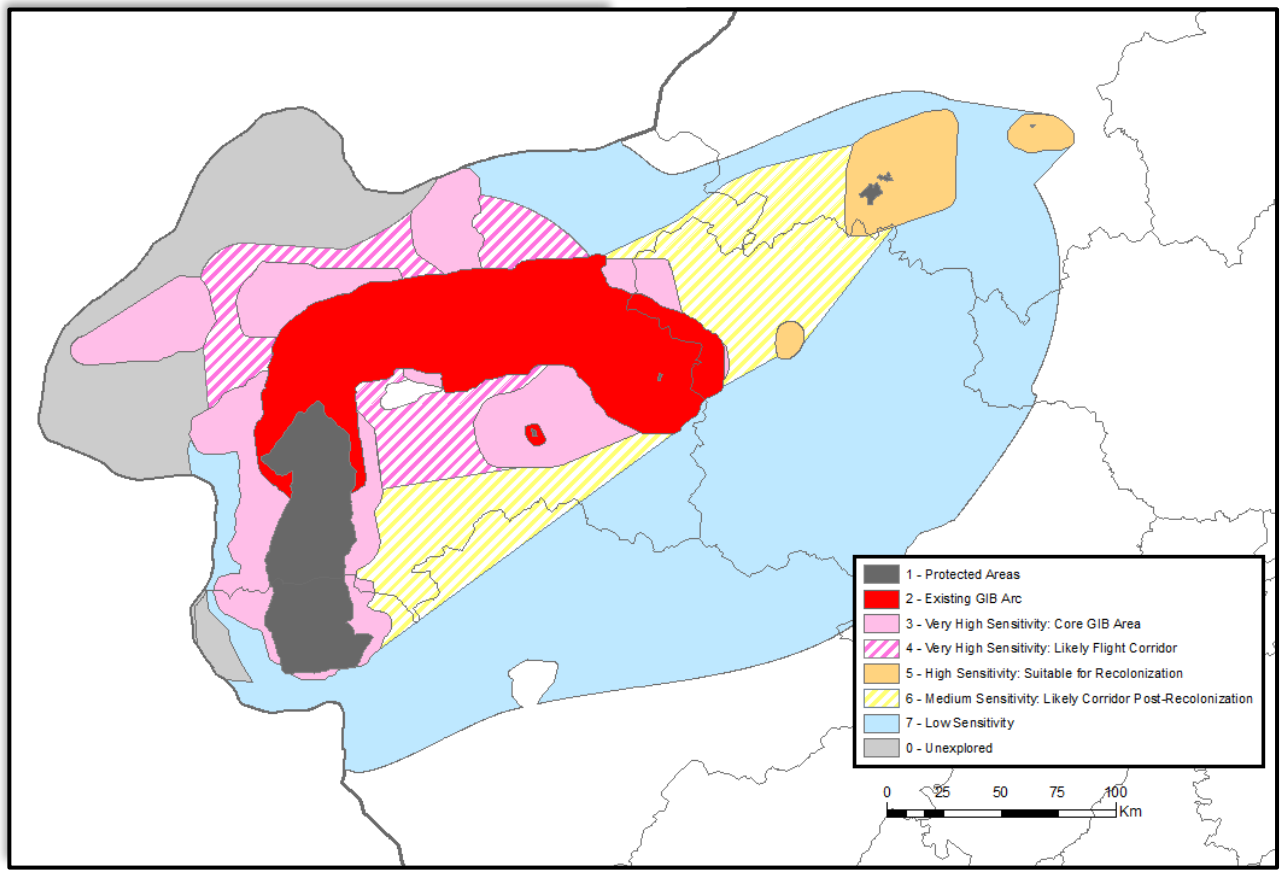

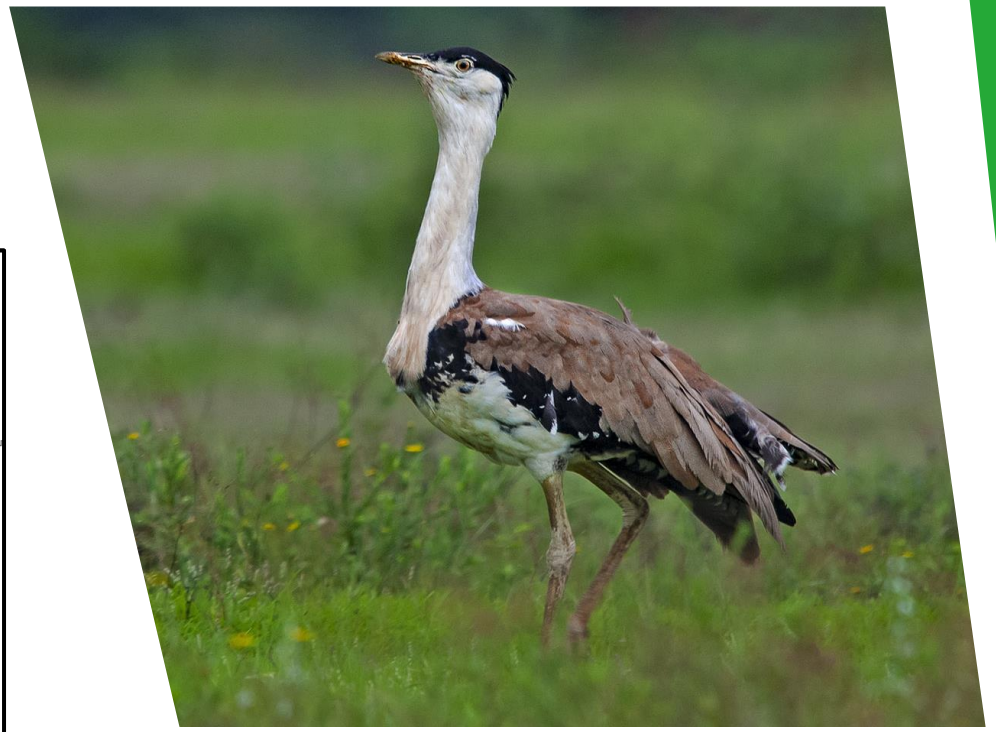

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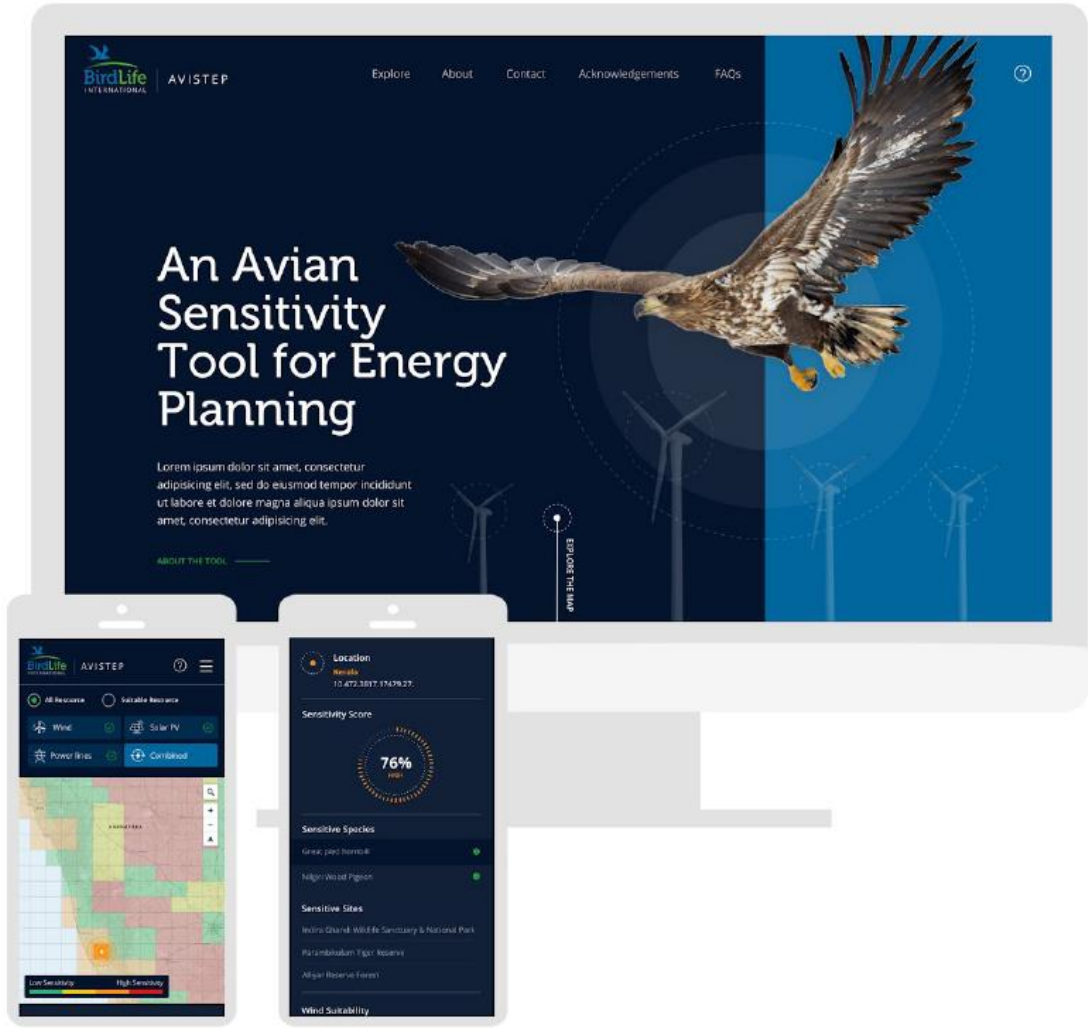
THE AVIAN SENSITIVITY TOOL FOR ENERGY PLANNING

AVISTEP will provide an assessment of avian sensitivity in relation to;

- Wind energy (on- and offshore)
- Photovoltaic (PV) solar
- Overhead power lines (transmission and distribution)



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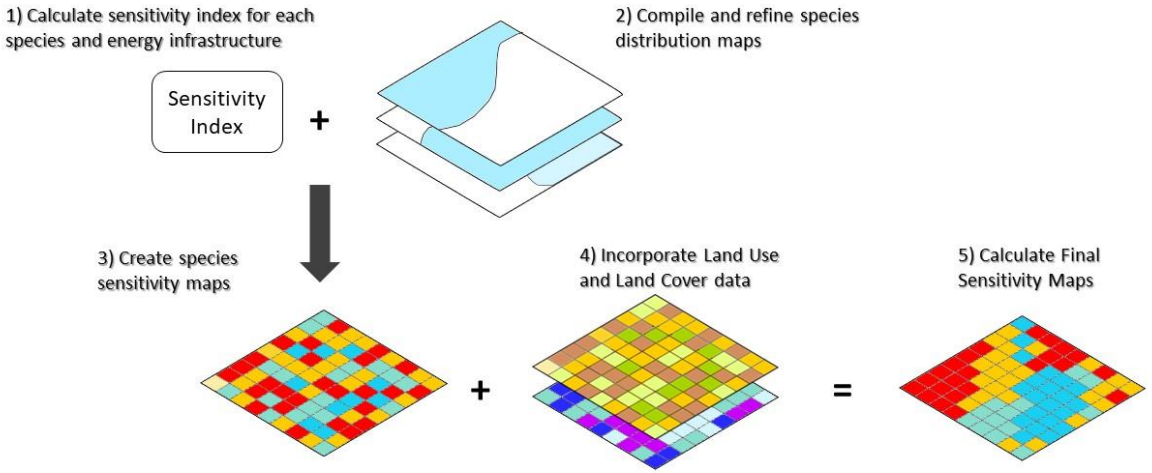
Wind Energy Sensitivity Index = Co + (Di/5) + CnS + S

Co = Collision

Di = Displacement

CnS = Conservation Status (Red List)

S = Survivorship (k- and r-selected species)



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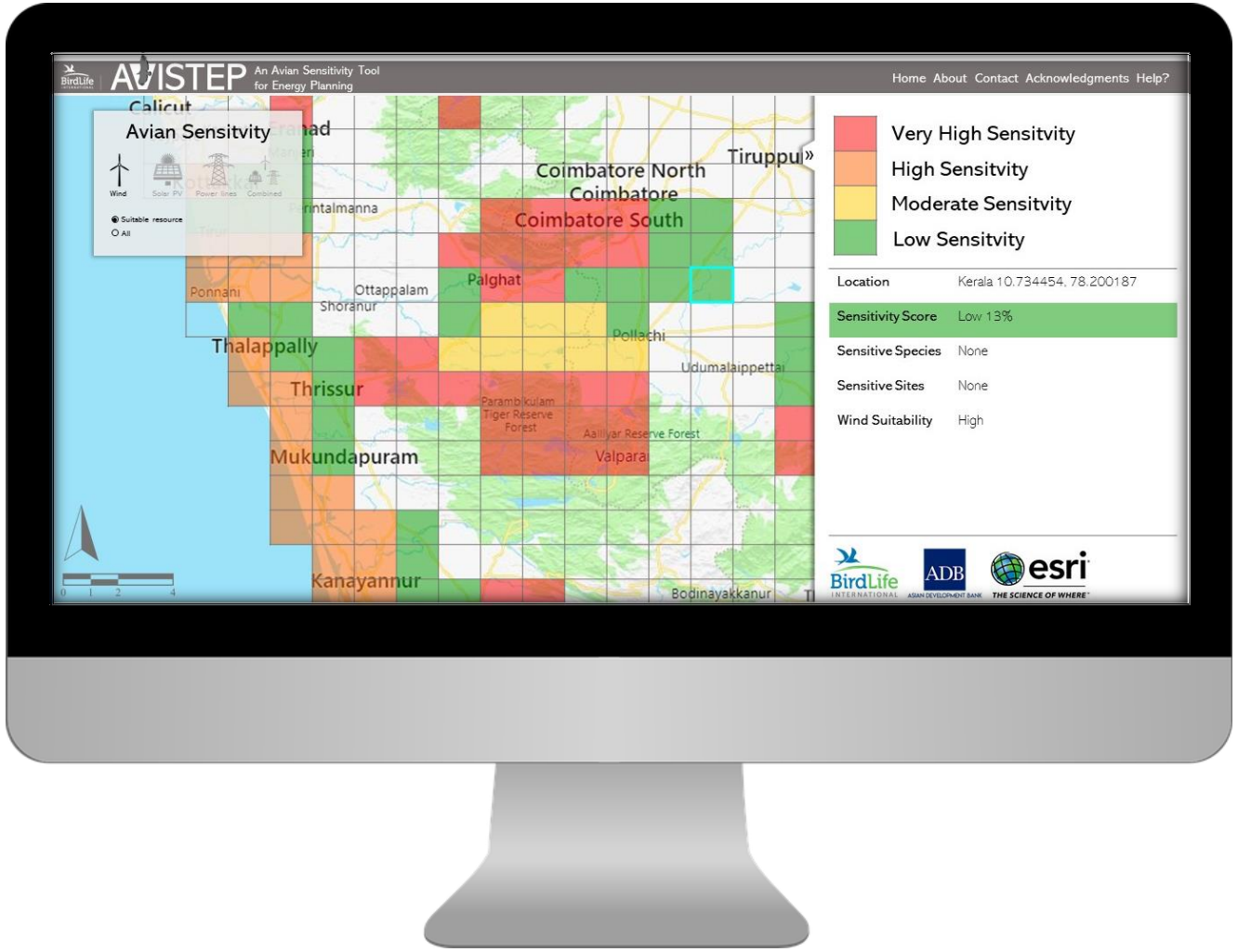
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Wind
Solar PV
Power lines
Combined
Suitable resource
All
Very High Sensitvity
High Sensitvity
Moderate Sensitvity
Low Sensitvity
Location
Kerala 10.734454, 78.200187
Sensitivity Score
Low 13%
Sensitive Species
None
Sensitive Sites
None
Wind Suitability
High
Calicut
Coimbatore North
Coimbatore
Coimbatore South
Tiruppu
Palghat
Ponnani
Ottappalam
Shoranur
Pollachi
Thalappally
Udumalaippettai
Thrissur
Parambikulam Tiger Reserve Forest
Aaliyar Reserve Forest
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Route Finder
117 kilometre Sensitivity 28%
146 kilometre Sensitivity 11%
123 kilometre Sensitivity 19%
Pimpri
Khadki
Pune
Mulshi
Haveli
Tala
Velhe
Purandhar
Goregaon
Bhor
Mhasla
Mahad
Kanheri
Khandala

AVISTEP Launch

June 2022 Asia Clean Energy Forum

Our longer-term ambition is to expand AVISTEP around the world, establishing it as a preeminent tool for renewable energy planning globally.