EPRI

TECHNICAL BRIEF

Biodiversity Conservation Terminology Guide for Energy Utilities

INTRODUCTION

The relationship between energy and nature evolved several times over the past decade. While reducing carbon emissions and assessing the effects of climate change have been a prominent focus, in the past few years concerns about biodiversity conservation and the causal impacts of human activity are becoming a greater part of the dialogue at national and international levels. Companies globally are experiencing stakeholder and public pressure to consider how their operations impact biodiversity. Energy utilities interact with the natural landscape as part of their day-to-day transmission, distribution, and generation operations. Traditionally, those interactions focus on project permitting and compliance with some smaller scale voluntary conservation efforts. However, there has been growing stakeholder interest in how businesses such as energy utilities can further impact nature and biodiversity.

This heightened interest has prompted increasing collaboration within energy utilities between departments that traditionally lead biodiversity-related work, such as environmental permitting, and departments tasked with managing

the company's sustainability efforts. This cross-functional collaboration creates a need for a common language and understanding of terminology related to biodiversity. This document defines common biodiversity concepts and terms to create a baseline consensus for communication and effective collaboration.

Note that the definitions listed in this brief may not exactly match those from official or externally published sources – while informed by existing definitions, they were modified to align with the operational needs and activities of the energy industry.

This biodiversity nomenclature project is a collaboration between EPRI's Strategic Sustainability Science (P198), Endangered and At-Risk Species (P195), and Ecosystem Risk and Resilience (P258) programs, which collaborated to define biodiversity-related terms and describe their relevance to energy utilities.

THE NATURAL WORLD

Nature[1 2] is the physical world and everything in it (such as plants, animals, mountains, oceans, stars, etc.) that is not made by people.

1 "Nature," Merriam-Webster Dictionary. Accessed October 12, 2024 at: https://www.merriam-webster.com/dictionary/nature

2 "Nature," The Britannica Dictionary. Accessed October 12, 2024 at: https://www.britannica.com/dictionary/nature

An **ecosystem**[3 4] is an area where living things such as plants and animals interact with nonliving elements such as rocks and weather to form a balanced environment. Ecosystems provide **ecosystem services**[5 6], or benefits to people such as goods (e.g, timber, food), regulating services (e.g., climate regulation, waste decomposition), supporting services (e.g., photosynthesis, soil formation, pollination [*see "Pollinators and Nature-Based Solutions"*]), and cultural services (e.g., recreational, spiritual). More than half of global gross domestic product (GDP), around $44 trillion of economic value, moderately or heavily depends on ecosystem services.[7]

Biodiversity[8 9], or biological diversity, refers to the variety of species found in an ecosystem. **Species**[10 11] are related organisms that share common characteristics and are capable of interbreeding. **Wilderness**[12 13] is a place that is mostly biologically intact and undisturbed by human activity; and that is legally protected so it remains free of industrial infrastructure, open to traditional indigenous use, or low impact recreation.

Energy utility activities often impact certain notable species, including:

- American burying beetle
- Bald and Golden eagles (through the Bald and Golden Eagle Protection Act)
- Bats (several species)
- Freshwater mussels (several species)
- Lesser prairie chickens
- Monarch butterflies
- Sturgeon (aquatic utilities).

Habitat and Species Terminology

Transmission and distribution rights-of-way (ROWs) run through large stretches of land covering many different types of habitats and ecosystems. Utilities should consider the unique attributes of each different type of ecosystem and habitat across the landscape that their ROWs intersect.

A **habitat** is a place where an organism lives, and that meets the environmental conditions it requires to survive[14 15].

Habitat fragmentation[16 17] occurs when an organism's preferred environment is divided into smaller, isolated patches

3 "Ecological Condition," U.S. Environmental Protection Agency, n.d. Accessed at: https://www.epa.gov/report-environment/ecological-condition

4 "Ecosystem," National Geographic n.d. Accessed at: https://education.nationalgeographic.org/resource/ecosystem/

5 *Ecosystems and Human Well-being: Synthesis*, Millennium Ecosystem Assessment, Washington, DC: Island Press, 2005. Accessed at: https://www.millenniumassessment.org/documents/aspx.pdf

6 Haines-Young, Roy, and Marion Potschin. "Common International Classification of Ecosystem Services (CICES) V5.1: Guidance on the Application of the Revised Structure," Fabis Consulting Ltd., Nottingham, UK: 2018. Accessed at: https://cices.eu/content/uploads/sites/8/2018/01/Guidance-V51-01012018.pdf

7 "Why measuring the economic value of ecosystems is important," World Economic Forum, February 27, 2023. Accessed at: https://www.weforum.org/stories/2023/02/an-ecosystems-economic-value-can-now-be-measured-heres-how/

8 "What Is Biodiversity?", Smithsonian National Museum of Natural History, n.d. Accessed at: https://naturalhistory.si.edu/education/teaching-resources/life-science/what-biodiversity

9 "What is Biodiversity? Why it's under threat and why it matters," World Wildlife Fund, n.d. Accessed at: https://www.worldwildlife.org/pages/what-is-biodiversity

10 "Species," Encyclopedia Britannica. Accessed September 20, 2024 at: https://www.britannica.com/science/species-taxon

11 The Endangered Species Act as Amended by Public Law 97-304 (the Endangered Species Act Amendments of 1982). Washington: U.S. G.P.O., 1983.

12 "Wilderness," Merriam-Webster Dictionary. Accessed October 12, 2024 at: https://www.merriam-webster.com/dictionary/wilderness

13 "The Wilderness Story," U.S. Forest Service, n.d. Accessed at: https://www.fs.usda.gov/managing-land/wilderness

14 "Habitat," The Brittanica Dictionary. Accessed October 12, 2024 at: https://www.britannica.com/dictionary/habitat

15 "Habitat," National Geographic, n.d. Accessed at: https://education.nationalgeographic.org/resource/habitat/

16 "What Is Habitat Fragmentation and What Does It Mean for Wildlife?", Woodland Trust, August 16, 2018. Accessed at: https://www.woodlandtrust.org.uk/blog/2018/08/what-is-habitat-fragmentation-and-what-does-it-mean-for-our-wildlife/

17 Wilcove, D. S., C.H. McClellan, and A.P. Dobson. "Habitat fragmentation in the temperate zone," Conservation Biology: the Science of Scarcity and Diversity, pp.237–256, 1986. Sinauer Associates, Sunderland, MA.

from the surrounding landscape. These patches result from the reduction or elimination of continuous habitats due to natural processes (such as fire or volcanic eruptions) or human activities (such as forest clearing for development or mowing).

Critical habitat[18 19] is an area with the physical or biological features essential to the conservation of a species, and that may require special management or protection. Areas where species listed under the Endangered Species Act (ESA [*see "Regulations and Permitting"*]) naturally reside can be considered critical habitat. By establishing and appropriately managing utility assets such as wind, solar, and transmission corridors, energy utilities can enhance landscape-level conservation efforts by using these areas to create natural corridors that help connect valuable habitat fragments and mitigate adverse effects to species' migratory routes.

REGULATIONS AND PERMITTING

Power companies regularly complete transmission and distribution system construction and maintenance projects, which may trigger environmental permitting under local, state, and/or federal regulations, such as the **Endangered Species Act (ESA)**. The ESA is a U.S. federal law passed in 1973 that obligates federal and state governments and agencies to protect all species threatened with extinction that fall within the borders of the United States and its outlying territories.

In some cases, a development project may result in a "take." The ESA defines **take**[20 21] as actions that "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" a species listed on the U.S. ESA. When a species is listed as endangered, take prohibitions are automatically extended to it under ESA Section 9.

Energy utility projects can face significant delays due to the presence of endangered species. When a project site is found to host an endangered species, it triggers the consultation process under Section 10 of the ESA. When necessary, a utility company can apply for an **Incidental Take Permit (ITP)**[22], through the U.S. Fish and Wildlife Service (FWS), which will allow for a certain amount of incidental take of a species. **Incidental take**[23] is unintentional, but anticipated, taking of a species. The process involves evaluating the project's impact on the species and determining conservation measures needed to mitigate or eliminate adverse effects, which are all described in a **Habitat Conservation Plan (HCP)** [*see "compensatory mitigation"*]. The development of these documents typically involves consultation with FWS, which can extend project timelines by months or even years, but

18 "Critical Habitat," U.S. Fish and Wildlife Service, March 1, 2017. Accessed at: https://www.fws.gov/project/critical-habitat

19 "Critical Habitat," NOAA Fisheries, n.d. Accessed at: https://www.fisheries.noaa.gov/national/endangered-species-conservation/critical-habitat

20 "Endangered Species Act," NOAA, n.d. Accessed at: https://www.fisheries.noaa.gov/national/endangered-species-conservation/endangered-species-act

21 "Endangered Species Act: Section 3. Definitions," U.S. Fish and Wildlife Service, n.d. Accessed at: https://www.fws.gov/laws/endangered-species-act/section-3

22 "Permits for Native Endangered and Threatened Species," U.S. Fish and Wildlife Service, n.d. Accessed at: https://www.fws.gov/library/collections/permits-native-endangered-and-threatened-species

23 "Glossary: Endangered Species Act," NOAA Fisheries (n.d.). Accessed at: https://www.fisheries.noaa.gov/laws-and-policies/glossary-endangered-species-act

plays an important role in mitigating potentially negative impacts on species.

Under the Endangered Species Act

A **candidate species**[24] is a plant or animal the FWS proposes as endangered or threatened, but other higher priority activities prevent FWS from developing a listing regulation. Candidate species are not protected under the ESA (*see "RTE species"*).

A **petition**[25] is a formal request from a person or organization to list a species as threatened or endangered, reclassify a species, or delist a species. The species may be referred to as a "petitioned species."

Finally, a species is said to be "**at-risk**"[26] if it is currently unlisted but its population is declining, making it "at risk" of becoming a candidate for listing (*see "RTE"*).

The presence of a candidate, petitioned, or at-risk species can also cause significant project delays to utilities due to the need to complete extensive environmental assessments and permitting processes to ensure compliance with regulations. These delays can increase costs and logistical challenges for utility companies but also helps increase the potential that a species might not need to be listed in future (resulting in further regulatory challenges).

ENERGY INDUSTRY BIODIVERSITY RESPONSE

The management of biodiversity by energy utilities is traditionally thought of in relation to practices for compliance with environmental laws about transmission and distribution ROWs and generation plants, although some engage in more voluntary types of biodiversity-related efforts such as creating and enhancing habitat for plants and animals by prioritizing the planting of diverse, native plants on ROWs (*see "native species"*).

Biodiversity is an increasingly important topic in recent years, with growing corporate and investor interest in how

businesses balance the drive for renewable energy with nature conservation.

Sustainability[27], in the context of an energy utility, is the management and balance of economic, environmental, and social issues that contribute to the long-term viability of power companies and/or their stakeholders, today and for future generations.

Conservation[28] is the protection, care, and active management and maintenance of ecosystems, habitats, wildlife species, and populations, within or outside of their natural environments, to safeguard the natural conditions long term.

Preservation[29] refers to protecting the environment from harmful human development or activity.

Stewardship[30 31] refers to the responsible use and protection of the natural environment through active participation in conservation efforts and sustainable practices.

24 "Candidate Species," U.S. Fish and Wildlife Service, 2017. Accessed at: https://www.fws.gov/sites/default/files/documents/Candidate-Species.pdf

25 "The Petition Process," U.S. Fish and Wildlife Service, August 2016. Accessed at: https://www.fws.gov/media/petition-process

26 "Policy Regarding Voluntary Prelisting Conservation Actions," U.S. Fish and Wildlife Service, May 31, 2018. Accessed at: https://www.fws.gov/sites/default/files/policy/pdfs/a1735fw1.pdf

27 "Sustainability Priorities for the North American Energy Utility Industry: Results of 2023–2024 Research with Energy Utilities and Stakeholders in the United States and Canada," EPRI, Palo Alto, California. April 26, 2024. 3002029539

28 "Recognising and Reporting Other Effective Area-Based Conservation Measures," IUCN-WCPA Task Force on OECMs, Gland, Switzerland, 2019. Accessed at: https://portals.iucn.org/library/sites/library/files/documents/PATRS-005-En.pdf

29 "Preservation," National Geographic Society, n.d. https://education.nationalgeographic.org/resource/preservation/

30 Chapin, F. S., S.R. Carpenter, G.P. Kofinas, C. Folke, N. Abel, W.C. Clark, P. Olsson, D.M. Stafford Smith, B. Walker, O.R. Young, F. Berkes, R. Biggs, J.M. Grove, R.L. Naylor, E. Pinkerton, W. Steffen, and F.J. Swanson. "Ecosystem Stewardship: Sustainability Strategies for a Rapidly Changing Planet," Trends in Ecology & Evolution 25 (4), pp. 241–249, April 2010. Accessed at: https://www.sciencedirect.com/science/article/abs/pii/S0169534709003255

31 "Environmental Stewardship," U.S. Environmental Protection Agency, February 20, 2016. Accessed at: https://archive.epa.gov/stewardship/web/html/

Power companies may adopt proactive voluntary conservation measures, or may associate conservation measures with a permit for a construction or maintenance project (*see "mitigation banking" and "compensatory mitigation").*

WETLAND PROTECTION

A **wetland**[32] is a distinct semi-aquatic ecosystem in which the ground is flooded or saturated in water seasonally, for several years or decades, or permanently. Wetlands can benefit ecosystems with improved water quality, flood storage, wildlife habitat, and reduced storm damage.

As utility construction and maintenance activities may impact wetlands, the **Clean Water Act** safeguards these areas by requiring companies to adhere to specific permitting programs.

Mitigation banking[33 34] is a program originally aimed at delineating and protecting a wetland or stream area that has been restored, established, enhanced, or preserved to compensate for developing other wetlands.

Similarly, **compensatory mitigation**[35] is a project proponent's activities, monetary payments, or in-kind contributions to conduct offsite actions to offset adverse impacts of a proposed onsite action. Utilities may purchase credits from a mitigation bank or engage in compensatory mitigation to meet permitting requirements to offset unavoidable impacts to wetlands. A **conservation bank**[36] is a similar program for conserving the habitat of at-risk or listed species.

Many **RTE**, or **R**are, **T**hreatened, or **E**ndangered species are found in company service territories, such as around their facilities or on their ROWs. **Rare**[37] species have small populations, restricted geographic ranges, and often, narrow environmental niches. **Threatened**[38 39] (or "Near Threatened" or "Vulnerable"[40]) plants and animals are those that are likely to become endangered in the future throughout all or a significant portion of their ranges. **Endangered**[41] plants and animals are so rare they are in danger of becoming extinct.

Vegetation management programs (*see "Integrated Vegetation Management"*) may focus on reducing or eradicating **invasive species**[42], which are organisms that are introduced by humans, either intentionally or accidentally, into places outside of their natural range, that cause or have potential to cause negative impacts to native biodiversity, ecosystem services (*see "ecosystem services"*), or human well-being.

32 "What Is a Wetland?" U.S. Environmental Protection Agency. Accessed April 25, 2024 at: https://www.epa.gov/wetlands/what-wetland
33 "Mitigation Banks under CWA Section 404," U.S. Environmental Protection Agency. Accessed June 28, 2024 at: https://www.epa.gov/cwa-404/mitigation-banks-under-cwa-section-404
34 "The Mitigation Banking Group | Leading Provider of Mitigation Credits in Florida," The Mitigation Banking Group. Accessed July 2, 2024 at: https://mitigationbankinginc.com/
35 "Wetlands Compensatory Mitigation," U.S. Environmental Protection Agency, n.d. Accessed at: https://www.epa.gov/sites/default/files/2015-08/documents/compensatory_mitigation_factsheet.pdf
36 "Conservation Banking: Incentives for Stewardship," U.S Fish and Wildlife Service, 2019. Accessed at: https://www.fws.gov/sites/default/files/documents/conservation-banking.pdf
37 Rabinowitz, D. Seven forms of rarity In Synge H. (Ed.), The biological aspects of rare plant conservation, John Wiley and Sons, New York, NY: 1981.
38 "Learn More About Threatened and Endangered Species," U.S. Environmental Protection Agency, updated March 18, 2024. Accessed at: https://www.epa.gov/endangered-species/learn-more-about-threatened-and-endangered-species
39 "The IUCN Red List of Threatened Species," International Union for Conservation of Nature, n.d. Accessed at: https://www.iucnredlist.org/
40 "The IUCN Red List of Threatened SpeciesTM," IUCN Red List, n.d. Accessed at: https://www.iucnredlist.org/
41 "Learn More About Threatened and Endangered Species," U.S. Environmental Protection Agency, updated March 18, 2024. Accessed at: https://www.epa.gov/endangered-species/learn-more-about-threatened-and-endangered-species
42 IUCN. "Invasive Alien Species,." IUCN, n.d. Accessed at: https://iucn.org/our-work/topic/invasive-alien-species

Alternatively, Vegetation management programs prioritize grid reliability and encourage **native species**[43][44] that are indigenous to a given region or ecosystem if its presence in that region is the result of only local natural evolution. Preserving native species is crucial as they are the foundation of healthy ecosystems and help maintain biodiversity and ecosystem services. In addition, such approaches may potentially reduce maintenance costs.[45]

An **ecotone**[46][47][48] is a transitional area of vegetation between two different plant communities, such as the forested edge and **early successional scrub-shrub habitat** (vegetation dominated by shrubs, brush, and very young trees[49]) on an energy utility's transmission or distribution ROW. This "edge" habitat is ideal for many species, as it provides more diversity of resources for species to meet their needs.

43 "Why Native Species Matter," U.S. Department of Agriculture, n.d. Accessed at: https://www.usda.gov/peoples-garden/gardening-advice/why-native-species-matter

44 Alverson, Edward R., David E. Hibbs, and Mark V. Wilson. "Native Plants, Native Ecosystems, and Native Landscapes: An Ecological Definition of 'Native' Will Promote Effective Conservation and Restoration," Kalmiopsis, 1991. Accessed at: https://www.npsoregon.org/kalmiopsis/kalmiopsis_v01x.pdf

45 "Influence of Vegetation Management Practices on Native Habitat Establishment and Pollinator Communities on Utility Lands in Illinois – Year 2," EPRI, Palo Alto, CA: January 19, 2024. 3002028639

46 "Ecotone," Encyclopedia Britannica. Accessed at: https://www.britannica.com/science/ecotone

47 Clements, F.E. Research Methods in Ecology, University Publishing Company, Lincoln, NE, 1905.

48 "Ecotone Explained," Ecological Society of America, n.d. Accessed at: https://www.esa.org/esablog/about/ecotone-explained

49 Greenberg, Cathryn H., Beverly S. Collins, Frank R. Thompson, III, eds. Sustaining Young Forest Communities: Ecology and Management of Early Successional Habitats in the Central Hardwood Region, USA, Springer Nature, pp. 1–10, New York, NY: 2011.

VEGETATION MANAGEMENT AND CONSTRUCTION

Effective vegetation management is essential for maintaining operational resilience and protecting energy infrastructure from severe weather impacts. **Integrated Vegetation Management (IVM)**[50] is the practice of promoting desirable, stable, low-growing plant communities that resist invasion by tall-growing plant species using appropriate, environmentally sound, and cost-effective control methods.

These methods can include a combination of chemical, biological, cultural, mechanical, and/or manual treatments. With the appropriate approach that meets both operational needs and regulatory requirements, transmission and distribution corridors can be sites of increased habitat diversity (e.g., creation of ecotones, edge habitat, native species proliferation), be used by wildlife as travel lanes between isolated patches of suitable habitats (*see "habitat fragmentation"*), increase the amount of early successional habitat available to species, and much more.

After completing the construction portion of a capital or maintenance project, a project typically enters the restoration or **reclamation** phase. **Reclamation**[51] is the process of assisting the recovery of degraded ecosystems to benefit native animal and plant life by establishing habitats, populations, ecological communities, or natural processes that are similar, but not necessarily identical, to surrounding and naturally occurring ecosystems.

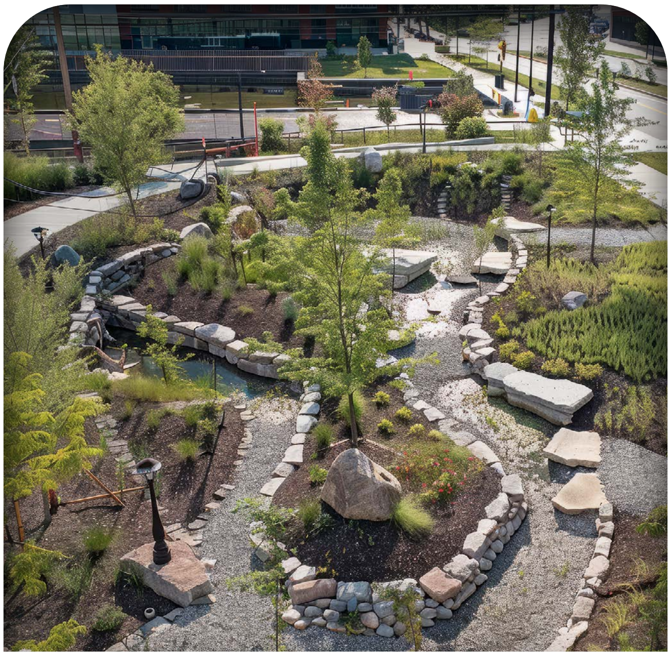
One challenge corporations face is measuring impacts on biodiversity throughout their footprint and value chain. Traditional methods to measure biodiversity consist of **richness** and **diversity. Richness**[52] is the count, or total number, of unique species within a given biological community,

50 "IVM – Integrated Vegetation Management," Right-of-Way Stewardship Council, n.d. Accessed at: https://rowstewardship.org/ivm.php

51 Gerwing, Travis G., Virgil C. Hawkes, George D. Gann, and Stephen D Murphy. "Restoration, reclamation, and rehabilitation: on the need for, and positing a definition of, ecological reclamation," Restoration Ecology, 2022. DOI: 10.1111/rec.13461

52 Pyron, Mark. "Characterizing Communities," Nature Education, 2010. Accessed at: https://www.nature.com/scitable/knowledge/library/characterizing-communities-13241173/

ecosystem, biome, or other defined area. **Diversity**[53] is a measure of the number of species in a community, and a measure of the abundance of each species. Measuring each of these can be resource intensive and challenging to quantify (sometimes making them less practical from an operations perspective); however, they are important for understanding the broader impacts of a company's operations.



POLLINATORS AND NATURE-BASED SOLUTIONS

ROW vegetation managers can foster low-growing, early successional habitat, making it an attractive environment for **pollinators**[54 55]. A pollinator is any organism that helps carry pollen from the male part of the flower (stamen) to the female part of the same or another flower (stigma), and includes animals such as bees, bats, beetles, flies, moths, and butterflies.

Pollinators are vital to the health of our planet and in the production of the food we eat and are considered **keystone species**[56 57], or a species whose presence is different from the dominant (most abundant) species, but that has a disproportionate effect on the community composition and ecosystem function. Pollinators help ecosystems function by supporting plant reproduction and diversity, which in turn provides many benefits to humans (*see "ecosystem services"*) and other animals.

Electric power companies often utilize **nature-based solutions (NBS)**[58], which are actions that protect, conserve, restore, and sustainably use and manage ecosystems in a way that addresses social, economic, and environmental challenges while providing measurable co-benefits to both people and nature alongside their intended outcomes. As an example, using bankfull and floodplain wetlands (*see "wetland"*) for flood mitigation and stormwater management, also provides essential habitats for plants and animals, and is one of the most cost-effective forms of stormwater control.[59]

BIODIVERSITY REPORTING FRAMEWORKS

The focus on biodiversity has grown to an international level with the **Kunming-Montreal Global Biodiversity Framework (GBF)**[60], adopted in December 2022 during the 15th meeting of the Conference of the Parties to the Convention on Biological Diversity. The GBF's 23 targets aim to halt and reverse biodiversity loss by 2030, and include 30% conservation of land, sea, and inland waters, 30% restoration of degraded ecosystems, halving the introduction of invasive species, and $500 billion/year reduction in harmful subsidies.

53 Grassle, J. Frederick. "Marine Ecosystems," Elsevier eBooks, pp. 45–55, 2013. Accessed at: https://doi.org/10.1016/b978-0-12-384719-5.00290-2

54 "What Is a Pollinator?" U.S. National Park Service, n.d. Accessed at: https://www.nps.gov/subjects/pollinators/what-is-a-pollinator.htm?loclr=blogadm

55 Clark, Carol A. "Life, as we know it, depends on pollinators," National Park Service, June 21, 2017. Accessed at: https://ladailypost.com/life-as-we-know-it-depends-on-pollinators/

56 Payne, Robert T. "Food Web Complexity and Species Diversity," The American Naturalist, 100(910), January 1966. Accessed at: https://www.jstor.org/stable/2459379?mag=how-the-keystone-species-concept-transformed-ecology

57 "EPA EcoBox Tools by Receptors – Endangered, Threatened, or Other Species of Concern," U.S. Environmental Protection Agency, September 25, 2024. Accessed at: https://www.epa.gov/ecobox/epa-ecobox-tools-receptors-endangered-threatened-or-other-species-concern

58 "Nature-based Solutions," U.S. Department of the Interior, n.d. Accessed at: https://nicholasinstitute.duke.edu/project/nature-based-solutions-roadmap#:~:text=Nature%2Dbased%20solutions%20are%20actions,both%20people%20and%20the%20environment

59 "Nature-Based Solutions: Real-World Applications and Benefits," EPRI, Palo Alto, CA: May 31, 2023. 3002026816

60 "Kunming-Montreal Global Biodiversity Framework," Secretariat of the Convention on Biological Diversity, n.d. Accessed at: https://www.cbd.int/gbf

Two leading global frameworks have emerged to provide guidance for businesses on biodiversity-related reporting. The **Taskforce on Nature-related Financial Disclosures (TNFD)**[61] helps companies integrate biodiversity into their decision making. It provides disclosure recommendations to identify nature-related risks, dependencies, and impacts. The TNFD has released sector guidance specifically for energy utilities and power generators.

The **Science-Based Targets Network (SBTN)**[62] provides companies with guidance to set targets for nature that align with global goals on climate, nature, and development.

A large focus of these frameworks is related to risk, specifically economic risks stemming from nature-related losses that impact a company's economic activities, their associated corporations, and the costs of goods and services. These may be further categorized as **physical** or **transitional** risks. **Physical risks**[63 64] refer to physical changes to the planet due to negative impacts on nature and loss of ecosystem services (*see* "*ecosystem services*"), such as the decline of water quality and availability due to ecosystem degradation, which can affect hydroelectric power generation and cooling processes. **Transition risks**[65 66] refer to regulations or costs that occur when working to mitigate nature loss. These could include stricter environmental regulations, increased costs for compliance, and shifts in consumer preferences toward more sustainable energy sources.

CONCLUSION

As stakeholder interest and expectations regarding company interactions with the natural environment and preservation of biodiversity continue to rise, it is imperative that companies have a common understanding of how various departments engage with and communicate on biodiversity issues. Moving forward, energy utilities can use this guide to align messaging and efforts in their organization, better comprehend daily interactions with nature, and effectively communicate these interactions to external stakeholders.

61 "Recommendations of the Taskforce on Nature-related Financial Disclosures," Taskforce on Nature-Related Financial Disclosures, September 2023. Accessed at: https://tnfd.global/wp-content/uploads/2023/08/Recommendations_of_the_Taskforce_on_Nature-related_Financial_Disclosures

62 "About Us," Science Based Targets Initiative, 2024. Accessed at: https://sciencebasedtargets.org/about-us

63 "Nature Risk Is the Next Challenge That Demands a Global Solution," McKinsey & Company, May 20, 2022. Accessed at: https://www.mckinsey.com/capabilities/sustainability/our-insights/sustainability-blog/nature-risk-is-the-next-challenge-that-demands-a-global-solution

64 U.S. National Park Service, "What is a Pollinator?" n.d. Accessed at: https://www.nps.gov/subjects/pollinators/what-is-a-pollinator.htm?loclr=blogadm

65 Menon, Ravi, Emmanuelle Assouan, and Marc Reinke. "Nature-Related Financial Risks: A Conceptual Framework to Guide Action by Central Banks and Supervisors," Network for Greening the Financial System, 2023. Accessed at: https://www.ngfs.net/sites/default/files/medias/documents/framework-on-nature-related-risks.pdf

66 Grassle, J. Frederick. "Marine Ecosystems." In Elsevier eBooks, 45–55, 2013. Accessed at: https://doi.org/10.1016/b978-0-12-384719-5.00290-2.

About EPRI

Founded in 1972, EPRI is the world's preeminent independent, non-profit energy research and development organization, with offices around the world. EPRI's trusted experts collaborate with more than 450 companies in 45 countries, driving innovation to ensure the public has clean, safe, reliable, affordable, and equitable access to electricity across the globe. Together...shaping the future of energy.

EPRI CONTACT

DEANNA SASSOROSSI, *Principal Sustainability Analyst*
704.595.2057, dsassorossi@epri.com

NORMAN SHAFTO, *Principal Sustainability Analyst*
704.595.2729, nshafto@epri.com

KATIE SURREY, *Species and Ecosystem Scientist*
857-270-3279, ksurrey@epri.com

For more information, contact:

EPRI Customer Assistance Center
800.313.3774 • askepri@epri.com

3002031449 **February 2025**

EPRI

3420 Hillview Avenue, Palo Alto, California 94304-1338 USA • 650.855.2121 • www.epri.com