

Minimum Requirements for Avifaunal Mitigation at Wind Energy Facilities Initiative: Summary of Progress to Date

1) Overview

Wind energy facilities (WEFs) in South Africa provide a low-impact renewable alternative to meet the country's energy demand. With a relatively small and dispersed footprint, they can coexist effectively with agriculture, grazing, and nature-based land uses, and largely avoid the widespread habitat destruction associated with many other energy developments.

The potential for this multi-use integration is a real strength and supports South Africa's just energy transition. At the same time, wind energy introduces a unique and persistent risk: due to wind farms largely maintaining the ecological integrity of the sites in which they are located, birds continue to use the landscape around turbines and powerlines (for nesting, breeding and migration). This leads to collisions that are difficult and costly to eliminate entirely.

Data from operational wind farms (2015–2023), summarised in [BirdLife South Africa's \(BLSA\) Summary of Bird Monitoring Reports \(February 2025\)](#), indicate that fatality rates vary significantly across sites. While some facilities report low mortality, others record higher levels, often involving priority species such as raptors, vultures, and passerines. This variation can be attributed to various factors such as:

- Variable avifaunal risk between wind energy sites,
- Differences in how these risks are characterised during Environmental Impact Assessments (EIAs),
- Vague and inconsistent commitments in Environmental Management Programmes (EMPrs) and
- The absence of independent oversight and auditing.

Furthermore, the imperative to site energy infrastructure where there is available grid capacity has created an additional challenge for proposed WEFs as opportunities to avoid sensitive avifaunal areas and exploit good wind resource are increasingly limited.

2) Intent and Purpose of Initiative

Against this background, in 2025 the South African Wind Energy Association's (SAWEA) Birds and Renewable Energy Task Team and BLSA launched an initiative to develop voluntary, sector-endorsed guidance on the minimum requirements that every EMPr should contain for avifaunal mitigation at wind energy facilities. The intent is to create greater **certainty, fairness, and consistency** so that responsible mitigation does not place operators at a competitive disadvantage, while supporting both bird conservation and the continued, responsible growth of wind energy in South Africa.

The initiative is a collaborative, sector-driven effort to address gaps in current practice through engagement with key role-players. It recognises that monitoring and mitigation measures can be costly and that developers are faced with varying levels of avifaunal risk, and that they have varying priorities. The goal is to ensure that the sector moves toward standardised, enforceable minimum standards that reduce perverse incentives, promote sustainable mortality rates of priority bird species, and maintain the industry's social licence and investor appeal.

This document summarises the engagement process undertaken to date and the outcomes that will inform the development of the framework.

3) Progress to Date

Since the initiative's launch in 2025, engagement with stakeholders has progressed through a series of structured events designed to build consensus and gather practical input. An initial workshop at the IAIAsa Conference in August 2025 tested early ideas with Environmental Assessment Practitioners (EAPs) and other role-players. This was followed by a national [Blades & Birdlife webinar](#) in November 2025 to raise awareness and frame the key issues, and a three-city [workshop series](#) later that month to gather detailed, cross-sector input on the minimum requirements framework.

The outcomes of these engagements, summarised in the sections that follow, have confirmed strong cross-sector alignment on the need for standardised, outcome-based avifaunal mitigation requirements and have provided a practical foundation for the next phase of framework development.

3.1) IAIAsa Workshop: Strengthening EMPs for Wind Energy Facilities (21 August 2025)

A workshop titled *Strengthening EMPs for Wind Energy Facilities* was facilitated at the IAIAsa Conference in August 2025 in the Drakensberg. Approximately 50 participants, primarily EAPs, but also developers, regulators and ECOs, interrogated the practical shortcomings of operational EMPs at wind energy facilities. Participants reviewed real-world EMP examples and identified weaknesses in the EMPs including:

- Vague commitments,
- Absent or vague mitigation outcomes,
- Unclear roles and responsibilities,
- Inadequate carcass and data management protocols, and
- No clear process to update EMPs as conditions change.

Cross-stakeholder group feedback converged on the need for Specific, Measurable, Achievable, Relevant, and Time-Bound (SMART) standardised minimum EMP requirements, scientifically defensible thresholds embedded in Environmental Authorisations (EAs), independent enforcement, and centralised data portals.

3.2) The Webinar: Turbine Talks – Balancing Blades & Birdlife (14 November 2025)

The [Turbine Talks – Balancing Blades & Birdlife webinar](#) was the formal launch and awareness-raising event for the initiative to develop guidance for minimum requirements for avifaunal mitigation at wind energy facilities. It convened developers, asset managers, specialists, Non-Governmental Organisations (NGOs), government representatives, funders, and other stakeholders to present the current state of avifaunal mitigation, and test early consensus on the need for clearer, more consistent standards for avifaunal mitigation.

The session was moderated by [Kishaylin Chetty](#) (EWT) and featured contributions from developers ([Matthew Law](#)), asset managers ([Andrew Pearson](#) and [Kagiso Mthembu](#)), government (Victor Loate and [Sindiswa Dlomo](#)), avifaunal specialists ([Jon Smallie](#)), and conservationists ([Samantha Ralston-Paton](#)).

Key points raised included:

- Agreement that inconsistency in mitigation performance is a shared challenge for the sector.
- Recognition of the need to shift toward measurable outcomes in EMPs rather than relying on one-size-fits all prescriptive actions.
- Growing openness to fatality thresholds as potential adaptive management triggers.
- Consensus that monitoring must be standardised (consistent data formats and independent oversight) to make outcomes verifiable and enforceable.
- Acknowledgement that financial provision for adaptive management is essential.
- Agreement that compliance with the EMP and EA must be audited during operations as a condition of EA.

The webinar successfully raised awareness, demonstrated cross-sector willingness to collaborate, and set the stage for deeper consultation through the workshop series.

3.3) The Workshop Series (26–28 November 2025)

The three in-person interactive workshops (Cape Town on 26 November, Gqeberha on 27 November, Johannesburg on 28 November) comprised the primary consultation phase to date. These workshops brought together developers, asset managers, specialists, ECOs, EAPs, NGOs, funders, and government representatives for structured, honest, open and at times contentious discussions on avifaunal mitigation.

The workshops aimed to:

- Critically evaluate current EMP approaches, identifying strengths, weaknesses, and potential risks with respect to regulatory compliance, biodiversity outcomes, and project feasibility.
- Identify the key requirements for avifaunal impact management to ensure consistent, measurable and enforceable outcomes.

- Assess the case for greater standardisation of avifaunal environmental management requirements and identify priority areas for standardisation.
- Ensure any guidance developed supports both the wind sector's growth and bird conservation.

Participants at each workshop were grouped by their role in the industry: EAPs; Government Agencies; NGOs and Avifaunal Specialists; Developers; and Operators and Lenders. In breakout sessions, each group was asked to debate and discuss the deficiencies of current EMPs for wind farms in South Africa from their sector's perspective, and then to report back to the plenary on behalf of their group / the sector of the industry which they represent.

Workshop Process and Approach:

- i) Within the breakout groups, participants examined the relative strengths and weaknesses of three different EMPs, evaluating both the clarity and appropriateness of impact management outcomes and actions.
- ii) Using this analysis as a basis for further discussions, the groups interrogated what constitutes a well-constructed EMP for wind energy facilities and debated the appropriate allocation of requirements between conditions of EA and the EMP itself.
- iii) The question of standardisation was a central theme, with participants considering whether greater consistency in avifaunal environmental management requirements is warranted and, if so, which aspects would benefit most from a standardised approach.
- iv) Participants were also asked to address the practical question of what is needed to ensure more effective EMP implementation on the ground.

The workshops achieved strong participation (between 40 and 60 participants per session) and constructive dialogue across all three days, demonstrating genuine momentum and a shared commitment to moving beyond the current inconsistencies.

4) The Workshop Series Outcomes

The following section presents a synthesis of the feedback from each stakeholder group (i.e. EAPs; Government Agencies; NGOs and Avifaunal Specialists; Developers; and Operators and Lenders), consolidated across all three workshop sessions. Rather than reporting by location, the feedback from all groups representing the same industry role has been combined, as the themes raised were broadly consistent across the three cities.

4.1) Environmental Assessment Practitioners (and ECO/ESOs)

Across the EAP workshop groups, there was strong alignment that strengthening avifaunal mitigation should focus less on expanding pre-construction requirements and more on improving the clarity, enforceability, and operational effectiveness of environmental management for avifaunal species.

A consistent concern voiced by EAPs at the workshops was that current EMPs are often too vague, conceptual, and inconsistent, limiting their usefulness for on-site implementation and compliance. Recognising that limitation, EAPs emphasised that effective EMPs must be specific, and implementation-focused, with clearly defined responsibilities, timeframes, monitoring protocols, and measurable targets (including species-specific thresholds and trigger points for action) – in other words, EAPs emphasised that EMPs should be SMART.

There was also clear consensus on the need to distinguish between mitigation outcomes (what mitigation should achieve) and mitigation actions (how mitigation outcomes are to be achieved).

Mitigation outcomes being:

- binding and measurable (e.g. fatality thresholds, habitat integrity) and
- embedded in EAs as conditions of authorisation, and

Mitigation actions being flexible and adaptive contained in EMPs.

This enables adaptive management to achieve fixed mitigation outcomes by allowing mitigation actions (e.g. curtailment, shutdown-on-demand) to evolve based on changing environmental conditions, operational data and technological advances.

EAPs strongly supported standardisation of minimum information requirements for operational avifaunal management, including monitoring methods, reporting formats, and mitigation outcomes, while avoiding overly prescriptive actions. Improved data sharing, transparency, and feedback loops were also seen as critical to refining Good Industry Practice and enabling industry-wide learning.

Other key issues raised by EAPs regarding operational phase avifaunal management were as follows:

- Adequate financial provision should be made for adaptive management;
- Operational fatality monitoring data should be used to validate mitigation performance and inform adaptive management (against clear mitigation outcomes) from the start of operations; and
- Compliance monitoring and enforcement of operational environmental management commitments must be enhanced, including clearer role definition and minimum competency standards for Environmental Control Officers (ECOs).

In summary, EAPs view strengthened avifaunal mitigation as achievable through better-designed and measurable environmental management commitments, underpinned by consistent operational data collection to inform adaptive management and strong enforcement.

4.2) Government Agencies

Government stakeholders expressed a clear and consistent view that strengthening avifaunal mitigation should be driven by firm, enforceable outcomes and stronger accountability mechanisms, rather than additional pre-construction complexity.

Central to this perspective is the need for non-negotiable, measurable mitigation outcomes embedded in EAs as conditions of authorisation, particularly fatality thresholds and habitat integrity indicators, supported by robust enforcement and tangible consequences where these outcomes are not achieved. Government representatives emphasised that if mitigation outcomes cannot be met, developers must revisit the EIA or elect not to proceed, rather than dilute mitigation commitments based on cost or feasibility.

Consistent with the EAP groups, government reinforced the importance of clearly distinguishing between mitigation outcomes and mitigation actions, with outcomes fixed in EAs and adaptive, site-specific actions contained within EMPs. This enables adaptive management, allowing mitigation actions, such as curtailment and Shut-Down-on-Demand (SDOD), to evolve in response to operational data and changing environmental conditions without undermining regulatory certainty.

Government also reinforced that EMPs must be specific and implementation-ready, with clearly defined monitoring protocols, fatality thresholds, and trigger-based responses. A key concern was that current EMPs are often too vague and lack the rigour required to support compliance and enforcement.

Other key issues raised by government regarding operational phase avifaunal management were as follows:

- Mandatory, detailed monitoring and mitigation protocols should be included in, or appended to EMPs.
- Avifaunal monitoring at wind farms should take place for the full lifecycle of operations, rather than on arbitrary timeframes;
- Operational fatality monitoring data should be used to validate mitigation performance and refine mitigation actions from the start of operations;
- Adequate financial provision should be made for ongoing monitoring and adaptive management;
- Standardised minimum information requirements for operational management systems for avifauna at wind farms is needed to support consistency, transparency, and enforceability across projects, while still enabling innovation through adaptive management; and
- Effective implementation requires stronger institutional and human oversight capacity (ECOs and government bodies).

Overall, government views strengthening avifaunal mitigation as requiring a shift toward outcome-based regulation and lifecycle accountability; supported by enforceable, well-structured environmental management systems for avifauna, with a particular focus on operational compliance and adaptive management.

4.3) NGOs and Avifaunal Specialists

Avifaunal specialists and NGOs consistently emphasised that strengthening avifaunal mitigation must be grounded in scientific rigour, high-quality data, and transparent, standardised systems, with a strong focus on long-term, population-level conservation outcomes rather than site-specific metrics alone.

A central concern to NGOs and avifaunal specialists is that environmental management systems for avifaunal species at wind farms in South Africa are currently undermined by poor data quality, lack of standardisation (e.g. in data collection), and fragmented data systems. These role players also highlighted the need for nationally standardised methodologies for data collection, operational monitoring, and compliance auditing, supported by centralised, accessible databases and robust data verification (e.g. GPS validation). Without this standardisation, there is a risk of “garbage in, garbage out,” limiting confidence in mitigation effectiveness and the ability to accurately assess cumulative impacts and therefore set scientifically robust mitigation targets or fatality thresholds.

There was also strong support for scientifically informed fatality thresholds as measurable mitigation outcomes for wind energy facilities from these stakeholders. These stakeholders noted that thresholds should be precautionary when data is imperfect (species of high conservation concern may require zero or near-zero tolerance thresholds) and informed by tools such as Population Viability Analysis (PVA) and Potential Biological Removal (PBR), ideally applied at a national scale.

Consistent with other stakeholder groups, NGOs and avifaunal specialists supported the distinction between mitigation outcomes and mitigation actions, with clear, enforceable outcomes in EAs (e.g. population-level protection and fatality limits), and adaptive, site-specific mitigation actions in EMPs. However, they stressed that these actions must be supported by detailed, standardised monitoring protocols and scientifically robust frameworks to ensure credibility.

Other key issues raised by NGOs and avifaunal specialists regarding operational phase avifaunal management were as follows:

- Lifecycle operational fatality monitoring is essential to enable prompt adaptive management responses to both predictable and emerging risks;
- Financial provision for monitoring, specialist input during operations, and adaptive management is a critical enabler of strong mitigation performance. Conversely, inadequate financial provision currently inhibits Good Industry Practice at some South African wind farms;
- Greater transparency through improvements in fatality monitoring data sharing (especially where data has broader conservation value) and associated accountability (enforcement) are required; and
- Collaborative, cross-sector engagement is essential to align thresholds, improve data systems, and ensure that mitigation achieves meaningful conservation outcomes.

Overall, this group views strengthened avifaunal mitigation as dependent on robust science, standardised and transparent data systems, enforceable outcome-based mitigation frameworks, and sustained investment in long-term monitoring and adaptive management, rather than increased reliance on pre-construction processes.

4.4) Developers

Developers highlighted several practical implementation challenges with current EMPs, including:

- variable quality of on-site implementation,
- lack of clarity in requirements,
- gaps during handover between project phases,
- difficulty embedding EMP requirements into contractual and operational systems,
- the need for effective training of ECOs, ESOs (Environmental Site Officers), contractors, and site managers.

A key observation raised by the development community is that avifaunal mitigation is costly, both in terms of capital costs and lost production, and that, therefore, the inconsistent application of avifaunal mitigation across the sector creates competitive distortions.

Standardisation of mitigation was cited by developers as an opportunity to promote consistency relative to avifaunal risk and counter this inconsistency. In this context, developers emphasised that mitigation standards should direct clear operational performance requirements (outcomes) while providing flexibility to enable practical, adaptive implementation without unduly restricting the development of wind energy in South Africa.

Consistent with other stakeholder groups, developers supported the distinction between fixed, measurable mitigation outcomes recorded in EAs and flexible, practicable mitigation actions recorded in EMPs.

Other observations made by developers regarding operational phase avifaunal management were as follows:

- Good governance coupled with accountability, including clear consequences for non-performance, are critical to the implementation of any environmental management system;
- Standardised minimum requirements for avifaunal mitigation should not be prescriptive, especially in terms of possible mitigation actions;
- Environmental management systems must be specific in terms of expected performance targets (outcomes), monitoring pathways (who monitors, how, and what triggers action), adaptive management responses, implementation timeframes and responsibilities;
- Mitigation actions must be practicable and flexible enough to accommodate evolving technologies, changing site conditions, and lessons learnt from operational data;
- Early operational fatality monitoring enables prompt adaptive management responses;
- Financial provisioning for adaptive management to unforeseen impacts in an evolving environment is essential; and
- Increased collaboration between developers would reduce variation, improve efficiency, and support shared learning.

Overall, developers view strengthened avifaunal mitigation as achievable through practicable EMPs that are drafted to achieve clear performance standards (outcomes), supported by adaptive management, strong monitoring systems, and adequate resourcing, while retaining the flexibility needed to respond to real-world conditions and technological change.

4.5) Operators and Lenders

Operators and Lenders emphasised that strengthening avifaunal mitigation must be practical, clearly defined, and financially predictable, with a strong focus on operational certainty, risk management, and long-term accountability.

A central concern is the need for clear, unambiguous responsibilities, thresholds, and definitions, particularly around what constitutes a “significant impact” and when mitigation is considered effective. Without this clarity, operators face difficulty in implementing actions, while lenders face uncertainty in assessing risk and allocating capital.

Importantly, this group framed avifaunal mitigation within a risk-based, engineering mindset, noting that absolute zero fatality is not always realistic or scientifically defensible, that Probabilistic thresholds and risk tolerances may be more appropriate, and that mitigation systems (e.g. SDOD) must be operationally reliable, with failure triggering operational consequences.

Consistent with other stakeholder groups, operators and lenders supported the distinction between fixed, measurable outcomes defined in EAs and flexible, adaptive actions detailed in EMPs. However, operators stressed that EMPs must translate these actions into highly specific, site-level instructions, including exact locations (e.g. turbine-specific), timelines, responsible parties, and reporting lines to enable execution within operational systems.

A key theme was the importance of planning and budgeting certainty. Adaptive management is supported in principle, but it introduces financial and operational risk if not clearly scoped upfront.

Other key issues raised by operators and lenders were as follows:

- Early definition of mitigation outcomes and potential mitigation pathways during development is essential to enable financial planning;
- Dedicated financial provisioning for adaptive mitigation is required, potentially as a defined percentage of project cost, with consideration of financial security mechanisms (e.g. trust funds) to ensure long-term implementation;
- Triggered mitigation (e.g. shutdowns) can have significant revenue implications, reinforcing the need for clearly defined thresholds and response protocols;
- Lifecycle operational fatality monitoring, supported by clear monitoring and reporting frameworks, is essential to inform adaptive management and verify mitigation performance;
- EMPs should be treated as living documents, updated regularly to reflect operational data and changing conditions, with standardised documentation that clearly links actions, responsibilities, and timelines while remaining site-specific;
- Stronger external oversight and independent auditing is required to ensure credibility, consistency, and compliance across the sector; and
- Transparency and data sharing are critical enablers for improving implementation and managing reputational and financial risk, though concerns remain around confidentiality and the potential commercial implications of sharing operational data.

Overall, operators and lenders' view strengthened avifaunal mitigation as dependent on clear, standardised, and implementable requirements, supported by early planning, financial provisioning, robust monitoring, and risk-based adaptive management, ensuring that environmental outcomes can be achieved without undermining operational viability or investment certainty.

5) Lessons Learned

The workshop series demonstrated remarkable convergence across all five stakeholder groups on the fundamental requirements for strengthening avifaunal mitigation at wind energy facilities in South Africa. Despite approaching the topic from different perspectives and with different priorities, the themes raised were strikingly consistent.

The matrix overpage maps fifteen key themes against each stakeholder group. Themes are grouped into four categories: 1) outcome-based framework, 2) environmental management, 3) monitoring and data, and 4) accountability and resourcing. For each theme, the matrix indicates whether the group raised and emphasised the theme as a central element of their position (dark), raised the theme in support of broader discussion (light), or did not explicitly raise it (open). The distinction between "emphasised" and "raised" reflects the relative prominence a theme held in each group's feedback, not agreement or disagreement: in no instance did any group oppose a theme raised by others.

Of the fifteen themes identified, thirteen were raised by all five stakeholder groups. Only two themes, ECO capacity and cross-sector collaboration, were not raised by one group each. No group took an outlier or opposing position on any theme. This level of alignment across groups with fundamentally different mandates, risk profiles, and commercial interests provides a strong foundation for the development of a national framework.

Cross-sector alignment on key themes

Workshop series synthesis: 26 – 28 November 2025 | Cape Town, Gqeberha, Johannesburg

● Raised and emphasised ● Raised ○ Not explicitly raised

THEME	EAPs	Govt	NGOs & specialists	Developers	Operators & lenders	Alignment
OUTCOME-BASED FRAMEWORK						
Measurable mitigation outcomes in EAs	●	●	●	●	●	5/5
Separate outcomes (EAs) from actions (EMPrs)	●	●	●	●	●	5/5
Fatality thresholds as adaptive management triggers	●	●	●	●	●	5/5
ENVIRONMENTAL MANAGEMENT						
SMART, implementation-ready EMPrs	●	●	●	●	●	5/5
Adaptive management linked to triggers	●	●	●	●	●	5/5
Flexibility in mitigation actions (not prescriptive)	●	●	●	●	●	5/5
MONITORING AND DATA						
Lifecycle operational fatality monitoring	●	●	●	●	●	5/5
Standardised data collection and reporting	●	●	●	●	●	5/5
Data transparency and sharing	●	●	●	●	●	5/5
ACCOUNTABILITY AND RESOURCING						
Financial provision for adaptive management	●	●	●	●	●	5/5
Independent compliance auditing	●	●	●	●	●	5/5
Consequences for non-performance	●	●	●	●	●	5/5
ECO capacity, training, and role clarity	●	●	○	●	●	4/5
Cross-sector collaboration and shared learning	●	○	●	●	●	4/5

THEMES WITH UNANIMOUS SUPPORT

13 of 15

raised by all five groups

UNIVERSAL CONSENSUS THEMES

5

emphasised by every group

THEMES RAISED BY NO GROUP

0

no outlier positions

A brief narrative on each theme is provided below:

5.1) Outcome-based Framework

Measurable mitigation outcomes in EAs. All five groups agreed that measurable, enforceable mitigation outcomes must be embedded in Environmental Authorisations as conditions of authorisation. Outcomes must be non-negotiable, scientifically defensible, and aligned with population-level conservation goals. This was the single most consistently emphasised theme across all groups.

Separate outcomes from actions. There was universal agreement that mitigation outcomes (what must be achieved) belong in EAs, where they are fixed and enforceable, while mitigation actions (how outcomes are to be achieved) belong in EMPs, where they can remain flexible, adaptive, and site-specific. This separation is critical to enable adaptive management and technological evolution without regulatory rigidity.

Fatality thresholds as adaptive management triggers. All groups supported the use of scientifically informed fatality thresholds as measurable triggers for adaptive management. NGOs and specialists placed particular emphasis on the need for thresholds to be precautionary where data is imperfect and informed by tools such as Population Viability Analysis and Potential Biological Removal at an appropriate scale. Developers raised the theme but placed less central emphasis on the specific mechanisms.

5.2) Environmental management

SMART, implementation-ready EMPs. There was strong consensus that current EMPs are too vague, conceptual, and inconsistent to support effective on-site implementation or compliance. All groups agreed that EMPs must be specific, measurable, achievable, relevant, and time-bound, with clearly defined responsibilities, timeframes, site-specific instructions, and trigger-based mitigation responses. Operators and lenders placed particular emphasis on the need for EMPs to translate requirements into highly specific, site-level instructions that can be executed within operational systems.

Adaptive management linked to triggers. All five groups emphasised that adaptive management must be linked to clearly defined triggers, with pre-defined response actions and timeframes. This was seen as the mechanism that enables mitigation to respond to changing environmental conditions, operational data, and emerging risks over the life of the facility, rather than relying on static pre-application predictions.

Flexibility in mitigation actions. All groups supported the principle that mitigation actions should not be overly prescriptive, allowing methods to evolve as technologies advance and site conditions change. EAPs, developers, and operators emphasised this most strongly, recognising that innovation in mitigation technology, including AI-based detection, smart curtailment, and other emerging approaches, is advancing rapidly and should not be constrained by rigid prescriptions.

5.3) Monitoring and data

Lifecycle operational fatality monitoring. All groups supported robust operational fatality monitoring for the full lifecycle of the facility, rather than for arbitrary or limited timeframes. This was seen as the foundation for informed adaptive management and for verifying whether mitigation outcomes are being achieved. Early operational monitoring from the start of commercial operations was highlighted as essential to enable prompt adaptive management responses.

Standardised data collection and reporting. There was strong support for nationally standardised methodologies for data collection, operational monitoring, reporting formats, and compliance auditing. NGOs and specialists placed particular emphasis on the risks of poor data quality, noting that without standardisation there is a risk of unreliable data undermining confidence in both thresholds and mitigation effectiveness, and limiting the ability to assess cumulative impacts.

Data transparency and sharing. All groups recognised the critical need for improved data sharing across the sector, supported by centralised, accessible databases and robust data verification. NGOs and specialists emphasised the broader conservation value of shared data, while operators and lenders acknowledged the importance of transparency for managing reputational and financial risk, though noting concerns around confidentiality and commercial sensitivity that will need to be addressed in the framework design.

5.4) Accountability and resourcing

Financial provision for adaptive management. All five groups emphasised that adequate financial provision for monitoring and adaptive management is essential and that current provision is often inadequate. Operators and lenders highlighted the need for early definition of potential financial exposure and consideration of financial security mechanisms to ensure long-term implementation. There was widespread concern that adaptive mitigation is underfunded, and strong support for aligning financial models with environmental obligations.

Independent compliance auditing. All groups supported independent compliance auditing at specified intervals as a critical mechanism for ensuring credibility, consistency, and accountability. This was seen as essential to verify that mitigation commitments are being implemented and that outcomes are being achieved.

Consequences for non-performance. Government, developers, and operators emphasised the need for clear, tangible consequences where mitigation outcomes are not achieved. Government representatives were particularly firm that if outcomes cannot be met, developers must revisit the EIA or elect not to proceed, rather than dilute commitments. This accountability framework was seen as the mechanism that drives genuine investment in effective mitigation.

ECO capacity, training, and role clarity. Four of the five groups raised the need to strengthen Environmental Control Officer capacity, qualifications, and role clarity. EAPs and government emphasised minimum competency standards. Developers highlighted the importance of training across all levels, including contractors and site managers, and clear handover processes between project phases. NGOs and specialists did not explicitly raise this theme.

Cross-sector collaboration and shared learning. Four groups raised the value of increased collaboration across the sector to reduce variation, improve efficiency, and support shared learning. NGOs and specialists emphasised the need for collaborative engagement to align thresholds and improve data systems. Developers saw collaboration as a mechanism to reduce inconsistency and support industry-wide learning. Government did not explicitly raise this theme.

6) Proposed Next Steps for Framework Development

The workshop series has confirmed strong cross-sector alignment on the deficiencies of current environmental management systems at wind farms in South Africa, and what constitutes effective avifaunal environmental management at wind energy facilities. The task now is to translate that alignment into a practical, framework that can guide the sector toward greater consistency while recognising the unique circumstances of every project.

The proposed next step is to develop a draft framework that defines the minimum information requirements that every environmental management system for a wind energy facility should address for avifaunal species. The framework will specify the categories of information that should be present across the components of the management system, including:

- i) conditions of EA,
- ii) EMPr content,
- iii) monitoring programmes,
- iv) adaptive management protocols,
- v) financial provision, and
- vi) compliance auditing, without prescribing the specific outcomes, thresholds, methods, or actions for any given site.
- vii) remains the domain of the specialist, the developer, and the competent authority, determined on a site-specific basis through the EIA process.

For example, the framework would require that an EA includes measurable mitigation outcomes as conditions of authorisation, and that the corresponding EMPr includes appropriate actions and an adaptive management protocol linked to those outcomes, but it would not define what the outcomes, actions or triggers should be for a particular facility. Similarly, it would encourage that financial provision is made for adaptive management but would not prescribe the quantum or mechanism.

The intent is to ensure that every environmental management system is structurally complete and consistently addresses the elements that the workshop series identified as essential, while preserving the flexibility that site-specific conditions and evolving technologies demand.

The draft framework will be circulated for consultation with all stakeholder groups engaged through the workshop series, as well as the broader industry. Based on that consultation,

the framework will be refined and put forward for endorsement by SAWEA and BLSA, and potentially other key stakeholders including the Endangered Wildlife Trust (EWT) and DFFE. Once endorsed, the guidance may be adopted by government as minimum, non-prescriptive information requirements for environmental management systems at wind energy facilities.

This approach is consistent with the principles that emerged consistently across all five stakeholder groups: outcome-based, non-prescriptive, enforceable, and grounded in adaptive management. It builds on the considerable common ground that already exists between industry and the conservation community and provides a practical pathway from the alignment demonstrated at the workshops to a framework that supports both effective avifaunal conservation and the continued responsible growth of wind energy in South Africa.

7) Final Thoughts

The engagement process to date has confirmed that there is **clear cross-sector alignment** on both the deficiencies in current environmental management systems for avifaunal species at wind energy facilities, and the principles required to address them. Strengthening avifaunal mitigation is achievable through standardisation, clarity, scientific rigour, and operational practicality, supported by adaptive management, robust data systems, and strong compliance mechanisms. Critically, this alignment extends across stakeholder groups with fundamentally different mandates and interests, from conservation NGOs to developers to government, lending the conclusions both credibility and durability.

Across all groups, the emphasis was consistently on strengthening operational-phase environmental management, through measurable outcomes, enforceable commitments, lifecycle monitoring, and credible adaptive management, as the priority for improving avifaunal conservation outcomes at wind energy facilities. The next phase should focus on translating this alignment into a practical, non-prescriptive national framework.

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Your contributions have been invaluable and will directly inform the development of the framework.

Nomenclature

BLSA – BirdLife South Africa

DFFE – Department of Forestry, Fisheries and the Environment

EA – Environmental Authorisation

EAP – Environmental Assessment Practitioner

ECO – Environmental Control Officer

EIA – Environmental Impact Assessment

EMPr – Environmental Management Programme

ESO – Environmental Site Officer

EWT – Endangered Wildlife Trust

IAIASa – International Association for Impact Assessment South Africa

NGO – Non-Governmental Organisation

SAWEA – South African Wind Energy Association

SDoD – Shut Down on Demand

SMART – Specific, Measurable, Achievable, Relevant, Time-Bound

WEF – Wind Energy Facility