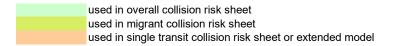
COLLISION RISK ASSESSMENT Sheet 1 - Input data



used in available hours sheet
used in large array correction sheet
not used in calculation but stated for reference

	Units	Value	Data											
Bird data											\Box			
Species name	San	dwich Tern												
Bird length	m	0.41												
Wingspan	m	1.00												
Flight speed	m/sec	10.3												
Nocturnal activity factor (1-5)		1												
Flight type, flapping or gliding		flapping												
			Data	a sources										
Bird survey data			Jan Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	D	ec
Daytime bird density	birds/sq km		0	0	0	0	0	0	0	0	0	0	0	0
Proportion at rotor height	%	0.0%												
Proportion of flights upwind	%	50.0%												
			Data	a sources										
Birds on migration data					_	_	_							$\overline{}$
Migration passages	birds		0	0	0	0 364	210	0	0	0	0	0	0	0
Width of migration corridor	km	3												
Proportion at rotor height	%	8%												
Proportion of flights upwind	%	50.0%												
	Units	Value	Data	a sources										
Windfarm data														
Name of windfarm site														
Latitude	degrees	57.50												
Number of turbines		3												
Width of windfarm (proportion)	km	0.7												
Tidal offset	m	0												
	Units	Value	Data	a sources										
Turbine data														
Turbine model	161	MW turbine												
No of blades		3												
Rotation speed	rpm	12												
Rotor radius	m	122.5												
Hub height	m	142.5	Jan Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	, D	ec
Monthly proportion of time operational	%		90%	90% 9)% :		00%	90%			90%	90%	90%	90%
Max blade width	m	8.500												
Pitch	degrees	30												
Avoidance rates used in presenting re	95.00%	Data sources (if applicable)												
				·		•								
		99.00%												
		99.50%												

COLLISION RISK ASSESSMENT (BIRDS ON MIGRATION) Sheet 2 - Overall collision risk All data input on Sheet 1: from Sheet 1 - input data from Sheet 6 - available hours no data entry needed on this sheet! Bird details: other than to choose option for final tables from Sheet 3 - single transit collision risk Species Sandwich Tern from survey data Flight speed m/sec 10.3 calculated field Flight type flapping Windfarm data: Number of turbines Rotor radius 122.5 m Minimum height of rotor m 142.5 Total rotor frontal area sq m Sep Feb Mar May Jul Oct Nov Jan Apr Jun Aug Dec year average % 90% 90% 90% 90% 90% 90% 90% 90% 90% 90% Proportion of time operational 90.0% Stage A - flight activity per annum Migration passages Migrant flux density birds/ km 121403.3 8% Proportion at rotor height % Flux factor Option 1 -Basic model - Stages B, C and D Potential bird transits through rotors Collision risk for single rotor transit (from sheet 3) 16.0% Collisions for entire windfarm, allowing for birds per month non-op time, assuming no avoidance or year Option 2-Basic model using proportion from flight distribution Option 3-Extended model using flight height distribution Proportion at rotor height (from sheet 4) 10.5% Potential bird transits through rotors Flux integral 0.0542 Collisions assuming no avoidance #VÆRDI! ####### ###### ###### ###### #VÆRDI! #VÆRDI! #VÆRDI! #VÆRDI! #VÆRDI! #VÆRDI! #VÆRDI! #VÆRDI! #VÆRDI! Collision integral Average collision risk for single rotor transit #VÆRDI! Stage E - applying avoidance rates 0.00% Using which of above options? Option 1 birds per month 95.00% Collisions assuming avoidance rate or year 98.00% 99.00% 99.50% Collisions after applying large array correction 95.00% 98.00% 99.00%

99.50%