

Guidance Note 6 corresponds to Performance Standard 6. Please also refer to Performance Standards 1–5 and 7–8 as well as their corresponding Guidance Notes for additional information.

Introduction

1. Performance Standard 6 recognizes that protecting and conserving biodiversity, maintaining ecosystem services, and sustainably managing living natural resources are fundamental to sustainable development. The requirements set out in this Performance Standard have been guided by the Convention on Biological Diversity, which defines biodiversity as “the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species, and of ecosystems.”

2. Ecosystem services are the benefits that people, including businesses, derive from ecosystems. Ecosystem services are organized into four types: (i) provisioning services, which are the products people obtain from ecosystems; (ii) regulating services, which are the benefits people obtain from the regulation of ecosystem processes; (iii) cultural services, which are the nonmaterial benefits people obtain from ecosystems; and (iv) supporting services, which are the natural processes that maintain the other services.¹

3. Ecosystem services valued by humans are often underpinned by biodiversity. Impacts on biodiversity can therefore often adversely affect the delivery of ecosystem services. This Performance Standard addresses how clients can sustainably manage and mitigate impacts on biodiversity and ecosystem services throughout the project’s lifecycle.

¹ Examples are as follows: (i) provisioning services may include food, freshwater, timber, fibers, medicinal plants; (ii) regulating services may include surface water purification, carbon storage and sequestration, climate regulation, protection from natural hazards; (iii) cultural services may include natural areas that are sacred sites and areas of importance for recreation and aesthetic enjoyment; and (iv) supporting services may include soil formation, nutrient cycling, primary production.

GN1. The requirements set out in Performance Standard 6 and the interpretation of those requirements provided in this Guidance Note are guided by the Convention on Biological Diversity (CBD), including its Strategic Plan for Biodiversity 2011–2020 and the Aichi Biodiversity Targets.^{GN1} As emphasized by the Biodiversity for Development Program of the CBD, biodiversity loss can result in critical reductions in the goods and services provided by the earth’s ecosystems, all of which contribute to economic prosperity and human development. This is especially relevant in developing countries where natural resource-based livelihoods are often prevalent. It should also be noted that the CBD specifically calls on “business to consider the revised 2012 IFC Performance Standards” in its Decision XI-7, paragraph 2 of the 11th CBD Conference of the Parties-11.

GN2. The definition of ecosystem services provided in paragraph 2 of Performance Standard 6 is derived from the Millennium Ecosystem Assessment.^{GN2} All four categories of ecosystem services (provisioning, regulating, cultural and supporting services) are recognized in this Performance Standard. Performance Standard 6 recognizes that sustainable development cannot be achieved if either biodiversity or ecosystem services are lost or degraded by development efforts. While recognizing that these two dimensions are inextricably linked, Performance Standard 6 provides separate client requirements for biodiversity and ecosystem services. This is in part because biodiversity management involves expertise and scientific knowledge found mainly in the community of practice of ecologists and conservation biologists, while the implementation of assessment, mitigation and management programs for ecosystem services often require

^{GN1} Biodiversity targets for the 2011–2020 Strategic Plan, “Convention on Biological Diversity”, <http://www.cbd.int/decision/cop/?id=12268>.

^{GN2} Millennium Ecosystem Assessment Homepage, “Millennium Ecosystem Assessment”, 2006, <http://www.maweb.org>.

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the expertise of social and other specialists (for example, agronomists, geologists, hydrologists, hydrogeologists, soil and erosion control specialists, and water management specialists) and direct engagement with Affected Communities.

GN3. Biodiversity and ecosystem services are especially relevant to sectors that develop living natural resources as commodities, such as agriculture, forestry, fisheries, and animal husbandry. Sustainable management practices for many such sectors have been codified in internationally recognized standards. For this reason, additional requirements are provided for companies involved in the primary production of living natural resources as commodities.

Objectives

- **To protect and conserve biodiversity.**
- **To maintain the benefits from ecosystem services.**
- **To promote the sustainable management of living natural resources through the adoption of practices that integrate conservation needs and development priorities.**

Scope of Application

4. The applicability of this Performance Standard is established during the environmental and social risks and impacts identification process. The implementation of the actions necessary to meet the requirements of this Performance Standard is managed through the client's Environmental and Social Management System (ESMS), the elements of which are outlined in Performance Standard 1.

5. Based on the risks and impacts identification process, the requirements of this Performance Standard are applied to projects (i) located in modified, natural, and critical habitats; (ii) that potentially impact on or are dependent on ecosystem services over which the client has direct management control or significant influence; or (iii) that include the production of living natural resources (e.g., agriculture, animal husbandry, fisheries, forestry).

GN4. The application of Performance Standard 6 is established during the environmental and social risks and impacts identification process. General client requirements for this process are provided in paragraphs 7–12 of Performance Standard 1, and accompanying guidance is provided in paragraphs GN15–GN28 of Guidance Note 1. The risks and impacts identification process should include scoping of potential issues relating to biodiversity and ecosystem services. Scoping may take the form of an initial desktop analysis and literature review, including a review of regional studies and assessments, and the use of global or regional screening tools, such as the Integrated Biodiversity Assessment Tool (IBAT). Early field reconnaissance and consultation with specialists can also be very useful. Scoping for ecosystem services may also take place through consultation with Affected Communities as part of Stakeholder Engagement requirements outlined in paragraphs 25–33 in Performance Standard 1 and its accompanying guidance (see paragraphs GN91–GN105 in Guidance Note 1).

GN5. The risks and impacts identification process will vary depending on the nature, scale, and location of the project. At a minimum, the client should screen and assess the risks to and potential impacts on biodiversity and ecosystem services in the project's area of influence, taking into account the following: (i) the location and scale of project activities, including those of associated facilities; (ii) its supply chains (as required in paragraph 30 of Performance Standard 6); (iii) the project's proximity to areas of known biodiversity value or areas known to provide ecosystem services; (iv) the types of technology that will be used (for example, underground mining versus open pits, directional drilling and multi-well pads versus high-density single-well pads, air-cooled condensers versus wet-cooling towers, and so forth) and efficiencies of the proposed equipment; and (v) the project's potential to induce impacts by third parties

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(e.g., via new modes of access to remote areas), such as informal settlement or hunting. Performance Standard 6 will not be applicable where there are no known risks to biodiversity or ecosystem services, including risks related to potential knowledge gaps, are identified through screening.

GN6. With respect to ecosystem services, Performance Standard 6 will in most cases apply when the (main) direct beneficiaries of such services are the Affected Communities, as defined in paragraph 1 of Performance Standard 1.^{GN3} Performance Standard 6 will not apply in instances where a client, through its project, does not have direct management control or significant influence over such services—and example would be regulating ecosystem services whose benefits are received on a global scale (for example, local carbon storage that could contribute to mitigation of global climate change). Impacts on this scale are covered as part of the risks and impacts identification process in Performance Standard 1 and some additional guidance is provided in paragraphs GN31–GN35 of its accompanying Guidance Note. Client requirements related to greenhouse gas emissions are described in paragraphs 7 and 8 of Performance Standard 3 and in paragraphs GN16–GN26 of its accompanying Guidance Note.

GN7. Regarding living natural resources, Performance Standard 6 will apply for all projects involved in the primary production of such resources.

Requirements

General

6. The risks and impacts identification process as set out in Performance Standard 1 should consider direct and indirect project-related impacts on biodiversity and ecosystem services and identify any significant residual impacts. This process will consider relevant threats to biodiversity and ecosystem services, especially focusing on habitat loss, degradation and fragmentation, invasive alien species, overexploitation, hydrological changes, nutrient loading, and pollution. It will also take into account the differing values attached to biodiversity and ecosystem services by Affected Communities and, where appropriate, other stakeholders. Where paragraphs 13–19 are applicable, the client should consider project-related impacts across the potentially affected landscape or seascape.

7. As a matter of priority, the client should seek to avoid impacts on biodiversity and ecosystem services. When avoidance of impacts is not possible, measures to minimize impacts and restore biodiversity and ecosystem services should be implemented. Given the complexity in predicting project impacts on biodiversity and ecosystem services over the long term, the client should adopt a practice of adaptive management in which the implementation of mitigation and management measures are responsive to changing conditions and the results of monitoring throughout the project's lifecycle.

8. Where paragraphs 13–15 are applicable, the client will retain competent professionals to assist in conducting the risks and impacts identification process. Where paragraphs 16–19 are applicable, the client should retain external experts with appropriate regional experience to assist in the development of a mitigation hierarchy that complies with this Performance Standard and to verify the implementation of those measures.

GN8. Paragraphs 6–8 of Performance Standard 6 refer to the completeness of the risks and impacts identification process once it has been determined that Performance Standard 6 applies to a project. The risks and impacts identification process may take the form of an environmental and social impact assessment (ESIA) and should be ongoing as part of the Environmental and Social Management System (ESMS). The scope of the assessment will depend on the nature and scale of the project and sensitivities

^{GN3} Further guidance on this definition is provided in paragraph GN92 of Guidance Note 1.

in terms of biodiversity attributes and ecosystem services. Clients should refer to good practice guidelines and other reference documents on biodiversity baselines, impact assessment, and management. With respect to ecosystem services, clients should refer to paragraphs GN106–GN122 of this Guidance Note, which provide guidance on the systematic assessment of ecosystem services.

GN9. As part of the ESIA, baseline studies should be conducted for the relevant biodiversity attributes and ecosystem services. Baseline studies should comprise some combination of literature review, stakeholder engagement and consultation, field surveys, and other relevant assessments. The requirements for the baseline study will vary depending on the nature and scale of the project. For sites with potentially significant impacts on natural and critical habitats and ecosystem services, the baseline should include field surveys over multiple seasons, to be undertaken by competent professionals and with the involvement of external experts, as necessary. Field surveys and assessments should be recent, and data should be acquired for the direct project footprint, including related and associated facilities, the project's area of influence, and potentially beyond (see paragraph GN58 of this note).

GN10. Baseline studies should be informed by a literature review and initial desktop analysis. The extent of the literature review will depend on the sensitivity of the biodiversity attributes associated with the project's area of influence and the ecosystem services that may be affected. Literature reviews could include sources such as (i) peer-reviewed journals, (ii) regional assessments, (iii) national or regional planning documents (for example, the National Biodiversity Strategy and Action Plan and Local Biodiversity Action Plans), (iv) existing assessments and studies in the location of the project and its area of influence, (v) web-based data such as information provided in the International Union for Conservation of Nature (IUCN) *Red List of Threatened Species*, (vi) national Red Books and Lists, (vii) landscape prioritization schemes including Key Biodiversity Areas, (viii) systematic conservation planning assessments and plans, and (ix) masters and doctoral theses, among others.

GN11. Depending on the nature, scale, and location of the project, existing spatial data and landscape mapping may form part of the initial desktop analysis. This is important for projects located in any habitat—modified, natural, or critical—or areas where Affected Communities are highly dependent on ecosystem services. This initial analysis should draw on land-classification and land-use maps, satellite imagery or aerial photographs, vegetation type and ecosystem maps, and topographical and hydrological mapping, such as mapping of watersheds and interfluvial zones. Numerous regional ecosystem mapping efforts have been completed or are currently underway by academic and governmental institutions, intergovernmental organizations, and nongovernmental organizations (NGOs). This information can directly inform the ESIA and any related assessments of landscape integrity, resource development and management analyses, ecosystem services valuations, and reporting and prediction of environmental trends.

GN12. Stakeholder engagement and consultation is one of the key means to understanding biodiversity related impacts and identifying appropriate mitigation responses. The ESIA or any follow-up biodiversity or ecosystem services-related assessment will be expected to take into account the differing values attached to biodiversity and ecosystem services by Affected Communities. This includes values assigned by the IUCN *Red List of Threatened Species* and national listings. Performance Standard 7 includes requirements for projects that may affect ecosystem services of relevance to indigenous peoples.^{GN4} For ecosystem services, this process will form part of the systematic assessment described in paragraphs GN106–GN122 of this note. The client should consider the differing values attached to particular biodiversity attributes by relevant local, national, and international stakeholders. Stakeholders that should be consulted include Affected Communities, governmental officials, academic and research institutions, recognized external experts for the biodiversity attributes of concern, and national and international conservation NGOs, as

^{GN4} See Performance Standard 7 and Guidance Note 7 for requirements for indigenous peoples.

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appropriate. Together, the literature review, stakeholder engagement and consultation, and field surveys and assessments should establish a core set of *biodiversity values*—and the ecological features, functions, and processes that support them—to be addressed in the impact analysis and the definition of mitigation and management measures.

GN13. For some projects, biodiversity values and ecosystem services associated with a site might be numerous, and, in these cases, it is recommended that clients undertake a prioritization of such features. One potential way biodiversity and ecosystem services can be prioritized is along two axes: (i) the number of spatial options left where conservation can occur (that is, spatial limitation or the feature's *irreplaceability*); and (ii) the time available for conservation to occur before the feature is lost (that is, temporal limitation as caused by threats to the feature in question, which will provide an understanding of its *vulnerability*). For example, a particular forest may provide a type of fiber or medicinal plant found nowhere else, a low ridge in the land may provide singular flood control, a species may be endemic to a single site, or an ecosystem may be singular in the landscape. These are all spatially limited biodiversity values and ecosystem services in that they are relatively irreplaceable in the landscape. The concept of threat or vulnerability is equally applicable: the rate of deforestation or other type of ecosystem loss or the probability of a species being lost in a defined time as measured by lists of threatened species such as that of IUCN are examples of time limitations or threats. The relative importance with respect to conserving the feature as part of project operations could therefore be determined by its status in terms of these two axes: its *irreplaceability* in the landscape / seascape and its *vulnerability* in being able to remain there.

GN14. Paragraph 6 of Performance Standard 6 lists a number of threats to biodiversity and ecosystem services that the client should consider as part of the ESIA and its ESMS. Other threats may also be considered depending on the regional and/or local contexts. The client should provide an accurate account of threats, including regional level threats that are relevant to the project site and its area of influence. The client should describe any preexisting threats and the extent to which the project might exacerbate them. An analysis of threats should be used to inform the impact assessment. For example, if bushmeat hunting, wildlife trade, or timber extraction is ongoing, would project-induced access further this situation?

GN15. The ESIA should spell out project-related direct, indirect, and residual impacts on species, ecosystems, and ecosystem services identified in the baseline studies. Direct impacts might include (i) disturbance or reduction in species' populations or their habitats (for example, from wind turbine collisions, road kill, or results from noise, light, and land or shipping traffic); (ii) effects from emissions and effluents, (iii) alterations of surface hydrology, land forms, and coastal processes, (iv) competition by invasive species, edge effects, and barriers to dispersal, and (v) reduced access to ecosystem services, including loss or degradation. Indirect impacts might include project-induced access by third parties, in-migration and associated impacts on resource use, including land conversion, hunting and wildlife trade, and spread of invasive alien species. Mitigation and management measures should then be defined to address adverse impacts to biodiversity or ecosystem services. As mentioned in Performance Standard 1, residual impacts are those that might remain after measures are taken to avoid and minimize impacts on biodiversity and ecosystem services and/or to restore viability. It should be noted that a reliable determination of residual impacts on biodiversity needs to take into account uncertainties in the effectiveness of proposed mitigation measures. This is especially relevant with respect to the client's ability to ensure adequate restoration of biodiversity and ecosystem services. Where there is significant uncertainty, the client should take a conservative approach in ascertaining the significance of residual impacts. Regarding cumulative impacts, the client is responsible for considering such impacts in line with paragraph 8 of Performance Standard 1 and described in its accompanying Guidance Note.

GN16. Clients are expected to fully exercise the mitigation hierarchy, which is defined in the "Objectives" section of Performance Standard 1 and is further elaborated in paragraph 7 of Performance Standard 6

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and in this paragraph (GN16). Performance Standard 6 places considerable emphasis on the avoidance of impacts on biodiversity and ecosystem services. This is reflected in the first sentence of paragraph 7 of Performance Standard 6. Avoidance of impacts is sometimes the only means to prevent irreplaceable loss of biodiversity and associated ecosystem services; the emphasis on avoidance in the mitigation hierarchy should thus be proportional to the irreplaceability and vulnerability of the affected biodiversity and/or ecosystem service as described in paragraph GN13 of this note. In order to implement the mitigation hierarchy with respect to Performance Standard 6, an assessment of the project's area of influence within the existing landscape, including associated facilities, can inform the identification, screening, and design of alternatives as a form of avoidance. Alternatives may include variations in the layout of project facilities, alternative engineering and manufacturing processes and construction practices, selection of different sites or routing of linear facilities, and selection of alternative suppliers through screening to identify those with appropriate environmental and/or social risk-management systems. Second, once the preferred alternatives have been chosen, minimization of impacts may be possible through (i) design of drainage systems, (ii) construction methods (for example, to reduce dust and noise), (iii) the pattern of vegetation clearance, (iv) selection of different pollution abatement treatments, (v) implementation of erosion and sedimentation control measures, (vi) construction of wildlife thruways (for example, trench plugs or bridges in the case of linear infrastructure) and (vii) the layout of infrastructure. Minimization measures are elaborated on in paragraph GN42 of this note with respect to natural habitats. Third, where disturbance to biodiversity and ecosystem services has occurred, remediation may be possible in the form of rehabilitation and restoration.^{GN5} This may include vegetation rehabilitation (erosion control and facilitated natural regeneration of ecosystems); restoration of the original habitat type (where appropriate techniques are known or can be developed); and restoration of major ecosystem services, such as facilitated watercourse flow with dewatering water in the case of mining operations. Mitigations should be designed or reviewed by appropriate biodiversity and engineering specialists to ensure that mitigation has been optimized in accordance with the hierarchy. To compensate for significant residual impacts on biodiversity, and only after the prior steps in the mitigation hierarchy have been assessed and, where possible, undertaken, the client may consider the use of biodiversity offsets.

GN17. As stated in paragraph 6 of Performance Standard 6, in natural and critical habitats, clients should consider project-related impacts across the potentially affected landscape or seascape. Note that the term *landscape* includes freshwater aquatic habitats that exist within the overall landscape. The term *landscape/seascape* in this note does not necessarily correspond to a predefined unit of geographical space. It is a broadly defined term that might correspond to an ecoregion, a biome, or any other ecologically significant unit of space on a regional level (that is, not site-specific). In some cases, the landscape/seascape unit might be defined in terms of an administrative or territorial boundary or a particular zoned area within international waters. The intention of the requirement is that clients identify project-related impacts, especially those on habitat connectivity and/or on downstream catchment areas, outside the boundaries of the project site. Landscape/seascape analysis is a fundamental step in determining ecologically appropriate mitigation options that align with broader conservation efforts in the region. Such analyses support decision making as to whether impacts should be avoided or are appropriate for offsets and support the selection and design of a mitigation strategy, including offset mitigation, that contributes to regional-level conservation goals rather than solely site-level impacts. Landscape/seascape analysis does not necessarily imply field data collection outside the project site. Desktop assessment, including mapping

^{GN5} Rehabilitation is defined as the stabilization of the terrain, insurance of public safety, aesthetic improvement, and return of the land to what, within the regional context, is considered to be a useful purpose. Revegetation may entail the establishment of only one or a few species. Rehabilitation is used interchangeably with the term *reclamation* in this Guidance Note. Restoration is defined as the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed. An ecosystem has recovered when it contains sufficient biotic and abiotic resources to continue its development without further assistance or subsidy. It would sustain itself structurally and functionally, demonstrate resilience to normal ranges of environmental stress and disturbance, and interact with contiguous ecosystems in terms of biotic and abiotic flows and cultural interactions.

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exercises and consultation with regional specialists, can help the client understand its area of influence in the context of the greater landscape/seascape. This type of analysis is especially important in preventing the degradation and fragmentation of natural habitat, especially from cumulative impacts. For example, the effects of a wind farm may be viewed quite differently when assessed in a larger landscape context where there are multiple wind farms affecting the same bird population.

GN18. Large-scale and complex projects that involve significant risks and impacts across multiple biodiversity values and ecosystem services would benefit from applying an *ecosystem approach* to understanding the environment in which the project is located. As described by the Convention on Biological Diversity, the ecosystem approach is “a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way.” The CBD defines “ecosystem” as a “dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit.” This definition does not specify any particular spatial unit or scale. Instead, the CBD advises that scale of analysis and action should be determined by the problem being addressed. Performance Standard 6 also takes a similar approach when defining *habitats*.

GN19. The ecosystem approach focuses on the relationship between components and processes in an ecosystem. It acknowledges that the many components of biodiversity control the stores and flows of energy, water, and nutrients within ecosystems, which provide resistance to major perturbations. Knowledge of ecosystem structure and function contributes to an understanding of ecosystem resilience and the effects of biodiversity loss and habitat fragmentation. The ecosystem approach acknowledges that functional biodiversity in ecosystems provides many goods and services of economic and social importance (that is, ecosystem services). This approach should be considered when developing the risks and impacts identification process, which often analyzes impacts in isolation from one another and prescribes mitigation measures in the same manner. Clients should consider implementing integrated, innovative, and real-time approaches to assessing the *socioecological* environment, especially for large-scale and complex projects with significant unique, multiple, and/or diverse environmental and/or social impacts.

GN20. Performance Standard 6 uses the term *adaptive management* to mean a practical approach to managing uncertainty in biodiversity mitigation and management planning. As is often the case in determining the risks to and impacts on biodiversity and ecosystem services, data gaps may exist even after sometimes lengthy data collection and completion of the ESIA or additional studies. The client’s mitigation strategy should be commensurate with the project’s risks and impacts to ensure that the requirements of Performance Standard 6 are met and should take a risk-averse approach that explicitly identifies and accommodates uncertainty about outcomes of mitigation measures. Flexibility should be built into the client’s ESMS so that the mitigation and management approach can be adapted according to its performance over time. Adaptive management is not a trial-and-error process, however, but rather a structured “learning by doing” approach. Monitoring plans should define performance thresholds or triggers for adapting mitigation and management so that they achieve the requirements of Performance Standard 6. It is recommended that adaptive responses to such triggers be predefined in the ESMS, while acknowledging that those mitigation and management options may change over time due to knowledge gained through experience or changing conditions. New findings may arise from the client’s monitoring program or from independent sources. In either case, the client has the responsibility to update its approach to integrate these findings and to continually improve on the existing management of biodiversity, ecosystem services, and living natural resources.

GN21. Clients are responsible for identifying competent professionals to identify biodiversity values and ecosystem services and propose appropriate mitigation options. The range of specialists is wide, and the needed skillsets will vary. For example, ecologists with regionally specific experience, biologists with expertise in a specific taxon, and evolutionary or landscape biologists might be suitable for the identification

of certain biodiversity values. Biodiversity management specialists who are familiar with the relevant industry (for example, extractive industries, hydropower, wind power, forestry, fisheries, and agribusiness) will bring a different skillset in terms of identifying mitigation options in line with current good international practices in the sector. Specialists in wildlife trade are useful in areas where this is a concern. A single project may need to work with various specialists to adequately characterize its environment and a mitigation strategy. Ecosystem services assessment may require several specialists, depending on the service in question: for example, soil and erosion control specialists, geologists and hydrologists, agronomists, rangeland ecologists, specialists in the economic valuation of natural resources, and resettlement and social specialists with expertise in natural resource-based livelihood.

GN22. For projects located in critical habitats (including legally protected and internationally recognized areas), clients must ensure that external experts with regional experience are involved in the biodiversity and/or critical habitat assessment. If habitat is critical due to the presence of critically endangered or endangered species, recognized species specialists must be involved (for example, including individuals from IUCN Species Survival Commission Specialist Groups). In areas of critical habitat, clients will benefit from establishing a mechanism for external review of the project's risks and impacts identification process and proposed mitigation strategy. This is especially relevant where uncertainty is high, where potential impacts are complex and/or controversial, and/or where no precedent exists for proposed mitigations (such as some types of offsets). Such a mechanism would also promote the sharing of good international practice between projects and improve transparency in decision making.

GN23. Clients are encouraged to develop partnerships with recognized and credible conservation organizations and/or academic institutes. This is especially relevant with respect to potential developments in natural or critical habitat. Partnering organizations may bring regional experience in biodiversity conservation that clients lack. Partnering organizations may be helpful in identifying species specialists, undertaking field surveys, advising on management plans, conducting biodiversity monitoring programs, advising on Biodiversity Action Plans (BAPs) and managing relations with civil society groups and other local stakeholders.

Protection and Conservation of Biodiversity

9. Habitat is defined as a terrestrial, freshwater, or marine geographical unit or airway that supports assemblages of living organisms and their interactions with the non-living environment. For the purposes of implementation of this Performance Standard, habitats are divided into modified, natural, and critical. Critical habitats are a subset of modified or natural habitats.

10. For the protection and conservation of biodiversity, the mitigation hierarchy includes biodiversity offsets, which may be considered only after appropriate avoidance, minimization, and restoration measures have been applied.² A biodiversity offset should be designed and implemented to achieve measurable conservation outcomes³ that can reasonably be expected to result in no net loss and preferably a net gain of biodiversity; however, a net gain is required in critical habitats. The design of a biodiversity offset must adhere to the "like-for-like or better" principle⁴ and must be carried out in alignment with best available information and current practices. When a client is considering the development of an offset as part of the mitigation strategy, external experts with knowledge in offset design and implementation must be involved.

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² Biodiversity offsets are measurable conservation outcomes resulting from actions designed to compensate for significant residual adverse biodiversity impacts arising from project development and persisting after appropriate avoidance, minimization and restoration measures have been taken.

³ Measurable conservation outcomes for biodiversity must be demonstrated in situ (on-the-ground) and on an appropriate geographic scale (e.g., local, landscape-level, national, regional).

⁴ The principle of “like-for-like or better” indicates that biodiversity offsets must be designed to conserve the same biodiversity values that are being impacted by the project (an “in-kind” offset). In certain situations, however, areas of biodiversity to be impacted by the project may be neither a national nor a local priority, and there may be other areas of biodiversity with like values that are a higher priority for conservation and sustainable use and under imminent threat or need of protection or effective management. In these situations, it may be appropriate to consider an “out-of-kind” offset that involves “trading up” (i.e., where the offset targets biodiversity of higher priority than that affected by the project) that will, for critical habitats, meet the requirements of paragraph 17 of this Performance Standard.

GN24. In developing requirements for biodiversity, Performance Standard 6 is guided by and supports the implementation of applicable international law and conventions, including the following:

- The Convention on Biological Diversity, 1992
- The Convention on the Conservation of Migratory Species of Wild Animals, 1979 (Bonn Convention)
- The Convention on International Trade in Endangered Species of Wild Flora and Fauna, 1975
- The Convention on Wetlands of International Importance especially as Waterfowl Habitat, 1971 (Ramsar Convention)
- The Convention Concerning the Protection of World Cultural and Natural Heritage, 1972 (UNESCO World Heritage Convention)

GN25. Numerous good practice guidelines on integrating biodiversity into impact assessment and on biodiversity management exist. Clients should make use of such reference documents when project-related impacts on biodiversity are expected. Extensive regional and sector-specific guidance and case studies are widely available. Academic journals dedicated to environmental impact assessment are another source of information.

GN26. Paragraph 9 of Performance Standard 6 purposely provides a broad definition of habitats as geographical units (that include marine and freshwater aquatic areas as well as airway passages), which is clearly a departure from a classic ecological definition of habitat (i.e., the place or type of site where an organism or population naturally occurs). Modified, natural and critical habitat refers to the biodiversity value of the area as determined by species, ecosystems, and ecological processes. As part of the risks and impacts identification process, the client should develop and present a map of the modified, natural, and/or critical habitats in the landscape of the project’s area of influence to inform the applicability of Performance Standard 6’s habitat requirements.

GN27. In practice, natural and modified habitats exist on a continuum that ranges from largely untouched, pristine natural habitats to intensively managed, modified habitats. Project sites will often be located among a mosaic of habitats with varying levels of anthropogenic and/or natural disturbance. Clients are responsible for delineating the project site as best as possible in terms of modified and natural habitat. This determination is made based on the level of human-induced disturbance (for example, presence of invasive species, level of pollution, extent of habitat fragmentation, viability of existing naturally occurring species assemblages, resemblance of existing ecosystem functionality and structure to historical conditions, degree of other types of habitat degradation) and the biodiversity values of the site (for example, threatened species, ecosystems, and ecological processes necessary for maintaining nearby critical habitats). The level of anthropogenic impact should be determined with respect to the greater landscape/seascape in

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which the project is located. In other words, is the project site (or parts of it) located in a disturbed area amid an otherwise intact landscape? Is the project site (or parts of it) an isolated area of natural habitat within a heavily disturbed or managed landscape? Is the project site located near areas of high biodiversity value (for example, wildlife refuges, corridors, or protected areas)? Or, is the project site located in a mosaic of modified and natural habitats that contain biodiversity values of varying importance to conservation?

GN28. Both natural and modified habitats may contain high biodiversity values, thereby qualifying as critical habitat. Performance Standard 6 does not limit its definition of critical habitat to *critical natural* habitat. An area may just as well be *critical modified* habitat. The extent of human-induced modification of the habitat is therefore not necessarily an indicator of its biodiversity value or the presence of critical habitat.

GN29. Certain sectors, most notably agriculture and forestry, refer to areas of High Conservation Value (HCV) when determining the conservation value of a land area or management unit. The HCV Resource Network provides information and support on the evolving usage of HCV to ensure a consistent approach; it is an internationally recognized group that includes environmental and social NGOs, international development agencies, timber and forest product certifiers, suppliers, buyers, and forest managers. The Network recognizes six HCV types, based on both biodiversity and ecosystem services. These HCV types are tailored to national standards via toolkits or national interpretations. Performance Standard 6 does not require HCV assessments except where these are required to meet third-party certification standards. Due to differences in definitions and practices, HCV assessments are useful sources of information but a supplemental assessment will usually be required to demonstrate alignment and fill gaps, if any, with respect to Performance Standard 6 requirements.

GN30. A biodiversity offset is a set of actions with on-the-ground “*measurable conservation outcomes*” that can balance significant residual biodiversity losses caused by the client’s project *only after appropriate avoidance, minimization and restoration measures have been applied*, with equivalent biodiversity gains in terms of ecological characteristics (“like-for-like or better”) and size of expected gains. The decision to undertake a biodiversity offset therefore would never be a substitute for the implementation of good management practices that prevent significant impact. The actions must be designed to deliver “on-the-ground” conservation outcomes for as long as project impacts persist, usually at one or several offset sites located within the region.

GN31. Two general types of offsets can be used to compensate for significant residual impacts: 1) ‘Restoration’ offsets remediate past damage to biodiversity (due to factors unrelated to the client’s project) via rehabilitation or enhancement of biodiversity components (or even re-creation of ecosystems and their associated biodiversity values) at suitable *offset* sites; and 2) ‘Protection’ or ‘averted loss’ offsets protect biodiversity in an area demonstrated to be under threat of imminent or projected loss (due to factors unrelated to the client’s project). Projections of the losses of biodiversity that will be averted by an offset require credible analysis of those trends. In some cases, this type of offset may not be appropriate where there is great uncertainty or there is a lack of stakeholder support for the analysis supporting those projections.

GN32. Where socioeconomic and cultural uses of biodiversity (that is, ecosystem services) are at issue, biodiversity offsets may include the provision of compensation packages for Affected Communities impacted by the project and offset. Note that ecosystem services are covered in paragraphs 24 and 25 of Performance Standard 6, and compensation for ecosystem services is covered in Performance Standards 5, 7, and 8.

GN33. The main biodiversity offset design steps include (i) scoping, in consultation with relevant stakeholders, of potential conservation activities / offset sites within the landscape that could benefit the biodiversity values potentially impacted by the project (i.e., “like-for-like or better”); (ii) an assessment to

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determine if the loss of biodiversity at the project site can be compensated by gains at the offset site; (iii) identifying means for securing offset activities over the long term, including, for example, legal protections; (iv) establishing an effective process for communities affected by the offset to participate in the design and implementation of the biodiversity offset; (v) defining the specific offset activities and how they will be implemented in a biodiversity offset management plan, including the roles, responsibilities, and budget projections for the involved parties; (vi) establishing a funding mechanism to support the offset for as long as project impacts persist (see GN49 in this note); (vii) designing a system for monitoring, evaluation, and adaptive management; and, (viii) ensuring that the project also meets all applicable laws, regulations, and policies pertaining to biodiversity offsets. The members of the Business and Biodiversity Offsets Program were the first to develop a set of internationally recognized Principles on Biodiversity Offsets, and good biodiversity offset design is synthesized in the World Bank's *Biodiversity Offsets: A User Guide*.^{GN6} The design of offsets, particularly the assessment of losses and gains, may be accomplished through an expert-led process and/or through an assessment that is commensurate with the risks posed to biodiversity. Lastly, clients should pursue long term legal protection in order to demonstrate offset permanence.

GN34. In some countries (for example, Brazil), offsets may be a regulatory requirement in which a project proponent has limited control over the design. Where possible, the client will collaborate with the responsible government agency, to the extent permitted by law, to agree on the key outcomes that need to be achieved to ensure consistency with Performance Standard 6. Otherwise, project proponents should supplement the regulatory offset with Performance Standard 6 requirements, notably with respect to the concept of "like-for-like or better", achieving on-the-ground conservation outcomes and monitoring the success of identified offset activities over the long term.

Modified Habitat

11. Modified habitats are areas that may contain a large proportion of plant and/or animal species of non-native origin, and/or where human activity has substantially modified an area's primary ecological functions and species composition.⁵ Modified habitats may include areas managed for agriculture, forest plantations, reclaimed⁶ coastal zones, and reclaimed wetlands.

12. This Performance Standard applies to those areas of modified habitat that include significant biodiversity value, as determined by the risks and impacts identification process required in Performance Standard 1. The client should minimize impacts on such biodiversity and implement mitigation measures as appropriate.

⁵ This excludes habitat that has been converted in anticipation of the project.

⁶ Reclamation as used in this context is the process of creating new land from sea or other aquatic areas for productive use.

GN35. Human activity may modify the structure and composition of natural habitats to the degree that nonnative species become dominant and/or the natural ecological functions of the habitat fundamentally change. At the extreme, this takes the form of urbanized areas. However, there is a wide spectrum of modified habitats that includes agricultural areas, plantation forestry, and lands partially degraded by a range of other human interventions. The landscape context (for example, fragmentation of surrounding natural habitat, if any) will also influence the degree to which a project site is considered modified. Where there is doubt whether a habitat is modified or natural see paragraph GN39 in this note. See also paragraph GN27, which provides additional context on the assessment of modified and natural habitats on the landscape scale.

^{GN6} Ledec and Reay Johnson, *Biodiversity Offsets: A User Guide*, <http://documents.worldbank.org/curated/en/344901481176051661/Biodiversity-offsets-a-user-guide>

GN36. Clients should endeavor to site the project in modified habitat rather than on natural or critical habitat and demonstrate this effort through a project alternatives analysis conducted during the risks and impacts identification process.

GN37. Performance Standard 6 requires that projects with significant biodiversity values in modified habitats minimize their impacts and implement mitigation and management measures as needed to conserve those values. Significant biodiversity values that might occur in modified habitat include species of conservation concern (for example, species that are threatened or otherwise identified as important by stakeholders) and remnant ecological features that persist in the modified landscape, especially those that perform important ecological functions. In some cases, significant biodiversity values may cause natural or critical habitat requirements to be applied, in which case they should be treated using the guidelines for those habitat designations.

GN38. The “project” in footnote 5 of Performance Standard 6 refers to the client’s project as it is described for proposed financing. Habitat will not be considered modified habitat if it was recently degraded by the client or a third party in anticipation of obtaining lender financing or regulatory approval for the development in which IFC is considering investing. Natural disturbances such as forest fire, hurricane, or tornado affecting a natural habitat would not lead to a modified habitat designation. Where uncertainty over prior modification exists, the client should provide evidence to support why it believes the pre-project habitat modification designation does not apply. Also, as relevant to the standard’s paragraph 26 on “Sustainable Management of Living Natural Resources,” Performance Standard 6 will respect cutoff dates for the conversion of natural habitat as established by internationally recognized voluntary standards, such as the Forest Stewardship Council and the Roundtable on Sustainable Palm Oil.

Natural Habitat

13. Natural habitats are areas composed of viable assemblages of plant and/or animal species of largely native origin, and/or where human activity has not essentially modified an area’s primary ecological functions and species composition.

14. The client will not significantly convert or degrade⁷ natural habitats, unless all of the following are demonstrated:

- **No other viable alternatives within the region exist for development of the project on modified habitat;**
- **Consultation has established the views of stakeholders, including Affected Communities, with respect to the extent of conversion and degradation;⁸ and**
- **Any conversion or degradation is mitigated according to the mitigation hierarchy.**

15. In areas of natural habitat, mitigation measures will be designed to achieve no net loss⁹ of biodiversity where feasible. Appropriate actions include:

- **Avoiding impacts on biodiversity through the identification and protection of set-asides;¹⁰**
- **Implementing measures to minimize habitat fragmentation, such as biological corridors;**
- **Restoring habitats during operations and/or after operations; and**
- **Implementing biodiversity offsets.**

⁷ Significant conversion or degradation is (i) the elimination or severe diminution of the integrity of a habitat caused by a major and/or long-term change in land or water use; or (ii) a modification that substantially minimizes the habitat’s ability to maintain viable populations of its native species.

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⁸ Conducted as part of the stakeholder engagement and consultation process, as described in Performance Standard 1.

⁹ No net loss is defined as the point at which project-related impacts on biodiversity are balanced by measures taken to avoid and minimize the project's impacts, to undertake on-site restoration and finally to offset significant residual impacts, if any, on an appropriate geographic scale (e.g., local, landscape-level, national, regional).

¹⁰ Set-asides are land areas within the project site, or areas over which the client has management control, that are excluded from development and are targeted for the implementation of conservation enhancement measures. Set-asides will likely contain significant biodiversity values and/or provide ecosystem services of significance at the local, national and/or regional level. Set-asides should be defined using internationally recognized approaches or methodologies (e.g., High Conservation Value, systematic conservation planning).

GN39. The determination of natural habitat will be made using credible scientific analysis of best available information. An assessment and comparison of current and historical conditions should be conducted, and local knowledge and experience should be utilized. Where natural habitats are suspected, a map showing location and extent of natural and modified habitats should be included in the risks and impacts assessment. Natural habitats are not to be interpreted as untouched or pristine habitats. It is likely that the majority of habitats designated as natural will have undergone some degree of historical or recent anthropogenic impact. The question is the degree of impact. If, in the judgement of a competent professional, the habitat still largely contains the principal characteristics and functions of a native ecosystem(s), it should be considered a natural habitat regardless of some degree of degradation and/or the presence of some invasive alien species, secondary forest, human habitation, or other human-induced alteration.

GN40. Significant conversion or degradation of natural habitat will not take place unless the client is able to demonstrate that all three requirements in paragraph 14 of Performance Standard 6 have been undertaken and the company has demonstrated that its proposed activities comply with land-use and licensing regulations. The first requirement is that no viable alternatives exist for that project on modified habitat (within the region). In these cases, a well-developed locations alternative analysis should be conducted to explore potential viable options for development on modified habitat. The term *viable* includes, but is not limited to, technically and financially feasible alternatives. This analysis will in most cases be in addition to the alternatives analysis included as part of the risks and impacts identification process. It should be a considerably more in-depth analysis than is typically included in an ESIA and should provide specifics on alternatives in the landscape for developing the project as well as the breakdown of cost increases for developing modified versus natural habitat.

GN41. The second bullet point in the standard's paragraph 14 relates to stakeholder engagement and consultation. If a project has the potential to result in significant conversion or degradation of natural habitats, relevant stakeholder groups must be engaged as part of a rigorous, fair, and balanced multi-stakeholder dialogue. Client requirements for stakeholder engagement are described in Performance Standard 1, and related guidance can be found in Guidance Note 1. Stakeholders should be engaged specifically with respect to (i) the extent of conversion and degradation; (ii) the alternatives analyses; (iii) biodiversity and ecosystem services values associated with the natural habitat; (iv) options for mitigation, including set-asides and biodiversity offsets; and (v) identification of additional opportunities for biodiversity conservation. Clients must keep a record of such stakeholder engagement and consultation activities and demonstrate how viewpoints have been reviewed and integrated into the project design. Stakeholder participation should provide a diverse set of opinions from knowledgeable sources, including local scientific and technical experts, relevant authorities and agencies responsible for biodiversity conservation or the regulation and management of ecosystem services, and members of the national and international conservation organizations, in addition to Affected Communities.

GN42. The third bullet in the standard's paragraph 14 reiterates the importance of demonstrating implementation of the mitigation hierarchy. General guidance on the mitigation hierarchy is provided in paragraph GN16 of this note. However, further guidance is provided here with respect to the implementation

of on-site mitigation measures as a means to minimize habitat degradation, which is of particular importance when operating in natural habitats. With respect to on-site mitigation, the types of possible measures are numerous and are often best identified by environmental engineers and erosion control or reinstatement specialists in addition to biodiversity management specialists. Overall, clients should seek to minimize habitat degradation by adhering to a footprint-minimization principle throughout the project's life cycle. Habitat degradation is one of the most significant potential direct threats to biodiversity associated with projects involving significant land development. In addition to footprint minimization, the client should implement appropriate ecological restoration strategies, including physical reinstatement, rehabilitation, and revegetation (or restoration) planning and methods, at the earliest possible stage in project planning. The principles guiding these strategies should include (i) protection of topsoil and restoration of vegetation cover as quickly as possible after construction or disturbance, (ii) reestablishment of original habitat to its preconstruction or pre-disturbance conditions, (iii) minimization measures including management controls and workforce education, and, (iv) where native species (especially protected species) cannot be retained *in situ*, consideration of conservation techniques such as translocation and relocation following established IUCN guidelines.^{GN7}

GN43. As described in paragraph 15 of Performance Standard 6, in all areas of natural habitat, regardless of the prospects of significant conversion and degradation, the client should design and implement mitigation measures to achieve no net loss of biodiversity, where feasible, through the application of various on-site and offset mitigation measures. The client should consider the term *where feasible* as per footnote 3 of Performance Standard 3, and where it is not considered feasible, the client will document the technical, financial or other reasons why achieving no net loss is not feasible. The term *no net loss* is defined in footnote 9 of Performance Standard 6 as “the point at which project-related impacts on biodiversity are balanced by measures taken to avoid and minimize the project's impacts, to undertake on-site restoration, and finally to offset significant residual impacts, if any, on an appropriate geographic scale (for example, local, landscape-level, national, regional).” No net loss includes natural habitat and its associated significant biodiversity values. Significant biodiversity values may include species of conservation concern (for example, species that are threatened, legally protected, or otherwise identified as important by stakeholders) and ecological features in the landscape that are important to stakeholders. A defensible rationale for how no net loss will be achieved should be provided. A variety of methods exist to calculate losses and gains of the quantity *and* quality of identified biodiversity values and to assess the likelihood of success of proposed mitigation and management actions. While appropriate methods and metrics will vary from site to site, these should be evidence-based, utilizing quantitative and semi-quantitative methods as inputs to an expert-led process. The level of confidence in the results of the analysis should be commensurate with the risks and impacts that the project poses to the natural habitat.

GN44. Paragraph 15 of Performance Standard 6 then describes a series of potential mitigation measures that conform to the mitigation hierarchy but are of particular relevance to achieving no net loss in natural habitats. The first bullet identifies “set-asides,” which are land areas, usually within the project site or in other adjacent areas over which the client has management control, that are “excluded from development and targeted for the implementation of conservation enhancement measures” (the standard's footnote 10). Set-asides may also be High Conservation Value (HCV) areas (see paragraph GN29 of this note). The client should clearly demarcate and map set asides to ensure their protection over the life of the project.

GN45. Set-asides and biodiversity offsets are related but different concepts. Biodiversity offsets are intended to compensate for significant residual impacts and must demonstrate no net loss, and preferably

^{GN7} International Union for Conservation of Nature, Guidelines for Reintroductions and Other Conservation Translocations, Version 1.0.

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net positive gains of biodiversity. Set-asides are equivalent to avoidance measures along the mitigation hierarchy. Unlike a set-aside, the design of a biodiversity offset requires skilled practitioners to carry out an assessment to determine whether the loss of biodiversity on-site will be compensated by the gains in biodiversity at the offset site. (See paragraph 10 in Performance Standard 6 and related guidance on offsets as provided in paragraphs GN30–GN34 of this note.) Where a set-aside generates outcomes beyond the simple avoidance of impacts to on-site biodiversity values from client impacts, such as additional gains in biodiversity quality and quantity via restoration or active protection from external threats, and those outcomes are sustained for as long as project impacts persist, the set-aside could serve as an offset.

GN46. The second bullet of paragraph 15 of Performance Standard 6 emphasizes the need for the client to consider mitigation measures aimed at reducing habitat fragmentation. Habitat fragmentation is one of the most pervasive impacts to biodiversity in natural habitats and often leads to long-term habitat degradation due to edge effects, increased third-party access into previously undisturbed areas, and sometimes genetic isolation of fauna and flora populations. When a project is located in an expansive intact wilderness, the client should seek to define mitigation measures to limit fragmentation, such as the design of wildlife corridors or other measures to help ensure connectivity between habitats or existing populations. This requirement is linked to the requirement in paragraph 6 of Performance Standard 6 on landscape/seascape level considerations (also see paragraph GN17 in this note). Landscape/seascape level analyses can help the client identify mitigation measures of value on a larger scale. Indirect impacts associated with induced third-party access can be especially detrimental to biodiversity and are related to the topic of habitat fragmentation. Clients developing linear infrastructure and/or access roads that cross natural habitat and/or potentially facilitate third-party access to natural habitat, should as a matter of priority develop strict means to control third-party use of such infrastructure. Mitigation measures should be fully discussed with both project construction and operations managers to ensure a coordinated and long-term approach. The government, including law enforcement agencies, should be made fully aware of project commitments as it may be interested in maintaining project access routes for public use after the construction phase and/or project decommissioning. Mitigation measures of this nature are best implemented through an Induced Access Management Plan.

GN47. With respect to the third bullet in paragraph 15 of Performance Standard 6, see relevant guidance in paragraph GN16 in this note on habitat restoration.

GN48. Finally, with respect to the fourth bullet of paragraph 15 in Performance Standard 6, the implementation of biodiversity offsets is one important option by which the client may achieve no net loss of biodiversity in natural habitat. Guidance on biodiversity offsets is provided in paragraphs GN30–GN34 of this note, and all the requirements defined in paragraph 10 of Performance Standard 6 for biodiversity offsets would also apply in these situations: for example, like-for-like or better, measurable conservation outcomes demonstrated *in situ*, or on-the-ground, etc.).

GN49. Especially relevant, but not limited, to extractive industries, reclamation-funding mechanisms should be established by clients for projects located in natural habitats and characterized by potentially significant impacts due to their footprint, the footprint of their associated facilities, and related land conversion. The costs associated with reclamation and/or with post-decommissioning activities should be included in business feasibility analyses during the project planning and design stages. Minimum considerations should include the availability of all necessary funds, by appropriate financial instruments, to cover the cost of reclamation and project closure at any stage in the project's lifetime, including provision for early or temporary reclamation or closure. Reclamation funding mechanisms are well established in the mining industry and are described in section 1.4 of the World Bank Group Environmental, Health and Safety

(EHS) Guidelines^{GN8} for mining. A similar mechanism may also be established when biodiversity offsets are implemented.

GN50. Biodiversity-related commitments and mitigation and management actions should be captured in the client's ESMS. For all projects that have the potential to significantly convert or degrade natural habitats and for projects in critical habitats, these biodiversity actions should be captured in a single dedicated Biodiversity Management Plan (BMP) or integrated into one or more topic-specific management plans (for example, Invasive Species Management Plan, Induced Access Management Plan, Water Management Plan). The BMP or equivalents should be auditable management plans, integrated into a project's ESMS, which define parties responsible for an action, monitoring and/or verification requirements of an action, and an implementation schedule or frequency for an action. The BMP or equivalents are operational tools for site managers and contractors, with focus on on-site mitigation measures. If biodiversity-related mitigation and management measures appear in other management plans, cross-references to the BMP or to the biodiversity-relevant section in the ESMS should be included. The corresponding monitoring/verification requirements should reflect the principal of adaptive management (see paragraph GN20 of this note), where relevant. Some projects in natural habitats may be required to develop a Biodiversity Action Plan to accompany these documents (see paragraph GN91 of this note).

GN51. Long-term biodiversity monitoring may be required to validate the accuracy of predicted impacts and risks to biodiversity values posed by the project, and the predicted effectiveness of biodiversity management actions. The monitoring and evaluation program should include the following: (i) *baseline*, measures of the status of biodiversity values prior to the project's impacts; (ii) *process*, monitoring of the implementation of mitigation measures and management controls; and (iii) *outcomes*, monitoring of the status of biodiversity values during the life of the project, compared to the baseline. In addition, clients should consider *controls*, monitoring in comparable areas where project impacts are not occurring in order to detect effects unrelated to project impacts. The client is expected to develop a practical set of indicators (metrics) for the biodiversity values requiring mitigation and management. Indicators and sampling design should be selected on the basis of *utility*, that is, their ability to inform decisions about mitigation and management, and *effectiveness*, their ability to measure effects with adequate statistical power given the estimated ranges of natural variability for each biodiversity value. Proxy indicators for some biodiversity values may be necessary to satisfy these criteria.

GN52. Specific thresholds should be set for monitoring results that will trigger a need to adapt the management plan(s) to address any deficiencies in performance. The results of the monitoring program should be reviewed regularly. If they indicate that the actions specified in the management plan(s) are not being implemented as planned, the reasons for failure need to be identified (for example, insufficient staff, insufficient resources, unrealistic timeline, etc.) and rectified. If outcome monitoring results indicate that project impacts to biodiversity values were underestimated or that the benefits to biodiversity from management actions including offsets were overestimated, the impact assessment and management plans should be updated.

Critical Habitat

16. Critical habitats are areas with high biodiversity value, including (i) habitat of significant importance to Critically Endangered and/or Endangered¹¹ species; (ii) habitat of significant

^{GN8} World Bank Group, Environmental, Health, and Safety Guidelines for Mining, <https://www.ifc.org/wps/wcm/connect/1f4dc28048855af4879cd76a6515bb18/Final%2B-%2BMining.pdf?MOD=AJPERES&id=1323153264157>

importance to endemic and/or restricted-range species; (iii) habitat supporting globally significant concentrations of migratory species and/or congregatory species; (iv) highly threatened and/or unique ecosystems; and/or (v) areas associated with key evolutionary processes.

¹¹ As listed on the International Union for the Conservation of Nature (IUCN) Red List of Threatened Species. The determination of critical habitat based on other listings is as follows: (i) If the species is listed nationally / regionally as critically endangered or endangered, in countries that have adhered to IUCN guidance, the critical habitat determination will be made on a project by project basis in consultation with competent professionals; and (ii) in instances where nationally or regionally listed species' categorizations do not correspond well to those of the IUCN (e.g., some countries more generally list species as "protected" or "restricted"), an assessment will be conducted to determine the rationale and purpose of the listing. In this case, the critical habitat determination will be based on such an assessment.

Critical Habitat Definition

GN53. The critical habitat definition presented in paragraph 16 of Performance Standard 6 is in line with criteria captured from a wide range of definitions of priority habitat for biodiversity conservation in use by the conservation community and incorporated in related governmental legislation and regulations. Critical habitats are areas of high biodiversity value that include at least one or more of the five values specified in paragraph 16 of Performance Standard 6 and/or other recognized high biodiversity values. There is no one criterion that is more important than any other for making critical habitat designations or for determining compliance with Performance Standard 6. For ease of reference, these values are referred to as "critical habitat criteria" for the remainder of this document. Each criterion is described in detail in paragraphs GN70–GN83. Critical habitat criteria are as follows and should form the basis of any critical habitat assessment:

- Criterion 1: Critically Endangered (CR) and/or Endangered (EN) species
- Criterion 2: Endemic or restricted-range species
- Criterion 3: Migratory or congregatory species
- Criterion 4: Highly threatened and/or unique ecosystems
- Criterion 5: Key evolutionary processes

GN54. Certain internationally recognized areas of high biodiversity value may be recognized as critical habitats and should be given special attention during assessments. Examples include the following:

- Areas that meet the criteria of the IUCN's Protected Area Categories Ia, Ib and II.^{GN9}
- Key Biodiversity Areas (KBAs),^{GN10} which encompass Important Bird and Biodiversity Areas (IBAs), and meet the criteria and thresholds described in paragraphs GN70 – GN83.

GN55. Based on the mitigation and management requirements of paragraph 17 of Performance Standard 6, some areas will not be acceptable for financing, with the possible exception of projects specifically designed to contribute to the conservation of the area. Consultation with the relevant national and international organizations that designate these areas is required. These areas should be identified during the assessment of critical habitat and brought to the attention of IFC as early as possible in the financing process. They include the following:

^{GN9} IUCN, "Protected Areas Category", <https://www.iucn.org/theme/protected-areas/about/protected-area-categories>

^{GN10} IUCN, "A Global Standard for the Identification of Key Biodiversity Areas", 2016, <https://portals.iucn.org/library/node/46259>

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- UNESCO Natural and Mixed World Heritage Sites
- Sites that fit the designation criteria of the Alliance for Zero Extinction (AZE)^{GN11}

Determination of Critical Habitat

GN56. In order to facilitate decision-making, numerical thresholds have been defined for the first four critical habitat criteria (i.e., CR/EN species; endemic/restricted-range species; migratory/congregatory species; threatened and unique ecosystems). The thresholds presented in this Guidance Note were obtained from globally standardized numerical thresholds published in the IUCN's *A Global Standard for the Identification of Key Biodiversity Areas* and *Red List Categories and Criteria*. The thresholds are indicative and serve as a guideline for decision-making only. There is no universally accepted or automatic formula for making determinations on critical habitat. The involvement of external experts and project-specific assessments is of utmost importance, especially when data are limited (as will often be the case).

GN57. For Criterion 5, there are no numerical thresholds. – Best available scientific information and expert opinion should be used to guide decision-making with respect to the relative “criticality” of a habitat in these cases.

GN58. *Relatively broad landscape and seascape units might qualify as critical habitat.* The scale of the critical habitat assessment depends on the biodiversity attributes particular to the habitat in question and the ecological patterns and processes required to maintain them. Even within a single site designated as critical habitat there might be areas or features of higher or lower biodiversity value. There also will be cases where a project is sited within a greater area recognized as critical habitat, but the project site itself has been highly modified. *A critical habitat assessment therefore must not focus solely on the project site.* The client should be prepared to conduct desktop assessments, consult with experts and other relevant stakeholders to obtain an understanding of the relative importance or uniqueness of the site with respect to the regional and even the global scale, and/or conduct field surveys beyond the boundaries of the project site. These considerations would form part of the landscape/seascape analyses as referred to in paragraph 6 of Performance Standard 6 and in paragraph GN17 of this note.

GN59. The project should identify an ecologically appropriate area of analysis to determine the presence of critical habitat for *each* species with regular occurrence in the project's area of influence, or *ecosystem*, covered by Criteria 1-4. The client should define the boundaries of this area taking into account the distribution of species or ecosystems (within and sometimes extending beyond the project's area of influence) and the ecological patterns, processes, features, and functions that are necessary for maintaining them. These boundaries may include catchments, large rivers, or geological features. The client will use this area of analysis to assess applicability of the critical habitat criteria and thresholds (see paragraphs GN70–GN83 of this note) in order to determine critical habitat for the species and/or ecosystems concerned. Critical habitats boundaries should be equivalent in scale to areas mapped for practical site-based conservation management activities. For some wide-ranging species, critical habitat may be informed by areas of aggregation, recruitment, or other specific habitat features of importance to the species. In all cases, the critical habitat should consider the distribution and connectivity of such features in the landscape/seascape and the ecological processes that support them. Where it can be shown that multiple values have largely overlapping ecological requirements and distributions, a common or aggregated area of critical habitat may be appropriate. The final area(s) of critical habitat against which

^{GN11} The criteria for AZE sites can be found at: www.zeroextinction.org, along with a map of current AZE sites. Clients may conduct additional field work to validate the designation of current AZE sites near proposed project sites.

project impacts will be assessed should be revised based on additional knowledge documented through field work and other assessment after the initial critical habitat assessment has been conducted.

GN60. Specific methods for the assessment of biodiversity will inherently be project- and site-specific, considering the breadth of ecosystems, the various forms of critical habitat, and the range of species covered under Performance Standard 6. Guidance Note 6 therefore does not provide methodologies for conducting biodiversity assessments. Instead, the three broad-level steps outlined below direct the client in designing the overall scope of a critical habitat assessment. The approximate location of a project and its area of influence should be considered when establishing an ecological area of analysis but the project type, its impacts and its mitigation strategy are irrelevant in carrying out Steps 1 through 3. The definition of the critical habitat and the impacts of a particular project are two unrelated concepts. The definition of the critical habitat is based on the presence of high biodiversity values whether or not a project is to be undertaken in that habitat. Clients should not argue that they are not in critical habitat on the basis of the project's footprint or its impacts. For example, if the biodiversity value is an Endangered reptile (that meets the thresholds in Criterion 1), and the client is developing a windfarm in such critical habitat, the client would be in a critical habitat regardless of the impacts (or "non-impacts") of that windfarm. In either case, the client is responsible for recognizing the existing biodiversity values of the area in which it is located.

Step 1: Stakeholder Consultation/Initial Literature Review

Aim: To obtain an understanding of biodiversity within the landscape from the perspective of all relevant stakeholders.

Process: Field consultation exercises and desktop research.

GN61. A substantive initial literature review and consultation with relevant stakeholders including established conservation organizations, governmental or other relevant authorities, academic or other scientific institutions, and recognized external experts, including species specialists, is essential in determining if a project site is located in a critical habitat. The stakeholder consultation and literature review should provide a sense of the biodiversity values associated with the project's area of influence. This step is similar to the guidance provided in paragraphs GN10–GN12 of this note for the general client requirements for Performance Standard 6, but it is expected to be more rigorous for projects located in critical habitats. This stage of the assessment should not focus on whether biodiversity values actually qualify the area as critical habitat and/or if the project will have an impact on a particular biodiversity value. The focus of this initial stage should be to acquire an impartial understanding of the landscape/seascape with respect to biodiversity values. Critical habitat determinations should be made in alignment with existing landscape prioritization schemes for biodiversity conservation as established by the existing in-country network of conservation organizations, global conservation groups, academic institutions, and/or the local and national governments. Therefore, systematic conservation planning assessments carried out by governmental bodies, recognized academic institutions, and/or other relevant qualified organizations (including internationally recognized NGOs) should also be sought at this stage. These may provide information on threatened ecosystems, vegetation types, and land classes.

Step 2: Field Data Collection and Verification of Available Information

Aim: To collect field data and verify available detailed information necessary for the critical habitat assessment

Process: Engage qualified specialists to collect field data as necessary both within and outside of the ecologically appropriate area of analysis (see GN59 of this note)

GN62. Field biodiversity data may already have been acquired as part of the project's overall ESIA as described in paragraphs GN9–GN10 of this note. In cases where these data are inadequate or where quantified unaggregated data/metrics were not considered as part of the ESIA, the client should collect

such data using a combination of methods: for example, biodiversity baseline surveys, focused surveys by specialists, ecological research, expert consultation, and data obtained from recent scientific literature and National Biodiversity Strategies and Action Plans (NBSAPs),^{GN12} as available. Information should be gathered on species, habitats, ecosystems, evolutionary processes and ecological processes—both within the project's area of influence and also in the broader national, regional and global contexts, as relevant. Note that the data gathered as part of Step 2 might also be of use to the separate but related topic of ecosystem services. Coordination and information-sharing with social specialists might be important for some projects, especially when Affected Communities engage in natural resource-based livelihoods. Regarding species, the client is expected to consult the current version of the IUCN Red List of Threatened Species, any in-country Red Data Books and Red Lists and best available scientific data.

Step 3: Critical Habitat Determination

Aim: Determine whether the project is situated in critical habitat.

Process: Analysis and interpretation of the desktop and field data collected.

GN63. Based on the broad pool of data obtained as part of Steps 1 and 2, biodiversity values should be screened using critical habitat criteria and thresholds (paragraphs GN70–83 in this note) at an appropriate ecological scale, as defined in GN59.

GN64. By carrying out these steps, the client should be in a position to determine if the project is located in a critical habitat based on identified high biodiversity values. *This determination is independent of the project type, impacts or its mitigation strategy.*

GN65. Where estimates of species' global population and/or local population are not available (or not obtainable by reasonable means through a field assessment in the case of the local population), the client is expected to use expert opinion to determine the significance of the potential critical habitat with respect to the global population. Surrogates of population size (for example, extent of occurrence, estimates of total area of known sites, estimates of area of occupied habitat) will be essential in this decision-making. This statement applies to Criteria 1 through 3.

GN66. Clients should always consult the IUCN *Red List of Threatened Species* and national lists that are based on the Red List methodology when assessing applicability of criteria 1–3. However, there are limitations of the IUCN Red List and national lists. Listings may be out of date or based on limited information, and many species have not yet been evaluated by the IUCN or national authorities. Where there is potential to materially change the mitigation approaches of a project, clients should engage specialists (who should include members of an IUCN species group) to perform an unofficial assessment (including updating existing conservation status assessments) using the IUCN Red List methodology. This should be assessed on a case-by-case basis.

GN67. Where nationally or regionally listed species categories do not correspond well to those of the IUCN (for example, some countries more generally list species as protected or restricted) a rationale will be required prior to consideration as a critical habitat criterion.

GN68. Where subspecies and sub-populations have been separately assessed for inclusion in the IUCN Red List, they may be considered under Criteria 1, as appropriate.

^{GN12} Convention on Biological Diversity, "National Biodiversity Strategies and Action Plans", <http://www.cbd.int/nbsap>

GN69. It should be noted that critical habitat Criteria 1-3 were based on the criteria and thresholds established in the IUCN Key Biodiversity Area (KBA) Standard.^{GN13}

Guidance by Criterion

Criterion 1: Critically Endangered and Endangered Species

GN70. Species threatened with global extinction and listed as CR and EN on the IUCN *Red List of Threatened Species* shall be considered as part of Criterion 1.^{GN14} Critically Endangered species face an extremely high risk of extinction in the wild. Endangered species face a very high risk of extinction in the wild.

GN71. As described in footnote 11 of Performance Standard 6, the inclusion of species in Criterion 1 that are listed nationally/regionally as CR or EN in countries that have adhered to IUCN guidance,^{GN15} shall be determined on a project-by-project basis in consultation with competent professionals.

GN72. Thresholds for Criterion 1 are the following:

- (a) Areas that support globally-important concentrations of an IUCN Red-listed EN or CR species ($\geq 0.5\%$ of the global population AND ≥ 5 reproductive units^{GN16} of a CR or EN species).
- (b) Areas that support globally-important concentrations of an IUCN Red-listed Vulnerable (VU) species, the loss of which would result in the change of the IUCN Red List status to EN or CR and meet the thresholds in GN72(a).
- (c) As appropriate, areas containing important concentrations of a nationally or regionally-listed EN or CR species.

GN73. Special consideration should be given to great apes (gorillas, orangutans, chimpanzees and bonobos) due to their anthropological significance. Where great apes may potentially occur,^{GN17} the IUCN/Species Survival Commission (SSC) Primate Specialist Group (PSG) Section on Great Apes (SGA) must be consulted as early as possible to assist in the determination of the occurrence of great apes in the project's area of influence. Any area where there are great apes is likely to be treated as critical habitat. Projects in such areas will be acceptable only in exceptional circumstances, and individuals from the IUCN/SSC PSG SGA must be involved in the development of any mitigation strategy.

Criterion 2: Endemic and Restricted-range Species

GN74. For purposes of this Guidance Note, the term endemic is defined as restricted-range. Restricted range refers to a limited extent of occurrence (EEO).

^{GN13} IUCN, "A Global Standard for the Identification of Key Biodiversity Areas", 2016, <https://portals.iucn.org/library/node/46259>

^{GN14} IUCN, "The IUCN Red List of Threatened Species", www.iucnredlist.org.

^{GN15} National Red Lists, Zoological Society of London, <http://www.nationalredlist.org/site.aspx>. See also IUCN. 2003. Guidelines for Application of IUCN Red List Criteria at Regional Levels, version 3.0. Gland, Switzerland: IUCN Species Survival Commission.

^{GN16} The IUCN Biodiversity Areas standard uses the following definition for reproductive unit: "the minimum number and combination of mature individuals necessary to trigger a successful reproductive event at a site Examples of five reproductive units include five pairs, five reproducing females in one harem, and five reproductive individuals of a plant species." Eisenberg, 1977. *The Evolution of the Reproductive Unit in the Class Mammalia*.

^{GN17} Ape Populations Environments Surveys Portal (A.P.E.S.), <http://apesportal.eva.mpg.de/>.

- For terrestrial vertebrates and plants, a restricted-range species is defined as those species that have an EOO less than 50,000 square kilometers (km²).
- For marine systems, restricted-range species are provisionally being considered those with an EOO of less than 100,000 km².
- For coastal, riverine, and other aquatic species in habitats that do not exceed 200 km width at any point (for example, rivers), restricted range is defined as having a global range of less than or equal to 500 km linear geographic span (i.e., the distance between occupied locations furthest apart).

GN75. The threshold for Criterion 2 is the following:

- a) Areas that regularly hold $\geq 10\%$ of the global population size AND ≥ 10 reproductive units of a species.

Criterion 3: Migratory and Congregatory Species

GN76. Migratory species are defined as any species of which a significant proportion of its members cyclically and predictably move from one geographical area to another (including within the same ecosystem).

GN77. Congregatory species are defined as species whose individuals gather in large groups on a cyclical or otherwise regular and/or predictable basis. Examples include the following:

- Species that form colonies.
- Species that form colonies for breeding purposes and/or where large numbers of individuals of a species gather at the same time for non-breeding purposes (for example, foraging and roosting).
- Species that utilize a bottleneck site where significant numbers of individuals of a species occur in a concentrated period of time (for example, for migration).
- Species with large but clumped distributions where a large number of individuals may be concentrated in a single or a few sites while the rest of the species is largely dispersed (for example, wildebeest distributions).
- Source populations where certain sites hold populations of species that make an inordinate contribution to recruitment of the species elsewhere (especially important for marine species).

GN78. Thresholds for Criterion 3 are the following:

- (a) Areas known to sustain, on a cyclical or otherwise regular basis, ≥ 1 percent of the global population of a migratory or congregatory species at any point of the species' lifecycle.
- (b) Areas that predictably support ≥ 10 percent of the global population of a species during periods of environmental stress.

Criterion 4: Highly Threatened or Unique Ecosystems

GN79. The IUCN is developing a Red List of Ecosystems, following an approach similar to the Red List for Threatened Species. The client should use the Red List of Ecosystems where formal IUCN

assessments have been performed. Where formal IUCN assessments have not been performed, the client may use assessments using systematic methods at the national/regional level, carried out by governmental bodies, recognized academic institutions and/or other relevant qualified organizations (including internationally-recognized NGOs).

GN80. The thresholds for Criterion 4 are the following:

- a) Areas representing $\geq 5\%$ of the global extent of an ecosystem type meeting the criteria for IUCN status of CR or EN.
- b) Other areas, not yet assessed by IUCN, but determined to be of high priority for conservation by regional or national systematic conservation planning.

Criterion 5: Key Evolutionary Processes

GN81. The structural attributes of a region, such as its topography, geology, soil, temperature, and vegetation, and combinations of these variables, can influence the evolutionary processes that give rise to regional configurations of species and ecological properties. In some cases, spatial features that are unique or idiosyncratic of the landscape have been associated with genetically unique populations or subpopulations of plant and animal species. Physical or spatial features have been described as surrogates or spatial catalysts for evolutionary and ecological processes, and such features are often associated with species diversification. Maintaining these key evolutionary processes inherent in a landscape as well as the resulting species (or subpopulations of species) has become a major focus of biodiversity conservation in recent decades, particularly the conservation of genetic diversity. By conserving species diversity within a landscape, the processes that drive speciation, as well as the genetic diversity within species, ensures the evolutionary flexibility in a system, which is especially important in a rapidly changing climate.

GN82. For illustrative purposes, some potential examples of spatial features associated with evolutionary processes are as follows:

- Landscapes with high spatial *heterogeneity* are a driving force in speciation, as species are naturally selected based on their ability to adapt and diversify.
- *Environmental gradients*, also known as *ecotones*, produce transitional habitat, which has been associated with the process of speciation and high species and genetic diversity.
- *Edaphic interfaces* are specific juxtapositions of soil types (for example, serpentine outcrops, limestone, and gypsum deposits), which have led to the formation of unique plant communities characterized by both rarity and endemism.
- *Connectivity* between habitats (for example, biological corridors) ensures species migration and gene flow, which is especially important in fragmented habitats and for the conservation of metapopulations. This also includes biological corridors across altitudinal and climatic gradients and from “crest to coast.”
- Sites of demonstrated importance to *climate change adaptation* for either species or ecosystems are also included within this criterion.

GN83. The significance of structural attributes in a landscape that may influence evolutionary processes will be determined on a case-by-case basis, and the determination of critical habitat will be heavily reliant on scientific knowledge. In the majority of cases, this criterion will apply in areas that have been previously investigated and that are already known or suspected to be associated with unique evolutionary processes. While systematic methods to measure and prioritize evolutionary

processes in a landscape do exist, they are typically beyond a reasonable expectation of assessments conducted by the private sector.

17. In areas of critical habitat, the client will not implement any project activities unless all of the following are demonstrated:

- **No other viable alternatives within the region exist for development of the project on modified or natural habitats that are not critical;**
- **The project does not lead to measurable adverse impacts on those biodiversity values for which the critical habitat was designated, and on the ecological processes supporting those biodiversity values;¹²**
- **The project does not lead to a net reduction in the global and/or national/regional population¹³ of any Critically Endangered or Endangered species over a reasonable period of time;¹⁴ and**
- **A robust, appropriately designed, and long-term biodiversity monitoring and evaluation program is integrated into the client's management program.**

18. In such cases where a client is able to meet the requirements defined in paragraph 17, the project's mitigation strategy will be described in a Biodiversity Action Plan and will be designed to achieve net gains¹⁵ of those biodiversity values for which the critical habitat was designated.

19. In instances where biodiversity offsets are proposed as part of the mitigation strategy, the client must demonstrate through an assessment that the project's significant residual impacts on biodiversity will be adequately mitigated to meet the requirements of paragraph 17.

¹² Biodiversity values and their supporting ecological processes will be determined on an ecologically relevant scale.

¹³ Net reduction is a singular or cumulative loss of individuals that impacts on the species' ability to persist at the global and/or regional/national scales for many generations or over a long period of time. The scale (i.e., global and/or regional/national) of the potential net reduction is determined based on the species' listing on either the (global) IUCN Red List and/or on regional/national lists. For species listed on both the (global) IUCN Red List and the national/regional lists, the net reduction will be based on the national/regional population.

¹⁴ The timeframe in which clients must demonstrate "no net reduction" of Critically Endangered and Endangered species will be determined on a case-by-case basis in consultation with external experts.

¹⁵ Net gains are additional conservation outcomes that can be achieved for the biodiversity values for which the critical habitat was designated. Net gains may be achieved through the development of a biodiversity offset and/or, in instances where the client could meet the requirements of paragraph 17 of this Performance Standard without a biodiversity offset, the client should achieve net gains through the implementation of programs that could be implemented in situ (on-the-ground) to enhance habitat, and protect and conserve biodiversity.

Client Requirements in Critical Habitat

GN84. There are numerous factors involved in the decision making regarding the client's ability to comply with paragraphs 17–19 of Performance Standard 6. Most predominant are the following:

- The relative irreplaceability and vulnerability of the biodiversity values (see GN13 of this note)
- The quality of the biodiversity assessment and/or critical habitat assessment
- The type of project
- The management capacity, commitment, and track record of the client, including the comprehensiveness of its ESMS

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- The comprehensiveness of the client's mitigation strategy and consideration of biodiversity offsets
- The level of confidence in predictions and assurance of outcomes of measures in the mitigation hierarchy
- The timing of these measures in contexts of high risk and uncertainty
- The willingness of the client to engage external experts and advisory and/or other types of scientific panels
- The willingness of the client to establish effective, long-term strategic partnerships with the government, academic and research institutions, Affected Communities and/or internationally recognized conservation NGOs
- The capacity of the host government
- The degree of information uncertainty

GN85. The first bullet in paragraph 17 of Performance Standard 6 emphasizes the importance of seeking to avoid critical habitats entirely as the first means of demonstrating compliance with the mitigation hierarchy. This is required for any proposed project in critical habitat regardless of the size of its footprint. The client should provide evidence of avoidance in a thorough analysis of project alternatives. Where set-asides are part of avoidance, the client should map the areas to ensure their protection over the life of the project.

GN86. The second bullet of paragraph 17 explicitly focuses on the biodiversity values for which the critical habitat was designated as a means of emphasizing the importance of considering biodiversity values across a broader scale. Therefore, the second bullet of paragraph 17 means that project-related direct and indirect impacts will not jeopardize the long-term persistence of the biodiversity value(s) for which the critical habitat was designated, considering the range of mitigation measures implemented by the client throughout the life of the project and in alignment with the mitigation hierarchy.^{GN18}

GN87. The third bullet of paragraph 17 is applicable to Criterion 1 only (CR and EN species). Projects will not lead to a net reduction in these species on the global and/or the regional/national scale. Net reduction is defined in footnote 13 of Performance Standard 6. Footnote 13 also provides insight on what is meant by "and/or," i.e., when compliance is determined on the scale of the global population and when it is determined on the national/regional scale. This depends on the species listing by which the critical habitat is determined in the first place. This is explained in footnote 11 of Performance Standard 6. In most cases, the habitat will be critical based on the global IUCN Red List, and in these cases, net reduction will be determined with respect to the global population. In instances where the habitat is determined to be critical for Criterion 1 based on the regional and/or national threatened species listing, the net reduction will be determined with respect to the regional and/or national population. Decision-making of this type must take place in consultation with competent professionals, including individuals from IUCN Species Survival Commission Specialist Groups.

GN88. The third bullet of paragraph 17 also uses the terminology "over a reasonable period of time." This concerns the question of when the client is expected to be able to demonstrate no net reduction. The timeframe is inherently case-specific and should consider the species' reproductive cycle, lifespan, and any other variables that may determine its ability to recover successfully from project impacts. The acceptable reduction in population should not be interpreted as the survival of every individual on-site. Although this might be the case in some situations, for example for CR species nearing extinction in

^{GN18} See the ecosystem approach described in paragraphs GN18 and GN19 of this note.

the wild, no net reduction is based on the species “ability to persist at the global and/or regional/national scales for many generations or over a long period of time” (footnote 13 of Performance Standard 6).

GN89. A biodiversity monitoring and evaluation program (BMEP) is a fundamental aspect of demonstrating compliance with paragraphs 7 and 17 of Performance Standard 6, as well as Performance Standard 1. See paragraphs GN51 and GN52 of this note for a description of a suitable BMEP.

GN90. In areas of critical habitat, the client will be expected to demonstrate net gains in biodiversity values for which the critical habitat was designated, as stated in paragraph 18 of Performance Standard 6. Net gains are defined in footnote 15 of Performance Standard 6 and could be considered “no net loss *plus*,” therefore, the requirements defined for critical habitat build upon and expand those defined for natural habitat. Net gains may be achieved through the biodiversity offset. As described in footnote 15 of Performance Standard 6, net gains of biodiversity values must involve measurable, additional conservation outcomes. Such gains must be demonstrated on an appropriate geographic scale (e.g., local, landscape-level, national, regional) as determined by external experts. In instances where a biodiversity offset is not part of the client’s mitigation strategy (i.e., there are no significant residual impacts), net gains may be obtained by supporting additional opportunities to conserve the critical habitat values in question. In these cases, qualitative evidence and expert opinion may be sufficient to validate a net gain.

GN91. A Biodiversity Action Plan (BAP) is required for projects located in critical habitat and is recommended for high-risk projects in natural habitats. The BAP describes (i) the composite of actions and a rationale for how the project’s mitigation strategy will achieve net gain (or no net loss), (ii) the approach for how the mitigation hierarchy will be followed, and (iii) the roles and responsibilities for internal staff and external partners. BAPs are living documents that should include agreed-on timelines for regular review and update as new information arises, project implementation progresses, and conservation context changes over time. Where project mitigation measures are included in the project ESMS/BMP (paragraph GN50 of this note), this should be referenced in the BAP. A BAP differs from a BMP in that the latter is an operational document developed largely for site managers and contractors (see paragraph GN50); whereas the BAP will almost always include actions for off-site areas (for example, offsets and additional actions) and involve external partners (for example, implementing partners, reviewers, or advisors). The BAP may also be accompanied by documents that would be developed at a later timeframe, such as an Offset Management Plan or a Biodiversity Evaluation and Monitoring Plan. In these cases, the BAP would be updated to reference these critical documents when they are developed. Depending on the nature and scale of the project, an initial BAP may describe a strategy and timeline for identifying actions to deliver net gain (or no net loss).

GN92. Any offset attempted in critical habitat should be identified, designed and managed according to good international practice and be sustainable as long as the project impacts persist.^{GN19} The guidance on biodiversity offsets provided in paragraphs GN30–GN34 of this note also applies to critical habitat.

Legally Protected and Internationally Recognized Areas

20. In circumstances where a proposed project is located within a legally protected area¹⁶ or an internationally recognized area,¹⁷ the client will meet the requirements of paragraphs 13 through 19 of this Performance Standard, as applicable. In addition, the client will:

- **Demonstrate that the proposed development in such areas is legally permitted;**

^{GN19} Business and Biodiversity Offsets Program, <http://bbop.forest-trends.org/guidelines/principles.pdf>.

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- **Act in a manner consistent with any government recognized management plans for such areas;**
- **Consult protected area sponsors and managers, Affected Communities, Indigenous Peoples and other stakeholders on the proposed project, as appropriate; and**
- **Implement additional programs, as appropriate, to promote and enhance the conservation aims and effective management of the area.¹⁶**

¹⁶ This Performance Standard recognizes legally protected areas that meet the IUCN definition: "A clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values." For the purposes of this Performance Standard, this includes areas proposed by governments for such designation.

¹⁷ Exclusively defined as UNESCO Natural World Heritage Sites, UNESCO Man and the Biosphere Reserves, Key Biodiversity Areas, and wetlands designated under the Convention on Wetlands of International Importance (the Ramsar Convention).

¹⁸ Implementing additional programs may not be necessary for projects that do not create a new footprint.

GN93. Paragraph 20 of Performance Standard 6 applies to legally protected areas that meet the IUCN definition, as provided in footnote 16 of Performance Standard 6, and "internationally recognized areas," which are areas of recognized importance to biodiversity conservation but are not always legally protected. Areas that will qualify as "internationally recognized" per Performance Standard 6 are explicitly defined in footnote 17. Performance Standard 6 adopts the terminology "internationally recognized area" instead of "internationally designated area," as *designated* is often used to describe protected areas that are designated by governments. In terms of international designations, conventions differ in their terminology (for example, inscribed, adopted, designated, recognized), and therefore the more generic term *recognized* was deemed more appropriate.

GN94. If a project is located in or near a legally protected or internationally recognized area, the client should consult the following sources, which were developed by UNEP-WCMC.

- *World Database on Protected Areas (WDPA)*.^{GN20} The WDPA is a global inventory of protected areas. Information is provided to the WDPA from national governments, NGOs, international conventions, and regional partners. It is managed and developed through collaboration between UNEP-WCMC and IUCN.
- *A to Z Areas of Biodiversity Importance*.^{GN21} The *A to Z* is an online guide with detailed information for a number of recognized systems to prioritize and protect areas of biodiversity importance that fall into two main categories: areas under protected area frameworks that are supported by national or subnational institutions as well as international conventions and programs, and global prioritization schemes that are developed by academic and conservation organizations.

GN95. With respect to mitigation, clients are expected to comply with requirements for natural or critical habitat, depending on the qualifying biodiversity values present in the legally protected (including areas officially proposed for protection) or internationally recognized area.

GN96. When projects are located in legally protected and internationally recognized areas, clients should ensure that project activities are consistent with any national land use, resource use, and management criteria (including Protected Area Management Plans, National Biodiversity Strategy and Action Plans (NBSAPs) or similar documents). This will entail securing the necessary approvals from the responsible

^{GN20} UNEP, "World Database on Protected Areas", Protected Planet, <http://www.protectedplanet.net>

^{GN21} UNEP. "A to Z Areas of Biodiversity Importance" <http://www.biodiversitya-z.org>.

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government agencies, and consulting with protected area sponsors and Affected Communities, indigenous peoples, and other relevant stakeholders. Note that stakeholder engagement and consultation is required for all projects located in legally protected and internationally recognized areas. The terminology “as appropriate” in the third bullet of paragraph 20 of Performance Standard 6 refers to the appropriateness/relevance of stakeholder groups to engage as part of this process. For internationally recognized areas that are not legally protected, clients would need to consult with the appropriate conservation agencies responsible for the designation. Client requirements for stakeholder engagement are described in paragraphs 26–33 of Performance Standard 1 and related guidance can be found in paragraphs GN91–GN105 of Guidance Note 1. Related client requirements are covered in Performance Standard 7 with respect to indigenous peoples and in Performance Standard 8 with respect to cultural heritage, and their accompanying Guidance Notes.

GN97. Projects proposed inside legally protected or internationally recognized areas should result in tangible benefits to the conservation objectives of that area, and clear conservation advantages should be gained by the presence of the project. This can be achieved through implementing programs that, for example, provide support for park management, address alternative livelihoods for Affected Communities, or support and/or carry out research needed for the conservation aims of the protected area. The only exception to this might be for projects that are not creating a new footprint (see footnote 18 of Performance Standard 6).

GN98. If no management plan exists for the protected or designated area, the client should consider supporting the development of one with the suitable government agencies and conservation organizations. This type of activity might also suffice as the “additional program” per the fourth bullet of paragraph 20 of Performance Standard 6 if developed and/or implemented in a way that involved endorsement by relevant stakeholders.

Invasive Alien Species

21. Intentional or accidental introduction of alien, or non-native, species of flora and fauna into areas where they are not normally found can be a significant threat to biodiversity, since some alien species can become invasive, spreading rapidly and out-competing native species.

22. The client will not intentionally introduce any new alien species (not currently established in the country or region of the project) unless this is carried out in accordance with the existing regulatory framework for such introduction. Notwithstanding the above, the client will not deliberately introduce any alien species with a high risk of invasive behavior regardless of whether such introductions are permitted under the existing regulatory framework. All introductions of alien species will be subject to a risk assessment (as part of the client’s environmental and social risks and impacts identification process) to determine the potential for invasive behavior. The client will implement measures to avoid the potential for accidental or unintended introductions including the transportation of substrates and vectors (such as soil, ballast, and plant materials) that may harbor alien species.

23. Where alien species are already established in the country or region of the proposed project, the client will exercise diligence in not spreading them into areas in which they have not already been established. As practicable, the client should take measures to eradicate such species from the natural habitats over which they have management control.

GN99. An alien or nonnative plant or animal species is one that is introduced beyond its original range of distribution. Invasive alien species are nonnative species that may become invasive or spread rapidly by outcompeting other native plants and animals when they are introduced into a new habitat that lacks their controlling factors as determined by natural evolution. Invasive alien species are now recognized to be a major global threat to biodiversity and to ecosystem services.

GN100. The introduction of any alien species as part of the client's operations should be assessed for compliance with the existing host country regulatory framework for such introductions. The client will not intentionally introduce any new alien species (that is, those that are not currently established in the country or region in which the project is operating) unless this is carried out in accordance with the existing regulatory framework, if such is present. If not, a risk assessment should be conducted on the invasiveness of the species, in coordination with competent professionals with knowledge of the particular species in question. Alien species of known high risk of invasive behavior shall not be introduced into a project site under any circumstances, even if such an introduction is not forbidden by the host country regulatory framework.

GN101. Despite the risk assessment and the existing regulatory framework, accidental introduction of invasive fauna and flora species is extremely difficult to predict. Clients should take all preventive measures designed to reduce the risk of transportation or transmission of invasive alien plant or animal species, pests, and pathogens through their activities. In area where invasive species are known to pose a significant risk to natural and critical habitats, surveys and reviews for such invasive species should be included in the client's preconstruction baseline, and the potential spread of such species should be monitored throughout the life of the project. In these situations, a dedicated management plan should be developed (for example, Invasive Species, Pests, and Pathogens Management Plan), which specifies preventive and mitigation measures such as inspection, washdown, and quarantine procedures specifically designed to address the spread of invasive species. A management plan of this type is of particular relevance for projects located in critical habitats and where the spread of invasive species in such habitats poses a significant risk.

GN102. Preventive and mitigation measures are essential when the project includes a linear infrastructure, such as a pipeline, transmission line, road, or rail development, as the right-of-way will likely traverse and link several habitats through one corridor, providing optimal means for a species to quickly spread through the region. In certain cases, and especially for projects operating in largely undisturbed habitats, clients should also include provisions in suppliers' contracts to prevent alien species from arriving in-country if cargo is transported from outside the country. This may include requirements for inspection and quarantine of containers and heavy equipment. Equipment should arrive "clean as new" to prevent risk of introductions.

GN103. With respect to the international shipping of goods and services, clients are expected to comply with appropriate obligations developed in the framework of the International Convention for the Control and Management of Ships' Ballast Water and Sediments Convention (the Ballast Water Management Convention). Clients should also refer to Guidelines for the Control and Management of Ships' Ballast Water to Minimize the Transfer of Harmful Aquatic Organisms and Pathogens, published by the International Maritime Organization.^{GN22}

GN104. In many cases, invasive species will have already been established in the region in which the project is located. In these cases, the client has the responsibility to take measures to prevent the species from further spread into areas in which it has not already been established. For example, in the case of linear infrastructure, invasive weeds might be spread into forested habitats, especially if the forest canopy is not able to reestablish itself (due to maintenance of the right-of-way for operational purposes). This is exacerbated if opportunistic agricultural or logging activities further widen the right-of-way, thereby facilitating spread. In these cases, the client is expected to determine the severity of the threat and the mode of spread of that species. The situation should be monitored as part of the overall ESMS, and the client should seek effective mitigation measures in coordination with local and national authorities.

^{GN22} IMO, Guidelines for the Control and Management of Ships'. GoBallast Partnership, 1997, <http://globallast.imo.org/868%20english.pdf>.

GN105. Living modified organisms can also be considered to be alien species, with similar potential for invasive behavior as well as potential for gene flow to related species. Any new introduction of such organisms should be assessed with due regard to the Cartagena Protocol on Biosafety.

Management of Ecosystem Services

24. Where a project is likely to adversely impact ecosystem services, as determined by the risks and impacts identification process, the client will conduct a systematic review to identify priority ecosystem services. Priority ecosystem services are two-fold: (i) those services on which project operations are most likely to have an impact and, therefore, which result in adverse impacts to Affected Communities; and/or (ii) those services on which the project is directly dependent for its operations (e.g., water). When Affected Communities are likely to be impacted, they should participate in the determination of priority ecosystem services in accordance with the stakeholder engagement process as defined in Performance Standard 1.

25. With respect to impacts on priority ecosystem services of relevance to Affected Communities and where the client has direct management control or significant influence over such ecosystem services, adverse impacts should be avoided. If these impacts are unavoidable, the client will minimize them and implement mitigation measures that aim to maintain the value and functionality of priority services. With respect to impacts on priority ecosystem services on which the project depends, clients should minimize impacts on ecosystem services and implement measures that increase resource efficiency of their operations, as described in Performance Standard 3. Additional provisions for ecosystem services are included in Performance Standards 4, 5, 7, and 8.¹⁹

¹⁹ Ecosystem service references are located in Performance Standard 4, paragraph 8; Performance Standard 5, paragraphs 5 and 25–29; Performance Standard 7, paragraphs 13–17 and 20; and Performance Standard 8, paragraph 11.

GN106. Performance Standard 6 defines ecosystem services as “the benefits that people, including businesses, obtain from ecosystems” (paragraph 2), which is in line with the definition provided by the Millennium Ecosystem Assessment.^{GN23} As described in paragraph 2 and footnote 1 of Performance Standard 6, ecosystem services are organized into four major categories:

- *Provisioning ecosystem services* include, among others, (i) agricultural products, seafood and game, wild foods, and ethnobotanical plants; (ii) water for drinking, irrigation, and industrial purposes; and (iii) forest areas, which provide the basis for many biopharmaceuticals, construction materials, and biomass for renewable energy.
- *Regulating ecosystem services* include, among others, (i) climate regulation and carbon storage and sequestration; (ii) waste decomposition and detoxification; (iii) purification of water and air; (iv) control of pests, disease, and pollination; and (v) natural hazard mitigation.
- *Cultural services* include, among others, (i) spiritual and sacred sites; (ii) recreational purposes such as sport, hunting, fishing, and ecotourism; and (iii) scientific exploration and education.
- *Supporting services* are the natural processes that maintain the other services, such as (i) nutrient capture and recycling, (ii) primary production, and (iii) pathways for genetic exchange.

^{GN23} Millennium Ecosystem Assessment Homepage, “Millennium Ecosystem Assessment”, 2006, <http://www.maweb.org>.

GN107. Performance Standard 6 also recognizes the importance of The Economics of Ecosystems and Biodiversity (TEEB) initiative, a long-term study that draws on expertise from around the world to evaluate the costs of the loss of biodiversity and the associated decline in ecosystem services worldwide. The TEEB initiative defines ecosystem services as “the direct and indirect contributions of ecosystems to human well-being.” TEEB also makes reference to the concept of natural capital in that, from an economic point of view, the flows of ecosystem services can be seen as the dividend that society receives from natural capital, and that maintaining stocks of natural capital allow the sustained provision of future flows of ecosystem services, and thereby help to ensure enduring human well-being.

GN108. Ecosystem services are indeed services because there is an identified (human) beneficiary (that is, the user). Ecosystem services are related to biophysical processes in the environment, but until there is a person or group of persons benefiting from the process, it is not a service. The beneficiary might be on the local, regional, or even global scale. For example, wild foods and freshwater collected by local communities accrue benefits to users on a local scale; the capacity for ecosystems to reduce damage caused by natural disasters such as hurricanes and tornados might benefit recipients of such services on the regional scale (as well as the local scale); and intact forests that capture and store carbon dioxide and regulate climate benefit recipients of such services on the global scale.

GN109. In recent years, a variety of reports, guidance documents, mapping tools, and toolkits have been developed as resources to support the application of these concepts. A large body of literature on payments for ecosystem services (PES) has existed for many years but is not directly applicable to Performance Standard 6 and is therefore not referenced in this Guidance Note. Client requirements are focused on the mitigation of impacts on ecosystem services and the benefits that ecosystem services might bring to companies rather than on the economic valuation for such services. If PES schemes exist in or near areas where clients are doing business, the client should be aware of them in accordance with any existing regulatory framework and/or other ongoing initiatives.

GN110. Guidance documents and tools for consideration of ecosystem services other than PES have been developed. Some are oriented more toward policy making, regional planning, education, and awareness, while others may be useful in private sector field applications. Clients should make use of relevant and appropriate guidance documents and mapping tools when ecosystem services are a key focus of the project, while recognizing that not all tools have been robustly tested in private sector project applications. Specific tools may be appropriate for different stages of a project’s life cycle, and multiple tools could be used in combination with one another to integrate the ecological and social considerations of ecosystem services into assessment, mitigation, and management planning.

GN111. Degradation and loss of ecosystem services can pose operational, financial, and reputational risks to project sustainability. In terms of risk, ecosystem services can generally be grouped as follows: (i) those that might potentially pose a risk to clients if project-related impacts are incurred on such services and (ii) those that present an opportunity for clients in that there is a direct dependence on such services for the client’s business operations (for example, water in hydropower projects). Furthermore, ecosystems are increasingly recognized and protected under legal and regulatory frameworks. Some countries have included ecosystem services within legislation at the national and provincial levels. Clients should be familiar with such legislation in the countries in which they are working.

GN112. Ecosystem services is a transdisciplinary topic; hence, it is covered under a number of the Performance Standards. With respect to provisioning and cultural ecosystem services, it is the community of practice of social development specialists (notably resettlement specialists and livelihood restoration specialists) and cultural heritage specialists who are most familiar with the assessment and evaluation of this topic; this is especially true given the importance of stakeholder engagement and consultation. On the

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other hand, biodiversity management specialists and environmental engineers might be the best placed to evaluate technical mitigation options for regulating ecosystem services. In either case, ecosystem services are a socio-ecological topic, which require collaboration between the client's environmental and social specialists. As already stated in paragraph GN21 of this note, a single assessment may require any number of specialists, depending on the service in question; these include soil and land capability and soil erosion control specialists, geologists and hydrologists, agronomists, rangeland ecologists, specialists in the economic valuation of natural resources, land-use planning and resettlement specialists with expertise in natural resource-based livelihood, livelihood restoration specialists and cultural anthropologists.

GN113. The concept of ecosystem services is covered in Performance Standard 4 ("Community Health, Safety, and Security"); Performance Standard 5 ("Land Acquisition and Involuntary Resettlement"); Performance Standard 7 ("Indigenous Peoples"); and Performance Standard 8 ("Cultural Heritage"). Performance Standard 3 ("Resource Efficiency and Pollution Prevention") is also relevant in terms of ecosystem services on which the client's business operations are dependent (that is, the section on "Resource Efficiency," paragraphs 6–9). A summary table is provided in Annex A of this Guidance Note to demonstrate the integration of this topic throughout the Performance Standards and the relationship to Performance Standard 6.

GN114. Client requirements in Performance Standard 6 for ecosystem services are applicable only when the client has "direct management control or significance influence" over such services. Therefore, ecosystem services whose beneficiaries are at the global scale, and sometimes the regional scale,^{GN24} are not covered under Performance Standard 6. These include regulating ecosystem services, such as carbon storage or climate regulation, where the benefits of such services are received on a global scale. Project-related impacts on ecosystem services where the client does not have direct management control or significance influence will be assessed per Performance Standard 1.

GN115. As described in paragraphs GN4–GN6 of this note, the risks and identification process will include a scoping for ecosystem services, which should primarily take place through literature review and consultation with Affected Communities as part of the stakeholder engagement process outlined in Performance Standard 1. Stakeholder engagement is covered under paragraphs GN91–GN105 of Guidance Note 1. Of particular relevance to ecosystem system services is engagement with poor and vulnerable communities, especially indigenous peoples (see related ecosystem services requirements in Performance Standard 7). Particular emphasis should also be paid to engaging with women, as they are some of the most likely users of natural resources. Where potentially significant project-related risks to ecosystem services are identified, clients will be responsible for identifying priority ecosystem services. Priority ecosystem services are defined in paragraph 24 of Performance Standard 6 as (i) those services on which project operations are most likely to have an impact and, therefore, which result in adverse impacts to Affected Communities; and/or (ii) those services on which the project is directly dependent for its operations (for example, water). Priority ecosystem services should be identified using a systematic review and prioritization (paragraph 24 of Performance Standard 6). For the purposes of this Guidance Note, this process is referred to as a *systematic assessment of ecosystem services*.^{GN25}

^{GN24} Performance Standard 6 requirements could apply to ecosystem services whose beneficiaries are at the regional scale, as projects with very large footprints could have an effect on regional level ecosystem services (for example, large wetlands or coastal areas required for natural hazard mitigation). The client, through the application of mitigation measures, may be determined to have significant influence over such services.

^{GN25} The Ecosystem Services Review for Impact Assessment terminology was developed by the World Resources Institute (WRI) i: Hanson, Craig, Corporate Ecosystems Service Review, <https://www.wri.org/publication/corporate-ecosystem-services-review>. The use of this term in this Guidance Note is not meant to be an exact duplication of WRI's application of this term. WRI's ESR method is one of several recommended methods that clients may choose to utilize to assess this topic.

GN116. For the purposes of Performance Standard 6 implementation, ecosystem services are categorized as two types:

- **Type I:** Provisioning, regulating, cultural and supporting ecosystem services, over which the client has direct management control or significant influence, and where impacts on such services **may adversely affect communities**.
- **Type II:** Provisioning, regulating, cultural and supporting ecosystem services, over which the client has direct management control or significant influence, and on which **the project directly depends for its operations** (examples of this type of ecosystem service are provided below in paragraph GN122).

GN117. Where a project is likely to have an impact on ecosystem services, the systematic assessment should screen for all type I and type II ecosystem services in the project site and its area of influence and prioritize ecosystem services based on the following: (i) the project's likelihood to have an impact on the service and (ii) the project's direct management control or significant influence over that service.

GN118. Type I ecosystem services will be considered priority, under the following circumstance:

- Project operations are likely to result in a significant impact on the ecosystem service;
- The impact will result in a direct adverse impact on Affected Communities "livelihood, health, safety, and/or cultural heritage."
- The project has direct management control or significant influence over the service.

GN119. Type II ecosystem services will be considered priority under the following circumstance:

- The project directly depends on the service for its primary operations.
- The project has direct management control or significant influence over the service.

GN120. For Type I ecosystem services, the systematic assessment must be conducted as part of a participatory stakeholder consultation process. Social specialists will be the primary agents conducting this consultation, and requirements are defined in paragraphs 25–33 of Performance Standard 1. Related guidance can be found in paragraphs GN91–GN105 of Guidance Note 1. As part of the systematic assessment, the client should consider the following:

- Review the nature and extent of ecosystem services in the project site and its area of influence.
- Identify the condition, trends, and external (non-project) threats to such services.
- Distinguish the beneficiaries of such services.
- Assess the extent to which the project depends on or may impact identified services.
- Assess the significance of the services in terms of livelihoods, health, safety, and cultural heritage
- Identify the associated key social, operational, financial, regulatory and reputational risks
- Identify courses of action and mitigation measures which can reduce identified risks.

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GN121. For **Type I** ecosystem services determined to be priority services, clients will implement the mitigation hierarchy to avoid impacts, and if impacts are unavoidable, clients will minimize them and implement mitigation measures to maintain the “*value and functionality of priority services*” as stated in paragraph 25 of Performance Standard 6. Considering the significant variation in mitigation measures that could be implemented to achieve this objective, mitigation measures are not detailed in this Guidance Note. They should be identified with the relevant environmental and social specialists. Note that compensation requirements with respect to natural resource-based livelihoods and access to natural resources are provided in Performance Standard 5. Clients are expected to demonstrate implementation of the mitigation hierarchy, in terms of avoidance, minimization and restoration, before compensation is considered.

GN122. For **Type II** ecosystem services determined to be priority services, clients should minimize impacts on ecosystem services and implement measures that increase resource efficiency of their operations as stated in paragraph 25 of Performance Standard 6. This requirement refers to actions that clients can implement within the natural environment to maintain the services that ecosystems provide to business operations. For example, maintaining vegetation along forested slopes might increase dam reservoir capacity and power output for hydropower projects; protecting mangroves or other nearshore ecosystems that provide juvenile habitat to fish and other aquatic species might benefit fisheries and other aquaculture operations; protecting coral reefs and other marine resources would improve the recreational value of coastal resources of importance to the tourism industry. All of these actions are means of optimizing the company’s reliance on provisioning, regulating and cultural ecosystem services. The requirements are related to, but different than, those contained in Performance Standard 3, which cover resource efficiency for energy and water consumption as part of project design and production processes (i.e., “in-house” efficiency measures).

Sustainable Management of Living Natural Resources

26. Clients who are engaged in the primary production of living natural resources, including natural and plantation forestry, agriculture, animal husbandry, aquaculture, and fisheries, will be subject to the requirements of paragraphs 26 through 30, in addition to the rest of this Performance Standard. Where feasible, the client will locate land-based agribusiness and forestry projects on unforested land or land already converted. Clients who are engaged in such industries will manage living natural resources in a sustainable manner, through the application of industry-specific good management practices and available technologies. Where such primary production practices are codified in globally, regionally, or nationally recognized standards, the client will implement sustainable management practices to one or more relevant and credible standards as demonstrated by independent verification or certification.

GN123. Primary production is defined for the purpose of this Performance Standard as being the cultivation of plants and animals for human or animal consumption and use, both in the wild or in a cultivated situation. It includes: all types of forestry, whether in natural forests or in plantations, as well as non-timber forest products which may be harvested from natural forests; all types of agriculture, including both annual and perennial crops and animal husbandry, including livestock; and both wild and capture fisheries including all types of marine and freshwater organisms, both vertebrate and invertebrate. This scope is intended to be broad enough to cover all cases where living natural resources are being managed by the client for the public’s benefit.

GN124. The overriding principle is that clients who are involved in these activities are required to manage the resource in a sustainable manner. This means that the land or water resource maintains its productive capacity over time, and that agricultural and aquacultural practices do not degrade the surrounding

environment. Sustainable management also ensures that people who are dependent on these resources are properly consulted, enabled to participate in development, and share equitably in the benefits of that development.

GN125. Paragraph 26 of Performance Standard 6 states that sustainable management will be achieved through the application of industry-specific good management practices and available technologies. Depending on the industry sector and geographic region, there is a range of such resources which should be consulted. These focus largely on environmental and occupational health and safety aspects, although social aspects are increasingly being addressed. The EHS Guidelines, and IFC's Good Practice Notes and related publications are a useful initial source of references for clients. Such industry-specific guidance is very dynamic and new materials are being published regularly. A diligent internet search will reveal a range of useful and up-to-date sources. An exceptional source for updates on standards and management practices include the International Trade Centre's Standards Map.^{GN26}

GN126. In recent years a number of industry sectors have developed and/or adopted formal environmental and social sustainability standards which incorporate good environmental and social practice. Adherence to such formal standards, which incorporate principles, criteria and indicators specific to the needs of a sector or geographic region, can then be subject to independent audit and verification of compliance. In the forestry sector, sustainable forest management standards include those developed by the Forest Stewardship Council (FSC), as well as a range of national forest standards (e.g., Sustainable Forestry Initiative (SFI) in the United States; Canadian Standards Association Sustainable Forest Management Standard (CSA); *Programa Brasileiro de Certificação Florestal* (CERFLOR) in Brazil; *Sistema Chileno de Certificación de Manejo Forestal Sustentable* (CERTFOR) in Chile; etc.). The Sustainable Agriculture Network (SAN) was created in 1992 and is now applied across many high value crops. More recently commodity-specific multi-stakeholder initiatives have been developed such as the Roundtable on Sustainable Palm Oil (RSPO). Implemented in 2008, RSPO has standards based on their Principles and Criteria for the production of palm oil, and there are comparable initiatives currently under development in other commodity sectors (sugar cane, cotton, soy, etc.). If a sector has in place an "appropriate" (as defined below) environmental and social sustainability standard, Performance Standard 6 requires that clients apply that standard and obtain independent verification or certification and that they are in conformity for all operations which they own directly or over which they have management control.

GN127. Paragraph 26 also makes explicit that, "*where feasible, the client will locate land-based agribusiness and forestry projects on unforested land or land already converted.*" This requirement should be implemented in conjunction with paragraph 14 (first bullet) of Performance Standard 6 (see natural habitats), which requires clients to demonstrate that there are "*no other viable alternatives within the region...for development of the project on modified habitat.*"

27. Credible globally, regionally, or nationally recognized standards for sustainable management of living natural resources are those which (i) are objective and achievable; (ii) are founded on a multi-stakeholder consultative process; (iii) encourage step-wise and continual improvements; and (iv) provide for independent verification or certification through appropriate accredited bodies for such standards.²⁰

²⁰ A credible certification system would be one which is independent, cost-effective, based on objective and measurable performance standards and developed through consultation with relevant stakeholders, such as local people and communities, Indigenous Peoples, and civil society organizations representing consumer, producer and conservation interests. Such a system has fair, transparent and independent decision-making procedures that avoid conflicts of interest.

^{GN26} ITC, "Standards Map-Your Roadmap to sustainable Trade", <http://www.standardsmap.org/Index.aspx>

GN128. While a large number of standards have been proposed, many of these lack adequate coverage of relevant sustainability issues, or may lack the ability to be independently and uniformly applied. For a standard to be appropriate for use, it should:

- Be objective and achievable—based on a scientific approach to identifying issues, and realistic in assessing how these issues can be addressed on the ground under a variety of practical circumstances.
- Be developed or maintained through a process of ongoing consultation with relevant stakeholders—there should be balanced input from all relevant stakeholder groups, including producers, traders, processors, financiers, local people and communities, indigenous peoples, and civil society organizations representing consumer, environmental and social interests, with no group holding undue authority or veto power over the content.
- Encourage step-wise and continual improvement—both in the standard and its application of better management practices, and require the establishment of meaningful targets and specific milestones to indicate progress against principles and criteria over time.
- Be verifiable through independent certifying or verifying bodies—which have defined and rigorous assessment procedures that avoid conflicts of interest, and are compliant with ISO guidance on accreditation and verification procedures.

GN129. In general, standards which conform to the ISEAL^{GN27} Code of Good Practice for Setting Social and Environmental Standards will be consistent with the above requirements.

GN130. Performance Standard 6 requires external verification or certification to an appropriate voluntary standard as a way of providing additional assurance that clients are adequately addressing environmental and social sustainability issues. While requiring external verification or certification of sustainable resource management (if an appropriate standard exists), Performance Standard 6 does not endorse any particular standard as meeting its requirements, since standards can change in both content and application on the ground over time. Standards are considered for application on a case-by-case basis, making a determination of whether the standard and its external verification or certification system are generally consistent with the above requirements.

GN131. Verification or certification to multiple standards may be unnecessary if one standard covers the key issues, but clients may choose to become certified to a number of standards, depending on their own needs for risk management, complexity of their supply chains, and the demands of their target markets. Clients are encouraged to select standards which meet the requirements outlined above and help them minimize environmental and social risks.

GN132. Where there is a lack of a single comprehensive standard and criteria for a particular commodity, Performance Standard 6 allows for the verification or certification to a combination of standards which cover relevant biodiversity and ecosystem services aspects and may be combined with other standards that cover other environmental and social issues such as occupational health and safety, social and labor issues, product quality and environmental management.

28. Where relevant and credible standard(s) exist, but the client has not yet obtained independent verification or certification to such standard(s), the client will conduct a pre-

^{GN27} ISEAL Alliance, good practice documents, <http://www.isealalliance.org/code>.

assessment of its conformity to the applicable standard(s) and take actions to achieve such verification or certification over an appropriate period of time.

GN133. In cases where there is a relevant standard, but the client has not yet achieved verification or certification, clients are required, in the early stages of project design, to undertake a pre-assessment or gap analysis of conformity with the selected standard, carried out by a suitably experienced practitioner, to indicate areas where the client needs to develop materials and procedures and improve practice, prior to scheduling a formal compliance audit for verification or certification. The pre-assessment will form the basis of an action plan to address those issues, with an appropriate timeline. In agreeing to an appropriate timeline for achieving conformance with standard(s) as well as appropriate verification or certification, the nature and scale of the client's operations and the client's human resource capabilities should also be considered.

29. In the absence of a relevant and credible global, regional, or national standard for the particular living natural resource in the country concerned, the client will:

- ***Commit to applying good international industry operating principles, management practices, and technologies; and***
- ***Actively engage and support the development of a national standard, where relevant, including studies that contribute to the definition and demonstration of sustainable practices.***

GN134. Where a relevant standard has not yet been developed, or a national interpretation of a generic global standard has yet to be approved for use in a specific geographic region or country, clients are required to operate in the spirit of internationally-accepted good industry practices. The intent is that clients would use this period to prepare for eventual verification or certification in the future. Further, clients are expected to actively engage in the development process for a relevant standard, to the extent appropriate to the nature and scale of their operations. Such participation could include, among others, hosting and/or participating in local workshops, or pilot field testing of specific requirements which are planned for inclusion in the standard. When the standard is developed, clients will apply for and achieve verification or certification to that standard, for all operations which they own directly or over which they have management control.

Supply Chain

30. Where a client is purchasing primary production (especially but not exclusively food and fiber commodities) that is known to be produced in regions where there is a risk of significant conversion of natural and/or critical habitats, systems and verification practices will be adopted as part of the client's ESMS to evaluate its primary suppliers.²¹ The systems and verification practices will (i) identify where the supply is coming from and the habitat type of this area; (ii) provide for an ongoing review of the client's primary supply chains; (iii) limit procurement to those suppliers that can demonstrate that they are not contributing to significant conversion of natural and/or critical habitats (this may be demonstrated by delivery of certified product, or progress towards verification or certification under a credible scheme in certain commodities and/or locations); and (iv) where possible, require actions to shift the client's primary supply chain over time to suppliers that can demonstrate that they are not significantly adversely impacting these areas. The ability of the client to fully address these risks will depend upon the client's level of management control or influence over its primary suppliers.

²¹ Primary suppliers are those suppliers who, on an ongoing basis, provide the majority of living natural resources, goods, and materials essential for the core business processes of the project.

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GN135. Clients may purchase food, fiber, wood, animals, and animal products, and related commodities for further processing or trade, while not being directly involved in the growing or harvesting of such products. In addition, such products may pass through several intermediaries before being acquired by clients. Clients should be aware that there may be substantial reputational risks to their involvement in such supply chains where significant negative impacts on biodiversity have been identified in the production of these products.

GN136. Negative concerns and impacts include areas and situations where there has been significant conversion of natural and critical habitat as defined in paragraphs 13 and 16, respectively, of Performance Standard 6.

GN137. Clients involved with processing or trading of such commodities should develop and implement appropriate policies and procedures as part of their ESMS to identify their supply chains risks, and to assess their operational and reputational exposure to such risks. Clients should have appropriate quality assurance and traceability systems which allow them to identify with accuracy the source and origin of their products. Such traceability or chain-of-custody systems should be adequate to allow the client to eliminate products or suppliers who do not meet their policies and procedures and pose risks to biodiversity.

GN138. In situations where such concerns are identified, clients will identify ways to address them and reduce their risks, in a manner commensurate with their degree of control and influence over their supply chain. In particular, clients should identify their primary suppliers, who, on an ongoing basis, provide the majority of the living natural resources, goods and materials essential for the core processes of the client's business.

GN139. Clients should work with those primary suppliers to encourage and assist them in identifying where risks and concerns arise in their supply chains, and if possible, in identifying where and how those primary suppliers can work to prevent significant conversion and/or degradation of natural and critical habitat and secure sustainable management of living natural resources through the application of industry-specific good management practices and available technologies. As part of their ESMS, clients should develop and implement or adopt monitoring tools, metrics and methods to measure ongoing performance of primary suppliers, where relevant.

GN140. Where there are appropriate certification and verification systems in place for sustainable natural resource management in the country of origin, clients are encouraged to consider the procurement of certified product and demonstrated certification or verification under a credible chain-of-custody scheme relevant to the commodity or product in question.

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Annex A. References to Ecosystem Services in Other Performance Standards

Performance Standard	Paragraph Number	Reference and Relation to Performance Standard 6
1	Paragraph 8/ first bullet	With respect to the definition of the project's area of influence, indirect project impacts on biodiversity or on ecosystem services upon which Affected Communities' livelihoods are dependent are to be accounted for.
4	Paragraph 8	Describes the client's responsibility to take into account the project's potential direct impacts on priority ecosystem services that may result in adverse health and safety impacts to Affected Communities. Ecosystem services are limited to provisioning and regulating services. Client requirements link back to paragraph 25 in Performance Standard 6.
5	Paragraph 1/ footnote 1	Footnote explains that natural resource-based livelihoods are considered "livelihoods" per Performance Standard 5.
	Paragraph 5/ third bullet	Notes that Performance Standard 5 applies when economic displacement caused by project-related restrictions on land use and access to natural resources causes a community (or groups within a community) to lose access to resource usage.
	Paragraph 5/ footnote 9	States that the term "natural resource assets" as referred to in Performance Standard 5 are equivalent to the provisioning ecosystem services terminology of Performance Standard 6.
	Paragraph 27	Describes general client requirements for economically displaced persons who face loss of assets or access to assets, which includes natural resource assets.
	Paragraph 28/ second bullet	Describes additional client requirements for livelihood restoration for persons whose livelihoods are natural resource-based livelihoods and where there are project-related restrictions on access to natural resources, i.e., these would be considered priority provisioning ecosystem services of relevance to Affected Communities per Performance Standard 6.
7	Paragraph 11/ footnote 5	States that the term "natural resources and natural areas with cultural value" as referred to in Performance Standard 7 are equivalent to the provisioning and cultural ecosystem services terminology in Performance Standard 6.
	Paragraph 13/ footnote 6	States that the term "natural resource assets" as referred to in Performance Standard 7 is equivalent to the provisioning ecosystem services terminology of Performance Standard 6.

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Performance Standard	Paragraph Number	Reference and Relation to Performance Standard 6
	Paragraph 14	Describes client requirements if the client proposes to locate a project, or commercially develop natural resources on lands traditionally owned by, or under customary use of Indigenous Peoples.
	Paragraph 14/ footnote 9	States that the term “natural resources and natural areas of importance” as referred to in Performance Standard 7 is equivalent to priority ecosystem services as defined in Performance Standard 6. This footnote is slightly different than footnote 5 in that it states that where impacts on natural resources and natural areas of importance trigger client requirements in Performance Standard 7, they will be considered priority ecosystem services per Performance Standard 6.
	Paragraph 16/ footnote 13	Describes client requirements with respect to impacts on critical cultural heritage for Indigenous Peoples. Footnote 13 explains that this includes “natural areas with cultural and/or spiritual value,” which would be considered priority cultural ecosystem services per Performance Standard 6.
8	Paragraph 3	Explains that “unique natural features or tangible objects that embody cultural values” (such as sacred groves, rocks, lakes and waterfalls) is covered under Performance Standard 8 (unless these are cultural sites of Indigenous Peoples in which case they are covered under paragraph 16 of Performance Standard 7). “Unique natural features or tangible objects that embody cultural values” are equivalent to the cultural ecosystem services terminology used in Performance Standard 6.
	Paragraphs 11 and 12	Describes the client requirements for “Replicable” and “Non-replicable” cultural heritage. Cultural ecosystem services that meet definition 3(ii) of paragraph 3 in Performance Standard 8 will be covered by the requirements in paragraphs 11 or 12, as appropriate. The definitions of “Replicable” and “Non-replicable” cultural heritage are provided in footnotes 3 and 5 of Performance Standard 8.
	Paragraph 11/ footnote 4	Describes client requirements for “Replicable” cultural heritage and includes the mitigation hierarchy as it applies to Performance Standard 8. These requirements place emphasis on “maintaining or restoring any ecological processes needed to support (the cultural heritage).” The “ecological processes” term is essentially equivalent to priority regulating ecosystem services as defined in Performance Standard 6.

Annotated Bibliography

International Agreements

Several of the requirements set out in Performance Standard 6 relate to standards set by the following international agreements:

CMS (Convention on Migratory Species) Secretariat and UNEP (United Nations Environment Programme). 1979. "Convention on the Conservation of Migratory Species of Wild Animals" CMS Secretariat, Bonn, Germany, and UNEP, Nairobi. <http://www.cms.int/index.html>. Known as the Bonn Convention, this intergovernmental treaty strives to conserve terrestrial, marine, and avian migratory species; their habitats; and their migration routes.

IMO (International Maritime Organization). 2004. "International Convention for the Control and Management of Ships' Ballast Water and Sediments Convention." IMO, London. [http://www.imo.org/About/Conventions/ListOfConventions/Pages/International-Convention-for-the-Control-and-Management-of-Ships'-Ballast-Water-and-Sediments-\(BWM\).aspx](http://www.imo.org/About/Conventions/ListOfConventions/Pages/International-Convention-for-the-Control-and-Management-of-Ships'-Ballast-Water-and-Sediments-(BWM).aspx). This convention is intended to prevent the spread of harmful aquatic organisms carried by ships' ballast water from one region to another.

IUCN (International Union for Conservation of Nature). 1975. "Convention on International Trade in Endangered Species of Wild Fauna and Flora." IUCN, Gland, Switzerland. <http://www.cites.org>. This international agreement is aimed at ensuring that international trade in specimens of wild animals and plants does not threaten their survival.

Ramsar Secretariat. 1971. "Convention on Wetlands of International Importance, especially as Waterfowl Habitat." Ramsar Secretariat, Gland, Switzerland. <http://www.ramsar.org>. This intergovernmental treaty provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources.

Secretariat of the CBD (Convention on Biological Diversity). 1992. "Convention on Biological Diversity." Secretariat of the CBD, Montreal. <http://www.cbd.int/>. The convention was developed from agreements adopted at the 1992 Earth Summit in Rio de Janeiro. CBD is an international treaty to sustain the diversity of life on Earth. The convention's three main goals are the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of the benefits from the use of genetic resources.

———. 2000. "Cartagena Protocol on Biosafety to the Convention on Biological Diversity." Secretariat of the CBD, Montreal. <http://www.cbd.int/biosafety/default.html>. This protocol is a supplement to the Convention on Biological Diversity. Its objective is to ensure the safe handling, transport, and use of living modified organisms resulting from modern biotechnology that may have adverse effects on biological diversity or cause risks to human health.

———. 2011. "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." Secretariat of the CBD, Montreal. <http://www.cbd.int/abs>. This international agreement aims to share the benefits that arise from the use of genetic resources in a fair and equitable way, including by appropriate access to genetic resources and transfer of relevant technologies. The Nagoya Protocol will be open for signature by parties to the convention from February 2, 2011, to February 1, 2012.

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UNESCO (United Nations Educational, Scientific, and Cultural Organization). 1972. "Convention Concerning the Protection of World Cultural and Natural Heritage." UNESCO, Paris. <http://whc.unesco.org/en/conventiontext>. Known as the World Heritage Convention, this international agreement aims to identify and conserve the world's cultural and natural heritage. Its World Heritage List contains sites of outstanding cultural and natural value.

Biodiversity Conservation and Management

The following resources provide guidance and other references relevant to biodiversity conservation and management:

Biodiversity Action Plans

For guidance on the development of biodiversity action plans, see the following resources:

Croucher, Toby, and Erica Dholoo. 2010. "To BAP or Not to BAP? Challenges and Opportunities in the Adoption of Biodiversity Actions Plans for the Oil and Gas Sector." Paper 127133-MS presented at the Society of Petroleum Engineers International Conference on Health, Safety, and Environment in Oil and Gas Exploration and Production, Rio de Janeiro, April 12–14.

IPIECA (International Petroleum Industry Environmental Conservation Association). 2005. "A Guide to Developing Biodiversity Action Plans for the Oil and Gas Sector." IPIECA, London. <http://www.ipieca.org/publication/guide-developing-biodiversity-action-plans-oil-and-gas-sector>.

Maguire, Simon, Carolina Casaretto, David Vexler, Richard Kingham, and Scott Rolseth. 2010. "Developing a Biodiversity Action Plan through an Integrated Phased Approach." Paper 127208-MS presented at Society of Petroleum Engineers International Conference on Health, Safety, and Environment in Oil and Gas Exploration and Production, Rio de Janeiro, April 12–14.

CBD (Convention on Biological Diversity), National Biodiversity Strategies and Action Plans, Accessed December 17, 2018, see: <http://www.cbd.int/nbsap>

Biodiversity and Environmental Impact Assessments

For guidance on biodiversity and ecological impact assessments, see the following resources:

CMS (Convention on Migratory Species) Secretariat and UNEP (United Nations Environment Programme). 2002. "Convention on the Conservation of Migratory Species of Wild Animals: Resolution 7.2—Impact Assessment and Migratory Species." CMS Secretariat, Bonn, Germany, and UNEP, Nairobi. http://www.cms.int/bodies/COP/cop7/proceedings/pdf/en/part_I/Res_Rec/RES_7_02_Impact_Assessment.pdf.

IEEM (Institute of Ecology and Environmental Management). 2006. "Guidelines for Ecological Impact Assessment in the United Kingdom." IEEM, Winchester, U.K. <http://www.ieem.net/ecia/EcIA%20Approved%20%20July%202006.pdf>.

Energy and Biodiversity Initiative. 2003c. "Measuring Impacts and Actions on Biodiversity." In *Integrating Biodiversity Conservation into Oil and Gas Development*, 43–46. Washington, DC: Energy and Biodiversity Initiative. http://www.theebi.org/pdfs/ebi_report.pdf. This document

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and chapter give further information on measuring biodiversity values with respect to project-related impacts.

Ramsar Secretariat. 2007. "Ramsar Handbook for the Wise Use of Wetlands, Volume 13: Impact Assessment." Ramsar Secretariat, Gland, Switzerland.
http://www.ramsar.org/pdf/lib/lib_handbooks2006_e13.pdf.

———. 2008. "Ramsar Convention on Wetlands, Resolution X.17, Environmental Impact Assessment and Strategic Environmental Assessment: Updated Scientific and Technical Guidance." Ramsar Secretariat, Gland, Switzerland. http://www.ramsar.org/pdf/res/key_res_x_17_e.pdf.

Secretariat of the CBD (Convention on Biological Diversity). 2006a. "Biodiversity in Impact Assessment: Background Document to Decision VIII/28 of the Convention on Biological Diversity: Voluntary Guidelines on Biodiversity-Inclusive Impact Assessment." CBD Technical Series 26, Secretariat of the CBD, Montreal. <http://www.cbd.int/doc/publications/cbd-ts-26-en.pdf>.

———. 2006b. "Voluntary Guidelines on Biodiversity-Inclusive Impact Assessment." Decision VIII/28, Secretariat of the CBD, Montreal. <http://www.cbd.int/doc/decisions/cop-08-dec-28-en.pdf>.

Slootweg, Roel, Asha Rajvanshi, Vinod Mathur, and Arend Kolhoff. 2009. *Biodiversity in Environmental Assessment: Enhancing Ecosystem Services for Human Well-Being*. Cambridge, U.K.: Cambridge University Press.

Treweek, Jo. 1999. *Ecological Impact Assessment*. Oxford, U.K.: Blackwell Science.

World Bank. 2000. "Biodiversity and Environmental Assessment Toolkit." World Bank, Washington, DC. <http://go.worldbank.org/QPXINZOES0>.

Biodiversity Management Systems

For guidance on the development of biodiversity management systems, see the following resources:

Energy and Biodiversity Initiative. 2003. "Integrating Biodiversity into Environmental Management Systems." In *Integrating Biodiversity Conservation into Oil and Gas Development*. Washington, DC: Energy and Biodiversity Initiative. <http://www.theebi.org/products.html>.

Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety. 2010. "Corporate Biodiversity Management Handbook." Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety, Berlin <http://www.bmu.de/english/nature/downloads/doc/46144.php>. This publication offers businesses a practical tool for implementing a biodiversity management system. For more information, visit the Biodiversity in Good Company Initiative, <http://www.business-and-biodiversity.de>.

IUCN (International Union for Conservation of Nature). 2010. *Biodiversity Management Systems: Proposal for the Integrated Management of Biodiversity at Holcim Sites*. Gland Switzerland: IUCN. http://cmsdata.iucn.org/downloads/biodiversity_management_system_final.pdf. The Holcim Group–IUCN Independent Expert Panel developed this system. This comprehensive document was prepared for the cement sector but is of relevance to biodiversity management in all sectors.

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Partnerships

The following sample documents on partnerships between biodiversity conservation organizations and the private sector are provided for the mining, oil and gas, and cement industries:

Holcim. 2010. "Partnership for Biodiversity: Making Biodiversity Part of Business." Jona, Switzerland, Holcim.

http://www.holcim.com/holcimcms/uploads/CORP/partnership_for_biodiverstiy/index.html

ICMM (International Council of Mining and Metals). "Work Programs: Resources for Partnerships." ICCM, London. <http://www.icmm.com/mpd/resources>.

IPIECA (International Petroleum Industry Environmental Conservation Association). 2006. *Partnerships in the Oil and Gas Industry*. London: IPIECA.

<http://www.ipieca.org/publication/partnerships-oil-and-gas-industry>.

Other Resources

American Bird Conservancy. 2011. "Alliance for Zero Extinction." American Bird Conservancy, Washington, DC. <http://www.zeroextinction.org>. The Alliance for Zero Extinction (AZE) is a global initiative of biodiversity conservation organizations that identifies sites in critical need of protection and safeguarding to prevent imminent species extinctions. Information on AZE sites, species, and selection criteria is available at Taylor H. Ricketts, Eric Dinerstein, Tim Boucher, Thomas M. Brooks, Stuart H. M. Butchart, Michael Hoffmann, John F. Lamoreux, John Morrison, Mike Parr, John D. Pilgrim, Ana S. L. Rodrigues, Wes Sechrest, George E. Wallace, Ken Berlin, John Bielby, Neil D. Burgess, Don R. Church, Neil Cox, David Knox, Colby Loucks, Gary W. Luck, Lawrence L. Master, Robin Moore, Robin Naidoo, Robert Ridgely, George E. Schatz, Gavin Shire, Holly Strand, Wes Wettengel, and Eric Wikramanayak, 2005, "Pinpointing and Preventing Imminent Extinctions," *Proceedings of the National Academy of Sciences* 102 (51): 18497–501.

BBOP (Business and Biodiversity Offsets Program). Homepage. Forest Trends, Washington, DC. <http://bbop.forest-trends.org>. The BBOP guidelines and principles establish a framework for designing and implementing biodiversity offsets programs and for measuring their conservation outcomes. Numerous publications, guidance, and references are available on biodiversity offsets and related topics through BBOP's online library and toolkit. See also BBOP, 2005, "BBOP Phase One: Overview, Principles, Interim Guidance, and Supporting Materials," BBOP, Washington, DC, <http://bbop.forest-trends.org/guidelines>, and BPOP, n.d., "Principles on Biodiversity Offsets," BBOP, Washington, DC, <http://bbop.forest-trends.org/guidelines/principles.pdf>.

BirdLife International. Homepage. BirdLife International, Cambridge, U.K. <http://www.birdlife.org>. BirdLife International is a global partnership of conservation organizations that focuses on conservation of birds, bird habitats, and global biodiversity. BirdLife International makes available data on endangered bird species and important bird areas (IBA) through its publications and online database. For IBA criteria, see BirdLife International, "BirdLife International Data Zone," BirdLife International, Cambridge, U.K. <http://www.birdlife.org/datazone/info/ibacriteria>.

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- Bishop, Joshua, Sachin Kapila, Frank Hicks, Paul Mitchell, and Francis Vorhies. 2008. *Building Biodiversity Business*. London: Shell International; Gland, Switzerland: International Union for Conservation of Nature. <http://data.iucn.org/dbtw-wpd/edocs/2008-002.pdf>. This publication covers various sectors, such as forestry, agriculture, and carbon.
- Conservation International. 2011. "RAP Tool Kit." <https://learning.conservation.org/biosurvey/RAP/Toolkit/Pages/default.aspx#>. The RAP (Rapid Assessment Program) Tool Kit provides information, resources, and tools related to rapid biodiversity assessment.
- Earthwatch Institute (Europe). 2011. "Business and Biodiversity Resource Centre." <http://www.businessandbiodiversity.org/index.html>. This site provides a wealth of sector-specific resources on biodiversity management.
- Edgar, Graham J., Penny F. Langhammer, Gerry Allen, Thomas M. Brooks, Juliet Brodie, William Crosse, Naamal De Silva, Lincoln D. C. Fishpool, Matthew N. Foster, David H. Knox, John E. McCosker, Roger McManus, Alan J. K. Millar, and Robinson Mugo. 2009. "Key Biodiversity Areas as Globally Significant Target Sites for the Conservation of Marine Biological Diversity." *Aquatic Conservation: Marine and Freshwater Ecosystems* 18 (6): 969–83. This publication discusses key marine biodiversity areas.
- Eisenberg, John F. eds 1977. *The Evolution of the Reproductive Unit in the Class Mammalia*. Rosenblatt, Jay, and B. R. Komisaruk, <https://pdfs.semanticscholar.org/8323/ad414157dba9a25b1e2cc61da78186f026e3.pdf>
- Energy and Biodiversity Initiative. 2003a. "Deciding Where to Work." In *Integrating Biodiversity Conservation into Oil and Gas Development*, 38–42. Washington, DC: Energy and Biodiversity Initiative. http://www.theebi.org/pdfs/ebi_report.pdf.
- . 2003b. "Good Practice in the Prevention and Mitigation of Primary and Secondary Biodiversity Impacts." Energy and Biodiversity Initiative, Washington, DC. <http://www.theebi.org/pdfs/practice.pdf>.
- Food and Agriculture Organization (FAO) of the United Nations. Homepage. FAO, Rome. <http://www.fao.org>. FAO specializes in agriculture, forestry, and fisheries.
- . 2010. *Global Forest Resources Assessment 2010*. Rome: FAO. <http://www.fao.org/forestry/fra/en>. The assessment is based on data provided to FAO by countries in response to a questionnaire.
- . 2011a. "Biodiversity for a World without Hunger." FAO, Rome. <http://www.fao.org/biodiversity>. FAO's biodiversity webpage provides information on biodiversity aspects in food and agriculture, including issues related to agro-ecosystems and biotechnology.
- . 2011b. "National Forest Monitoring and Assessment—NFMA." FAO, Rome. <http://www.fao.org/forestry/nfma/en>. This website provides links to information on the current status of forest resources and their changes over time from FAO's global and national forest assessment and monitoring programs.
- GEO (Group on Earth Observations). Homepage. http://www.geoportal.org/web/guest/geo_home. GEO coordinates the international efforts to build a Global Earth Observation System of

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- Systems (GEOSS). Its website offers access to a wide array of instruments and systems for monitoring and forecasting global environmental change, including a single internet access point for existing global databases and portals. For more information on GEOSS, visit <http://www.earthobservations.org/geoss.shtml>.
- GISP (Global Invasive Species Programme). Homepage. GISP, Nairobi. <http://www.gisp.org>. GISP was established in 1997 to address global threats caused by invasive alien species and to support the implementation of Article 8(h) of the Convention on Biological Diversity. GISP's website contains links to databases and related information on invasive species.
- HCV (High Conservation Value) Resource Network. Homepage. HCV Resource Network, Oxford, U.K. <http://www.hcvnetwork.org>. This site's resource center provides guidance, manuals, tools, and studies for assessing high conservation value areas. Visit <http://www.hcvnetwork.org/resources> for more information.
- Holland, Robert A., William R. T. Darwall, and Kevin Smith. Forthcoming. "Conservation Priorities for Freshwater Biodiversity: The Key Biodiversity Area Approach Refined and Tested for Continental Africa." *Biological Conservation*.
- IAIA (International Association for Impact Assessment). Homepage. IAIA, Fargo, ND. <http://www.iaia.org>. IAIA provides a variety of resources on the impact assessment process. See also the IAIA Wiki site, which provides a variety of information on biodiversity, ecosystems and ecosystem services, and impact assessment consideration and approaches: [http://www.iaia.org/IAIAWiki/\(X\(1\)S\(50zqs2rmrpdcul55maeul545\)\)/Default.aspx?Page=biodiv&NS=&AspxAutoDetectCookieSupport=1](http://www.iaia.org/IAIAWiki/(X(1)S(50zqs2rmrpdcul55maeul545))/Default.aspx?Page=biodiv&NS=&AspxAutoDetectCookieSupport=1).
- . 2005. "Biodiversity in Impact Assessment." Special Publication Series 3, IAIA, Fargo, ND.
- IBAT (Integrated Biodiversity Assessment Tool). Homepage. <https://www.ibatforbusiness.org>. IBAT is a joint project of BirdLife International, Conservation International, International Union for Conservation of Nature, and United Nations Environment Programme's World Conservation Monitoring Centre. IBAT allows users access to information on biodiversity and ecosystems, including high-priority sites for conservation, such as protected areas and key biodiversity areas.
- ICMM (International Council on Mining and Metals). Homepage. ICMM, London. <http://www.icmm.com>. Within ICMM's environment work program is sector-specific information on biodiversity management, including its landmark publication and other discussion papers on biodiversity offsets. See <http://www.icmm.com/biodiversity>.
- . 2006. *Good Practice Guidance for Mining and Biodiversity*. London: ICMM.
- . 2010. *Mining and Biodiversity: A Collection of Case Studies—2010*. London: ICMM.
- IFC (International Finance Corporation). 2007. "Environmental, Health, and Safety Guidelines for Mining." IFC, Washington, DC. http://www1.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/ifc+sustainability/risk+management/sustainability+framework/sustainability+framework+-+2006/environmental%2C+health%2C+and+safety+guidelines/ehsguidelines.
- . 2011. "A Guide to Biodiversity for the Private Sector: Why Biodiversity Matters and How It Creates Business Value." IFC, Washington, DC.

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http://www1.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/ifc+sustainability/publications/biodiversityguide. This online guide is designed to help companies that are operating in emerging markets to better understand their relationship to biodiversity issues and how they can effectively manage those issues to improve business performance and to benefit from biodiversity. It provides a useful source of sector-specific biodiversity management issues.

IMO (International Maritime Organization). 1997. "Guidelines for the Control and Management of Ships' Ballast Water to Minimize the Transfer of Harmful Aquatic Organisms and Pathogens." IMO, London. <http://globallast.imo.org/868%20english.pdf>. These voluntary guidelines provide relevant authorities with guidance on ways to improve ballast water management and to prevent the introduction of unwanted aquatic organisms and pathogens.

IPIECA (International Petroleum Industry Environmental Conservation Association). Homepage. IPIECA, London. <http://www.ipieca.org>. Biodiversity is one of IPIECA's main focus areas. Sector-specific information on biodiversity management has been developed by the IPIECA–International Association of Oil and Gas Producers Biodiversity Working Group.

———. 2010. "Alien invasive species and the oil and gas industry: Guidance for prevention and management." IPIECA, London. http://www.ipieca.org/sites/default/files/publications/alien_invasive_species.pdf. This document delivers practical information to on-the-ground staff at onshore and offshore projects and operations, helping them to identify key issues and solutions and to embed active consideration of alien invasive species (AIS) from the earliest stages of the project.

IUCN (International Union for Conservation of Nature). 2003. "Guidelines for Application of IUCN Red List Criteria at Regional Levels: Version 3.0," IUCN Species Survival Commission, IUCN, Gland, Switzerland. This document provides guidance on the application of Red List criteria at the regional level.

IUCN (International Union for Conservation of Nature) Species Survival Commission. 2013. Guidelines for Reintroductions and Other Conservation Translocations. Version 1.0. Gland, Switzerland: IUCN Species Survival Commission.

IUCN (International Union for Conservation of Nature). 2016. A Global Standard for the Identification of Key Biodiversity Areas, Version 1.0. First edition. Gland, Switzerland. See IUCN. <https://portals.iucn.org/library/node/46259>

IUCN (International Union for Conservation of Nature). Protected Areas Category. <https://www.iucn.org/theme/protected-areas/about/protected-area-categories>

———. 2011a. "About the Species Survival Commission." http://www.iucn.org/about/work/programmes/species/about_ssc. This site includes information about the Species Survival Commission and its work, with links to publications and technical guidelines, as well as a specialists group directory and profiles.

———. 2011b. "Ecosystems Red List." IUCN, Gland Switzerland. http://www.iucn.org/about/union/commissions/cem/cem_work/tg_red_list. For information on the initiative to establish criteria and categories for threatened and unique ecosystems, see <http://www.iucn.org/about/union/commissions/cem/>.

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- . 2001c. “Global Business and Biodiversity Programme.” IUCN, Gland, Switzerland. http://www.iucn.org/about/work/programmes/business/bbp_aboutus. The Global Business and Biodiversity Programme was established to influence and support private partners in addressing environmental and social issues. The program’s key priority, which is based on a strategy approved by the IUCN Council, is to engage the business sectors that have a significant impact on natural resources and livelihoods. Numerous related resources, including IUCN–private sector projects, can be found on IUCN’s website.
- . 2011d. “The IUCN Red List of Threatened Species.” <http://www.iucnredlist.org>. This site provides comprehensive data related to the risk of extinction and conservation status of plant and animal species.
- . 2011e. “Protected Area Management Categories.” IUCN, Gland, Switzerland. http://www.iucn.org/about/work/programmes/pa/pa_products/wcpa_categories. This site summarizes the definitions of the six protected area management categories and contains links to full texts of the guidelines for protected areas management categories.
- Langhammer, Penny F., Mohamed I Bakarr, Leon A. Bennun, Thomas M. Brooks, Rob P. Clay, Will Darwall, Naamal De Silva, Graham J. Edgar, Güven Eken, Lincoln D. C. Fishpool, Gustavo A. B. da Fonseca, Matthew N. Foster, David H. Knox, Paul Matiku, Elizabeth A. Radford, Ana S. L. Rodrigues, Paul Salaman, Wes Sechrest, and Andrew W. Tordoff. 2007. “Identification and Gap Analysis of Key Biodiversity Areas: Targets for Comprehensive Protected Area Systems.” Best Practice Protected Area Guideline Series 15, International Union for Conservation of Nature, Gland, Switzerland. This publication discusses key biodiversity issues in general.
- Ledec, George Campos, and Sally Diana Reay Johnson. 2016. Biodiversity Offsets: A User Guide. Washington, DC: World Bank Group. <http://documents.worldbank.org/curated/en/344901481176051661/Biodiversity-offsets-a-user-guide>
- Miranda, Marta, Philip Burris, Jessie Froy Bincang, Phil Shearman, José Oliver Briones, Antonio La Viña, and Stephen Menard. 2003. “Mining and Critical Ecosystems: Mapping the Risks” World Resources Institute, Washington, DC. This publication was made in collaboration with the Environmental Science for Social Change and Papua New Guinea NGO Environmental Watch Group.
- NatureServe. NatureServe database. NatureServe, Arlington, VA. <http://www.natureserve.org/getData/LACecologyData.jsp>. The website gives access to the completed, working classification of terrestrial ecological systems in Latin America and the Caribbean.
- Plantlife International. 2004. “Identifying and Protecting the World’s Most Important Plant Areas.” Plantlife International, Salisbury, U.K. This publication discusses key plant biodiversity areas.
- Ramsar Secretariat. 2009. “What Are the Criteria for Identifying Wetlands of International Importance.” Ramsar Secretariat, Gland, Switzerland. http://www.ramsar.org/cda/en/ramsar-about-fags-what-are-criteria/main/ramsar/1-36-37%5E7726_4000_0. This webpage gives overview of the criteria adopted for the identification of Ramsar sites.

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- Rodriguez, Jon Paul, Jennifer K. Balch, and Kathryn M. Rodriguez-Clark. 2007. "Assessing Extinction Risk in the Absence of Species-Level Data: Quantitative Criteria for Terrestrial Ecosystems," *Biodiversity and Conservation* 16 (1): 183–209.
- Rodriguez, Jon Paul, Kathryn M. Rodriguez-Clark, Jonathan E. M. Baillie, Neville Ash, John Benson, Timothy Boucher, Claire Brown, Neil D. Burgess, Ben Collen, Michael Jennings, David A. Keith, Emily Nicholson, Carmen Revenga, Belinda Reyers, Mathieu Rouget, Tammy Smith, Mark Spalding, Andrew Taber, Matt Walpole, Irene Zager, and Tara Zamin. 2011. "Establishing IUCN Red List Criteria for Threatened Ecosystems." *Conservation Biology* 25 (1): 21–29.
- Secretariat of the CBD (Convention on Biological Diversity). 2002. "Guiding Principles for the Prevention, Introduction, and Mitigation of Impacts of Alien Species That Threaten Ecosystems, Habitats, or Species." Decision VI/23 in the Sixth Conference of the Parties (COP-6) to the CBD, Secretariat of the CBD, Montreal. <http://www.cbd.int/doc/decisions/cop-06-dec-23-en.pdf>.
- . 2004a. "Addis Ababa Principles and Guidelines for the Sustainable Use of Biodiversity." Secretariat of the CBD, Montreal. <http://www.cbd.int/doc/publications/addis-gdl-en.pdf>. These guidelines were developed as part of the CBD.
- . 2004b. "Akwé: Kon Guidelines." Secretariat of the CBD, Montreal. <http://www.cbd.int/doc/publications/akwe-brochure-en.pdf>. These guidelines were developed as part of the Convention on Biological Diversity.
- . 2004c. "Guidelines on Biodiversity and Tourism Development." Secretariat of the CBD, Montreal. <http://www.cbd.int/doc/publications/tou-gdl-en.pdf>. Also see the accompanying user's manual, *Managing Tourism and Biodiversity: User's Manual on the CBD Guidelines on Biodiversity and Tourism Development* (Montreal: CBD), <http://www.cbd.int/doc/programmes/tourism/tourism-manual-en.pdf>.
- . 2008a. "Biodiversity for Development Program." Secretariat of the CBD, Montreal. <http://www.cbd.int/development>. The program's website provides various materials on the role that biodiversity can play in poverty alleviation and development, including case studies and best practice documents.
- . 2008b. "'Biodiversity in Good Company' Initiative." Secretariat of the CBD, Montreal. <http://www.business-and-biodiversity.de/en/about-the-initiative.html>. This initiative was developed following Decision IX/26 in the Ninth Conference of the Parties (COP-9) to the CBD and is an initiative with international participation under the CBD. Various publications from the initiative are offered through the website.
- . 2010. "Aichi Biodiversity Targets." Secretariat of the CBD, Montreal. <http://www.cbd.int/decision/cop/?id=12268>. Revised and updated biodiversity targets are provided for the 2011–2020 Strategic Plan for the Convention on Biological Diversity, specifically Decision X/2 of the 10th Conference of the Parties (COP-10).
- . 2011a. "Ecosystem Approach." Secretariat of the CBD, Montreal. <http://www.cbd.int/ecosystem>. This webpage offers information on the CBD's Ecosystem Approach Program, including background, implementation guidance and case studies, and the "Ecosystem Approach Sourcebook."

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- . 2011b. “National Biodiversity Strategies and Action Plans (NBSAPs).” Secretariat of the CBD, Montreal. <http://www.cbd.int/nbsap>. The website gives access to NBSAPs and related documents for the implementation of the CBD at the national level.
- SER (Society for Ecological Restoration International). Homepage. SER, Washington, DC. <http://www.ser.org>. SER serves the field of ecological restoration by facilitating dialogue among restorationists, encouraging research, promoting awareness, contributing to public policy discussions, and promoting ecological restoration. The website offers numerous resources on ecological restoration.
- SPE (Society of Petroleum Engineers). OnePetro database. SPE, Richardson, TX. <http://www.onepetro.org>. This multisociety library operated by SPE on behalf of participants allows users to search and purchase papers from organizations in the oil and gas sector in a single transaction. A search of the keyword “biodiversity” will reveal many related publications on biodiversity management in the oil and gas sector.
- UNEP (United Nations Environment Programme) Finance Initiative. Homepage. UNEP, Geneva. <http://www.unepfi.org>. This program is a global partnership between UNEP and the financial sector. More than 190 institutions, including banks, insurers, and fund managers, work with UNEP to understand the impacts of environmental and social considerations on financial performance. Through peer-to-peer networks, research, and training, the UNEP Finance Initiative carries out its mission to identify, promote, and realize the adoption of best environmental and sustainability practices at all levels of financial institution operations.
- UNEP (United Nations Environment Programme)–WCMC (World Conservation Monitoring Centre). “A to Z Areas of Biodiversity Importance.” UNEP-WCMC, Cambridge, U.K. <http://www.biodiversitya-z.org>. This online glossary contains detailed information for a number of recognized systems to prioritize and protect areas of biodiversity importance that fall into two main categories: (a) areas under protected area frameworks that are supported by national or subnational institutions and by international conventions and programs and (b) global prioritization schemes that are developed by academic and conservation organizations.
- . CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) Trade Database. UNEP-WCMC, Cambridge, U.K. <http://www.unep-wcmc.org/citestrade/trade.cfm>. CITES is a unique resource and currently holds more than 10 million records of trade in wildlife and 50,000 scientific names of taxa. More than 750,000 records of trade in CITES-listed species of wildlife are reported annually.
- . “Ocean Data Viewer.” UNEP-WCMC, Cambridge, U.K. <http://data.unep-wcmc.org>. Developed by UNEP-WCMC, this website provides an overview and access to a range of data, including data from the World Database on Protected Areas and relevant conventions related to the conservation of marine and coastal biodiversity.
- . World Database on Protected Areas—Marine. UNEP-WCMC, Cambridge, U.K. <http://www.wdpa-marine.org>. Developed by UNEP-WCMC, the database is dedicated to providing the most comprehensive set of marine protected areas data available.
- UNEP (United Nations Environment Programme)–WCMC (World Conservation Monitoring Centre) and IUCN (International Union for Conservation of Nature). “Protected Planet.” UNEP-WCMC, Cambridge, U.K. <http://www.protectedplanet.net>. Developed by UNEP-WCMC and IUCN, Protected Planet is the new face of the World Database on Protected Areas, a joint initiative

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between IUCN and UNEP-WCMC. The website allows viewers to search in any language to find information about individual protected areas.

WBCSD (World Business Council for Sustainable Development) Cement Sustainability Initiative. Homepage. WBCSD, Geneva, Switzerland. <http://www.wbcscement.org>. The Cement Sustainability Initiative (CSI) is a global initiative of the leading cement producers to manage and minimize the impacts of cement production. Quarry rehabilitation is one of CSI's focus topics.

WWF (World Wildlife Fund) and World Bank. "Forests: WWF/World Bank Alliance." <http://www.worldwildlife.org/what/globalmarkets/forests/worldbankalliance.html>. WWF, Washington, DC. This website includes information on the identification and conservation of high conservation value forests and forest certification systems.

ZSL (Zoological Society of London). 2011. "National Red Lists." ZSL, London. <http://www.nationalredlist.org/site.aspx>. The website provides data on the conservation status of species at the regional and national levels.

ZSL (Zoological Society of London) EDGE of Existence Program. Homepage. ZSL, London. <http://www.edgeofexistence.org/index.php>. This program uses a scientific framework to identify the world's most evolutionarily distinct and globally endangered (EDGE) species. The EDGE of Existence program is the only global conservation initiative to focus specifically on threatened species that represent a significant amount of unique evolutionary history. For more information on evolutionary processes and conservation concerns, see Keith A. Crandall, Olaf R. P. Bininda-Emonds, Georgina M. Mace, and Robert K. Wayne, 2000, "Considering Evolutionary Processes in Conservation Biology," *Trends in Ecology and Evolution* 15 (7): 290–95.

Assessment and Management of Ecosystem Services

Guidance, tools, and other references with respect to the assessment and management of ecosystem services include the following:

ARIES Consortium. Homepage. <http://ariesonline.org>. This site is developed by a consortium of groups that include the University of Vermont's Gund Institute for Ecological Economics, Conservation International, and Earth Economics, as well as experts at Wageningen University. The computer model and decision-support system aims to assist decision makers and researchers by estimating and forecasting ecosystem services provision and their correspondent range of economic values in a specific area.

BBOP (Business and Biodiversity Offsets Program). 2009. "Biodiversity Offset Cost-Benefit Handbook." BBOP, Washington, DC. This handbook addresses the management of biodiversity and the design of an offset primarily for the sustained yield of particular ecosystem services on which affected communities are dependent.

BSR (Business for Social Responsibility Environmental Services, Tools, and Markets Working Group). Homepage. <http://www.bsr.org>. BSR, San Francisco, CA. Reports include identification of a wide range of ecosystem services tools and in-depth assessments of key selected tools of particular relevance to the private sector.

Hanson, Craig et al. The Corporate Ecosystem Services Review, Guidelines for Identifying Business Risks & Opportunities Arising from Ecosystem Change

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IPIECA (International Petroleum Industry Environmental Conservation Association). 2011. “Ecosystem services guidance: Biodiversity and ecosystem services guide and checklists.”

http://www.ipieca.org/sites/default/files/publications/ecosystem_services_guidance_8.pdf.

This document explains the relationship between biodiversity, ecosystem services and the oil and gas industry; it provides a set of checklists to help identify the main ecosystem service dependencies and impacts of oil and gas developments; and, it highlights key associated risks and opportunities for oil and gas companies and provides guidance on potential measures for managing them.

Millennium Ecosystem Assessment, 2006; Ecosystems and Human Well-Being: Opportunities and Challenges for Business and Industry; Millennium Ecosystem Assessment Homepage.

<http://www.maweb.org>.

National Capital Project. “Integrated Valuation of Ecosystem Services and Tradeoffs (InVEST).” National Capital Project, Stanford University, Stanford, CA.

<http://www.naturalcapitalproject.org>. InVEST is a family of online planning tools developed by the National Capital Project, a joint venture of Stanford University’s Woods Institute for the Environment, The Nature Conservancy, the World Wildlife Fund, and the University of Minnesota’s Institute on the Environment. The tools are a decision-making aid to map and value ecosystem services and to assess the trade-offs linked to different natural resource management scenarios.

NVI (Natural Value Initiative). Homepage. <http://www.naturalvalueinitiative.org>. [Flora and Fauna International, Cambridge, U.K.](http://www.naturalvalueinitiative.org) The initiative was created by Flora and Fauna International, the United Nations Environment Programme Finance Initiative, Nyenrode Business University, the Dutch Association of Investors for Sustainable Development, and the Brazilian Business School FGV. The initiative enables the finance sector to (a) evaluate how well the food, beverage, and tobacco sectors are managing biodiversity and ecosystem services risks and opportunities and (b) engage with companies in such sectors to reduce their risk exposure through the responsible management and harvesting of natural resources.

—. The NVI toolkit includes the “Ecosystem Services Benchmark: A Tool for Investors to Assess the Management of Biodiversity and Ecosystem Services Risks and Opportunities in Companies with an Agricultural Supply Chain,” Flora and Fauna International, Cambridge, U.K. <http://www.naturalvalueinitiative.org/content/003/303.php>.

—. 2011. “Tread Lightly: Biodiversity and Ecosystem Services Risk and Opportunity Management Within the Extractive Industry.” http://www.naturalvalueinitiative.org/download/documents/Publications/NVI%20Extractive%20Report_Tread%20lightly_LR.pdf.

Secretariat of the CBD (Convention for Biological Diversity). 2010. “International Conference on Biological and Cultural Diversity: Diversity for Development—Development for Diversity.” Montreal, June 8–10. <http://www.cbd.int/meetings/icbcd/>. The conference aimed to bring together stakeholder groups of various backgrounds, including representatives of indigenous and local populations, to exchange knowledge and practices linking biological and cultural diversity. Various informational documents relevant to cultural ecosystem services, including sacred sites, are available on the conference’s website.

—. 2011. “The Tkarihwaí:ri Code of Ethical Conduct to Ensure Respect for the Cultural and Intellectual Heritage of Indigenous and Local Communities—COP-10, Decision X/42.”

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Secretariat of the CBD, Montreal. <http://www.cbd.int/decision/cop/?id=12308>. This code of conduct is relevant to cultural ecosystem services.

TEEB (The Economics of Ecosystems and Biodiversity). Homepage. TEEB, Geneva. <http://www.teebweb.org>. This site includes reports and resources for businesses, local and regional policies related to the evaluation of ecosystem services, the economic costs of biodiversity loss, and the costs and benefits of actions to reduce losses.

University of Vermont Gund Institute for Ecological Economics. Multiscale Integrated Models of Ecosystem Services (MIMES). Burlington, VT. <http://www.uvm.edu/giee/mimes/>. MIMES is a multiscale, integrated suite of models that enables understanding of the contributions of ecosystem services by quantifying the effects of varying environmental conditions derived from land use change. The models evaluate land use changes and subsequent effects on ecosystem services on global, regional, and local levels.

WBCSD (World Business Council for Sustainable Development). Homepage. WBCSD, Geneva. <http://www.wbcsd.org>. Ecosystems constitute one of the four key focus areas of the WBCSD. WBCSD argues the business case for the conservation of ecosystems. The site contains related publications on ecosystem services and discusses the business risks associated with the loss and degradation of ecosystems on which businesses depend.

WBCSD (World Business Council on Sustainable Development), IUCN (International Union for the Conservation of Nature), PricewaterhouseCoopers, and Environmental Resources Management. 2011. "Guide to Corporate Ecosystem Valuation: A Framework for Improving Corporate Decision-Making." WBCSD, Geneva. The document defines corporate ecosystem valuation (CEV) as a process to make better-informed business decisions by explicitly valuing both ecosystem degradation and the benefits provided by ecosystem services. The document provides a set of screening questions for companies to determine the need to undertake a CEV as well as a basic methodology.

WRI (World Resources Institute), WBCSD (World Business Council on Sustainable Development), and Meridian Institute. 2008. "Corporate Ecosystem Services Review: Guidelines for Identifying Business Risks and Opportunities Arising from Ecosystem Change." WRI, Washington, DC; WBCSD, Geneva, Switzerland; and Meridian Institute, Washington, DC. <http://www.wri.org/publication/corporate-ecosystem-services-review>. This document provides a structured methodology that helps managers proactively develop strategies to manage business risks and opportunities arising from their company's dependence and impact on ecosystems. To date, the review is arguably one of the most relevant to the private sector in terms of conceptualizing ecosystem services and integrating this concept into environmental and social assessments.

———. 2011. "Ecosystem Services Review for Impact Assessment." <http://www.wri.org/publication/ecosystem-services-review-for-impact-assessment>. The Ecosystem Services Review for Impact Assessment (ESR for IA) provides practical instructions to environmental and social practitioners on how to incorporate ecosystem services throughout environmental and social impact assessment.

Commodity Roundtables and Standards Setting Websites

The following websites provide information on commodity roundtables and standards setting:

APE (Ape Populations Environments Surveys Portal) A.P.E.S., <http://apesportal.eva.mpg.de/>

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AWS (Alliance for Water Stewardship). Homepage. <http://www.allianceforwaterstewardship.org>. AWS aims to establish a global water stewardship program that will recognize and reward responsible water managers and users by creating opportunities for enhanced community standing and competitive advantage.

BAP (Best Aquaculture Practices). Homepage. BAP, Crystal River, FL. <http://www.aquaculturecertification.org>. This certification system combines site inspections and effluent sampling with sanitary controls, therapeutic controls, and traceability.

Bonsucro (Better Sugar Cane Initiative). Homepage. Bonsucro, London. <http://www.bonsucro.com>. Bonsucro is dedicated to reducing the environmental and social impacts of sugar cane production.

CERFLOR (Brazilian National Forestry Certification Scheme). Homepage. CERFLOR, Brasília. <http://www.inmetro.gov.br/qualidade/cerflor.asp>. CERFLOR is Brazil's autonomous national forest certification scheme.

CSA (Canadian Standards Association) International. Homepage. <http://www.csa-international.org>. CSA International provides product testing and certification services.

FSC (Forest Stewardship Council). Homepage. FSC, Minneapolis. <http://www.fsc.org/>. FSC promotes responsible management of the world's forests.

GAA (Global Aquaculture Alliance). Homepage. <http://www.gaalliance.org>. GAA is an international, non-profit trade association dedicated to advancing environmentally and socially responsible aquaculture and has developed the Best Aquaculture Practices certification standards.

Global G.A.P. Homepage. GlobalG.A.P., Cologne, Germany. <http://www.globalgap.org>. GlobalG.A.P. sets voluntary standards for the certification of production processes of agricultural products around the globe.

IFOAM (International Federation of Organic Agriculture Movements). Homepage. IFOAM, Bonn, Germany. <http://www.ifoam.org>. IFOAM promotes the adoption of systems based on the principles of organic agriculture.

International Trade Centre. "Standards Map." <http://www.standardsmap.org>. This online tool enables analyses and comparisons of private and voluntary standards. The map analysis tool can be accessed by all registered users.

ISEAL Alliance. "ISEAL Codes of Good Practice." ISEAL Alliance, London. <http://isealalliance.org/code>. ISEAL is the global association for social and environmental standards. Working with established and emerging voluntary standard systems, ISEAL develops guidance and helps strengthen the effectiveness and impact of these standards.

ISO (International Organization for Standardization). "Standards Development." ISO, Geneva. http://www.iso.org/iso/standards_development.htm.

Leonardo Academy. "Sustainable Agriculture Standard." Leonardo Academy, Madison. <http://www.leonardoacademy.org/programs/standards/agstandard/development.html>. See also the Leonardo Academy's Sustainable Agriculture Standard Reference Library at <https://sites.google.com/a/leonardoacademy.org/sustainableag-referencelibrary/standards>.

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- MSC (Marine Stewardship Council). Homepage. MSC, London. <http://www.msc.org>. MSC's fishery certification program and seafood ecolabel recognize and reward sustainable fishing.
- PEFC (Programme for the Endorsement of Forest Certification). Homepage. PEFC, Geneva. <http://www.pefc.org/>. PEFC is promotes sustainable forest management.
- Rainforest Alliance. "Standards for Sustainable Agriculture." Rainforest Alliance, New York. <http://www.rainforest-alliance.org/agriculture/standards>.
- RSB (Roundtable on Sustainable Biofuels). Homepage. RSB, Lausanne, Switzerland. <http://rsb.epfl.ch>. RSB is an international initiative that brings together farmers, companies, nongovernmental organizations, experts, governments, and intergovernmental agencies concerned with ensuring the sustainability of biofuels production and processing.
- RSPO (Roundtable on Sustainable Palm Oil). Homepage. RSPO, Kuala Lumpur. <http://www.rspo.org>. RSPO promotes the growth and use of sustainable oil palm products through credible global standards and engagement of stakeholders.
- RTRS (Round Table on Responsible Soy Association). Homepage. RTRS, Buenos Aires. <http://www.responsiblesoy.org>. This multistakeholder initiative aims to facilitate a global dialogue on soy production that is economically viable, socially equitable, and environmentally sound.
- SAN (Sustainable Agriculture Network). Homepage. SAN, San José, Costa Rica. <http://sanstandards.org/sitio>. SAN promotes efficient and productive agriculture, biodiversity conservation, and sustainable community development by creating social and environmental standards.
- SFI (Sustainable Forestry Initiative). Homepage. SFI, Washington, DC. <http://www.sfiprogram.org>. SFI maintains, oversees, and improves an internationally recognized sustainable forestry certification program.
- TSPN (Trade Standards Practitioners Network). Homepage, Eschborn, Germany. <http://www.tradestandards.org/en/Index.aspx>. TSPN's mission is to improve the effectiveness of initiatives that support developing-country capacity and participation in the development and implementation of trade-related social, environmental, and food safety standards and associated measures in agriculture, forestry and fisheries, with a focus on voluntary standards.
- WBG (World Bank Group), Environmental, Health, and Safety Guidelines, www.ifc.org/ehsguidelines
- WWF (World Wildlife Fund). "Aquaculture Dialogues." WWF, Washington, DC. <http://www.worldwildlife.org/what/globalmarkets/aquaculture/aquaculturedialogues.html>.