POLICY PERSPECTIVE

The Value of the IUCN Red List for Business Decision-Making

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Abstract

The IUCN Red List of Threatened Species provides assessments of extinction risk for over 80,000 species. It has become an important tool for conservation and for informing natural resource policy and management more broadly. Over the last 10–15 years, the role of the Red List in business decision-making has become increasingly significant. We describe the key business uses of the Red List and their benefits to conservation, focusing on industrial-scale development and supply chains. The Red List is used by business throughout the process of planning and implementing projects, in order to understand and manage potential impacts on biodiversity. It informs screening and impact avoidance, baseline survey design, impact assessment and mitigation, biodiversity action plan development, and offset design and implementation. Business use could be strengthened by recognizing business needs when prioritizing improvements, so as to address specific aspects of consistency and coverage, access, information relevance, and assessment transparency. Finding effective ways to feed relevant business-generated data back into the Red List process would, in turn, strengthen the assessments. The crucial role that the Red List has assumed in good-practice business decision-making represents both a success and an opportunity for the Red List community.

Scope of the Red List

The IUCN Red List of Threatened Species (the Red List) is the most comprehensive resource on the global status of biodiversity. Over the past 20 years it has become increasingly objective, transparent, accurate, and rigorous (Mace *et al.* 2008). Red List categories are assigned against widely reviewed and tested Red List criteria (IUCN 2012a), supported by data on range size, population size and trend, distribution, habitat preferences, altitudinal range, threats, and conservation actions in place or needed (Rodrigues *et al.* 2006). A very wide global network of >10,000 experts provides information, assessment and review, including 140 IUCN-SSC Specialist Groups, Red List Authorities, Task Forces and Subcommittees, and 12 Red List Partner institutions (IUCN 2015). In addition to this, the Red List undergoes a process of independent peer review. Red List Authorities

convene external reviews, the IUCN Red List Programme undertakes consistency checks, and the independently appointed Standards & Petitions Subcommittee adjudicates appeals. These mechanisms are also important for ensuring that the Red List represents an objective perspective and avoids potential conflicts of interest. The Red List thus represents a mechanism for compiling, synthesizing, disseminating, and updating species-related data that would otherwise remain scattered and inaccessible: far more than a simple list of species categorized by extinction risk. It is recognized and used as a crucial network of expertise and a tool for conservation planning, including identification of key biodiversity areas (Eken *et al.* 2004; Dudley *et al.* 2014), monitoring (Young *et al.* 2014; Brooks *et al.* 2015), and decision-making (Meynell 2005; Rodrigues *et al.* 2006). Red List data are freely available online for noncommercial use at www.redlist.org and for commercial use via the Integrated Biodiversity
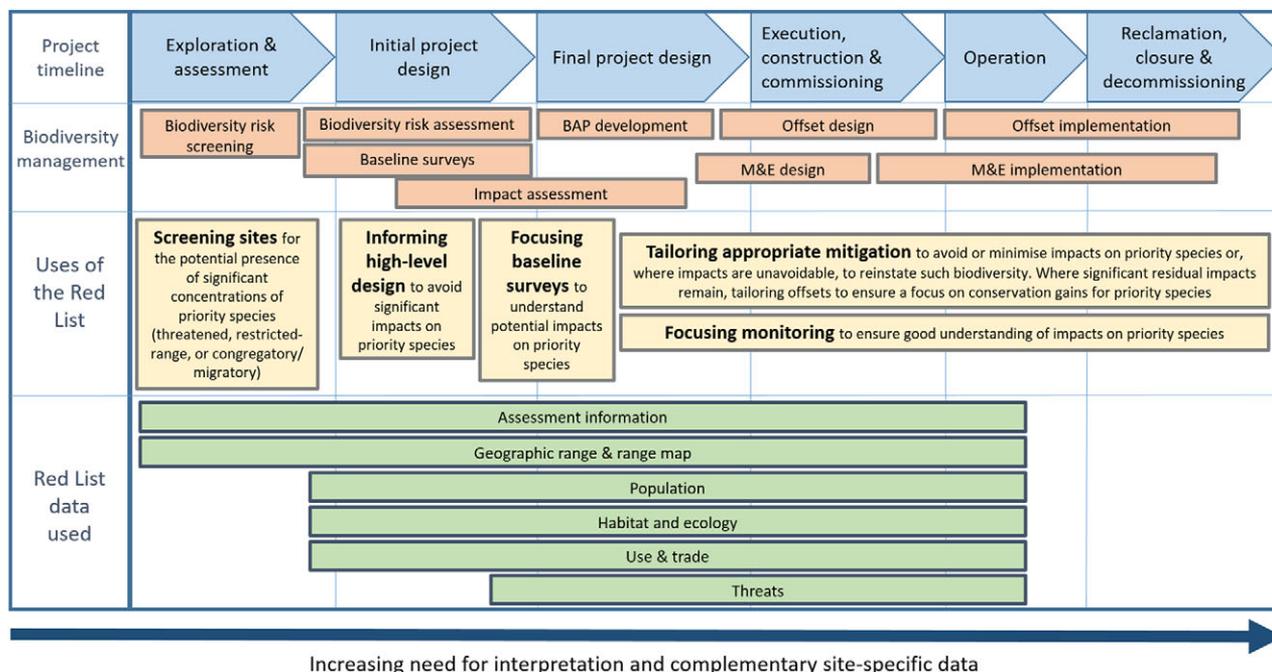
Figure 1 Generalized schematic of the use of the IUCN Red List by large-scale primary and secondary industry.

Assessment Tool (IBAT: www.ibatforbusiness.org), developed by a consortium of conservation groups. Since 2015, IBAT has made available individual species range map polygons (where these exist), in addition to a grid-cell summary of species range information.

Why businesses use the Red List

Though a diversity of businesses may use the Red List, we focus here on those involving commodity supply chains, or industrial-scale operations in agriculture, infrastructure, extractives, or energy. As a global standard, underpinning international goals such as Aichi Target 12 and Sustainable Development Goal 15, the Red List is central to numerous safeguard and sustainability frameworks, e.g., of the Forest Stewardship Council, High Conservation Value network, Roundtable on Sustainable Palm Oil, and multilateral lenders such as the Asian Development Bank (Juffe-Bignoli 2014). Particularly influential is the International Finance Corporation's Performance Standard 6 (IFC PS6) on Biodiversity Conservation and Sustainable Management of Living Natural Resources, one of eight standards used by the IFC to assess and manage environmental and social risks. The IFC, part of the World Bank Group focused on the private sector in developing countries, requires use of the Red List to inform project risks and encourages consultation with IUCN species ex-

perts when managing high risk of negative impacts on biodiversity and associated social, economic, and reputational costs (IFC 2012). On top of the US$22 billion lent each year by IFC, this influence is leveraged to an estimated further US$250 billion (TBC, unpublished data) via voluntary application of PS6 by the Equator Principles Financial Institutions, including 83 signatories accounting for over 70% of international project finance debt in emerging markets (excluding India and China), and 32 OECD export credit agencies (Equator Principles Association 2013; Rainey *et al.* 2014). The revised World Bank's Environment & Social Safeguards (World Bank 2016) indicate that close alignment with PS6 can be expected from public sector financing in future, which may further influence national good practice. Some companies (e.g., Toro Gold and Total) and government agencies (e.g., Canada and Liberia) have already chosen to align with elements of PS6 and similar good practice standards, increasing the reach of the Red List even further (ICMM & IUCN 2013).

Key business uses of the Red List

Red List data can inform decision-making to avoid, minimize, restore, or offset impacts on biodiversity during all stages of major development projects (Figure 1 and Table 1). To inform risk management, the Red List

Table 1 Examples of the use of IUCN Red List data by businesses (only examples with publicly available documents are included; many others are confidential)

Project	Reference	Use of Red List	Examples of key species/subspecies
Akyem Gold Mine, Ghana	(Newmont Golden Ridge Limited 2009)	Planning for biodiversity offset	*Cussonia bancoensis* (VU), Green-tailed Bristlebill *Bleda eximius* (VU), Pel's Flying-squirrel *Anomalurus pelii* (DD)
Ambatovy nickel and cobalt mine, Madagascar	(Von Hase *et al.* 2014)	Informing prioritization of species, avoidance measures (including rerouting of pipeline around Golden Mantella frog breeding site) and offset planning	Diademed Sifaka *Propithecus diadema*, Indri *Indri indri*, Golden Mantella Frog *Mantella aurantiaca* (all CR)
Angola LNG (gas extraction, pipelines, processing)	(IPIECA & OGP 2012)	Identifying and prioritizing species for inclusion in Biodiversity Action Plan	Atlantic Humpback Dolphin *Sousa teuszii* (VU), West African Manatee *Trichechus senegalensis* (VU) Olive Ridley Turtle *Lepidochelys olivacea* (VU)
Cargill Poliplant Group oil palm plantations PT Poliplant Sejahtera and PT Maya Agro Investama, Indonesia	(Daemeter 2015)	Informing high conservation value assessment of the proposed development area	Red Balau *Shorea balangeran* (CR), White Bearded Gibbon *Hylobates albibarbis* (EN)
Corrib Gas, Ireland	(Shell E & P Ireland Limited 2014)	Identifying priority species for assessment, mitigation, and monitoring (using global and national Red Lists)	Sei Whale *Balaenoptera borealis* (EN), Otter *Lutra lutra* (national Red List status: NT)
Oyu Tolgoi copper and gold mine, Mongolia	(TBC & FFI 2012)	Assessing for Critical Habitat, researching prioritization, and designing of mitigation measures	Asiatic Wild Ass *Equus hemionus* (EN), Goitered Gazelle *Gazella subgutturosa* (VU)
Peru LNG pipeline	(Peru LNG 2007)	Identifying priority species for inclusion in a Biodiversity Action Plan	Long-snouted Bat *Platalina genovensium* (NT), *Kageneckia lanceolata* (VU), *Corryocactus quadrangularis* (DD)
QMM mineral sands mine. Madagascar	(Temple *et al.* 2012)	Identifying and prioritizing biodiversity features for loss-gain accounting	Madagascar Heron *Ardea humbloti* (EN), Madagascan Flying Fox *Pteropus rufus* (VU), *Aloe helenae* (CR)
Simandou Project (iron ore mine, railway, and port), Guinea	(Rio Tinto Simfer S.A. 2012; TBC 2015b)	Identifying species of conservation concern for Critical Habitat Assessment and Environmental Impact Assessment of the mine, informing avoidance, and prioritizing further research and monitoring	Western Chimpanzee *Pan troglodytes verus* (CR), Guinea Screeching Frog *Arthroleptis crusculum* (NT), *Raphionacme caerulea* (EN)

criteria are also often applied by expert consultants to nonassessed taxa to provide an indication of threat category. The Red List is also increasingly used to understand and manage biodiversity issues in supply chains and for tracking corporate performance.

1. Screening sites

Before investing in exploration permits or project development, companies often screen areas for "biodiversity risks"—alongside other factors such as social or security risks. Such risks equate closely to potential impacts on biodiversity. Avoid or reducing such risks may have financial costs, but there may be reputational costs if risks are left unmanaged. An investment decision will weigh all project costs and benefits. Very high biodiversity risks may prompt a decision at this stage to avoid investing altogether.

This early stage involves frequent, rapid decisions, particularly within banks considering investments, and funds are usually scarce. The easy availability of spatial data provided by the Red List makes rapid, low-cost, and spatially explicit—albeit imprecise—assessments of the presence of threatened species feasible.

Many companies use IBAT directly, while others integrate Red List and complementary data within their own internal screening systems under license through IBAT. The World Bank Group and IBAT Alliance have developed a customized version of IBAT for project screening.

An increasing focus of screening is "Critical Habitat," a term used in PS6 for areas with high biodiversity value. Red List data are required to determine "habitat of significant importance to Critically Endangered and/or Endangered species," and extremely important in identifying "habitat of significant importance to endemic and/or restricted-range species" and "habitat supporting globally significant concentrations of migratory species and/or congregatory species."

2. Informing high-level design

Opportunities for avoidance of impacts on biodiversity are greatest in the development concept stage, before detailed project design. Transport corridor projects, for instance, may have significant potential to "design out" impacts. The Red List can provide an initial rapid assessment of threatened or other priority species that may occur in an area, and the habitats that support them and are best avoided. Supplementary information may be needed, in particular to assess sites against the quantitative thresholds used in PS6 and similar safeguards. For initial Critical Habitat assessment under PS6, the relatively broad-brush Red List range maps available for most species may need refinement through application of Key Biodiversity Area data, where available, along with

modeling and mapping the extent of suitable habitat, to give more realistic estimates of the percentages of range within a project study area.

3. Focusing baseline surveys

As a project concept is chosen, investment funding becomes available, and an environmental and social impact assessment is planned, companies will frequently contract extensive baseline surveys of environmental and social features, including biodiversity. In our experience, such surveys are very variable in quality and focus, not always effectively advancing knowledge or informing project planning. Survey coverage may be channeled by regulation, but in other circumstances the Red List is invaluable for prioritizing effort. Surveys might be directed to refine knowledge of the distribution and status of priority species known or thought likely to be in a project area, or that are classed as Data Deficient. For PS6, baseline surveys aim to fill gaps in knowledge identified during initial Critical Habitat assessment. Focusing surveys in this way can reduce costs, optimize information gap-filling, and address biodiversity risks more effectively. Through screening, initial project design and baseline surveys, the Red List can help identify priorities for detailed impact assessment and mitigation planning. Red List information helps to highlight existing threats and how these might be exacerbated by project impacts, e.g., unsustainable harvesting of bushmeat species could be worsened by an influx of work-seekers. Red List information on ecology and behaviour may also suggest how potential impacts can be mitigated (e.g., avoiding seismic activity seasonally when a sensitive cetacean species migrates through the project area) or where further assessment of species' sensitivities is needed (e.g., migratory freshwater fish in the context of hydropower dams).

4. Tailoring appropriate mitigation and focusing monitoring

Following impact assessment, a detailed project design is developed. A Biodiversity Action Plan is often developed to capture necessary mitigation actions and plans for their implementation. Biodiversity offsets may also be planned to compensate for any residual biodiversity impacts that remain after avoidance, minimization and restoration have been applied as far as feasible (CSBI & TBC 2015). Monitoring and evaluation plans are needed for both BAPs and offsets. Red List information continues to feed into these planning processes, although additional detailed data will usually be needed too. For example, information on the wider distribution and status of priority species helps selection of potential offset sites (Temple *et al.* 2012). Information on threats and recommended conservation actions, including species

action plans, may inform management interventions and monitoring priorities.

5. Nonfinancial reporting and supply chains

Driven by investor and public concerns, businesses are increasingly adopting "nonfinancial reporting" to provide a fuller picture of business performance and impacts alongside financial accounts (World Business Council for Sustainable Development 2015). The Red List, as one of a handful of global standards for biodiversity assessment, features strongly in nonfinancial reporting frameworks, including The Global Reporting Initiative (GRI 2013; indicator EN-14), the Carbon Disclosure Project (Forests) and the Dow Jones Sustainability Index.

More broadly, nonfinancial assessment is increasingly focused on the concept of "natural capital," including biodiversity (International Integrated Reporting Council 2013; Natural Capital Coalition 2015a). Natural Capital assessment and accounting has many potential applications, but a key interest for many businesses is the understanding and managing risks in supply chains (Natural Capital Coalition 2015b). Methods and metrics for natural capital assessment are still evolving, but the Red List is likely to figure centrally.

National Red Lists

Most conservation planning happens at the local, national, or regional level. In light of this, IUCN developed guidelines to apply the Red List at these smaller scales (IUCN 2012b). Over 100 countries have undertaken national Red List assessments since 2003. Often, both global and national Red List assessments must be considered in Environmental Impact Assessments (e.g., in South Africa; SANBI 2016 and Sweden; Swedish Species Information Centre 2016). IFC PS6 also recognizes national/regional Red List assessments, where these exist, in its criteria for identifying Critical Habitat.

Feedback into the Red List

Businesses not only use the Red List, but themselves often gather substantial species information during baseline surveys, impact assessment, and monitoring. Ideally, these data should also feed back into the Red List (Figure 2). Some companies have contributed important information on priority species back to Red List assessors, e.g., Rio Tinto in Guinea (Cheek 2014) and in Mongolia (Kaczensky *et al.* 2015). Unfortunately, business often regards such data as confidential or is reluctant to incur the costs of sharing them in an appropriate format. Overcoming the barriers that business perceives to data sharing is important to strengthen the information base on which business itself depends (GBIF Secretariat 2015).

Strengthening the Red List's role in business decision-making

The Red List is already an invaluable tool for business, but could be even more effective, with better outcomes for biodiversity, given improvements in some key areas.

1. Consistency and coverage:

   a. *Taxonomic coverage*: Only a small proportion of known species is currently assessed on the Red List (IUCN 2015). The taxonomic coverage (best for vertebrates) is largely congruent with business needs but patchy for some groups, such as bees, that have important roles in ecosystem services provision (Stuart *et al.* 2010).

   b. *Geographic coverage*: Inconsistencies in coverage of biomes are well known (IUCN Red List Committee 2013). Gaps in information for freshwater and marine species are a particular constraint to business decision-making.

   c. *Currency*: Red List information is not always up-to-date. Assessments for some species are updated regularly (e.g., birds and primates), but many plants have not been reassessed since 1998 (IUCN Red List Committee 2013). Out-of-date information can distort true priorities and lead to poor decision-making.

   d. *Consistency and quality of range maps*: Red List maps are based sometimes on extent of occurrence (the overall limits of the range) and sometimes on area of occupancy (the detailed pattern of local presence). This distinction is not always clear. The quality and age of range maps also varies considerably between assessments, and many assessed taxa have no range maps. IUCN and its Red List Partners are refining range maps to show where habitat suitable for a species occurs. This will greatly improve the utility of the maps for business, including for the application of PS6 criteria.

   e. *Depth of information*: The completeness and depth of available information varies substantially geographically and across taxa for assessed species (it is best for temperate regions, and for terrestrial vertebrates; Collen *et al.* 2008; IUCN Red List Committee 2013). Furthermore, species assessed as Least Concern or Near Threatened often have far less detailed accounts than those assessed as threatened. Extinction risk is only one aspect considered during business decision-making: the Red
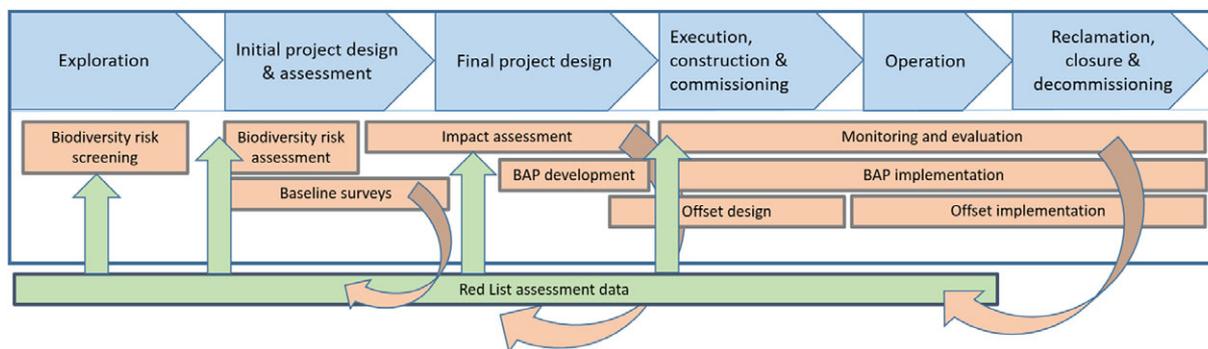
Figure 2 Generalized schematic of where Red List data are used in project management (green arrows) and the feedback that would ideally happen from business and the Red List (orange arrows).

List could usefully enhance coverage or comparability of other relevant aspects (e.g., those referred to in PS6, such as range size, migratory status, significant congregations, or keystone roles in ecosystems).

f. *National Red Lists*: National Red Lists often contain valuable information additional to that in the global Red List (Brito *et al.* 2010), but may not receive the same rigorous review. Their reliability should be evaluated before use for business decision-making.

2. Access

a. *Cost barriers*: The annual cost of maintaining the IUCN Red List is substantial, estimated at US$4.7 million in 2013 (Juffe-Bignoli *et al.* 2016). Red List information is free to use for noncommercial purposes. IUCN's "Policy for Commercial Use of IUCN Biodiversity Data" (IUCN 2012cc) states that commercial users should pay to support the maintenance and currency of these data. This is via the IBAT, which packages together several biodiversity knowledge products, including the Red List, specifically to support implementation of environmental impact assessments and screening of potential projects. In our experience, the cost of accessing IBAT can be a barrier to use of these data, especially for smaller businesses and consultancies, and for low turnover, large footprint sectors like agriculture. The viability of other cost-recovery models, which would support wider access (such as an improved pay-per-view option), merit exploration.

b. *Access to sub-global Red Lists*: National and regional Red Lists are not available via IBAT, and many are not hosted on an easily accessed Web platform.

c. *Language*. The global Red List is in English only, though Web-translation tools are now readily available. The IUCN Species Survival Commission Red List Committee accepts Red List assessments in the three IUCN official languages (French and Spanish as well as English) and exploring this for other languages.

3. Relevance for business use

a. *Information on mitigation*: The Red List often provides information on threats (other than for birds) but rarely on conservation actions that could address these. While mitigation is often very project-specific, general information on relevant approaches can be helpful. For example, the Red List could highlight noise sensitivity in primates and list the key mitigation actions that are routinely taken to avoid such impacts.

b. *Other supplementary information*. Business decision-making would benefit from consistent inclusion and clearer flagging of particularly relevant species attributes, for example, range restriction (including whether Alliance for Zero Extinction status is triggered (Ricketts *et al.* 2005) and migratory status. It would also be valuable to include or link to other species-related information held by IUCN, e.g., contacts for Species Specialist Groups, species action plans, and species-specific guidance from the IUCN Species Survival Commission. However, a Red List assessment cannot cover every aspect of a species' ecology. Other information, and expert interpretation, also need to be brought to bear to inform business decision-making effectively.

4. Transparency of assessment process

Red List assessments increasingly underpin the determination of appropriate types and levels of mitigation

by business. This can have significant financial and so-
cial consequences, so it is important that assessments can
bear close scrutiny. Increased transparency in the pro-
cess of assessments, with clear opportunities for input,
can improve confidence in their robustness. BirdLife In-
ternational's Globally Threatened Bird Forums are exam-
ples. These forums encourage contribution of new data,
obtain expert feedback on proposed status changes, and
alert business to those changes in advance. For example,
forum publication of proposed changes to the status of
several vulture species enabled precautionary consider-
ation of these species (now Critically Endangered) in at
least one West African mining project (TBC 2015a).

5. Avoiding negative uses

In the United States, listing of species under the En-
dangered Species Act has sometimes led to perverse out-
comes, with landowners pre-emptively removing endan-
gered species or damaging their habitats to avoid future
land-use restrictions (e.g., Lueck & Michael 2000; Brook
et al. 2003). The Red List could be open to similar misuse
by business. Improved species mapping, depth of infor-
mation, and data access can reduce this potential problem
by putting the species' presence in the public domain.

Conclusions

Global red lists remain a work in progress (Stuart *et al.*
2010; Juffe-Bignoli *et al.* 2016). Nevertheless, they have
already achieved the original aim of providing the most
comprehensive and scientifically rigorous information
about extinction risk faced by species. In the 50 years
since it was conceived, the Red List has evolved to be-
come a key tool in conservation. Over the last 10–15
years it has also become crucial to good-practice business
decision-making, representing a success and an opportu-
nity for the Red List community. In the medium-term,
conservation outcomes can be further improved by recog-
nizing business needs when prioritizing improvements to
the Red List and finding effective ways to feed business-
generated biodiversity data back into the Red List assess-
ment process.

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