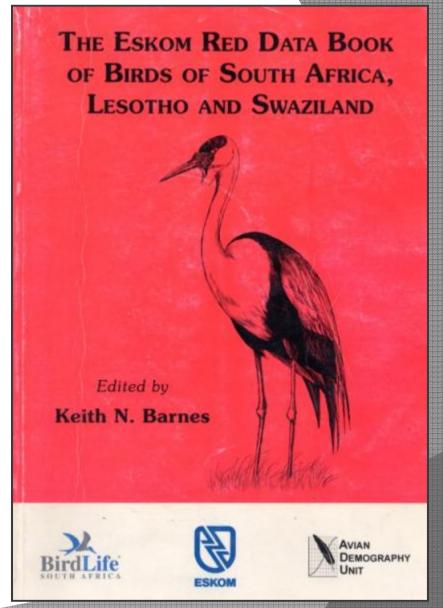




Red Data species

(125/844) = 15%!





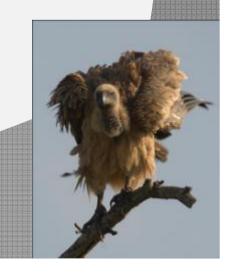






- Prevention is better than cure
- Experience in other countries showed that the correct placement of wind farms will minimise bird casualties
- International best practice
- Various examples Altamont Pass, USA and Tariffa, Spain

BLSA and EWT developed two tools to: **Guide** EIA practitioners, avifaunal specialists,
developers (industry), government and financiers
in **decision-making**



1. Avian Wind Sensitivity Map Retief et al.

2. BirdLife South Africa / Endangered Wildlife
Trust: best practice guidelines for avian
monitoring and impact mitigation at proposed
wind energy development sites in
southern Africa

Jenkins et al.

Avian Wind Sensitivity Map

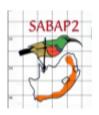
Retief et al.

Purpose of the Map:

To provide an indication of the geographic areas in South Africa where the possible establishment of wind farms might have a negative impact on birds

How is the sensitivity rating of an area calculated?

- Status of the land
- Status based on the species that occur at a specific locality



End of the migration route!!!!!!

Not a substitute for a dedicated avifaunal study!!

Status of the Land

The following were taken into consideration

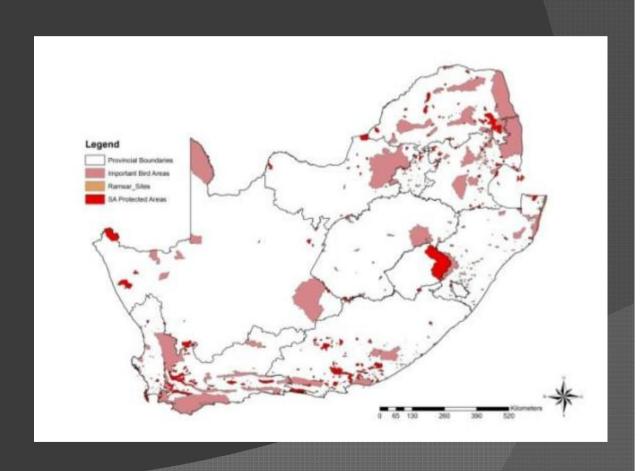
Formal protected area

- National Parks
- Nature Reserves

Ramsar sites

Important Bird Areas

Buffer Wetlands



Status of the Species

Species List

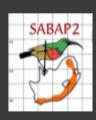
Conservation Score

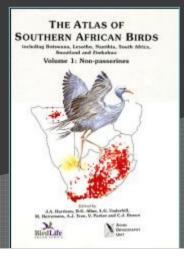
- Global Threatened Status
- Regional Threatened Status
- Endemic and Near-Endemic

Risk score

- Soaring
- Predatory
- Ranging Behaviour
- Flocking Behaviour
- Night Flying
- Aerial Display
- Habitat Preference
- Sensitivity to Disturbance
- Overlap with Wind Farms

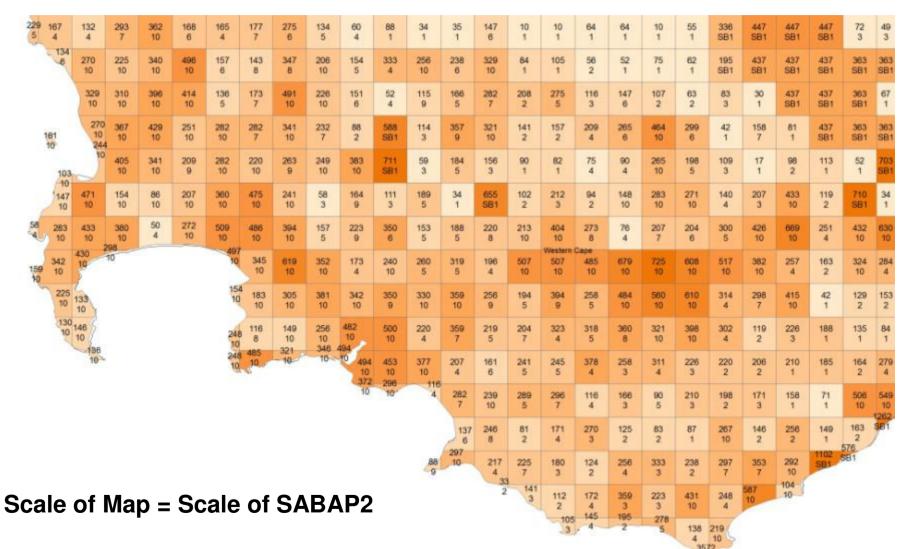
		-																	Appropries			
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		Global Brookers	Regional	Conservation		New.	Emberia	Conservation			Vest			Ranging		New	Arriel	Make	Sensitivity	Overlap mith		Species Princip Store
1	Common Names	d States	Batus	Status Score	Endonie	Endemic	Score	Sens	Sor	Wing Leading	Anthy	Sealing	Pretitory	Seharian	Florking	Phing	Display	Pademore	Disturbance	Wood Farme	Flak Source	Risk Stoor'D
2	Cage Wulture	71	10	36		15	11-	65	15	10	- 0	20	5	8	5	0	1	38	- 5	38	125	388
3	Rearded Volture		90						15	5	0	30	5	15	0	0	1	.30	. 5	30	126	386
4	Lodeigh Bosteri	91	10	94				94	10	9		1	0	15	10	- 5	1	36	- 5	31	105	386
5	Southern Raid Bis	70	- 10	26	20		26	- 14	5	3	2	5		- 11	10	- 1	-	30	5	36	194	296
6	Blue Crare	78	10	- 31	20		28		10	. 5	2	5	0	11	10	-	1	38	5	36	161	294
7	Olack Harrier	- 71	50	38		15	15	6	5	2	0	10	10	- 5	0	3	11	26	. 5	38	160	299
	Watted Crare	71	101	100				100	ti	5	2			4 .	5	- 2		. 36	- 11	36	н	200
9.	Great White Polices		50	94				- 11	15	10	2	15	0	11	.10	0	1	38	5	30	187	284
10	Stock Stock		50	38				98	10	5	2	20	0	- 8	- 0	0	1	м	5	N	117	264
11	Merial Exple	9	- 10	. 10				21	Ti .			ti	10	- 15				19		ж	186	298
12	Pink-backed Relican		.70	38					#5	5	5	ti			10			26	- 11	-16	100	279
13	Denham's Bostani	51	10	N				21	15	10	5	- 1	0	5	5	5	- 1	26	5	31	100	209
14	Lower Keetrel	78	70	N				28	2	2	0	5	10	11	10	- 6	-1	36	5	38	99	26
15	Alrican Mareh-Ramler	-	10	28				76	5	1	0	10	10		0	. 0	11	36	5	M	- 11	284
16	Seatown Ground Rendall	78	70	N				N	ti		2			- 11	5		1	- 10	11	36	11	266
17	Greater Flaminge		50	94				9	10	9	2	1	0	11	10	15	1	36	5	30	187	284
18	Lesser Flamings	51	50	28				94	10	5	2	1	0	11	10	15	1	26	5	30	167	264
19	Dumuna Tere	9	90	98				-	2	2	2			1	10	1		38	11	38	38	382
20	Pengrine Falcon		50	34				91	5	5		16	19	3		1	5	38		34	185	299
21	Alvisor Grass Del	1	- 10	24				28	2	1	0	1	10	5	0	- 15	1	26	-11	36	14	268
22	Size Swallow	70	101	90				100	0	1	. 0	1	10	0	- 5	2	- 1	38	11	38	11	254
23	Yellow billed Stork		- 99	34			+	98	ti	3	ż	16	+	1	10	+	-	26	5	×	160	254
24	Secretarylairel		50	10				SH .	10	i		16	10	1			- 5	36	5	38	100	250
	Cape Commount	91	50	54		15	Ħ.	6	- 5	5	2	- 1	0	- 11	10	- 5	1	26	5	30	- D	249
	Caspian Term		50	98				98	5	1	5	5	0	-1	5	- 5	5	26	5	30	127	246
_	Tultu Falcon	91		98				98	2	3		16	10	1		- 1	- 5	36	9	30	9.7	24
28	White-hooked Vulture	71	. 10	26				78	ti-	5		16	5	- 6	19		- 1	26	5		B	240
29	White looked Vulture	9	- 10	31				21	ti	5		1i	5	15	- 5		1	10	5	10	ti .	218
30	African Growned Engle		50	94				98	10	5	0	10	10	- 5	0	0	-11	10	5	30	95	290
31	Verrascer' Eagle			- 1					10	5		ti	19	š			-11	30	5	30	120	210
32	Gery Cranwool Crame	71	30	24				21	10	5	2	- 1	0	11	10	- 2	- 1	10	5	30	84	258
33	Towny Engle		70	24				78	10	2		15	19	5			5	20	5	16	O.	254
34	Handed Valture Second List 2nd Priority Score	101	. 10	10				106	11	5		16	- 5	- 15			- 5	-11	- 5		46	200
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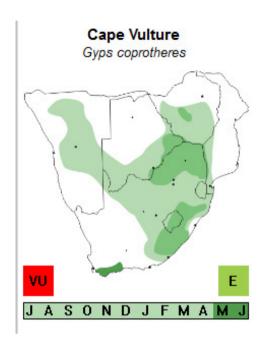




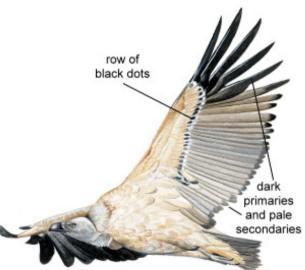
Western Cape



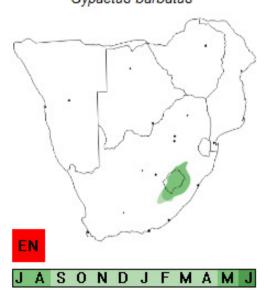
 $7 \times 8 \text{ km} = 5 \text{ min } \times 5 \text{ min}$







Bearded Vulture Gypaetus barbatus





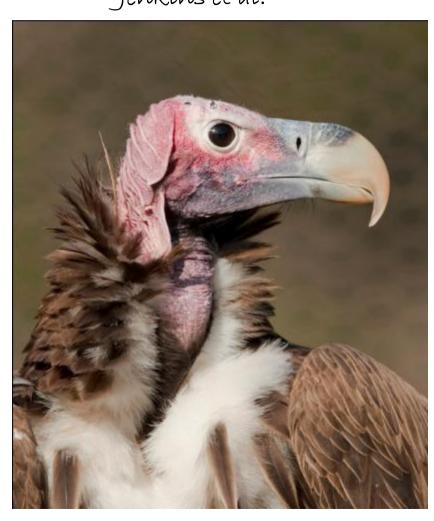


- The map is published on the BirdLife South Africa website <u>www.birdlife.org.za</u> go to conservation, birds and wind energy <u>http://www.birdlife.org.za/conservation/birds-and-wind-energy/windmap</u>
- And the EWT website <u>https://www.ewt.org.za/WHATWEDO/OurProgrammes/WildlifeEnergyProgramme/OurProjects/WindMap.aspx</u>
- KML File
- Clear guidance as to the purpose of the map and how the map should be interpreted!



Best Practice Avifaunal Monitoring/ Impact Assessment

Jenkins et al.



Why are the best practice guidelines important?

- Respect Biodiversity
- Management decisions should be based on good science
- International best practice = globally accepted in all developed countries
 - Equator principles
- Financing

Stages/Tiers of Monitoring

- 1. Reconnaissance and scoping phase
- 2. Baseline/Pre-construction monitoring
 Avifaunal Specialist Report and Impact Assessment
- 3. Comparative post-construction monitoring



1. Reconnaissance/Scoping

A brief site visit informs

- a desk-top assessment of likely avifauna and possible impacts,
 - review of existing literature and data
 - Avian Wind Sensitivity Map,
 - Atlas projects (SABAP1 and SABAP2)
 - CAR and CWAC
- Priority species
- No-go areas
- and the design of a site-specific survey and monitoring project

Aims of Baseline Monitoring

- Measure
 - potential collision risk
 - potential displacement
- Inform final turbine layout
- No-go and buffer areas



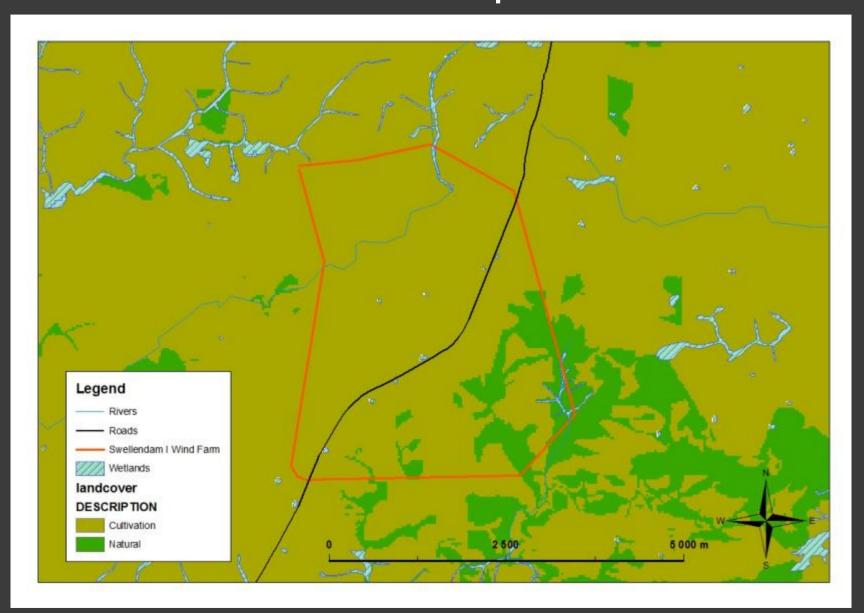
- To prevent and where prevention is not possible, mitigate impacts by informing the final design, construction and management strategy of the development
- Impact Assessment EIA

2. Baseline Monitoring

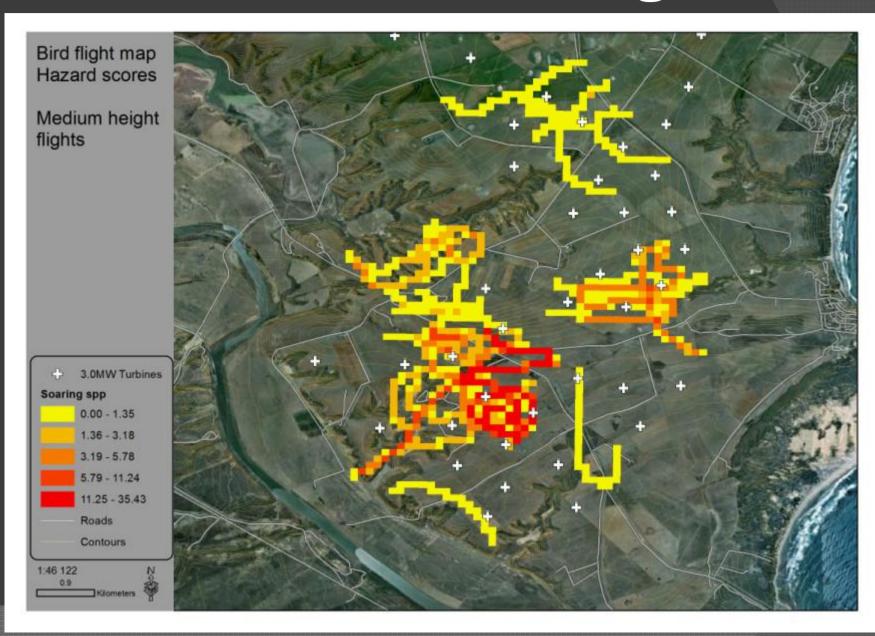
- A minimum of 4 surveys per year to allow for seasonal variation
- Surveys involve 5 -15 days per visit depending on the size of the site
- Abundance estimates (all species);
- Recording flight behaviour (priority species);
- A prediction of which species will be most at risk of collision and displacement;
- Monitoring of focal points nests/breeding behaviour and important wetlands (risk of displacement)
- Control or reference site



Traditional Avifaunal Specialist Studies



EIA with monitoring



Annual review:

- Participation of BLSA, EWT, BAWESG,
- Specialist Consultants,
- SAWEA (Industry),
- Eskom,
- DEA,
- IAIAsa???



- Quarterly and Final reports submitted to BLSA and EWT
- data will be centrally stored and analyzed by these organizations,
- to facilitate the assessment of results on a multi-project, landscape and national scale.







Minimum requirements for final report:

- Terms of reference
- Assumptions and limitations
- Detailed description of methods
- Habitat classes (turbine and control sites)
- Priority species (how selected)
- Results of monitoring
- Analyses
 - Habitat preferences
 - Statistical analyses of all flight data to test for associations between flight behaviour and a range of environmental factors
- Site specific flight behaviour maps indicating areas of highest risk
- Site specific collision risk rating per priority species (explain methods) from a collision perspective.





Minimum requirements for final report:

Discussion of results

 Discussions should present a synthesis of spatial data, statistical analysis and the various risk indices

 Management recommendations to mitigate the identified potential risks

Acknowledgements

- Co-authors (Jenkins, Retief & other)
- WEP EWT
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- Photos: C.van Rooyen



BAWESG

M. Diamond,

J. Smallie,

M. Anderson,

H. Smit,

E. Retief,

S. Ralston,

A. Jenkins,

C. van Rooyen,

R. Simmons,

D. Harebottle,

S. Stoffberg,

P. Barnard,

M. Brooks,

P. Hockey.





Contact

Hanneline Smit conservation@birdlife.org.za



Sam Ralston energy@birdlife.org.za



Megan Diamond megand@ewt.org.za