

Birds and Solar Energy Best Practice Guidelines: comments and response table

General comments

Issue	Raised by	Comment	Response
Need for, and purpose of the guidelines	Kent Russell, Stantec (Canada)	Overall, I think the document is detailed and provides a great stepping stone for the industry (not limited to South Africa). As a general comment, I tried to review it in terms of the ability for me to apply it to the region I work in (prairie provinces of Canada). The more regions this document can be applicable to, the more robust it will be (e.g., following internationally accepted terminology, using IBA criteria, etc.).	Thank you!
Need for, and purpose of the guidelines	Terence Govender	The executive summary contains generic statements and not related to the extensive EIA process undertaken in SA by independent specialists as part of the EIA process. Guidelines must be presented based on local practices.	Agreed, although we must also learn from international experiences.
Need for, and purpose of the guidelines	Dick Berlijn, Subsolar	We have gone through your new regulations and agree that birdlife must be considered and protected in any new development.	Please note that our guidelines are not legislation.
Need for, and purpose of the guidelines	Sandi Robertson, Wildlife Biologist, Alberta Environment and Parks	We (Alberta Environment and Park) are also in the process of creating guidelines for the solar industry in Alberta. My opinion is that your guidelines are comprehensive and well done.	Thank you!
Need for, and purpose of the guidelines	Terence Govender	<i>First line second paragraph (Executive summary):</i> This does not make sense: do you want to avoid OR minimise the impacts? All infrastructure projects affect birds. As such we need to put in place the best Mitigation measures, if not, we will not build any new infrastructure projects in the world.	Please refer to the mitigation hierarchy, a principle firmly embedded in the National Environmental Management Act, which states "That the disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied".

<p>Need for, and purpose of the guidelines</p>	<p>Davin Chown, SAPVIA</p>	<p>We find the guidelines onerous, unreasonable and unjustified. The net effect of what you proposed, without considering inputs from the industry despite committing to do so, simply increases project time lines costs and risk all of this with very little real-life operational validation behind the guidelines.</p>	<p>Comment noted. Our intention is to reduce risk to the environment and we have made every attempt to reduce the burden on developers (e.g. by adopting a tiered approach and promoting for data sharing). We will gladly amend our recommendations if our concerns are proved to be over-cautious and will continue to engage with industry to find solutions. We are confused by your concern that we have not considered inputs from industry as this is the very process underway.</p>
<p>Need for and purpose of guidelines</p>	<p>Davin Chown, SAPVIA</p>	<p>We have noted that insufficient on-site monitoring has been conducted in South Africa. In this context we have also noted that, for example, objections to a project using the proposed guidelines as a basis for these objections, thus treating the guidelines as they were valid, agreed and accepted by all parties. This is simply bad faith on the part of BLSA and flies in the face of the supposed consultative process.</p>	<p>We are pleased that the value of on-site monitoring has been recognised. It is not clear what particular objections are being referred to, but any objection from BirdLife South Africa would be formulated around whether an impact assessment has adequately identified and addressed impacts. While the guidelines (draft or not) may help determine the former by surmising our current state of knowledge, it is likely that, in the absence of any guidelines, our opinion and recommendations would have been the same. While we hope to get agreement and acceptance from relevant stakeholders, the guidelines are a BirdLife South Africa product. It represents our specialist opinion and has been favourably reviewed by two international experts.</p>
<p>Need for and purpose of guidelines</p>	<p>Davin Chown, SAPVIA</p>	<p>Until we have evidence that the guidelines have been amended, via a proper process of consultation and negotiation based on acceptable scientific research and observation, we remain opposed to them as they stand and will resist their implementation. We do not accept that there is locally validated scientific evidence for your guidelines.</p>	<p>We note that SAPVIA's code of conduct includes the following principles 1) businesses should support a precautionary approach to environmental challenges; and 2) undertake initiatives to promote greater environmental responsibility. As we understand it SAPVIA is requesting two things 1) evidence that the guidelines have been amended and 2) evidence that there is a need for the guidelines. With regards to the former, we will provide you with an updated version of the draft guidelines as soon as this has been completed, and propose we meet again to discuss these changes.</p>

			<p>Scientists working elsewhere in the world have raised concerns that large-scale solar energy (PV and CSP) can cause significant changes in land use, which may be associated with negative ecological effects (for example, Hernandez et al. 2014). While we are not aware of similar studies in South Africa, we believe that a precautionary approach is warranted and is aligned to SAPVIAs principles as well as those of the National Environmental Management Act.</p> <p>The Eskom Red Data Book of Birds in South Africa, Lesotho and Swaziland (2015) provides ample evidence that habitat loss is already a significant threat to birds in our region. According to feedback from DEA in 2015, 422 applications for solar energy have been received with a combined capacity of 20 663 MW. Using an average of 3 ha per MW that equates to just under 70 000 ha of land that could potentially be transformed. It is our opinion that habitat alteration of this potential scale must be subjected to rigorous assessment, both at a site-specific and cumulative scale.</p> <p>There is some evidence of birds colliding with PV panels (much like birds collide with windows) in the literature (for example Walston et al. 2015 and 2016). However, more research is needed with regards to the potential significance of these impacts. It is, however, important to note that collision-related impacts alone are not pivotal to determining the need for, or scope of, avifaunal impact assessment for PV facilities.</p>
<p>Need for and purpose of guidelines</p>	<p>Davin Chown, SAPVIA</p>	<p>We cannot support your assertion that the guidelines must be implemented whilst the research is being done and the two must be done in parallel. We cannot support your approach and need the research to be concluded so the guidelines can then be agreed between all parties.</p>	<p>Refer to comments above. BirdLife South Africa stands by its position that the impacts of solar energy on birds and their habitats must be adequately assessed. These guidelines provide recommendations with regards to the appropriate assessment protocols. We respect your position with regards to endorsement of the guidelines. However, unless the solar industry is prepared to put a hold on further EIA applications for solar energy until the results of this research is completed, we remain of the</p>

			opinion that the standard of impact assessments must be improved. Our guidelines, following a tiered approach based on type (PV, CSP trough, CSP tower) and size of development, as well as habitat sensitivity, reflect what we would recommend on a case-by-case basis when we comment on EIAs.
Scope of guidelines	Savannah Environmental	The guidelines as drafted are very focussed in tower plants. If this is the main concern the should other solar technologies not be subject to different requirements more focussed on specific impacts thereof. It is recommended that separate guidelines be developed for power tower and other solar technologies.	We note your suggestion, but disagree that the guidelines are primarily focussed on tower plants (see Table 1)
Consultation	Davin Chown, SAPVIA	Our response is not meant to be a comprehensive review of the rational and methodology etc, but rather states our concerns with the approach, such as stating the that RE Associations have given endorsement to these guidelines and that they have been developed in consultation with us, when in fact they have not.	We have made an effort to engage and consult as widely as possible, including with individual developers and with industry representatives. SAPVIA was invited, and due to present at the Birds and Renewable Energy Forum in 2015 when the guidelines were discussed; unfortunately you were not able to attend at the last minute. SASTELLA was present and actively engaged in the discussions. This very engagement is part of the consultation process. At no point in the guidelines do we suggest that any RE association has endorsed the guidelines, although we do hope that we can get to a point of where we have industries support. It was perhaps premature Birdlife South Africa's part to include this claim about wide consultation in the first draft, but reflected our intention of consultation (this process) prior to the finalisation of the guidelines.
Consultation	Terence Govender , SolarReserve	The presentations made at the public forum lacked major detail from what in this document. To date, none of our suggestions was taken into account. I suggest another public forum to discuss the comments and a way forward to ensure we benefit the environment and the Developers/ SA	The Birds and Renewable Forum was the first formal engagement with industry and amendments to the draft guidelines were made available following this event for stakeholder comment. Industry has now had the opportunity to comment (i.e. this process) and further amendments are being made. We have also had follow-up meetings with key stakeholders. Unfortunately we

			are not able to accommodate all the industry's recommendations and still meet the objectives of the guidelines (i.e. ensure impacts on birds are adequately assessed). We will consider a further forum to discuss final comments.
Consultation	Davin Chown, SAPVIA	You have not considered the inputs and comments made at the workshop, and in fact have simply ignored the inputs. This is unacceptable and this confrontational approach does nothing to a build good working relationship between the parties	We did amend the guidelines in response to inputs received in the workshop and have similarly amended the guidelines in response to written comment. We have met with SAPVIA to discuss outstanding concerns, as these were not expanded on it the comments. It may not always be possible to take up stakeholder comment and still meet the objectives of the guidelines (i.e. ensure that impacts on birds are adequately assessed).
Consultation	Davin Chown, SAPVIA	Was a way forward, whilst we are supported of responsible development of projects, the development of any guidelines must be a) done on mutually agreed basis (i.e. jointly developed programme and objectives), b) based on sound agreed monitoring and assessment methodologies and programmes piloted on current operational sites, as agreed between all parties and BLSA, and c) results/outcomes of the monitoring programme to be used to validate and further develop the proposed guidelines and establish a long term programme of implementation which is mutually agreed and accepted.	We would welcome the opportunity to work more closely with industry and will gladly consider revising our guidelines once such a process is in place.
Consultation	Davin Chown, SAPVIA	Whilst the meeting (of 17 February 2016) may have taken us forward collectively we would need to have evidence that the amendments you said may be incorporated into the guidelines will in fact be incorporated and the guidelines will be amended in a manner that represents a reasonable, fair and equitable mechanism and approach to the process of bird	We are unclear what is meant by "collective review". The guidelines been peer reviewed by the Birds and Renewable Energy Specialist Group, two international experts, and now industry and other stakeholders have had an extensive opportunity to provide input. We will provide you with clarification on our proposed changes to the draft guidelines and continue to engage through meetings etc.

		<p>monitoring. We will need a collective review of these before we can agree to them. Thus we need to see evidence of this process of engagement from your side.</p>	
<p>Consultation</p>	<p>Davin Chown, SAPVIA</p>	<p>Please be advised that our exchange yesterday in no way endorses the guidelines in any way, and this only constitutes a first step in a revision process that may lead to mutually acceptable guidelines. What we learned yesterday gave us more cause for concern both in terms of your process as well as the content of the guidelines.</p>	<p>One of the reasons that the BirdLife South Africa's 2012 guidelines on solar energy are being updated is that many stakeholders requested more clarity on the expected scope of avifaunal impact assessments – the 2012 guidelines left much up to the discretion of the specialist. The draft guidelines have undergone an extensive consultation process. They were reviewed by the Birds and Renewable Energy Specialist Group, and then by two international experts. A presentation on the draft guidelines was given at the International Association for Impact Assessment South Africa Conference, 13 August 2015, and the guidelines were discussed in detail at the Birds and Renewable Energy Forum, 15 October 2015. SAPVIA was invited to attend and present at the latter meeting, but failed to show up at the last minute. On request of industry, we allowed for an extended comment period of two months, well beyond the norm in South Africa. SAPVIA asked for further extension to this deadline, which we agreed to without hesitation. Our meeting on 17 February is further indicative of our intent to adopt a consultative approach; we requested the meeting as we wanted to better understand SAPVIAs specific concerns - few substantive issues were raised in your comments on the guidelines, which focused largely on concerns around lack of consultation and lack of evidence.</p> <p>We would like SAPVIA to promote environmental sustainability and as such to endorse the guidelines when finalised, but we respect your current position in this regard. While we acknowledge the financial and practical implications of the guidelines for industry, we believe that it is important to find a balance between the industry's concerns and the imperative to protect the</p>

			environment.
Consultation	Davin Chown, SAPVIA	<p>Whilst we are supportive of responsible development of projects, the development of any guidelines must be:</p> <p>a. done on mutually agreed basis (i.e. a jointly developed programme and objectives),</p> <p>b. based on sound agreed monitoring and assessment methodologies and programmes piloted on current operational sites, as agreed between all parties and by BLSA, and</p> <p>c. results/outcomes of the monitoring programme to be used to validate and further develop the proposed guidelines, and establish a long term programme of implementation which is mutually agreed and accepted.</p>	<p>We are pleased that SAPVIA is supportive of responsible development and we would value the opportunity to work with you to find a mutually agreeable solution, but a solution that still allows for adequate assessment of the impact on birds. The aims of the guidelines are outlined in the document and we would welcome constructive input in this regard. However, we question the need to “pilot” the guidelines. The survey methods proposed for impact assessment are well-established and well-tested survey techniques. There is no need to test these further. We are, however, committed to update our guidance with regards to the required scope of assessments and recommended mitigation measures as our understanding of the impacts and issues improves.</p>
Consultation	Davin Chown, SAPVIA	<p>We have become aware of a workshop that you are due to hold with the DEA around the guidelines very shortly. You mentioned to us that you were under pressure to complete these guidelines but failed to tell us that this was in preparation for the forthcoming workshop. It is deeply disappointing that you choose not act in an open, honest and transparent manner and declare your intentions. This does not constitute good faith negotiations and flies in the face of your stated intent to work collaboratively with the industry.</p>	<p>The training workshop with the Department of Environmental Affairs (DEA) was convened by DEA in partnership with BirdLife South Africa and the South African Bat Assessment Advisory Panel. The intention of the workshop was to foster dialogue and help develop a shared understanding between stakeholders, including between the relevant departments within DEA (i.e. Biodiversity, Strategic Infrastructure Development, Compliance and Enforcement and Integrated Environmental Management). While we touched on solar energy, the primary focus and trigger for the meeting was to clarify how DEA responds (or needs to respond) to the results of operational phase monitoring of birds and bats at wind farms. Following discussions with SAWEA, we requested that SAWEA be included in these discussions, as they too are seeking clarity on these issues.</p> <p>BirdLife South Africa has regular meetings with the DEA and we would not be surprised if SAPVIA had similar engagements. It is not our intention to exclude SAPVIA</p>

			<p>from discussions; on the contrary, one of the intentions of our Birds and Renewable Energy Forums (convened by BirdLife South Africa and the EWT) is to foster debate amongst all stakeholders.</p> <p>We will not finalise the guidelines before the meeting with DEA, or before a further meeting with SAPVIA. The pressure to complete the document is in no way related to the DEA workshop, but comes from stakeholders (e.g. specialists and environmental consultants) who are eager for more clarity than our 2012 guidelines provide.</p> <p>There was no plan to finalise the solar energy guidelines during the DEA workshop, or even to discuss the solar energy in much detail; we had planned on sharing the current state of knowledge relating to the impacts though. We therefore propose that a separate meeting be held with SAPVIA, SASTELLA and DEA to discuss the solar energy guidelines at a later date.</p>
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EIA process and the guidelines

<p>EIA process and the guidelines - timing</p>	<p>Leanna Rautenbach, Solar Reserve</p>	<p>With regards to the recommendation that baseline surveys start before the EIA process - How will this be done? The DEA approves the EIA specialist terms of reference during the scoping phase. If the approved scope of work differs from the study, the work will have to be revised and redone. How will this fit in with the DEA timelines as promulgated in 2014?</p>	<p>It is recommended that the initial phases of the assessment be conducted before the commencement of the formal EIA process. There is no reason that a developer should not appoint an environmental consultant and EAP early on in the process. A similar approach is recommended in DEAs draft Minimum Requirements for Biodiversity Assessment. The responsibility does ultimately falls on DEA to decide whether the proposed assessment methods are adequate. They should therefore be consulted as early as possible.</p>
<p>EIA process and the guidelines - timing</p>	<p>Terence Govender, Solar reserve</p>	<p>This guideline does not provide proper explanation and guidance on what must be done for what period. 1-2 years does not make sense. As such, any monitoring must be done during the EIA process if needed. We cannot add another year to the EIA process, the current EIA process does not allow for this.</p>	<p>We suggest that the initial consultation takes place before the EIA application is lodged with DEA. This is the “pre-application phase” as referred to in DEA’s draft minimum requirements for biodiversity assessment – <i>i.e.. information gathered during pre-application phase, before formal submission of the application</i></p>
<p>EIA process and the guidelines - timing</p>	<p>Savannah Environmental</p>	<p>The timing for impact assessment and scoping is unclear. The regulatory timeframes do not allow for extended period of monitoring to be taken following a scoping phase. If this is not intended to be the scoping phase of an EIA process, then please make use of a different term here. It is not possible to define study area and scope of assessment at the scoping stage of the assessment process regulated timeframes under the 2014 Regulations. The scoping study and part of the monitoring process for regimes 2 and 3 will need to be completed prior to the commencement to the formal EIA process.</p>	<p>We have amended the terminology and provided further clarification.</p>
<p>EIA process and the</p>	<p>Leanna Rautenbach,</p>	<p>This proposed timeframe for Regime 3</p>	<p>We have amended the terminology and provided further</p>

guidelines - timing	SolarReserve	pushes the assessment outside the EIA phase – should this not be incorporated into the EIA timeframes?	clarification. Data collection should be initiated prior to the EIA process being initiated.
EIA process and the guidelines - timing	Leanna Rautenbach, SolarReserve	The methodology needs to be approved by the DEA for the EIA phase of the impact assessment. Does this mean that the EIA will be delayed with 6 – 12 months?	It is recommended that the initial phases of the assessment be conducted before the commencement of the formal EIA process. The responsibility does ultimately fall on DEA to decide whether the proposed assessment methods are adequate. They should therefore be consulted as early as possible.
EIA process and the guidelines - timing	Andrew Pearson, Arcus	The Scoping report has to define the scope of the 12 months study of a Regime 3 project, it end up being compiled a long time before the EAP commences there scoping stage. This must be communicated to EAP. The timing and alignment with EAP's and the DEA process is a concern for me.	Noted. We have renamed “avifaunal scoping” and now refer to this as Preliminary Avifaunal Assessment and clarified that this should be conducted before the EIA application is lodged.
EIA process and the guidelines - timing	Terence Govender	This (12 month surveys) must occur during the EIA process, if needed- all sites to be treated on an individual basis.	Please see above.

Terminology

Terminology - Title	Terence Govender	The tile “Solar Energy” should be replaced by “Birds and Solar Power Generating Facilities”	Thank you. We have amended the title.
Terminology - CSP	Terence Govender and Leanna Rautenbach, SolarReserve	Please relook at this the definition of CSP and include all technologies and the correct description.	Thank you. We have revised this
Terminology - scoping	Savannah Environmental	If this (Scoping) is not intended to be the scoping phase of an EIA process, then please make use of a different term here.	Thank you. We have renamed this stage “Preliminary Avifaunal Assessment”
Terminology - hardware	Leanna Rautenbach, SolarReserve	Please define “solar hardware”	The context of these guidelines solar hardware refers to solar panels, heliostats, CSP troughs etc., but in the case of CSP also include the power block. We have included this in the glossary.
Terminology - utility scale	Leanna Rautenbach, SolarReserve	Please define utility scale	Utility scale implies large-scale power generation that feeds into a grid for sale. What constitutes “utility-scale” is the subject of some debate in the literature, but it can be assumed that it involves a capacity of a couple of MW or more.
Terminology - small scale distributed solar	Leanna Rautenbach, SolarReserve	What is a small scale distributed solar facility?	Small –scale distributed generation refers to installations with a small output (e.g. less than 1MW) where energy is generated and/or stored by a variety of devices (e.g. multiple rooftops). Compare to utility scale generation.
Terminology – significance (regional)	Leanna Rautenbach, SolarReserve	Define regional significance	Regionally significant populations or features are those that contribute to observed biodiversity pattern and/or process at regional (as opposed to local) scale.
Terminology – significance (local)	Kent Russell, Stantec (Canada)	Local significance – This term could provide confusion because it is unclear how it is defined. E.g., an argument could be made that any wetland is locally significant (especially in a landscape where water is limiting). We have a lot of PV solar projects proposed in the province of Alberta, Canada, that are in the 10 MW range. The direction from the provincial government is to site these projects in cultivation, however, we	Defining significance is a challenge and even placing a standard buffer around IBAs is difficult given how IBAs and the species they are designed to protect vary. We suggest that the specialist applies their mind to the issue.

		are in the prairie pothole region, which means there are an abundance of wetlands (a quarter section [800m x 800m] could have 5-10 small wetlands). Considering the classification regime, you could argue these cultivated sites with small wetlands could fall within either regime 1 or 2. Also, I assume the ranking system is indicating that a project needs to be within an area of local/regional/national significance? It would also be useful to define if you are considering a distance from a significant area as well (e.g., 2 km from a nationally significant IBA – does this still constitute High Avifaunal Sensitivity).	
Terminology – solar flux	Leanna Rautenbach, SolarReserve	Is there a difference between solar and thermal flux?	Yes. Solar flux refers to the amount of <i>solar energy</i> passing through an area, while thermal flux is what is commonly called heat (thermal energy). According to Walston et al. 2015 “Any object exposed to solar flux... will absorb energy and be affected by that energy based on the object’s size and optical properties (dark objects absorb sunlight better than light objects), its mass and thermal heat capacity (how much absorbed energy is required to generate a temperature increase), and its duration in the flux zone). The air temperature itself is virtually unaffected except in the immediate vicinity of the receiver. This is because air absorbs very little of the solar energy, and only air directly contacting the receiver is heated to any significant degree”.
Terminology - impactful development	Savannah Environmental	Please reword (text in executive summary relating to regime 3) – this is not clear what is intended. What is an impactful development?	Addressed. Table 1 has also been included in the executive summary.
Terminology - impactful development	Leanna Rautenbach, SolarReserve	Impactful must be defined	Addressed
Tone	Thomas Siepelmeyer, IPD power	The Birdlife (BL) report is set in a “doomsday” tone and not written in a	The lead author of the guidelines, Dr Jenkins, is one of South Africa’s leading ornithologists and the guidelines

		neutral and sceptical scientific manner when it describes the PV facilities and its relationship to birds and also contains major flaws wrt the so-called "destruction of habitat".	have also been reviewed by international experts, we therefore do not agree with your interpretation of the tone. However, we have amended the text. In South Africa many sites for PV facilities are bulldozed, or otherwise altered, resulting in the destruction of vast tracts of habitat. We are not clear how this statement can be interpreted as being flawed.
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Impacts

<p>Impacts - general</p>	<p>Davin Chown, SAPVIA</p>	<p>There is no valid scientific basis for the onerous proposed guidelines. We have reviewed the BLSA guidelines (and in particular the rationale for the guidelines and the statements that impacts are poorly understood in many jurisdictions, in particular South Africa) and find that whilst some may seem relevant for other markets or climates, those proposed for South African circumstances have no sound, evidential scientific basis.</p> <p>Given that built and operational PV projects in South Africa have not recorded any fatalities, it is incumbent on BLSA to conduct its baseline studies and provide substantive information that demonstrate, in a proper scientific and valid manner, that PV plants have the impacts suggested as per the proposed guidelines.</p> <p>We believe that BLSA needs to provide more substantiated and scientifically validated research based on findings from local studies that justifies these kinds of guidelines given the impact on the industry and consequently on local economic development which is critical to South Africa at this time.</p>	<p>According to feedback from DEA in 2015, 422 applications for solar energy have been received with a combined capacity of 20 663 MW. Using an average of 3ha per MW that equates to just under 70 000 ha of land that could be transformed - an area just less than the entire extent of the Karoo National Park. With the massive number of solar facilities already with environmental approval relative to the number of preferred bidders in the REIPPP it is difficult to see how these guidelines present a major obstacle to the transition to a low carbon economy and retard development. There appear to be other more major obstacles to the development of solar energy. Habitat loss and degradation are a significant threat for many bird (and other) species (see for e.g. Taylor et al., 2015). It is therefore not unreasonable to expect the impacts of habitat loss on birds to be assessed and we would hope that the industry would take the opportunity to embrace sustainability and set that standard locally and internationally.</p> <p>There is less certainty with regards to impacts associated with collision, although this has been documented in the literature for sites in the United States (e.g. Walston et al, 2015 and 2016). The extent and significance of these potential impacts in the South African context is unclear. This is why monitoring and research is so critical. The precautionary principle and polluter pays principle of NEMA are both applicable, it is incumbent on developers to illustrate that they will not harm the environment. BirdLife South Africa has, however, partnered with the Percy FitzPatrick Institute at UCT and we hope to obtain funding for further research in this field. A small research project has been conducted at a PV facility in the Northern Cape. The results have yet to be finalised, but a small number of bird fatalities were detected.</p>
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			Please be assured that should further research and monitoring confirm acceptable and low levels of mortality, that does not (or will not) present a threat to the conservation status of species, our guidelines will be amended accordingly. It should also be noted that the risk of collisions or lack thereof pivotal in the decision to recommend an avifaunal assessment.
Impacts - general	Leanna Rautenbach, SolarReserve	Solar energy is not the first energy generation process that have potential impacts on fauna. The second sentence of the executive summary makes it seem that this industry is the only culprit that negatively impacts on avifaunal life. What about conventional coal fire stations? Impacts related to habitat loss, noise impacts, construction and maintenance of substations, power lines, servitudes and roadways are not exclusive to solar projects.	Agreed. This is discussed in main text of the guidelines, but we also have amended the Executive Summary to clarify. These guidelines are, however, guidelines for solar energy and not intended as a comparison of different technologies.
Impacts of solar - general	Terence Govender, Solar Reserve	The guideline state that “The overall environmental impacts of solar energy developments globally are poorly understood ... as are the specific impacts of these plants on birds”. These are very general statements- we have plants in operation in SA and very detailed EIA process that governs the impact study.	While we have good processes to govern impact assessment <i>processes</i> , predictions made in impact assessments need to be supported by scientific research and data.
Impacts - size	Leanna Rautenbach, SolarReserve	Since the guidelines are aimed at all SEFs that require environmental authorisation for electricity generation. Is the assumption is that if the DEA does not require an EA for a project as it generation size is too small, there will be no impacts on avifauna?	Many small facilities could have little or no impacts and avifaunal studies would be a waste of resources. However, it is true that some smaller SEFs may also impact on avifauna. Most of these are likely to trigger the need for environmental authorisation (e.g. destruction of wetlands, loss of habitat etc.) or require some sort of environmental oversight so the appropriate measures should still be put in place.
Impacts - Context	Terence Govender and Leanna Rautenbach, Solar Reserve	The guidelines state that: “the physical extent of natural habitat affected by many proposed developments is a concern, and	The references quoted are from the international literature, primarily from the United States. We have clarified this. As yet there are no monitoring reports

		measured avian mortality rates at a number of solar projects have been unexpectedly high (Kagan et al. 2014, Walston et al. 2015).” Is this in the SA context? We have different laws in SA with respect to the EIAs and the EMPrs. WRT Solar facilities, please provide the methods used to determine the loss in the SA context and the number of deaths.	publicly available for South Africa. It is only once studies have been conducted in South Africa (as is proposed in the guidelines) that we will be able to confirm the applicability in South Africa. Until then, we are of the opinion that it is appropriate to apply the precautionary principle.
Impacts- technology	Leanna Rautenbach, SolarReserve	Technology differs and the application thereof is customised per country. Local practices to be taken into consideration.	Agreed, this should be considered and as our understanding of the impacts develops our guidelines will be updated.
Impacts - positive	Terence Govender	These guidelines, which seem to restrictive at this early stage development, need to consider the benefits these SEF can have on the local habitats.	The risks and benefits solar energy presents to biodiversity still need to be fully explored in South Africa and we would welcome efforts to enhance and restore the environment.
Impacts - positive	Thomas Siepelmeyer, IDP Power	Solar power facilities reduce the environmental impacts of combustion used in fossil fuel power generation, such as impacts from green house gases and other air pollution emissions. Unlike fossil fuel power generating facilities, solar facilities have very low air emissions of air pollutants such as sulfur dioxide, nitrogen oxides, carbon monoxide, volatile organic compounds, which also are a great cause of bird deaths worldwide, and the greenhouse gas carbon dioxide during operations. In addition to these benefits of solar development, construction and operation of solar facilities creates both direct and indirect employment and additional income in the regions where the development occurs	We agree. We look forward to exploring ways solar energy can enhance benefits to the environment further.
Impacts – positive	Terence Govender, Solar Reserve	These are very general statements (with regards to impacts) and each project must be assessed based on its merits. These	Agreed. The intention is not to provide a detailed review of impacts (other literature does that), but rather to help ensure impacts are adequately assessed, minimised and

		projects can also assist in Bird Conservation and as such could be win win.	mitigated to facilitate that win-win scenario at each facility.
Impacts – positive vs. negative	Davin Chown, SAPVIA	We further noted the position taken by your advisors regarding the undesirability of renewable energy, and the statements around RE’s purported impact on or threat to biodiversity, and will take it that unless confirmed in writing to the contrary, that this negative sentiment remains the view of BLSA. This is in stark contrast to the statements made by yourself and BLSA that you are supportive of renewable energy.	BirdLife South Africa stands by our position and public statements with regards to renewable energy (i.e. we support the responsible development of renewable energy). At no time have we, or any our advisors, expressed the opinion that renewable energy is undesirable. However, renewable energy development must take place in a considered and sustainable manner. In order for this to happen, impacts must be rigorously assessed.
Impact - habitat loss	Dr Philip Desmet (Spatial Biodiversity Planner)	In the Northern Cape I have noticed with all PV renewables that they (1) target greenfield sites i.e. sites that are natural (not cultivated, degraded or otherwise transformed), and (2) always bulldoze the entire site prior to construction (therefore the site is 100% transformed). Given that renewables are likely to be scaled up significantly in the near future, my view is that “renewables present the greatest short to medium term threat to biodiversity in SA”. A big statement, but when people talk about areas the size of the Free State being converted to renewables to supply our energy needs, and this area is going to come out of “natural veld”, then we are on the cusp of the next great wave of habitat loss in SA.	We are also concerned about the potential for habitat transformation (bearing in mind that even cultivated fields may be important habitat for birds). These guidelines are intended to help ensure that our most critical habitats are not lost, but cumulative impacts remain a concern as it is notoriously challenging to assess cumulative impacts in EIA processes.
Impacts – Habitat loss	Thomas Siepelmeier	The planned, built and existing SEF’s in South Africa and elsewhere are not directed at the destruction of the habitat but often at the amelioration of the existing, already very degraded habitats. Possibilities and examples of how to do that are well known in the world solar community and	We encourage and support development in degraded habitats, particularly where development can result in improvements to the environment. While solar facilities in Europe may primarily be developed in very degraded habitats, we are not sure about this being the case in South Africa , where many developments are proposed in Bushmanland/ Savanna environments with extensive (as

		<p>expressively, e.g., researched by the Fraunhofer Solar Energy Institute in Germany. It is possible to raise sheeps and goats between the panel rows and even to do small scale farming of agricultural products below the panels. Water / rain run-off from the panel rows can be used to irrigate the area below the panels, so no big altered run-off water patterns will occur. <i>(Comment goes on to site Fraunhofer SE: "Agro photovoltaic - Resource-efficient land use to defuse the land use conflict between energy and agriculture")</i></p> <p>The perceived loss of habitat is seen as a major problem by the avifauna specialists; but they are not taking into account that most of the solar areas in South Africa are already highly altered agricultural areas and the potential habitat loss through any agricultural production, also on the specific solar project farms, are possible and unregulated, without considering bird habitats in special. So the development of SEF's and the applied rules and regulations incl. mitigation measures therefore act as a strong instrument to preserve birds and other natural habitats which would otherwise been degraded or destroyed by "normal" agricultural development.</p>	<p>opposed to intensive) grazing take place. Please also see Dr Philip Desmets' comments in this regard. Hernandez et al (2015) considered the effect of large-scale of solar energy developments on landuse and protected areas in California and found that less than 15% of utility scale solar installations are sited in "compatible" areas. It would be a worthwhile exercise to conduct a similar research study in South Africa.</p>
Impacts - nests	Leanna Rautenbach, SolarReserve	What about impacts on nesting birds?	Reference to nesting birds is included in the guidelines.
Impacts - nests	Alvaro Camina	From my experience in ZA common species increase for sure but surely not affecting the surrounding species composition (all would be small passerines). Thus, I consider not very dangerous for the populations as to suggest or even mentioning "nest removal	It is our understanding that many developers tend to remove nest structures on solar infrastructure due to the perceived fire risk or nuisance factor. The guidelines do not suggest that nests should be removed due to impacts on the local bird community, but rather are responding to the existing management practice.

		by developers”	
Impacts - disturbance and displacement	Thomas Siepelmeyer, IDP Power	The long discussion in the report about so-called "disturbance of birds and displacement effects" is only supported by a CSP solar plant example, the Ivanpah CSP in the US.	Incorrect. There is ample evidence of birds being displaced by many different kinds of development. There is evidence of possible displacement of Martial Eagles near solar energy facilities in South Africa. There is also evidence of changes in bird communities (unpublished MSc thesis).
Impacts - Vulnerability to of species to impacts	Leanna Rautenbach, SolarReserve	How do you determine if a species is susceptible to solar energy impacts?	Please refer to section on priority species.
Impacts - PV mortality	Thomas Siepelmeyer, IDP Power	Surfing / googling the internet ("solar farm bird") nothing could be find wrt birds killed by PV. All the articles found do relate to birds killed by CSP type of solar farms, and here especially the tower type because of its huge temperatures (birds get literally burned) and heliostats.	There is a small, but growing amount of literature reporting bird mortalities at PV facilities (birds may collide with PV panels, much like they do with windows) (e.g. Walston et al. 2015 and 2016, Harvey and Associates 2014). This area is poorly researched and we do not yet understand if this is a significant issue, hence the recommendations for monitoring and research.
Impacts - Collisions	Savannah Environmental	Are collisions with heliostats only a problem at CSP towers? If the focus is on tower plants, then should not other CSP technologies be discussed separately?	There is evidence of collisions at CSP troughs and PV facilities (see for example Walston et al. 2015, Harvey and Associates, 2014). We disagree that the focus is on CSP tower projects – although these do require the most rigorous assessment.
Impacts - Collisions (troughs)	Leanna Rautenbach, SolarReserve	The position and placement of trough infrastructure could have a large impact for low flying birds – collision with trough? Why is this not included? All impacts are presented in terms of the tower.	The risk of collisions for CSP tower, trough and PV is outlined in sections 1.1 and 1.2. CSP tower was “singled out” when developing the matrix as it presents an additional threat (i.e. solar flux injuries).
Impacts – Mortality rates	Leanna Rautenbach, SolarReserve	Is comparison of mortality rates with wind energy applicable? (Page 10) The findings of this site (Ivanpah) is broadcast a lot – but it never states if the site is situated in proximity to a migration route etc. There are a lot of factors that could have impacted and contributed to the incident but the background is not provided. Please elaborate on the CSP plants that were used as reference points – for this statement. How many plants were used for this	A list of references is provided at the end of the guidelines where one can find more detail. The intention is not to provide a comprehensive review of our state of knowledge about the impacts, but to provide a framework for impact assessment and monitoring to improve that knowledge. We would like to help ensure impacts are adequately assessed, minimised and mitigated.

		determination?	
Impacts - wastewater	Leanna Rautenbach and Terence Govender, SolarReserve	The guidelines suggest that CSP facilities produce a large amount of wastewater (brine), which can be difficult to manage and treat. On what is this statement based? Is it supported by a government or research institution? This is very well understood and easy to treat by the Project Company. Is this applicable to this guideline?	We have amended the text in this regard and refer to Hernandez et al. 2014 . It is applicable as evaporation ponds may attract birds, which in itself may impacts bird communities or exacerbate the risk of mortality.
Impacts – Chemicals & Dust suppression	Savannah Environmental	High pressure water is used to clean panels and not chemicals	Noted, although this may not always be the case.
Impacts – Chemicals & Dust suppression	Leanna Rautenbach, SolarReserve	The guidelines state that: “Chemical pollution associated with measures taken to keep the PV panels clean, such as the use of dust suppressants (Lovich and Ennen 2011).” Dust suppression chemical stabilisation has various eco-friendly options – pollution is not a given.	Agreed. Impacts are listed as possible impacts.
Impacts - Evidence of	Davin Chown, SAPVIA	Further to our deep concern around the basis for the guidelines, and the lack of evidence based scientific research to support the guidelines, we require a proper programme of observation and research to be conducted to support the assertion and the basis for the guidelines. a. To this end, and as part of our commitment to moving this forward, one of our member companies has committed to offering their two current operational PV sites to expand the monitoring you are doing. b. They will require an NDA to be put in place and they will require you to first seek permission from the Board before sharing any of this information. c. They will want to review the study methodology in order to ensure it meets	Please see comments under “Need for and purpose of guidelines”. In addition to the operational phase monitoring recommended for Regime 2 and 3 projects, BirdLife South Africa has partnered with the University of Cape Town to promote research at solar facilities. We see these two data gathering processes as running in parallel. BirdLife South Africa is committed to updating our guidance in response to the results of these scientific studies. With regards to accessing PV sites for research purposes, we are grateful for the offer of additional support from SAPVIA. BirdLife has already received permission to study several PV (and CSP) sites, and very few of the developers have requested non-disclosure agreements (NDAs). Our intention is to ensure the data are relevant, useful and widely disseminated. We respect the need to protect commercially sensitive information and would not want to single out a development if impacts prove to be problematic, but the content of any NDA would need to be carefully thought out to ensure

		best practice standards to ensure that the data is meaningful and robust.	that it does not compromise the objective of the research.
Impacts - Evidence of	Davin Chown, SAPVIA	On the matter of current monitoring, we cannot accept that you will not share with the industry your findings of the supposed study you are conducting. Indeed, your reluctance seems to show that the study has more to hide. What we need a clear answer on is whether the study is being conducted at a PV plant or a CSP plant. We require that you are open and transparent on these matters.	Please be assured that it is not our intention to withhold the results of the research currently underway; as noted above we are committed to facilitating the exchange of information. The research project we referred to in the meeting is an MSc project at the PV facility in the Northern Cape; the author is in the process of finalising her thesis. Once it has been finalised, and with the author's permission, we will make the report available and it is hoped the results will be published in a peer review journal. We hope to expand research at both CSP and PV facilities once funding has been secured.

Preliminary assessment (scoping/screening)

Site visit - duration	Leanna Rautenbach & Terence Govender SolarReserve	Duration of scoping/screening site visit needs to be quantifiable.	We have amended the text to clarify this, but a degree of flexibility is required. The site visit could be a few hours up to a few days depending on the size and complexity of the site and whether the intention is to use this as the first survey for monitoring and assessment purposes.
Site visit - season	Leanna Rautenbach, SolarReserve	Should this (the site visit) be in a particular season?	The intention of the site visit is to develop understanding of the receiving environment (e.g. available habitats, as well as where and when priority species are likely to be present). The site visit should guide the nature and scope of subsequent work required to inform the avian impact assessment. The season of the site visit for Regime 2 and 3 sites is therefore not critical, as it will be followed by further site visits at the appropriate time of year. At Regime 1 sites the site visit could be timed to coincide with the peak in avian abundance, in which case it may not be necessary to further surveys.
Site visit – obligatory/when	Rob Simmons	I think given the paucity of cards in the Northern Cape, where most of these solar sites are located, a Scoping report MUST include a site visit.	Agreed. The guidelines state that a site visit “..is particularly important, and should be considered obligatory, in instances where there are few if any existing data available to inform initial decision-making”
Site visit – obligatory/when	Andrew Pearson, Arcus	Ideally? Must it or mustn't it (<i>scoping, include a site visit</i>)?	Only in the limited cases where there is ample existing information a site visit may not be necessary during scoping and the specialist may choose to time the survey(s) to coincide with the likely peak in bird abundance.
Site visit– obligatory/when	Andrew Pearson, Arcus	Perhaps it should be defined when a site visit is required during scoping. For example if there are fewer than 5 SABAP1 cards submitted for the QDSQ, or if more than 50% of the pentads within and adjacent to the site have only 1 or 0 cards submitted, and/or no other EIA studies with suitable data within 5km are available?	Thank you for the suggestion.
Data collection	Andrew Pearson, Arcus	Can this site visit be combined with the first site visit of data collection (e.g. if it is regime	Yes – the scoping site visit could be used as the first site visit of data collection.

		2/3)?	
Survey design	Leanna Rautenbach, SolarReserve	Who decides if this site-specific survey or monitoring project should take place? What regulates this process?	Ultimately the avifaunal specialist must advise the scope of survey and monitoring work required. This should be guided by the recommendations in the Guidelines (i.e. with regards to monitoring regime), available information, and possible presence of potentially vulnerable species.
Survey design	Leanna Rautenbach, SolarReserve	Who decides and instructs the developer to do further data gathering etc. in line with the tasks presented in this guideline if this is not submitted to the DEA for approval of the Specialist Terms of Reference and SR findings. The SR approval process should lead any additional studies that are required – this could mean that the additional studies done prior to the SR may be regarded as insufficient by the DEA and then all efforts need to be redone. How does the Avifaunal IA process integrated with the DEA EIA process?	Please refer to the Guidelines, to DEA’s draft minimum requirements for biodiversity assessment and to the EIA regulations. We have clarified the recommended timing with regards to the EIA process. It is advisable to conduct a preliminary assessment, before applying to DEA. The specialist will make their recommendation, but it is ultimately up to DEA to confirm if the scope of the work was acceptable.
Study area/broader impact zone	Savannah Environmental	Please state absolute criteria study area areas/extents. This is relevant to ensure that all specialists work to the same set of requirements and to avoid criticism of the programme implemented at a later date.	The extent of the study area should be informed by the receiving environment and the species potentially affected. We do not think it would be beneficial to assign a standard figure to this.
Study area/broader impact zone	Leanna Rautenbach, SolarReserve	Definition of broader impact zone is too broad and open-ended.	This should be defined by the specialist during the impact assessment and will depend on the receiving environment and species affected.

Study area/broader impact zone	Leanna Rautenbach, SolarReserve	Guidelines recommend that surveys for large terrestrial species and raptors should extend well beyond the specified boundaries of the development, in order to account for indirect disturbance and displacement. This needs to be clearly defined, otherwise the broader area to be assessed could be extremely large for no reason. All development or study areas need to be subject to clear and concise parameters defining the boundaries of the area.	This should be defined by the specialist during the impact assessment and will depend on the receiving environment and species affected.
Avifaunal Scoping Report	Andrew Pearson, Arcus	Does a separate bird specialists scoping report need to be produced, or can the specialist just provide input to the EAP?	We recommend that an avifaunal scoping report (preliminary assessment) is produced and shared with both the developer and environmental consultant as this will help ensure no misunderstandings. This report should also be included in the Scoping Report to give interested and affected parties an opportunity to provide input at an early stage.

Assessment regimes

<p>Data requirements - Influence of size</p>	<p>Leanna Rautenbach SolarReserve</p>	<p>Data requirements should be the same across board and technology specific rather than “site” determined. The environmental impact assessment process allows for determination of the quality and quantity of baseline data requirements – why should this now be changed based on the size of the site? (page 3 executive summary). Larger does not necessarily mean the impact will be greater. The assumption that larger projects will generally be more impactful than smaller ones is questioned - a smaller site in a more sensitive environment may have a larger impact than a very large site in a no impact zone.</p>	<p>There are a number of factors that influence the potential significance of impacts, including but not limited to size. This is why we adopted a matrix approach.</p>
<p>Data requirements - Influence of size</p>	<p>Terence Govender SolarReserve</p>	<p>I think quality (of data collection) should be based on the size of the site, it must be a standard set of protocols that must be used for all projects.</p>	<p>The size of the site AND the receiving environment (will influence the likely risk presented to birds. While a one size fits all approach is tempting, we do not believe it is necessary to recommend rigorous data collection at lower risk sites.</p>
<p>Data requirements</p>	<p>Terence Govender SolarReserve</p>	<p>This (the data requirements/assessment regime) must be assessed on a project-by-project basis, on a site by site basis.</p>	<p>We agree that the scope of a project and receiving environment should influence the assessment regime (hence the assessment regimes). However, by providing guidance, our recommendations can be incorporated into EIA processes without us being actively involved in each and every EIA. The document should also provide developers and environmental practitioners more clarity with regards to the recommended scope of work required to ensure their developments do not impact on birds. There is also value in standardising data collection requirements across all projects (see for e.g. Walston et al 2016)</p>
<p>Duration of site visits - Table 1</p>	<p>Andrew Pearson</p>	<p>The recommended duration of the site visits should not be capped. For example, is it not</p>	<p>The intention was not to set a cap, but rather to give an idea of the scope of work to be expected. If only the</p>

		better to say a minimum of three days? It may be more than 5 days?	minimum is suggested developers and specialists tend to do only the minimum. We have amended the text to clarify.
Priority species	Terence Govender SolarReserve	How does one determine which species will be susceptible to the impacts of solar energy facilities?	The specialist, using their expert opinion, combined with a literature review, can determine the likely susceptibility of species to impacts. For example, we can predict that habitat specialists are more likely than generalists to be affected by habitat alteration at solar facilities. We can also predict that birds that spend a lot of time on the wing and potentially within the area of solar flux, will be most susceptible to solar flux related injuries. Endemic species with restricted ranges and threatened species may also be vulnerable. Monitoring of existing facilities will help develop this understanding and improve predictions in the future.
Data collection	Leanna Rautenbach, SolarReserve	Which of these two steps (i.e. screening or scoping) constitutes as the baseline data collection phase? (comment on executive summary)	Baseline data collection falls under the second tier, i.e. "data collection". Note that for Regime 1 projects, data may be collected for the purposes of impact assessment only, and before after studies/ baseline data collection is not necessary. This is explained in the main text.
Fatal flaws/decision-making	Terence Govender SolarReserve	I agree we need proper mitigation measures to be in place, but this guide is not allowing for such. DEA should make the final call on whether projects should be awarded an EA or not. This is the responsibility of DEA/ the SA Government (to determine if the project should proceed or not). The specialists must present their findings to DEA who will decide. No one else has the legal right to decide if the project can go ahead or not.	Agreed, although the applicant can also decide whether or not to proceed or withdraw a project based on the specialist's recommendations.
Assessment regimes	Davin Chown, SAPVIA	The decision ranking methodology proposed is not suited to the realities of the South African situation and needs to be reworked in its entirety, in a proper consultative manner with experts from the industry.	We assume that this refers to the Table 1, which outlines the proposed assessment regime? It would help if the issue (and a proposed solution) was outlined so we could attempt to address the concern.
Assessment regimes -	Savannah Environmental	Habitat should be considered as the key	It is an important component, but the size and

habitat		component in the determination of site sensitivity and possible impacts	technology will also influence the scope of work required. Cumulative impacts must be considered.
Assessment regimes - Size	Savannah Environmental	Executive summary implies that Regime 1 can ONLY apply to a small site – why would that be the case?	The text provides an example of when it would be applicable (at a small, low impact site with low avifaunal sensitivity), but does not exclude other scenarios. This is addressed in full text, but examples have been expanded.
Assessment regimes - Size	Leanna Rautenbach, SolarReserve	Majority of renewable facilities is larger than 150 ha	Noted. The cumulative impact of these large facilities is a potential concern.
Assessment regimes - Size	Dick Berlijn, Subsolar	For solar PV, with no evaporation ponds, no hot beams from mirrors and not steam, we see a very small risk of impact. Hence we ask for you to reconsider the size of 150ha, and increase that for example to 250ha, based on the sensitivity.	While the evaporation ponds etc. may present additional challenges, it is primarily the threat of habitat loss that is of concern with PV facilities, although the risk of collisions presents an additional risk, at this stage it is difficult to quantify. While the majority of solar projects in South Africa fall within this category, if we increased the threshold to above 150 ha almost all PV projects would fall under Regime 1 (DoE has set a maximum capacity of 75MW, at 2-3 ha per MW, the maximum size would be 150-225 ha). We have, however, amended the guidelines to allow instances where regime 1 could apply to even large sites (i.e. where there is sufficient baseline data from adjacent sites and the environment is homogenous).
Assessment regimes - technology	Leanna Rautenbach, SolarReserve	Different technologies may carry different intrinsic levels of risk, which should be taken into account in impact significance ratings. There is no allowance made for this inclusion? How will this be quantified?	The Guidelines focus on how data should be gathered for the purposes of impact assessment, not how that data should be interpreted (i.e. how significance ratings should be assigned). This should be done by the specialist, in consultation with the EAP.

Regime 1

Habitat classification and mapping	Alvaro Camina	Habitat classification and mapping should be required under ALL regimens 1, 2 and 3. It does not requires too much work and it is the basis of any baseline assessment on which to relate the avian fauna present.	Good point. Thank you. We have amended the guidelines to reflect this.
Site visit - timing	Andrew Pearson	The site visit must be timed to coincide with this peak time (not “ideally”)	Agreed, although we have made allowance for instances where there is sufficient existing data.

Site visit - preliminary	Leanna Rautenbach, SolarReserve	Who decides if the initial site visit is adequate for the purpose of impact assessment?	The avifaunal specialist should make a recommendation, based on his professional judgement. The environmental assessment practitioner then decides the appropriate course of the EIA. Interested and affected parties may review these decisions during the public participation process, but ultimately the decision lies with the Department of Environmental Affairs.
Scope of work	Savannah Environmental	The scope of work done on site for lower risk project is largely at the discretion of the consulting specialist. Please state absolute criteria to determine requirements. This is relevant to ensure that all specialists work to the same set of requirements and to avoid criticism of the programme implemented at a later date.	We do not wish to be unnecessarily prescriptive as this may result in work that does not help inform decisions. Conversely, by being prescriptive there is a risk that all scenarios are not accounted for and key issues or impacts may be missed. Key to avoiding criticism (and more importantly to ensure that impacts are adequately identified and addressed) is to ensure that a reputable and qualified specialist is appointed.

Regime 2 and 3

Focal point surveys - Executive summary	Savannah Environmental	Add “any other sensitive avifaunal habitats” to point (v) second paragraph of page two of the executive summary.	Thank you. Addressed.
Scope of work	Leanna Rautenbach, SolarReserve	Who decides on what parameters should be measured (Regime 2 and 3)	The avifaunal specialist; as informed by these guidelines, their expert opinion and experience, and the receiving environment.
Focal point surveys - Large terrestrial and raptors (nest sites)	Alvaro Camina	In the case of cranes, nests change from one year to another. They do not nest in the exact same location every year. Other terrestrial birds –bustards- do the same to avoid predation. For these species, it should be better to refer as breeding areas, than breeding sites. For cliff nesting raptors it would not be a problem, as SEFs are on mainly plain grounds. The key issue would be the feeding areas.	Thank you for the suggestion, we have amended the text. Some raptors (e.g. Martial Eagle) do nest on pylons and isolated trees and these sites may be affected by development.
Focal surveys - Large terrestrial and raptors (nest sites)	Savannah Environmental	Should focal nest surveys only focus on key raptors?	Text has been amended to include other priority species.
Focal surveys - powerlines	Alvaro Camina	Are the guidelines requiring the developers to survey existing powerlines prior to development? This is an issue of the specialists; anyone with some knowledge would do a check of these structures but it is different as to say “you as developer must do a prior survey of any existing power line in the area of your future project”. It is Eskom or whoever responsible of the powerline of having made/doing a survey. It sound as to cover gaps that nobody has checked and now because a SEFs project there is an opportunity to fill it.	We do recommend that any powerlines within the proposed development area are checked for collisions and electrocutions. It may be argued that it is Eskom’s responsibility to do this, however, systematic surveys of powerlines are not conducted by Eskom. Further, the purpose of the surveys is not to assess the impacts of the powerline, but give an indication of additional risk the facility may pose to certain species.
Vantage Point Surveys - radius	Alvaro Camina	The maximum radius of 2 km is excessive, observers cannot detect species as the Verreaux’s Eagle at distance further than 1.5	Thank you for this point. The detectability of species will vary according to the landscape, weather and size of the species concerns. We added the suggestion this be

		km (Camiña et al. in prep. <i>Potential impacts of Renewable energy on the Verreaux's Eagle in South Africa</i>).	reduced where there are likely to be small priority species at risk and note your concern about Verreaux's Eagle. Specialists are encouraged to account for detectability in the analysis and we will consider amending the guidelines (wind and solar) once more data is available.
Vantage Point Surveys - duration	Alvaro Camina	If guidelines set a minimum, whatever this number is, then all developers would say 12 hours, as here it is the case. See Douglas et al (2012) about the effect of monitoring time on collision risk assessment.	It should not be up to the developer to make this decision. The environmental consultant and avifaunal specialist should indicate the scope of work required. While we acknowledge the challenges associated with setting a minimum standard 1) there is a need to set some sort of benchmark and 2) we do not want to penalise developers with low sensitivity sites by setting that standard unnecessarily high.
Vantage Point Surveys - species	Andrew Pearson	I don't think this is possible to record "all species". We tried to record doves for example on one site. Beyond 200m or so you miss most of them. Also, how does one record short flights of passerines?	Noted. We suggest focussing on priority species, survey methods may need to be augmented where small priority species are present.
Vantage Point Surveys - viewshed	Andrew Pearson	Above Ground Level (ABL) height must be used for viewsheds. Much better coverage will be shown if the viewshed shows 'areas where all birds above 100m are visible', than if ground level or is used.	Noted. We have included this.
Vantage Point Surveys - coverage	Andrew Pearson	The guidelines state that vantage point surveys "should provide information on the time spent flying over or in the "vicinity" of the development area. Can this area be defined? E.g. 'within 1 km of the proposed heliostat/trough field'	The appropriate area will depend on the habitat, landscape, and priority species, and other features present. We suggest that the specialist should apply their minds to defining this area.
Survey Area	Savannah Environmental	The guidelines suggest that sampling number and density of small birds should be sampled at various distances radiating away from the core development area, well beyond the actual footprint. What would this distance depend on?	The appropriate area will depend on the habitat, landscape, and priority species, and other features present.
Survey area	Andrew Pearson	The guidelines suggest that data should also	Understood. We have added "as far as possible".

		be collected from in the surrounding area 1-2 km from the development area). However, access to neighbouring properties may be difficult. Developer may not have a good relationship with certain landowners, and may even request a specialist to avoid certain farms.	
Baseline surveys - timing	Leanna Rautenbach, SolarReserve	The guidelines suggest that if there is a significant gap (i.e. more than 3 years) between the completion of the initial data collection and impact assessment and the anticipated commencement of construction, consideration should be given to repeating the baseline data collection (or parts thereof) to assess whether there have been any changes in species abundance, movements and/or habitat use. How did the authors arrive at three years?	This period was determined somewhat arbitrarily, but is the authors' experience that marked changes in landscape can take place within a period of three years (sometimes less). Similarly Environmental Authorisations are usually only valid for a defined period (often 3 years). This recommendation need not have onerous implications, but we do urge developers and specialists to be cognisant of changes in the landscape and how they may influence bird communities. Failure to do so may result in impacts being apportioned to a solar facility when it is actually as a result of other factors.
Baseline surveys - timing	Alvaro Camina	The current deadlines of the bidding process, the announcement of successful bidders (with longer delays), the improvement of the grid connection or the financial close are currently affecting most of the projects. This is causing unexpected delays from developers. A developer may want to afford all the requirements but later the authorities do not meet the timeline, they are not so responsible of failing this deadline of "3 years". Probably another short survey checking the outcomes of the prior study would be enough. If the habitat changes its coming status will be surely worse than the current situation but not better as to make another assessment.	Please see above. It is a recommendation to consider repeating baseline data collection (or parts thereof) if there is a significant gap between the initial surveys and construction, but this is not a strict requirement. As you noted, a short survey to check on the habitat status may be adequate.
Timing and duration of surveys - seasons	Savannah Environmental	We suggest that it is important that appropriate seasons are sampled (e.g. peak wet and dry seasons) as opposed to "full	Thank you, comment noted. However, in highly variable environments 1) ensuring that surveys only coincide with the peak season can be difficult and 2) surveys that do

		annual cycle”	coincide with the peak season only may give a skewed indication of the potential risk.
Timing and duration of surveys - discretion	Savannah Environmental	If the intention is to leave certain aspects up to the specialist to decide /determine, surely the key timing for surveys should also be left to the discretion of the specialist?	The specialists have some degree of discretion when determining which assessment regime is appropriate. They also can determine the scope of work required for lower risk sites. However, we believe that it is important to set clear criteria for higher risk sites, particularly when it comes to issues such as the required duration of surveys. In our experience developers are likely to pressure specialists to minimise the time spent conducting surveys, which can compromise the rigour of the assessment.
Timing and duration of surveys	Savannah Environmental	The guidelines suggest: “Additional baseline data collection should be done over a period of 6-12 months, ideally encompassing a wide range of environmental conditions, and in some cases (assessment regime 3) including the full spectrum of “seasonal” variation present within a complete annual cycle.” This should also consider the characteristics of the area and the likely timing of bird movements (e.g. in arid areas, wet and dry season monitoring may be more important to obtain an understanding of the avifauna of the area.	Thank you. We have amended the text accordingly.
Timing and duration of surveys	Savannah Environmental	What are the triggers which may change bird behaviour or abundance. The specialist should be able to consider this and plan a programme around this. How is this covered in the guideline?	There are many different triggers that may affect bird behaviour and abundance. The most obvious one in the area where most solar facilities are proposed is rainfall. Another example is the presence of migrating birds which is affected by the time of year/season. Local weather events (e.g. rainfall) and food availability can affect the local migration abundance and behaviour of species (e.g. feeding and breeding) and temperature and wind direction, and the presence of temporary landscape features (e.g. wetlands, pans, or seasonal crops) can also affect movement patterns. These may all change over time and different groups of species might be affected

			differently at different times and patterns are changing with climate change. The guidelines attempt to address this by recommending surveys over multiple seasons. In arid environments regular surveys over two or more years would be more effective, but we recognise the need to be pragmatic and made decisions on imperfect data.
Timing and duration of surveys	Savannah Environmental	The need for the surveys to be undertaken in the most applicable period to ensure that the most representative data is obtained should be considered when developing a monitoring programme. The triggers which determine bird behaviour should be considered as opposed to seasonality alone. For example surveys in arid areas should be aligned with the wet and dry season as opposed to the seasons of the year.	Agreed.
Timing and duration of surveys	Dr Rob Simmons	I like the "regime" approach for the degree of input into small vs. large PV or CSP sites. All seems pretty logical. However I would say it needs to be more wet and dry season orientated since most solar sites are in the arid Orange region. I suggest make it a necessity that if there is one visit to a (small) solar PV site that the 1 visit should be a wet season visit. If it's a regime 2 category then there should be 2-3 visits – one in the wet and one in the dry over 6 months etc. Having spent many years recording birds in arid areas, it is much better to have just one visit in the wet than 3 visits in the dry. In arid areas the community is flooded with migrants and nomads in the wet and reverts to the residents (i.e. those species always there) in the dry. So you will record everything in just one well-timed wet season visit. Refer to Syemour et al (2015)	Thank you. The guidelines do recommend the following for Regime 1 sites "If there is reason to suspect an obvious and predictable seasonal peak in avian abundance or activity in the general area of the proposed development, the site visit should ideally be timed to coincide with this peak time (e.g. soon after rain which prompts influxes of birds into dry areas, or in summer when the majority of migratory birds would be present)". It is difficult to balance the need for well-timed surveys with the time-constraints imposed by the EIA process and developer. This is one of the reasons we are also promoting sharing of data across sites, further research, atlasing, and strategic assessment (with ground-truthing). However, it remains the responsibility of the applicant to ensure that impacts are adequately assessed.

		<p>Given the vagaries of the rains and the active El Nino, it is actually unlikely that within 6 or even 12 months that a rain event will occur in the Northern Cape zone where all the solar development is concentrated. However we must strongly encourage all specialists to go when it the rains do occur wherever possible.</p> <p>I suggested that the only way we can get around this hit and miss possibility is by having all specialists submit their records to SABAP from these Northern Cape sites, especially when it does coincide with a green “wet” season. Perhaps we can make a call to the bird clubs (through Birdlife SA) to get their members out to these areas to atlas like crazy so the boom part of the “boom and bust” cycle can be captured? A second alternative is to have a directed research programme. This should perhaps be highlighted as a research priority?</p>	
Timing and duration of surveys - regime 2	Savannah Environmental	Regime 2 surveys should cover the correct season to ensure bird movements are appropriately observed.	Agreed. We have clarified this in the text
Timing and duration of surveys - regime 3	Savannah Environmental	Regime 3 Surveys should be timed to ensure that the studies are undertaken in the correct seasons for the study area (e.g. in arid areas the important periods would be the wet and dry seasons as opposed to winter, spring, summer and autumn)	Agreed.
Surveys - time of day	Andrew Pearson	Surveys late in the day may be an issue if Health and Safety does not allow for driving when dark.	Noted. The specialist team will need to ensure that the necessary policies and insurance is in place in order to undertake the required tasks.

Post- construction monitoring

<p>Timing of post-construction surveys</p>	<p>Alvaro Camina</p>	<p>The guidelines imply that birds habituate, post cons monitoring should be not necessary. There are many aspects still affecting the habitat/birds just after being operational; still many people moving around the facility until the final staff remains, trucks and others removing rubbish and remains... to understand impacts you must assess on the long-term. The same occurs with bird populations that evolve over time.</p>	<p>Thank you for pointing that out, it was not our intention to give that impression. We have amended the text.</p>
<p>Duration of post-construction surveys</p>	<p>Savannah Environmental</p>	<p>The duration of post-construction monitoring should be informed by the results of preconstruction monitoring as well as the initial post construction monitoring. It is recommended that a minimum of one year should be undertaken only on sites where significant impacts are expected and that the results should then inform the need for additional monitoring during operation.</p>	<p>Thank you for your suggestion. Bird communities are likely to change over time once a solar facility is operational and activity levels reduce. In an area such as the Northern Cape a large amount of inter-annual variation can also be expected. It would therefore be valuable to obtain data on the impacts over multiple years. Once we have sufficient data on the impacts, and can confidently predict what will be high, medium and low risk sites, we will certainly reconsider our recommendations with regards to the duration (and possibly scope) of monitoring.</p>
<p>Duration of post-construction surveys</p>	<p>Andrew Pearson</p>	<p>If the intention is to repeat the activity component (i.e. the preconstruction baseline), why two years if the baseline was only 6 months (Regime 2) or 1 year (Regime3)? I agree though that the fatality search component should be over at least two years.</p>	<p>Thank you for pointing out this ambiguity. We have clarified this.</p>
<p>Habitat classification</p>	<p>Alvaro Camina</p>	<p>Do habitats change inside a SEF facility from year to year? If any type of habitat exist after installing e.g. a CSP. PV plants are all fenced so there is no habitat to change as it is like a "farm". The habitat it is outside the facilities may change.</p>	<p>Thank you, we have amended the text to clarify. The habitat structure may, however, change within (and outside) the SEF depending on the management approach and methods used during construction.</p>

Before : after construction data collection	Andrew Pearson	What happens if post-con monitoring happens two or three year after baseline, and the baseline methods used are no longer compliant with updated guidelines. Does one still repeat the baseline methods?	The guidelines recommend that consideration should be given to collecting additional baseline data if there is a gap between the initial assessment and construction. We suggest that the specialist uses their discretion and apply appropriate survey methods that will address the purpose of post-con monitoring (e.g. to investigate if and how bird communities have been affected by the SEF). Sampling varying distances from the facility may, for example, also help distinguish between impacts related to the facility vs. other variation.
Before : after construction data collection	Andrew Pearson	What if the baseline methods were not even compliant to the guidelines of the time, and a new specialist has been appointed for post-con work. Does the new specialist repeat what was done by the pre-con specialist, even if they believe the methods were inadequate and/or incomplete?	Please see above. The specialist should use their discretion and if necessary include additional surveys or amend sampling protocols to meet the purpose of the study.
Survey teams	Andrew Pearson	The guidelines state that "To minimise the impacts of observer bias, the same observers should ideally be used for before and after-construction". This is very difficult to achieve, especially if the specialist changes. Also, most observers are subcontracted to specialists, and may not be available. Time between baseline and post con monitoring can be 2-3 years or more.	Noted. However this source of potential bias must be acknowledged, and where possible minimised.
Reporting of mortalities (ad hoc)	Leanna Rautenbach, SolarReserve	Who at the DEA will collate the mortality data for all bird mortalities and is there a reporting structure and format?	DEA is developing a spatial database (monitoring data tool) where fatalities at wind and solar farms can be uploaded and later analysed by approved users. In the interim, BirdLife South Africa keeps a record of all fatalities associated with renewable energy developments that are reported to them.
Carcass surveys - persistence	Kent Russell, Stantec (Canada)	Considering the fact that a lot of sites are fenced (well, in Canada they are), there is limited ability for terrestrial scavenger removal. Considering this, the impact from scavenger removal would be lessened,	Sites in South Africa are also very well fenced. However, surveys at a PV facility in the Northern Cape (South Africa) MSc student Elke Visser found that scavengers are present, even where there are two rows of electric fencing. Avian predators would also not be deterred by

		therefore, we should be mainly concerned with decay rates (as is discussed) in terms of the ability of observers to detect fatalities within the search period. I would therefore suggest using "Carcass Persistence" as your terminology instead of Scavenger Removal, since scavenger removal and carcass decay rates are factors that would influence detection and the appropriate search frequency. Regardless, I agree with the statement that there is limited value in sampling every two weeks vs. every month.	fencing. We have, however adopted your proposed terminology.
Scavenger removal trails	Andrew Pearson	Are the guidelines suggesting 20 carcasses be placed in the year, altogether, or 20 in one trial/season?	We suggest 20 in each trail.
Search interval	Andrew Pearson	A search interval of two weeks is too long. I propose weekly or at least every 10 days.	Noted. This is a rule of thumb, not a rule and should ideally be informed by the scavenger removal/carcass persistence trails.
Carcass management	Andrew Pearson	Possible post-mortem: By who, where, how and at what cost? Can birdlife SA provide some guidance with regards to this	This would need to be done at the discretion of the specialist. Post-mortems would be particularly valuable where the cause of death is uncertain (e.g. at CSP tower projects) and understanding this will help shed light and mitigate on possible effects.
Carcass management	Andrew Pearson	Lodging carcasses with museums mean significant additional cost. I think this should only be for red-listed /rare species perhaps?	This is a suggestion, not requirement and can be negotiated between the specialist, developer and museum in question.
Alternative survey methods (dogs)	Alvaro Camina	This is onerous for solar developments according to the ground cover of CSP and PV facilities. I am sure that fatalities if existing would be of non-priority species.	The use of dogs is encouraged but not required. Given the increased detection rates it will help provide more certainty with regards to the impacts, particularly for small certainty to detect species. At this stage we do not share your confidence that fatalities will only be of non-priority species.
Fatality rate estimates and reporting	Kent Russell, Stantec (Canada)	Existing estimators for the wind industry will definitely need to be adapted for the solar industry, as there are considerable differences in assumptions (e.g., fall distances of carcasses)	Agreed.

Fatality rate estimates and reporting	Alvaro Camina	The sudden reference to bats is strange.	We have amended the text to clarify
Fatality rate estimates and reporting	Kent Russell, Stantec (Canada)	In addition to a standard approach of reporting found fatalities and corrected fatality rates per MW, it will also be useful to report these numbers per area (acres, or hectares). As solar PV technology evolves, we should see the ration of production per area increase, therefore a rate per area may be more appropriate to compare to future projects.	Thank you. We have included this in the text.
Reporting to BirdLife South Africa	Leanna Rautenbach, SolarReserve	Birdlife SA is not a competent authority with respect to environmental decision making processes.	Agreed. BirdLife South Africa is not a competent authority, but we are an interested and affected party and have a memorandum of understanding with the Department whereby we have agreed to cooperate and collaborate with regards to our respective objectives, mandates and functions. By receiving monitoring reports we aim to assist the department in identifying and responding to key issues and impacts relating to renewable energy and birds.
EMPr	Andrew Pearson	Who will amend the EMPr?	This responsibility ultimately falls on the holder of the environmental authorisation, but the ECO or environmental consultant is likely to do the actual amending. The EIR regulations make provision for EMPrs to be periodically updated.
Mitigation - general	Sandi Robertson, Wildlife Biologist, Alberta Environment and Parks	Mitigation options are deficient. A significant concern is if high numbers of birds are found dead from attempting to land on the panels during post-construction monitoring. What can be done if this is observed? In Alberta, we have nasty toxic ponds for the oilsands industry and occasionally water birds land in these ponds and die. Devices have been developed to prevent birds from attempting to land and I think that these devices can be useful for solar farms as well if the 'lake effect' happens. I have attached	Thank you for the suggestion. Initially our focus was on protocols for impact assessment and monitoring, but mitigations are an important part of impact assessment and we have expanded on this section.

		a couple links to give you examples. Also, avian deterrents used at airports may be other useful deterrent systems. http://www.detect-inc.com/bird_control_radar.html , http://www.birdavert.com/?q=node/6	
Mitigation - layout	Savannah Environmental	The guidelines suggest that variation in the spacing of PV panels could be assessed to determine if collision rates change with different panel configurations (page 15). This would not be possible to implement after the project has already been constructed	Agreed, at least not without substantial cost implications. The text has been amended to clarify
Mitigation - layout	Leanna Rautenbach, SolarReserve	PV configurations are done for optimal generation and based on financial modelling. Will this (i.e. carrying the spacing of panels) not detrimentally impact the viability of a project?	Any such changes post construction would almost certainly come at a cost. This is a suggestion for possible investigation/research, not a requirement at this stage.
Mitigation - location	Dt Philip Desmet	My view as a greenie is now very anti-renewable, especially PV, in natural areas. As general recommendations for where PV renewables should be located these should be: 1. PVs should ideally be restricted to urban landscapes (roof-top - how many hectares of roof are there in SA?); or 2. If located outside of the urban landscape then should be located ONLY in existing transformed areas (crop lands, old-fields or heavily degraded sites); or 3. If targeting natural landscapes then: 3.1 Remain outside of any CBA or ESA as identified in a bioregional plan or biodiversity sector plan 3.2 Remain outside of any remaining patches of near-threatened, vulnerable, endangered or critically endangered vegetation type	BirdLife South Africa supports the sustainable development of renewable energy. We agree with you your recommendations that PV should ideally be restricted to already transformed or degraded habitats . Development should be outside any threatened vegetation types and any existing or proposed protected areas. We have amended the text accordingly.

		<p>3.3 Remain outside of the 5km development buffer around existing PAs</p> <p>3.4 Remain outside of the 5km buffer around proposed PA development nodes or landscape biodiversity corridors (future PAs)</p> <p>These recommendations focus on habitat retention but relate directly to retaining all aspects of biodiversity (plants, birds, etc.) in a landscape.</p>	
Compensation	Leanna Rautenbach, SolarReserve	What do compensation options entail?	Compensation options could include conservation actions to remedy significant impacts on biodiversity (e.g. interventions to reduce mortality in an affected species, or improved management and protection of important habitat).
Significance – acceptable levels of fatality	Kent Russell, Santec (Canada)	<p>Have you considered including guidance on acceptable levels of fatality (or do you have the data to determine this)? Considering what is being observed for bird fatalities at wind projects in the US and Canada... fatality rates are publically available from more than 100 studies at over 70 wind projects across North America and fatality rates from most studies range from 3 to 5 birds/MW/year for all species combined and adjusted for detection biases. This range is generally considered an acceptable rate for bird fatality for most jurisdictions. Considering this, rates of fatality reported at 3 solar PV projects within the NREL (2015) report (Desert Sunlight – 0.23 birds/MW/year; CVSR - 1.47 birds/MW/year; Topaz – 0.11 bird/MW/year) are well below the 3 5/MW/year acceptable range for wind projects. If these were wind projects, with these mortality rates, they would be considered lower risk overall for birds (especially Desert Sunlight and Topaz). As</p>	<p>While it can be useful to look at average fatality rates across projects and across technologies, we caution against using this to determine what is acceptable. It is important to consider which species are affected and how this might influence its conservation status, both at individual projects, but also cumulatively. It will be useful to provide guidance for acceptable levels of fatality for particular species and we will consider including this in future guidance, once a clear picture has emerged with regards to which species are most vulnerable.</p>

		solar project development guidelines are established, I would hope the solar industry is treated fairly relative to other industries.	
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Implementation

List of specialists	Leanna Rautenbach and Terence Govender SolarReserve	List of specialists - why was this included?	This was included in the equivalent guidelines for wind energy on request of developers. We also wish to promote the use of specialists who have agreed to use the Guidelines. However, this list is not yet in place so we have removed this reference.
Applicability of guidelines to facilities that do not require environmental authorisation for electricity generation	Leanna Rautenbach, SolarReserve	Since the guidelines are aimed at all SEFs that require environmental authorisation for electricity generation. Is the assumption is that if the DEA does not require an EA for a project as its generation size is too small, there will be no impacts on avifauna?	No. While many small facilities could have little or no impacts on birds, poorly located small SEFs may still impact on avifauna (e.g. if they are located in an important wetland). These facilities are likely to trigger the need for environmental authorisation for some other reason (e.g. destruction of wetlands, loss of habitat etc.), or have some form of environmental oversight and the need for further avifaunal assessment should be considered.
Survey effort (Discretion of specialist)	Savannah Environmental	How much is really left to the discretion of the specialist? This is relevant to ensure that all specialists understand the flexibilities or requirements and to avoid criticism of the programme implemented at a later date or else every specialist states that the maximum must be done to avoid criticism.	It is always difficult to find a balance between being prescriptive and leaving things to the discretion of the specialist. In our experience specialists are normally under pressure to do the minimum amount required, and rarely proposed the maximum amount of work required. We have attempted to allow for some flexibility (e.g. the range of what should be expected) and have highlighted non-negotiable points. Where there are deviations from what is recommended, the specialist should motivate why this is considered necessary and appropriate.
Specialists and field teams (number of field workers)	Alvaro Camina	This (two field workers) is good for wind farms, but in my opinion is too much for SEFs unless they divide the area to account for more coverage. The vegetation cover and ground it is quite different in this case	We agree that there may be circumstances where a single field worker is adequate and have therefore included this as a recommendation, not a requirement. The specialist's discretion should be applied.
Specialists and field teams (number of field workers)	Leanna Rautenbach, SolarReserve	I do not agree with the recommendation that fieldworks should work in pairs - this decision should be left to the discretion of the avian specialist.	See above.
Peer review	Savannah Environmental	The guidelines suggest that the original	Not necessarily as the specialist would be best placed to

		author should be advised that a peer review will be conducted. Ideally the original author should be requested to provide a list of potential candidates to conduct the review. Would this not jeopardise the independence of the review?	know who is qualified to address the review issues related to the project. However, if there is any uncertainty, BirdLife South Africa would be happy to assist in identifying reputable specialists.
Peer review	Leanna Rautenbach, SolarReserve	Why is peer review required? What will the value add be to the developer or the DEA?? The specialist signs a declaration whereby he/she states their work will be independent and as accurate as possible.	Peer review is not a requirement, but is usually requested by a developer (normally if they are not happy with the specialists recommendations) or in some cases the Department of Environmental Affairs (if there is uncertainty or debate about the specialists independence or expertise). The NEMA EIA regulations provide for review.
South African Bird Atlas 2	Leanna Rautenbach, SolarReserve	Specialists are encouraged to register with the SABAP2 project and contribute to the project. This will be done at the discretion of the project company – the specialist cannot just register the project if this is not a legal requirement.	It is unclear why a developer would not permit the specialist to upload relevant data to SABAP2. Data gathered in the EIA process should be the public domain. SABAP2 is a valuable tool that benefits developers by providing information for impact assessment and screening and uploading data takes very little time and effort. The data captured on SABAP2 will only represent the species present on site, not their numbers, nests or pathways. Any individual that access any particular area can upload such data to SABAP2. We are surprised that representatives from an industry that purportedly has sustainability at its core would be opposed to this and it is unfortunate that developers and specialists who access and benefit from SABAP2 data, at no charge, are so reluctant to contribute to the project.
South African Bird Atlas 2	Dr Rob Simmons	All consultants should also be compelled to submit their data to SABAP. It is shocking how little data there given the amount of work going on there.	Agreed.
South African Bird Atlas 2	Alvaro Camina	The aim of the assessment must be the footprint of the solar facility and a "buffer" zone. This buffer area would depend of the size of the SEF. Sometimes a pentad would be more than required, other times not	Please see above. While we agree that the primary purpose of surveys should be data collection for impact assessment and monitoring, this does not preclude the possibility of submitting atlas cards. Where it is not possible to follow full SABAP2 protocols, incidental

		enough, but the monitoring has not to serve as to complete a SABAP.	records are still of value. It is a pity that developers and specialists who access and benefit from SABAP2 data, at no charge, are so reluctant to contribute to the project. Tools like BirdLasser make aliasing very simple.
Research	Leanna Rautenbach, SolarReserve	The guidelines suggest the following: "Specialists are encouraged to submit findings (whether positive, negative or inconclusive) to peer-reviewed scientific journals to promote wider dissemination of results and experience. Among other things this will help improve study design and knowledge of possible impacts. Developers are encouraged to give permission to use data from their facilities for this purpose and to allow access to their sites for independent research." How does this statement fit into a guideline document that has the primary aim of guiding and defining the impact assessment process for avifaunal species?	The aim of the guideline is to guide impact assessment <i>and monitoring</i> of avifauna at solar energy facilities. The intention of the statement is to ensure that the lessons learned from monitoring are shared so that the industry can ultimately be developed in a more sustainable way.
Research	Stuart Shearer	I wonder if you would consider including a clause regarding access to the site and surrounding areas for post-construction data collection and monitoring being a lease condition.	This has been included.
Standards	Terence Govender, Solar Reserve	Are the proposed Standards registered?	These guidelines are BirdLife South Africa's Guidelines and the recommended standards have not been registered.
SEA/ Renewable Energy Zones	Davin Chown, SAPVIA	There is no recognition of how to apply this methodology in RE development Zones, a concept which BLSA supported and subscribed to. This is a serious flaw in the entire approach and methodology.	The lead author of our solar guidelines was also the avifaunal specialist for the SEA, and we do not believe that the two are incompatible. The SEA process has not been finalised and we have yet to see the final document and protocols. This makes complete alignment difficult, but we have amended the guidelines to include reference to the SEA , and have made provision for reduced survey effort were multiple development are considered. While we participated in the Strategic Environmental

			Assessment for wind and solar energy (the process of identifying REDZ) and support the idea of an SEA, we are not in full support of the outcome. It is important to note that the SEA did not include site field-work within the Renewable Energy Development Zones. We are of the opinion that site assessments and monitoring should still be conducted within REDZ.
Use of draft guidelines	Davin Chown, SAPVIA	We have become aware that the BLSA guidelines for PV developments are being used by practitioners in the wind industry. How is this possible that you are sanctioning this and that this is allowed when you have no agreed sign-off from the DEA and these guidelines are of no force or effect? This demonstrates in practical terms that there is no good faith consultation or engagement from BLSA and that you are prepared to flout consultative and regulatory approvals processes to foist your guidelines on the industry.	We are confused by this statement. Our guidelines for wind energy have been available since 2011 so it is unclear how or why the wind energy industry would use our solar energy guidelines. If the intention was to note concern that BirdLife South Africa is including our draft guidelines for solar energy in our comments on EIAs for PV facilities, please note that the guidelines reflect BirdLife South Africa's opinion and outlines what we would recommend on a case-by-case basis when we comment on EIAs. Environmental consultants, avifaunal specialists and DEA are not obliged to take up these recommendations, but are required to apply their minds to our suggestions.

References

References	Savannah Environmental	Reference to Kagan et al. 2014, Walston et al. 2015. Please also consider the technical reports from actual monitoring programmes undertaken at operational facilities. There are several recent reports available. There are many relevant papers and monitoring reports from operational solar facilities which may not have been considered, and are not listed as reference sources. We are able to provide these to you for your review and consideration.	Additional references were obtained from Savannah. However, these all related to the Ivanpah facility and were already referenced in by Walston et al. 2015 (which provides overview of monitoring results at solar facilities in California). The intention of the guidelines is not to revisit the Walston review, or to delve into the specifics of Ivanpah, but rather provide an overview of the current state of knowledge and outline how impacts should be assessed in South Africa.
References	Kent Russell, Stantec (Canada)	Below are a few reference you might want to consider. Note that the ANL & NREL (2015) document provides a summary of many solar sites in the US and provides data contrary to some of the findings from the Kagan et al. (2014) paper.	Many thanks. We have incorporated many of your suggestions.
References	Thomas Siepelmeyer, IPD	Another point which gives us the impression of the BL draft report being flawed is the literature it uses to compile the report. Nearly half of it deals with birds and wind energy / wind farm projects, only a few with solar energy and birds. On the one hand it proves that there is not much research so far on this issue but one asks why the exorbitant use of literature re wind energy and birds? There is also a huge amount of literature available re coal power stations and birds, why not use these as references? You would also find much more sources on traffic and bird collision than wind energy, why not use that? Why not putting your focus on buildings and birds? Cats and birds?	We used our Best Practice Guidelines for Wind Energy as a basis for these guidelines. Many of the required assessment methods are standard survey techniques; their value is not limited to wind energy. One can also expect that many of these survey techniques (e.g. surveys of bird populations) will be (or at least should be) used when assessing the impacts of other developments, including coal-fired power stations. On the other hand, impacts associated with cats and buildings (in urban areas) are different and require different assessment methods. We do acknowledge your point about contextualising the impacts of solar energy in terms of other sources of impacts. The purpose of these guidelines is to set the framework for impact assessment and monitoring so that the impacts can be properly contextualised and ultimately so that impacts on vulnerable species and habitats from multiple anthropogenic sources can be minimised.

References	Terence Govender, Solar Reserve	Very old literature has been used to develop this section (i.e on impacts). We have operating plants in SA and they should be consulted for input into this section- they have real data and operational experience.	Noted. We have relied on published literature, but recognise that this is a rapidly changing technology and will update references as these come available.
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