



**E Z E M V E L O
K Z N W I L D L I F E**

Conservation, Partnerships & Ecotourism

*Concise Guideline:
Biodiversity Offsets in
KwaZulu Natal*

Version: 4Final
Date: February 2013
Compiled by: IEM
Available from: data@kznwildlife.com



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1. INTRODUCTION

This concise practical guide is a condensed version of the comprehensive Norms and Standards prepared for Ezemvelo KZN Wildlife (Ezemvelo). It was prepared as a 'hands on' guide for use by staff who are well acquainted with the comprehensive Norms and Standards; for this reason, it *does not* contain an executive summary, glossary of terms and acronyms, or background information on the legal, policy or planning context for offsets in KwaZulu-Natal. In addition, it does not explain the roles and responsibilities of different role-players considering offsets, or provide a list of references or priority actions to be pursued in the province.

This concise document emphasizes consideration of biodiversity offsets during the EIA process; i.e. in specific relation to activities listed in the National Environmental Management Act (NEMA) EIA regulations. However, since all organs of State are bound by NEMA's national environmental management principles that require impacts on biodiversity to be avoided or, when they cannot be altogether avoided, to be minimized and remedied, biodiversity offsets should be considered for any and all land use changes that could have a significant adverse impact on biodiversity.

For additional information and reference material, please consult the comprehensive guidelines.

1.1 What is meant by 'biodiversity' and 'ecosystem services'?

According to the National Environmental Management: Biodiversity Act (Act 10 of 2004), biological diversity or 'biodiversity' means *"the variability among living organisms from all sources including, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part and also includes diversity within species, between species, and of ecosystems"*. The persistence of biodiversity depends on its 'pattern' and on 'process', both of which underpin the delivery of a range of ecosystem services.

The National Environmental Management: Protected Areas Act (Act no 57 of 2003) refers to ecosystem services as 'environmental goods and services', and defines them as *"benefits obtained from ecosystems such as food, fuel and fibre and genetic resources; benefits from the regulation of ecosystem processes such as climate regulation, disease and flood control and detoxification; and cultural non-material benefits obtained from ecosystems such as benefits of a spiritual, recreational, aesthetic, inspirational, educational, community and symbolic nature"*. A more recent definition of 'ecosystem services'¹ is 'the aspects of ecosystems utilized (actively or passively) to produce human well-being'. This definition highlights the direct (e.g. harvesting, tourism) and indirect (water supply) use values, as well as non-use (option and existence) values of biodiversity and ecosystems to society.

1.2 What are biodiversity offsets?

Biodiversity offsets are defined as 'the measurable conservation outcomes resulting from actions designed to compensate for significant residual adverse biodiversity impacts arising from project development² after appropriate prevention and mitigation measures have been taken. The goal of

¹ Fisher *et al* 2009

² While biodiversity offsets are defined here in terms of specific development projects (such as a road or a mine), they could also be used to compensate for the broader effects of programmes and plans.

biodiversity offsets is to achieve no net loss and preferably a net gain of biodiversity on the ground with respect to species composition, habitat structure, ecosystem function and people's use and cultural values associated with biodiversity³. In simple, practical terms, a biodiversity offset is 'on the ground' compensation for negative impacts on biodiversity that remain after higher priority measures in the mitigation hierarchy (avoid/ prevent first, then minimize, restore/ repair) have been taken into account (Figure 1).

Offsets are seen as a mechanism to give effect to a number of the NEMA principles, including the remedying of impacts on biodiversity and protecting ecological integrity, and demonstration of the polluter-pays principle in particular: the costs of cumulative impacts on natural systems and ongoing erosion of natural capital are currently being borne by society as externalities, rather than by those responsible for these impacts.

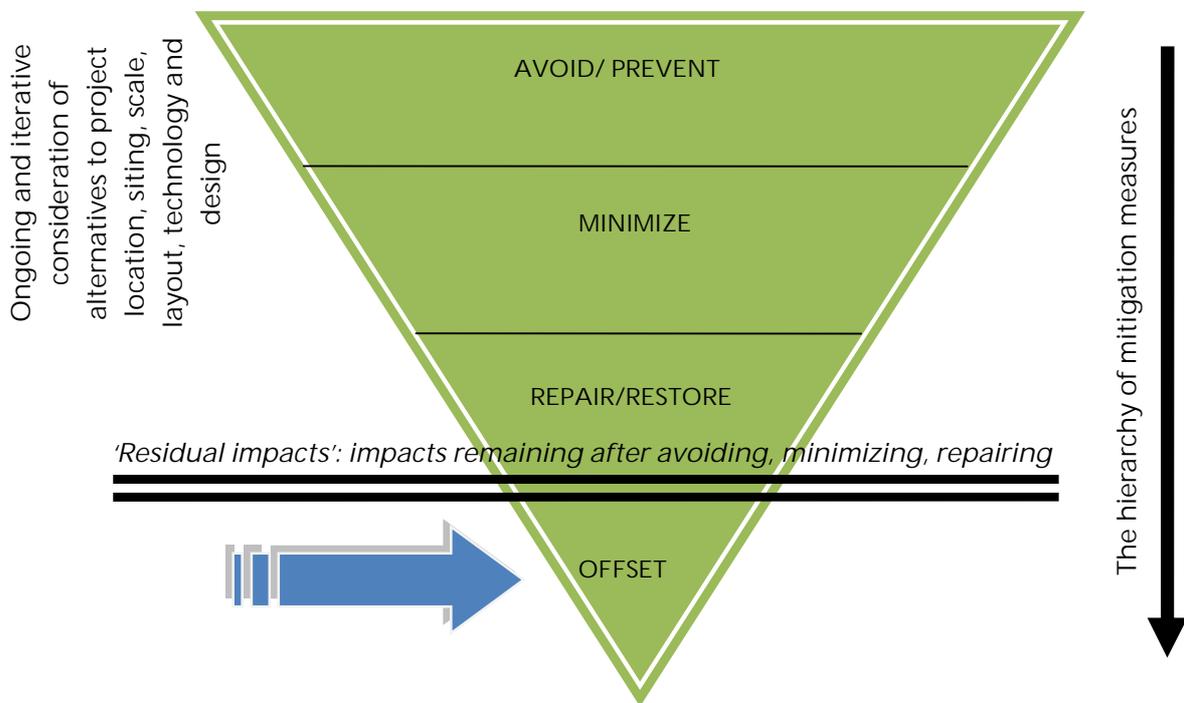


Figure 1: Offsets to compensate for the residual negative impacts on biodiversity: the last resort in the mitigation hierarchy

1.3 Main approaches to biodiversity offsets

The focus of biodiversity offsets is to provide an in kind, or like for like area of the same habitat structure, species composition and ecological function to compensate fully for that lost or negatively affected by development, and/or result in an overall improvement in biodiversity conservation. In exceptional cases,

³The international Business and Biodiversity Offset Program (BBOP) Principles as finalized in December 2008.

out of kind provision of an offset area of greater conservation significance (trading up) may be considered if it would have greater conservation benefit from a strategic perspective. Where the securing of on the ground habitat as an offset is not feasible or practicable within the time-frame available, monetary compensation, for the sole and explicit purpose of securing such habitat, may be an option.

There are four main approaches to offsetting residual negative impacts:

1. Re-creating or fully restoring lost habitat.
2. Enhancing the management of degraded areas e.g. by re-introducing native species, rehabilitation measures, etc.
3. Averting risk of imminent or projected loss of biodiversity by securing areas for protection and effective management in perpetuity.
4. Averting risk of imminent or projected loss of biodiversity by tackling the underlying causes of biodiversity loss in an area through working with communities to support sustainable livelihoods.

1.4 Principles for biodiversity offsets

The following principles underpin biodiversity offsets⁴:

1. **Conservation targets:** offsets must be determined in such a way as to ensure that conservation targets are attainable and not undermined through development, and that the size of offset is commensurate with the residual negative impact on biodiversity..
2. **Application of the mitigation hierarchy:** impacts must first be avoided or minimized by using all cost-effective and reasonable prevention, mitigation and restoration/ rehabilitation measures. Offsets are only used to address the residual impacts.
3. **Limits to what can be offset:** offsets are not appropriate to compensate for impacts on irreplaceable biodiversity.
4. **Additional conservation outcomes:** offsets must be 'new' conservation activities, over and above outcomes that would have occurred without the offset; e.g. existing or planned conservation areas cannot be used to offset a new activity. Also, offsets should not comprise actions or activities *already required by law*.
5. **Enduring conservation outcomes:** offsets must last for the duration of project impacts⁵ or in perpetuity. They should be monitored and managed adaptively to sustain desired conservation outcomes.
6. **Science and traditional knowledge:** the design and implementation of offsets should be based on sound science as well as traditional or local indigenous knowledge.
7. **Enforceable and auditable:** offsets must be able to be legally enforced and audited, through explicitly worded conditions, covenants or contracts.
8. **Landscape context:** offsets should contribute to conservation in a landscape context, supporting an ecosystem approach.
9. **Timing:** offsets in the most appropriate form must preferably be secured before development commences.

⁴ The principles listed below are adapted and drawn from a synthesis of principles used internationally (BBOP December 2008; Dept of Environment and Conservation, NSW, Australia 2005 and 2006; International Council on Mining and Metals 2005; WWF 2006).

⁵ The onus is on the developer to demonstrate conclusively that residual negative impacts of the development on biodiversity have ceased.

10. All residual impacts: offsets must address all significant residual impacts on biodiversity; direct, indirect and cumulative.
11. Comprehensiveness: offsets must explicitly target the pattern, process and/or ecosystem services residually impacted by the proposed development (e.g. improving process areas would not compensate for residual loss of significant biodiversity pattern unless these 'out of kind' offsets were supported by the provincial conservation agency).
12. Values and equity: offsets must consider and compensate for adverse impacts on biodiversity and ecosystem services with intrinsic, use and non-use values to affected communities in particular, and society as a whole, giving special attention to vulnerable or disadvantaged parties.
13. Stakeholder engagement: offsets should be designed and implemented in a transparent and timely manner, engaging with interested and affected parties. The rights and responsibilities, risks and rewards associated with an offset should be shared in a fair and balanced way, respecting legal and customary arrangements, and recognised rights of indigenous peoples and local communities.
14. Displacement of impacts: offsets should not create more impacts that would in turn need compensation, or displace impacts on biodiversity to other locations.
15. Precaution: the size of offsets must be designed in a risk-averse and cautious way, to take into account uncertainties about the success or performance of planned offset measures.

2. BIODIVERSITY OFFSETS IN KWAZULU-NATAL

Of all the provinces in South Africa, KwaZulu-Natal contains the greatest combined area of Critically Endangered plus Endangered terrestrial ecosystems in South Africa: 688 000 ha. Of this area, one third (224 000 ha) consists of Critically Endangered ecosystem; second only in area to the Western Cape.

All potential biodiversity offsets should be evaluated against the objective and desired outcome of offsets stated below.

The objective of the biodiversity offsets policy in KwaZulu-Natal, through the development authorization and any change in landuse process, is to ensure that residual impacts on biodiversity and ecosystem services that are of medium to high significance (i.e. that do not represent a fatal flaw from a biodiversity perspective) are duly compensated by developers in such a way that a material contribution is made to implementing provincial and/ or municipal level conservation plans and reaching associated targets, and to safeguarding valued ecosystem services. An additional objective is to achieve development and conservation objectives more effectively by creating opportunities for conservation beyond the site of development, rather than focusing only on that site.

The desired outcome of biodiversity offsets is to ensure that:

- § The cumulative impact of development authorization and landuse change does not result in:
- the loss of CBAs in the province or jeopardize the ability to meet the province's targets for biodiversity conservation;

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- ecosystems to become more threatened than 'Endangered'⁶; and/or
 - the conservation status of species and the presence of 'special habitats'⁷ to decline;
- § Conservation efforts arising from the development application process, and contributing to improved protection of KwaZulu-Natal's unique species and ecosystems in perpetuity, are focused in areas identified as priorities for biodiversity conservation. Particular emphasis is on consolidation of priority areas and securing links between priority areas; and
- § Ecosystem services provided by affected biodiversity and on which local or vulnerable human communities, or society as a whole, are dependent for livelihoods, health and/or safety, are at minimum safeguarded, and preferably improved.

- An offset system that focuses on a combination of risk aversion through protecting priority areas and improved management offers most potential in KwaZulu-Natal.
- Offsets must apply both to private and public sector development.

Figure 2 shows a broad approach to considering biodiversity offsets in KwaZulu-Natal.

⁶ The NEMBA makes provision (s52) for listing threatened ecosystems (Critically Endangered, Endangered and Vulnerable) and for listing (s56) threatened species (Critically Endangered, Endangered and Vulnerable). The listing of threatened ecosystems is anticipated during 2009. South Africa's Red Data Books and Red Lists indicate threatened species, the NSBA lists threatened ecosystems.

⁷ As referred to in the NBSAP, and defined in some fine-scale biodiversity plans (e.g. calcrete and quartzitic patches, wetlands, etc). The identification of these special habitats captures elements of significant biodiversity that would not be covered by considering coarser indicators like threatened ecosystem or species. They could foreseeably include habitat known to be important for migratory species, for particular life-stages of threatened or commercially important species, to support keystone species that drive ecosystems, and/or for locally rare or range-restricted species. In addition to being identified in fine-scale biodiversity plans, these features could be identified by Ezemvelo or biodiversity specialists.

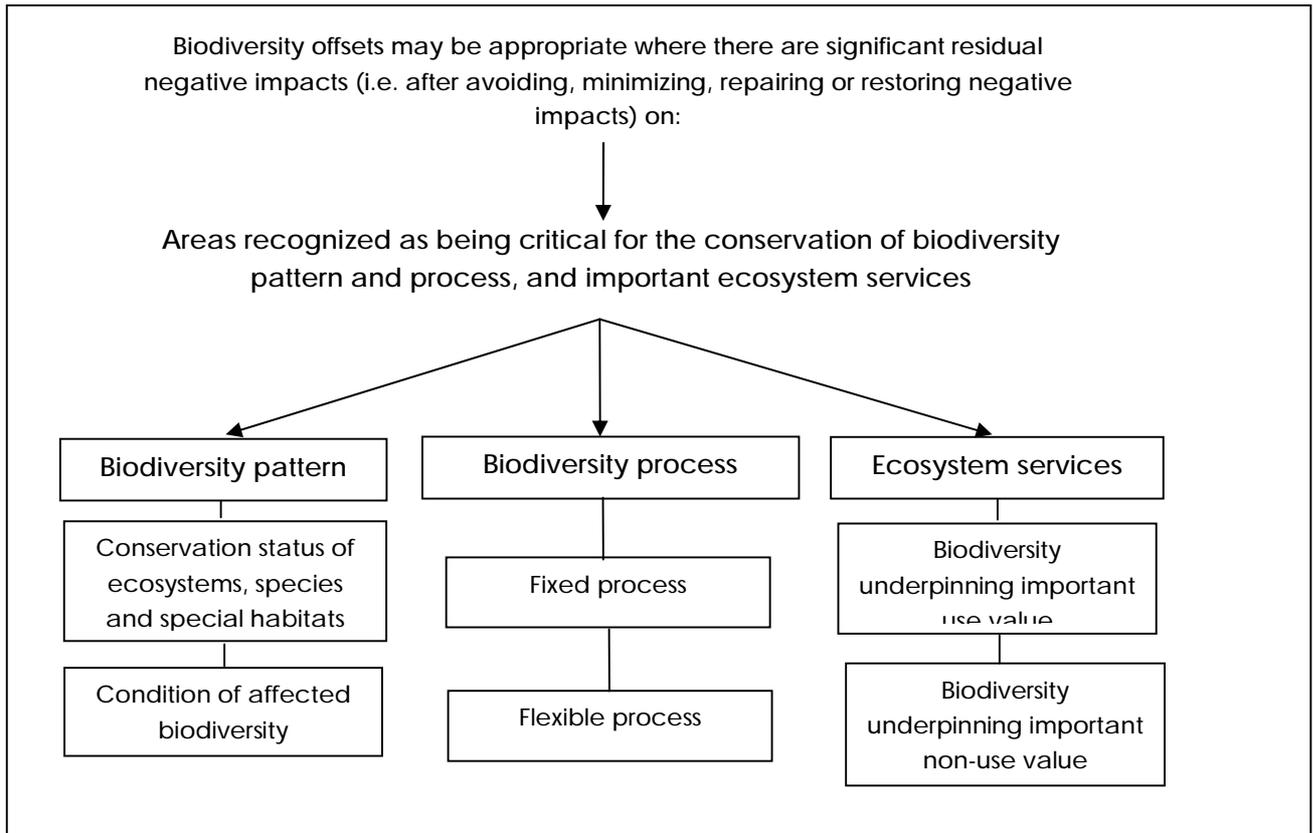


Figure 2: Broad approach to considering biodiversity offsets in KwaZulu-Natal

3. OFFSETS IN THE EIA PROCESS

3.1 When should biodiversity offsets be considered?

Offsets can be considered during the EIA process in terms of the NEMA EIA regulations, as well as for s24G applications. They could also be required in terms of other laws; e.g. Minerals and Petroleum Resources Development Act 28 of 2002, changes in land use in terms of the Development Facilitation Act 67 of 1995, and other relevant planning and land use change legislation where proposed development may have a significant negative impact on the environment.

The need for offsets would not depend on the scale or nature of development, but on the significance of residual negative impacts on biodiversity and ecosystem services predicted as a result of that development. Biodiversity offsets should be considered to compensate for residual negative impacts on biodiversity of medium to high significance.

§ Residual impacts of very high significance are a fatal flaw for development. Impacts would in all likelihood lead to irreplaceable loss of biodiversity, and/or irreversible deterioration in valued ecosystem services, and therefore could not be compensated.

§ Residual impacts of medium to high significance should trigger an investigation into biodiversity offsets; and

§ Residual biodiversity impacts of low significance would not require any offsets.

It is essential when evaluating the significance of affected biodiversity and of impacts to remember that:

- Depending on the time of year, recent history of land use, and/or management practices on site, the visible biodiversity may fluctuate.
- Impacts on a Near Threatened ecosystem are not necessarily of low significance. Similarly, impacts on a degraded habitat are not necessarily of low significance. In both cases, the affected ecosystem may deliver important ecosystem services, play a key ecological function in the landscape and/or provide invaluable habitat for one or more threatened species. Investment in rehabilitating or restoring these habitats may yield significant benefits for both biodiversity and society in the long term.
- The size of residual impact (footprint) does not necessarily relate to its significance: the destruction of 3ha or 300ha of an Endangered ecosystem remains a significant impact. In this context, the significance of residual impacts could, at most, be reduced from high to medium significance.
- It is not only the footprint impact which may be significant: building footprint may impact 5ha, but occupy 50ha; lead to habitat fragmentation, disrupt landscape-scale ecological processes or function, and/or prevent effective management of the ecosystem.

There are four key things that need to be considered when evaluating the significance of impacts on biodiversity. These things must be addressed in an integrated way to obtain a holistic picture of residually affected biodiversity and to enable offset design: composite considerations; pattern and process considerations; and, ecosystem services considerations.

3.1.1 Composite considerations reflected in bioregional or biodiversity plans or networks.

Residual impacts on a Critical Biodiversity Area, or other significant ecological corridors or areas identified by national (e.g. SANParks or Department of Environmental Affairs), Department of Agriculture, Environmental Affairs and Rural Development in KwaZulu-Natal (DAEA&RD), or the provincial conservation agency would be likely to be of *very high significance*, regardless of the current condition of the affected habitat.

3.1.2 Biodiversity pattern considerations

- The overall significance rating for 'pattern' considerations should reflect the highest rating for affected ecosystems, species and/ or special habitats.
- Residual impacts on threatened ecosystems that are not transformed would be at least of medium significance. Where the condition of the affected ecosystem is either good or moderate, the significance rating should be dictated by the ecosystem status (e.g. Critically Endangered, Endangered, Vulnerable or Near Threatened). Residual impacts on 'Critically Endangered' or 'Endangered' habitat in moderate or good condition, albeit isolated, should *not* be 'discounted' to 'low' significance.

Where the affected site does not lie within a CBA, Critical Ecological Support Area or other priority area identified by Ezemvelo, where other pattern considerations with regard to threatened species and special habitats, as well as process and ecosystem services considerations, do not raise significant impacts, then the condition of the affected habitat may influence the significance rating.

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The condition of the affected ecosystem can be described as good, moderate or degraded, as shown below (this table serves as a guide only, and is not a definitive formula).

Percentage of expected species supported by the affected habitat, compared with undisturbed site in a comparable vegetation type or ecosystem	Condition
>75%	Good
>25% but <75%	Moderate
<25%	Degraded

Where the condition of the affected ecosystem is either good or moderate, the significance rating should effectively be dictated by the ecosystem status (e.g. Critically Endangered, Endangered, Vulnerable or Near Threatened). That is, the condition of that ecosystem should not influence that rating. Only where the habitat is degraded could the significance rating be reduced (e.g. from high to medium, or medium to low).

- Residual impacts on threatened species or their known habitat would be of *'medium'* to *'very high'* significance, depending on their conservation status, the size and viability of the affected population in the long term, and the contribution of the affected population to the persistence of the species; areas of known concentrations of threatened and/or local endemic species would be regarded as *'non-offsetable'* or *'very high'*.
- Residual impacts on special habitats⁸ would be of *'medium'* to *'very high'* significance, depending on their rarity and distribution (many are associated with particular geological, hydrological or geohydrological formations; their loss would in effect be irreplaceable).

3.1.3 Biodiversity process considerations

Biodiversity processes comprise fixed and flexible processes in the landscape. Residual impacts on fixed processes may be from *'medium'* to *'very high'* significance, depending on the value attached to the process either from an intrinsic perspective or from an *'underpinning valued ecosystem services'* perspective, regardless of the ecosystem status or condition of the affected area. Residual impacts on flexible processes may range from *'low'* to *'high'*, depending on the options available to compensate spatially for these impacts.

3.1.4 Ecosystem services considerations

Direct impacts on biodiversity often result in indirect and/ or cumulative negative impacts on human wellbeing, given that local communities, or society as a whole, may be totally or partially dependent on the ecosystem services provided by that biodiversity for health or livelihoods. Residual impacts on the biodiversity or ecosystems underpinning valued ecosystem services may be from *'low'* to *'very high'* significance, depending on both the level of dependence on those services and whether or not acceptable, accessible and affordable substitutes for those degraded or lost services exist.

⁸ Important small-scale features that would not be detected by broader indicators like *'threatened ecosystem'* or *'threatened species'*; e.g. wetlands or rocky outcrops.

The following considerations are essential before arriving at offsets as a possible option:

- § Has a positive, 'planning with nature' approach has been adopted;
- § Has a 'good practice' approach to evaluating the significance of impacts on biodiversity and ecosystem services been used⁹.
- § Is there clear evidence that all reasonable and feasible alternatives to avoid or minimize negative impacts on biodiversity and valued ecosystem services have been duly considered;
- § Is there clear evidence that the mitigation hierarchy has been followed, namely impact avoidance, impact minimization, and repair/restoration of impacted biodiversity;
- § Is there clear evidence that the residual impacts really are 'residual'; i.e. that mitigation can and will be implemented effectively¹⁰. Where there are risks or uncertainties it would be best to take the 'pre-mitigation' significance ratings as a more reliable indication of development effects.
- § Is there clear evidence that the risks and consequences associated with either non-implementation, or ineffective implementation, of planned mitigation measures have been assessed by the biodiversity specialist (e.g. risk of fire management not being implemented, and associated implications).

3.2 When should biodiversity offsets not be considered?

1. As a rule, biodiversity offsets should not be considered when residual impacts are of *very high* significance (e.g. when priority, Critical Biodiversity Areas identified in provincial or municipal conservation plans, Critically Endangered ecosystems or ecosystems containing irreplaceable biodiversity, or ecosystems that provide irreplaceable or critical ecosystem services would be negatively affected). In these cases, the proponent should be asked to seek alternatives to the proposed development and/ or revisit earlier steps in the mitigation hierarchy.
2. Residual impacts are of *low* significance (and therefore there would not be any meaningful impacts to be compensated);
3. Biodiversity losses could not, or would not, be adequately compensated by offsets;
4. The long-term security, effective management and viability of the proposed offset is not assured or cannot be guaranteed;
5. There is a high risk of failure of the offset (e.g. rehabilitation/ restoration is unlikely to succeed);
6. Knowledge of the current status and distribution of threatened species, their population dynamics, recovery rates, and/ or of how to offset residual impacts are uncertain or carry a high risk of failure;
7. There are no viable options for an offset (e.g. insufficient space to establish on offset); and
8. The proposed offset activities are activities required by other laws (e.g. rehabilitation of areas disturbed by mining).

⁹ Please refer to the full Guideline for a description of 'good practice' in evaluating significance of impacts.

¹⁰ In terms of Regulation 8(b)(iv) of the NEMA EIA Regulations: the Department must take into account "the ability of the applicant to implement mitigation measures and to comply with any of the conditions subject to which the application may be granted"

3.3 General procedures to be followed when considering offsets

Figure 3 shows the sequence of steps in the EIA and decision-making process, integrating the consideration and evaluation of biodiversity offsets.

1. When residual negative impacts on biodiversity are confirmed to be of 'medium'/ 'high' significance in the final stages of the Basic Assessment or EIA, the competent authority should instruct the proponent to investigate potential offsets. As a general rule, offsets should only be considered as a 'last resort' after measures to avoid/ prevent, minimize and restore/ repair have been thoroughly investigated in the course of the EIA. There are, however, exceptions to the rigid application of the mitigation hierarchy where offsets would be addressed only as a 'last resort'. In these situations, offsets could offer significant advantages for biodiversity conservation over the 'minimize and repair/ restore' options, and thus could start to be addressed earlier in the EIA process:
 - In situations where it is clear that development will be authorized due to strategic interests and the nature of development means that residual negative impacts on biodiversity are unavoidable (e.g. surface mining). In these cases, consideration of offsets should begin as early as possible in the planning process.
 - In cases where the proposed measures to restore/ repair residual impacts on biodiversity would only be implemented at the end of the proposed project (i.e. there would be a significant time gap between the impact and its restoration/ repair), consideration of offsets as an immediate term measure – secured before development commences – could be appropriate, if and only if offsets would be an appropriate way of mitigating residual negative impacts (i.e. the significance of residual impacts is not 'very high'). In such cases, rehabilitation on site should be implemented in any event in the longer term, but could lead to a net gain for biodiversity and foreseeably could be seen as an investment in a potential offset for future development.
 - In instances where the effort to reduce the potential impacts of a proposed project would result in relatively small and fragmented gains for biodiversity conservation on site, but where an offset could make a significant contribution to achieving conservation targets should a larger development be permitted on that site, and the proponent's preferred option is the latter, then offsets could be considered as appropriate.
2. Biodiversity specialist(s) should determine the key requirements of a biodiversity offset, the best type of offset, and the best way to secure that offset, as well as how to manage it to ensure its persistence in the long term. It may be appropriate to involve a social specialist/ resource economist in support of the biodiversity specialist(s) where there would be residual negative impacts on ecosystem services.
3. Specialist findings should be incorporated in an 'Offset Report' and 'Offset Management Plan' as part of a revised Basic Assessment Report or EIA Report/Environmental Management Plan (EMP), and made available to stakeholders for review and comment prior to finalisation.
4. If the proposed offset were found to be acceptable by the competent authority, it should be included as a key deciding factor in the approval given for the development, and appropriate conditions should be attached to the environmental authorization.

Figure 4 provides support to the decision-maker in relation to both the EIA and offset design processes.

The following key questions need to be answered during the EIA process.

- Has a reliable measure of residual negative impacts on biodiversity been determined?
- Has the optimum type of biodiversity offset been determined ('like for like' habitat, 'out of kind' or 'trading up' habitat, etc.)?
- Has the size of biodiversity offset that would adequately compensate for residual biodiversity impacts been reliably calculated, using the basic offset ratio for the specific vegetation type(s) affected, and adjusted according to the criteria listed in Section 4.3.1 and Figure 6?
- For the purpose of monetary compensation, has the size of biodiversity offset been reliably 'translated' into monetary terms?
- Has an organization or institution been identified as the recipient of any monetary compensation? Is this organization or institution considered to be reliable, auditable and reputable (i.e. accredited, where a Public Benefit Organization¹¹)?

For offsets comprising physical habitat to be secured by the proponent:

- Can adequate and appropriate offset/s be found that would compensate fully for the residual negative impacts on biodiversity, be functionally viable in the long term and contribute to biodiversity conservation plans and targets in the province?
- Would these offsets be located in identified 'offset receiving areas'?
- Would the offsets for residual negative impacts on valued ecosystem service be acceptable to the main affected parties?
- Would the offset/s lead to residual negative effects on local communities that, in turn, would need to be offset? Or could any negative effects be mitigated within the proposed offset?
- Are there sufficient guarantees that the offset/s would be secured, managed, monitored and audited as required?
- Would the capacity of the institutions, organizations or other parties that would be responsible for these actions be sufficient to undertake them effectively?

Of relevance in the NEMA EIA regulations are provisions for the authorization to require:

a) that the authorized activity may not commence before specified conditions are complied with (s38(2)(a)) (this provision could ensure that the offset was secured before project activities began);

b) management, monitoring and reporting of impacts on the environment throughout the life cycle of the activity (s38(1)(d)(ii));

c) the holder of the authorization to furnish the competent authority with environmental audit reports (s38(2)(c)); and

d) any other conditions that the competent authority considers necessary for the protection of the environment (s38(2)(d)).

- Are there any unacceptable risks associated with the offset?

¹¹ A Public Benefit Organization registered in terms of Section 18 of the Income Tax Act 58 of 1962, which is purpose built to stand scrutiny to the offsets transactions in the province, to administer the endowment fund created, and to purchase, where appropriate, suitable offsets sites. This would bring a large element of the requisite efficiency, lowered transaction costs, and fidelity to the biodiversity priorities of the Western Cape.

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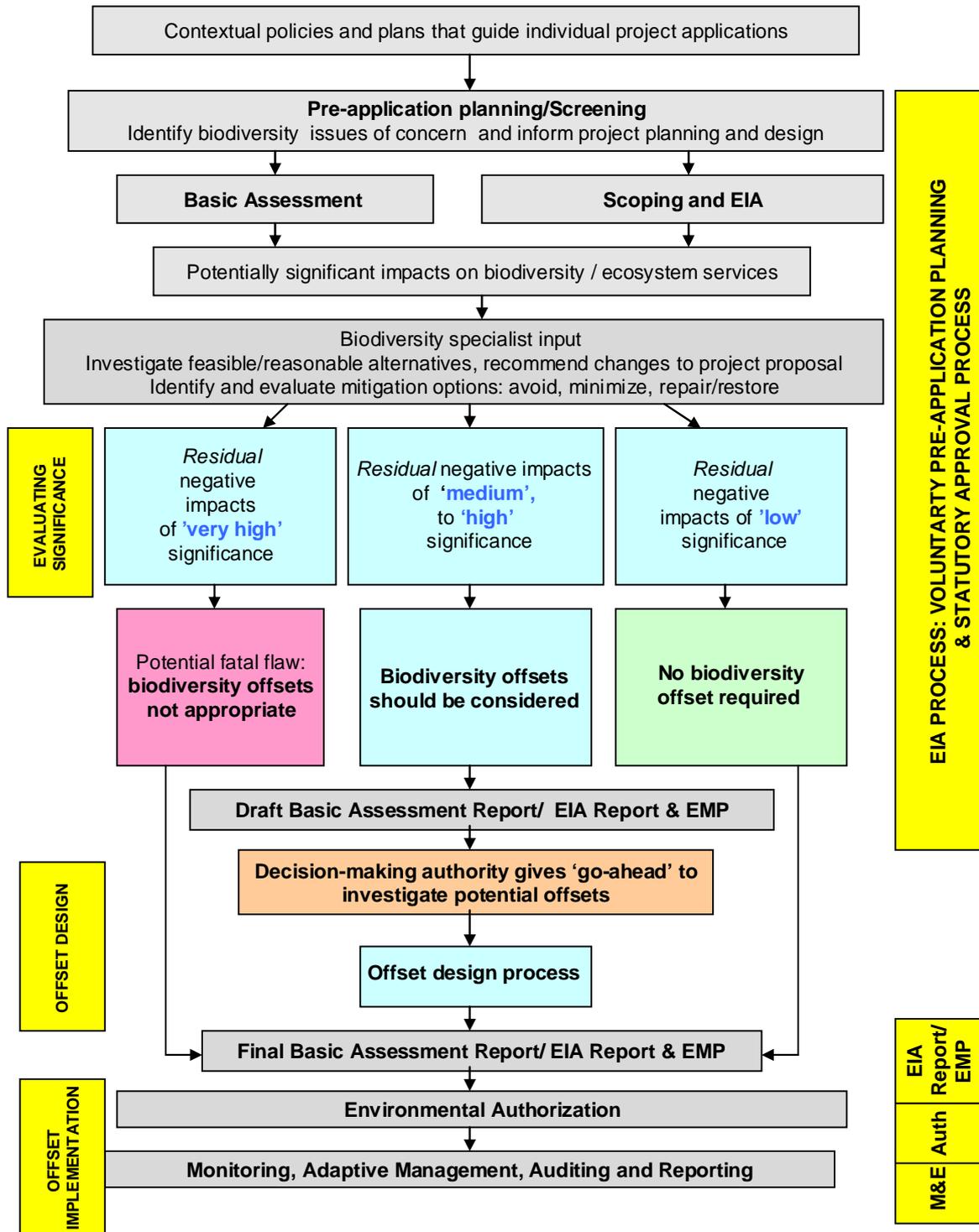


Figure 3: EIA and the Biodiversity Offset Design Process

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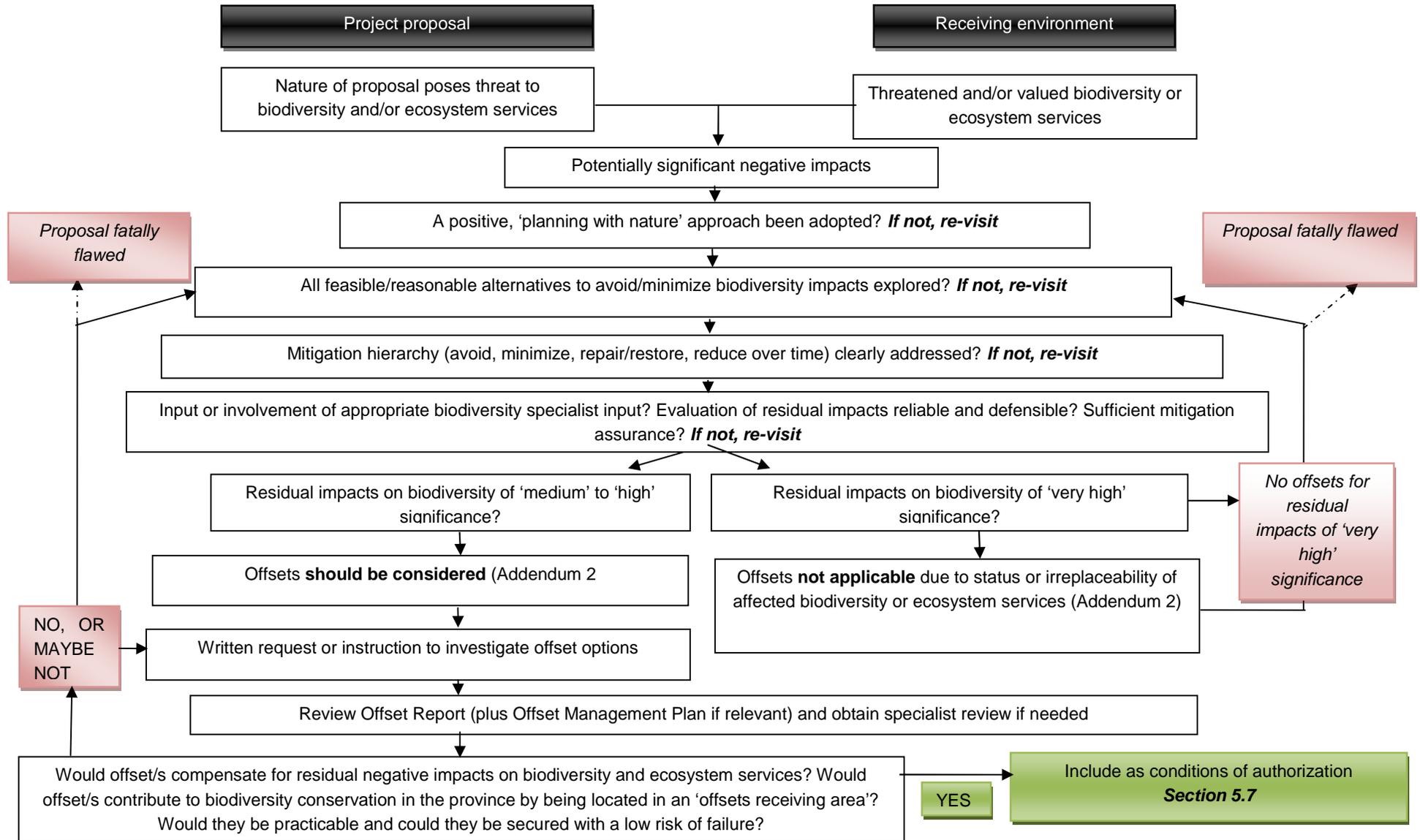


Figure 4: Decision Support system for the competent authority

3.4 Decision-making and setting conditions of authorization

1. A proposed offset should not be accepted by the authority as satisfying requirements for due remedying of residual negative impacts on biodiversity arising from the proposed development if:
 - It would not fully compensate for significant residual negative impacts on biodiversity.
 - There would be a risk of residual irreversible impacts and/or irreplaceable loss of resources
 - Residual negative impacts could jeopardize ecosystem integrity, and/ or would lead to deterioration in or loss of important ecosystem services (thus negatively impacting on human health and wellbeing)
 - Offset activities would have a high risk of failure.
2. Where any loss of irreplaceable biodiversity and/ or of biodiversity underpinning important ecosystem services is permitted, the authorization must demonstrate clearly how, and on what basis, trade-offs were made in the interests of sustainable development and in light of the Constitution, the NEMA principles and international obligations to conserve biodiversity and ecological integrity.
3. If the proposed offset were acceptable, the offset should be included as a deciding factor in the authorization of the development and would be specified as a condition (i.e. not a recommendation). Offset conditions must be explicit, implementable by the proponent, and enforceable and auditable by the DAEA&RD, conservation agency and/ or other competent authority.
4. In its authorization, the competent authority must indicate clearly that the proponent has satisfied the hierarchy of pre-conditions for considering offsets. The authorization must include a legally defensible motivation to include biodiversity offsets as conditions; i.e. the offsets as mitigation must be explicitly linked to the residual negative impacts of proposed development on biodiversity. The rationale must clearly link the need for offsets to s24 of the Constitution¹² and the State's obligation to, amongst others take heed of the NEMA principles in its decisions.

The authorization and conditions must:

- a) Give an *accurate description* of the offset activities and/ or requirements (Table 1).
 - the type of offset (e.g. land, money), giving clear and defensible reasons in the case of monetary compensation why that type of offset was agreed upon,
 - where (e.g. accurate description of land parcels, which trust fund),
 - how much (e.g. how many hectares, how much money),
 - how the offset is to be secured in the long term (e.g. stewardship agreement),
 - who will be responsible for securing the offset, as relevant (e.g. the proponent, a third party),
 - who will be responsible for managing, monitoring and auditing the offset, as relevant (e.g. the proponent, a third party, biodiversity credit holder),
 - what management, monitoring, auditing of the offset site(s) is required, how often and when (to refer clearly to, and binding on, contents of the offsets management plan);
- b) Allocate clear and unambiguous responsibility for carrying out the offset activities;
- c) Provide clear time frames for delivery and completion of offset activities; and
- d) Specify the duration of the required offset activities.

¹² Everyone has the right to an environment that is not harmful to health or wellbeing, and to have the environment protected for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation, promote conservation, and secure ecologically sustainable development while promoting justifiable economic and social development.

Table 1: Template for inclusion in authorization – offset considerations and requirements

Conservation status of impacted vegetation type	Description	Area of residually impacted vegetation type (ha)	Basic offset ratio for particular vegetation type	Condition of impacted vegetation	Adjusted offset ratio, based on condition of impacted vegetation (where applicable)	Required offset area (ha) in the same or more threatened vegetation type, to be located in a CBA or other priority area for biodiversity conservation
Endangered ecosystem	[List Vegetation types affected]		[Up to 25:1, depending on type, refer to Table 7]	*	**	***
Vulnerable ecosystem	[List Vegetation types affected]		[Up to 5:1, depending on type, refer to Table 7]	*	**	***
Near Threatened ecosystem	[List Vegetation types affected]		[Up to 5:1, depending on type, refer to Table 7]	*	**	***
Critically Endangered ecosystems, CBA, Protected Area	No offset allowed, as biodiversity is irreplaceable					
Additional offset requirements to take into consideration (as applicable) compensation for residual negative impacts on the following, where the above, vegetation-based offset would not accommodate these factors:						
Known habitat for threatened species	Special habitats	Important ecological process area/corridor	Valued ecosystem services			
Offset must secure habitat of known viable populations of that species. [Size and location of offset to be determined by specialist]	Offset must secure such habitat. [Size and location of offset to be determined by specialist]	Offset must secure an area that would safeguard process area/corridor. [Size and location of offset to be determined by specialist]	Offset must secure substitute services and fully compensate for residual adverse impacts on users and society. [To be determined by specialist(s)]			
Financial provision to secure and manage biodiversity offset						
A: Estimated cost of acquiring offset land						
Vegetation type	Average cost of land in that vegetation type (R/ha) ¹³	Offset area required (ha)	Anticipated cost of offset (R)			
(name)						
(name)						

¹³ It is crucial that this estimated cost of land is up to date and/ or projected in terms of longer term trends in land value over the period during which land must be secured. If underestimated, it would be impossible to secure the necessary offset.

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Etc.			
		Land survey costs	
		Legal/ transaction costs	
		Total cost of offset land	
B: Estimated cost of managing offset			
For each vegetation type:		For offset area	
Measures required on an annual basis (indicate as appropriate for particular vegetation type)	Estimated cost (R) per annum over at minimum a 10 year period	Measures required on a one-off or occasional basis (indicate as appropriate)	Estimated cost (R) over at minimum a 10 year period.
Vegetation type 1 (name)	Invasive alien organisms	Fencing	
	Fire/ burning	Biodiversity specialist advice	
	Erosion	Financing advice ¹⁴	
	Other (specify)	Monitoring	
Vegetation type 2 (name)	Invasive alien organisms	Auditing	
	Fire/ burning	Administrative costs	
	Erosion	Risk premium/ insurance	
	Other (specify)	Other (specify)	
Vegetation type 3 (etc) (name)	Etc.		
Sub-total of costs over at <i>minimum</i> a 10 year period		Sub-total of costs over at <i>minimum</i> a 10 year period	
Total costs of managing offset			
Total costs (A + B)			

* Good, moderate or degraded

** If the affected area supports less than 25% of expected species compared with an undisturbed site in a comparable vegetation type or ecosystem, the required offset ratio can be reduced by up to 50%. Otherwise, no reduction in offset ratio.

*** Total offset area required = area residually impacted x basic offset ratio (or adjusted offset ratio if applicable)

¹⁴ e.g. structuring funding in the long term: endowments or sinking fund or phased payments (etc.)

Where monetary compensation is involved, conditions must specify:

- a) The amount of money to be deposited in a Biodiversity Offsets Trust Fund (or equivalent vehicle) before the development begins. This amount should meet the anticipated costs of the offset detailed above for its duration, and must be adjusted to take into account inflation;
- b) Where that money is to be deposited;
- c) By when the money is to be deposited. If a time lag between payment and start of development is agreed, the funds required as monetary compensation must be adjusted to take into account inflation over time.

The authorization/ conditions should specify the consequences of failure to fulfil any of the conditions.

In every case, the offset must be secured before any development may commence.

Important to note: Decision making and conditions

As a general rule, the Offset Report and Offset Management Plan (where relevant) should be submitted as part of the documentation given to decision makers who must decide on a land use change or development authorization. Conditions of authorization should be directly and explicitly linked to these reports.

In some cases, however, where the proponent's stated intention is to negotiate with landowner(s) and enter an offset agreement on, and/ or purchase, parcel(s) of land identified in the EIA (or equivalent land use change) process, or to buy biodiversity credits, it may be appropriate to issue an authorization with an explicit offset condition that clearly defines a fixed time period during which the proponent may finalize the purchase/ agreement. The authorization should stipulate that, should the proponent's efforts to secure an appropriate offset fail during this period, monetary compensation would be required, as described in Section 6.5.2. That compensation should be secured before development could begin.

An environmental authorization may:

- § Provide that the authorized activity may not commence before specified conditions are complied with (s38(2)(a)). [It is important that the required contractual agreements for the offset are met prior to the commencement of the development];
- § Require management, monitoring and reporting of impacts on the environment throughout the life cycle of the activity (s38(1)(d)(ii)); and
- § Include any other conditions that the competent authority considers necessary for the protection of the environment (s38(2)(d)).

3.5 Implementation, Monitoring and Auditing

For offsets comprising habitat, implementation of the Offset Management Plan (Section 5.2) needs to be monitored and audited by the proponent (or appointed responsible party).

Drawing on international experience in implementing offsets, there may be merit in forging formal partnerships with conservation NGOs and/ or local CBOs in implementing and managing offset areas on private land. The scope for such partnerships should be investigated. In addition, land owners or land

occupiers may be paid or compensated in kind for lost land use opportunities as a consequence of managing the offset for conservation (rather than other land uses).

Important to note: Condition of authorization

Of direct relevance to biodiversity offsets, an environmental authorization may require the holder of the authorization to furnish the competent authority with environmental audit reports (s38(2)(c)). Without monitoring, adaptive management, and performance audits, the success of biodiversity offsets could not be determined.

4. OFFSET DESIGN PROCESS

There is no single 'best approach' to deciding on an appropriate offset. The offset design process comprises six steps (see Figure 4):

1. Obtaining a measure of the residual loss of biodiversity as a consequence of the project;
2. Determining the best type of offset;
3. Determining the appropriate size of offset and, where applicable, its optimum location;
4. Deciding on the best way of securing the offset, and ensuring that the offset option would be acceptable to the competent authority and Ezemvelo;
5. Preparing an Offsets Report; and
6. Reaching agreements on offsets and developing an Offset Management Plan, where applicable.

4.1 Obtaining a reliable measure of the residual loss of biodiversity

The residual loss of biodiversity as a result of the proposed development must be quantified in order to determine a commensurate offset. The size of residual impact is related both to the 'footprint' or direct impact of the proposed development on the property, in hectares, as well as to the indirect impacts that are probable as a consequence of that development (e.g. downstream effects, habitat fragmentation). The residual impact may extend beyond the development footprint to the greater landscape (e.g. if a critical ecological corridor were interrupted or broken). The size of residual impacts on physical habitat is generally calculated *in hectares*. Impacts on threatened species, ecological processes and ecosystem services are similarly best 'translated' into a measure of habitat area.

4.2 Determining the best type of biodiversity offset

There are three main types of offset that could be considered, namely:

- a) *'Like for like' or 'in kind' habitats* comprising the same habitat structure, species composition and ecological function(s) that could be located either close to or at some distance from the property on which the development site is located;

- Ø Offsets for residual negative impacts on threatened ecosystems or species, or on special habitats, mainly comprise securing and managing priority areas for conservation in perpetuity. These areas should preferably be in good condition, giving assurance that they support most/all species associated with that particular habitat¹⁵.
- Ø Offsets for residual negative impacts on ecological processes could include securing and rehabilitating (restoring, where feasible) degraded or disturbed areas, preferably in offset receiving areas as described in Section 4.3.2.
- Ø Offsets for residual negative impacts on valued ecosystem services could include restoration/rehabilitation of degraded habitats to restore their ecological function and improve services delivery, and/or provision of substitute services that would be acceptable to affected parties.

¹⁵ Degraded habitat may be difficult if not impossible to restore, and thus may never support the full range of species associated with this type of habitat. In relation to meeting conservation targets, therefore, a 'first prize' would be to secure habitat in as near a pristine condition as practicable.

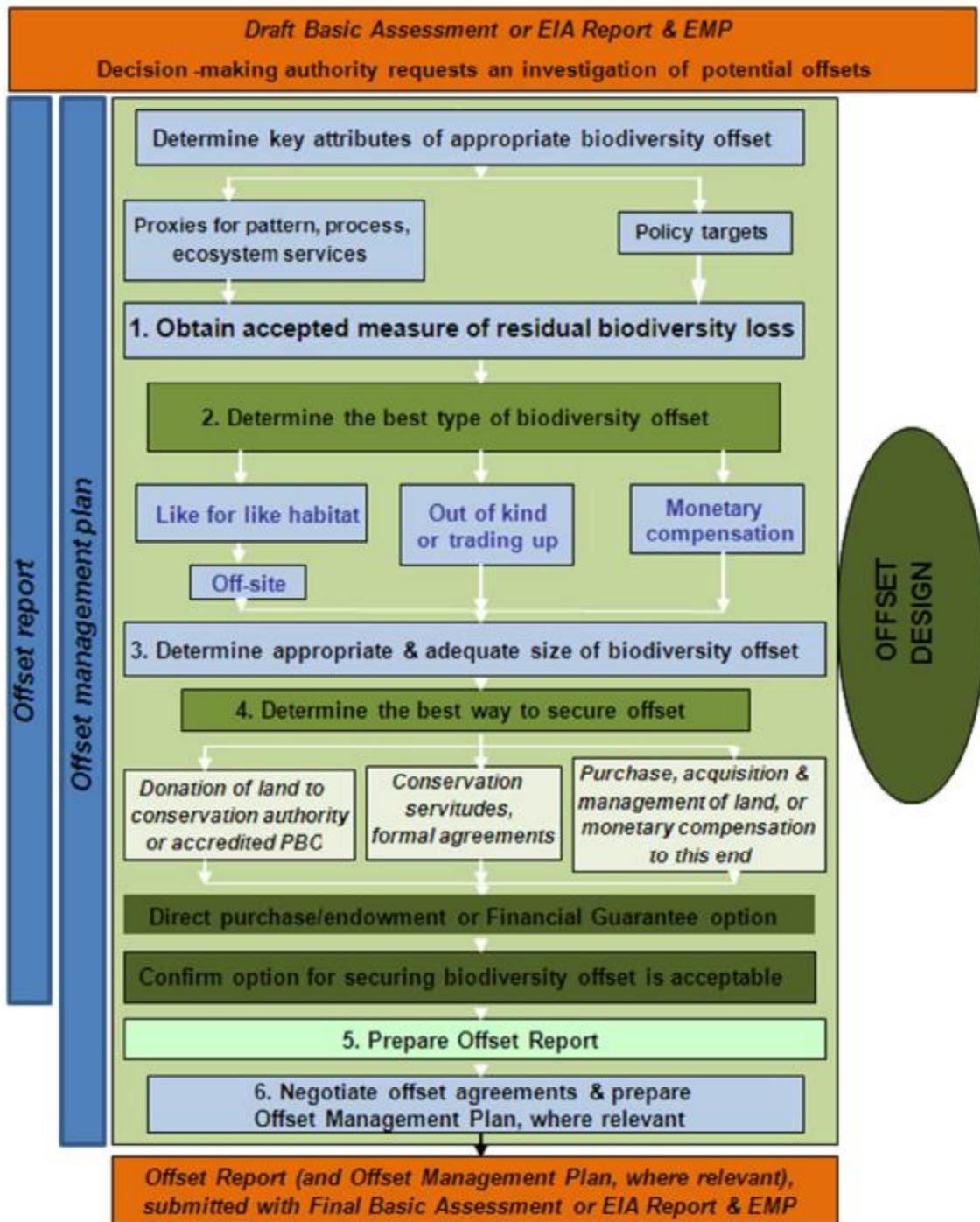


Figure 4 : Biodiversity Offset Design Process

- b) 'Trading up' habitat involves securing and managing habitat with a more threatened status or higher conservation priority than that affected. The size of offset required would be the same as that for the residually impacted ecosystem. These offsets may be used where there is a greater

immediate threat to an ecosystem of relative high priority, or a 'window of opportunity' to secure habitat of a relatively high conservation priority. Other 'out of kind' offsets could involve activities targeting the underlying causes of biodiversity loss, such as planting of woodlots to remove pressure on particular vegetation for fuelwood. They would have to be tied to formal agreements with the affected communities, and are seen largely as supporting mechanisms rather than the primary focus of offsets.

When considering trading up offsets:

- Where the habitat with a more threatened ecosystem status is less vulnerable to pressures of transformation than the affected habitat, a like for like habitat offset would be preferable.
- No trading up should be allowed where it could compromise the status of impacted ecosystem, special habitats or species (e.g. Endangered grassland should not be traded up for an area of Critically Endangered forest if it meant that grassland would become Critically Endangered).
- Trading up should be considered only where the non-replacement of impacted biodiversity would have no significant negative implications for delivery of valued ecosystem services (e.g. loss of wetland habitat would affect water quality and flow, so conserving a different ecosystem as an offset would be likely to have unacceptable long term negative implications for ecosystem services).
- Trade-ups are preferable within rather than between ecosystems (e.g. offset one grassland type with another grassland type of higher priority, rather than forest for grassland).

c) *Monetary compensation* may be warranted where the available portions of land for purchase that would meet the requirements of an appropriate biodiversity offset are either far too big or too small, and leasing a suitable area of land would not be feasible. Financial contributions from individual projects could enable larger or more significant land parcels to be secured for biodiversity conservation purposes than could otherwise be achieved on a project-by-project basis. This type of offset may include financial contributions to an accredited biodiversity conservation offsets fund¹⁶, for the clearly defined, sole and express purpose of acquiring and/or managing additional priority habitat, or expanding, consolidating and managing public protected areas to incorporate critical biodiversity. The quantum of money required would be commensurate with funds needed to acquire, secure and manage an appropriate area of like habitat (or habitat of higher conservation priority) at least for the life of the proposed development, and preferably in perpetuity.

Funding of biodiversity research¹⁷, education or capacity building in government agencies is not considered as an offset in KwaZulu-Natal.

4.3 Determining the appropriate size and location of offset

Figures 5 and 6 illustrate the conceptual approach:

¹⁶Money in these trusts or funds must be ring-fenced for financing the acquisition and management of priority areas for biodiversity conservation. They should preferably be administered by a Public Benefit Organization.

¹⁷ In some cases it may not be feasible to provide an offset by designating new and additional protected area or demarcating land for conservation purposes. In such cases, other types of investments may be the best or only option for offsetting residual biodiversity impacts. One option would be to support biodiversity research and education, training and awareness-raising. An example is a World Heritage Site that is at risk due to a lack of management planning. Research could be conducted in order to better understand the threats and thus manage the park more effectively.

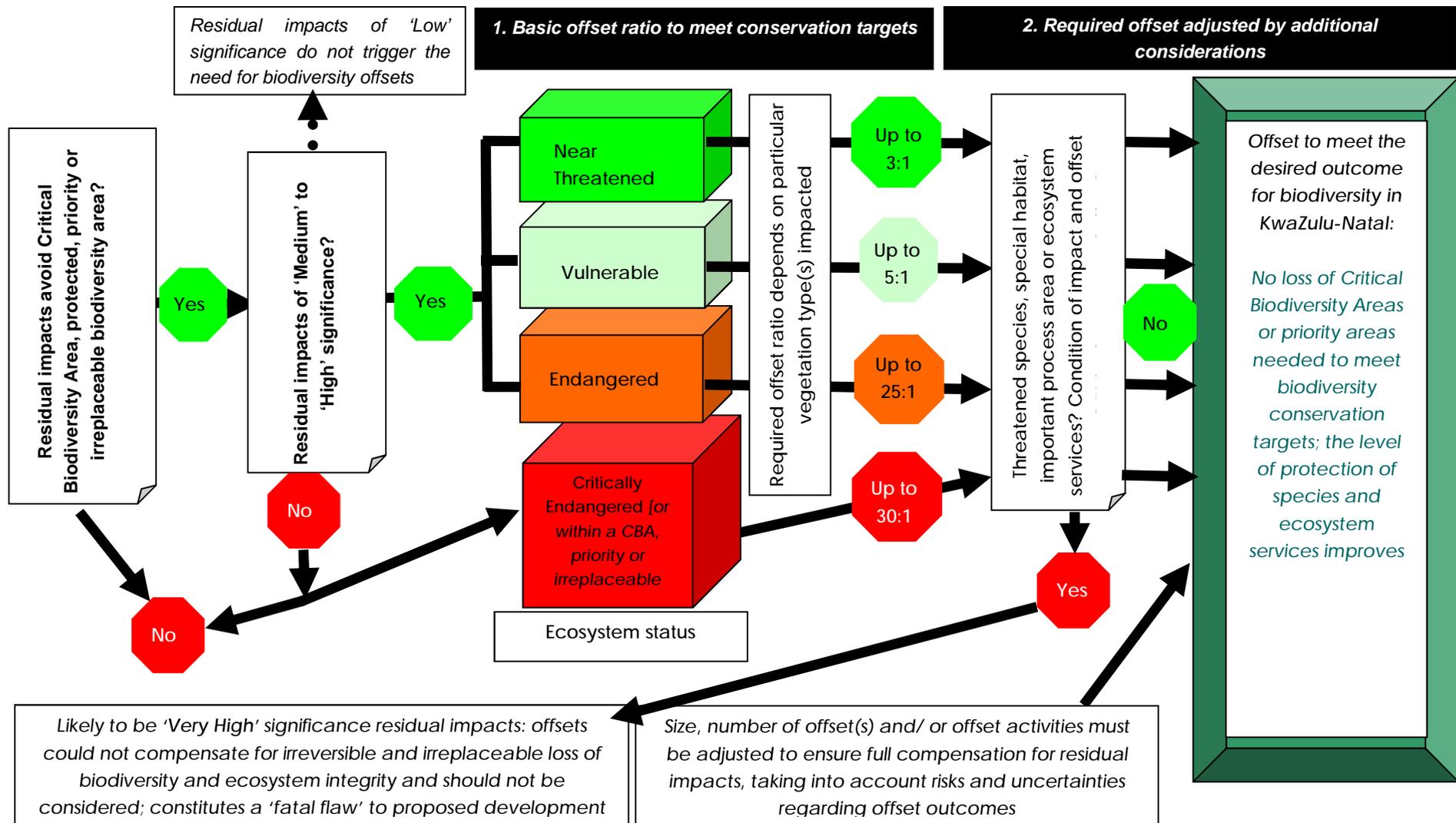


Figure 5: Designing offsets to contribute to meeting desired outcome for biodiversity

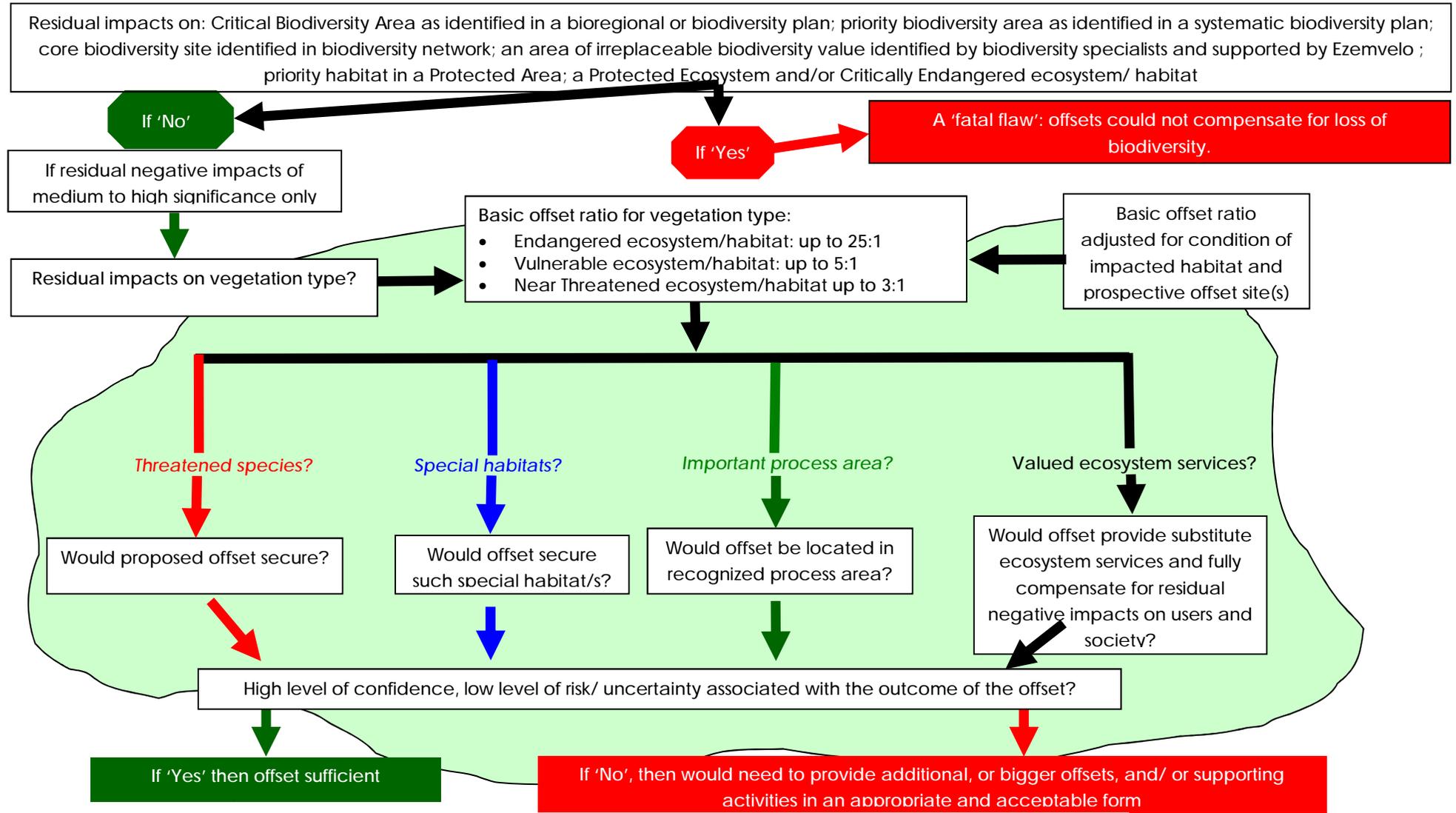


Figure 6: Adjusting the basic offset ratio to arrive at an adequate offset

4.3.1 Size of offset

Area-based policy and conservation targets provide a sound basis for determining this loss and the size of offset required. A basic offset ratio is used, linked to the particular ecosystem affected, and adjusted according to a number of biodiversity and ecosystem services considerations.

Determining the physical size of the *terrestrial* offset involves:

1. Using a basic offset ratio linked to the conservation significance and status of the each of the 67 terrestrial ecosystems (vegetation type) in the province (Annexure 1). The ratio is calculated by deducting the area of that vegetation type currently protected in KwaZulu-Natal from the area that would need to be protected to meet the province's conservation targets, and working out the relative area of offset (ha) that would be required for every ha of remaining ecosystem transformed to ensure that those targets could be met. A 'safety margin' has been built into these ratios, taking into account uncertainties regarding the current accuracy of transformed land cover data (2005), rates of illegal conversion of natural habitats, and background rates of degradation of biodiversity. and
2. Adjusting the basic ratio in terms of the size, number and nature of the offset/s.

The point of departure for determining suitable offsets for *wetland and coastal* ecosystems focuses on providing gains in functional equivalence¹⁸ equal (at least) to loss as a result of predicted residual impacts. Consideration of the condition and functionality of the affected habitat as well as that of the proposed offset area, rather than basic offset ratios, would thus determine the appropriate basic size of offset.

The basic offset ratio

The required offset ratios¹⁹ for different vegetation types in KwaZulu-Natal are given in Table 2:

¹⁸ 'functional equivalence' should take into account the current role of the affected area in determining water quality (role in sedimentation, erosion control, removal of phosphates, nitrates, pollutants or toxicants), water flow regulation, flood attenuation, providing habitat for important or valued biodiversity, and space or resources of use or non-use value (e.g. recreation, harvestable goods, food, etc.)

¹⁹ An offset ratio of 15:1 means that *for every 1 ha of habitat lost, an offset of 15 ha of like habitat would have to be secured for conservation* to compensate for that loss.

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Table 2: Offset ratios for different vegetation types in KwaZulu-Natal, in order to meet conservation targets²⁰

No.	Vegetation Type	Conservation Status	Conservation target (%)	Area Protected (%)	Area outstanding as % of area remaining (%)	Offset ratio (ha required for each ha transformed). CR vegetation types cannot be offset ²⁰
1	Drakensberg-Amatole Afromontane Fynbos	NT	27	51	0	1
2	Amersfoort Highveld Clay Grassland	NT	24	0	30	3
3	Drakensberg Afroalpine Heathland	NT	27	86	0	1
4	Drakensberg Foothill Moist Grassland	VU	23	6	29	3
5	Drakensberg Montane Shrubland	NT	28	0	31	3
6	Dry Ngongoni Veld	EN	25	1	91	5
7	East Griqualand Grassland	VU	23	0	41	3
8	Eastern Free State Sandy Grassland	NT	24	0	26	3
9	Glencoe Moist Grassland	VU	24	0	48	3
10	Income Sandy Grassland	VU	24	0	53	3
11	Ithala Quartzite Sourveld	NT	27	17	13	3
12	KaNzwane Montane Grassland	CR	24	0	211	n/a
13	KwaZulu-Natal Sandstone Sourveld	CR	23	0	348	n/a
14	Lebombo Summit Sourveld	CR	24	1	391	n/a
15	Lesotho Highland Basalt Grassland	NT	27	77	0	1
16	Low Escarpment Moist Grassland	NT	23	2	27	3
17	Mabela Sandy Grassland	NT	23	0	34	3
18	Maputaland	EN	25	20	12	3

²⁰ The offset ratio was first calculated assuming 'perfect information' and then increased to allow for inaccuracies in data and uncertainties regarding background trends in illegal conversion or degradation of indigenous habitat.

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	Wooded Grassland					
19	Maputaland Coastal Grassland	EN	25	19	17	3
20	Midlands Mistbelt Grassland	CR	23	1	107	n/a
21	Moist Ngongoni Veld	CR	25	0	144	n/a
22	Mooi River Highland Grassland	VU	23	0	50	3
23	North Coast Grassland	CR	35	0	667	n/a
24	Northern Drakensberg Highland Grassland	NT	27	55	0	1
25	Northern KwaZulu-Natal Moist Grassland	VU	24	1	48	3
26	Northern Zululand Mistbelt Grassland	VU	23	2	45	3
27	Paulpietersburg Moist Grassland	EN	30	1	75	5
28	Pondoland-Ugu Sandstone Coastal Sourveld	CR	31	6	145	n/a
29	South Coast Grassland	CR	25	1	383	n/a
30	Southern Drakensberg Highland Grassland	NT	27	67	0	1
31	Southern KwaZulu-Natal Moist Grassland	EN	23	3	59	5
32	uKhahlamba Basalt Grassland	NT	27	89	0	1
33	Wakkerstroom Montane Grassland	NT	27	0	33	3
34	Delagoa Lowveld	CR	19	0	104	n/a
35	Eastern Valley Bushveld	NT	25	0	41	3
36	Granite Lowveld	EN	19	0	62	5
37	KwaZulu-Natal Highland Thornveld	NT	23	1	31	3
38	KwaZulu-Natal Hinterland Thornveld	VU	25	0	51	3
39	Makatini Clay	NT	19	43	0	1

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	Thicket					
40	Maputaland Coastal Thicket	NT	25	12	20	3
41	North Coast Bushland	CR	25	0	118	n/a
42	Northern Zululand Sourveld	VU	19	7	21	3
43	South Coast Bushland	EN	25	1	82	5
44	Southern Lebombo Bushveld	NT	24	10	19	3
45	Swaziland Sour Bushveld	NT	19	18	1	3
46	Tshokwane-Hlane Basalt Lowveld	NT	19	26	0	1
47	Tembe Sandy Bushveld	NT	19	16	3	3
48	Thukela Thornveld	NT	25	1	31	3
49	Thukela Valley Bushveld	NT	25	0	32	3
50	Western Maputaland Clay Bushveld	VU	19	11	14	3
51	Western Maputaland Sandy Bushveld	VU	19	18	2	3
52	Zululand Coastal Thornveld	EN	19	0	61	5
53	Zululand Lowveld	NT	19	12	9	3
57	Drakensberg Montane Forest	NT	63	58	6	3
59	Eastern Mistbelt Forest, including Northern KwaZulu-Natal Mistbelt Forest	NT	67	14	58	3
60	Eastern Scarp Forest					
60.1	Ngome-Nkandla	NT	62	31	32	3
60.2	Northern Coastal	NT	62	64	0	1
60.3	Northern Zululand Lebombo	NT	62	45	17	3
60.4	Southern Coastal	NT	62	5	61	3
61	Pondoland Scarp Forest	NT	67	40	28	3
62	KwaZulu-Natal	NT	72	54	20	3

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	Coastal Forest						
63	KwaZulu-Natal Dune Forest	NT	69	63	6		3
64	Licuati Sand Forest						
64.1	Eastern	NT	69	39	31		3
64.2	Western	NT	69	72	0		1
65	Lowveld Riverine Forest	NT	70	68	2		3
66	Swamp Forest						
66.1	Barringtonia	NT	70	51	21		3
66.2	Ficus trichopoda	NT	70	44	31		3
66.3	Rafia	NT	70	42	28		3
66.4	Voacanga thuarsii	CR	70	0	103		n/a
67	Mangrove Forest	NT	70	73	0		1
68	Subtropical Seashore Vegetation	NT	20	58	0		1
69	Subtropical Coastal Wind Blown Dune	VU	20	45	0		3
71	Drakensberg Wetlands	VU	24	34	0		3
72	Eastern Temperate Wetlands	NT	24	2	34		3
75	Subtropical Alluvial Vegetation	EN	31	10	57		5
76	Subtropical Freshwater Wetlands	NT	24	45	0		3
77	Subtropical Salt Pans	NT	24	67	0		1
78	Temperate Alluvial Vegetation	VU	24	4	34		3

Please note:

- CR is Critically Endangered, EN is Endangered, VU is Vulnerable, NT is Near Threatened.
- Conservation targets are the highest of the national and provincial targets as at April 2008; Forest and wetland targets are national targets. The conservation status is currently under review, and best practice would be to contact Ezemvelo for updated information.
- Provincial vegetation type 58 is subsumed into 59, 73 into 71 and 74 into 76. Not included are Freshwater lakes (54), Subtropical Coastal Lagoons (55), Dams (56) and Estuary Mouths (70).
- Offsets may be required even though conservation targets have been met for a particular vegetation type, if the area impacted is a provincial priority in terms of a biodiversity plan, and/ or important from a biodiversity process, special habitat or ecosystem services perspective.
- Initial calculations based the initial ratio which was amended with specialist input, and logic based on date of information informing transformation data.

Adjusting the basic offset ratio

For terrestrial ecosystems, the basic offset ratio should be adjusted where appropriate, depending on the following six considerations, namely:

- The condition of the affected terrestrial habitat;
- The presence of threatened species;
- The presence of special habitats;
- The biodiversity process value of the affected habitat;
- The importance of biodiversity underpinning valued ecosystem services;
- The condition of the potential offset area(s); and
- The level of risk or uncertainty associated with the outcome of the offset.

Each of these considerations is addressed separately below. Readers should refer to Addendum 2 for detailed information on linking the residual negative impacts on biodiversity to appropriate offsets. In circumstances where there would be residual impacts on threatened ecosystem/s, threatened species, special habitats, important process areas, and/or valued ecosystem services, a single biodiversity offset may not compensate adequately for all residual impacts. In these situations, a package of offsets may be required.

For *wetland/ coastal* ecosystems, the initial size of the offset should be adjusted to take into account residual impacts on threatened species, and levels of risk or uncertainty associated with the success of the proposed offset.

a) The condition of the affected habitat

The condition of the residually affected terrestrial habitat must be taken into account when determining an appropriate offset. Where the habitat is in moderate to good condition, then the basic offset ratio would apply. When the habitat is degraded but not completely transformed (i.e. where there is less than 25% of expected species supported by the affected habitat, compared with an undisturbed site in a comparable vegetation type or terrestrial ecosystems (Box 8), then the ratio could be reduced by as much as 50% on the advice of the biodiversity specialist in collaboration with Ezemvelo, provided that the habitat serves no other significant function as covered in b) – e) below.

For wetlands or aquatic systems, the condition of the affected biotope should be taken into account when determining the equivalent functional ecosystem that would be needed to offset residual negative impacts. For example, if a 180ha wetland were judged by a wetland specialist to be only 60% functional, then the offset area required to be added to a subcatchment/ catchment would be at least 108ha of fully functional wetland. The size of offset would then depend on the restoration potential (i.e. added functionality through restoration) of targeted wetlands – e.g. if 50% degraded, then 0.5ha of wetland could potentially be added through restoring every 1ha, meaning that a total of 216ha would be needed, at minimum, as an offset.

b) The presence of threatened species

The offset area should contain, or contribute through restoration of degraded habitat or consolidation of land fragments, sufficient habitat to support viable populations of the affected species within its/their natural range. It should preferably already accommodate populations of the species. If the area being considered as an offset does not contain suitable habitat, then it may be necessary to seek an additional offset. The size of offset will depend on the particular characteristics of the affected species, but should be commensurate with the residual impacts on that species, take into account related conservation targets and threats, and ensure that the status of the species would remain unchanged.

c) The presence of special habitats

Loss of special habitats in effect constitutes irreplaceable loss. Where development is likely to be authorized due to broader strategic issues in the public interest despite their irreplaceability, compensation should be required either through trading up type offsets, or through restoration of degraded 'like' special habitats, in both cases securing those habitats in perpetuity.

d) The biodiversity process value of the affected habitat

The size of that offset would depend on the particular context and whether or not the impacted ecological process was land hungry, and should be informed by a biodiversity specialist in collaboration with Ezemvelo.

e) The importance of biodiversity underpinning ecosystem services with socio-economic value

In some cases, residual negative impacts could be addressed through pattern and/or process offsets. However, there may be instances where valued ecosystem services rely on biodiversity pattern or process not recognized as significant using a strict biodiversity approach (e.g. livelihoods may depend on a particular plant species that has little biodiversity importance, or on a Near Threatened ecosystem for grazing). In these cases, offsets should be considered to compensate for specific losses and meet the needs of the user community. The offset area should deliver the same quantum of substitute services to the affected communities and/or society as that lost as a result of the proposed development; in some cases it may be necessary to secure more than one, or different offset areas, to provide adequate compensation and achieve this desired outcome.

f) The condition of the potential offset area(s)

- Where an offset is being sought mainly to compensate for loss of a particular ecosystem, offset habitat should preferably be in good or moderate condition for the basic offset ratio to apply.
- Where an offset is being sought to compensate for loss of ecological process areas and/ or linkages in the landscape, then offset areas of degraded to good may be appropriate, provided that they would fulfil the particular process/linkage needs. Where the intention is to rehabilitate offset areas (i.e. where their condition is degraded or poor then the size of offset required may be reduced to take into account the additional investment in rehabilitation and management of these areas, on the advice of the biodiversity specialist in collaboration with Ezemvelo. However, should the risk of success be low, this ratio may need to be increased, rather than decreased).
- Where an offset is being sought to compensate for residual impacts on habitats that provide valued ecosystem services through either their particular species composition (goods) or their function, then offset areas of degraded to good may be appropriate, depending on the specific ecosystem service affected. That is, the offset must fulfil the particular ecosystem service delivery needs. Where it is not feasible to re-create the impacted habitat, and all such ecosystems are considered to be irreplaceable (e.g. wetlands), the rehabilitation of existing but degraded habitat as an offset would make a significant positive contribution.

g) The level of risk or uncertainty associated with the outcome of the offset

Where rehabilitation or restoration is proposed, but their success is not known, and/or where background patterns of land and/or natural resource use may pose a threat to the future viability of a potential offset area, either the size of the proposed offset should be increased to provide an appropriate safety margin for the offset, and/or appropriate supporting activities should be provided to remove or substantially reduce threats to the offset site(s); e.g. introducing alternative, more sustainable livelihoods and/or alternative sources of those materials that are under threat.

4.3.2 Locating offsets in the landscape – offset receiving areas

Identifying potential offset areas should start by determining those sites with the highest priority for biodiversity conservation for the affected ecosystem, as flagged in bioregional plans (through CBAs), biodiversity plans and/or biodiversity networks. These areas are known as receiving areas for offsets. As far as possible, offset sites should be connected to other formally protected sites and/or identified in expansion plans for protected areas.

Offsets should be located in the landscape to (in order of priority):

- § Make the maximum contribution to securing, protecting and/or linking biodiversity priority areas, and consolidating ecological corridors in the landscape identified in the provincial biodiversity plan, bioregional or other provincial or municipal conservation plans, SDFs, EMFs, fine scale plans, (etc). These areas are broadly grouped as key receiving areas for offsets. Ezemvelo should play a key role in identifying appropriate offset areas²¹.
- § Minimize fragmentation of habitat, consolidate or buffer existing protected or priority conservation areas and/or create corridors between these areas;
- § Provide comparable ecosystem services to those delivered by the impacted site;
- § Provide comparable ecosystem services specifically to those parties adversely affected by impacts on their ecosystem services;
- § Be in the same biotope, bioregion and, preferably, the same sub-catchment as the impact site; and
- § Be as close to the impacted site as possible.

4.4 Considering the impacts of, and on, potential offsets

Setting aside an area as a biodiversity offset may negatively affect current users of that area, e.g. by restricting access or uses, and/or displacing activities to another priority area for conservation, resulting in negative impacts on biodiversity elsewhere. Existing/planned development (e.g. in spatial development plans, through informal settlement, prospecting or mining rights, land claims, etc.) may also pose a threat to the viability of a potential offset area.

It is essential that both the impacts of, and on, prospective offsets are taken into account in choosing the optimum offset, since they have a number of practical, cost and conservation implications. Best practice would be to select an offset site where there would be no or negligible negative impacts on local communities, but where improved management of the site could deliver better ecosystem services to that community. It is also valuable to seek opportunities for synergies with development plans and strategies (e.g. boosting nature-based tourism).

Where a potential offset site is being used by local communities, negotiations with stakeholders may lead to formal agreement between the proponent, conservation agency and the local community whereby some form of payment for conservation management (or 'payment for ecosystem services') is reached to compensate those whose existing activities may be curtailed, thereby promoting a different form of livelihood.

²¹ According to the PSDF (DEA&DP 2005), any Core 2 (ecological corridor areas without formal protection) should be brought up to Core Area 1 status (i.e. secured in perpetuity for conservation purposes).

4.5 Determining the best way to secure the biodiversity offset

4.5.1 Options for securing biodiversity offsets

Offsets can be secured through:

- § Land donation by the developer to an appropriate statutory conservation authority or an accredited PBO, together with financial provision for its long term management;
- § Conservation servitudes (e.g. stewardship agreements) entered into between the developer, landowner and the State;
- § Purchase or other securing of land by the developer for either of the above purposes; and
- § Purchase of biodiversity credits by the developer²².

Recognition of offset areas as 'Sites of Conservation Significance', formal agreements between the developer and Ezemvelo and changes in zonation do not offer the same level of security in the long term as the above approaches; they are seen as interim or 'holding' strategies. The option of funding the management of existing under-funded municipal or provincial protected areas is not considered to be appropriate in KwaZulu-Natal.

The developer or a third party appointed to act on the developer's behalf could pursue the design, location and implementation of the offset.

Donation of land to an appropriate statutory conservation authority or an accredited Public Benefit Organization

The developer would donate land to an appropriate statutory conservation authority (i.e. Ezemvelo, SANParks, or a recognized, accredited 'offsets PBO'²³) that is geared to handling such donations and has the approval of the DAEA&RD and Ezemvelo. Acceptably endowed capital fund/s for managing, monitoring and auditing the offset area for at least for the life of the proposed development, and preferably in perpetuity, would also need to be established and transferred to the offset recipient (Section 4.5.2). The size of that donation would have to be acceptable to the receiving party. The donation should be recorded in the environmental authorization.

Conservation servitudes

Conservation servitudes are given effect in terms of the National Environmental Management (NEM) Protected Areas Act 57 of 2003. The proponent commits to securing the offset site through an agreement entered into with the Member of the Executive Council (MAC) responsible for provincial protected areas, and the Board of Ezemvelo, to conclude an agreement to establish and manage a Nature Reserve in terms of subsection 23(1) or Protected Environment (subsection 28(1)) of the NEM Protected Areas Act. Concurrence from Ezemvelo would be required.

An adequately resourced endowment fund for the offset site would have to be set up, directly related to the costs of managing, monitoring and auditing the offset for at least for the life of the proposed development, and preferably in perpetuity, as well as obtaining specialist advice where appropriate. If

²² No such credit scheme exists at present. However, the development of a biodiversity credit trading system is believed to have potential in future.

²³ A Public Benefit Organization registered in terms of Section 18 of the Income Tax Act 58 of 1962, which is purpose built to stand scrutiny to the offsets transactions in the province, to administer the endowment fund created, and to purchase, where appropriate, suitable offsets sites. This would bring a large element of the requisite efficiency, lowered transaction costs, and fidelity to the biodiversity priorities of the Western Cape.

any actions were required from third parties they would have to be funded from that endowment according to an agreed schedule at specified rates. The operations and payments from the fund must be stipulated in a schedule/annex to the Offsets Management Plan (Section 5.2). Recent tax and property rates laws may help ease the burden on landowners opting for this offset route.

Purchase or other form of acquisition of land by the developer for either of the above purposes

The developer could buy or negotiate a long term lease on suitable offset land, with a legally enforceable commitment to concluding a conservation servitude (e.g. stewardship) agreement and pursuing the declaration of a Protected Area. The agreement may also be concluded through contract law. A proponent may appoint a third party service provider to facilitate any purchase or agreement as required, but would retain ultimate responsibility for ensuring that the offset is secured, managed, monitored and audited effectively, as required.

Biodiversity banking and credit trading schemes

Biodiversity credit trading schemes provide a mechanism to register and trade biodiversity credits. No such credit scheme exists at present. However, the development of a biodiversity credit trading system, perhaps linked to the Stewardship Programme, is believed to have potential in future (e.g. wetland mitigation banking in the grasslands ecosystem is currently being investigated and evaluated by SANBI, with a State entity proposed to play the role of banker).

4.5.2 Financial mechanisms to facilitate securing offsets

Three mechanisms are proposed to facilitate securing offset areas, namely direct purchase of land by the developer and/or negotiated financial agreement with landowners, monetary compensation paid to a dedicated Biodiversity Offsets Fund charged with securing and managing priority areas for conservation purposes, or the purchase of biodiversity credits as an offset through a credit trading scheme²⁴.

In all cases, the DAEA&RD and Ezemvelo would provide formal endorsement of the proposed approach to selecting and securing adequate and appropriate offsets, and/or the size of the monetary compensation for acquiring and/or managing offsets.

Characteristics peculiar to each of these mechanisms are outlined below.

Direct purchase or securing of land for the offset

The costs of acquiring and securing the offset site would be borne directly by the proponent. The offer to purchase the offset site would have to be accepted, and the transfer completed, before the development could proceed. Alternatively, a financial package linked to a legal agreement with landowners to secure and manage an area targeted as an offset would have to be finalized before the start of development. It could be prudent for a proponent to pursue the identification and securing of an acceptable offset as early as possible in the EIA and decision-making process, at the proponent's risk.

²⁴ There is currently no such scheme in the province, although this approach has potential for future application.

Monetary compensation

A mechanism would be set up for an Independent Trust or PBO, or the State or its partners, to pursue the acquisition of the offset²⁵ on behalf of the proponent.

To this end, the physical size/area of suitable offset must be translated into a monetary measure²⁶. This monetary measure must reflect:

- § The probable costs of acquiring/securing a sufficient area of suitable habitat, comprising costs of land plus transaction costs;
- § The costs of managing the offset and, where necessary, obtaining specialist input about its management, for at least the duration of the residual impact, but preferably in perpetuity;
- § The costs of monitoring and auditing performance and compliance; and
- § Any costs related to the administration and management of funds, plus a risk premium.

A single independent Fund for biodiversity offsets should ideally be established, which would enable ring-fencing²⁷ of funds specifically for the acquisition, administration, management and accounting of offset transactions. The Fund should be registered as a PBO. It would be critical for that PBO to set up a detailed, transparent, accountable and auditable system of accounting to keep track of the offsets required and implemented, and of their performance.

Consistence with requirements of the public finance management laws must be confirmed where funds are to be received by the State for offset purposes.

Purchase of biodiversity credits as an offset through a credit trading scheme

The proponent would either buy the required number of biodiversity credits from an accredited conservation or biodiversity bank, or purchase credits directly from landowners who have registered biodiversity credits with a State department, relevant institution or conservation agency. (These options have potential for future use. They are not yet available in the province as an offset mechanism.)

4.6 Reaching offset agreements

Developers intending to buy or lease land as an offset must reach agreement with a suitable land-owner and/ or land users before developing an Offset Management Plan. Such a contract could include issues on ownership, access, biodiversity uses, possible title deed restriction, management, monitoring and evaluation, and auditing of the proposed offset. Agreements should include accurate and enforceable descriptions of the roles and responsibilities of each party to the agreement, and limits to those responsibilities.

Formal conservation agreements may be reached between the proponent and stakeholders, supported by Ezemvelo, whereby some form of payment of stakeholders is agreed to by the proponent

²⁵ It is assumed that best practice EIA and the contents of this guideline, as relevant, would be applied to the acquisition of offsets, taking into consideration the potential socioeconomic impacts – both positive and negative - on local communities and society as a whole of acquiring priority habitat for biodiversity conservation purposes, with associated implications for ecosystem service delivery.

²⁶ The advice of Ezemvelo should be sought with regard to this 'translation' of physical area into a monetary measure, taking into account the market value of comparable land.

²⁷ Specifies that money would be used for an explicitly-defined purpose only.

in exchange for clearly defined conservation management actions. Provided that formal and binding agreement can be reached to secure the land for conservation purposes in perpetuity, and there are no conflicts of interest among parties to the agreement, this type of initiative may avoid the need for the project developer to purchase land for an offset. Establishing clear roles and responsibilities and formalizing them in agreements is crucial; payment would be conditional on compliance with the agreement.

4.7 Offset reporting

An Offsets Report would need to be submitted to the competent authority as part of the final Basic Assessment or EIA Report. Where the developer has secured and will manage (or contract a third party to manage) an offset, an Offsets Management Plan would also have to be submitted to the competent authority.

5. OFFSET REPORT AND OFFSET MANAGEMENT PLAN

For all proposed biodiversity offsets, a statement from Ezemvelo either supporting and endorsing the selection and design of that offset, with recommended conditions, and/or rejecting the proposed offset (with reasons) should be required by the decision-maker as a key decision-making informant.

5.1 Offset Report

The Offset Report should include the following information; use could be made of Table 1 as a template for this purpose:

1. Description of residual negative impacts on biodiversity and ecosystem services requiring offsets.
2. Explicit statement on the required size of the biodiversity offset.
3. Description of types of offset considered, with defensible reasons for proposed offset type.
4. Explicit and defensible statement of the option arrived at for securing the offset.
5. Where the proposed offset comprises like for like or trading up habitat:
 - a) Description of stakeholder engagement process in identifying and evaluating the adequacy and acceptability of the proposed offset site.
 - b) Description of any impacts on biodiversity, ecosystem services and/or associated socioeconomic factors associated with securing the proposed offset site.
 - c) Description of potential offset site/s.
 - d) Description of security of offset in terms of both tenure and management. The proposal should contain reference to the contracts and agreements governing the offset area.
 - e) Evaluation of adequacy of proposed offset site and its location by biodiversity specialist and, where relevant, social specialist/ resource economist, in terms of:
 - Ø compensating for pattern, process and ecosystem services impacts

- Ø making a contribution to biodiversity conservation in the province
 - Ø viability of the proposed offset site in the long term;
 - Ø costs of managing, monitoring, auditing, and obtaining specialist input where necessary on managing, the offset site;
 - Ø responsibility for managing, monitoring and auditing the offset;
 - Ø adequacy of capacity of the institution, organization or other party to meet obligations in terms of above responsibilities; and
 - Ø ensuring that society as a whole, and affected communities in particular, would not be left more vulnerable or less resilient as a consequence of either the proposed development or the proposed offset.
- f) Details of the offset agreement/s between all parties involved.
- g) The distributional or equity effects of the offset.
- h) Economic efficiency of the offset.
- i) Administrative costs of the offset.
- j) A brief statement of any residual negative impacts once the proposed offset has been taken into account.
- k) Statement of any risks associated with the offset, and measures that would be needed to minimize these risks.
6. Where the proposed offset involves monetary compensation:
- a) Details of the proposed offset amount and the basis on which it was determined. The Offset Report should show the measure of residual biodiversity loss, the size of an appropriate offset that would adequately compensate for that loss, and the 'translation' of that offset size into the costs of acquiring and managing a suitable offset.
 - b) Details of the receiving party/ies or fund/s.
 - c) Details of any agreement/s between parties involved.
 - d) Schedule of payments, where appropriate.
 - e) Performance auditing and reporting schedule.
 - f) Statement of any risks associated with the offset, and measures that would be needed to minimize these risks.

5.2 Offset Management Plan

For physical offsets, the proponent would prepare an Offset Management Plan. Partnerships with NGOs, community-based organizations and/or research institutions may offer significant potential in drawing up plans for implementing and managing biodiversity offsets.

The contents of the Offset Management Plan should be as follows:

- § Management (and, where appropriate, a restoration) plan with clear objectives, targets, actions, responsibilities, and timing²⁸.

²⁸ Where the area is to be declared a nature reserve in terms of the National Environmental Management Protected Areas Act, the requirements of that Act with regard to management and monitoring would have to be satisfied.

- § Monitoring and evaluation requirements with associated indicators,
- § Appropriate corrective or adaptive management in response to monitoring results, and audit requirements.
- § For large-scale or mega-projects, an independent body should be established to monitor and oversee the area set aside as an offset, to ensure it continues to maintain the characteristics for which it was set aside. Such a body should include independent technical experts, community representatives and the provincial conservation agency.
- § Performance auditing and reporting requirements.
- § Roles and responsibilities for all of the above activities.
- § Schedule of costs linked to management plan and associated activities, specialist input, management of offset bond or trust fund.

Addendum 1: Guidance for the consideration of offsets in relation to the significance of residual negative impacts on biodiversity and ecosystem services, having taken account of measures to avoid, minimize and or repair/restore these impacts

Criteria	Description	Significance rating of residual impacts	Potential to consider offset	Type of offset – outside Town Planning Scheme boundaries ²⁹	Type of offset – inside Town Planning Scheme boundaries
A : Composite considerations as a 'first filter'					
Biodiversity and/or bioregional plans, biodiversity networks	Any habitat identified as a CBA in a published bioregional or fine-scale plan, or as a core site in a biodiversity network. A priority biodiversity area in other biodiversity plans.	Very High – would constitute a fatal flaw: an irreversible impact; one which would result in irreplaceable loss of biodiversity and ecological integrity. Proposed development should not proceed. Medium to Very High, depending on the relative accuracy of biodiversity mapping	No offsets should be considered for Very High impacts; offset should be considered for medium to high significance impacts	For medium to high residual impacts, secure and protect significant areas identified in fine-scale (or other appropriate and relevant) biodiversity plans that could provide a substitute for impacted area in ratio corresponding to characteristics of affected biodiversity (see 'B').	No offsets should be considered where development impacts on conservation networks or priority areas for conservation.
Protected Area i.t.o. Chapter 3 of the NEM Protected Areas Act 2003; Protected Ecosystem i.t.o. s52(2)(d)	Any area declared as a Protected Area or a 'Protected Ecosystem', or an area for which a Biodiversity Management Plan has been approved in terms of these Acts.	Could be low to very high, depending on the category of PA, the characteristics of the PE or area for which a BMP has been approved, the characteristics of development, its location within the PA/ecosystem/area for which the BMP was approved, its	Offsets should be considered where there would be residual negative impacts of medium to high significance.	Secure and protect significant areas identified in bioregional or systematic biodiversity plans that could provide a substitute for impacted area in ratio corresponding to characteristics of affected biodiversity (see 'B'). Offsets for residual impacts within	

²⁹ Offset should comprise both physical habitat (i.e. through direct purchase or securing by way of monetary compensation or through a third party), and financial provision for its management in the long term (Section 5 of the guideline). This Addendum focuses on the physical habitat component of the offset.

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and/or area for which a Biodiversity Management Plan has been approved i.t.o s43 of the NEMBA,		consistency with the specific provisions of these Acts and/or the particular objectives and/or purpose of declaring that Protected Area, Protected Ecosystem or area for which a BMP was approved. e.g. residual impacts on Special Nature Reserves are likely to be 'very high' as they could not be compensated; development on disturbed sites in common habitat within a national park of World Heritage Site would have relatively low significance.	Would need to apply criteria in 'B'.	World Heritage Sites and associated changes to the boundary of the WHS would need to be agreed to by DEA and the World Heritage Committee. Note that changes to the boundaries of many protected areas to include offset areas would need to go through parliament.	
Context-specific considerations, particularly where biodiversity plans at an appropriate scale have not yet been prepared	An area of irreplaceable biodiversity value identified by biodiversity specialists and supported by Ezemvelo. That is, any habitat where its size, connectivity, structure, composition and condition would make it irreplaceable for ensuring the persistence of an ecosystem or species.	Very High – would constitute a 'fatal flaw': an irreversible impact; one which would result in irreplaceable loss of biodiversity and ecological integrity. Proposed development should not proceed.	No offsets should be considered		
B : Biodiversity pattern and process, and ecosystem services issues as a 'second filter'					
Biodiversity pattern	Ecosystems				
	Critically Endangered	High to Very High, depending	None		

	(irreplaceable loss) ecosystem ³⁰ identified in biodiversity plan and ratified by biodiversity specialist and/or Ezemvelo.	on condition of habitat – would constitute a fatal flaw: an irreversible impact; one which would result in irreplaceable loss of biodiversity and ecological integrity. Proposed development should not proceed.			
	Endangered ecosystem, identified in biodiversity plan and ratified by biodiversity specialist and/or Ezemvelo.	<p>Medium to High, depending on the size of the area to be residually impacted (i.e. extent), presence of threatened species and/or special habitats, position in the landscape in relation to broader spatial components of ecological processes³¹, and the condition of the impacted habitat³².</p> <p>As a broad guide only³³, loss of >1ha of Endangered habitat in moderate to good condition would constitute a medium significance impact; loss of >5ha in moderate to good condition would be considered</p>	Yes	<p>Like for like or better habitat, ratio as required for particular vegetation type, consistent with/contribute to CBAs identified in bioregional or systematic biodiversity plans, priority areas in other biodiversity plans, municipal SDFs and biodiversity networks, EMFs.</p> <p><i>[Refer to species and special habitat sections below for guidance where applicable]</i></p>	Offsets should be secured in perpetuity, within conservation or open space networks preferably by means of conservation servitudes and/ or zonation.

³⁰ Unless otherwise stated, the ecosystem status relates to habitat in that ecosystem of moderate to good condition, rather than degraded.

³¹ Refer to the Fynbos Forum Ecosystem Guidelines for Environmental Assessment in the Western Cape (De Villiers et al 2005) for a useful discussion of how to apply consideration of these components in planning and environmental assessment.

³² If the affected habitat supports >75% of expected species compared with an undisturbed site in a comparable vegetation type or ecosystem, it would be in good condition; if >25% but <75% it would be in moderate condition, and <25% it would be degraded

³³ The evaluation of significance would need to be carried out by an appropriate biodiversity specialist; the variables and contextual considerations are complex.

		a high significance impact. Where threatened species and/or special habitats were present, areas <5ha could be bumped up to high significance.			
	Vulnerable ecosystem, identified in biodiversity plan and ratified by biodiversity specialist and/or Ezemvelo.	<p>Medium to High, depending on area to be residually impacted, presence of threatened species and/or special habitats, and position in the landscape in relation to broader spatial components of ecological processes, and the condition of the impacted habitat.</p> <p>As a broad guide only³⁴, loss of >1ha -5ha of Vulnerable habitat that contained threatened species and/or special habitats, or >5ha of Vulnerable habitat in moderate to good condition, would constitute a medium significance impact; loss of >5ha-10ha of Vulnerable habitat that contained threatened species or special habitats, or >10ha of Vulnerable habitat in moderate to good condition, would constitute a</p>	Yes, for residual impacts of medium to high significance	<p>Like for like or better habitat, ratio as required for particular vegetation type(s). To be consistent with/contribute to CBAs identified in bioregional or systematic biodiversity plans, priority areas in municipal SDFs and biodiversity networks, EMFs.</p> <p><i>[Refer to species and special habitat sections below for guidance where applicable]</i></p>	

³⁴ The evaluation of significance would need to be carried out by an appropriate biodiversity specialist; the variables and contextual considerations are complex.

		high significance impact.			
	Near Threatened ecosystem, identified in biodiversity plan and ratified by biodiversity specialist and/or Ezemvelo.	<p>Low to High, depending on the area to be residually impacted, presence of threatened species and/or special habitats, and position in the landscape in relation to broader spatial components of ecological processes, and the condition of the impacted habitat.</p> <p>As a broad guide only³⁵, loss of >5ha-20ha of Near Threatened habitat that contained threatened species and/or special habitats, would constitute a medium significance impact; loss of >20ha -50ha of Near Threatened habitat that contained threatened species and/or special habitats would be considered a high significance impact.</p>	Not necessary for low, should be considered for medium and high	Where threatened species and/or special habitats trigger the need for offsets in Near Threatened systems, offsets should focus on securing and protecting habitat for those threatened species/containing those special habitats, at least at the basic offset ratio for that vegetation type. <i>[Refer to species and special habitat sections below for guidance where applicable]</i>	
Species					
	Critically Endangered species, assessed by biodiversity specialist and/or Ezemvelo, and drawing on GIS	Likely to be Very High- would constitute a 'fatal flaw': an irreversible impact; one which would result in irreplaceable loss of biodiversity and ecological	None		

³⁵ The evaluation of significance would need to be carried out by an appropriate biodiversity specialist; the variables and contextual considerations are complex.

	databases of known rare species occurrences	integrity. Proposed development should not proceed			
	Endangered species, assessed by biodiversity specialist and/or Ezemvelo, and drawing on GIS databases of known rare species occurrences	Medium to Very High, depending on size and viability of affected population, and contribution of affected population to the persistence of the species.	Should be considered for 'medium to high' impacts, offsets.	Secure and protect habitat with known viable populations of the same species, its location preferably contributing to provincial and/or municipal priorities for biodiversity conservation. Size of offset related to habitat of viable population of the same species, but at least at the basic offset ratio for that vegetation type; rely on specialist guidance.	Habitat with known viable populations of the same species, contributing to urban biodiversity network/EMF. Size of offset related to habitat of viable population of the same species; rely on specialist guidance.
	Vulnerable species, assessed by biodiversity specialist and/or Ezemvelo, and drawing on GIS databases of known rare species occurrences	Medium to High, depending on size and viability of affected population, and contribution of affected population to the persistence of the species.	Should be considered for medium to high impacts.	Secure and protect habitat with known viable populations of the same species, its location preferably contributing to provincial and/or municipal priorities for biodiversity conservation. Size of offset related to habitat of viable population of the same species, but at least at the basic offset ratio for that vegetation type; rely on specialist guidance.	Habitat with known viable populations of the same species, contributing to urban biodiversity network/EMF. Size of offset related to habitat of viable population of the same species; rely on specialist guidance.
	Near Threatened species assessed by biodiversity specialist and/or Ezemvelo, and drawing on GIS	Low	Not necessary		

	databases of known rare species occurrences				
	Special Habitats				
	Special habitat recognized in fine-scale biodiversity plan, by Ezemvelo or by a biodiversity specialist	Medium to very high, depending on the particular special habitat, its rarity, the project context and the irreplaceability of that habitat	Should be considered for medium to high impacts.	Secure, restore (if appropriate), protect and manage comparable special habitats. Size of offset related to special habitat affected, but at least at the basic offset ratio for that vegetation type, or to ensure functional equivalence if wetland; rely on specialist guidance.	Comparable special habitats that would contribute to urban biodiversity networks, EMF. Size of offset related to habitat affected; rely on specialist guidance.
Biodiversity process	Should the affected area fall within a CESA, the significance rating may be relatively high, depending on options in the landscape to fulfill the particular CBA-support purpose, as described in a Fine-Scale or Bioregional Plan.				
	Fixed process				
	Fixed process at provincial to local level, identified on biodiversity or bioregional plans, and/or by biodiversity specialist (i.e. limited alternatives or substitutes and could be important in enabling the persistence of biodiversity or delivery of ecosystem services of provincial importance) Important: unless the scale of available plans supports high confidence predictions, it is critical	Likely to be medium to very high, depending on the type of process and context. Where fixed process areas are identified on biodiversity and/or spatial plans, professional judgment must be applied: it is important to determine the purpose of that process area (e.g. what process is being safeguarded or conserved in this corridor?) in order to evaluate the potential residual impact on that process area (i.e. would the proposed development undermine or	No offsets should be considered for very high significance residual impacts. Offsets should be considered for high or medium significance impacts.	Protect CBAs identified in bioregional or fine scale biodiversity plans, priority ecological corridors or process areas in other biodiversity plans, municipal SDFs and biodiversity networks. Area of offset would depend on context but could involve offset ratios of up to 20:1 for land-hungry processes. At minimum, offset should satisfy the basic offset ratio for the affected vegetation type. The advice of a biodiversity specialist, supported by Ezemvelo, should inform the offset size.	

	<p>that residual impacts on connectivity and the spatial components of ecological processes are addressed, evaluated and ground-truthed by an appropriately qualified biodiversity specialist in consultation with Ezemvelo.</p>	<p>adversely affect that process?).</p> <p>If essential to maintain evolutionary processes OR processes that underpin function of important, valued or valuable ecosystems, OR processes that underpin critical ecosystem services (i.e. with health or livelihood implications) then impact would be very high and no offsets should be considered. If high or medium residual significance, then offsets could be considered.</p> <p>As a broad guide only, where the residual impact would be on largely undisturbed vegetation within a demarcated ecological corridor, CBA, any residual impact on that corridor would constitute an impact of very high significance. Where a number of options exist for conserving a representative area of the spatial components of ecological processes in the landscape, then the advice of a biodiversity specialist, supported by Ezemvelo, should</p>			
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		inform the significance rating.			
	Flexible process				
	Flexible ³⁶ process at provincial or local level (i.e. some alternatives or substitutes), identified on bioregional or biodiversity plans, and/or by biodiversity specialist	<p>Likely to be low to high, depending on the number of options in the landscape, the type of process and the particular context.</p> <p>Where flexible process areas are identified on biodiversity and/or spatial plans, professional judgment must be applied: it is important to determine the purpose of that process area (e.g. what process is being safeguarded or conserved in this corridor?) in order to evaluate the potential residual impact on that process area (i.e. would the proposed development undermine or adversely affect that process?).</p> <p>The advice of a biodiversity specialist, supported by Ezemvelo, should inform the significance rating.</p>	Offsets should be considered for medium to high impacts	Must be low risk of irreversible impact on continued function, appropriate location in landscape is critical - must be consistent with NSBA, should target CBAs in bioregional or fine-scale biodiversity plans, or priority ecological corridors or ecological process areas in other biodiversity or spatial plans. Area of offset would depend on context but could involve offset ratios of up to 20:1 for land-hungry processes. At minimum, offset should satisfy the basic offset ratio for the affected vegetation type. The advice of a biodiversity specialist, supported by Ezemvelo, should inform the offset size.	
Ecosystem	Locally valued or	Low to Medium	Offsets should	Must provide like for like or better	

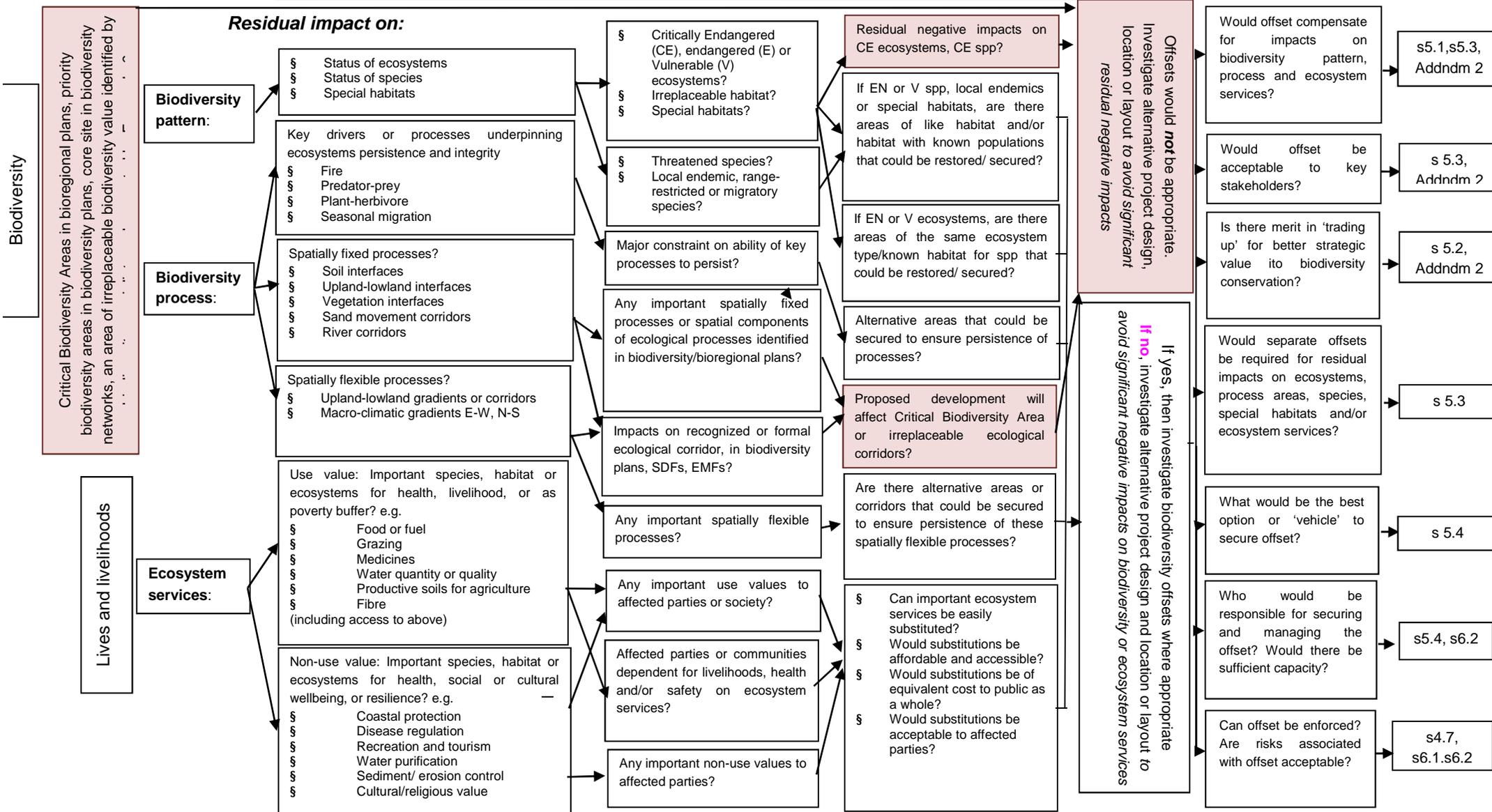
³⁶ It is important to note that the term flexible does not imply that there would always be alternative areas that would act as an ecological corridor. In many cases, land in low-lying areas that could be suitable for a corridor from mountains to the coast has been extensively transformed, and options for creating linkages are absent.

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services	important, can be easily substituted to play the same role in ecosystem, as identified by biodiversity/environmental resource economics specialist/s		be considered for medium impacts.	substitute ito use, area served, access and value, substitutes must be accessible and acceptable to affected parties at no costs to these parties. At minimum, offset should satisfy the basic offset ratio for the affected vegetation type. Substitutes for ecosystem services must ensure local livelihoods, health or wellbeing are not compromised.	
	Locally valued or important, local substitute difficult or not possible.	High to very high, depending on type of ecosystem service and level of reliance for livelihoods, health and wellbeing.	None for very high, consider for high.	Must provide like for like or better substitute ito use, area served, access and value, substitutes must be accessible and acceptable to affected parties at no costs to these parties. At minimum, offset should satisfy the basic offset ratio for the affected vegetation type. Substitutes for ecosystem services must ensure local livelihoods, health or wellbeing are not compromised.	
	Provincially valued or important, as identified by biodiversity specialist/environmental resource economist	High to very high, depending on type of service and levels of reliance for livelihoods, health and wellbeing	None for very high, consider for high.	Must provide like for like or better substitute ito use, area served, access and value, substitutes must be accessible and acceptable to affected parties at no costs to these parties. At minimum, offset should satisfy the basic offset ratio for the affected vegetation type. Substitutes for ecosystem services	

				must ensure local livelihoods, health or wellbeing are not compromised.	
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Evaluation of probable residual impacts



Addendum 2 : Finding adequate and appropriate offsets for residual negative impacts