



GUIDELINES FOR APPROPRIATE USES OF IUCN RED LIST DATA

Incorporating, as Annexes, the 1) Guidelines for Reporting on Proportion Threatened (ver. 1.1); 2) Guidelines on Scientific Collecting of Threatened Species (ver. 1.0); and 3) Guidelines for the Appropriate Use of the IUCN Red List by Business (ver. 1.0)

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GUIDELINES FOR APPROPRIATE USES OF RED LIST DATA

The IUCN Red List of Threatened Species™ is the world's most comprehensive data resource on the status of species, containing information and status assessments on over 80,000 species of animals, plants and fungi. As well as measuring the extinction risk faced by each species, the IUCN Red List includes detailed species-specific information on distribution, threats, conservation measures, and other relevant factors. The IUCN Red List of Threatened Species™ is increasingly used by scientists, governments, NGOs, businesses, and civil society for a wide variety of purposes.

These Guidelines are designed to encourage and facilitate the use of IUCN Red List data and information to tackle a broad range of important conservation issues. These Guidelines give a brief introduction to *The IUCN Red List of Threatened Species™* (hereafter called the IUCN Red List), the Red List Categories and Criteria, and the Red List Assessment process, followed by some key facts that all Red List users need to know to maximally take advantage of this resource. More detailed information on the IUCN Red List is available, and references are provided at the end of this document. Finally, these Guidelines include a table giving examples of the wide variety of uses to which IUCN Red List data and information can be utilized, and outlining a few common errors and pitfalls to avoid.

The IUCN Red List of Threatened Species™

The IUCN Red List is jointly developed and managed by the IUCN Global Species Programme, the IUCN Species Survival Commission and the IUCN Red List Partnership. The Red List partners are Arizona State University, BirdLife International, Botanic Gardens Conservation International, Conservation International, NatureServe, Royal Botanic Gardens Kew, Sapienza University of Rome, Texas A&M University, and Zoological Society of London. The IUCN Red List is a searchable online database (www.iucnredlist.org), and users can register to freely download data provided this is for non-commercial use only and in accordance with the IUCN Red List Terms and Conditions of Use.

The IUCN Red List Assessment Process

The IUCN Red List draws on contributions from a network of thousands of scientific experts around the world both within the IUCN community and beyond -- including universities, museums, and NGOs. It uses a scientific process based upon objective criteria. Assessments are impartial, independent, and not politically driven. This approach allows for a robust and rigorous peer review process of all incoming data. Only after the data have been through a transparent and thorough process of peer review, are they added to the database. Assessments are periodically updated to ensure current information is available for users. The IUCN Red List is therefore a synthesis of the best available species knowledge from the top experts.

The IUCN Red List Categories and Criteria

The IUCN Red List Categories and Criteria are the world's most widely used system for gauging the extinction risk faced by species. Each species assessed is assigned to one of eight different Categories (Extinct, Extinct in the Wild, Critically Endangered, Endangered, Vulnerable, Near Threatened and Data Deficient), based on a series of quantitative Criteria (http://www.iucnredlist.org/info/categories_criteria2001). Species classified as Vulnerable, Endangered and Critically Endangered are regarded as 'threatened'. The IUCN Red List Criteria were developed following extensive consultation and testing with experts familiar with all kinds of different species from all over the world, and it can be used to assess any species (apart from microorganisms).

The IUCN Red List of Threatened Species™ – the key facts:

1. The IUCN Red List is much more than just a list – the Red List database includes information on population size and trends, distribution, ecology and habitat preferences, utilization, threats, and conservation measures in place and needed. For an increasingly large number of species on the IUCN Red List, spatial distribution maps (in digital format) are freely available.
2. The IUCN Red List includes more than threatened species and not all threatened species have been assessed; the IUCN Red List provides the threat status of the assessed species and therefore includes information on both threatened and non-threatened species.
3. The sample of species on the IUCN Red List are representative of the state of biodiversity, though not all species have been assessed:
 - a. Between 1.4 – 1.8 million species have been described, yet the estimates of the total number of species on earth range from 2 – 100 million. We are far from knowing the true status of the entire earth's biodiversity.
 - b. There are 82,845 species assessed for inclusion on IUCN Red List version 2016.1.
 - c. This total includes, among others, all known birds, amphibians, mammals, reef-building corals, freshwater crustaceans, sharks and rays, mangroves, seagrasses, cacti, conifers and cycads.
 - d. Only a relatively small proportion of plants, invertebrates, and freshwater and marine species have been assessed to date.
4. IUCN Red List Categories are broad – one Vulnerable species isn't necessarily identical in status to another Vulnerable species. A species can decline (or improve) in status without necessarily changing its Red List Category.

5. Even if species assessments are done using the best available knowledge at the time, species may undergo non-genuine changes in categories across assessment periods for several reasons, including change in taxonomy and the availability of improved knowledge. – Thus, a change in extinction risk between any two assessment periods does not necessarily mean the extinction risk of the species has genuinely changed.
6. The status of a species may be different at the global level and at the local level. In certain situations, a species may be listed as threatened on a national Red List even though it is considered Least Concern at the global level on the IUCN Red List.
7. The Red List Criteria were developed for large-scale assessments; they can be applied to broad-scale regional assessments, but by itself may not be appropriate at very small scales (for more information see the Red List Guidelines (<http://www.iucnredlist.org/documents/RedListGuidelines.pdf>) and Regional Red List Guidelines (http://www.iucnredlist.org/documents/reg_guidelines_en.pdf)).
8. The IUCN Red List of Threatened Species™ is not, on its own, a system for setting conservation priorities. Red List assessments simply measure the relative extinction risk faced by species, subspecies, or subpopulations. To set conservation priorities, additional information must be taken into account.
9. Many Red List assessments include spatial distribution maps. However, these maps generally show current known limits of distribution of a species, accounting for all known, inferred or projected sites of occurrence, including conservation translocations outside native habitat, within historical range. Within these ranges, species may be variably present or absent. Hence, for the purpose of site-based analyses, more detailed information on confirmed presence, such as Key Biodiversity Areas, should be consulted.
10. Red List assessments and criteria for each species reflect the best data available. However, it must be noted that there is a time lag between the collection of data and inclusion of the status of a species on the Red List. Therefore the information on the Red List refers to the time at which supporting data were gathered and not at the time it was published on the Red List.

The IUCN Red List of Threatened Species™ – appropriate and inappropriate uses

The following table gives an indication of the wide variety of uses to which the IUCN Red List (and data contained therein) can be utilized. Some examples of inappropriate applications are also given so that users of these data do not expend unnecessary resources on analyses that may prove to be counterproductive in the conservation arena – these examples should be taken as indicative rather than exhaustive.

Types of Use	Appropriate Uses	Inappropriate Uses
Policy and Legislation		
International/national/sub-national legislation and policy.	<p>Informing the development of:</p> <ul style="list-style-type: none"> • National/regional/sub-national threatened species lists • National Biodiversity Strategies and Action Plans. <p>Using the IUCN Red List Index to determine genuine changes in species status over time.</p>	<p>Automatically linking a legislative response to the inclusion of a species in a particular Red List Category e.g., enacting national law banning all trade of any species that is listed as threatened. Well-regulated trade can contribute positively to the conservation of some threatened species, and may be essential for human livelihoods.</p> <p>For information on IUCN's guidelines on scientific collecting of threatened species see Annex 2.</p>
International agreements.	<p>Guiding or informing decisions in international conventions, including:</p> <ul style="list-style-type: none"> • Convention on Biological Diversity (CBD) • Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) • Ramsar Convention on Wetlands • Convention on the Conservation of Migratory Species of Wild Animals (CMS), including the various CMS Regional Agreements • Fisheries agreements 	<p>Automatically including threatened species on lists without considering the underlying cause of the threat and other relevant factors e.g., including a threatened species on a CITES Appendix when it is not threatened by international trade and does not resemble any species that is threatened by international trade.</p>
Development Planning and Environmental Review		
Regional and national resource management and development.	Guiding the management of natural resources at scales ranging from local to national development policies and legislation (e.g., in the areas of land-use planning, certification,	Relying solely on the global Red List status for local planning (e.g., developing a harvest plan for a local plant population based solely

	transport, energy, river-basin management, poverty reduction strategies).	on the global Red List status).
Site-level planning and Environmental Impact Assessment.	Guiding the site level evaluation, the Red List is a key input for an EIA. Evaluating the possible effects of large-scale, infrastructure development initiatives or assessing project impacts at site level.	Relying solely on Red List information without incorporating site level information e.g. assuming a site can be developed because, according to Red List maps, no threatened species appear to be present. The IUCN Red List can provide broad context, but cannot replace targeted site level investigations.

Conservation Planning

Informing conservation action for individual species.	Using Red List data (including information on habitat requirements, threats that need to be addressed, conservation actions that are recommended, etc.) to identify species that require specific conservation action, and to help determine the conservation measures that are needed.	Relying solely on the Red List Category without incorporating supporting information and/or additional relevant data sources.
Geographic priority setting: site-level, landscape/seascape level; and global level.	<p>Determining site-scale conservation priorities, such as Important Bird Areas, Important Plant Areas, Key Biodiversity Areas, and Alliance for Zero Extinction Sites, which can be used to inform protected areas gap analyses.</p> <p>Informing the conservation of wide-ranging species, and species threatened by broad-scale ecological processes, such as water quality.</p> <p>Informing the identification of global priorities, e.g., Endemic Bird Areas, biodiversity hotspots, etc.</p> <p>Setting geographical priorities for conservation funding, e.g. Global</p>	<p>Misinterpreting range map information presented on the IUCN Red List. It is important to be aware that IUCN Red List maps show species distribution on a broad scale – at the site level they provide a good indication of which species may be present, but this information needs to be verified through site surveys.</p> <p>It is always important to remember that not all species have been assessed.</p>

	Environment Facility System for Transparent Allocation of Resources (STAR) for country allocations.	
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Monitoring and Evaluation

<p>Evaluating the state of biodiversity and monitoring changes in the state of biodiversity.</p> <p>Measuring the effectiveness and impact of conservation activities.</p>	<p>Answering important questions regarding the state of biodiversity, including: the overall status of biodiversity; the varying status of biodiversity between regions, countries and sub-national areas; the rate at which biodiversity is being lost; where biodiversity is being lost most rapidly; and the main drivers of decline and loss of biodiversity.</p> <p>A useful tool for tracking changes in species status over time is the IUCN Red List Index.</p>	<p>Assuming that the IUCN Red List provides a comprehensive picture of all the species that are threatened. So far, only some groups of species have been comprehensively assessed.</p> <p>It is important to recognize that species may change in Red List Category just because better information has become available; a category change does not necessarily mean that the species' status has changed.</p>
<p>Documenting extinction.</p>	<p>Determining extinction rates across globally and comprehensively assessed species groups.</p>	<p>Assuming that the number of Extinct and Extinct in the Wild species on the IUCN Red List represents a comprehensive global list of extinctions. Many extinctions go undocumented, and many species may have gone extinct before they could be formally described. Also, many extinctions took place before 1500 AD, the date from which extinctions are recorded on the IUCN Red List.</p>

Scientific Research

<p>Informing species-specific survey work and ecological studies.</p>	<p>Using data gaps identified in the assessment process (e.g., Data Deficient (DD) species or known data gaps for threatened species)</p>	
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	to guide research and funding opportunities.	
Informing survey work and research into threatening processes across multiple species.	Using Red List data to highlight general overarching threatening processes, including emerging threats.	

Education, Communication and Awareness-raising

Education.	Informing academic work (e.g., school home-work assignments, undergraduate essays and dissertations, etc.).	
Media.	Promoting knowledge of the state of biodiversity, species-conservation issues, species at risk, etc.	
Fund-raising.	Providing a solid factual basis for funding proposals to engage in meaningful conservation work.	

Sources for additional information:

- [IUCN Red List Categories and Criteria](#)
- [RLI documents](#)
- [Red List Guidelines](#)
- [Regional Red List Guidelines](#)

Annex 1

Guidelines for Reporting on Proportion Threatened (Version 1.1) ¹

The uncertainty introduced by Data Deficient species

The true levels of threat we report for the taxa we assess are imperfectly known, because in most groups many species are categorized as Data Deficient (DD), meaning that there is insufficient information currently available to assess their risk of extinction. The uncertainty over the degree of threat to DD species introduces uncertainty to estimates of the proportion of species threatened in the group as a whole. One might expect a high proportion of DD species to be Least Concern (LC) in reality, given that if threats can be inferred from contextual information, this information should be used in assessments (often leading to a non-LC non-DD listing). On the other hand, given that many DD species are likely to have small ranges they might be expected to have an elevated risk of extinction.

Examining the fate of species formerly classified as DD and subsequently re-categorized in a category of threat provides some insight. Among birds, for example, 37 of 58 (64%) DD species that have been re-evaluated over time have been classified as LC or Near Threatened (NT), three (5%) were re-categorized as Endangered (EN), eight (14%) as Vulnerable (VU), with 10 (17%) no longer recognized due to taxonomic revision (Butchart and Bird 2010). Using all the available information on known records, contextual information on habitat condition and plausible threats, and inferences from congeners, Butchart and Bird (2010) posited that of the 63 current DD bird species, three (5%) are likely to prove to be hybrids, subspecies or taxonomically invalid, nine (14%) may be threatened, and 51 (81%) not threatened (NT or LC). In other words, in birds, DD species appear to very roughly have the same fraction of threatened species as data sufficient (i.e., non-DD) species.

However, it is not immediately evident whether this trend will hold in other taxa, particularly in groups with high discovery rates from regions experiencing high threat. Unfortunately, there is currently limited information available to assess this trend in other taxa. However, a reassessment of South African DD amphibians resulted in the reclassification of seven (of a total of eight) species classified as DD in 2004 into other categories: 4 (57%) were assessed as LC, 1 (14%) as NT and 2 (29%) as VU, again roughly the same fraction of threatened species as data sufficient species.

¹ These guidelines apply to taxa that have been completely assessed, or assessed by means of a random sampling approach (Baillie *et al.* 2008). It is not appropriate to report on proportion of species threatened in groups that have not been completely or randomly assessed.

As a result of the uncertainty that Data Deficient species introduce to estimates of proportions of species threatened, we have generally reported three values (not always publicly, but certainly in publications), as follows:

- Lower bound: percentage of threatened species among all species assessed, including Extinct and Extinct in the Wild, i.e., number of threatened species divided by the total number of species assessed $[(CR+EN+VU) / \text{Assessed}]$. This corresponds to the assumption that none of the Data Deficient species is threatened. This may be an intuitive measure for some, but more than likely underestimates risk of extinction.
- Mid-point: percentage of threatened species among those for which threat status could be determined, i.e., number of threatened species divided by the number of data sufficient species² $[(CR+EN+VU) / (\text{Assessed}-DD)]$. This corresponds to the assumption that Data Deficient species have the same fraction of threatened species as data sufficient species. This represents a best estimate, and demonstrates that the true value lies somewhere between the upper and lower bound.
- Upper bound: percentage of threatened or Data Deficient species among those assessed, i.e., number of threatened species plus Data Deficient species, divided by the total number of species assessed $[(CR+EN+VU+DD) / \text{Assessed}]$. This corresponds to the assumption that all of the Data Deficient species are threatened. This is the most pessimistic estimate of extinction risk.

So, for example, based on groups that have been completely assessed, degree of uncertainty regarding the true level of threat is greatest in cartilaginous fishes (range=17-64%; mid-point=33%) and freshwater brachyurans (range=16-65%; mid-point=31%) and least in birds (range=12-13%; mid-point=12%).

Reporting proportion threatened

For academic purposes, we recommend reporting the lower bound, mid-point, and upper bound estimates, with the emphasis (e.g., in the abstract or conclusions) placed on the mid-point value as the main result, provided that this distinction is made clear and qualified (e.g., Schipper *et al.* 2008; Hoffmann *et al.* 2010³). Note further that Extinct (EX) species should now be excluded from all calculations of proportion of species threatened (but NOT Extinct in

² Where “data sufficient” species equates to all non-DD species.

³ Both of these papers contain detailed explanations in their Supplementary Online Material regarding the practice of citing a mid-point estimate framed by a lower and upper bound. Either may, therefore, be used by way of explanation to academic editors of manuscripts who may be unfamiliar with the practice.

the Wild, which can be downlisted). In other words, revised formulas for calculating the lower, mid- and upper bounds are:

Lower bound: $(CR+EN+VU) / (\text{assessed} - EX)$

Mid-point: $(CR+EN+VU) / (\text{assessed} - EX - DD)$

Upper bound: $(CR+EN+VU+DD) / (\text{assessed} - EX)$

For communication purposes, it is appropriate to report the mid-point figure (“xx% of extant species for which sufficient data are available are threatened”) as the best estimate of extinction risk. Its underlying assumption that DD species are equally threatened as data sufficient species appears to be roughly borne out by available evidence from reassessed taxa, although this requires further investigation and may not necessarily hold true. It is essential to specify, in ‘notes to editors’, the mid-point figure, with the lower and upper bound figures as a range; for example, “xx% of extant species are threatened, although the precise figure is uncertain and could lie between xx% (if all DD species are not threatened) and xx% (if all DD species are threatened)”. Reporting proportions as fractions (e.g., one in three or one-quarter) is acceptable, provided that fractions are calculated according to the preceding guidance and using the same proposed language (e.g., *two in five extant amphibians for which sufficient data are available are threatened*).

Emphasis always should be on reporting the proportion “threatened”, but it may be appropriate to report the proportion of “species of elevated conservation concern” where this is defined as $(EW+CR+EN+VU+NT) / (\text{assessed} - DD)$. Use of the terminology “elevated risk of extinction” should be avoided.

Guidelines on reporting extinctions

In addition to reporting the proportion of species in a clade or taxonomic group threatened with extinction, it may also be appropriate to report the number of species documented as being formally Extinct and Extinct in the Wild. For example, “*in addition, xx species are known to have become Extinct since 1500, while yy survive only in captivity and are classified as Extinct in the Wild*”. However, according to the IUCN Guidelines for Using the IUCN Red List Categories and Criteria, “*an evidentiary approach to classifying extinctions is appropriate in order to encourage continuing conservation efforts until there is no reasonable doubt that the last individual of a species has died. However, if assessments of EX or EW are too evidentiary, then extinction rates based on the Red List are likely to be underestimated. To avoid this bias, it is necessary to include 'possibly extinct' species in estimates of numbers of extinct taxa...*” Critically Endangered species tagged as Possibly Extinct (or

Possibly Extinct in the Wild) are those considered likely to be extinct, but for which there remains some reasonable doubt that the last individual (in the wild) has died (Butchart *et al.* 2006). For this reason, we strongly encourage reporting both the confirmed documented number of extinctions as well as the number of species flagged as Possibly Extinct or Possibly Extinct in the Wild (for example, " *in addition, xx species are known (y species) or considered likely (z species) to have become Extinct since 1500, while yy are known or considered likely to survive only in captivity.*

A note on use of the term Red Listed

The use of the term "red-listed" is discouraged owing to ambiguity as to whether this includes Least Concern species or not, given that species assessed as Least Concern are included on the IUCN Red List. To refer to a set of species all of which have assessments on the IUCN Red List, the phrase "assessed for the IUCN Red List" can be used. To refer to threatened (i.e. Critically Endangered, Endangered and Vulnerable) plus Extinct in the Wild and Near Threatened species collectively, the phrase "species of elevated conservation concern" may be used

References

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Schipper, J. *et al.* 2008. The status of the world's land and marine mammals: Diversity, threat, and knowledge. *Science* 322: 225-230.

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Annex 2

Guidelines on the Implementation of the “IUCN Policy Statement on Research Involving Species at Risk of Extinction”⁴, with special reference to Scientific Collecting of Threatened Species (Version 1.0)

The IUCN Policy Statement on Research Involving Species at Risk of Extinction⁵ was approved at the 27th Meeting of IUCN Council, June 1989, and encourages basic and applied research on threatened species that contributes to the likelihood of their survival.

The current guidelines were called for in Resolution 3.013 "The Uses of the IUCN Red List of Threatened Species" of the 3rd World Conservation Congress in Bangkok in 2004, and Resolution 4.015 "Guidelines regarding research and scientific collecting of threatened species" of the 4th World Conservation Congress in Barcelona in 2008. These motions were tabled in response to an awareness that a) some governments are prohibiting the scientific collection of species included in the IUCN Red List and which may, in turn, be detrimental to the conservation of those particular species; and b) that many scientists are increasingly reluctant to provide data to the Red List process, due to the risk that the listing of a species in one of the threat categories will, in some cases, lead to government restrictions on scientific collecting or a requirement for expensive research permits. The current guidelines are, therefore, intended to better guide the development and implementation of legislation in response to the listing of a species by IUCN in a threatened category. They are also intended to promote responsible collecting of threatened species by researchers. These guidelines do not address the specific issue of taking live individuals (both whole organisms and 'living tissues') from the wild for maintenance in ex-situ collections⁶.

The guidelines focus solely on scientific collecting of threatened species (recognizing that such collecting is seldom the cause of the species becoming threatened in the first instance), and are not intended to represent comprehensive IUCN guidelines on the complex topic of collecting in general. These guidelines are developed mindful of the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity, adopted by the Conference of the Parties to the Convention on Biological Diversity at its tenth meeting on 29 October 2010 in Nagoya, Japan⁷. All scientific collecting should take place in accordance with the provisions of the Nagoya Protocol.

⁴ http://intranet.iucn.org/webfiles/doc/SSC/SSCwebsite/Policy_statements/IUCN_Policy_Statement_on_Research_Involving_Species_at_Risk_of_Extinction.pdf

⁵ http://intranet.iucn.org/webfiles/doc/SSC/SSCwebsite/Policy_statements/IUCN_Policy_Statement_on_Research_Involving_Species_at_Risk_of_Extinction.pdf

⁶ A process is currently underway to revise the current IUCN Technical guidelines on the management of ex situ populations for conservation (http://intranet.iucn.org/webfiles/doc/SSC/SSCwebsite/Policy_statements/IUCN_Technical_Guidelines_on_the_Management_of_Ex_situ_populations_for_Conservation.pdf)

⁷ <http://www.cbd.int/abs/>

The IUCN Species Survival Commission recommends that:

1. Research and threatened species. In the spirit of the *IUCN Policy Statement on Research Involving Species at Risk of Extinction* (IUCN, 1989), governments and research institutions should encourage and facilitate research on globally threatened species by competent scientists to enhance understanding of the natural history and conservation needs of these species. Successful conservation programmes focusing on globally threatened species will normally need to be fully integrated with dedicated research programmes on these species, ideally led by scientists from the country or countries where the species occurs. In some cases, such research may require the collection of scientific specimens.

2. Legislative procedures. Blanket prohibitions on research and the collection (including lethal collection) of scientific specimens of globally threatened species can hinder conservation efforts, and it is recommended that governments should avoid imposing them unless essential. Although careful review of any scientific research application is important, complex or time-consuming procedures for issuing research, collecting and (in the case of specimens moving across international borders) export / import⁸ permits may discourage the implementation of such research. Permit-issuing agencies should attach high priority to the timely review of applications related to threatened species. Where appropriate, SSC encourages involving the national conservation community in an advisory role for permit decisions. Conversely, scientists should be aware that many permit-issuing agencies have very limited capacity and resources, and so applicants should understand the process for issuing permits and apply in a timely manner.

3. Non-lethal collecting. Much modern research involves analysis of material collected non-lethally from animals, plants and fungi, including body fluids, faeces, hair, feathers, scales, seeds, roots, and leaves. Governments are encouraged to minimize the administrative burden involved in the issuing of permits for non-lethal samples of species that IUCN has listed as threatened.

4. Responsible collecting. Scientists working on globally threatened species should act responsibly to ensure that their research is either directed towards enhancing the conservation status of the species that they are studying, or providing important information that will assist in the conservation of the species. They should ensure that:

(a) the material they need is not already available in museum or other institutional collections;

⁸ Including export, re-export, import and introduction from the sea

(b) they do not collect more than the minimum number of specimens necessary for the accomplishment of their research;

(c) they use non-lethal sampling methods instead of lethal collecting when the research objectives allow this, and employ preferential collection of post-reproductive individuals (or the life stage with the least reproductive value) when lethal collection is essential for enhancing the survival prospects of the species;

(d) they place all specimens collected in institutions where they can be preserved in perpetuity and be made available to other scientists, thus limiting the need for further collections; and

(e) they submit copies of reports and publications based on their research in a timely manner to permit-issuing agencies.

Several professional societies produce and regularly update guidelines regarding the use and treatment of wild species in research⁹, including scientific collecting, and scientists should consult and comply with these guidelines (and, obviously, any collecting must be in full accordance with the laws and regulations of the country, state, or province where the collecting is being conducted).

5. Small populations. In the case of species listed as Vulnerable under criterion D1 (less than 1,000 mature individuals and stable), or Endangered under criterion C (less than 2,500 mature individuals and declining), scientists should provide evidence to permit-issuing agencies that the number of specimens that they wish to collect lethally is very unlikely to increase the risk of extinction of the species in question, and that the research proposed is essential for assisting in the conservation of the species.

6. Very small populations. In the case of species listed as Critically Endangered under criteria C or D, and as Endangered under criterion D (in all these cases there are less than 250 mature individuals), the lethal collection of scientific specimens (i.e. collections that involve killing of wild individuals within the population) should not normally take place, and should only be permitted when it is clear that the research proposed is demonstrably essential for enhancing the survival prospects of the species.

7. Considerations for species with small populations. In issuing permits for the lethal scientific collection of species listed as Vulnerable under criterion D1, or as Endangered and / or Critically Endangered under criteria C or D, permit-issuing agencies should take into account the cumulative effects of scientific collecting within a generation of the species in question. If a permit has been granted for the lethal collection of scientific material from a

⁹ For example, the "Guidelines of the American Society of Mammalogists for the use of wild mammals in research" (<http://www.mammalsociety.org/uploads/Sikes%20et%20al%202011.pdf>), the "Guidelines for use of live amphibians and reptiles in field and laboratory research" (<http://www.asih.org/files/hacc-final.pdf>) of the American Society of Ichthyologists and Herpetologists, and the Marine Mammal Society's "Guidelines for the treatment of marine mammals in field research" (<http://onlinelibrary.wiley.com/doi/10.1111/j.1748-7692.2008.00279.x/pdf>)

threatened species, the results from that study should preferably be considered before issuing further collection permits for that species.

8. **CITES.** Finally, in instances where scientific collecting of threatened species involves the movement of specimens across international borders, IUCN State members and others are encouraged to make full use of the provisions agreed by CITES Parties to regulate and, where appropriate, facilitate the movement of specimens used in scientific research¹⁰.

¹⁰ Most cross-border movements of CITES-listed specimens will be for purposes which are not primarily commercial in nature. The purpose codes 'G' - Botanical gardens or 'S' - Scientific are likely to be used on CITES permits. Therefore, provided that the specimens have been legally acquired and that the Scientific Authority of the State of export has advised that their export will not be detrimental to the survival of the species, even Appendix I listed species can be imported and exported for scientific purposes. In addition, in the case of the non-commercial loan, donation or exchange of herbarium specimens, other preserved, dried or embedded museum specimens, and live plant material, the text of CITES provides a specific exemption from the CITES standard permitting requirements. Such specimens must be transferred between scientists or scientific institutions registered by a CITES Management Authority of their State and carry a label issued or approved by that Management Authority to be able to benefit from this exemption. The CITES Parties have adopted a resolution on this issue [Resolution Conf. 11.15 (Rev. CoP12)], which encourages scientific research on wild fauna and flora, where it may be of use in conserving species that are threatened with extinction or that may become so, but considers that museum needs for research specimens can also have an adverse impact on small populations of rare animals and plants. The Resolution also contains some standards for scientific institutions which may qualify for registration.

In other Resolutions, CITES Parties have also recommended that, even where entry into trade might otherwise have been considered detrimental to the survival of the species in the wild, international trade in salvaged specimens of Appendix-I and Appendix-II plants be permitted where all of the following conditions are met:

- i) such trade would clearly enhance the survival of the species, albeit not in the wild;
- ii) import is for the purposes of care and propagation of the species; and
- iii) import is by bona fide botanic garden or scientific institution.

Furthermore, the CITES Parties have agreed on the expedited processing of permits and certificates for trade in certain biological samples, where such trade will have a negligible impact, or none, on the conservation of the species concerned, and, the purpose of the transaction is, inter alia, in the interest of the conservation of the species concerned or other species listed in the Appendices. Full details of this provision can be found in Section XII and Annex 4 of Resolution Conf. 12.3 (Rev. CoP13) on Permits and certificates.

Annex 3

Guidelines for the Appropriate Use of the IUCN Red List by Business (Version 1.0)

This guidance summarises how the International Union for Conservation of Nature (IUCN) Red List of Threatened Species (hereafter, the IUCN Red List; www.iucnredlist.org) can help inform business decision-making. It is aimed at environmental managers, consultants, NGOs and regulatory bodies working in all sectors of industry and in finance. The guidance outlines key applications of Red List information, including impact assessment and mitigation planning, and how common pitfalls can be avoided.

I. What is the IUCN Red List?

The primary purpose of the IUCN Red List is to catalogue and highlight species that face global extinction risk. However, despite its name, The IUCN Red List of Threatened Species™ doesn't only include threatened species, but also information on non-threatened species. Currently, the Red List provides assessments of extinction risk for over 80,000 individual species. A Red List assessment uses objective criteria to place each species into one of eight IUCN Red List Categories. The Red List criteria use information such as global population size, rate of population decline, area of geographic distribution, and distribution fragmentation (IUCN 2012).

The Red List Categories (Figure 1) are:

Extinct – no known individuals remaining;

Extinct in the Wild – known only to survive in captivity, or as a naturalized population outside its historic range;

Critically Endangered (CR) – extremely high risk of extinction in the wild

Endangered (EN) – high risk of extinction in the wild

Vulnerable (VU) – medium risk of extinction in the wild;

Near Threatened (NT) – likely to become threatened in the near future;

Least Concern (LC) – lowest risk (but note that many such species may still be declining);

Data Deficient (DD) – not enough data to make an assessment of its risk of extinction.

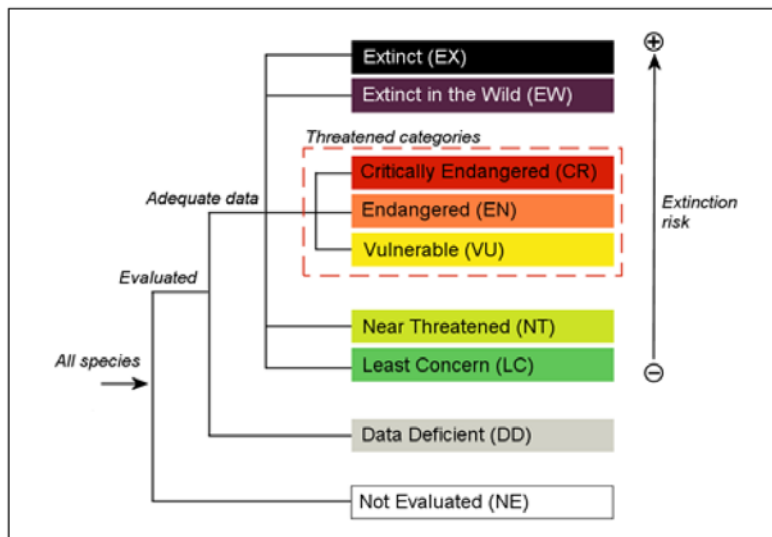


Figure 1. Structure of the IUCN Red List Categories.

Red List assessments include a rationale summarising the assessment, the Red List Category, and supporting data (which may be quite extensive in some cases, less so in others) on species' population size and trend, distribution, habitat preferences, threats and conservation actions in place or needed.

The Red List draws on a global expert network (>10,000 experts) for information, assessment, and review. This includes the IUCN Species Survival Commission and a suite of Red List Partner organisations, co-ordinated by the Red List Unit in the IUCN Secretariat. The individuals or organizations involved in this process are named in the assessment documentation. The Red List website is updated several times per year, with both new assessments as well as with updates to some existing assessments.

The Red List is thus much more than a list of species and threat status. It is an important mechanism for compiling, synthesising, disseminating and updating species-related data.

The Red List is one of a suite of inter-related biodiversity knowledge products that are compiled by a broad range of partners and collaborators, and delivered through IUCN. These also include the Red List of Ecosystems, Protected Planet (powered by the World Database on Protected Areas) and Key Biodiversity Areas (see Appendix I).

II. Accessing the IUCN Red List

The full set of Red List data including species distribution maps can be accessed for commercial use through the Integrated Biodiversity Assessment Tool (IBAT - <https://www.ibatforbusiness.org/>). Note that full acknowledgement and citation (including reference to the version of the IUCN Red List Data used) should be provided; relevant citation details are provided with each dataset.

In addition to the global IUCN Red List, many national and regional Red Lists exist. IUCN has developed guidelines for undertaking species assessments at a sub-global scale. However, national and regional Red List processes are not overseen by IUCN, may or may not follow the IUCN guidelines or even the IUCN Categories and Criteria, and may or may not include or require the same minimum documentation standards as those on the global IUCN Red List. Many national/regional Red Lists are available on the website of the National Red List working group (<http://www.nationalredlist.org/>) or on the Red List website (http://www.iucnredlist.org/about/links#National_Regional_Red_Lists). See Section V for caveats in using information from national/regional Red Lists.

III. Using the IUCN Red List

The IUCN Red List is a key dataset for informing business decisions and reporting, related to biodiversity management.

The Red List can be used to provide information on potential risks and opportunities including:

- **Project-level decision-making** and priority setting (for projects that may impact biodiversity) including screening for potential presence of threatened species, impact avoidance design, baseline survey design, application of the mitigation hierarchy, biodiversity action plan development, offset design and implementation, and monitoring and evaluation.
- **Assessment and reporting** along supply-chains or at business level, including Natural Capital Accounting (e.g. the Natural Capital Protocol (Natural Capital Coalition 2016)).
- **Alignment with environmental standards and safeguards** including government Environmental and Social Impact Assessment (ESIA) policies and financial performance standards (e.g. the International Finance Corporation's Performance Standard 6 (PS6)).

III.1 Project-level decision-making

Red List data can be used to help identify, manage, and reduce the negative impacts of development projects across a range of sectors (e.g. agriculture, infrastructure, extractives, and energy) on biodiversity and ecosystem services. These data can be used in the implementation of the mitigation hierarchy to anticipate and avoid, minimize, rehabilitate or restore, and offset impacts (Figure 2).

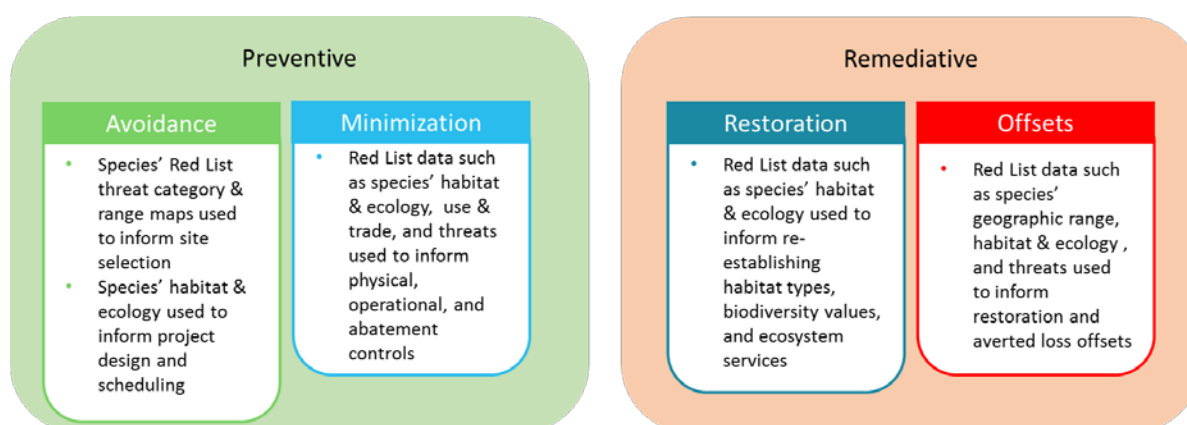


Figure 2. Schematic diagram showing how IUCN Red List data can be used in the implementation of the mitigation hierarchy.

Red List data help inform key stages in project decision-making (Figure 3). These include:

Screening and scoping risk: Before investment in exploration permits or development of projects, companies often screen potential project sites for biodiversity risk, alongside other factors such as social or security risk. The Red List species' range maps and assessment information are valuable for early assessment and identification of potential biodiversity risk, at a stage where up-front avoidance, such as alternative project siting, is still possible. For example, in IFC's PS6, the presence of Endangered or Critically Endangered species may qualify an area as 'Critical Habitat', with specific stipulations for the project. Critical Habitat screening for a project site could use IUCN Red List species range maps to identify if Endangered or Critically Endangered species were likely to be present. Red List information on range size and migratory status can be used to assess qualification under other PS6 criteria. Another example is that the presence of threatened species and ecosystems may qualify an area as High Conservation Value (HCV).

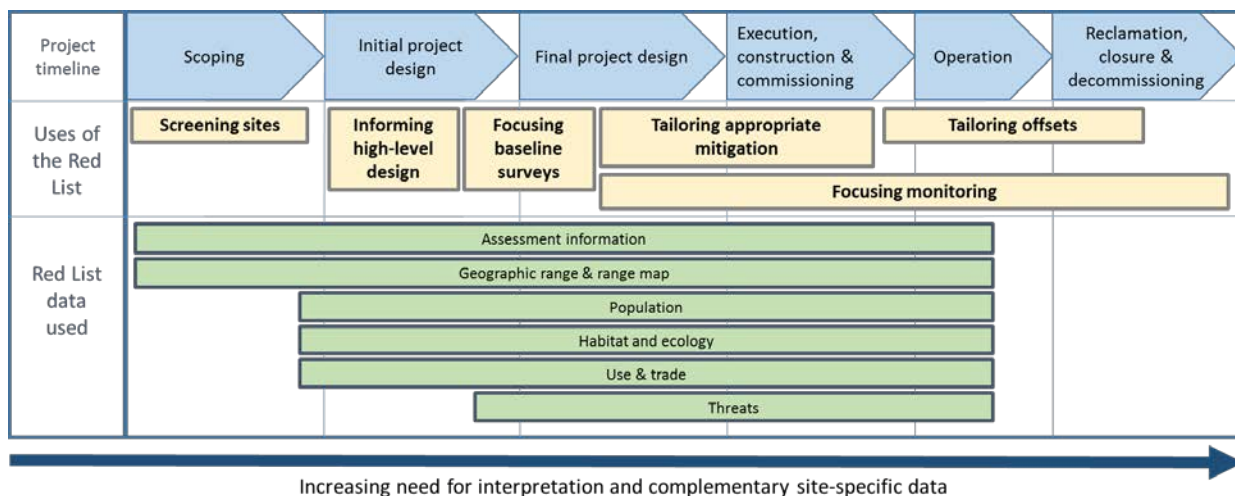


Figure 3. Generalised schematic of the use of the IUCN Red List by industry for project decision-making (may vary per sector). As design and implementation progress, there is likely to be increasing need for site-specific data to be collected and for additional analysis and interpretation of Red List information.

Prioritising and guiding baseline surveys and monitoring: Once a project concept is chosen and investment funding becomes available, an environmental and social impact assessment is required. At this point companies will frequently contract extensive baseline surveys to fill gaps in knowledge identified during initial screening and scoping. The Red List is an invaluable tool for prioritising where biodiversity survey effort will be most effective. Priorities for survey could be

- To refine knowledge of the distribution of threatened or restricted-range species known to be in a project area
- To assess the actual status of species that the Red List indicates might be present
- To improve understanding of the status of species that are classed as Data Deficient (this is not always seen as a task for business but important for a realistic understanding potential risk)

Focusing surveys in this way can reduce costs, optimise filling of data gaps, and address biodiversity risks more effectively.

Screening/scoping and *baseline surveys* inform *initial project design*, which offers the biggest opportunities for avoidance of impacts on priority species identified using the Red

List. For example, this might allow re-routing of planned roads or re-siting of processing plants that would otherwise impact on highly threatened species.

Impact analysis and assessment, mitigation planning: 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 point to 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).

The Red List is a key information source for such assessments, but supplementary information is frequently needed. For instance, to assess against the quantitative thresholds used in PS6 and similar safeguard frameworks, the relatively broad-brush Red List range maps available for most species may need to be refined through modelling and mapping the extent of suitable habitat, using land cover data, and perhaps even refined further through consultation with taxon experts, to give more realistic estimates of the percentages of range covered by the project study area.

Identifying potential offsets: Information on the wider distribution and status of species helps selection of potential offset sites, and in producing standardised metrics such as Units of Global Distribution (based on proportion of global population or range) (Temple *et al.* 2012). Information on threats and recommended conservation actions coming from the Red List may also inform management interventions and priorities for monitoring.

III.2 Business-level decision-making

Driven by investor and public concerns, businesses are increasingly adopting 'non-financial reporting' to provide a fuller picture of business performance and impacts alongside financial accounts. The Red List, as one of a handful of global standards for biodiversity assessment, features strongly in non-financial reporting frameworks, including The Global Reporting Initiative (GRI 2013). Although the Red List is included in these frameworks, it may be more useful to consider reporting on how businesses are impacting on species positively or negatively (for example, species accounting (UNEP-WCMC 2016)) rather than just the overlap with Red Listed species. More broadly, non-financial assessment is increasingly focused on the concept of 'natural capital'. Natural capital assessment and accounting has many potential applications, but a key interest for many businesses is understanding and managing risks in supply chains. Methods and metrics for natural capital assessments are still evolving and the Red List is likely to figure centrally in the biodiversity part of these assessments (Bolt *et al.* 2016). Added to this the Red List Index is listed in the official indicator framework for the 17 Sustainable Development Goals (SDGs). There is on-going

discussion around corporate accountability in the context of private sector contributions to solving sustainable development challenges.

III.3 Environmental standards and safeguards

Environmental standards and safeguards aim to prevent and mitigate undue harm to the environment at the earliest possible planning stages. The growing application of such safeguards reflects rapidly increasing national and international awareness of the need for effective environmental sustainability. The Red List is a key data source for the application of these standards and safeguards (UNEP-WCMC 2011; Table 1)¹¹.

¹¹ UNEP-WCMC (2011) found that the Red List Categories were used in over half of 36 standards assessed. Juffe-Bignoli (2014) also provides numerous examples of how the Red List is used in standards & safeguards.

Table 1. Examples of the use of IUCN Red List data within sustainability frameworks across different business sectors

Standard/safeguard	Red List data use
Agriculture	
Roundtable on Sustainable Palm Oil's (RSPO) Principles and Criteria for the Production of Sustainable Palm Oil (2013)	Used to support determination of the biodiversity value of a forest and requires forest managers to pay particular attention to threatened species (Principle 5.2) ¹²
Forestry	
International Tropical Timber Organisation's (ITTO)/IUCN Guidelines for the Conservation and Sustainable Use of Biodiversity in Tropical Timber Production Forests (2009)	Used to support determination of appropriate management action, based on the presence of threatened species (Principle 2, guidelines 3 and 4)
Forest Stewardship Council (FSC) Forest Management Standards	Used to determine the type of High Conservation Value (HCV) Forests as part of early assessment
International Finance Institutions	
The International Finance Corporation's (IFC) Performance Standard 6 (PS6) on the Biodiversity Conservation and Sustainable Management of Living Natural Resources (2012) ¹³	Used to support determination of the biodiversity value of an area, with stringent requirements for operating in areas that contain significant numbers of threatened species to ensure projects do not lead to a net reduction in their population (paragraphs 16-19); Encourages consultation with IUCN species experts to evaluate unlisted species based on

¹² Threatened species refers to species listed as one of the three threatened categories: 'Critically Endangered' (CR), 'Endangered' (EN) and 'Vulnerable' (VU) on the IUCN Red List. In many cases, the Red List will also be used to assess species that have a restricted range, are endemic to a region or country, are migratory or form congregations.

¹³ Equator Principles Financial Institutions also voluntarily apply PS6.

	Red List criteria (Guidance Note 69 & 78).
European Bank for Reconstruction and Development's Performance Requirement 6 on Biodiversity Conservation and Sustainable Management of Living Natural Resources (2014)	Draws from IFC PS6 guidelines for determining the biodiversity value and implications of operating in an area, based, in part, on the presence of threatened species (paragraphs 14-18).
European Investment Bank's Statement of Environmental and Social Principles and Standards (2009)	Identifies the biodiversity value of an area based, in part, on the presence of threatened species. The bank does not fund project's operating in these areas where there are negative impacts (paragraph 71).
The World Bank's Environmental & Social Safeguards (ESS) (2016)	The revised 2016 ESS aligns closely with IFC PS6 requirements for biodiversity.
Asian Development Bank's Safeguard Policy (2009)	Used to determine the biodiversity value of an area. Projects must not lead to a net reduction to the threatened species for which it was designated (paragraph 28).
Inter-American Development Bank's Environment and Safeguards Compliance Policy (2006)	Used to determine the biodiversity value of an area based, in part, by the presence of habitats crucial for threatened and near-threatened species. The Bank will not support operations that significantly convert or degrade such habitats (clause B9 4.23).

IV. Dynamism in the IUCN Red List

The Red List is subject to change. On an on-going basis, new assessments are added, increasing taxonomic and geographic coverage. New or updated information (including spatial information) is also added to existing assessments. To keep the Red List current, the aim is that every species will be re-assessed at least once each 10 years after which assessments technically are flagged as out of date. However, some species are assessed more frequently.

The threat category assigned to a species may change for several reasons:

- Changing knowledge, as new information becomes available on a species that previously was not available, thereby changing understanding of a species' conservation status
- Changing taxonomy (e.g. taxonomic review may split a species into two or more new species, or lump two or more species together)
- Changing threats: the actual conservation status of a species may deteriorate or improve. This could be because of general or site-specific threats, or because of effective conservation action.

Business decisions that are informed by the Red List may clearly be sensitive to such changes. Where knowledge of a species is poor, or the assessment does not take into account recent new threats, further targeted survey or research work may often be a sound project investment. This can help improve certainty about a species' status. Quite often, poorly-known species turn out to be more widespread and abundant than previously thought, reducing the risks that a project needs to manage.

A number of measures are in place to reduce volatility in the Red List through changing knowledge and taxonomy. These include:

- Rigorous peer and expert review
- Adoption of standard taxonomic references, and critical evaluation of proposed changes
- Training for Red List assessors

At the same time, the Red List remains sensitive to genuine change in species' status through the contributions and expertise contained in its vast support network comprising over 130 Specialist Groups and Red List Authorities, 10,000 members of the IUCN Species Survival Commission, and the Red List Partnership.

V. Steering clear of pitfalls

Valuable as it is, the Red List has limitations and needs careful interpretation. It is advisable to seek expert guidance, e.g. from specialist consultants, when using the Red List to inform decisions.

There are a number of caveats to bear in mind (this is not an exhaustive list):

- **Many species are yet to be assessed:** there are perhaps as many as 1.9 million described species, and only ~82,000 have been assessed as of October 2016. The fact that a species does not appear on the Red List does not mean it may not be threatened with extinction. Red List coverage is best for vertebrates, for temperate regions and for terrestrial species; coverage is still relatively poor, but improving, for freshwater species in Latin America and many parts of Asia, and generally for plants and invertebrates. How up-to-date and comprehensive the information is also varies considerably across species and across taxonomic groups. The Red List aims to include assessments for a more representative set of 160,000 species by 2020.
- **Risk of extinction is only one aspect of conservation priority.** Species may be important to key stakeholders for many other reasons, including because they are seen as flagships or charismatic or because they provide key ecosystem services. Red List species accounts do not always reference these values. Increasingly the assessments do include information on use and trade, and sometimes on ecosystem services provided, although the latter is not consistently documented.
- The criteria should always be used in conjunction with the categories. The criteria are expressed in the syntax after the category (E.g. VU B1ab (iii)). These **criteria can provide important contextual understanding**, especially to understanding why a widespread, long-lived species with relatively large populations might be listed in the same category of threat as a more narrowly distributed species with a small population size.
- **The IUCN Red List global dataset covers global threat status. National or regional conservation status may be as important to many stakeholders**, and national and regional Red Lists can provide detailed and very useful information. However, unlike global Red List assessments, national or regional Red Lists may not be rigorously reviewed, and some may use non-standard criteria. On the other hand, some national Red Lists may be of even higher quality and be more up-to-date than the global Red List assessments. Therefore, the reliability of national or regional Red Lists should be carefully evaluated before use (e.g. their use of peer-review, expert consultation, and application of IUCN criteria)
- **Red List assessments may be scale-dependent.** For example, a species that is listed as Least Concern globally could be assessed as Vulnerable in a particular country or region. Because of the nature of some Red List criteria (e.g. relating to rapid population decline), the reverse is also sometimes true: a species could be listed in a lower threat category nationally/regionally, but listed as threatened globally. Assuming the IUCN Categories and Criteria have been correctly applied, it is usually advisable (and precautionary) to refer to the highest-level threat categorisation.

- **Overlap of a species' range map with the project area does not mean the species definitely occurs in that area.** IUCN Red List maps generally reflect current known limits of distribution of a species, accounting for all known, inferred or projected sites of occurrence. Sometimes, they reflect the detailed pattern of local presence (area of occupancy: AOO). Unfortunately, the distinction between the two is not always clear. The quality and age of range maps also varies considerably between assessments.
- Conversely, **non-overlap of a species' range map with the project area does not mean that the species is definitely absent.** Range extensions are not unlikely for poorly-known species where suitable habitat is present.

VI. Strengthening the IUCN Red List

There is an increasing business demand for comprehensive, reliable and up-to-date biodiversity information to support risk management and sustainability reporting. The Red List provides such information, but itself depends on the extensive sharing of data and expertise. Many data collected by industry during baseline surveys and impact assessments are relevant to the Red List and could contribute greatly to strengthening it. However, such data are often not accessible (because of confidentiality or competition concerns), discoverable (because they are not in public repositories, or have limited documentation) or inter-operable (because they are already aggregated, or do not follow common standards).

More open sharing of data can help avoid major cost inefficiencies for business (e.g. the duplication of survey effort or over-estimation of risk). Every record of a threatened or Data Deficient species available to IUCN Red List authorities improves understanding of the species' true status (and more records most often result in a downgrading of the species' threat status, and lowered company risk). Data availability can help governments and lenders to understand cumulative impacts, conduct strategic impact assessments, and improve spatial planning.

Effective data sharing typically involves submission of species records (at minimum spatial location and date) and relevant meta-data to recognised national or international biodiversity databanks (e.g. the Global Biodiversity Information Facility). Through sharing relevant data, businesses that use the Red List have a great opportunity to strengthen the resource on which they depend, and to improve the information base for effective assessment, management and monitoring of biodiversity. To share such data, the appropriate person to contact is the Red List Authority Coordinator in each taxonomic group. A full directory may be found here: <https://www.iucn.org/ssc-groups>.

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VIII. Acknowledgements

IUCN, SSC and the Red List Partners would like to acknowledge the contribution of The Biodiversity Consultancy in the development of this guidance document.

Appendix I. The IUCN Red List and other global biodiversity knowledge products delivered through IUCN and Partners

Knowledge Product	Notes	Business applications
1 IUCN Red List of Threatened Species	The presence of threatened species is a criterion for identification of Key Biodiversity Areas (#4), which may be strong candidates for formal Protected Area designation (#5)	Outlined in this report.
2 IUCN Red List of Threatened Ecosystems	IUCN has co-ordinated a consultative process to develop criteria for assessing the threat status of ecosystems. These are now being applied to create a global Red List of ecosystems by 2025	Threatened ecosystems feature alongside threatened species in many environmental safeguards, but have not been assessed via a standard framework until recently. The extent of threatened ecosystems and the ranges of threatened species may often overlap, but with incomplete congruence. The two datasets thus provide complementary information.
3 Key Biodiversity Areas	IUCN has co-ordinated a consultative process to develop criteria for defining Key Biodiversity Areas, sites of global significance for the persistence of biodiversity. These criteria draw on the Red Lists of species and ecosystems, among other information. Many KBAs have already been identified using earlier, non-unified criteria, including over 12,000 Important Bird and Biodiversity Areas and nearly 600 Alliance for Zero Extinction sites. Expansion of KBA identification to fill geographic and taxonomic gaps is underway.	KBAs are likely to be of significant concern to stakeholders, and feature in many environmental safeguards (e.g. as Internationally Recognised Areas in IFC PS6). Global KBA data are managed by the Key Biodiversity Areas Partnership through the Key Biodiversity Areas Database and available for commercial use through the IBAT.
4 Protected Planet (<i>powered by the World Database of Protected Areas</i>)	PAs may be set up to protect threatened species, but also for other conservation objectives. IUCN's World Commission on Protected Areas (PAs) recognise six categories of Protected Areas, based on their conservation aims and governance. However, not all countries use the IUCN categories and so all PAs in the	Protected Areas (and particularly those in Categories I, II and III) are likely to be of significant concern to stakeholders, and feature in many environmental safeguards. Global Protected Area data are managed by UNEP-WCMC through the World Database on Protected Areas (WDPA) and available for commercial use through the IBAT.

	database need to be considered in any analyses undertaken. If not protected already, Key Biodiversity Areas are often strong candidates for Protected Area status.	
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