

Spatial Conservation Planning for Wind Farm Siting in Lesotho

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Objectives of Presentation

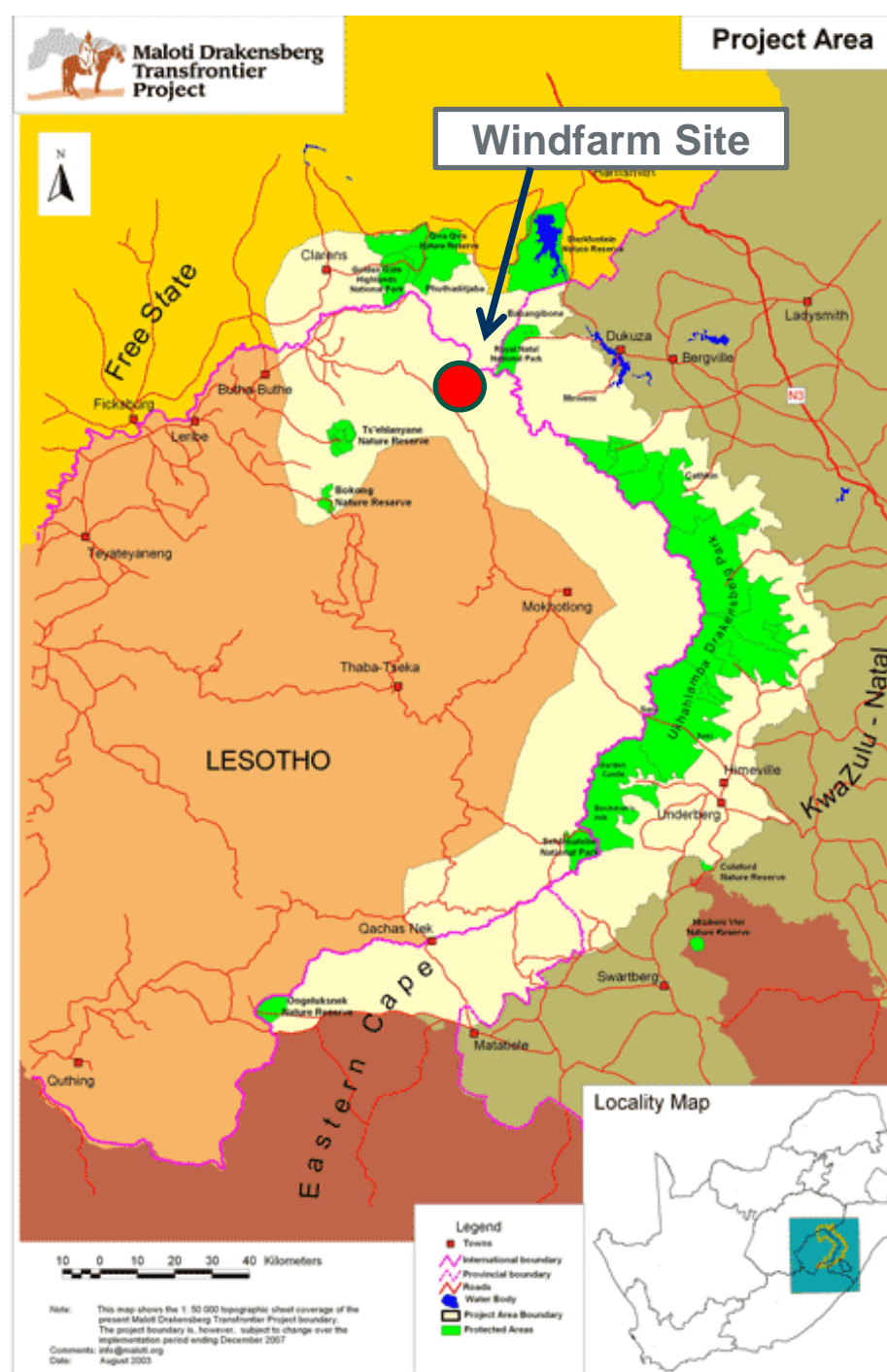
Windfarm Case Study - demonstrates the value of spatial data in early project screening and assessment

Success of this approach depends on:

- Knowledge of data existence
- Access and application of spatial data: ownership, use rights
- Understanding data sources (metadatabase)
- Experienced team familiar with study area and data sources

Location - Lesotho

- Landlocked within South Africa
- Small, largely rural population
- Source of Orange River
- Exports water to S Africa
- Dependent on South Africa for electricity and jobs
- Potential wind energy
- Maloti Drakensberg Trans-frontier Park (cream area)
- UNESCO World Heritage Site (green areas along E Border): scenery; heritage & biodiversity



Lesotho Environmental Context

- Open grassland,
- Pockets of woodland in valleys
- High altitude wetlands (eroding)
- Bearded Vulture – Flagship species
- Endemic alpine flora



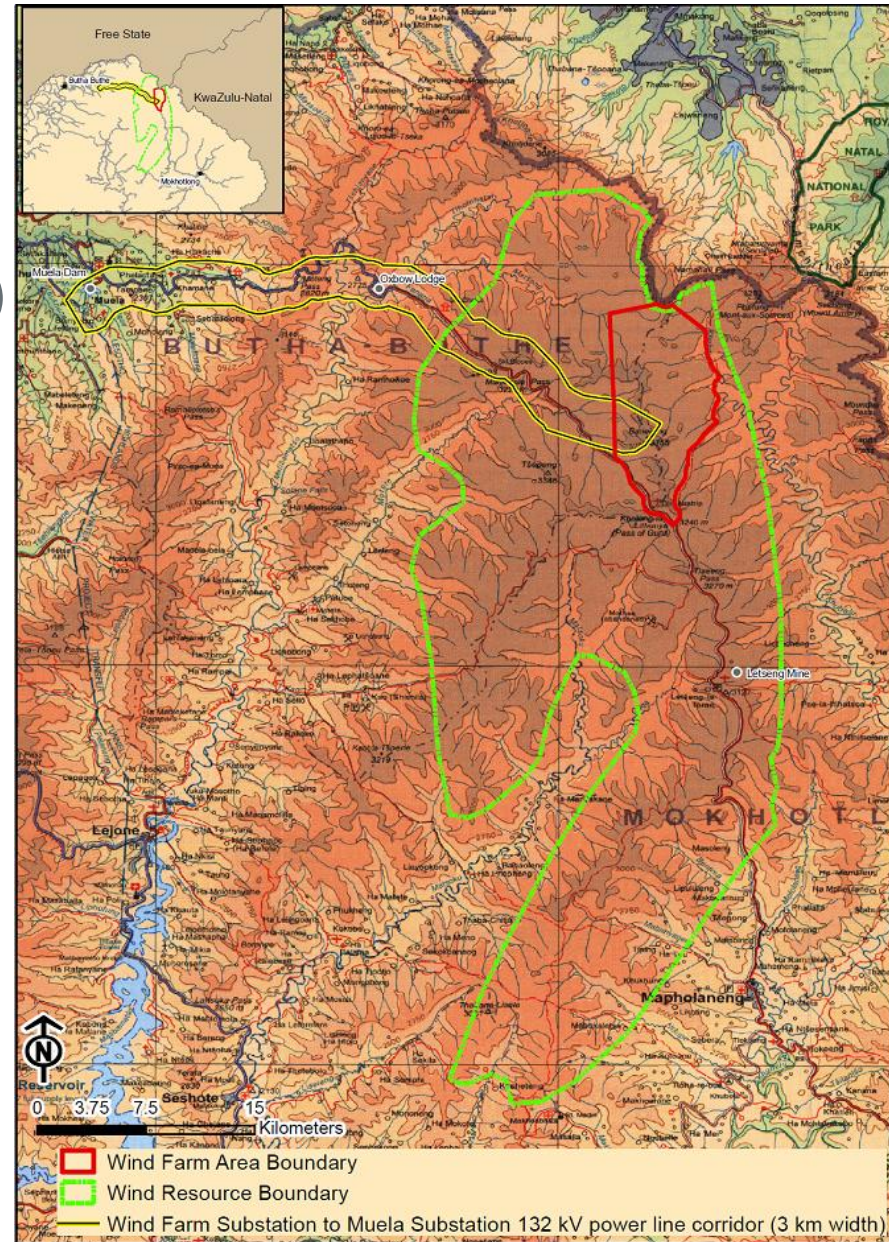
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- Livestock grazing
- Rural settlements (<2800m)
- Subsistence agriculture

The Project – 150MW Wind Farm

- 100 turbines (1.5MW) on ridge line at ~3200m
- New powerline of 39km (132kv)
- Above ground electrical connectors between turbines
- Internal road network
- Nearest turbine 2km from escarpment (cliff nesting birds)
- No alternative sites given for assessment in EIA
- Pre-screening - high bird risk at all sites



Windfarm Location – Mont aux Sources



Scoping Phase Tasks

Conservation Sensitivity Analysis (key focus):

- Assembly of Spatial Datasets :
 - Maloti Drakensberg Conservation Plan (MDTP 2007)
 - Mapping of cliff-nesting birds (key risk factor)
- Helicopter survey of cliffs
- Buffer zone mapping

Other Activities

- Viewshed analysis – impact on wilderness tourism
- Meeting with key conservation stakeholders in South Africa

Collision Risk Birds – Bearded Vulture

- Distribution – 2 subpopulations:
 - *Gypaetus barbatus barbatus*
S Europe, N Africa and Himalayas
 - *Gypaetus barbatus meridionalis*
S Africa / Lesotho
- Global IUCN Red List: Near Threatened
- Southern Africa: Endangered
- Nest in pairs on high cliffs >1800m alt.
- One chick per year – low pop. turnover
- Threatened with extinction: ~100-200 pairs left in Lesotho / South Africa.
- Fly large distances (up to 700km / day)
- Need thermal uplifts (eg along ridges)
- Threats: poisoning, collision with powerlines, traditional medicinal use,



Photo credit: Chris van Rooyen

Collision Risk Birds – Cape Vulture

- *Gyps coprotheres* – Endemic to Southern Africa
- IUCN Red List: Vulnerable
- Nest in colonies <10 to >1000 birds on high cliffs
- One chick per year – low turnover
- Threatened with extinction: pop size of 8000
- Fly large distances
- Use thermal uplifts on ridges
- Threats: poisoning, collision with powerlines, traditional medicine,



Photo credit: Chris van Rooyen

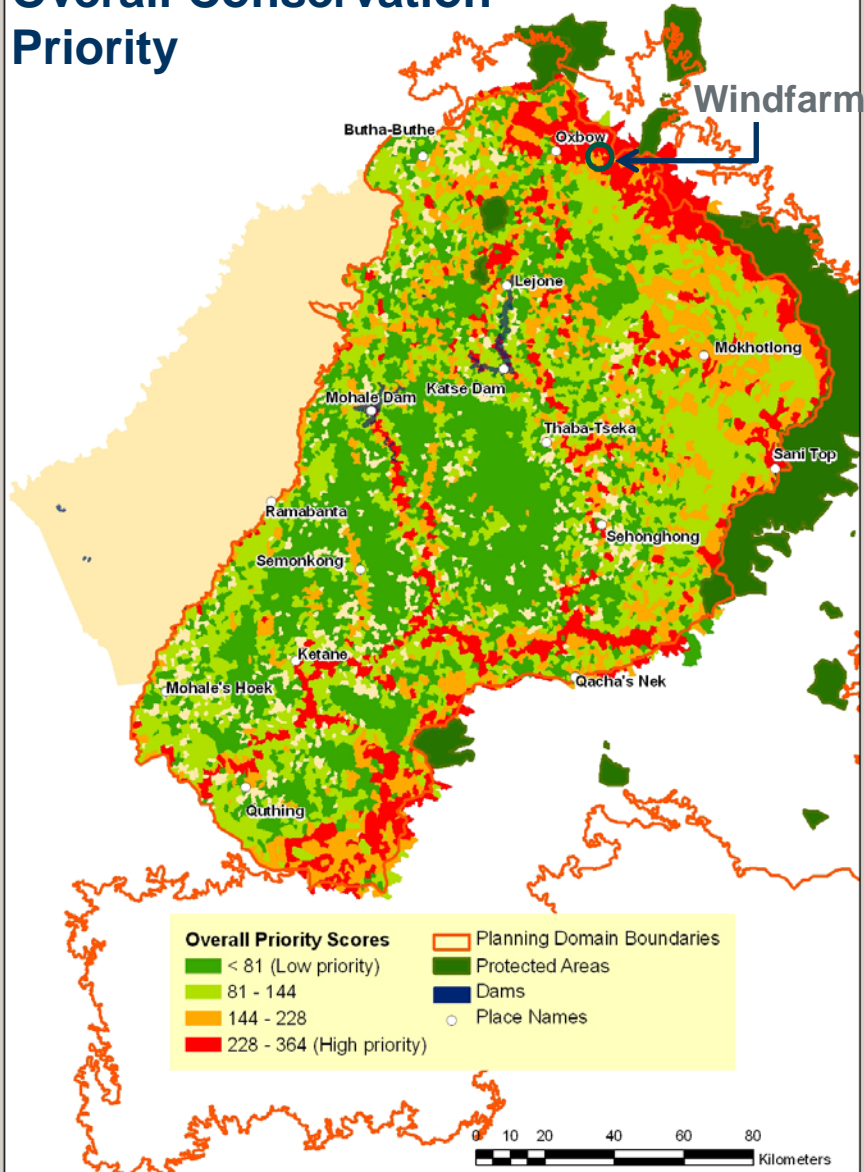
Conservation Planning Spatial Datasets

Spatial data from Maloti Drakensberg Transfrontier Park (MDTP) conservation plan (2005-2007):

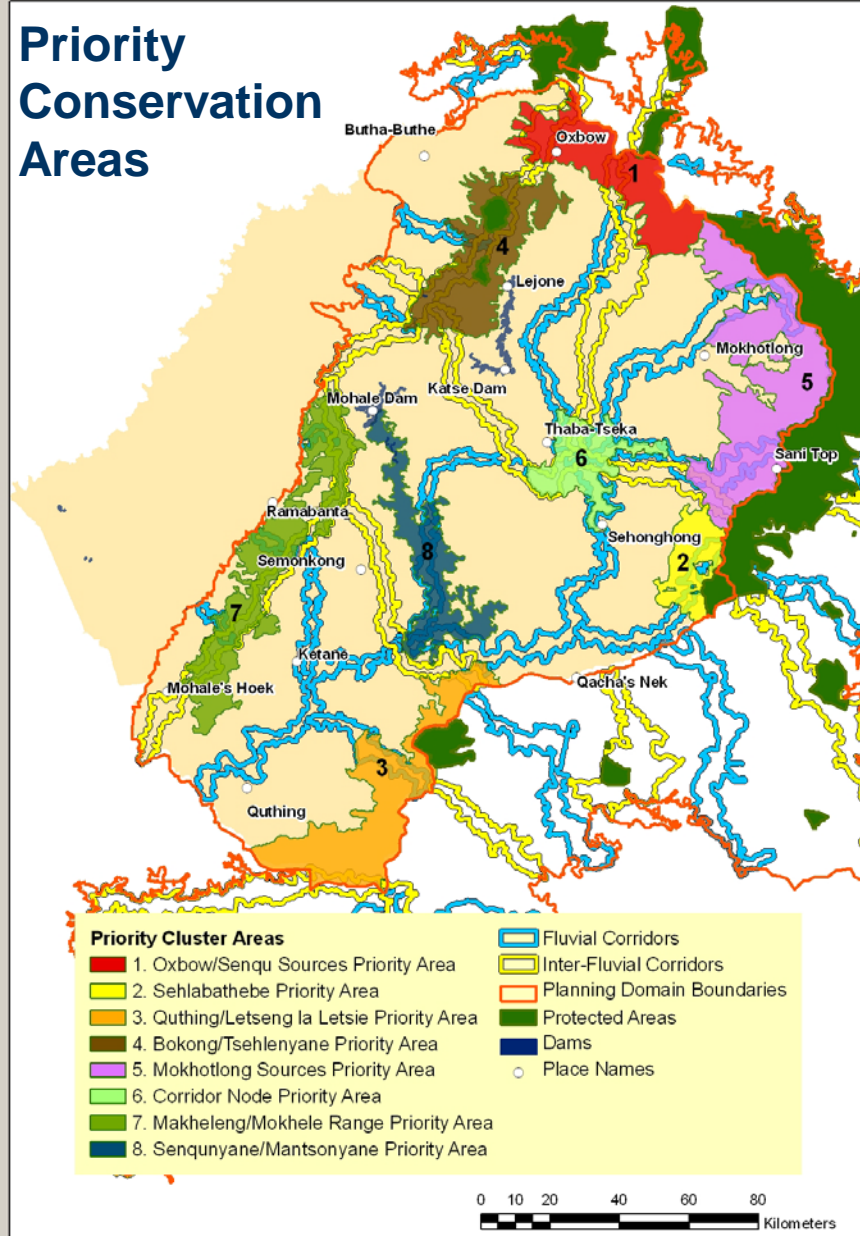
- Vegetation Types & Priority Alpine Flora
- Wetland Types (eg High Altitude Fens)
- Priority Birds (collision risk species) (eg Bearded Vulture; Cape Vulture; Black Eagle, Black Stork, Bald Ibis)
- Rivers and fish distribution
- Degradation status & Threats
- Integrated spatial conservation priorities
 - terrestrial & aquatic ecosystems and processes
 - priority conservation areas

MDTP Conservation Planning Outputs

Overall Conservation Priority



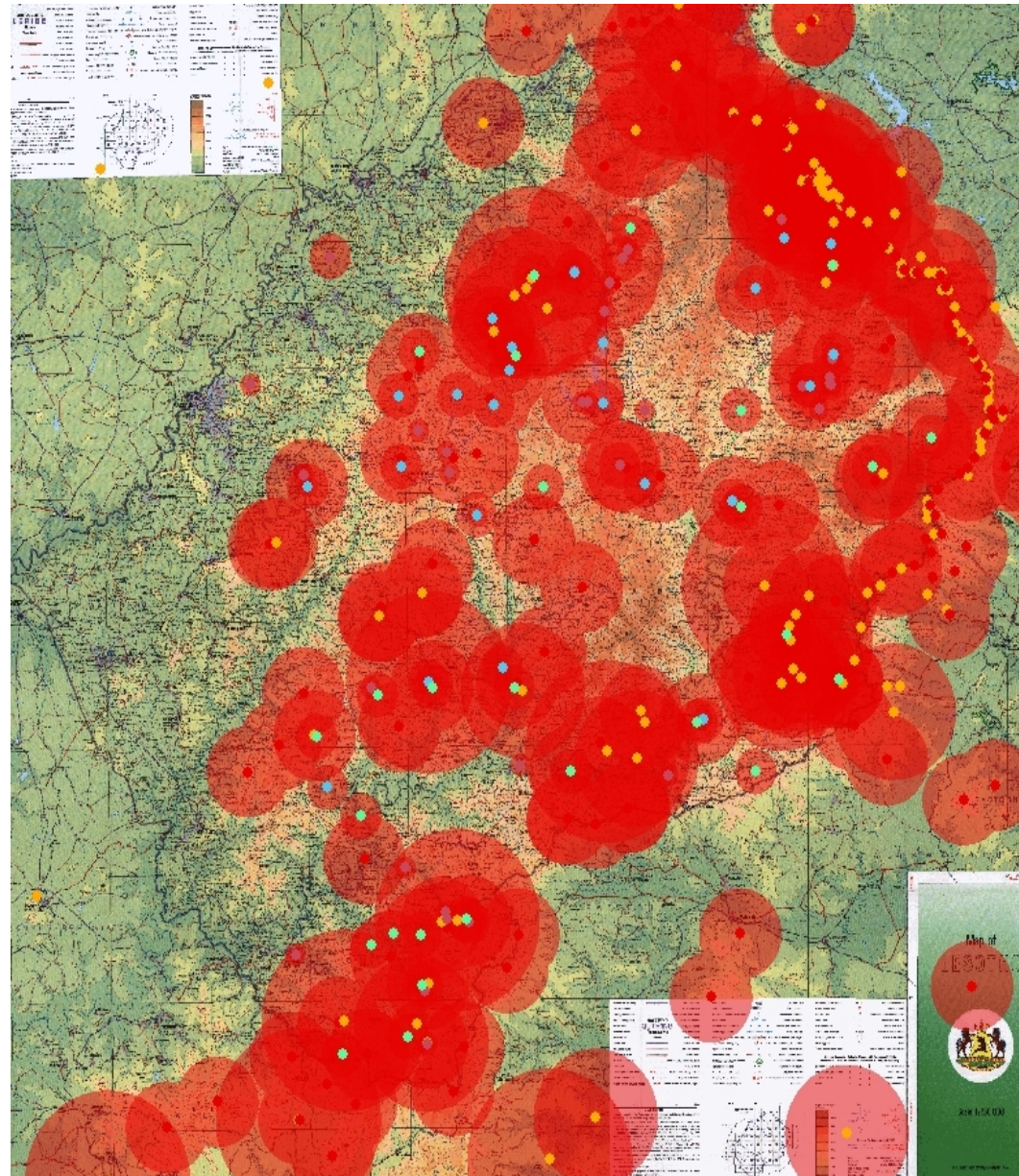
Priority Conservation Areas



Bird Buffers

Bird buffers

- 20km Cape Vulture colony >25 birds
- 15km Cape Vulture colony 10-25 birds
- 10km Bearded Vulture nests & Cape Vulture colonies <10 birds
- 5km Black Stork and Verreaux's (Black) Eagle
- 2.5km Bald Ibis colonies or nest



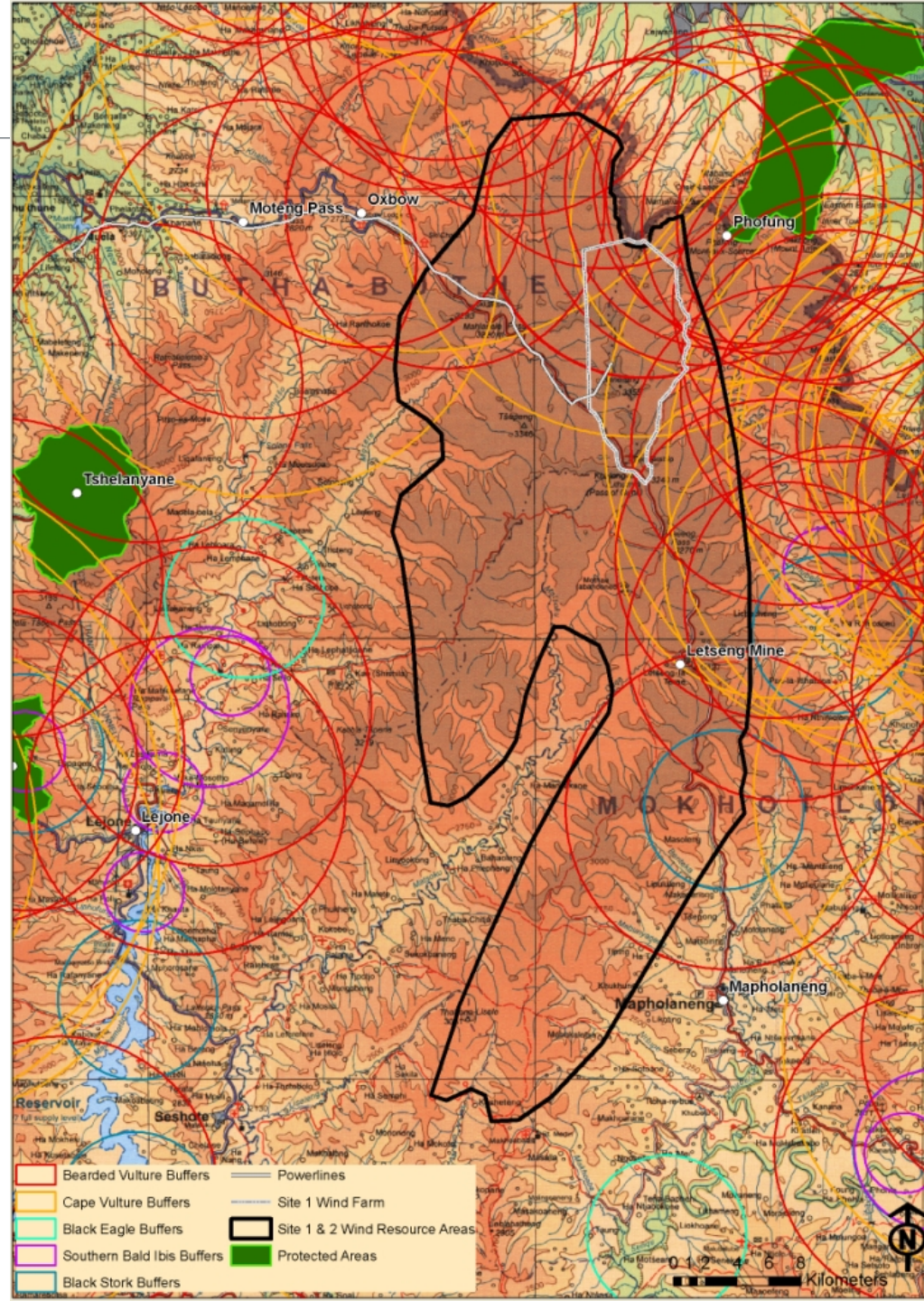
Buffer Results:

High overlap with collision risk bird buffers (red & orange circles):

- Bearded Vulture
- Cape Vulture

Highest density of Bearded Vulture on escarpment cliffs.

New Bearded Vulture nest found 2km from wind farm.



Key Outcomes & Subsequent Initiatives

Outcomes:

- Wind Farm – identified as a Potential Fatal Flaw
- Recommended EIA investigates alternative site to south
- Developer proposed captive vulture breeding programme as mitigation (non-application of mitigation hierarchy)
- Scoping Report not released & project discontinued

Subsequent Initiatives

- Separate wind farm near Letseng Diamond Mine approved
- Significant controversy and adverse publicity raised
- Birdlife South Africa engaging Ministry of Environment to develop good practice guidelines (still to be done)
- Other sites under investigation (different developers).

Adverse Publicity

BIRD EXPERTS RAISE ALARM

Lesotho wind farm threat to vultures

Tony Carnie

THE WHIRLING blades of more than 4 000 wind turbines in the Lesotho Highlands could wipe out Southern Africa's last stronghold of the endangered Bearded Vulture and degrade the neighbouring World Heritage Site in SA.

These are some of the fears of bird experts and conservation officials over the recent push to build wind farms in Lesotho to supply Eskom's SA customers with "green" and climate-friendly electricity.

Birdlife SA and avian scientists warn that plans of these birds still survive in Ethiopia and parts of East Africa, the Maloti-Drakensberg area has the only viable population in the southern hemisphere.

David Allan, the Durban Natural Science Museum curator of birds, said the project also posed a significant threat to the future of the Cape Vulture, classified as vulnerable in the Eskom Red Data Book of Birds. Other vulnerable species included Verreaux's Eagle, Black Stork and Southern Bald Ibis.

Ezemvelo KZN Wildlife, legal custodian of the Ukhahlamba-Drakensberg World Heritage Site, is also worried that a proliferation of wind farms close to the borderline could degrade the wild landscape values of the park and draw global criticism.

Already there are plans for a 150MW wind turbine farm in the vicinity of the Royal Natal National Park's Amphitheatre, one of the most iconic landmarks in SA.

Vulture experts estimate that there are only 100 remaining breeding pairs of Bearded Vulture south of the Equator,



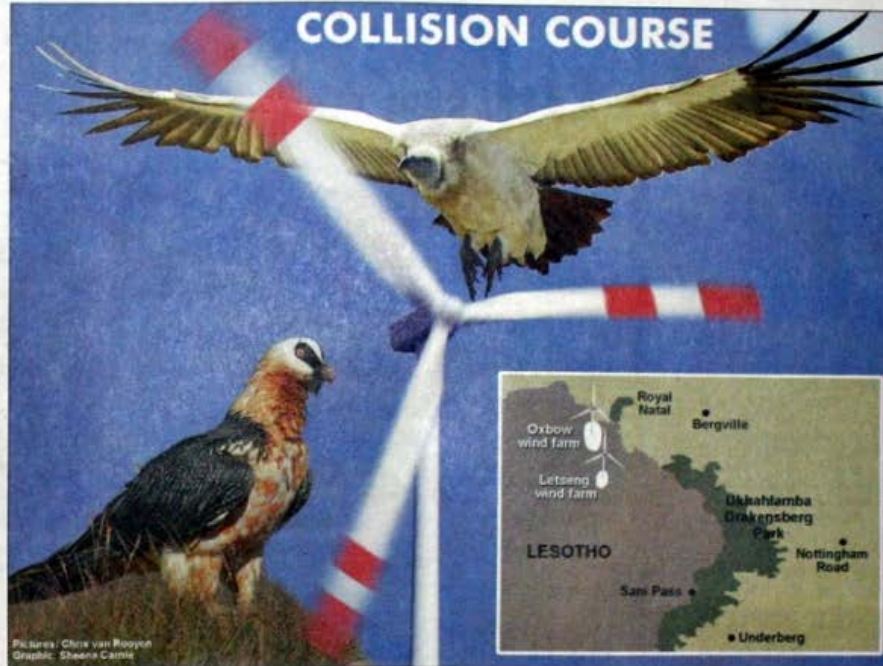
concentrated in the high-lying areas of Lesotho, KZN, Free State and Eastern Cape.

Though some of these birds still survive in Ethiopia and parts of East Africa, the Maloti-Drakensberg area has the only viable population in the southern hemisphere.

David Allan, the Durban Natural Science Museum curator of birds, said the project also posed a significant threat to the future of the Cape Vulture, classified as vulnerable in the Eskom Red Data Book of Birds. Other vulnerable species included Verreaux's Eagle, Black Stork and Southern Bald Ibis.

Eskom, the intended recipient of the Lesotho wind power, said it was aware of the plan but that it had not signed any agreement to purchase the electricity.

Nevertheless, Birdlife SA chief executive Mark Anderson has written to Energy Minister Dipuo Peters calling for



The endangered Bearded Vulture (left, and above left) and the Cape Vulture (top) are in the firing line from massive wind energy plans in the Lesotho Highlands. Several sites have been earmarked, including Sani Pass, Oxbow, Letseng and Masetise.



There are already plans for a 150MW wind turbine farm near Royal Natal National Park's Amphitheatre (above)

an urgent meeting of bird experts and government officials to discuss the impact on the region's birdlife before SA commits to buying any wind energy from Lesotho.

"A wind energy project on the scale proposed for the Lesotho Highlands would almost certainly be determined as fatally flawed under the

South African EIA system, purely on the grounds of its anticipated impacts on vultures," he said.

Peters had not responded. The largest project so far is from Breeze Power, a consortium 25 percent owned by the Lesotho government and 75 percent by South African, Chinese and other foreign in-

vestors. It hopes to generate 6 000MW of wind power before 2021.

Breeze Power quietly launched its first EIA last year, but the environmental consultants' contract was terminated, with neither Breeze nor the consultants explaining why the process stalled.

Other sources speculate that Breeze was dismayed by strong recommendations made against a wind farm near the Oxbow Plateau, in the vicinity of the Amphitheatre.

Breeze Power director Moss Leoka told The Mercury that the EIA would resume shortly with new consultants

and there were plans to mitigate the impacts of the Oxbow farm by shifting it about 15km southwards. There were also plans for a captive-breeding proj-

ect for Bearded Vultures to compensate for those killed in the Lesotho turbines.

"We are looking at breeding and releasing them faster than they are dying," said Leoka.

Turbine blades and towers could also be painted to make them more visible to birds.

But bird experts and Ezemvelo remain dubious about the viability of captive breeding plans or attempts to make turbines more visible. Recent research by University of Birmingham scientists suggest that birds live in a different visual world to humans.

In simple terms, making

turbines more conspicuous to human eyes was unlikely to solve the problems. While vultures had very keen eyesight they had adapted to looking down and to the side while searching for food – not forward, looking for obstacles, said research leader Prof Graham Martin.

Ezemvelo experts Ian Rushworth and Sonja Krüger, who studied Bearded and Cape Vulture movements in the Maloti-Drakensberg mountains with satellite trackers, say the population level of both species was already dropping by about 1% a year from poaching, poisoning and other threats.

Based on computer modelling studies, they estimated that just 200 turbines would push the rate of decline to about 5% a year for both species. Breeze Power plans translated to about 4 000 turbine towers.

Devastating

"The models (200 towers only) predict a devastating impact from wind farms, with a high probability of both populations going extinct. So-called 'clean' energy is not synonymous with 'green' energy," Rushworth and Krüger told the Pan African Vulture Summit in Kenya earlier this year.

Phillip Hockey, the director of the Percy FitzPatrick Institute of African Ornithology at the University of Cape Town and co-author of the birding bible, *Roberts Birds of Southern Africa*, has also spoken out strongly against the recent rush to build wind farms.

"Environmental experts in SA are being asked to comment on the likely impact of wind farms on a massive and immediate scale. What we see today is something akin to the gold rush of the 19th Century, but on a much, much greater scale. SA has no greater environmental challenge in its history than is posed by these cumulative wind farm proposals," he argued. ■ P12

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Threat to vultures as Lesotho wind farm gets go-ahead

The controversial wind farm proposed for Lesotho's Maluti-Drakensberg has received the go-ahead from the Lesotho Government. Conservationists are concerned that this decision does not bode well for the future of vultures in the region, or for the reputation of the fledgling wind energy industry in southern Africa.

The Maluti-Drakensberg Park has been identified as a transboundary World Heritage Site – an area of global importance for which both Lesotho and South Africa have responsibility. While the proposed wind farm does not fall within the Park, vultures move great distances and conservationists are concerned that the wind farm will be a threat to the overall population in the region.

PowerNET Developments (Pty) Ltd applied for permission to erect 42 wind turbines in north-eastern Lesotho. This site falls within the breeding, roosting and foraging grounds of important populations of both Bearded *Gypaetus barbatus* and Cape Vulture *Gyps coprotheres*. Cape Vulture, which is only found in southern Africa, is currently listed as Vulnerable. It is well known from international studies that vultures are prone to colliding with wind turbines.

BirdLife South Africa is concerned that the decision of the Lesotho Government to issue environmental clearance for the windfarm is procedurally flawed and not in line with the internationally-recognised precautionary principle.

"Additional studies required by the Record of Decision should have been completed prior to the approval, and should have informed the decision", said Samantha Ralston, Birds and Renewable Energy Manager at BirdLife South Africa. There is also

no assurance that stakeholders will be able to provide input on the additional reports or seek recourse should they be dissatisfied with the outcome. BirdLife South Africa and its conservation partners have therefore requested that the decision be reviewed.

BirdLife South Africa does not believe that we need to choose between renewable energy and birds. By working with wind energy developers, environmental consultants, as well as government and bird specialists, BirdLife South Africa's aim is to ensure that renewable energy is developed in a way that is truly sustainable ■

The proposed wind farm is within the breeding area of the globally Vulnerable Cape Vulture (fveronsi1; flickr.com)



Conclusions

Value of good systematic conservation planning data for:

- Screening of single project risks & early identification of Red Flags
- Comparison of alternative sites and alignments (eg roads / powerlines)
- Inform scoping level sensitivity and baseline assessments
- Inform critical habitat assessments (eg IFC PS 6)
- Inform biodiversity offset planning

Note: **Not** a replacement for site specific studies but a tool to guide project planning !

Acknowledgements

Key Contributors:

- Ornithologists: Andrew Jenkins (Independent) and David Allan (Curator of Birds at Durban Museum)
- Samantha Ralston (Birdlife South Africa)
- Grant Benn (GIS & Conservation Planner)

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