HINDUSTAN ZINC
Zinc & Silver of India

Sustainability Framework

Guidance Note GN 04

Biodiversity Management

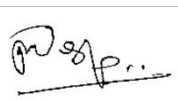
Hindustan Zinc Limited

SAFE SMART SUSTAINABLE

Standard Title:	**Site Closure**	**Date of Issue:**	**16/08/2025**
Standard:	HZL/CORP/SUST/GN 04	**Revision:**	V.1

Document Issue and Revision History

DATE	REVISION NUMBER	CHANGE SUMMARY
16/08/2025	v.1	Initial issue

Authorised	**Pradeep Singh**
Signature	
Position:	Chief HSE & Sustainability

Confidentiality

1 INTRODUCTION

1.1 Who is this Guidance Note aimed at?

All HZL operations and managed sites, including new acquisitions, corporate offices and research facilities and to all new and existing employees and contractor employees. This Guidance Note is applicable to the entire operation lifecycle (including exploration and planning, evaluation, operation and closure).

1.2 What is the aim of this Guidance Note?

This document provides best practice guidance for biodiversity management at operations within the HZL portfolio. It provides a framework for biodiversity risk management, together with descriptions of recommended processes, activities and outcomes. This document is intended to be used by line managers who wish to implement best practice biodiversity management. This document supports the HZL *Biodiversity Management* Technical Standard TS 7, which outlines the requirements for biodiversity management at HZL operations.

1.3 What issues does this Guidance Note address?

This Guidance Note provides an outline for recommended biodiversity management activities but is flexible enough for individual companies to adopt as necessary. The Guidance Note provides guidance on activities, methodologies and tools that can be used for managing biodiversity as well as references to useful sources of information that provide further detail on methodologies or tools.

The focus of the Guidance Note is on the provision of preferred methods and outcomes rather than prescriptions whilst at the same time representing a practical “how to” guide for all HZL operators. The Guidance Notes represent a standard baseline guidance for all HZL staff within all the operations whilst recognising the need for flexibility at a site and activity level depending upon project specific circumstances or regulatory specific requirements. In this sense, Guidance Notes are not designed to be definitive text, nor are they designed to provide prescriptive methods and procedures for undertaking tasks.

The assessment and management of biodiversity and ecosystem services impacts need to be considered as part of the overarching environmental and social impact assessment and therefore this document should be read in conjunction with the Technical Standard and associated Guidance Notes for *Conducting ESIAs to International Standards.*

1.4 How should this Guidance Note be used?

This Guidance Note is intended to reflect good practice and provide the basis for continual improvement of sustainability issues across the HZL business. However, where this Guidance Note is not used, operations will need to demonstrate (and document) how an equivalent process is in place and how biodiversity management achieves good practice. The guidance has been designed to be applicable for all HZL operations.

Table of Contents

	Page
Section 2: The Importance of Biodiversity	5
Section 3: Overview of the Biodiversity Management Plan (BMP)	7
Section 4: Overview of the Biodiversity Management Process	8
Section 5: Stage 1 – Biodiversity Risk Screening	9
Section 6: Stage 2 – Biodiversity Risk Assessment	10
Section 7: Stage 3 - Developing a BMP	13
Section 8: Stage 4 – Monitoring and Reporting	31
Section 9: Knowledge and Awareness	33
Section 10: Roles and Responsibilities	33
Definitions	35
Supporting and Related Documentation	39
Annex A: Example Biodiversity Management Plan Structure	40
Annex B:Checklist for Biodiversity Protection during Exploration, Construction and Operation.	43
Annex C: Checklist for Ensuring that Biodiversity Protection and Enhancement are factored into Closure.	46
Annex D: Checklist for Stakeholder Analysis Matrix in Support of Biodiversity Protection and Enhancement.	47
Annex E: Checklist for Stakeholder Engagement Tools and Processes in Support of Biodiversity Protection and Enhancement.	48
Annex F:Checklist for Biodiversity Mitigation, Rehabilitation and Enhancement Tools.	50

2 THE IMPORTANCE OF BIODIVERSITY

Biodiversity (biological diversity) is the diversity of living organisms (plants and animals),the habitats they live in and the ecosystems (ecological systems) in which they interact with each other and with their environment. It encompasses the variety of life on Earth and is critical for supporting life itself.

Biodiversity and ecosystems provide a number of benefits to society, including:

- Sources of food;
- Cleaning, purifying and recycling water and nutrients;
- Sources of energy;
- Materials for shelter and wider societal needs; Income and livelihoods; and Recreational and cultural benefits.

As a mining company, our impacts on biodiversity can be a source of business risk. Mining activities impact biodiversity. For example, our activities could result in:

- Habitat loss or alteration;
- Species extinction;
- Introduction of invasive non-native species;
- Changes in the way natural systems function and changes in their ability to support species and people; and
- Loss of benefits for people that depend on biodiversity and ecosystems.

This becomes a source of business risk when stakeholders raise concerns about real or perceived impacts that have occurred, or may occur in future.

Figure 2.1 – Examples of IUCN Red listed species.Left: White-rumped vulture, thought to be common in India but is actually a critically endangered species. Right: Ilex khasiana*, a critically endangered species of holly plant unique to northeast India.*

HZL"s stakeholders are increasingly aware of the importance of biodiversity and their expectations for how we manage biodiversity are rising.

As a global mining company, our stakeholders not only expect us to comply with biodiversity regulations at local, national and international level, but also ensure good practice in biodiversity management according to international voluntary standards such as the International Finance Corporation (IFC) Performance Standard on Biodiversity Conservation and Sustainable Management of Living Natural Resources.

Our focus forbiodiversity management is on areas of Critical Habitat (see *Box 2.1*). In these places, our mining activities could have severe or irreversible impacts on biodiversity and ecosystems, so special attention is needed to ensure we operate responsibly.

Box 2.1 – Critical Habitat definition

Critical Habitats are areas of the planet where the significance of biodiversity conservation is high. It may include areas where particular species or habitats are threatened or rare. The following types of habitats are classed as „critical":

- Habitat of significant importance to Critically Endangered and/or Endangered species (as defined in the IUCN Red List).
- Habitat of significant importance to uniquespecies and/or species which occupy a small geographical area.
- Habitat supporting globally significant concentrations of migratory species and/or species for which an important portion of the world population gathers in one place in a stage of their life cycle.
- Highly threatened and/or unique ecosystems.
- Areas associated with key evolutionary processes.

Source: IFC Performance Standard 6 (2012)

Protecting biodiversity is an integral part of HZL"s commitment to sustainable development. HZL aims to achieve a minimum of No Net Loss (NNL) of biodiversity at all its operations. Further explanation is provided in the following section.

No Net Loss of Biodiversity
No Net Loss (NNL) is the point where biodiversity gains from targeted conservation activities ***match*** the losses of biodiversity due to the impacts of a specific development project, so that there is no net reduction overall in the type and amount of biodiversity present, over space and time (Business and Biodiversity Offsets Program (BBOP), 2011).

Where Critical Habitat is present, we aim to achieve Net Positive Gain (NPG) of biodiversity, in recognition of the importance of biodiversity at these sites.

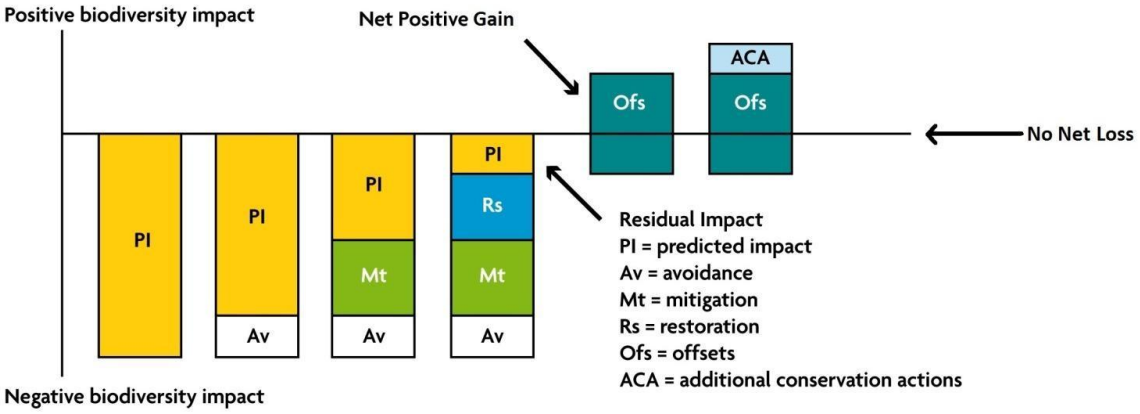
Net Positive Gain of Biodiversity

Net Positive Gain (NPG;) means that biodiversity gains from targeted conservation activities ***exceed*** the losses of biodiversity due to the impacts of a specific development project, so that there is a net gain in the type and amount of biodiversity present, over space and time(BBOP, 2011).

Box 2.2_ No Net Loss (NNL) and Net Positive Gain (NPG)

The concepts of NNL and NPG are gaining widespread recognition and form the basis of overarching biodiversity goals in countries (e.g. NNL goals set in US wetland habitat policy), states, financial institutions (including the IFC) and companies.

Conservation activities may serve to avoid, mitigate, or offset an operation‟s impact on biodiversity (see section 7.7.2 for further information about these). The diagram below demonstrates how various biodiversity management actions can contribute towards the goal of NNL or NPG.



Source: BBOP Biodiversity Offset Design Handbook (Adapted from Rio Tinto and Western Australia EPA)

3 OVERVIEW OF THEBIODIVERSITY MANAGEMENTPLAN (BMP)

The key tool for managing biodiversity throughout the lifetime of an operation is the Biodiversity Management Plan (BMP). This is a document that:

- Details the approach used to prepare a biodiversity risk assessment;
- Describes the level of biodiversity at the site;
- Outlines the risks to biodiversity resulting from site operations;
- Specifies the biodiversity management goals for the site; and
- Details the actions and responsibilities for managing or offsetting impacts on biodiversity.

The purpose of the BMP is to define specific objectives and management measures for biodiversity conservation. The BMP should be maintained and updated throughout the lifecycle of an operation and should change based on any feedback from the monitoring process, and in

accordance with any new activities and developments on site. The BMP may also need to be updated in response to any changes in laws.

In TS07 *Biodiversity Management*, every HZL operation is required to have a BMP to manage the risks to biodiversity which have been identified.

The exact scope and level of detail of the BMP varies according to the biodiversity risk rating of a site, which could be Low, Medium or High. This is determined through an initial biodiversity risk screening process. The process for developing the BMP is described in Section 4. The BMP should be an integrated part of the operation"s Environmental and Social Management Plan and the environmental management system (EMS). An example structure of a BMP is provided in Annex A.

At HZL, the focus of our efforts in biodiversity management is on High risk sites, where Critical Habitat is present. High risk sites should develop a detailed BMP in line with this guidance, which demonstrates that HZL is pro-actively protecting biodiversity. Medium and Low risk sites should put in place a simpler BMP, which demonstrates that HZL is taking the necessary steps to protect biodiversity.

4 OVERVIEW OF BIODIVERSITY MANAGEMENT PROCESS

*Figure 4.1*shows the main biodiversity management steps that should be undertaken for a HZL site.

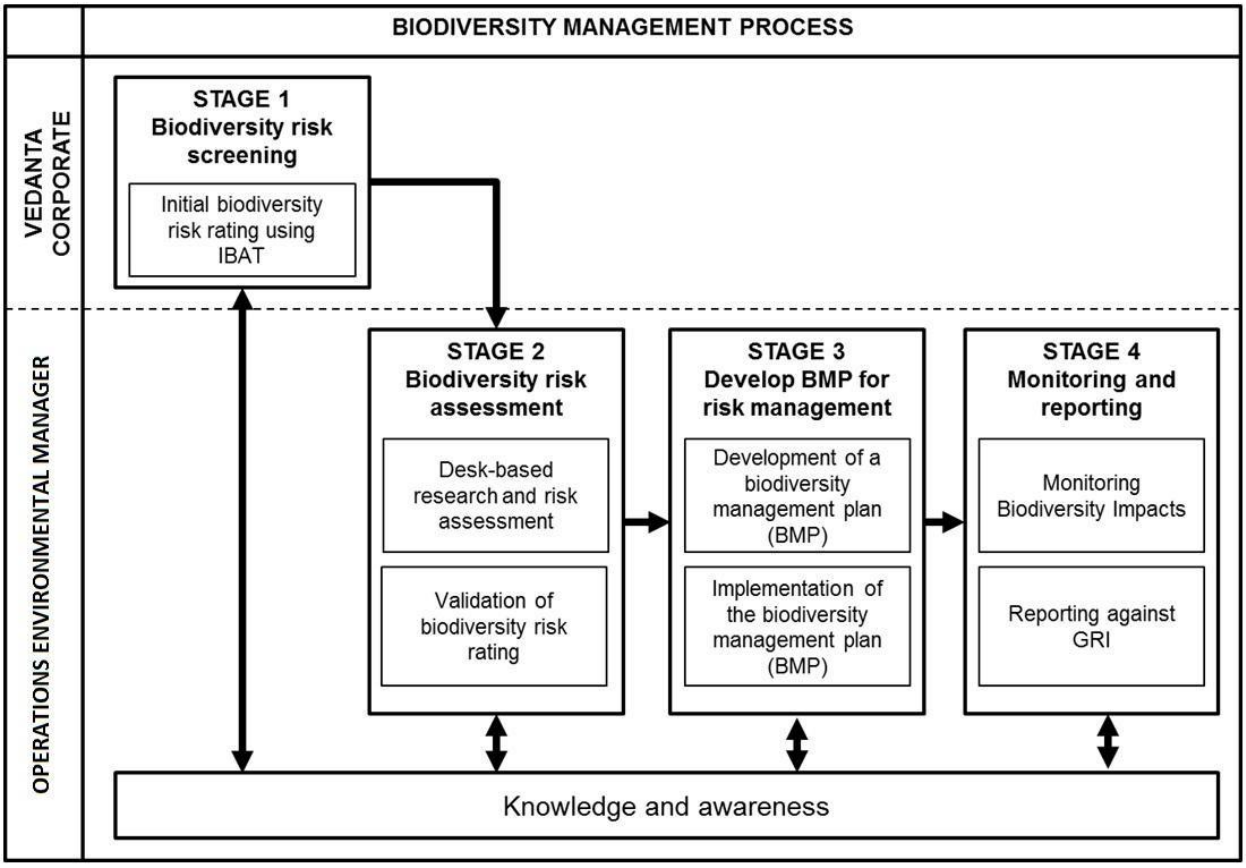


Figure 4.1 – Overview diagram of biodiversity management process

Planning for biodiversity management should take place as early as possible in the project lifecycle, i.e. at the exploration stage, and continue throughout the operation lifetime, from construction to operation to closure.
Ideally, Stages 1 and 2 should be undertaken prior to any construction or execution activities commencing on site to ensure that pre-existing conditions for biodiversity are fully understood, and so that biodiversity management can be considered in the site design.

Stage 3 should be undertaken during the feasibility and project stages of the operation lifecycle. Management actions should then be implemented from the point when construction commences and throughout operations and closure.

Monitoring and reporting (Stage 4) should also be undertaken throughout this time.

Sections 5 to 10 describe the biodiversity management steps in detail.
In the case of existing operations without arrangements for managing biodiversity, the guidance provided in this document remains applicable, although some activities may need to be conducted retrospectively. It is recognised this is the scenario for many HZL operations.

Capability to undertake many of the specialist or technical biodiversity assessments and activities described in this Guidance Note may not reside within the operation"s team or even at HZL Corporate level. Operation environmental managers should identify when additional capability is

required, and identify (if necessary in consultation with HZL"s Corporate Sustainability Department) a suitable specialist or external expert to assist.

5 STAGE 1 - BIODIVERSITY RISK SCREENING

Biodiversity risk screening is undertaken for each site by HZL Corporate, using IBAT (Integrated Biodiversity Assessment Tool).IBAT is a central database of globally recognised biodiversity information that can be used to map out the locations of important biodiversity areas, protected areas, and areas categorised by IUCN (International Union for Conservation of Nature) as significant for species of plants or animals. IBAT uses global-level data sets that cannot always take into account the detail of local conditions at a specific site. However, in general, the IBAT information provides a good indication of where Critical Habitats are located.

Using the IBAT maps, HZL Corporate can determine if a site is located in or near an important biodiversity area, which includes potential Critical Habitat.

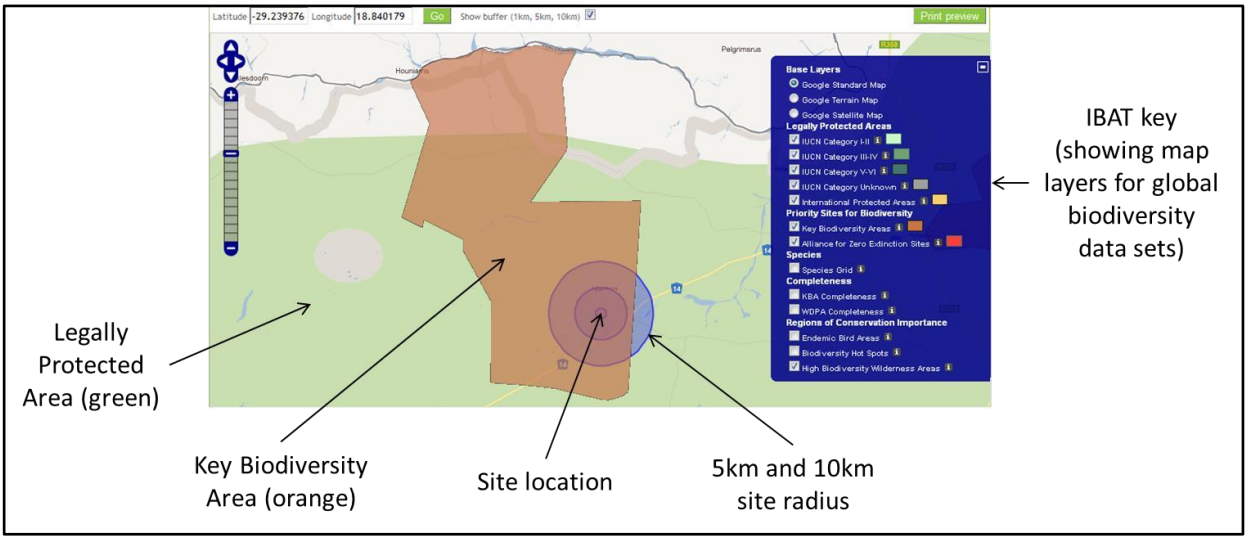


Figure 5.1 - Example IBAT map.In this example, the site is located in an area that has been classified as a Legally Protected Area (assigned protected status at national or international level) and a Key Biodiversity Area (where there is a presence of threatened species of plants or animals), so HZL Corporate would assign this site a biodiversity risk rating of 'high'.

Based on the results of the biodiversity risk screening, HZL Corporate will assign one of the following initial biodiversity risk ratings to each site:

- **Low Risk:** The operation/mine is located outside the 15km radius of any important biodiversity areas.
- **Medium Risk:** The operation/mine is located within a 5-15km radius of an important biodiversity area.
- **High Risk:** The operation/mine is located within a 5km radius of an important biodiversity area or a potential Critical Habitat.

The results of the biodiversity risk screening undertaken at Company level will be communicated to the operation"s environmental manager, who is responsible for undertaking the subsequent biodiversity management processes.

6 STAGE 2 - BIODIVERSITY RISK ASSESSMENT

In Stage 2, operations environmental managers conduct a biodiversity risk assessment, which consists of a desk-based study of information on local biodiversity and ecosystem services and associated regulations. This assessment provides more detailed and site-specific information than the initial biodiversity risk screening conducted by HZL Corporate in Stage 1. The purpose of the assessment is to verify that the site has been assigned the most appropriate biodiversity risk rating.

The operations environmental manager may choose to appoint a qualified consultant to conduct the biodiversity risk and impact assessment, or to provide support for conducting the assessment.

To conduct the biodiversity risk assessment, the operations environmental manager (or appointed consultant) should gather information through desk-based research on:

- Local legal requirements for biodiversity management, including:
  - Restrictions on where industrial sites can be located, e.g. regulations may prohibit industrial operations in designated protected areas such as Green Belt land (*Box 6.1*);
  - Additional costs (e.g. fees or penalties) payable for operating in or near areas of importance for biodiversity;
  - Legal obligations for industrial operators to offset any impacts on biodiversity through the purchase of biodiversity offset land or credits;
  - Management actions expected or required by regulators under local, regional or national biodiversity plans[1].

- Biodiversity on the site and surrounding areas, including the presence (permanent or temporary) of important or endangered species of plants or animals, as listed on the IUCN Red List[2];

- Land uses on and around the site (residential, agricultural, industrial, recreational, commercial etc.);

- Ecosystem services of importance in the site area (i.e. identification of particular ecosystems that provide local communities with provisioning services such as food, fuel and fresh water; regulating services such as flood regulation and water purification; and/or cultural services such as spiritual, aesthetic or recreational services) ; and

- Stakeholders who may be interested in the site (e.g. local communities, NGOs, academics).

This information can be gathered from a number of sources, such as internet websites, news articles, and reports/surveys by government, academics or NGOs, and maps and photographs (including aerial photographs) of the region. Information on local legal requirements can be gathered from the internet or through consultation with local subject-matter experts e.g. regulators, industry body representatives, environmental lawyers, academics, environmental consultants.

A summary of relevant information should be documented in the Biodiversity Management Plan (BMP) to document the process undertaken at Stage 2.

[1] Countries that are party to the Convention on Biological Diversity will have National Biodiversity Strategies and Action Plans (NBSAPs), which may be reinforced by biodiversity action plans at regional or local level. Such plans may impose additional constraints on the operation that are not necessarily required by law, but which reflect regulator expectations.
[2] The IUCN Red List of threatened Species can be found at http://www.iucnredlist.org/

Box 6.1 - Green Belts in India

In India, industrial operators are prohibited by law from developing areas designated as Green Belt land (which is protected under land use planning legislation to retain largely undeveloped, wild, or agricultural land surrounding urban areas). Operations in India must therefore be planned to prevent development on Green Belt land in order to comply with regulatory requirements. Furthermore, effective management and monitoring systems must be implemented to prevent any development on Green Belt land (such as expansion of operations) throughout the operation‟s lifetime.

Based on the information, the operations environmental manager should then determine which of the following biodiversity risk categories best describes the characteristics of the site.

High

- The area supports vulnerable (fragile or non-adaptable) ecosystems that are likely to be sensitive to changes.
- The area has been assigned a status of natural, conservation or cultural significance by local, regional or national regulatory authorities or by recognised organisations such as international NGOs or institutions.
- There are current or soon to be implemented regulatory restrictions on industrial activities in the area for the protection of biodiversity or nature conservation.
- The area provides temporary, migratory or permanent habitat to species that are classified as vulnerable, endangered or critically endangered, as listed on the IUCN Red List.
- The area provides habitat for significant populations of a given species (defined as 1% of the total global population of the species).
- The area provides habitat for species that have been identified as keystone species, i.e. species which play a disproportionately important role in their environment‟s structure relative to the size of the population
- The area supports ecosystem services that are perceived to be, or potentially are, of critical value to stakeholders.
- The size or location of the area affected by the operation is significant in terms of maintaining the health of a wider ecosystem or the connections between habitats.

Medium

- Areas of native, wild or natural habitat (i.e. areas composed of healthy assemblages of plant or animal species of largely native origin, and/or where human activity has not necessarily modified an area‟s historical natural processes and species composition) but where none of the high biodiversity risk criteria apply.

Low
Areas of modified habitat, i.e. areas that may contain a large proportion of plant and/or animal species of non-native origin and/or where human activity has substantially modified an area"s historical natural processes and species composition.(e.g. agricultural land) but where none of the high biodiversity risk criteria apply.

The risk rating determined should be confirmed with HZL Corporate. If the risk rating determined from the biodiversity risk assessment differs from the initial biodiversity risk rating assigned by HZL Corporate (in Stage 1), the operations environmental manager should inform HZL"s Corporate Sustainability Department and discuss with them the reasons why the final risk rating has been assigned.

The results of the biodiversity risk assessment, including confirmation of the final biodiversity risk rating, should be summarised in the BMP.

7 STAGE 3 - DEVELOPING A BMP

This section provides guidance on how to develop each section of the Biodiversity Management Plan – as per the template provided in Annex A. Sections 7.1 – 7.4, and Section 7.8 in this part of the Guidance Notecontain guidance applicable to Low, Medium and High Risk operations. However, the guidance in sections 7.5 – 7.7 is dependent on whether the site is Low / Medium Risk, or High Risk. When it comes to the development of those sections of the BMP, sites should follow the guidance according to their Risk Rating.

In summary:

- For Low and Medium Risk operations, the main objective of the BMP should be to ensure protection of existing levels of biodiversity (No Net Loss).
- For High Risk operations, the main objective of the BMP should be to improve existing levels of biodiversity and prevent any degradation in the existing level of biodiversity (Net Positive Gain).

It is critical that High Risk operations produce a detailed BMP that will effectively manage the risks to biodiversity. The following sections provide detailed guidance on how to produce a BMP that meets the requirements of HZL Corporate, and the expectations of HZL"s stakeholders.

7.1 Developing BMP Section 1: Document control (all operations)

This section should contain a table detailing amendments and revisions to the BMP document, including a date of revision, version number and brief description of the reasons for the revision (i.e. change summary).

Document Issue and Revision History		
DATE	**REVISION NUMBER**	**CHANGE SUMMARY**
10/12/2012	V1.	

Figure 7.1 – Example document control table

7.2 Developing BMP Section 2: Definitions (all operations)

This section should provide a table of definitions for terms used in the document. The table must include a definition for „biodiversity" as described in the Biodiversity Management Technical Standard.

7.3 Developing BMP Section 3: Introduction (all operations)

To set the scene, Section 3 of the BMP should contain a high-level introduction to the Operation, including background information, contextual information on the regional setting and a summary of the purpose of the BMP document itself.

Background of the Operation

This section should contain an overview description of the Operation including key information about the size and surface area of the Operation, the nature of the resource to be exploited (where applicable) or processes to be undertaken at the operation, production rates, operation lifetime, location and setting, status of surface rights ownership etc.

Regional setting

This section should detail the regional setting for the Operation, including details of the geographical location, predominant vegetation and land uses, any notable biodiversity features (such as the presence of endangered species), any ecosystem services that are of importance to local stakeholders, the regulatory context in relation to biodiversity, and the social and cultural context in relation to biodiversity.

Document purpose and scope

This section should detail the purpose of the BMP document. It should also outline the sections in the document, any exclusions, and references to supporting documents that should be read with the BMP.

7.4 Developing BMP Section 4: Approach to biodiversity (all operations)

Section 4 of the BMP should describe the processes that have been undertaken to plan biodiversity management at the site.

Methodology and approach

This section should describe how biodiversity management has been approached at the site. It should specify that biodiversity management has been planned in line with the HZL Technical Standard, this Guidance Note and IFC Performance Standard 6. It should also provide a summary description of the biodiversity management process (Stages 1 to 4, as shown in *Figure 4.1*). It should describe how the management objectives will be achieved through use of the mitigation hierarchy.

Site biodiversity risk rating

This section should detail the final biodiversity risk rating that was assigned to the site (as agreed with HZL Corporate). It should briefly describe the processes undertaken to determine the risk rating, including the use of IBAT in biodiversity risk screening during Stage 1 and desk-based research findings from the biodiversity and ecosystem services assessment conducted in Stage 2. A summary of the research findings form Stage 2 should be provided, including relevant regulations and legal provisions applicable to biodiversity and ecosystem services at the site, and any requirements for offsetting.

Biodiversity management commitment and objectives

This section should specify the Operation"s objectives for biodiversity management e.g. NNL or NPG according to the risk rating of the site (see *Box 2.2*).As far as possible through the implementation of biodiversity management actions:

- Low and Medium risk sites should aim to achieve No Net Loss (NNL) of biodiversity.
- High risk sites should aim to achieve Net Positive Gain (NPG) in biodiversity.

7.5 Developing BMP Sections 5: Biodiversity at the site

In this section of the BMP, sites should document the biodiversity and ecosystem services at the site.

7.5.1 BMP Section 5: Biodiversity at the site - Guidance for Low and Medium Risk operations

Section 5 of the BMP („Biodiversity at the Site") for Low and Medium Risk operationsshould provide a description of biodiversity and ecosystem services at the site. It should contain:

- **A description of the type(s) of land use** on the site, which may include:
  - Undeveloped land (in this case, provide a description of the main type of vegetation, such as grassland, scrubland, or natural forest)
  - Plantation forest
  - Agricultural land (crops)
  - Agricultural land (grazing)
  - Housing
  - Industrial and commercial

- **A list of plant and animal species** known to live on the site (permanently or temporarily during the year e.g. birds during migration), and their approximate population size (if known); and

- **A list of stakeholders** that may be interested in biodiversity or species/habitat conservation at the site, and the conservation of important provisioning, regulating or cultural ecosystem services at the site, such as local communities, local NGOs and other people that use the land.

Some of this information may have been gathered during the desk-based biodiversity risk assessment in Stage 2. If further information is required, this can be gathered through a baseline study.

A baseline study involves conducting field surveys of the total area affected by the operation and making observations of the land uses and species present there. It will typically form part of the scope of the environmental and social impact assessment (ESIA) where this is required for a new project. In cases where the baseline survey is not conducted as part of an ESIA (or for existing operations without any previous associated studies), a separate high-level baseline study can be undertaken. Where the necessary expertise does not exist in-house, the operations environmental manager should commission a suitably qualified external consultant (e.g. a specialist ecologist or biologist) for this activity.

An example is provided in Figure 7.2 below.

	Biodiversity at Site X (Total site area = 94 sq km)
Types of land use	82 sq km of undeveloped land (consisting of grassland and some isolated trees) 10 sq km of agricultural land (grazing) 2 sq km of housing (village of Mineton)
Plant and animal species	*Tectona grandis* (teak trees) – approximately 100 in the site area *Ficus carica* (common fig tree) – approximately 50 in the site area Grasses (various species) – throughout undeveloped land Hispid Hare (*Caprolagus hispidus*) – population of approximately 20 in western part of site Manipur mouse (*Diomys crumpi*) – common throughout site area, population size unknown House Martin (*Delichon urbicum*) – population of approximately 50 nesting pairs known to live throughout the site during winter season
Stakeholders	Local community in village of Mineton Local community in nearby villages using land for grazing cattle Local NGO (focused on rural development of nearby villages)

Figure 7.2 – Example description of baseline biodiversity at Site X (table format)

7.5.2 BMP Section 5: Biodiversity at the site –Guidance for High Risk operations

For High Risk operations, Section 5 of the BMP („Biodiversity at the Site") should provide a detailed description of biodiversity and ecosystem services at the site and their potential importance. It should contain:

- **A land use map** of the site, illustrating the location of different types of land use, and **highlighting any areas of Critical Habitat** (refer to *Box 2.1*). Land use types might include:
  - Critical Habitat
  - Undeveloped land (in this case, provide a description of the predominant type of vegetation or ecosystem, such as grassland, scrubland, or natural forest) Plantation forest
  - Agricultural land (crops)
  - Agricultural land (grazing)
  - Housing
  - Industrial and commercial

- **A description of the type of habitat(s)** on the site and where they are located, their condition (pristine or modified) and their vulnerability or sensitivity to change;

- **A description of important ecosystem services** on the site, i.e. products or services from particular ecosystems that local communities benefit from or depend upon;

- **A list of plant and animal species** known to live on the site (permanently or temporarily during the year e.g. birds during migration), including a **detailed inventory all IUCN Redlisted**[3] **plant and animal species** known to live on the site (permanently or temporarily during the year e.g. birds during migration), together with their approximate population size and conservation status (i.e. how rare or threatened the species is);

- **A list or map of any areas of potential but uncertain biodiversity importance**, which would benefit from additional study or wider stakeholder consultation to establish a full understanding of the baseline biodiversity value and benefits;

- **A list or map of areas where biodiversity is subject to a range of existing threats, or cumulative impacts** from a number of different causes, for which further investigation is required to characterise or the nature and extent of the threats (any threats from the spread of alien invasive plant, animal or pest species should be assessed at this stage); and

- **A list of stakeholders** that may be interested in biodiversity, species and habitat, or ecosystem services conservation at the site, such as local communities, local NGOs and other people that use the land, together with a **description of their interest in the site**.

[3] The IUCN Red List of threatened Species can be found at http://www.iucnredlist.org/

Conduct a baseline study

A baseline study should be conducted to provide detailed information on the items listed above. The baseline study should involve field surveys of the total area affected by the operation, but focused on areas of high biodiversity, particularly Critical Habitats.

The baseline study for a High Risk operation should be conducted by a specialist ecologist or biologist who is suitably qualified. As such, this activity is often sub-contracted to external specialists (such as academics, NGOs or consultants). Local requirements for involving experts and third parties in a baseline study should be complied with. .

The baseline study will typically be part of the scope of the environmental and social impact assessment (ESIA) where this is required for a new project. In cases where the baseline survey is not conducted as part of an ESIA, a separate baseline study should be done.

The biodiversity baseline study must be undertaken prior to any construction or operational activities to ensure that the pre-existing condition of biodiversity and ecosystems is fully understood and recorded. For high risk sites where construction or operations have already commenced but a biodiversity baseline study was not undertaken, a retrospective baseline (based on historic maps, photographs or records plus information on site history from stakeholders) should be established as soon as possible.

Conduct a stakeholder study

A stakeholder study should be conducted to identify the uses of and value derived from biodiversity and ecosystem services by relevant stakeholders.

Information on stakeholders who are interested in the site can be gathered from desk-research of publically available information sources, e.g. Internet websites (building upon the research conducted in Stage 2) or through stakeholder consultation (with, for example, local communities or NGOs). For a high risk operation, any stakeholder consultation should be conducted by specialists or external consultants who are suitably qualified to manage stakeholder engagement. This activity would usually be part of the wider stakeholder engagement programme as part of project development. Any communication with stakeholders should be sensitive to issues relating to raising stakeholder expectations or generating concern.

To conduct the stakeholder consultation, the nominated stakeholder engagement liaison should:

- **Identify affected stakeholders** – at high risk sites, the main stakeholders may include local communities and other people that use the land, and local, national and international NGOs interested in conservation or wildlife, industry bodies, government departments and regulators, academics, and the general public;

- **Develop a plan for engagement** with each stakeholder group e.g. setting up meetings, consultation forums, communication of information through posters or other media, feedback and grievance mechanisms;

- **Develop a list of questions or discussion points** to determine their interests in biodiversity and ecosystem services at the site (how they use the site; products or services

derived from ecosystem services that they benefit from or depend upon for their livelihood; their concerns for nature or wildlife conservation; cultural and recreational interests; any scientific or research interests) and how this might be affected by the mine at all stages of the lifecycle (from construction to operation to closure and rehabilitation) (See Box 7.1 for more information on assessing ecosystem services dependencies and impacts); and

- **Engage with the stakeholders** to collect their responses, feedback and any concerns relating to biodiversity and ecosystem impacts.

Box 7.1 Conducting an ecosystem services dependency and impact assessment

Ecosystem services can be assessed by way of an ecosystem services dependency and impact assessment. To conduct the assessment, the operations environmental manager or appointed consultant should construct an impact and dependency matrix, as exemplified below. For each ecosystem service in the left column of the matrix, the operations environmental manager or consultant should complete the right hand columns by determining, through the baseline study, stakeholder consultations and further reviews as necessary:

- Whether the operation **depends** on this ecosystem service; and
- Whether the operation could **impac**t this ecosystem service

Key Ecosystem Services	*Depend*	*Impact*
Provisioning		
Food	○	●
Timber & fibers	●	●
Freshwater	●	●
Genetic / Pharmaceutical resources	○	●
Regulating		
Climate & air quality regulation	●	●
Water regulation & purification	●	●
Pollination	–	●
Natural hazard regulation	●	●
Cultural		
Recreation & tourism	–	●
Aesthetic / non-use values	–	●
Spiritual values	–	●

Key
– Not relevant
○ Minor relevance
● Modorate to major relevance

Ecosystem Services Impact and Dependency Matrix - Adapted from WBCSD Guide to Corporate Ecosystem Valuation (2011)

- An operation may **depend** upon an ecosystem service if it **benefits from that service**. For example, a mine requires a supply of freshwater for processing, and relies on ecosystems to regulate and purify that water supply.

- An operation may **impact** an ecosystem service if it **depletes or damages that service** through resource use, operational activities, or emission of waste products. For example,

the construction of a mine may require clearance of forest, which would damage the ability of the forest ecosystem to regulate water flows and flooding.

The results of the ecosystem services dependency and impact assessment can help to identify critical ecosystem services that need to be prioritised for management by means of the mitigation hierarchy. The results of the assessment should be included in the BMP.

Annex D and Annex E provide example checklists of questions and issues to consider during the stakeholder engagement process, in terms of the identification and analysis of relevant stakeholders, and effective stakeholder engagement thereafter.

The results of the stakeholder consultation should be clearly documented in the BMP to maintain an auditable trail of the process undertaken and the results.

7.6 Developing BMP Section 6: Biodiversity risk and impact assessment

This section of the BMP records the ways in which the Operation might impact biodiversity at the site over the course of the mining lifecycle.

7.6.1 BMP Section 6: Biodiversity risk and impact assessment – Guidance for Low and Medium Risk Operations

For Low and Medium Risk Operations, theoperations environmental manager (or appointed consultant) should use the information collected to map out the areas on site that are most important to biodiversity and ecosystem services i.e. those areas that are important for uncommon species of plants of animals, or areas where local communities derive some value from using the land. Any areas of pristine natural habitat should also be mapped out.

The purpose of the biodiversity site map is to identify areas of focus for biodiversity management and protection. This could form part of a more detailed land use plan (for example as part of the wider ESIA documentation).

The biodiversity site map should be annotated or supplemented with a summary description of ways in which areas of biodiversity importance could be impacted over the course of the mining lifecycle, either directly (e.g. through habitat loss, emissions and effluents from operations) or indirectly (e.g. through the accidental introduction of alien invasive species that negatively impact habitats and species, or through the indirect biodiversity and ecosystem impacts associated with the production of certain materials and equipment that the site is procuring (i.e. supply chain impacts – see also *HZL Technical Standard 06 – Supplier and Contractor Management*). The following activities should be considered:

- Exploration drilling
- Construction of tailings dam
- Construction of water storage reservoirs
- Waste water treatment and discharge
- Dust emissions
- Air emissions

- Construction of processing plant
- Construction of access roads
- Construction of pipelines
- Construction of worker housing
- Blasting
- Surface mining
- Waste rock storage
- Water abstraction

Procurement of key materials
Transportation of product
Transportation of labour
Transportation of mining inputs
Decommissioning plant
Decommissioning tailings dam
Rehabilitation of waste rock dumps

Across any relevant activities, the potential for the introduction of invasive alien (non-native) plant, animal or pest species should be noted to such that mitigation measures can be planned accordingly.

Where an operational activity will potentially impact an area considered important for biodiversity, this should be specified in this section of the BMP. Project-related direct and indirect impacts on biodiversity and ecosystem services that are identified in this assessment should also be documented in the site"s ESIA.

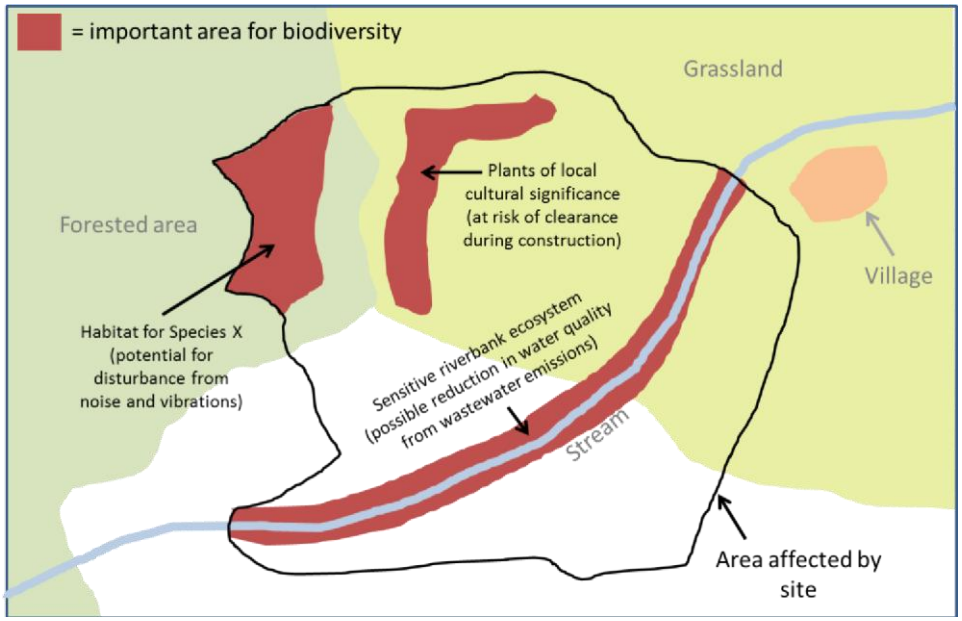


Figure 7.3 – Example biodiversity site map for low risk site

7.6.2 BMP Section 6: Biodiversity risk and impact assessment - Guidance for High Risk operations

For a high risk site, a detailed biodiversity risk and impact assessment should be conducted. The purpose of the assessment is to identify priority risks/impacts to biodiversity for the site that need to be managed. The project-related direct, indirect and residual impacts on biodiversity and ecosystem services that are identified in this assessment should also be documented in the site"s ESIA.

The assessment should be conducted by a biodiversity specialist or external consultant. To conduct the assessment, the operations environmental manager (or appointed consultant) should identify any operational activities that may interact with or impact upon: areas of Critical Habitat; or

- IUCN Red-listed species[4].

[4] The IUCN Red List of threatened Species can be found at http://www.iucnredlist.org/

Operational activities throughout the operational lifecycle should be considered as part of this exercise. Direct impacts on biodiversity and ecosystem services such as habitat loss, emissions and effluents should be considered, as well as indirect impacts such as biodiversity impacts resulting from the accidental introduction of alien invasive species to the site, or indirect biodiversity and ecosystem impacts that are associated with the production of certain materials and equipment that are procured by the site (i.e. supply chain impacts- – see also *HZL Technical Standard 06 – Supplier and Contractor Management*). Activities that may have significant direct or indirect impacts on biodiversity and ecosystem services include the construction of infrastructure, natural resource use, processing activities, introduction (accidental or otherwise) of potentially invasive alien (non-native) species and waste disposal or emissions.

The following operational activities should be considered:

- Exploration drilling
- Construction of tailings dam
- Construction of water storage reservoirs
- Construction of processing plant
- Construction of access roads
- Construction of pipelines
- Construction of worker housing
- Blasting
- Surface mining
- Waste rock storage
- Rehabilitation of waste rock dumps
- Water abstraction
- Waste water treatment and discharge
- Dust emissions
- Air emissions
- Procurement of key materials
- Transportation of product
- Transportation of labour
- Transportation of mining inputs
- Decommissioning plant
- Decommissioning tailings dam

Across any relevant activities, the potential for the introduction of invasive alien (non-native) plant, animal or pest species should be noted to such that mitigation measures can be planned accordingly.

Annex B provides a more detailed list of activities during mine exploration, construction, operation and closure that can be used a checklist for checking that all activities have been adequately considered in the biodiversity risk and impact assessment.

Where an operational activity will potentially impact an area of Critical Habitat, or area considered important for biodiversity or an IUCN Red-listed species, this should be specified in this section of the BMP.

There is no set format for how the findings of the biodiversity risk and impact assessment should be recorded. However, an interaction matrix can be a good way to summarise the degree to which site operations are expected to impact key areas of biodiversity importance (Figure 7.4).

Area of site / Operational activity	Nesting area for Critically Endangered eagle	Location of Endangered tree species	Feeding area for Vulnerable species of deer
Exploration drilling			
Construction of tailings dam			
Construction of water storage reservoirs			
Construction of processing plant			
Construction of access roads			
Construction of pipelines			
Construction of worker housing			
Blasting			
Surface mining			
Waste rock storage			
Water abstraction			
Waste water treatment and discharge			
Dust emissions			
Air emissions			
Transportation of product			
Transportation of labour			
Transportation of mining inputs			
Decommissioning plant			
Decommissioning tailings dam			
Rehabilitation of waste rock dumps			

Figure 7.4 - Example of an interaction matrix (including biodiversity risk scoring system)
Note: In this example, a rating system has been used to assess the severity of the potential impact of each operational activity on the three areas identified as important for biodiversity. Red = high potential impact; orange = medium potential impact; yellow = low potential impact; grey = no interaction or impact anticipated.

The results of the interaction matrix should allow the operations environmental manager to identify the areas of the site that have the highest biodiversity risk, and the operational activities that will have the greatest impact. These areas and operational activities should be the priority focus of the biodiversity management measures.

7.7 Developing BMP Section 7: Biodiversity risk management

This section of the BMP records the management actions that will be taken to protect biodiversity at Low and Medium Risk sites (7.7.1) and at High Risk sites (7.7.2).

7.7.1 BMP Section 7: Biodiversity risk management – Guidance for Low and Medium Risk operations

For Low and Medium Risk Operations, the operationsenvironmental manager should identify the biodiversity management actions that will enable biodiversity at the site to be protected. Areas of natural (i.e. unmodified or „pristine") habitat should not be impacted by the operation, unless there are no other viable alternative nearby areas for development (for example areas of already modified habitat), and stakeholder consultation has taken place such that the importance of the

habitat and the impacts of the development are fully understood by all parties (refer to Section 7.5.2for guidance on how to conduct a stakeholder study).

The mitigation hierarchy should be followed when selecting biodiversity management actions for all areas affected by the operation (including areas of natural habitat where development must take place as discussed above). *Box 7.2* provides more detail on the mitigation hierarchy. Impact avoidance should be prioritised in the first instance (for example by restricting activities that disturb wildlife in areas where they are known to live).

If avoidance of impacts is not possible, for many Low and Medium Risk sites, the most appropriate biodiversity management measures are:

- **rehabilitation** of the mine site at closure (to return the site to the same level of biodiversity and ecosystem value that it was in prior to mine construction); and/or

- **biodiversity offset.**

If any of the management measures involve an extra cost, this should be indicated to the project or site manager so that appropriate budget can be allocated.

The operations environmental manager should record the list of the specific biodiversity management actions identified in a Biodiversity Commitment Register, which should be included in the BMP.

The Biodiversity Commitment Register should document all biodiversity actions or commitments made by the operation and should provide a means of tracking progress in their implementation and results. The following information should be captured in the Biodiversity Commitment Register:

- Biodiversity management commitment
- Risk of non-compliance
- Date of origin
- Original date set for completion
- Roles and responsibilities
- Status of completion at stage of review (see below)
- Proof of compliance

An example Biodiversity Commitments Register is provided in *Figure 7.5*.

Biodiversity Management Commitments	Origin	Status (March 2008)	Original Date for Completion	Outlook 2008	Outlook 2009	Risk to non-compliance	Level of Planning Complete (March 2008)	Proof of Compliance
Finalize the BM biodiversity priorities map and conservation area plan	BAP 2005	Achieved	Mid July 2005	Achieved	Achieved	Prevent achieving other objectives	Persons,Tasks,Time, Costs	Priorities completed 2005. CAMP completed 2006
Develop a budget for the implementation of the management programs.	BAP 2005	Achieved	End Sept 2005	Achieved	Reviewed	Prevent achieving other objectives	Persons,Tasks,Time, Costs	First budget submission 2007 for 2008
Review short and medium term goals annually. Where necessary improve BAP & associated EMP's to ensure compliance & relevance.	BAP 2005	Achieved	annually	Achieved	Reviewed	Prevent achieving other objectives	Persons,Tasks,Time, Costs	Review October 2006. EMP update 2007 for 2008
Integrate BAP into ISO 14001	MOU	Achieved	01 October 2006	Reviewed	Status	Prevent achieving other objectives	Persons,Tasks,Time, Costs	Integrated 2006, 2007 & 2008
Establish and Manage infrastructure for Conservation Area	CAMPlan	Implementation started	2005 to 2008	Achieved	Achieved	Prevent achieving other objectives	Tasks Defined	
Establishment of Staff and Acquire equipment and resources	CAMPlan	Near Completion	2005 to 2008	Achieved	Achieved	Prevent achieving other objectives	Persons, Tasks, Time, Costs	Position to be filled 2008
Collaborate to develop appropriately skilled personnel for the BMCA	MOU	Near Completion	Not specified	Achieved	Achieved	Prevent achieving other objectives	Persons,Tasks,Time, Costs	Conservation Officer
Ensure appropriate resource to manage conservation area is available	BAP 2005	Near Completion	01 January 2008	Achieved	Reviewed	Prevent achieving other objectives	Costs and budgeting	Conservation Officer
Do an accounting exercise to evaluate the cost of developing and implementing a BAP	BAP 2005	Achieved	End March 2006	Achieved	Reviewed	Reduced Sustainability	Costs and budgeting	First budget submission 2007 for 2008
Manage and Monitor natural resource utilization to maximize biodiversity	BAP 2005	Achieved	2005 to 2008	Achieved	Achieved	Reduced Sustainability	Persons,Tasks,Time, Costs	Monitoring according to Aaplc SSD progress against targets
Review the lease contract for the farm adjacent to Gamsberg (east) to ensure that makes reference to veldt management, grazing restrictions etc	BAP 2005	Achieved	End May 2005	Achieved	Reviewed	Reduced Sustainability	Tasks Defined	Contracts reviewed 2007
Establish a Conservation Management Area (BMCA) op portions Aggeneys No. 56, Aroams No. 57, Gams No 60	MOU	Achieved	Not specified	Achieved	Implementation started	Reduced Sustainability	No Details	Conservation Area as per Access SOP
Review BM LOM systems and plans to ensure biodiversity is adequately addressed	BAP 2006	Achieved	01 January 2008	Achieved	Reviewed	Reduced Sustainability	Tasks Defined	Reviewed 2007
Refine management actions necessary to optimize biodiversity conservation	BAP 2005	Achieved	01 January 2008	Implementation 50%	Reviewed	Reduced Sustainability	Persons, Tasks, Time, Costs	Detailed budgeting, structures & BAP reviews
Undertake a biodiversity GAP analysis in order to determine what baseline studies are required.	BAP 2005	Not Prioritized currently	01 June 2005	No Resources	Planning Phase	Reduced Sustainability	No Details	Must first complete current gap analysis 2005

Figure 7.5- Example Biodiversity Commitments Register

The Biodiversity Commitments Register should be updated during the operational stage of the mine as a record of how the management measures are implemented.

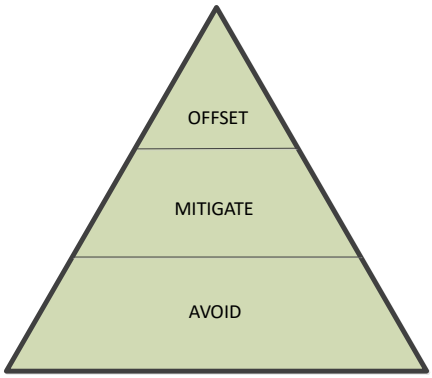
7.7.2 BMP Section 7: Biodiversity risk management – Guidance for High Risk operations

This section of the BMP records the management actions that will be taken to prevent harm to Critical Habitats and other areas considered important for biodiversity and ecosystem services, and to enhance biodiversity at High Risk sites.

Similar to low and medium risk sites, biodiversity and ecosystem services management actions should be selected according to the mitigation hierarchy (refer to *Box 7.2*). Impact avoidance should be prioritised in the first instance, and if avoidance is not possible, impacts should be minimised through mitigation measures. Compensation for biodiversity and ecosystem services impacts should be the last step.

Box 7.2 – The Mitigation Hierarchy

The mitigation hierarchy provides a structure for prioritising biodiversity management actions. It prioritises avoidance of impacts, followed by mitigation of impacts, and finally implementing offsets.



Specific risk management measures, as they apply to avoidance, mitigation and offsetting activities, are discussed in more detail below.

- **Avoidance**: As far as possible for any habitats, especially for highly vulnerable or irreplaceable plants, animals and habitats, negative biodiversity and ecosystem services impacts should be avoided. Risk management measures may include:
- *High conservation value (HCV) areas*: In some areas, it may not be possible to fully mitigate or compensate for the permanent impact on biodiversity that would result from operational activities such as mining. This is often the case for high-value biodiversity areas that are unique or vulnerable. In such cases, the only option that would enable biodiversity commitments (such as NNL or NPG) to be met would be to conserve that area and protect it from future exploitation or development.
- *Activity location / design change*: Biodiversity impacts can be avoided by changing the location of a particular activity or process (moving it to a lower risk area), or by altering the design of a certain activity or process (such that negative impacts to biodiversity are reduced).
- *Low-impact mining methods*: Non-conventional mining methods (potentially using new technology) could enable access to resources whilst avoiding or at least minimising the temporary and permanent disturbance to the overlying land and ecosystems.

- **Mitigation**: Where impacts cannot be avoided, they should be mitigated as far as possible. Mitigation measures may include:
- *Impact reduction technologies*: Technologies that allow the impact of mining activities to be reduced could be installed (for example, tertiary treatment to remove phosphates from effluents to reduce the risk of nutrient overload and plant overgrowth in bodies of water and/or wetlands and associated biodiversity loss).
- *Mine site reclamation*: Plans to return disturbed land to a stable and productive condition could be implemented, (including, for example, retaining seeds and topsoil during vegetation removal; replacement of topsoil after site closure, re-profiling, contouring, capping tailings dam, filling or backfilling pits). Planning for rehabilitation of the site should begin from the early development stages of the operation lifecycle. Annex C provides a checklist that can be used to check that biodiversity protection has been adequately considered in the closure plans.
- *Ecosystem reconstruction*: Ecosystems may be reconstructed (in terms of both structure and function i.e. provision of ecosystem services) using local species. In all cases, measures should be taken to avoid the potential for accidental or unintentional introduction of potentially invasive or alien (non-native) species, including the transportation of substrates or vectors (such as soil, ballast and other plant materials) that may harbour alien species. Reconstructed ecosystems should be stable, effective in retaining water and nutrients, and self-sustaining. Specific reconstruction activities may include re-vegetation, weed control, erosion control, soil and groundwater monitoring (and remediation).
- *Progressive closure / concurrent rehabilitation*: The total area of disturbance may be limited by closing facilities as they become defunct during the operational phase of the mine and restoring areas off site.

- **Biodiversity offsets**: Biodiversity offsets are defined as „measurable conservation outcomes resulting from actions designed to compensate for significant residual adverse biodiversity impacts arising from project development after appropriate prevention and mitigation measures have been taken" (BBOP, 2009). As the last and usually the most expensive step in the mitigation hierarchy, biodiversity offsetting provides a means of compensating for any biodiversity impacts that cannot be avoided or mitigated (i.e. residual impacts). Offsetting residual impacts on biodiversity may be required in order to achieve NNL or NPG objectives.

  A number of key considerations need to go into designing how much to offset and the type of offsetting to be applied. Central to offsets, and related to this achieving NPG or NNL, is the ability to measure, as far as is possible:

- Biodiversity value of the area;
- Biodiversity value loss resulting from project activities (i.e. residual biodiversity impacts, after avoidance and mitigation measures have been employed); and
- Biodiversity gains from offset activities (which should match or exceed biodiversity losses from residual impacts).

  A biodiversity offset should adhere to the „like-for-like" or „better" principle of offset design, and offset activities should be carried out in accordance with current information on best practices. An operation may purchase and maintain offset land directly, or may provide funding to a partner organisation to manage the offset land on their behalf.

  For example, in India, the State Government runs Compensatory Afforestation and Wildlife Management initiatives that are funded by industrial operators. These initiatives are designed to offset the impacts that industrial operations have on biodiversity in one area with positive gains in biodiversity in another area.

- **Additional Conservation Actions**: In addition to the above avoidance, mitigation, and offsetting actions, additional conservation actions can be pursued, particularly when trying to achieve Net Positive Gain (NPG) in biodiversity, and may include (amongst others):

- Forming partnerships with and providing capacity building support to existing local conservation initiatives;
- Conserving natural habitats within management control of the operation, and implementing measures to protect such habitats from damage through the control or eradication of any existing invasive alien species;
- Supporting scientific research on areas of biodiversity importance, and
- Supporting community education programmes on the environment, biodiversity, and sustainable resource use.

The management measures at a high risk site will typically comprise a combination of actions that avoid, mitigate and offset biodiversity risks/impacts (refer to *Box 7.2* above). Biodiversity offsets and additional conservations actions should be planned to the extent required to ensure that a Net Positive Gain in biodiversity is achieved.
For Critical Habitats, the management measure must be impact avoidance i.e. operational activities should be planned in such a way that they do not interfere in any way with the area of Critical Habitat, unless all of the following criteria are met:

- There are no viable alternatives in the area for the development of the project (i.e. on noncritical habitats);

- The aspects of the habitat that form the basis of its designation as „Critical Habitat" are not negatively impacted in any way (either directly, or indirectly through adverse impacts to environmental processes supporting the habitat);

- The project will not lead to a net reduction in the population of any Critically Endangered or Endangered species;

- A robust long-term biodiversity monitoring and evaluation program is in place; and

- Stakeholder consultation has taken place, such that the importance of the habitat is fully understood and mitigation measures have been communicated.

In cases where the above criteria can be met, a robust BMP should be developed in consultation with external experts and NPG of biodiversity should be met. Any remaining impacts to Critical habitats (after avoidance and mitigation measures have been employed) should be mitigated using biodiversity offsets. Similarly, impacts to any natural habitats must be avoided and managed according to the above criteria.

Expert ecological opinion should be sought in order to determine the optimal combination of avoidance, mitigation and offsetting measures for managing biodiversity risk at any high risk operation. The choice of management options should also be informed by discussions with the relevant authorities and consultations with stakeholders (in addition to expert opinion sought from biodiversity specialists).

The operations environmental manager should document the thought-process behind the selection of various biodiversity management measures, providing evidence that the mitigation hierarchy approach was followed and documenting the rationale behind certain biodiversity management actions being chosen for certain risks. Evidence should also be documented to demonstrate that the operation has met or exceeded all relevant legal requirements applicable to Legally Protected Areas and/or Internationally Recognised Areas. Such evidence should demonstrate that:

- The proposed development is legally permitted;
- Any government-recognised management plans for the area (e.g. Protected Area Management Plans, National Biodiversity Strategy and Action Plans, or similar) have been followed, or if no management plan exists, options to develop one with suitable government agencies and conservation organisations have been explored;
- Stakeholders (including area sponsors and managers, Affected Communities, and Indigenous Peoples) have been consulted; and
- Additional programs have been implemented in order to promote and enhance conservation in the area. Such programs might be focused on park management or conservation research.

Issues to consider during the selection and implementation of biodiversity management measures include:

- Appropriateness of different management measures with respect to the biodiversity risks and potential impacts on site;

- Role of rehabilitation planning as a management measure;
- Role of biodiversity offsets as a management measure;
- Responsibilities for implementing management measures; and
- Consistency with any government recognised management plans for the area.

Annex F provides a checklist to ensure abetterunderstandingofthedistinctionsbetween,andpractical toolsinsupportof,biodiversitymitigation,rehabilitation, offset and responsibilities.

Biodiversity risks should ideally be addressed in the pre-feasibility and feasibility/design phases where impacts on biodiversity can be more easily avoided or minimised. It is important that during the development of the project, the opportunities for impact avoidance and minimisation are fully explored, since it is often easier and less costly to design out impacts at the earlier stages of project development than to retrospectively mitigate impacts later on.

If any of the management measures involve an additional cost, this should be indicated to the project or site manager so that appropriate budget can be allocated.

Similar to low and medium risk sites, the operations environmental manager should compile a list of specific actions that should be taken to implement the planned biodiversity management measures. These should be recorded in a Biodiversity Commitment Register, which forms part of this section of the BMP.

It is important that those responsible for implementing biodiversity management measures are trained appropriately and have a good understanding of management objectives, and their role in helping to achieve these.

Throughout the implementation of the BMP, the operation should continue to engage with stakeholders (including traditional landowners, local communities and institutions, and NGOs) on biodiversity issues in order to maintain the credibility of their biodiversity management plan.

7.8 Developing BMP Section 8: Monitoring and reporting biodiversity management (all operations)

Guidance on how to monitor and report the progress of biodiversity management is provided in Section 8 of this Guidance Note document.

For all operations (High, Medium and Low Risk), Section 8 of the BMP should specify how monitoring and reporting will be carried out, including:

- Scope of monitoring activities, comprising:
  - Periodic review and update of the Biodiversity Commitment Register
  - Performance indicators to be measured and recorded
- Who will conduct monitoring activities
- Frequency of monitoring activities
- Frequency of data reporting

8 STAGE 4 - MONITORING AND REPORTING

All operations should monitor and report upon their progress with biodiversity management, in terms of:

- Progress in implementing the biodiversity management measures detailed in the Biodiversity Commitment Register (contained within the BMP); and
- Performance measured according to biodiversity performance indicators.

8.1 Monitoring and reporting progress in implementing the Biodiversity Commitment Register

The Biodiversity Commitment Register forms part of the BMP. The operations environmental manager should periodically (ideally at least once every 6 months) review the Biodiversity Commitment register to determine whether the biodiversity management measures listed have been implemented, and if necessary, put in place further action plans to ensure that biodiversity management objectives are met within the desired timeframes. The operations environmental manager should update the Biodiversity Commitment Register as a „live document" to ensure it is up-to-date with the latest status of biodiversity management measures.

8.2 Monitoring and reporting performance to GRI performance indicators

Operations should monitor and report against a set of the GRI"s biodiversity performance indicators (see *Figure 8.1*). These performance indicators should be reported to HZL Corporate level, where the data will be combined for external public reporting to promote transparency and good governance.

GRI ref	Description of performance indicator	Data to be reported by operations environmental manager
EN11	Location and size of land owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas	Low and Medium Risk operations should confirm that they are located more than 5km from areas of high biodiversity or Critical Habitat. If this has changed (e.g. due to expansion of the site, or identification of new areas of high biodiversity, protected area or Critical Habitat) then this must be reported to HZL Corporate, together with the area (in sq km) of the site that falls within 5km of the protected area. In this case, the risk rating of the operation may need to be escalated. High Risk operations should report the area (in sq km) of the site that falls within 5km of Critical Habitat or area of high biodiversity value.
MM1	Amount of land (owned or leased, and managed for production activities or extractive use) disturbed or rehabilitated	All operations should report the total area of the site (in sq km) that has been disturbed or rehabilitated.

EN13	Habitats protected or restored	All operations should report the total area (in sq km) of natural or modified habitat that has been protected (through impact avoidance) or restored (through rehabilitation).
EN14	Strategies, current actions, and future plans for managing impacts on biodiversity	All operations should provide a summary of their approach to biodiversity (drawing upon the information recorded in the BMP). This should include a copy of the Biodiversity Commitment Register, detailing the management measures and their status.
MM2	The number and percentage of total sites identified as requiring biodiversity management plans according to stated criteria, and the number (percentage) of those sites with plans in place.	All operations should confirm to HZL Corporate level that they have a BMP in place.
EN15	Number of IUCN Red List species and national conservation list species with habitats in areas affected by operations, by level of extinction risk	Low and Medium Risk operations should confirm that that there are no IUCN Red Listed species with habitats in areas affected by operations. If this has changed (e.g. due to expansion of the site, or identification of new areas of habitat used by IUCN Red Listed species) then this must be reported to HZL Corporate, together with the number and name of species affected, and their status (e.g. vulnerable, endangered, critically endangered) according to the IUCN Red List. In this case, the risk rating of the operation may need to be escalated. High Risk operations should report the number and name of all IUCN Red Listed species with habitats in areas affected by operations, together with their status (e.g. vulnerable, endangered, critically endangered) according to the IUCN Red List.

Figure 8.1: HZL Company GRI Performance Indicators (Source: Adapted from GRI Mining and Metals Supplement Version 3)

The GRI Mining and Metals Sector Supplement contains further guidance on how to report against the above indicators, providing additional details on what data should be collected and reported, as well as further information on the indicators‟ relevance, key definitions, and associated useful

documentation and references. Further guidance from this source should be sought when it comes to monitoring and reporting operational progress.

It should be noted that from time to time there may be other reporting requests from HZL Corporate, based on internal reporting requirements.

9 KNOWLEDGE AND AWARENESS

The implementation of the risk management framework relies on knowledge and awareness of biodiversity and ecosystem services within the operational-level team, at Company and HZL Corporate level and more widely amongst relevant stakeholders.

As described in the above sections, capacity to undertake many of the specialist or technical biodiversity assessments and activities may not reside within the operation team or even at Company or HZL Corporate level. In such cases, to ensure that the activities are carried out appropriately by a competent practitioner, external experts should be consulted. External biodiversity experts may include consultants, NGOs or research institutions.

Where opportunities arise to collaborate with external experts, particularly in relation to scientific research that could further knowledge and understanding of biodiversity attributes in HZL"s areas of operation, arrangements should be made to support these. This includes knowledge and awareness building beyond the activities necessary to implement the biodiversity risk management framework. Such research initiatives can provide useful data and information that enriches the understanding of biodiversity baselines, impacts and performance.

Building knowledge and awareness of biodiversity and conservation issues amongst employees, contractors and others in the supply chain is also beneficial. Stakeholders should be provided with opportunities to learn about the importance of biodiversity, which is essential for encouraging effective implementation of biodiversity management actions at an operational level. Building knowledge within the team can be done through a variety of ways, for example getting team members involved in biodiversity monitoring or by running initiatives to raise awareness.

Operations may also wish to build knowledge and awareness of biodiversity issues with external stakeholders such as affected communities or customers so that they fully appreciate the importance of biodiversity and the efforts being made by HZL to support responsible biodiversity management.

10 ROLES AND RESPONSIBILITIES

There are a number of key roles and responsibilities for effective biodiversity management, although the extent that these will be required at an individual site will depend on the level of biodiversity risk that has been identified.

Where sufficient knowledge and capacity to conduct the activities described in this guidance document do not exist to at operational level, operations should consult external subject-matter

experts (including experts from Company level or HZL Corporate level, or external consultants, as appropriate).
There are a number of options for obtaining specialist knowledge and skills from biodiversity experts:

- Consult with Company-level or HZL Corporate-level biodiversity specialists.
- Commission external consultants.
- Engage conservation organisations or NGOs.
- Involve research institutions or universities.

Although the planning and implementation of activities might fall to external specialists, it is important for the operational-level team to understand the rationale for biodiversity management and the practicalities of integrating biodiversity management actions into operations. The environmental manager and operation manager have specific responsibilities in relation to these aspects.

In general, the operations environmental manager should be responsible for:

- ensuring that the activities for biodiversity risk management are undertaken effectively, including employing external biodiversity experts to undertake the activities as necessary;

- accurately monitoring and reporting performance in relation to biodiversity management;

- identifying when the BMP needs to be updated or maintained (according to changing external conditions or operational activities that were not previously accounted for within the BMP) and ensuring that this is done appropriately, and

- ensuring that biodiversity-related risks, issues, dependencies and management actions are integrated into core operational plans and documents as appropriate, for example the operation‟s risk register, land acquisition plans, stakeholder engagement plans etc.

Ultimately, the operation manager should be accountable for the operation‟s performance in relation to biodiversity management. Therefore, the operation manager should be responsible for:

- reviewing the operation‟s performance in relation to biodiversity management;
- monitoring KPIs and ensuring appropriate reporting of performance to Company or HZL Corporate level, and
- ensuring that sufficient and competent resources (time, effort and people) are committed to biodiversity risk management activities.

DEFINITIONS

Definitions of key terms used in this document are shown in the following table.

Term	Definition
Affected Communities	Local communities directly affected by the new or existing project.
Alien (Non-Native) Species	An alien or non-native plant or animal species is one that is introduced beyond its original range of distribution.

Baseline Biodiversity Survey	A survey of the habitats and species in the project area to determine the biodiversity baseline and may include identification of Legally Protected Areas and Internationally Recognised Areas, critical and endangered habitats, natural and disturbed habitats, and alien (non-native) species of flora and fauna and shall address biodiversity attributes of all forms (e.g. water, land, flora, fauna, etc.).
Biodiversity	The variability among living organisms from all sources including inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems (*cf.* United Nations Convention on Biological Diversity).
Biodiversity Management Plan (BMP)	A document that sets out the organisational arrangements to eliminate, minimize, mitigate and manage impact to all biodiversity attributes associated with an operation or new project. The plan shall be commensurate with the level of risk identified.
Conservation Value	Relates to the inherent value of biodiversity and ecosystems, which is typically measured in terms of ecological diversity and rarity. Ecological diversity relates to genetic diversity (within a species), species richness (the number and diversity of species), and ecosystem or community diversity (the variety and composition of habitats, biotic communities and ecological processes within and between ecosystems). Rarity relates to the value of specific or prioritised species or areas, in relation to their endemism (uniqueness), condition or endangered status.
Critical Habitat	Critical habitats are areas with high biodiversity value, including (i) habitat of significant importance to Critically Endangered and/or Endangered species; (ii) habitat of significant importance to endemic and/or restricted-range species; (iii) habitat of significant importance to globally significant concentrations of migratory species and/or congregatory species; (iv) regionally significant and/or highly threatened or unique ecosystems; and/or (v) areas which are associated with key evolutionary processes (IFC Performance Standard Guidance Note 6).

Term	**Definition**
Critically Endangered and Endangered species	Species listed on the International Union for the Conservation of Nature (IUCN) Red List of Threatened Species.
Cumulative Impacts	Based on the IFC description, cumulative impacts are those that result from the incremental impact of the project when added to other existing, planned and reasonably predictable future projects and developments.

Direct Impacts	Based on the IFC description, direct impacts are impacts that result directly from project activities, such as habitat loss and disturbance, emissions and effluents, alterations of hydrology and land forms, loss of ecosystem services or access to such services, etc.
Ecosystem Services	The benefits that people, including businesses, derive from ecosystems. Ecosystem services are organized into four types of services: (i) provisioning services, which are the products people obtain from ecosystems; (ii) regulating services, which are the benefits people obtain from the regulation of ecosystem processes; (iii) cultural services, which are the nonmaterial benefits people obtain from ecosystems; and (iv) supporting services, which are the natural processes that maintain the other services (IFC Performance Standard Guidance Note 6).
Ecosystem Services Value	Relates to the human benefits derived from biodiversity and ecosystems, in the form of ecosystem services.
ESIA (Environmental and Social Impact Assessment)	A formalised process designed to identify and assess environmental and social impacts associated with a project, along with the mitigation measures and management arrangements for ensuring such measures are implemented.
ICMM (International Council on Mining and Metals)	The International Council on Mining and Metals (ICMM) was established in 2001 and seeks to drive performance improvement through its members which comprise 20 mining and metals companies as well as 30 national and regional mining associations and global commodity associations.
IFC (International Finance Corporation)	Member of the World Bank that finances and provides advice to private sector ventures and projects in developing countries.
Indirect Impacts	Based on the IFC description, indirect impacts are impacts that result indirectly from project activities, such as accidental introductions of alien invasive species, project-induced access by third parties, in-migration and associated impacts on resource use.
Internationally Recognised Area	Exclusively defined as UNESCO Natural World Heritage Sites,

Term	Definition
	UNESCO Man and the Biosphere Reserves, Key Biodiversity Areas, and wetlands designated under the Convention on Wetlands of International Importance (the Ramsar Convention) (IFC Performance Standard Guidance Note 6).

IUCN (International Union for Conservation of Nature)	A democratic membership union with more than 1,000 government and NGO member organizations, and almost 11,000 volunteer scientists in more than 160 countries which supports scientific research, manages field projects all over the world and brings governments, non-government organizations, United Nations agencies, companies and local communities together to develop and implement policy, laws and best practice.
Keystone Species	Species that exert a disproportionate influence on the integrity of an ecosystem relative to its abundance or total biomass.
„Like for Like or Better" Principle	In relation to biodiversity offsets, the adoption of this principle indicates that the offset must be designed to conserve the same biodiversity values that are being impacted by the project (an "inkind" offset) or, that where the biodiversity to be impacted by the project may be neither a national nor a local priority, and there are other biodiversity attributes of higher priority for conservation or in need of protection, an "out-of-kind" offset that involves "trading up" may be designed (IFC Performance Standard Guidance Note 6).
Legally Protected Area	A clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values (IUCN definition).
Mitigation Hierarchy	The prioritised list of mitigation measures that shall be used to determine the most appropriate measures for mitigating impact on biodiversity attributes. The hierarchy starts with elimination of impact, followed by use of engineering controls to reduce at source, impact reduction measures, offsetting and restoration of damage caused by the project.
Modified Habitat	Areas that may contain a large proportion of plant and/or animal species of non-native origin, and/or where human activity has substantially modified an area"s primary ecological functions and species compositions. Modified habitats may include areas managed for agriculture, forest plantations, reclaimed coastal zones, and reclaimed wetlands (IFC Performance Standard Guidance Note 6).
Natural Habitat	Areas composed of viable assemblages of plant and/or animal species of largely native origin, and/or where human activity has not essentially modified an area"s primary ecological functions and species compositions (IFC Performance Standard Guidance
Term	**Definition**
	Note 6).

Net Positive Gain (NPG)	"The point where biodiversity gains from targeted conservation activities exceed the losses of biodiversity due to the impacts of a specific development project, so that there is a net gain in the type and amount of biodiversity present, over space and time" (Business and Biodiversity Offsets Program (BBOP), 2011).
No Net Loss (NNL)	"The point where biodiversity gains from targeted conservation activities match the losses of biodiversity due to the impacts of a specific development project, so that there is no net reduction overall in the type and amount of biodiversity present, over space and time" (BBOP, 2011).
Offset	Measurable conservation outcomes resulting from actions designed to compensate for significant adverse biodiversity impacts arising from project development and persisting after appropriate avoidance, minimization and restoration measures have been taken (IFC Performance Standard Guidance Note 6).
Operation(s)	A location or activity that is operated by a HZL Company and is part of the HZL Group. Locations could include mines, refineries, ports or transportation activities, wind farms, oil and gas development sites, offices including corporate head offices and research and development facilities.
Project	Any planned or proposed change to either an existing site or to a Greenfield, undeveloped site which may be small, medium or large in scale – for example ranging from a building extension on an existing site, to construction of a facility comprising office buildings, to development of a new mine.
Residual Impacts	Residual impacts are significant project-related biodiversity and ecosystem services impacts that remain after on-site mitigation measures have been implemented.
Social and Environmental Management System (SEMS)	A SEMS defines the Company"s organizational structure, responsibilities, practices and resources for managing and monitoring its activities and performance on social and environmental issues.
HZL Company	A subsidiary of HZL Group either fully or majority owned that has its own management structure (e.g. Hindustan Zinc Limited, HZL Aluminium Limited, Sterlite Industries limited, etc.).

SUPPORTING INFORMATION

A summary of supporting documents relevant to the Guidance Notes is provided below.

Reference	Description

IFC Performance Standard PS1 and Guidance Note GN1 (v.1)	IFC Performance Standard and Guidance Note 1 on the Assessment and Management of Social and Environmental Risks and Impacts.
IFC Performance Standard PS6 and Guidance Note GN6 (v.1)	IFC Performance Standard and Guidance Note 6 on Biodiversity Conservation and Sustainable Management of Living Natural Resources.
ICMM Good Practice Guidance for Mining and Biodiversity	Guidance on good practice for biodiversity management by mining companies.
BBOP Standard on Biodiversity Offsets and associated material	Documentation and guidance on the mitigation hierarchy, biodiversity offsetting, and NNL / NPG calculations.
GRI Sustainability Reporting Guidelines and Mining and Metals Sector Supplement	GRI Guidelines for reporting of sustainability management, including Biodiversity Performance Indicators.
WBCSD Guide to Corporate Ecosystem Valuation	WBSCD guidance on conducting Corporate Ecosystem Valuation.
WRI Corporate Ecosystem Services Review Guidelines	WRI guidelines for identifying business risks and opportunities arising from ecosystem change.

RELATED DOCUMENTATION

A summary supporting documents relevant to this document is provided in the following table.

Doc. Ref.	Document name
	HZL Code of Conduct
POL 03	Biodiversity Management Policy
MS 02	Stakeholder Materiality and Risk Management
MS 03	New Projects, Planning Processes and Site Closure
TS 05	Stakeholder Engagement
TS 06	Supplier and Contractor Management
TS 07	Biodiversity Management
TS 08	Conducting ESIAs to International Standards

ANNEX A - EXAMPLE BIODIVERSITY MANAGEMENT PLAN STRUCTURE

This annex provides an example structure for a Biodiversity Management Plan (BMP). This structure should be adapted to suit each individual operation. The BMPs for high, medium and low sites will all follow the same broad structure outlined below but will vary in terms of the level of detail given for each section.

1 Document control

This section should hold a record of amendments and revisions, including a date of revision, version number, author, approver and brief description of the reasons for the revision.

2 Definitions

This section should provide a table of definitions for terms used in the document. The table must include a definition for „biodiversity" as described in the Biodiversity Management Technical Standard.

3 Introduction

3.1 Background of the Operation

This section should contain an overview description of the operation including key information about the size and surface area of the operation, the nature of the resource to be exploited (where applicable) or processes to be undertaken at the operation, production rates, operation lifetime, location and setting, status of surface rights ownership etc.

3.2 Regional setting

This section should detail the regional setting for the operation, including details of the geographical location, predominant vegetation and land uses, any notable biodiversity features (such as the presence of endangered species), the regulatory context in relation to biodiversity, and the social and cultural context in relation to biodiversity.

3.3 Document purpose and scope

This section should detail the purpose of the BMP document. It should also outline the sections in the document, any scope exclusions and references to supporting documents that should be read in conjunction with the BMP.

4 Approach to biodiversity

4.1 Methodology and approach

This section should describe how biodiversity management has been approached at the site, with reference to the HZL Technical Standard, this Guidance Note and IFC Performance Standard 6. It should also provide a high-level description of the biodiversity management process (Stages 1 to 4). The section describes at a high-level how the management objectives will be achieved through use of the mitigation hierarchy, including a description of the specific actions that are planned as part of the Biodiversity Commitment Register.

4.2 Site biodiversity risk rating

This section should detail the final biodiversity risk rating that was assigned to the site (as agreed with HZL Corporate). It should describe the processes undertaken to determine the risk rating, including the use of IBAT in biodiversity risk screening during Stage 1 and desk-based research findings from the biodiversity and ecosystem services assessment conducted in Stage 2. A summary of the research findings form Stage 2 should be provided, including relevant regulations and legal provisions applicable to biodiversity and ecosystem services at the site, and any requirements for offsetting.

4.3 Biodiversity management commitment and objectives

This section should specify the site"s objectives for biodiversity management e.g. NNL or NPG according to the risk rating of the site.

5 Biodiversity at the site
This section should provide a description of biodiversity and key ecosystem services (the baseline) at the Operation"s site, in line with the guidance provided in this Guidance Note for Low, Medium and High Risk operations.

6 Biodiversity risk and impact assessment
This section should provide details of the most important areas of the site in relation to biodiversity and ecosystem services, and/or the priority areas of focus for biodiversity management, in line with the guidance provided in this Guidance Note for Low, Medium and High Risk operations.

7 Biodiversity risk management
This section should detail the biodiversity management measures that will be implemented at the site to manage the biodiversity risks and impacts identified through the biodiversity risk and impact assessment, in line with the guidance provided in this Guidance Note for Low, Medium and High Risk operations. This section should include the Biodiversity Commitment Register.

8 Monitoring and reporting biodiversity management
This section should describe the monitoring and reporting program in place at the site. This should include how and how often monitoring occurs, the methodology used and who conducts the assessment. The section should describe the methodology for how this is compared to the baseline survey results to ascertain the level of impact the operation has had. Finally, the section will also describe reporting requirements and KPIs.

9 Appendices
Appendices may include maps, photo logs, supporting documentation etc.

ANNEX B: CHECKLIST FOR BIODIVERSITY PROTECTION DURING EXPLORATION, CONSTRUCTION AND OPERATION

The example checklist below provides a basis to conductaninitialscreeningexercisetodevelopanoverallappreciation ofthebiodiversityimportanceofanareaandensurethatimpactsonbiodiversityare minimized during exploration, construction and operation. Adapted from the *ICMM Good Practice Guidance for Mining and Biodiversity*.

Exploration

Issuestoconsider	**Action**	
Have biodiversity constraints to exploration already been identified by the regulatory authorities in-country?	Yes	Determine whether exploration or mining is compatible with designated land uses. If not, pursue alternative exploration targets

	No	Review any legal provisions relating to mining (or other types of development) and biodiversity that might influence exploration or mining
Have protected areas within the area of exploration been identified?	Yes	Consider implications for exploration or mining, e.g. World Heritage Sites off-limits to ICMM members
	No	Undertake mapping exercise to identify the occurrence or absence of protected areas, and consider implications for mining
Will the early stages of exploration involve subsurface sampling?	Yes	Ensure that barriers to access (and means of escape) are provided to protect wildlife and backfill promptly
	No	If geophysical techniques are used, try to avoid air surveying when migratory animals may be disturbed and avoid „line of sight" cuttings wherever practicable
Will new access roads be required for exploration drilling?	Yes	Ensure tracks follow natural contours to prevent erosion, are kept as small as practical, and are rehabilitated as early as possible
	No	No specific action required
Has exploration identified probable mineral reserves that justify the conduct of pre-feasibility studies?	Yes	Proceed to pre-feasibility studies
	No	Ensure that the impacts of exploration are rehabilitated as soon as practicable

Construction

Issuestoconsider	**Action**	
Will new access roads or upgrades to existing roads be required to enable construction, or will linear ancillary infrastructure be constructed, e.g. rail lines, pipelines, transmission lines?	Yes	Identify and assess potential impacts. Ensure that alignment avoids isolation or fragmentation of habitats and disruption of streams and rivers
	No	Consider risks to biodiversity adjacent to existing roads from accidental spillages, e.g. of fuel oil or other hazardous construction materials
Are areas of importance for biodiversity dependent on „limited access" and will	Yes	Consider alternative options for construction access (e.g. via air or water) and other mechanisms of control
construction facilitate wider access and induce potential adverse changes by other third- party users?	No	Begin to identify possible interfaces between mining and biodiversity, both direct and indirect
Does land clearance have the potential to adversely impact rare or otherwise important plant and animal species (e.g. of importance to natural resource dependent communities)?	Yes	Ensure that rare and important plant and animal species are identified during baseline or follow-up surveys and that appropriate mitigation measures are adopted
	No	Ensure that basic measures are undertaken to ensure that natural habitats are avoided to the extent possible through the design and location of construction facilities, storage areas, etc.
Does the sourcing of construction materials (such as dredging of sands and gravels) have potentially significant impacts on biodiversity?	Yes	Ensure that these aspects are fully addressed as part of the ESIA
	No	Where practical, ensure that construction materials have been obtained from approved sources
Is the proposed mine in an area which will require in-migration of a large temporary construction	Yes	Ensure that these aspects are fully addressed in the ESIA and that appropriate controls are implemented

workforce, and has a risk of longer- term post-construction in-migration?	No	Ensure that more limited impacts from construction related infrastructure (especially water and sanitation) are effectively managed

Operation

Issuestoconsider	**Action**	
Could the transport of process chemicals, products or waste materials by road or ancillary infrastructure (e.g. rail or pipeline) result in accidental releases to the environment which may impact biodiversity?	Yes	Ensure that Hazard and risk assessments are extended to include biodiversity as a receptor, to include potential impacts of weed or pest control.
	No	Ensure that the impacts on biodiversity of maintaining linear infrastructure, particularly weed and pest control, are also considered
Could ongoing clearing of vegetation for mine facilities and access roads result in habitat fragmentation and related impacts on biodiversity?	Yes	Ensure that these risks are recognized and managed through the EMS
	No	No specific action
Does the method of mining result in large quantities of overburden or waste rock removal, which may either occupy land of importance for biodiversity or cause secondary impacts such as acidic runoff?	Yes	Ensure that mitigation measures are applied to avoid or otherwise manage potential impacts
	No	No specific action
Do mining operations have the potential to adversely impact aquatic, riparian or wetland biodiversity (e.g. through altering hydrologic or hydrogeological regimes?	Yes	Ensure that these aspects are carefully monitored as part of the EMS for the mine or related EMP
	No	No specific action
Have the potential impacts on (and risks to) biodiversity from tailings management been fully considered?	Yes	Ensure that these aspects are carefully monitored as part of the EMS for the mine or related EMP
	No	Ensure that these aspects are carefully assessed and integrated into the EMS for the mine or related EMP
Have opportunities for biodiversity protection or enhancement been explored with the engagement of key stakeholders, and an	Yes	Ensure that these aspects are carefully monitored as part of the EMS for the mine or related EMP
assessment made of external threats to biodiversity?	No	Ensure that opportunities for protection and enhancement are explored, supported by an assessment of external threats to biodiversity

ANNEX *C: CHECKLIST FOR ENSURING THAT BIODIVERSITY PROTECTION AND ENHANCEMENT ARE FACTORED INTO CLOSURE*

The example checklist below provides a basis to ensurethatopportunitiesforre-establishingbiodiversityor conservationenhancementarerealizedduringclosureplanningand implementation. Adapted from the *ICMM Good Practice Guidance for Mining and Biodiversity*.

Issuestoconsider	**Yes / No**	**Comments**
Establishingclosureobjectivesandtargets:Havethefollowingbeen addressed?		
Have all regulatory requirements, including provisions to implement the Convention on Biological Diversity (CBD) been considered?		
Has effective consultation with stakeholders taken place?		
Through the process of consultation and on-going engagement, have competing interests been understood and reconciled?		
Has the available information on biodiversity been considered from an ecosystem perspective?		
Have technical constraints (such as ability to propagate plant species originally present) been factored into the establishment of biodiversity objectives?		
Have the pre-mining land uses (and value of biodiversity) and the extent of biodiversity degradation been considered		
Are the objectives and targets clear on whether the intention is to rehabilitate biodiversity to pre-mining conditions or enhance biodiversity?		
Have the constraints imposed by pre-mining (and post-mining) land tenure been considered?		
Has control of secondary impacts been explicitly considered?		
Have complimentary opportunities for biodiversity improvement been identified, where the company can leverage the commitment and resources of other biodiversity stakeholders to achieve a broader biodiversity benefit?		
Rehabilitationandpollutionpreventionduringclosureimplementation		
Have the potential benefits to biodiversity of alternative post-closure land uses been explicitly considered?		
Have realistic rehabilitation options been identified that do not raise false expectations amongst stakeholders?		
Where re-establishment of native ecosystems through rehabilitation is impractical, have alternative post-closure land uses explicitly considered the potential for compatible measures to enhance biodiversity?		
Have the following been adequately considered: management requirements to sustain conservation values in the longer term; responsibilities for implementation; and funding arrangements?		

ANNEX *D: CHECKLIST FOR STAKEHOLDER ANALYSIS MATRIX IN SUPPORT OF BIODIVERSITY PROTECTION AND ENHANCEMENT*

The example checklist below provides a basis to ascertain abetterunderstandingofhowtoeffectivelyengagewith stakeholdersinthecontextofbiodiversityidentification,assessmentand management. Adapted from the *ICMM Good Practice Guidance for Mining and Biodiversity*.

Questionstoaskstakeholders	**Stakeholders(impact/interest)**		
	Most	**Average**	**Least**
Who will be negatively affected by initiatives or projects aimed at biodiversity protection?			
Who will benefit from such initiatives or projects?			
Who will be responsible for implementing measures to mitigate any negative impacts?			
Whose cooperation, expertise or influence would be helpful to the success of the project?			
Who are the most vulnerable, least visible and most voiceless, for whom special consultation efforts may have to be made (such as critical dependence on on-going access to biodiversity resources)?			
Who supports or opposes the changes that the initiatives or projects will bring?			
Whose opposition could be detrimental to the success of the biodiversity initiatives/projects?			
Who might have resources to contribute?			
Who are the key decision-makers?			

ANNEX E: CHECKLIST FOR STAKEHOLDER ENGAGEMENT TOOLS AND PROCESSES IN SUPPORT OF BIODIVERSITY PROTECTION AND ENHANCEMENT

The example checklist below provides a basis to ascertain abetterunderstandingofhowtoeffectivelyengagewith stakeholdersinthecontextofbiodiversityidentification,assessmentand management. Adapted from the *ICMM Good Practice Guidance for Mining and Biodiversity*.

Issuestoconsider	**Yes / No**	**Comments**
Identificationandanalysisofbiodiversitystakeholders		
Has a systematic attempt been made to identify stakeholders, i.e. to determine who makes use of or affects the management or well-being of biodiversity?		
Have some or all of the following stakeholders been considered/consulted: • national and local government agencies with responsibility for management, conservation or protection of biodiversity? • national and local NGOs with an interest in biodiversity protection (such as Wildlife Trusts, Flora and Fauna Societies and bird watching groups)? • international governmental or nongovernmental organizations (for example, where internationally important protected areas are close to an operation)? • universities and research institutes? • local landowners and other users of natural resources in the vicinity of a project (particularly people who depend in some way on access to biodiversity resources)? • indigenous people with special ties to the land (who may be affected in many developing countries or in countries such as Canada, the United States or Australia)? • community organizations who may have an interest in biodiversity resources (such as angling clubs or fisheries or farming cooperatives)? • other private companies with a commercial interest in biodiversity resources (such as forestry operations)?		
Has an analysis of stakeholders been undertaken to help establish their interests in biodiversity, the extent to which these interests are compatible or in conflict, and the extent to which they might like to be involved in biodiversity protection or enhancement?		
Did the stakeholder analysis (see checklist 6.2) include: • defining the characteristics of key stakeholders? • identifying the interests of stakeholders in relation to biodiversity? • identifying conflicts of interests between stakeholders, to help manage potential sources of tensions during the course of mine development? • identifying relations between stakeholders that may facilitate biodiversity partnerships? • identifying the needs of stakeholders to overcome constraints to their effective participation (such as language needs or traditional consultative mechanisms)? • assessing the capacity of different stakeholder groups to participate in development activities? • assessing appropriate levels of engagement with different stakeholders – for example, informing, consulting or partnering – at different stages of the mining project cycle?		
Didthestakeholderanalysisidentifytheirinterestsinthebiodiversityofanarea and in its conservation or continued usage, and identify the groups or individuals with the strongest and most legitimate claim (key stakeholders)?		
Engagementwithbiodiversitystakeholders		

Was engagement with biodiversity stakeholders initiated early, in particular with indigenous groups and local communities?		
Did early and effective stakeholder engagement take place during exploration and enable mining companies to: • clarify the objectives of a proposed mining activity in terms of community needs and concerns and company commitments to biodiversity? • clarify the objectives of the proposed mining activity in terms of government policy directions, strategic plans and statutory or planning constraints? • identify feasible alternatives and clarify their merits in terms of biodiversity values?		
Did early stakeholder engagement help to ensure the ESIA was focused on matters of concern to stakeholders?		
Did early stakeholder consultation help to elicit valuable information to help develop an understanding of the biodiversity context of operation, or help identify biodiversity threats and opportunities?		
Once preliminary information was gathered, were stakeholders consulted in greater depth to help refine the understanding of biodiversity and the values that stakeholders place on it?		
Were stakeholders involved in participatory planning and decision-making approaches to the choice of mitigation measures or conservation enhancement initiatives?		
Did more in-depth engagement involve stakeholders in the participatory development of closure plans and initiatives to enhance biodiversity protection or conservation?		
As activities progressed towards developing initiatives for biodiversity conservation or enhancement, were stakeholders with the strongest interest in biodiversity encouraged to actively participate?		
Where capacity for engagement in either participatory planning or partnership arrangements was limited, were steps taken to enhance the capacity of local partners for substantive engagement?		
Was a structured approach adopted to assessing the biodiversity conservation capacities and resources available within a mining project area, anticipated future capacity needs and any critical gaps?		

For further information, the *ICMM Good Practice Guidance for Mining and Biodiversity (Chapter 6)* provides a detailed description of the wider stakeholder engagement activities for mining in relation to biodiversity.

ANNEX F: CHECKLIST FOR BIODIVERSITY MITIGATION, REHABILITATION AND ENHANCEMENT TOOLS

The example checklist below provides a basis to ascertain abetterunderstandingofthedistinctionsbetween,andpractical toolsinsupportof,biodiversitymitigation,rehabilitationandenhancement. Adapted from the *ICMM Good Practice Guidance for Mining and Biodiversity*.

Issuestoconsider	Yes / No	Comments
Selectionofmitigationmeasures		
Were mitigation identified and implemented to safeguard biodiversity and any affected stakeholders from potentially adverse impacts of mining, to prevent adverse impacts from occurring or to limit their significance to an acceptable level?		
Didmitigationmeasuresfollowthefollowinghierarchy(indescending orderofpriority): •**Avoiding**impactsbymodifyingaproposedmineorexistingoperationin ordertopreventorlimitapossibleimpact? •**Minimizing**impactsbyimplementingdecisionsoractivitiesthatare designedtoreducetheundesirableimpactsofaproposedactivityon biodiversity? •**Rectifying**impactsbyrehabilitatingorrestoringtheaffected environment? •**Compensating**fortheimpactbyreplacingorprovidingsubstitute resourcesorenvironments(whichshouldbeusedasalastresortand mightincludeoffsets?		
Were the mitigation measures adopted responsive to and commensurate with the significance of potential impacts identified through impact identification and assessment?		
Were mitigation options considered in consultation with affected stakeholders and biodiversity specialists, and did agreed mitigation measures attempt to reconcile the interests of various stakeholders?		
Was the acceptability of mitigation alternatives agreed with the relevant authorities?		
Rehabilitationplanningandimplementation		
Was a rehabilitation plan prepared that was responsive to established closure objectives and targets (see checklist 4.1), and integral to the overall Mining Plan?		
Did the rehabilitation plan clearly explain to regulators and other stakeholders how the company intended to carry out a rehabilitation program to meet agreed objectives?		
Did the rehabilitation plan take into account all relevant information on premining and likely post-mining landforms, soils, waste material characteristics, hydrology, land uses; any technical limitations posed by these; and pre-mining flora and fauna surveys and data from established reference monitoring sites?		

Didtherehabilitationplandescribethefinallanduse(s)andrelated objectivesandtargets,givingdetailsof: •soilandoverburdenmaterialshandling,toensurethatmaterials favourable toplantestablishment,aswellaspotentialproblem materials(suchasacid-generating,highmetallevel,salinesoilsor potentiallydispersivematerial),areplacedinthecorrectsequence? •topsoilhandlingprocedures,especiallythosedesignedtoconserve plantpropagules,nutrientsandsoilbiota? •soilameliorationtechniques tocreateconditionsfavourable forgrowth, suchastheapplicationoflimeorgypsum? •anytechniques forconservingandreusingvegetation,includingmulch, brushmattingforerosionprotectionandintroductionofseedandlog pilesforfaunahabitat? •landscapingprocedures,includingtheconstructionoferosioncontrol andwatermanagementstructures? •vegetationestablishmenttechniques? •weedcontrolmeasuresprior toandfollowingrehabilitation? •fertilizer application? •follow-upplantingandmaintenanceprograms?		
Were the rehabilitation plan provisions time-bound and did they take into account opportunities for progressive rehabilitation and closure?		
Was the rehabilitation plan reviewed periodically as further information on site conditions became available and as new rehabilitation procedures were developed?		
Biodiversityoffsets		
Where permanent destruction of a valuable ecosystem was unavoidable, were offsets considered only as a last resort?		
Were any compensatory protected areas established and were they ecologically similar to the original natural habitat converted or degraded by the project and subject to fewer existing (or anticipated) threats to biodiversity?		
Were compensatory protected areas of equivalent value and no smaller than the original natural habitat converted or degraded by the project?		
Did offsets complement other government/conservation partner programs and were they responsive to conservation priorities outlined in national or regional initiatives to implement the Convention on Biological Diversity?		
Did offsets result in a net gain for biodiversity over time, bearing in mind the timeframes of ecological processes, and was this credibly evaluated by peerreviewed scientific studies?		
Were the offsets enduring – did they offset the impact of the development not only for the period during which the impact occurred, but beyond?		
Were the offsets quantifiable – were the impacts, limitations and benefits reliably estimated?		
Were the offsets targeted – did they offset the impacts on a „like for like or better" basis?		
Were the offsets located appropriately – ideally they should offset impacts within the same area?		
Were the offsets supplementary – were they in addition to existing commitments and not already funded under a separate program?		
Were the offsets enforceable through the development of consent conditions, licence conditions, covenants or a contract?		
In choosing offsets, were biological criteria the primary consideration in preference to mixing threat and biological criteria?		
Were the offsets determined in consultation with stakeholders?		
Were any biodiversity enhancement measures implemented to enhance or improve biodiversity and respond to non-mining-related threats?		

Within the fence-line of an operation, were natural habitats in undisturbed areas managed to enhance their biodiversity value, or habitats that were subject to historical disturbance (unrelated to mining) improved or restored?		
Within the wider concession area, were any similar management approaches pursued and were these linked into existing conservation initiatives or adjoining protected areas?		
Within the area of environmental or social interactions (such as wetlands that may be connected to receiving watercourses for effluents, or communities from which employees are drawn) were possibilities for benefiting biodiversity conservation identified to address non-mining threats to biodiversity?		
Were any practical or advocacy efforts undertaken at a regional or national level in support of biodiversity conservation (e.g. enhancing scientific knowledge of ecosystems or species through ecosystem, habitat or species level studies)?		
Where opportunities for biodiversity enhancement were pursued, were the potential costs of biodiversity gains to stakeholders considered?		
Definingboundariesofresponsibility		
Was an attempt made to define the boundaries of responsibility for mitigation rehabilitation or enhancement?		
Did the company assume responsibility for all aspects of mitigation and rehabilitation within the fence-line, although this does not preclude the involvement of other parties?		
For biodiversity enhancement initiatives in the concession area, was the company"s responsibility commensurate with its direct influence over the management of land?		
For biodiversity enhancement measures within the area of environmental and social interactions, was the extent of environmental and social influence of the project considered (including indirectly affected areas)?		
Linked to the previous point, was the maturity of the conservation context and related factors considered and its influence on key factors such as the intractability of biodiversity threats and the capacity of potential partners?		
Beyond the area of environmental and social interactions, did the company ensure that the primary responsibility for biodiversity protection and enhancement resided with other parties?		
At this wider level, did mining companies limit their activities to a supportive role, such as advocating the case for biodiversity protection or linking to existing or proposed biodiversity initiatives at the regional or national level?		