

TNFD nature-related risk and opportunity registers

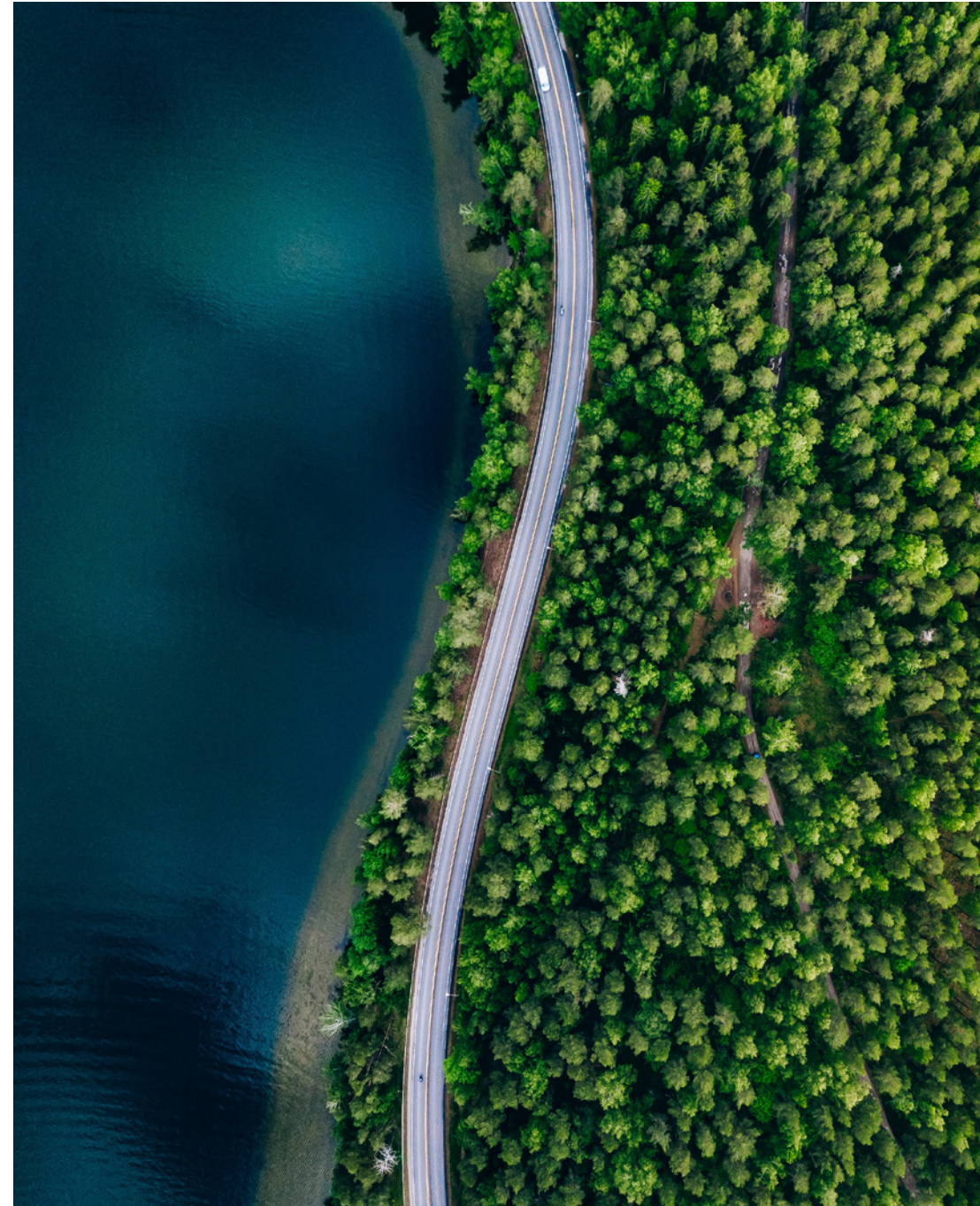
The TNFD risk and opportunity registers outline different categories of nature-related risks and opportunities, indicate useful information to record for each risk and opportunity identified and provide connections to other categories of metrics and prioritisation criteria outlined in the [TNFD LEAP approach](#). The TNFD risk and opportunity registers provide a template that can be completed by an organisation as they work through the Assess phase.

Guiding principles for the preparation of the risk and opportunity registers are as follows:

- The risk and opportunity registers should be completed for **each stage of the value chain** (upstream, downstream and direct operations). Where this is not possible, the area of the value chain with the greatest potential dependencies and impacts on nature should be prioritised in the first instance, as identified in the Locate and Evaluate phases;
- Where an organisation is unable to identify whether a risk exists, the effects on the organisation of the risk, or where significant assumptions have been made, for example, due to a lack of data, this risk should still be **identified and assessed as far as possible** as a precautionary measure; and
- The risk management process should identify **long-term risks, as well as short- and medium-term risks**. This should ideally involve the use of scenarios to explore how risks and opportunities (and the drivers of risks and opportunities) may change in the future.¹

An illustrative example is provided for a nature-related risk and opportunity at the start of each register.

¹ Adapted from: WWF (2022) [A Biodiversity Guide for Business](#).



TNFD Nature-related Risk Register – Worked Example

Nature-related risk category	Nature-related risk	Nature-related risk sub-categories	Illustrative example	Realm (Land, freshwater, ocean, atmosphere)	Organisational level (Product, entity, site/facility or location-specific)	Location	Risk generated by			Exposure metrics	Magnitude metrics	Risk rating (based on prioritisation criteria)	Responsibility for management	Connection to other environmental and social risks/ opportunities
							Change in state of nature	Change in flow of ecosystem services	Impact on society					
Physical risk – acute	<i>Changes in the state of ecosystems (condition and/or extent) and species (population size, extinction risk) the organisation is dependent on or impacted by, resulting in changes to the flow of ecosystem services</i>	<i>Water resources</i>	<i>Degradation of freshwater ecosystems due to pollutants released by the organisation and other stakeholders</i>	<i>Freshwater</i>	<i>Location-specific</i>	<i>Europe</i>	✓	✓		<i>Quantity and concentration of pollutants emitted (impact driver) Change in mean species abundance in freshwater ecosystems (ecosystem condition) Concentration of pollutants in water (ecosystem condition)</i>	<i>Costs associated with the relocation of operations and suppliers Reduction in revenue due to interruption of operations / supply chain Increased costs due to interruption of operations / supply chain Restoration costs Value of assets / revenue dependent on area Number of locations / business lines / facilities exposed</i>	<i>High</i>	<i>Sustainability manager</i>	<i>Potential for disruption of local community due to reduced water quality Potential for reduced carbon sequestration in area due to negative impact on freshwater plants</i>

TNFD Nature-related Risk Register

Nature-related risk category	Nature-related risk	Nature-related risk sub-categories	Realm (Land, freshwater, ocean, atmosphere)	Organisational level (Product, entity, site/facility or location-specific)	Location	Risk generated by			Exposure metrics Refer to component A4 of the LEAP approach	Magnitude metrics Refer to component A4 of the LEAP approach	Risk rating (based on prioritisation criteria) Refer to component A3 of the LEAP approach	Responsibility for management	Connection to other environmental and social risks/opportunities
						Change in state of nature	Change in flow of ecosystem services	Impact on society					
Physical risk – acute or chronic	Changes in the state of ecosystems (condition and/or extent) and species (population size, extinction risk) the organisation is dependent on or impacted by, resulting in changes to the flow of ecosystem services.	Changes to the supply of natural inputs (provisioning services), including: Water resources Animals Timber Plants Renewable energy sources Fossil fuels Minerals Other resources											

Nature-related risk category	Nature-related risk	Nature-related risk sub-categories	Realm (Land, freshwater, ocean, atmosphere)	Organisational level (Product, entity, site/facility or location-specific)	Location	Risk generated by			Exposure metrics Refer to component A4 of the LEAP approach	Magnitude metrics Refer to component A4 of the LEAP approach	Risk rating (based on prioritisation criteria) Refer to component A3 of the LEAP approach	Responsibility for management	Connection to other environmental and social risks/opportunities
						Change in state of nature	Change in flow of ecosystem services	Impact on society					
Physical risk – acute or chronic	Changes in the state of ecosystems (condition and/or extent) and species (population size, extinction risk) the organisation is dependent on or impacted by, resulting in changes to the flow of ecosystem services.	Changes to protection from natural hazards due to change in hazard mitigation services: Floods (river, coast, surface) Landslides, subsidence, coastal erosion Drought Extreme temperature events Wildfire Storms Diseases and plagues Other											

Nature-related risk category	Nature-related risk	Nature-related risk sub-categories	Realm (Land, freshwater, ocean, atmosphere)	Organisational level (Product, entity, site/facility or location-specific)	Location	Risk generated by			Exposure metrics Refer to component A4 of the LEAP approach	Magnitude metrics Refer to component A4 of the LEAP approach	Risk rating (based on prioritisation criteria) Refer to component A3 of the LEAP approach	Responsibility for management	Connection to other environmental and social risks/opportunities
						Change in state of nature	Change in flow of ecosystem services	Impact on society					
Physical risk – acute or chronic	Changes in the state of ecosystems (condition and/or extent) and species (population size, extinction risk) the organisation is dependent on or impacted by, resulting in changes to the flow of ecosystem services.	Changes in other regulating and maintenance ecosystem services: Carbon sequestration Light and noise pollution mediation Antimicrobial and agrochemical resistance Waste treatment Water input and output treatment Nutrient cycling & acidity regulation Pollination Pest control Other ecosystem services											

Nature-related risk category	Nature-related risk	Nature-related risk sub-categories	Realm (Land, freshwater, ocean, atmosphere)	Organisational level (Product, entity, site/facility or location-specific)	Location	Risk generated by			Exposure metrics Refer to component A4 of the LEAP approach	Magnitude metrics Refer to component A4 of the LEAP approach	Risk rating (based on prioritisation criteria) Refer to component A3 of the LEAP approach	Responsibility for management	Connection to other environmental and social risks/opportunities
						Change in state of nature	Change in flow of ecosystem services	Impact on society					
Physical risk – acute or chronic	Changes in the state of ecosystems (condition and/or extent) and species (population size, extinction risk) the organisation is dependent on or impacted by, resulting in changes to the flow of ecosystem services.	Changes in recreational value of area: Species of high tourism interest Condition of ecosystems of high tourism interest Other											

Nature-related risk category	Nature-related risk	Nature-related risk sub-categories	Realm (Land, freshwater, ocean, atmosphere)	Organisational level (Product, entity, site/facility or location-specific)	Location	Risk generated by			Exposure metrics Refer to component A4 of the LEAP approach	Magnitude metrics Refer to component A4 of the LEAP approach	Risk rating (based on prioritisation criteria) Refer to component A3 of the LEAP approach	Responsibility for management	Connection to other environmental and social risks/opportunities
						Change in state of nature	Change in flow of ecosystem services	Impact on society					
Transition risk – policy	Changes to legislation/regulations aimed at achieving nature-positive outcomes/ reducing nature-negative outcomes (e.g. trade restrictions, taxes, permits and allocations, protected areas / OECMs ²)												
	More stringent nature-related reporting obligations												

2 OECMs – Other Effective Area Based Conservation Measures

Nature-related risk category	Nature-related risk	Nature-related risk sub-categories	Realm (Land, freshwater, ocean, atmosphere)	Organisational level (Product, entity, site/facility or location-specific)	Location	Risk generated by			Exposure metrics Refer to component A4 of the LEAP approach	Magnitude metrics Refer to component A4 of the LEAP approach	Risk rating (based on prioritisation criteria) Refer to component A3 of the LEAP approach	Responsibility for management	Connection to other environmental and social risks/opportunities
						Change in state of nature	Change in flow of ecosystem services	Impact on society					
Transition risk – liability	Fines/penalties received due to nature-negative outcomes	Legal liability for nature-related risks											
		Compliance penalties											

Nature-related risk category	Nature-related risk	Nature-related risk sub-categories	Realm (Land, freshwater, ocean, atmosphere)	Organisational level (Product, entity, site/facility or location-specific)	Location	Risk generated by			Exposure metrics Refer to component A4 of the LEAP approach	Magnitude metrics Refer to component A4 of the LEAP approach	Risk rating (based on prioritisation criteria) Refer to component A3 of the LEAP approach	Responsibility for management	Connection to other environmental and social risks/opportunities
						Change in state of nature	Change in flow of ecosystem services	Impact on society					
Transition risk – liability	Fines/penalties received due to nature-negative outcomes	Other											
Transition risk – market	General												

Nature-related risk category	Nature-related risk	Nature-related risk sub-categories	Realm (Land, freshwater, ocean, atmosphere)	Organisational level (Product, entity, site/facility or location-specific)	Location	Risk generated by			Exposure metrics Refer to component A4 of the LEAP approach	Magnitude metrics Refer to component A4 of the LEAP approach	Risk rating (based on prioritisation criteria) Refer to component A3 of the LEAP approach	Responsibility for management	Connection to other environmental and social risks/opportunities
						Change in state of nature	Change in flow of ecosystem services	Impact on society					
Transition risk – market	Shifting customer/ investor values or preferences to products and/ or services that have positive impacts on nature/ mitigate negative impacts on nature												
	Stakeholder conflicts e.g. due to competition for ecosystem services												

Nature-related risk category	Nature-related risk	Nature-related risk sub-categories	Realm (Land, freshwater, ocean, atmosphere)	Organisational level (Product, entity, site/facility or location-specific)	Location	Risk generated by			Exposure metrics Refer to component A4 of the LEAP approach	Magnitude metrics Refer to component A4 of the LEAP approach	Risk rating (based on prioritisation criteria) Refer to component A3 of the LEAP approach	Responsibility for management	Connection to other environmental and social risks/opportunities
						Change in state of nature	Change in flow of ecosystem services	Impact on society					
Transition risk – market	Decline in brand and value proposition due to nature-performance being perceived worse than competitors	<ul style="list-style-type: none"> Due to environmental impact Due to social impact Due to impact on local economic capabilities Due to stigmatisation of industry and/or media scrutiny 											
	Volatility/ changes to costs of materials	<ul style="list-style-type: none"> Due to sourcing restrictions/ supply Due to change in global abundance of resource Due to changes in demand 											

Nature-related risk category	Nature-related risk	Nature-related risk sub-categories	Realm (Land, freshwater, ocean, atmosphere)	Organisational level (Product, entity, site/facility or location-specific)	Location	Risk generated by			Exposure metrics Refer to component A4 of the LEAP approach	Magnitude metrics Refer to component A4 of the LEAP approach	Risk rating (based on prioritisation criteria) Refer to component A3 of the LEAP approach	Responsibility for management	Connection to other environmental and social risks/opportunities
						Change in state of nature	Change in flow of ecosystem services	Impact on society					
Transition risk – reputation	Changes in sentiment towards the organization / brand due to impacts on nature	<ul style="list-style-type: none"> Due to environmental impact Due to social impact Due to impact on local economic capabilities Due to stigmatisation of industry and/or media scrutiny 											
Transition risk – technology	Requirements to transition to more efficient, resilient and less environmentally damaging technologies (e.g. precision agriculture, protein technologies)												

Nature-related risk category	Nature-related risk	Nature-related risk sub-categories	Realm (Land, freshwater, ocean, atmosphere)	Organisational level (Product, entity, site/facility or location-specific)	Location	Risk generated by			Exposure metrics Refer to component A4 of the LEAP approach	Magnitude metrics Refer to component A4 of the LEAP approach	Risk rating (based on prioritisation criteria) Refer to component A3 of the LEAP approach	Responsibility for management	Connection to other environmental and social risks/opportunities
						Change in state of nature	Change in flow of ecosystem services	Impact on society					
Transition risk – technology	New monitoring technologies used by regulators and other stakeholders												

TNFD Nature-related Opportunity Register – Worked Example

Nature-related opportunity category	Nature-related opportunity	Nature-related opportunity sub-category	Illustrative example	Realm (Land, freshwater, ocean, atmosphere)	Organisational level (Product, entity, site/facility or area)	Location	Purpose of opportunity		Exposure metrics	Magnitude metrics	Opportunity rating Based on prioritisation criteria	Responsibility for management	Connection to other environmental and social risks/ opportunities
							Risk reduction	Strategic transformation					
<p>Ecosystem protection, restoration and regeneration</p> <p>Reputational capital</p>	<p>Direct restoration, conservation or protection of ecosystems or habitats</p> <p>Actions that create positive changes in sentiment towards the organisation/ brand</p>	<p>Restoration</p> <p>Due to environmental impact</p>	<p>An organisation invests in the restoration of an area of degraded mangrove with the purpose to increase resilience of infrastructure</p>	<p>Marine</p>	<p>Area</p>	<p>Europe</p>	<p>✓</p>	<p>✓</p>	<p>Area of degraded land restored (impact driver)</p> <p>Improvement in ecosystem condition (ecosystem condition)</p> <p>Incidence of flooding events (ecosystem service)</p>	<p>Increase in revenue due to improved reputation</p> <p>Increased resilience, e.g. to natural disasters</p> <p>Reduced capital/ infrastructure costs</p> <p>Increased market valuation through resilience planning</p>	<p>Medium</p>	<p>Sustainability manager</p>	<p>Restoration of mangrove will increase carbon sequestration levels in local area</p>

TNFD Nature-related Opportunity Register

Nature-related Opportunity category	Nature-related opportunity	Nature-related opportunity sub-category	Realm (Land, freshwater, ocean, atmosphere)	Organisational level (Product, entity, site/facility or area)	Location	Purpose of opportunity		Exposure metrics (Refer to component A4 of the LEAP approach)	Magnitude metrics (Refer to component A4 of the LEAP approach)	Opportunity rating (Based on prioritisation criteria. Refer to component A3 of the LEAP approach)	Responsibility for management	Connection to other environmental and social risks/opportunities
						Risk reduction	Strategic transformation					
Business performance opportunities												
Resource efficiency	Transition to processes/circularity mechanisms that reduce risks related to business dependencies on nature, including within the value chain.	General Reduced resource extraction Diversification of use of nature-related resources (e.g. use of different plant species) Adoption of nature based solutions within service and product lines Increased resource efficiency										

Nature-related Opportunity category	Nature-related opportunity	Nature-related opportunity sub-category	Realm (Land, freshwater, ocean, atmosphere)	Organisational level (Product, entity, site/facility or area)	Location	Purpose of opportunity		Exposure metrics (Refer to component A4 of the LEAP approach)	Magnitude metrics (Refer to component A4 of the LEAP approach)	Opportunity rating (Based on prioritisation criteria. Refer to component A3 of the LEAP approach)	Responsibility for management	Connection to other environmental and social risks/opportunities
						Risk reduction	Strategic transformation					
Resource efficiency	Technological innovations that increase resource efficiency and/or reduce risks related to nature dependencies											
	Improved business performance resulting from collaborative engagement with stakeholders creating sustainable shared use of resources											

Nature-related Opportunity category	Nature-related opportunity	Nature-related opportunity sub-category	Realm (Land, freshwater, ocean, atmosphere)	Organisational level (Product, entity, site/facility or area)	Location	Purpose of opportunity		Exposure metrics Refer to component A4 of the LEAP approach	Magnitude metrics Refer to component A4 of the LEAP approach	Opportunity rating Based on prioritisation criteria. Refer to component A3 of the LEAP approach	Responsibility for management	Connection to other environmental and social risks/opportunities
						Risk reduction	Strategic transformation					
Resource efficiency	Protection/conservation/sustainable management of ecosystems and/or species the organisation is dependent on											
	Actions that create positive changes to the supply of natural resources that are inputs to production	Water resources Timber Plants Renewable energy sources Fossil fuels Minerals Other resources										

Nature-related Opportunity category	Nature-related opportunity	Nature-related opportunity sub-category	Realm (Land, freshwater, ocean, atmosphere)	Organisational level (Product, entity, site/facility or area)	Location	Purpose of opportunity		Exposure metrics Refer to component A4 of the LEAP approach	Magnitude metrics Refer to component A4 of the LEAP approach	Opportunity rating Based on prioritisation criteria. Refer to component A3 of the LEAP approach	Responsibility for management	Connection to other environmental and social risks/opportunities
						Risk reduction	Strategic transformation					
Products/ services	New business model/activities with positive impacts on nature/reduced negative impacts on nature	<p>Resource-efficient products and services</p> <p>Efficient and circular production systems and value chains</p> <p>Innovations that reduce impact of other sectors</p> <p>Nature-positive products that benefit nature</p> <p>Products and services that utilise/create nature-based solution</p>										

Nature-related Opportunity category	Nature-related opportunity	Nature-related opportunity sub-category	Realm (Land, freshwater, ocean, atmosphere)	Organisational level (Product, entity, site/facility or area)	Location	Purpose of opportunity		Exposure metrics Refer to component A4 of the LEAP approach	Magnitude metrics Refer to component A4 of the LEAP approach	Opportunity rating Based on prioritisation criteria. Refer to component A3 of the LEAP approach	Responsibility for management	Connection to other environmental and social risks/opportunities
						Risk reduction	Strategic transformation					
Products/ services	Development of financial solutions for nature positive outcomes (e.g. nature-related insurance risk products)											
Markets	Access to new and emerging markets											

Nature-related Opportunity category	Nature-related opportunity	Nature-related opportunity sub-category	Realm (Land, freshwater, ocean, atmosphere)	Organisational level (Product, entity, site/facility or area)	Location	Purpose of opportunity		Exposure metrics Refer to component A4 of the LEAP approach	Magnitude metrics Refer to component A4 of the LEAP approach	Opportunity rating Based on prioritisation criteria. Refer to component A3 of the LEAP approach	Responsibility for management	Connection to other environmental and social risks/opportunities
						Risk reduction	Strategic transformation					
Markets	Access to new assets and locations											
	Market valuation increase due to positive nature-related performance/ reduction in nature negative outcomes											

Nature-related Opportunity category	Nature-related opportunity	Nature-related opportunity sub-category	Realm (Land, freshwater, ocean, atmosphere)	Organisational level (Product, entity, site/facility or area)	Location	Purpose of opportunity		Exposure metrics Refer to component A4 of the LEAP approach	Magnitude metrics Refer to component A4 of the LEAP approach	Opportunity rating Based on prioritisation criteria. Refer to component A3 of the LEAP approach	Responsibility for management	Connection to other environmental and social risks/opportunities
						Risk reduction	Strategic transformation					
Capital flow and financing	Access to nature-related green funds, bonds or loans											
	Use of financial incentives for suppliers to improve nature and ecosystem management											

Nature-related Opportunity category	Nature-related opportunity	Nature-related opportunity sub-category	Realm (Land, freshwater, ocean, atmosphere)	Organisational level (Product, entity, site/facility or area)	Location	Purpose of opportunity		Exposure metrics Refer to component A4 of the LEAP approach	Magnitude metrics Refer to component A4 of the LEAP approach	Opportunity rating Based on prioritisation criteria. Refer to component A3 of the LEAP approach	Responsibility for management	Connection to other environmental and social risks/opportunities
						Risk reduction	Strategic transformation					
Capital flow and financing	Use of public-sector incentives (e.g. biodiversity credits, payments for ecosystem services)											
Reputational capital	Actions that create positive changes in sentiment towards the organisation/ brand due to impacts on environmental assets and ecosystem services that have impacts on society and local economic capabilities.	General Due to social impact Due to environmental impact										

Nature-related Opportunity category	Nature-related opportunity	Nature-related opportunity sub-category	Realm (Land, freshwater, ocean, atmosphere)	Organisational level (Product, entity, site/facility or area)	Location	Purpose of opportunity		Exposure metrics Refer to component A4 of the LEAP approach	Magnitude metrics Refer to component A4 of the LEAP approach	Opportunity rating Based on prioritisation criteria. Refer to component A3 of the LEAP approach	Responsibility for management	Connection to other environmental and social risks/opportunities
						Risk reduction	Strategic transformation					
Sustainability performance opportunities												
Ecosystem protection, restoration and regeneration	Direct restoration, conservation or protection of ecosystems or habitats	Restoration Conservation Protection										
	Indirect restoration, conservation or protection of ecosystems or habitats	Financing Reduction of harmful impact drivers/ pressures Advocacy										

Nature-related Opportunity category	Nature-related opportunity	Nature-related opportunity sub-category	Realm (Land, freshwater, ocean, atmosphere)	Organisational level (Product, entity, site/facility or area)	Location	Purpose of opportunity		Exposure metrics Refer to component A4 of the LEAP approach	Magnitude metrics Refer to component A4 of the LEAP approach	Opportunity rating Based on prioritisation criteria. Refer to component A3 of the LEAP approach	Responsibility for management	Connection to other environmental and social risks/opportunities
						Risk reduction	Strategic transformation					
Ecosystem protection, restoration and regeneration	Protection/conservation/sustainable management of threatened species											
	Implementation of site-based nature-based solutions											

Nature-related Opportunity category	Nature-related opportunity	Nature-related opportunity sub-category	Realm (Land, freshwater, ocean, atmosphere)	Organisational level (Product, entity, site/facility or area)	Location	Purpose of opportunity		Exposure metrics (Refer to component A4 of the LEAP approach)	Magnitude metrics (Refer to component A4 of the LEAP approach)	Opportunity rating (Based on prioritisation criteria. Refer to component A3 of the LEAP approach)	Responsibility for management	Connection to other environmental and social risks/opportunities
						Risk reduction	Strategic transformation					
Ecosystem protection, restoration and regeneration	Investment in infrastructure for nature positive outcomes											
	Integrated multi-stakeholder action at land/ seascape/ river basin/ jurisdictional scale											

Nature-related Opportunity category	Nature-related opportunity	Nature-related opportunity sub-category	Realm (Land, freshwater, ocean, atmosphere)	Organisational level (Product, entity, site/facility or area)	Location	Purpose of opportunity		Exposure metrics Refer to component A4 of the LEAP approach	Magnitude metrics Refer to component A4 of the LEAP approach	Opportunity rating Based on prioritisation criteria. Refer to component A3 of the LEAP approach	Responsibility for management	Connection to other environmental and social risks/opportunities
						Risk reduction	Strategic transformation					
Ecosystem protection, restoration and regeneration	Actions to improve ecological connectivity of land, basin and seascapes											
Sustainable use of natural resources	Transition to processes/circularity mechanisms with reduced negative impacts on nature/ increased positive impacts on nature, including within value chains	Reduced impact drivers Increased positive impacts										

Nature-related Opportunity category	Nature-related opportunity	Nature-related opportunity sub-category	Realm (Land, freshwater, ocean, atmosphere)	Organisational level (Product, entity, site/facility or area)	Location	Purpose of opportunity		Exposure metrics Refer to component A4 of the LEAP approach	Magnitude metrics Refer to component A4 of the LEAP approach	Opportunity rating Based on prioritisation criteria. Refer to component A3 of the LEAP approach	Responsibility for management	Connection to other environmental and social risks/opportunities
						Risk reduction	Strategic transformation					
Sustainable use of natural resources	Increased reuse and recycling of natural resources											
	Adoption of nature-based solutions within service and product lines											

Nature-related Opportunity category	Nature-related opportunity	Nature-related opportunity sub-category	Realm (Land, freshwater, ocean, atmosphere)	Organisational level (Product, entity, site/facility or area)	Location	Purpose of opportunity		Exposure metrics Refer to component A4 of the LEAP approach	Magnitude metrics Refer to component A4 of the LEAP approach	Opportunity rating Based on prioritisation criteria. Refer to component A3 of the LEAP approach	Responsibility for management	Connection to other environmental and social risks/opportunities
						Risk reduction	Strategic transformation					
Sustainable use of natural resources	Certification for projects/ products/ services											
	Technological innovations that reduce impacts on nature/increase positive impacts											

Nature-related Opportunity category	Nature-related opportunity	Nature-related opportunity sub-category	Realm (Land, freshwater, ocean, atmosphere)	Organisational level (Product, entity, site/facility or area)	Location	Purpose of opportunity		Exposure metrics (Refer to component A4 of the LEAP approach)	Magnitude metrics (Refer to component A4 of the LEAP approach)	Opportunity rating (Based on prioritisation criteria. Refer to component A3 of the LEAP approach)	Responsibility for management	Connection to other environmental and social risks/opportunities
						Risk reduction	Strategic transformation					
Sustainable use of natural resources	Collaborative engagement with stakeholders at local, national and international levels											