THE BIODIVERSITY CONSULTANCY

Biodiversity baselines

June 2014

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Summary

Biodiversity baselines are descriptions of biodiversity at a particular starting time. Their development may involve either rapid biodiversity surveys to qualitatively identify risk baselines or initial monitoring surveys to quantitatively measure monitoring baselines against which change can be measured into the future. These are two very different kinds of survey, and each project should carefully choose survey types and methods based on an assessment of project-specific drivers. It is not wise to simply follow previous approaches to baselines: the rapid evolution of regulatory and stakeholder expectations renders many of these out-dated. Biodiversity baselines need to be integrated into high-level project planning and risk management, and might take several years to finalise. Good baselines ensure that the project is best-placed for early management of biodiversity risks.

1 Why measure biodiversity baselines?

Biodiversity baselines describe species, habitats and other biodiversity at a starting time, usually before a project begins. There are two main reasons for wanting biodiversity baselines:

- Rapid biodiversity surveys: geographically extensive but quick searches for project risks, undertaken over the project's area of influence and particularly collecting qualitative presence/absence data for priority biodiversity that might be impacted by a project and may require further assessment, monitoring and/or mitigation.
- Initial monitoring surveys: detailed surveys in selected sample areas for specific biodiversity indicators, threats and/or actions to mitigate these threats, based on best-practice scientific protocols. These are quantitative and repeatable over time to monitor change, and will also occur in 'control' areas to allow identification of changes which occur for non-project reasons.

It is important that a project identifies internal and other stakeholder reasons for wanting biodiversity baselines at an early stage, in order to choose appropriate types and detail of survey. For example, rapid surveys for threatened species may provide useful risk baselines, but are unlikely to provide useful information for future monitoring.

2 What are the drivers for biodiversity baselines?

Poor biodiversity management is a business risk and high-quality biodiversity baselines underpin risk management. Biodiversity baselines need to:

- Meet project needs – many projects are directly dependent on ecosystem services, particularly water, and indirectly dependent on ecosystem services providing for local communities. Ecosystem service baselines require both biodiversity and socio-economic surveys.
- Meet regulators' needs – regulatory, permit and approvals requirements vary, but are generally increasing. Baselines which fail to meet regulators' needs can cause costly project delays while additional baseline fieldwork is undertaken.

- Meet lenders' requirements – many financial institutions have requirements on biodiversity baselines. In particular, International Finance Corporation Performance Standard 6, followed by many lenders (including >75 private financial institutions), has detailed baseline requirements.
- Meet internal corporate standards – many industry leaders have their own corporate standards with specific requirements to manage biodiversity risk
- Meet other stakeholders' expectations – local, national and global stakeholders have increasing expectations on biodiversity management. Baselines which fail to meet these expectations risk negative publicity (risking corporate social licence to operate) and costly project delays.

3 When should biodiversity baselines be developed?

Biodiversity baselines are effective when integrated into project design, rather than retro-fitted onto finalised design. They are best:

- Initiated by desktop assessments at exploration/scoping/order of magnitude stages.
- Obtained (for risk baselines) by fieldwork at scoping/order of magnitude/feasibility stages.
- Leading to assessment and mitigation planning at feasibility/planning stages.
- Developed (for monitoring baselines) at feasibility/planning stages.

Stakeholder expectations are leading to an increasing need for more detailed work and more stakeholder engagement, starting at earlier stages of the project cycle. Baseline surveys often require very early planning as they might have to be undertaken in a certain season, involve busy specialist surveyors or be repeated over several years.

4 What level of detail is expected?

Increasingly, stakeholders expect:

- Comparative surveys over seasons and years, not just a single point in time.
- Coverage of a wider range of species, habitats, sites and ecosystem services.
- Coverage of external and potential project impacts and threats.
- Coverage of the whole potential area of impact, including indirect impacts.
- Quantification.
- Baselines detailed enough to inform mitigation strategies.
- Public sharing of results and implications.

5 Key steps in developing biodiversity baselines

The Biodiversity Consultancy recognises nine main steps in developing baselines:

Identifying drivers and objectives

A project needs to define its drivers clearly. Based on those, a project can identify the type of biodiversity baseline necessary, and thus the appropriate type, timing and level of detail of surveys.

Defining a study area

A project should define a relevant study area based on both potential project activities/impacts and the landscape of relevance to priority biodiversity features. The area is likely to include:

- Direct impact area – including related transport and energy infrastructure, and the area potentially impacted by noise, dust and water emissions (which might include the whole downstream watercourse).
- Indirect impact area – including the secondary/induced impacts caused by people attracted to a project or its new infrastructure.
- Perceived impact area – including any areas of stakeholder concern even where the project anticipates having no impact.
- Control sites – a series of sites with similar habitats, species, human use and non-project impacts to the project impact area, used to measure and monitor a 'counterfactual' reference against which the impact site can be compared.
- Possible offset sites – if a biodiversity offset is likely to be needed.

Some of these areas are likely to be poorly-known when planning the baseline, meaning that it is advantageous to take a precautionary approach and define a large study area rather than having to return to expand the baseline.

Mapping habitats (desk-based)

Habitats are the simplest indicator of varying biodiversity values within a study area. Sometimes the project may be able to purchase or find publicly-available pre-classified habitat GIS layers. In other cases, classification of habitats will have to be conducted by experts using remote-sensing images. Other factors that could usefully be mapped include project impacts, existing infrastructure and human use of the landscape. A habitat map will help scope and plan fieldwork, and will be revised iteratively based on that fieldwork.

Prioritising biodiversity features (desk-based)

It is not necessary, or feasible, to survey all biodiversity. Surveys should focus on 'priority biodiversity features', defined by project drivers/risks (e.g. key stakeholder concerns), and usually include:

- Threatened, restricted and legally-protected species, particularly vertebrates and vascular plants. These include nationally and globally threatened species, restricted-range species and concentrations of migratory or congregatory species.
- Natural habitats – those which are largely native and retain their ecological function and species composition. Modified habitats (e.g. agricultural, plantations and artificial wetlands) are usually excluded unless they retain significant biodiversity value.
- Internationally and nationally recognised areas, including protected areas, Ramsar sites, natural and mixed World Heritage Sites, and Key Biodiversity Areas (including Important Bird Areas), see WCMC's biodiversity A-Z for more detail.

- Ecosystem services – while ecosystem services come from biodiversity, their utilisation is socio-economic, so baseline surveys must be undertaken by both biodiversity and socio-economic experts.

Designing fieldwork methods

Methods need to be agreed by the project, its regulators and its contractors, based on an assessment of regulatory requirements, cost-efficiency and stakeholder expectations. For example, regulations may require general species inventory surveys but, if not, it is more cost-effective to conduct focused surveys for priority species. Vegetation surveys to ground-truth desk-based habitat maps increasingly need to include assessments of habitat 'quality'. Such assessments overlap with assessments of non-project threats, so that project impacts can be differentiated (and assessed within a cumulative context). External threat assessments also help to identify biodiversity offset opportunities. Monitoring baseline surveys need to be quantified, designed in a way that can be repeated long-term and include control sites. Choosing sampling sites and designing surveys to generate statistically meaningful monitoring results is often extremely technically complex and projects are advised to seek specialist advice. Monitoring baseline surveys often fail to produce useful information owing to poor initial design. Biodiversity baseline surveys often require specific experts undertaking fieldwork in certain seasons, repeated over several years. Further guidance, written for carbon project managers but generally applicable, can be found in the report "Building Forest Carbon Projects: Biodiversity Impacts Guidance" also authored by TBC.

Consulting stakeholders

The project can reduce the risk of non-compliance or reputational loss by regularly consulting with key stakeholders. Best practice risk management involves ensuring that there is consensus among project stakeholders on biodiversity priorities and proposed survey methods.

Implementing surveys

Biodiversity baselines often benefit from an iterative or adaptive approach. These allow adequate management of changes to project design and schedule, changes in regulatory and stakeholder expectations, changes in the status of priority biodiversity features and changes in knowledge (including unexpected biodiversity discoveries). To accommodate these potential changes, substantial time and budget contingencies should be allowed when planning biodiversity baselines.

Analysing and communicating

Biodiversity baselines are undertaken to inform risk assessment and adaptive planning of mitigation. In some cases, there will be strong drivers, or even absolute requirements, to avoid areas supporting certain priority features, necessitating revision of plans. Any such conclusions need to be shared internally as soon as possible. Sharing biodiversity data externally is best practice, and will aid transparent positive relationships with conservation organisations and regulators. For example, industry bodies such as the International Commission on Mining and Metals have committed to "disseminate scientific data on and promote practices

and experiences in biodiversity assessment and management". Sharing baseline data is not problematic, but risk assessments based on those data may be complex (e.g. water models). Communication of potential project impacts and consequent risk might thus need to be tailored to external audiences.

Managing data

It is important to archive and manage biodiversity baseline data in an accessible format for reuse, for instance for mitigation planning under different project scenarios or expansion, for ongoing monitoring, or for project divestment. There are numerous examples of baseline data being seen as having a one-off use, and being discarded or lost.