

**RSB – ROUNDTABLE ON SUSTAINABLE BIOMATERIALS**  
**RSB Conservation Impact Assessment Guidelines**

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## Note on the use of this document

These guidelines help operators to conduct a conservation impact assessment by evaluating potential impacts of operations on conservation values.

They describe key aspects to be investigated during the planning of new projects or ongoing activities in order to identify the potential impact of operations on conservation values (including the use of invasive species) and suggest good practices to minimise such impacts.

These guidelines should be used as a priority by RSB participating operators who trigger a conservation impact assessment, as defined under Principle 7 of the RSB Principles & Criteria (RSB-STD-01-001). However, it is recommended that all RSB participating operators become acquainted with the issues described herein.

These guidelines may equally be used by the auditor and other actors involved in the verification of compliance in order to gain a better understanding of key aspects to be considered during the certification process.

Under no circumstances should this document serve as the basis for verification of compliance or audits of operators. No aspect of this document is normative.

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## Introduction

The purpose of this guideline is to assist in the definition and identification of conservation values, as well as identify the impacts, assess their importance, and discuss how to mitigate these impacts. The RSB Principles & Criteria were used as a basis to identify the components for this guideline.

These guidelines have been developed to enable environmental practitioners, proponents of biofuels or biomaterial projects, and stakeholders to understand, identify and manage areas containing conservation values of global, regional or local importance, which might be impacted when developing a biofuel or biomaterials project. This specialised impact assessment is triggered by the screening exercise described in RSB-GUI-01-002-02. It should be conducted using the methods and participatory processes recommended in the Impact Assessment Guidelines (RSB-GUI-01-002-01). Principle 7 of the RSB Principles & Criteria (RSB-STD-01-001), which is relevant to impacts on biodiversity, ecosystems and conservation values, is outlined in the box below. Principle 7 is divided into five criteria which are used to formulate the objectives of these guidelines.

The first section in these guidelines deals with identifying **conservation values**, ecosystem functions/services, buffer zones and ecological corridors, as well as assessing the invasiveness of the crop used for feedstock production. It is followed by a section on assessing the **nature and intensity of impacts** that will potentially affect these conservation values. The third section describes possible **mitigation measures and monitoring** with regards to potential impacts, in order to achieve compliance with Principle 7.

Specifically, these guidelines will:

- Be practical, so that impact assessment professionals, operators and auditors can accurately identify areas containing conservation values of local, regional or global importance;
- Be generic for use in any country, for farm or natural lands;
- Ensure that conservation values of local, regional or global importance are not in any way negatively impacted by a certified project;
- Ensure that existing ecosystem functions and services are maintained;
- Ensure that buffer zones are protected, restored or created;
- Ensure that ecological corridors are protected, restored or created to minimise fragmentation; and
- Determine if the crop species used is invasive under local conditions.

To ensure an operator produces biofuels or biomaterials compliant with RSB requirements, (and compliant with the Renewable Energy Directive<sup>1</sup> of the European Union), potential areas for feedstock production or existing production areas need to be assessed and managed according to these

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<sup>1</sup> The Renewable Energy Directive (RED) is intended to promote the use of renewable energy in Europe, and stipulates that biofuel production should be environmentally sustainable and meet certain targets laid down in the directive. Furthermore, it states that, if land with high stocks of carbon in its soil or vegetation needs to be converted for the production of raw materials for biofuels and other bioliquids, some of the stored carbon will be released into the atmosphere leading to the formation of carbon dioxide. This could offset the benefits of biofuels through greenhouse gas emissions, and consequently the full carbon effects of such conversions must be accounted for in calculating the greenhouse gas savings of any biofuels project. The RSB has similar guidelines and standards.

guidelines, and a justification for their inclusion or exclusion provided.

There are five criteria that need to be met in order to achieve Principle 7 (Box 1). These criteria are underpinned by the concept of conservation values, and this concept is therefore explained in some detail first, before dealing with the specifics of Criteria 7a to 7e.

**Principle 7. Operations avoid negative impacts on biodiversity, ecosystems, and conservation values.**

- **Criterion 7a.** Conservation values of local, regional or global importance within the potential or existing area of operation shall be maintained or enhanced.
- **Criterion 7b.** Ecosystem functions and services that are directly affected by the operations shall be maintained or enhanced.
- **Criterion 7c.** Operations shall protect, restore or create buffer zones.
- **Criterion 7d.** Ecological corridors shall be protected, restored or created to minimise fragmentation of habitats.
- **Criterion 7e.** Operations shall prevent invasive species from invading areas outside the operation site.

# 1. Identification of conservation values

## 1.1 Definition of conservation values

The term **conservation values** is repeatedly used in Principle 7. This term encompasses all the features which would make an area worth conserving. It includes **biodiversity, ecosystem services and functions**, as well as **social aspects**, such as the **extraction of resources for subsistence, health, livelihood** and the use of such areas for **cultural practices**. The intent of Principle 7 is to make sure that conservation values considered important from a local, regional or global perspective are adequately identified, monitored and maintained. Areas containing conservation values of local, regional or global importance are usually areas little disturbed by agriculture or forestry, whether commercial and large scale or informal and small scale. These areas are often undisturbed native ecosystems. In addition, such areas may also be adjacent to native systems or protected areas and form buffer zones between the protected areas and the developed or agricultural areas. However, conservation values can be found on land under cultivation, and some agricultural activities may be compatible with the maintaining of conservation values (e.g. agro-ecosystems). Hence, existing operation sites should be evaluated as well. Ecological corridors which link adjacent areas with conservation values of local, regional or global importance should also be identified.

Examples of conservation values of local, regional or global importance include, but are not limited to:

- The presence of rare, threatened or protected species;
- Pristine ecosystems;
- Natural ecosystems, under a limited influence of human activities;
- High stock of carbon under solid, liquid or gaseous forms;
- Outstanding biodiversity level, as per the definition provided in the glossary;
- Ecosystem services and functions;
- Critical resources for a local population's subsistence, health and/or livelihood; and
- Cultural importance from a local, regional or global perspective.

## 1.2 Identification of conservation values (Criterion 7a)

To comply with Principle 7, a fundamental task is to first identify the conservation values that are contained in the potential or existing production areas. Preliminary questions about conservation values are part of the screening exercise described in RSB-GUI-01-002-02. You may use the same responses as in the screening exercise to answer some the questions below (desk research).

The objective of these guidelines is to take the operator and impact assessment specialist through a more thorough identification of the conservation values of the land to be potentially used or that is currently being used, following a land-use impact assessment.

The **land-use impact assessment** is a top-down combination of desk and field work, in consultation with local experts and communities, and takes both conservation and economic aspects into consideration. The land-use impact assessment includes at least the following steps:

1. **Screening:** Review of publicly available data and maps;
2. **Landscape-level assessment:** The consultation of national/regional experts and institutions;
3. **Site-level mapping:** A detailed site-level assessment and planning through the consultation of local communities, and
4. **Responsible management:** The implementation of responsible land management practices (e.g. conservation agriculture).

Following this assessment, the potential impact of operations on conservation values is assessed and mitigation measures proposed. It may be necessary to work with an ecological specialist in order to answer these questions.

### Step 1: Screening - Review of publicly available data and maps

#### No-go areas

Was the area recorded as or included in any of the categories below anytime between the 1st of January 2008 <sup>2</sup> and now?	Yes	No
1. The World Conservation Union “IUCN” Category I-IV protected areas <a href="http://www.protectedplanet.net/">http://www.protectedplanet.net/</a>		
2. Wetlands of International Importance designated under the Ramsar Convention <a href="http://ramsar.wetlands.org/">http://ramsar.wetlands.org/</a>		
3. World Heritage Sites designated under the UNESCO World Heritage Convention <a href="http://whc.unesco.org/en/list">http://whc.unesco.org/en/list</a>		
4. Biosphere Reserves designated under the UNESCO Man and the Biosphere Programme <a href="http://www.unesco.org/new/en/natural-sciences/environment/ecological-sciences/biosphere-reserves/">http://www.unesco.org/new/en/natural-sciences/environment/ecological-sciences/biosphere-reserves/</a>		
5. Other legally protected areas		

<sup>2</sup> Note that an earlier cut-off date applies for palm oil and wood products, as described in the RSB Screening Tool RSB-GUI-01-002-02

Was the area recorded as or included in any of the categories below anytime between the 1st of January 2008 <sup>2</sup> and now?	Yes	No
<u>6.</u> Primary forest, i.e. naturally regenerated forest, where there is no clearly visible indication of human activities and the ecological processes are not significantly disturbed <sup>3</sup>		
<u>7.</u> Natural or non-natural highly biodiverse grassland		

If **YES** to any of the questions above: You are operating in a "no-go area". This means that you are not allowed to make any use of such area for your operation, unless feedstock production or processing operations are legally authorised as part of the conservation management for the area concerned.

### No-conversion areas

Was the area recorded as or included in any of the categories below anytime between the 1st of January 2008 <sup>4</sup> and now?	Yes	No
<u>1.</u> Ecological corridor (see 1.5 for more information)		
<u>2.</u> Buffer zone (see 1.4 for more information)		
<u>3.</u> Key Biodiversity Areas (KBA) as indicated in the IBAT for Business Tool ( <a href="http://www.ibatforbusiness.org">www.ibatforbusiness.org</a> ), including Alliance for Zero Extinction Areas (AZEs), Important Bird Areas (IBAs), and IUCN Key Freshwater Biodiversity Areas		
<u>4.</u> Natura 2000 sites (as determined under the European Birds and Habitats Directives <a href="http://natura2000.eea.europa.eu">http://natura2000.eea.europa.eu</a> )		
<u>5.</u> Areas listed on The IUCN Red List of Ecosystems <sup>5</sup>		
<u>6.</u> Forests, i.e. Land spanning more than 0.5 hectares with trees higher than 5 metres and a canopy cover of more than 10 percent, or trees able to reach these thresholds <i>in situ</i> <sup>6</sup>		

<sup>3</sup>For further information and clarification, please see *FAO (2015): Forest Resources Assessment Working Paper 2015, Terms and Definitions*

<sup>4</sup>Note that an earlier cut-off date applies for palm oil and wood products, as described in the RSB Screening Tool RSB-GUI-01-002-02

<sup>5</sup>IUCN-CEM 2016. *The IUCN Red List of Ecosystems*. <http://iucnrle.org>

<sup>6</sup>For further information and clarification, please see *FAO (2015): Forest Resources Assessment Working Paper 2015, Terms and Definitions*. RSB applies this definition as no other approach is currently operational that ensures protection of forests and deforestation-free supply chains. As soon as other approaches are operational and achieve consensus among RSB stakeholders, RSB may allow further approaches to define protected forests, e.g. the High Carbon Stock Approach (<http://highcarbonstock.org/>)



Was the area recorded as or included in any of the categories below anytime between the 1st of January 2008 <sup>4</sup> and now?	Yes	No
<u>7.</u> Area providing crucial ecosystem services		
<u>8.</u> High Conservation Value areas (HCVA) <sup>7</sup> , including but not limited to Landscape-scale forests and ecosystems		
<u>9.</u> Natural and semi-natural ecosystem (incl. forest or woodland) <sup>8</sup>		

If **YES** to any of the above questions, you are operating in a **no-conversion area**. This means that you are not allowed to convert the area for any operation after the cut-off date. You may possibly use the area as it is (e.g. sustainable harvesting) provided that the conservation value(s) of the area is maintained or enhanced.

## Step 2: Landscape-level assessment - The consultation of national/regional experts and institutions

### No-conversion areas

Does the consultation of experts or institutions provide strong evidence that the area contained any of the conservation values of local, regional or global importance below anytime between the 1 <sup>st</sup> of January 2008 <sup>9</sup> and now?	Yes	No
1. Presence of rare, threatened or protected species (e.g. species from the IUCN national, regional or global red list under “vulnerable”, “endangered” or “critically endangered”)		
2. Presence of pristine/primary ecosystem		
3. Viable populations of natural species in natural pattern of distribution and abundance, i.e. natural ecosystems		
4. Landscape-scale forest or ecosystems		

<sup>7</sup> <https://www.hcvnetwork.org/>

<sup>8</sup> Semi-natural vegetation typically encompasses vegetation types where the species composition and/or vegetation growth forms have been altered through anthropogenic disturbances such that no clear natural analogue is known, but they are a largely spontaneous set of plants shaped by ecological processes (see: RSB Glossary of Terms)

<sup>9</sup> Note that an earlier cut-off date applies for palm oil and wood products, as described in the RSB Screening Tool RSB-GUI-01-002-02

5. An important stock of carbon under solid, liquid or gaseous forms, such as, but not limited to, peatlands and primary forests		
6. Outstanding biodiversity level (number of species and/or species types and/or genetic variability among a species)		
7. Ecosystem services of local, regional or global importance (see also the next section)		
8. Critical resources for a local population's subsistence, health and/or livelihood		
9. Cultural importance (e.g. graveyard, ritual site, etc.)		

If **YES** to any of the above questions, you are operating in a **no-conversion area**. This means that you are not allowed to convert the area for any operation after the cut-off date. You may possibly use the area as it is (e.g. sustainable harvesting) provided that the conservation value(s) of the area is maintained or enhanced.

### Step 3: Site-level mapping - A detailed site-level assessment and planning through the consultation of local communities

#### No-conversion areas

Does the consultation of local stakeholders provide evidence that the area contains any of the conservation values of local, regional or global importance below anytime between the 1 <sup>st</sup> of January 2008 <sup>10</sup> and now?	Yes	No
1. Presence of rare, threatened or protected species (e.g. species from the IUCN national, regional or global red list under "vulnerable", "endangered" or "critically endangered")		
2. Presence of pristine/primary ecosystem		
3. Viable populations of natural species in natural pattern of distribution and abundance, i.e. natural ecosystems		
4. Landscape-scale forest or ecosystems		

<sup>10</sup> Note that an earlier cut-off date applies for palm oil and wood products, as described in the RSB Screening Tool RSB-GUI-01-002-02

5. An important stock of carbon under solid, liquid or gaseous forms, such as, but not limited to, peatlands and primary forests		
6. Outstanding biodiversity level (number of species and/or species types and/or genetic variability among a species)		
7. Ecosystem services of local, regional or global importance (see also the next section)		
8. Critical resources for local population’s subsistence, health and/or livelihood		
9. Cultural importance (e.g. funeral site, ritual site, etc.)		

If **YES** to any question of the above, you are operating in a **no-conversion area**. This means that you are not allowed to convert the area for any biofuel operation after the cut-off date. You may possibly use the area as it is (e.g. sustainable harvesting) provided that the conservation value(s) of the area is maintained or enhanced.

**Step 4: Responsible management - The implementation of responsible land management practices (e.g. conservation agriculture)**

<b>In the case that a non-conversion area has been detected, can the conservation value(s) contained in the area be maintained through appropriate management? If so, please specify below which practices are implemented to maintain this/these conservation value(s).</b>
a.
b.
c.

Note that key impacts from feedstock production and suggested mitigation and monitoring measures are described in more detail in Section 2 and Section 3.

**1.3 Ecosystem function and services (Criterion 7b)**

Under Criterion 7b, the minimum requirement states that “Participating Operators shall implement practices through the Environmental and Social Management Plan (ESMP) that maintain ecosystem functions and services both inside and outside the operational site, which are directly affected by

the operations”.

To achieve compliance with Criterion 7b, the specialist will need to identify ecosystem functions and services relevant to an area of production. This may be achieved through combined desk and field research about the proposed project, and it may be necessary to work with an ecological specialist in order to answer the following questions.

Is the project likely to have an influence on the following ecosystem functions, particularly in environmentally sensitive areas?	Yes	No
• Affect the regeneration of an ecosystem which has become degraded		
• Affect the succession of species in an ecosystem and thus displace natural ecosystem changes		
• Affect the natural genetic or species diversity of an ecosystem		
• Affect the diversity of ecosystems in the area		
• Interrupt or disturb natural cycles that affect the productivity of the ecosystem (e.g. decomposition of litter)		
Is the project likely to have an influence on the following ecosystem services, particularly in environmentally sensitive areas?		
• Affect provisioning services, such as plant nutrients or food for consumers		
• Regulating services: <ul style="list-style-type: none"> <li>• Affecting the micro-climate</li> <li>• Causing floods</li> <li>• Other?</li> </ul>		
• Supporting services: <ul style="list-style-type: none"> <li>• Interfering with nutrient cycling</li> <li>• Affecting soil formation</li> <li>• Upsetting growth of plants and primary production</li> <li>• Other?</li> </ul>		

If **YES** to any of the above questions, you may possibly still use the area, provided that the ecosystem functions or ecosystem service(s) of such area is/are maintained or enhanced. If this is not possible, the use of this area is not allowed.

**Please specify below which practices are implemented to maintain this/these ecosystem functions and/or services**

a.

b.
c.

### 1.4 Buffer zones (Criterion 7c)

Minimum requirements under Criterion 7c state that: “buffer zones shall be protected, restored or created to avoid negative impacts from operations on areas that are contiguous to the operation site” as well as “within the operational site, (...) to avoid negative impacts from the operations on areas that contain conservation value(s) of local, regional or global importance”.

In the RSB Glossary of Terms (RSB-STD-01-002), buffer zones are defined as follows:

*Buffer zones are small areas or strips of land in permanent vegetation, designed to intercept pollutants and manage other environmental concerns. Buffer zones include the regions near the border of an area which is protected or managed for conservation, transition zones between areas managed for different objectives (including e.g. riparian buffer zones between rivers and production areas), or areas on the edge of protected areas that have land use controls and allow only activities compatible with protection of the core area, such as research, environmental education, recreation, and tourism. Buffers include: riparian buffers, filter strips, grassed waterways, shelterbelts, windbreaks, living snow fences, contour grass strips, crosswind trap strips, shallow water areas for wildlife, field borders, alley cropping, herbaceous wind barriers, and vegetative barriers. (Source: UNEP-WCMC and USDA NRCS)*

Buffer zones will need to be identified during the impact assessment process, and the size, extent, location and linkages determined in order to avoid critical impacts associated with habitat loss and habitat fragmentation. The report will need to recommend the following, as minimum requirements:

- Existing buffer zones within the production site shall be protected and remain unexploited.
- Existing buffer zones between the production site and the surrounding areas shall be protected or, if no such buffer zones exist, they shall be created.
- Within the production site, buffer zones shall be created around any area containing conservation values of local, regional or global importance, and remain unexploited.
- The size and features of the buffer zones to be created shall be adapted to the type of areas they separate and the practices implemented on the production site on a case-by-case basis.

### 1.5 Ecological corridors (Criterion 7d)

Criterion 7d states that: “Ecological corridors shall be protected, restored or created to minimise fragmentation of habitats”.

In the RSB glossary (RSB-STD-01-00”), ecological corridors are defined as follows:

*A continuous strip of land or water that differs from the adjacent landscape on both sides, and allows movement of individuals and ecological processes between two or more habitat areas (Sanderson et al. 2003). Biological corridors help establish connectivity within biodiversity conservation corridors.*

Corridors will need to be identified during the impact assessment, and the size, extent, location and linkages determined in order to avoid critical impacts associated with habitat fragmentation. The report will need to recommend the following, as minimum requirements:

- Ecological corridors within the production site should be set aside with appropriate surrounding buffer zones, and in no case exploited after the 1st of January 2008.
- Whenever the production site impairs the connectivity between surrounding ecosystems, ecological corridors shall be created by the operator.
- New ecological corridors shall be created within the production site if it is surrounded by areas containing wildlife; ecological corridors destroyed prior to the cut-off date, and for which the operator is directly accountable, shall be restored.

## 1.6 Invasive species (Criterion 7e)

Criterion 7e states that: “Operations shall prevent invasive species from invading areas outside the operation site”.

The first step is to verify that the species you are using or planning to use is not prohibited in the country of operation. Participating operators may contact any governmental institutions in charge of agriculture and/or environment and/or sanitary affairs or any organisation working on conservation and environment. Prohibited crops in the country of operation are not allowed by the RSB Standard.

If no particular restriction exists at the country level, participating operators have to browse the species recorded in the Global Invasive Species Database (GISD) and verify that the species in use or to be used was never recorded as highly invasive under similar conditions (similar climate, and similar local ecosystems, and similar soil types).

If no such information can be found or if the preceding steps are inconclusive, the impact assessment will need to include a weed risk assessment of the species in the local context. The specialist must follow the procedure for invasiveness/weed risk assessment that exists in the country of operation, and if no such procedure exists, then a risk assessment procedure

described in Criterion 7e must be used. The IUCN Guidelines on Biofuels and Invasive Species may be consulted to conduct this process.<sup>11</sup>

Following the risk assessment, the species must not be used if (a) the risk assessment provides evidence of the species' high invasive potential in the local context; or (b) the risk assessment fails to provide evidence of the species' non-invasiveness in the local context, following the precautionary approach (i.e. in absence of clear results).

The following questions should be used for this determination.

QUESTIONS	Yes	No	Remarks
Is the species in use or to be used prohibited in the country of operation?			If <b>YES</b> , this species cannot be used.
Is the species in use or to be used recorded in the GISD as highly invasive under similar conditions (similar climate, and similar local ecosystems, and similar soil types)?			If <b>YES</b> , this species cannot be used.
Did you conduct a Weed Risk Assessment recognised by the RSB and did the Weed Risk Assessment provide conclusive results <sup>12</sup> ?			If <b>NO</b> , the species cannot be used.
Did the Weed Risk Assessment or any other source reveal that the species in use or to be used has high potential of invasiveness under the conditions of operation?			If <b>YES</b> , the species cannot be used.

## 2. Potential ecological impacts on conservation values

### 2.1 Identification of key issues and impacts

An environmental impact is any change to the environment, whether adverse or beneficial, wholly or partially resulting from an operator's environmental issues or aspects. An environmental aspect is an element of an operator's activities, products or services that can interact with the environment (adapted from ISO 14.001).

There are a large number of potential impacts to the natural environment and conservation values associated with biofuel or biomaterials operations, in particular feedstock production. Although these have been incorporated into the RSB Principles & Criteria, for the purpose of this guideline it is necessary to list the most common impacts as sourced from the relevant literature. A list of

<sup>11</sup> [http://cmsdata.iucn.org/downloads/iucn\\_guidelines\\_on\\_biofuels\\_and\\_invasive\\_species.pdf](http://cmsdata.iucn.org/downloads/iucn_guidelines_on_biofuels_and_invasive_species.pdf)

<sup>12</sup> <http://rsb.org/wp-content/uploads/2017/02/12-04-17-RSB-WRA-Template-1.docx>

examples of impacts to natural systems and sources of the impacts is provided in Table 1. It should be noted that it is necessary to consider both the direct impacts associated with the proposed development as well as potential cumulative impacts. While the direct impacts may be of low significance, their significance might be elevated when considered in the broader context (for example, a series of biofuel developments in a regional context).

**Table 1.** Examples of potential direct impacts to the natural environment and conservation values



Aspect	Impact
<p><b>Issue 1:</b> Removal / destruction of vegetation by construction processes and establishment of plantations</p> <p><b>Issue 2:</b> Introduction of exotic or indigenous plants propagated from seed originating in another area</p> <p><b>Issue 3:</b> Presence, introduction and spread of alien plant species</p>	<p><b>Impact:</b> Disturbance of indigenous vegetation</p> <p><b>Impact:</b> Loss of rare, endemic and, or endangered plant and animal species</p> <p><b>Impact:</b> Loss of sensitive habitats</p> <p><b>Impact:</b> Loss of flora and faunal diversity</p> <p><b>Impact:</b> Ecosystem disruption</p>
<p><b>Issue 4:</b> Establishment of monoculture plantations</p>	<p><b>Impact:</b> Shifts in community structures resulting in species dominance and reduced species diversity</p> <p><b>Impact:</b> Invasion of alien species which will compete with local species.</p> <p><b>Impact:</b> Increased fire risk</p>
<p><b>Issue 5:</b> Removal of topsoil during the establishment of the plantation plots</p>	<p><b>Impact:</b> Soil erosion</p>
<p><b>Issue 6:</b> Construction and use of roads and trails</p>	<p><b>Impact:</b> Soil erosion</p> <p><b>Impact:</b> Disruption to faunal movements and increase road kills</p> <p><b>Impact:</b> Habitat fragmentation</p>
<p><b>Issue 7:</b> Use of fire in management practices</p>	<p><b>Impact:</b> Loss of habitats</p> <p><b>Impact:</b> Loss of plant and animal species (abundance and diversity)</p> <p><b>Impact:</b> Loss of soil organic matter and soil microbiota</p>
<p><b>Issue 8:</b> Vehicle traffic (including at night)</p>	<p><b>Impact:</b> Noise and light pollution depressing local populations of sensitive birds and large mammals</p>

## 2.2 Assessment of the significance of key issues and impacts

The general approach to the identification and assessment of impacts as outlined in the Impact Assessment Guidelines (RSB-GUI-01-002-01) must be adopted. The assessment of the impacts should be specific rather than general, and must apply the impact significance rating scale adopted for the impact assessment process. The impact rating scale used must be the same as that used by all the other specialists. The impacts of the construction and operational stages of the proposed project need to be identified and assessed, as do the impacts of the project alternatives. The significance of the impacts also needs to be rated for the 'before' and 'after' mitigation scenarios.

The following should also be considered:

- It is important to seek input from local communities and experts who may have extensive knowledge of local baseline conditions;
- The IA practitioner must ensure that the specialist(s) are appropriately experienced and sufficiently knowledgeable about local conditions, the proposed development and assessment techniques to provide an accurate and defensible assessment of the potential ecological impacts.

## 3. Mitigation and monitoring

### 3.1 Mitigation measures

It is not possible to anticipate the possible mitigation measures needed, as these will depend on the nature and extent of the impacts, the local context and the practical constraints. The mitigation measures recommended for each impact need to be practical and effective in:

- eliminating negative impacts
- reducing/increasing either the temporal or spatial scale of the impact
- reducing the severity of negative impacts
- reducing the likelihood of negative impacts

The impact rating table needs to indicate how the mitigation measure will change one or more of these rating factors. For negative impacts, the mitigation measures should reduce the significance levels, but for beneficial impacts the measures should enhance the benefits. Usually the mitigation measures will be specific to an individual impact, but sometimes they will be relevant to all the impacts that fall under a specific issue (i.e. governance).

There are a number of general mitigating factors with respect to the natural environment, biodiversity and areas with conservation value(s) of local, regional or global importance that can be identified here, and easily introduced. These are aspects that should be considered early in the proposed introduction of biofuel or biomaterial crops.

Issues and impacts	Mitigation measures
1. Loss of indigenous vegetation, endangered plant species and loss of sensitive animal habitats	<ul style="list-style-type: none"> <li>• Siting of the estate should be planned on already modified and disturbed sites such as pastures and, cultivated fields and fallow lands, where invasive or weedy species are likely to dominate, and woody vegetation has been cleared.</li> <li>• A series of corridors within the estate should be created to protect the indigenous vegetation.</li> <li>• The area must be thoroughly searched by an expert prior to construction to identify any protected species, species of special concern or important vegetation types and habitats. Any endemic species could be removed from the site and re-located to other suitable areas.</li> <li>• Educate workers and visitors about the protected plants of the area to avoid disturbance to the natural vegetation.</li> </ul>
2. Introduction and spread of alien plant species	<ul style="list-style-type: none"> <li>• Remove existing and new alien vegetation immediately.</li> <li>• Educate workers and visitors on how to identify and manage alien vegetation.</li> </ul>
3. Loss of faunal diversity and animal species of special concern	<ul style="list-style-type: none"> <li>• Retain ecological corridors within the estate to allow for the migration and protection of the fauna.</li> <li>• Establish wide, natural drainage area within planted areas in preference to narrow drains with hard surfaces.</li> <li>• Ensure adequate buffers around areas of HCV.</li> <li>• Minimise vegetation clearing as far as possible through careful estate planning, by including ecological input.</li> <li>• Only establish roads in areas designated as 'not sensitive'.</li> <li>• Educate workers and visitors to not disturb the wild animals.</li> </ul>
4. Disruption to faunal movements	<ul style="list-style-type: none"> <li>• As above</li> </ul>
5. Introduction and spread of alien animals	<ul style="list-style-type: none"> <li>• Remove any alien fauna immediately.</li> <li>• Educate workers regarding alien animal identification and eradication.</li> </ul>
6. Increased fire risk	<ul style="list-style-type: none"> <li>• Remove any fire hazards.</li> <li>• Educate workers regarding fire, fire management and controls.</li> </ul>
7. Noise and light pollution	<ul style="list-style-type: none"> <li>• Control the traffic at night.</li> <li>• Limit the amount of lights, especially in remote areas.</li> </ul>
8. Ecosystem disruption	<ul style="list-style-type: none"> <li>• Confine development to specific regions.</li> <li>• Keep development away from wetlands and other sensitive areas</li> </ul>

### 3.2 Ongoing monitoring programme

Given that the impact assessment process and Environmental and Social Management Plan (ESMP) will be used by the RSB auditors to assess the conformity of operations against RSB standards, it will be necessary for the ESMP to include a Monitoring Plan that will facilitate ongoing assessment of the impact of the biofuel or biomaterial development. Consequently, the expert needs to develop some recommendations with respect to what indicators should be monitored, when, by whom and how. These recommendations should be sufficiently detailed to allow the responsible persons to be able to collect the data, analyse it and use it to assess project performance.

It is important that, as soon as the project is initiated, a monitoring programme is also initiated so as to detect the following types of changes in natural ecosystems and conservation values:

- Alien invasive plants: the abundance of the alien species must be monitored through repeat surveys to indicate mitigation actions (e.g. where, how and when the alien invasive plants should be eradicated).
- Overall vegetation changes: general changes to vegetation and habitats should be monitored.
- Vegetation change and natural succession: any changes to vegetation should be noted on the frequency indicated by the expert.

**Monitoring** should be ongoing for the life of the project.

### 3.3 Contents of a specialist report

Each of the specialist reports should follow that same structure and format. A suggested structure for the conservation impact assessment report is as follows:

#	Section Title	Contents
1	Summary	This should provide a summary of the specialist study including the impacts, conclusions and recommendations.
2	Introduction	The introduction should provide brief background information, the terms of reference for the study, and the study team. An overview of the legislative framework, including applicable international agreements and conventions, national Acts, and sub-national laws and regulations of relevance to the management and conservation of the ecosystems of the area.

	Project description	An overview of the proposed development, including details of the agricultural, industrial and auxiliary components as well as the nature and extent of persons to be employed on the project, and any social development components.
3	Methodology	This section should indicate what data sources and research methods were used as well as the methods of data analysis.
4	Description of the natural environment	A description of the local bio-physical and ecological systems, with a focus on the nature of biodiversity (e.g. endemism, rare, threatened or endangered species), natural ecosystems and High Conservation Value areas, buffer zones, ecological corridors. Maps showing the location of project elements such as vegetation and habitats, species distributions, migration pathways, etc. as relevant to each particular study.
5	Impact assessment and mitigation measures	This section should form the bulk of the report. It should identify and discuss each of the individual impacts to the natural ecosystems and the biota, and use the impact ratings method to rate their significance before and after mitigation, as well as during the construction, operational and decommissioning phases of the project. For each impact, the recommended mitigation measures needed in order to reduce the negative impacts and enhance the positive impacts associated with the proposed development should be discussed. Attention should be drawn to any very high and irreversible impacts that cannot be mitigated, as these may be fatal flaws that prevent the project from going ahead and detailed justification for such a significance rating will need to be provided.
6	Monitoring recommendations	This section should identify the key indicators that should be monitored over time and the methods that should be employed to monitor them.
7	Conclusion	This should provide a summary of the context and impacts.
8	Recommendations	The recommendations should focus on the suggested mitigation measures.
9	References	A list of all the references and sources.
10	Appendices	These should include key sources of data/results that informed the study, lists of all the vegetation and habitat types with lists of the dominant species, lists of species and those of special concern such as endemics, rare and endangered species, etc.

## References

IFC, 2007a. Environmental, Health and Safety Guidelines for Plantation Crop Production.  
Available at: [www.ifc.org/ifcext/enviro.nsf/Content/EnvironmentalGuidelines](http://www.ifc.org/ifcext/enviro.nsf/Content/EnvironmentalGuidelines)