GPSC Biodiversity Risk Assessment Report 2024

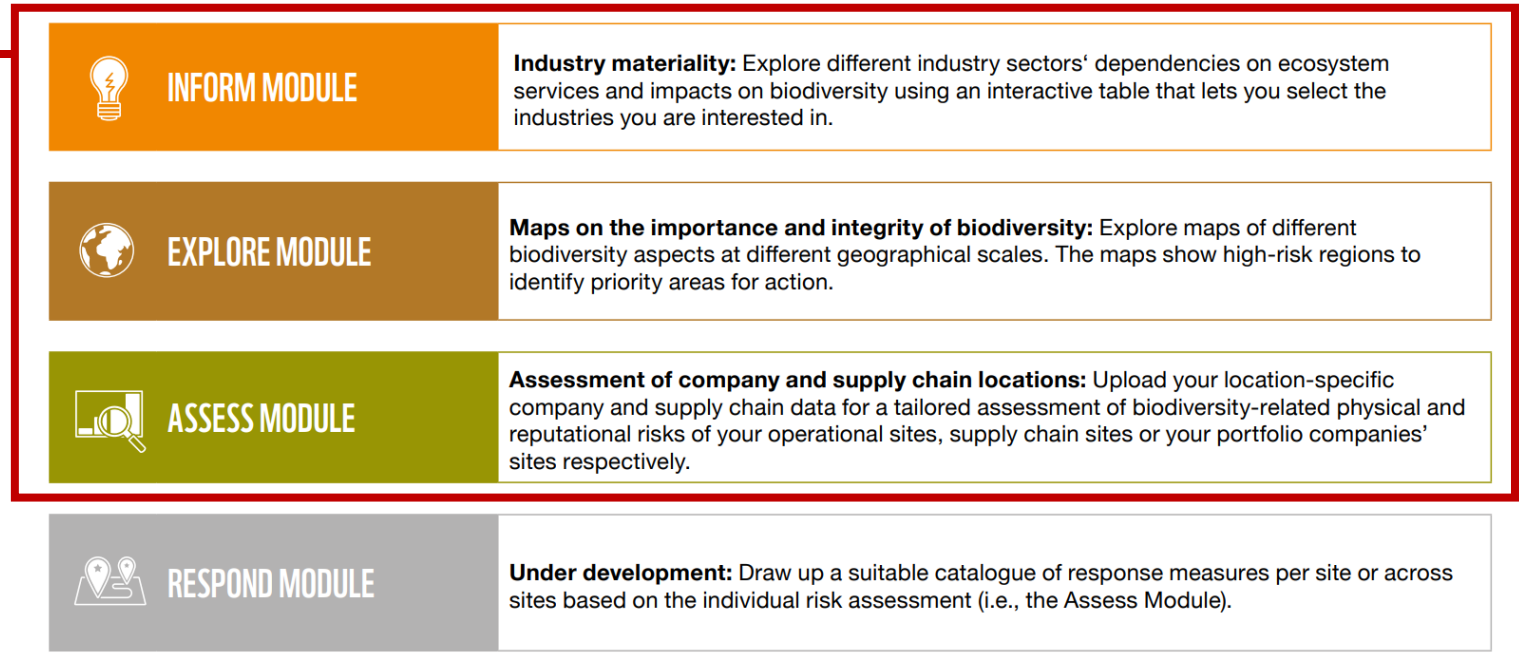
Content: GPSC Biodiversity Risk Assessment Report 2022

Biodiversity Risk Assessment Methodology

- GPSC applies the WWF biodiversity risk filter (WWF BRF) to assess potential ecological impacts of existing and proposed projects or activities.
- The WWF BRF is developed by the World Wildlife Fund (WWF), a global conservation organization with 5 million supporters in 100+ countries. WWF aims to stop environmental degradation, preserve biodiversity, promote sustainable resource use, and reduce pollution.
- It is a tool for assessing and prioritizing biodiversity risks at the corporate and portfolio levels. It helps companies evaluate risks at their operational and supplier locations and develop response plans. Financial institutions can also assess biodiversity risks for companies in their portfolios.

GPSC currently implements 3 out of 4 modules, including inform, explore, and assess, that are enable the organization to gather information and assess potential impacts. However, the fourth module, focused on response strategies, is currently under development, reflecting an ongoing improvement and comprehensive approach to project management and sustainability.

Figure 2: The four modules of the WWF BRF tool



Ref: https://cdn.kettufy.io/prod-fra-1.kettufy.io/documents/riskfilter.org/BiodiversityRiskFilter_Methodology.pdf

Biodiversity Risk Assessment Methodology

Biodiversity Risk Filter

WWF

Biodiversity risks arise from a business's dependencies and impacts, in combination with the state of local and global biodiversity health. This includes the diversity and intactness of ecosystems, the diversity and abundance of species and genes, and the provision of ecosystem services. These risks may be (or become) material from a financial or environmental and social perspective as the main 4 risk types.

Physical Risk

Transition Risk

Risk type	Risk category
Physical risk	**INPUTS: Lack of natural inputs** Production inputs extracted from nature (including feed, raw materials, and genetic material) become locally scarce or inaccessible
	ENABLERS: Lack of natural enablers of business productivity Lack of ecosystem services as enablers of production processes, including cultivation of crops or breeding of animals but also access to extraction sites
	DISTURBANCES: Acute disturbance of value chain or operations Natural hazards disrupting projects, operations, or entire value chains
	ATTRACTIVENESS: Decline in attractiveness of land-/basin-/seascapes or specific sites Landscapes or specific sites that companies depend on (e.g., for tourism or education) become increasingly unattractive
	VULNERABILITY: Increasing vulnerability of ecosystems to the effects of business activities Land, basin, and seascapes become increasingly unable to remediate adverse effects from business activities (e.g., effects on nutrient balances) and may potentially require further interference to stay productive
Regulatory risk	**CURRENT LEGISLATION: Risk of project/operation-specific interventions** Risk of current legislation leading to restriction of operations at certain sites of operation, requirements or delays to specific projects, litigation, and/or fines
	FUTURE LEGISLATION – SITES: Risk of new site-specific restrictions and requirements Risk of forthcoming regulation leading to stranded assets or restricted operations, e.g., due to additional areas being designated as protected or conserved
	FUTURE LEGISLATION – ACTIVITIES: Risk of new activity-specific restrictions and requirements Risk of forthcoming regulation leading to new mandatory standards (e.g., thresholds, taxation, prohibition) on resource extraction, cultivation, or production processes that cause non-compliant firms to face restrictions or miss out on subsidies
Reputational risk	**ENVIRONMENTAL: Reputation damage due to environmental impact** Negative publicity concerning company's environmental sustainability performance (impact on environmental assets), causing direct brand damage, loss of consumer demand and investor scrutiny
	SOCIAL: Reputation damage due to social impact Negative publicity concerning company's social sustainability performance impact on social assets, causing direct brand damage, loss of consumer demand, investor scrutiny and social unrest
	ECONOMIC: Reputation damage due to impact on local economic capabilities Negative publicity concerning company's impact on the economic capabilities and development of a region, causing direct brand damage, loss of consumer demand, investor scrutiny and social unrest
Market risk	**INPUTS: Input price increases** Risk of production cost increases due to restrictions on sourcing or use of certain resources, or decline of global abundance of a resource
	COMPETITION: Declining brand and value proposition (relative to competitors) Companies are perceived to perform worse on biodiversity than direct competitors and lose market share and investor goodwill

Risks to Opportunities

Biodiversity stewardship opportunities for businesses include addressing risks and responding to threats in various ways. These opportunities go beyond typical sustainability practices and involve influencing global biodiversity loss within value chains and operational areas. They align with a nature-positive goals, allowing actions that support nature, build networks, and enhance sustainability. Benefits include cost savings, revenue streams, stakeholder relationships, and brand value. Opportunities arise from understanding biodiversity actions and their positive outcomes, aligning with risk management approach for obtaining 3 biodiversity opportunities for companies.

Opportunity type	Response option category – what does nature need?	Potential benefits for businesses
Scape-based opportunities: Allowing firms to realize benefits by supporting the preservation or restoration of specific places	**Conservation:** Businesses can directly support the conservation of specific sites, land-/basin-/seascapes, or entire ecosystems through instruments like funding or technical assistance	• Permission to operate at local sites (e.g., mining concessions) • CSR stories and materials based on verified contributions • Marketable credits for certified projects (e.g., PES = Payment for Ecosystem Services) • New revenue streams from commercialization of nature-based products • Local use of own products and services
	Addressing pressures: Businesses can help combat specific pressures on biodiversity by • Eliminating sources of pressure (e.g., poaching) • Mitigation of impact (e.g., removing invasives)	• Permission to operate at local sites (e.g., mining concessions) • CSR stories and materials based on verified contributions • Local use of own products and services • New revenue streams from commercialization of nature-based products
	Restoration: Businesses can support the restoration of habitats and entire ecosystems	• Permission to operate at local sites (e.g., mining concessions) • CSR stories and materials based on verified contributions • Marketable credits for certified projects (PES = Payment for Ecosystem Services) • New revenue streams from commercialization of nature-based products • Local use of own products and services
	Sustainable policies: Businesses can advocate for policy changes that facilitate business in harmony with nature	• Permission to operate at local sites (e.g., mining concessions) • Local use of own products and services
Operation-based opportunities: Allowing firms to realize benefits by changing practices in ways that benefit or prevent harm to biodiversity	**Integrate improved production systems:** Significant improvements in natural resource use, emissions, pollution, and waste for existing products	• Reduced production costs • Enhanced brand image • Enhanced value proposition to consumers
Market-based opportunities: Allowing firms to realize benefits by catering to market participants' needs or desires for biodiversity-friendly products and value chains	**Efficient and circular production systems:** Create and support sustainable, eco-efficient and circular value chains through significant improvements in natural resource use, emissions, and waste for existing products	• Reduced production costs • Enhanced brand image to consumers, investors and in recruiting
	New resource-efficient business models: Create and support eco-efficient and circular value chains through consumer end products and services that radically reduce biodiversity impact (e.g., Product-as-a-Service models)	• Enhanced brand image and specifically value proposition to consumers
	Enablers of biodiversity-safe business: Develop product and service innovations that reduce the biodiversity impact of other sectors, especially in resource extraction and cultivation (e.g., precision farming tools)	• Opportunity to capture B2B demand for such products and services • Enhanced brand image to consumers, investors, and in recruiting
	Biodiversity-positive products: Develop product and service innovations that benefit biodiversity (e.g., soil-replenishing seeds, targeted pest control)	• Opportunity to capture B2B/B2P/B2C demand for such solutions • Enhanced brand image to consumers, investors, and in recruiting

Ref: https://wwwwwfse.cdn.triggerfish.cloud/uploads/2022/05/wwf-a-biodiversity-guide-for-business.pdf

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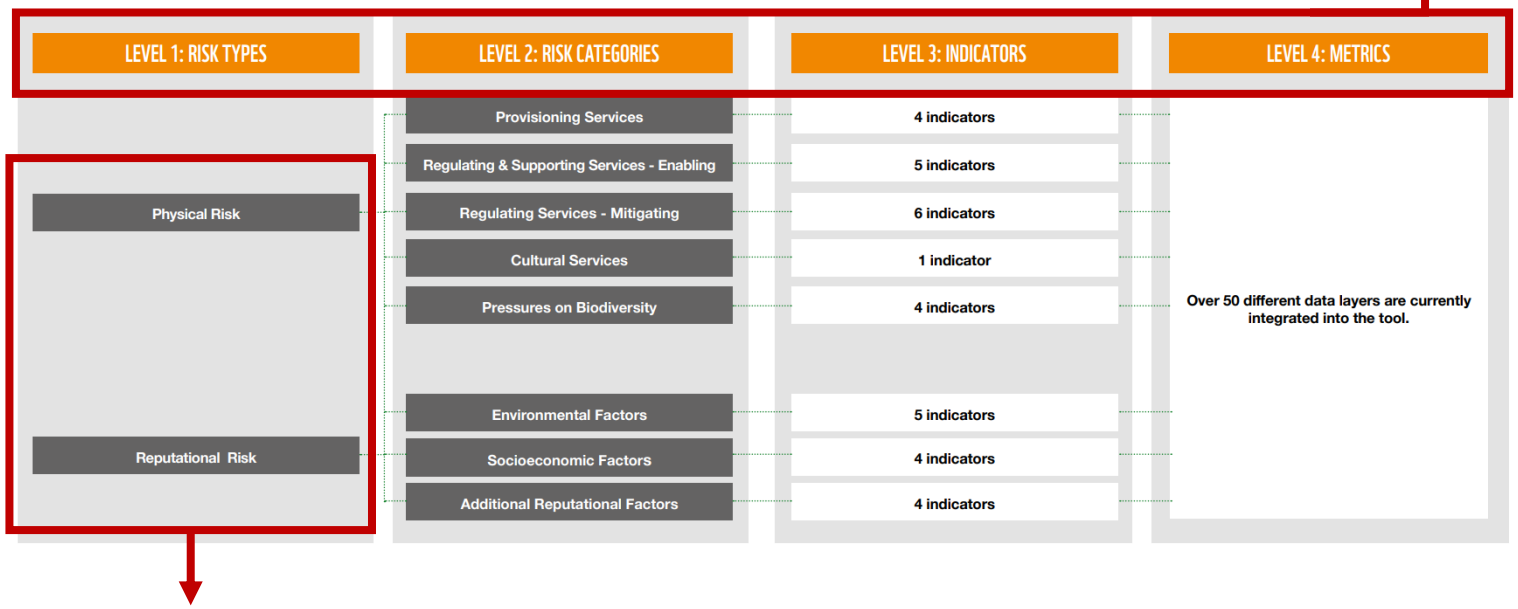
Biodiversity Risk Assessment Methodology

WWF BRF establishes a comprehensive risk hierarchy comprising four distinct risk levels covering biodiversity-related risks that have impacts onto the geographical locations of company or supply chain sites:

Figure 4: WWF BRF risk hierarchy



LEVEL 1, Risk types, combines the risk categories into the broader risk types (physical risks and reputational risks)
LEVEL 2, Risk categories, groups the indicators into higher-level risk clusters with more direct relevance to companies and financial institutions (5 physical risk categories and 3 reputational risk categories)
LEVEL 3, Indicators, comprises information on the importance and local integrity of biodiversity aspects, spatially (dis-)aggregated to an assessment unit and translated to a risk score (33 indicators - 20 physical risk and 13 reputational risk indicators)
LEVEL 4, Metrics, comprises the raw global data sets that measure different aspects of biodiversity and ecosystems in a specific location that may lead to biodiversity-related risks for companies and financial institutions. Currently, the WWF BRF tool contains 56 global biodiversity data (metrics)

Physical risks arise from the dependence of a business and its supply chains on natural and human-induced conditions of land and seas. These risks can negatively impact ecosystem services, potentially resulting in reduced productivity (e.g., lack of fertile soils and pollination) or increased input costs (e.g., scarcity of natural fibers or harvest losses).

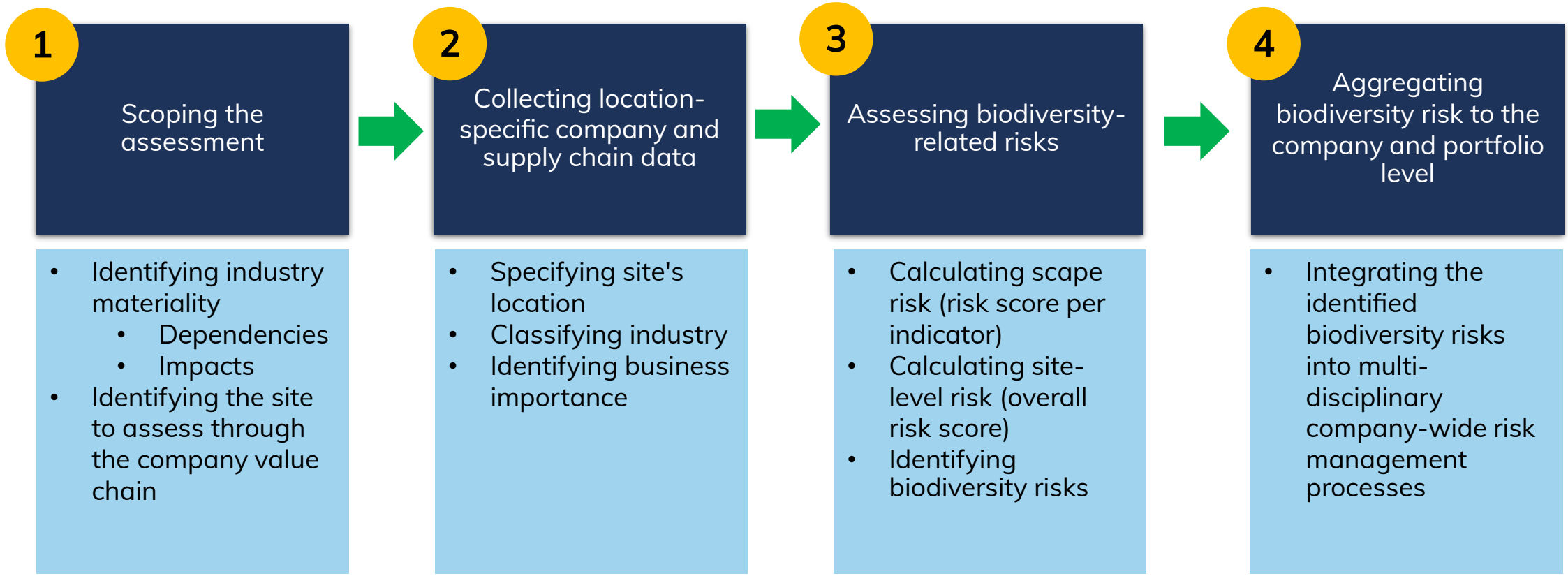
Reputational risks stem from a company's negative impacts on biodiversity and people, both actual and perceived. These risks are tied to stakeholders' and local communities' perceptions of a company's sustainability and responsible practices regarding biodiversity. Reputational risks can have various consequences, including damage to the corporate brand, decreased sales, increased investor scrutiny, and declining share prices.

Additional biodiversity-related risks, such as **regulatory** (i.e., policy and legal) and **market risks**, as well as an assessment of biodiversity-related opportunities, are **under development** and will be added in due course.

Ref: https://cdn.kettufy.io/prod-fra-1.kettufy.io/documents/riskfilter.org/BiodiversityRiskFilter_Methodology.pdf

Biodiversity Risk Assessment Process

GPSC Group applied the **WWF biodiversity risk filter (WWF BRF)**, the WWF's biodiversity risk assessment, as a reference to methodologies or frameworks used for assessment on physical and reputational risks. It is a tool for assessing the potential risks and impacts on biodiversity associated with a company's operations as a location-specific approach. The tool evaluates a range of factors based on the location of the operations, including threatened species, ecosystems, and protected areas.



*The scope of biodiversity risk assessment covers own operations, adjacent areas to own operations, upstream activities, downstream activities

Biodiversity Risk Assessment Results

Biodiversity Risk Filter

WWF

1 Scoping the assessment

Indicator #		Impact/ Dependency	Industry						
			Chemicals & Other Materials Production	Electric Energy Production - Combustion (Biomass, Coal, Gas, Nuclear, Oil), Geothermal Energy	Electric Energy Production – Hydropower	Electric Energy Production - Solar, Wind	Oil, Gas & Consumable Fuels	Other (Average of all sectors)	
Physical Risk									
Provisioning Services									Avg
1.1	Water Availability	Dependency	4	5	5	3	4	4	4
1.2	Forest Productivity and Distance to Markets	Dependency	0	4	0	0	4	1	2
1.3	Limited Wild Flora & Fauna Availability	Dependency	1	0	0	0	0	1	1
1.4	Limited Marine Fish Availability	Dependency	0	0	0	0	0	1	0
Regulating & Supporting Services - Enabling									
2.1	Soil Condition	Dependency	0	0	0	0	0	1	1
2.2	Water Condition	Dependency	3	2	3	2	2	3	3
2.3	Air Condition	Dependency	3	3	2	3	3	3	3
2.4	Ecosystem Condition	Dependency	0	0	0	0	0	1	0
2.5	Pollination	Dependency	0	0	0	0	0	1	0
Regulating Services - Mitigating									
3.1	Landslides	Dependency	3	3	3	3	3	3	3
3.2	Wildfire Hazard	Dependency	3	3	3	3	3	3	3
3.3	Plant/Forest/Aquatic Pests and Diseases	Dependency	0	0	0	0	0	1	1
3.4	Herbicide Resistance	Dependency	0	0	0	0	0	1	1
3.5	Extreme Heat	Dependency	3	4	3	3	4	4	4
3.6	Tropical Cyclones	Dependency	3	3	3	3	3	3	3
Cultural Services									
4.1	Tourism Attractiveness	Dependency	0	0	0	0	0	1	0
Pressures on Biodiversity									
5.1	Land, Freshwater and Sea Use Change	Impact	1	1	5	3	5	3	3
5.2	Forest Canopy Loss	Impact	1	4	4	1	5	3	3
5.3	Invasives	Impact	0	0	2	0	2	2	2
5.4	Pollution	Impact	5	5	3	4	5	4	4
Environmental Factors									
6.1	Protected/Conserved Areas	Impact	3	5	4	4	5	3	3
6.2	Key Biodiversity Areas	Impact	2	4	3	3	4	3	3
6.3	Other Important Delineated Areas	Impact	2	4	4	2	4	3	3
6.4	Ecosystem Condition	Impact	2	4	4	2	4	3	3
6.5	Range Rarity	Impact	1	3	3	3	3	2	2
Socioeconomic Factors									
7.1	Indigenous Peoples (IPs); Local Communities (LCs) Lands and Territories	Impact	3	3	5	3	5	3	3
7.2	Resource Scarcity: Food - Water - Air	Impact	1	1	1	0	2	1	1
7.3	Labor/Human Rights	Impact	2	2	2	2	4	3	3
7.4	Financial Inequality	Impact	2	2	2	2	2	2	2
Additional Reputational Factors									
8.1	Media Scrutiny	Dependency	4	2	2	2	4	3	3
8.2	Political Situation	Dependency	2	3	3	2	3	2	2
8.3	Sites of International Interest	Dependency	2	3	3	2	3	2	2
8.4	Risk Preparation	Dependency	2	2	2	2	2	2	2

1 – Very low dependency/impact

2 – Low dependency/impact

3 – Medium dependency/impact

4 – High dependency/impact

5 – Very high dependency/impact

Blank – This indicator is not applicable for this sector

The industry materiality, including dependencies and impacts, is identified. In overall, the GPSC operation, upstream and downstream fall into the following industry categories:

- Own operation, subsidiaries, and joint ventures
  - Electric Energy Production (EEP) - Combustion (Biomass, Coal, Gas, Nuclear, Oil), Geothermal Energy
  - Electric Energy Production (EEP) – Hydropower
  - Electric Energy Production (EEP) - Solar, Wind
- Adjacent areas
  - Other (average of all sectors)
- Upstream activities
  - Oil, Gas & Consumable Fuels
- Downstream activities
  - Chemicals & Other Materials Production

The results show:

- The dependency indicators that are classified to be high priority
  - 1.1 Water Availability
  - 2.2 Water Condition
  - 2.3 Air Condition
  - 3.1 Landslides
  - 3.2 Wildfire Hazard
  - 3.5 Extreme Heat
  - 3.6 Tropical Cyclones
  - 8.1 Media Scrutiny
- The Impact indicators that are classified to be high priority
  - 5.1 Land, Freshwater and Sea Use Change
  - 5.2 Forest Canopy Loss
  - 5.4 Pollution
  - 6.1 Protected/Conserved Areas
  - 6.2 Key Biodiversity Areas
  - 6.3 Other Important Delineated Areas
  - 6.4 Ecosystem Condition
  - 7.1 Indigenous Peoples (IPs); Local Communities (LCs) Lands and Territories
  - 7.3 Labor/Human Rights

Biodiversity Risk Assessment Results

Biodiversity Risk Filter

WWF

1 Scoping the assessment

53 of total assessed sites
(49 sites include own operation, subsidiaries, and joint ventures)

Type of site	Location	Site
Own operation, Subsidiaries, and Joint Ventures (49 site)	**Chonburi (3 sites)**	• Sriracha Power Plant (SRC) • GIPP • Chonburi Clean Energy (CCE)
	KhonKaen (counted as 1 site)	• PPS 1 • PPS 2 • PPS 3
	Pichit (counted as 2 sites: phase 1, 2)	• NPS 1 • WXA 1 • WXA 2 • WXA 3
	Suphanburi (2 site)	• NPS 2 • TSR (SSE1)
	Lopburi (1 site)	• NPS3
	Bangkok (1 site)	• CHPP
	Chanthaburi (1 site)	• CHPP Solar
	Saraburi (1 site)	• Glow Energy Solar PV Rooftop Project 1
	Ratchaburi (1 site)	• RPCL
	Pathumthani (2 site)	• NNEG • NNEG Expansion
	Ayutthaya (2 site)	• BIC-1 • BIC-2
	Kanchanaburi (1 site)	• TSR (SSE1)
	Rayong (19 sites)	• Central Utility Plant 1 (CUP 1) • Central Utility Plant 2 (CUP 2) • Central Utility Plant 3 (CUP 3) • Central Utility Plant 4 (CUP 4) • GHECO-One Power Plant • Glow Energy Phase 1 • Glow Energy Phase 2 • Glow Energy Phase 4 • Glow Energy Phase 5 • Glow SPP 2, 3, 2 replacement • Glow Energy CFB 3 • Glow SPP 11 Project 1, 3 • Glow SPP 11 Project 2 • IRPCCP Phase 1 • IRPCCP Phase 2 • IRPCCP Phase 3 • Glow Energy Solar • Glow Energy Solar PV Rooftop Project 2 • Rayong Waste to Energy
	The North of Vientiane (Laos) (1 sites)	• NL1PC
	Atta pue (Laos) (1 sites)	• Huay Ho
	The South of Luang Prabang (Laos) (1 sites)	• XPCL
	India (7 sites)	• GRSC (AEPL) **(7 locations)**
	Taiwan (2 sites)	• GRP 1 (Shan Yang Energy) • CFXD (Offshore Wind Farm)

Biodiversity Risk Assessment Results

1 Scoping the assessment

53 of total assessed sites
(4 sites include adjacent areas, upstream, downstream activities)

Type of site	Location	Site
Adjacent Areas (1 site)	**Atta pue, Laos**	• The area which are adjacent between 0 and 2 km from the **Huay Ho** site where was identified as the high reputation risk and high physical risk from WWF BRF (repeat adding Huay Ho site)
Upstream Activities (2 sites as the representative suppliers)	**Sangatta Utara, Kalimantan Timur, Indonesia**	• PT. Kaltim Prima Coal (KPC)
	Sirikit Conventional Oil Field, Kamphaeng Phet, Thailand	• PTTEP - S1 Project (Sirikit)
Downstream Activities (1 site as the representative area where are the critical customers located)	**Map Ta Phut Industrial Estate, Thailand**	• Map Ta Phut Industrial Estate

Biodiversity Risk Assessment Results

2 Collecting location-specific company and supply chain data (1/3)

In this step, GPSC specifies **geographic location** of the assessed site in term of the coordinates or approximated address/zone on the map. **Industry sector classification** and **business importance identification** per site are also conducted to prepare for the next step. In the assessment, we classify the representative adjacent area, suppliers (upstream) and customer (downstream) as high business importance level, and all facilities into 3 business importance level by the following criteria:

- **High business importance level**
  - Operational control
  - Equal to or more than 75% of share holding
- **Medium business importance level**
  - Non-operational control
  - Equal to or more than 50% but less than 75% of share holding
- **Low business importance level**
  - Non-operational control
  - Less than 50% of share holding

Type of site	Location	Industry sector	Business importance level	Site
Own operation, Subsidiaries, and Joint Ventures (49 site)	**Chonburi (3 sites)**	EEP – Combustion, Geothermal Energy	High	• Sriracha Power Plant (SRC) • GIPP
			Low	• Chonburi Clean Energy (CCE)
	KhonKaen (counted as 1 site)	EEP – Solar, Wind	Medium	• PPS 1 • PPS 2 • PPS 3
	Pichit (counted as 2 sites: phase 1, 2)	EEP – Solar, Wind	Medium	• NPS 1 • WXA 1 • WXA 2 • WXA 3

Biodiversity Risk Assessment Results

2 Collecting location-specific company and supply chain data (2/3)

Type of site	Location	Industry sector	Business importance level	Site
Own operation, Subsidiaries, and Joint Ventures (49 site)	**Suphanburi (2 site)**	EEP – Solar, Wind	Medium	• NPS 2
			Low	• TSR (SSE1)
	Lopburi (1 site)	EEP – Solar, Wind	Medium	• NPS3
	Bangkok (1 site)	EEP – Combustion, Geothermal Energy	High	• CHPP
	Chanthaburi (1 site)	EEP – Solar, Wind	High	• CHPP Solar
	Saraburi (1 site)	EEP – Solar, Wind	High	• Glow Energy Solar PV Rooftop Project 1
	Ratchaburi (1 site)	EEP – Combustion, Geothermal Energy	Low	• RPCL
	Pathumthani (2 site)	EEP – Combustion, Geothermal Energy	Low	• NNEG • NNEG Expansion
	Ayutthaya (2 site)	EEP – Combustion, Geothermal Energy	Low	• BIC-1 • BIC-2
	Kanchanaburi (1 site)	EEP – Solar, Wind	Low	• TSR (SSE1)
	The North of Vientiane (Laos) (1 sites)	EEP - hydropower	Low	• NL1PC
	Atta pue (Laos) (1 sites)	EEP - hydropower	Medium	• Huay Ho
	The South of Luang Prabang (Laos) (1 sites)	EEP - hydropower	Low	• XPCL

Biodiversity Risk Assessment Results

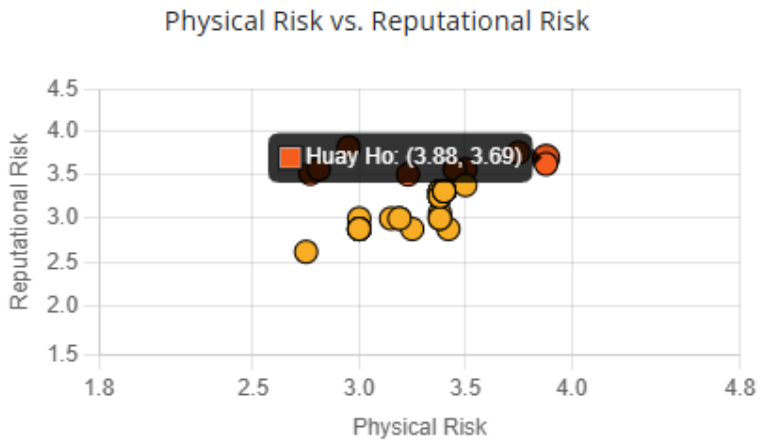
2 Collecting location-specific company and supply chain data (3/3)

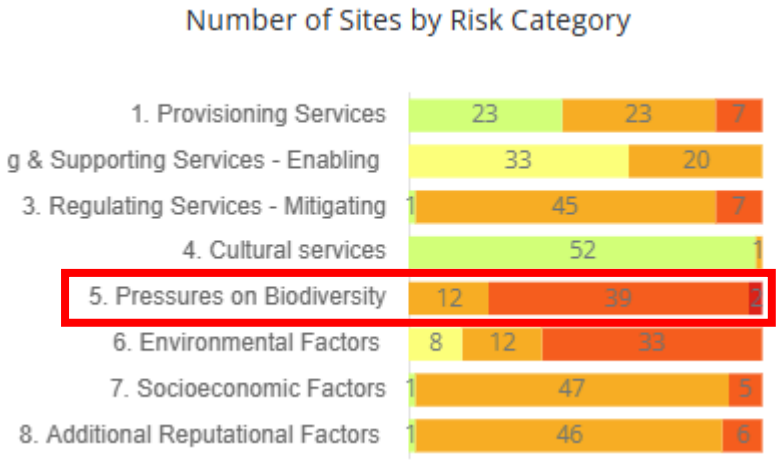
Type of site	Location	Industry sector	Business importance level	Site
Own operation, Subsidiaries, and Joint Ventures (49 site)	**Rayong (19 sites)**	EEP – Combustion, Geothermal Energy	High	• Central Utility Plant 1 (CUP 1) • Central Utility Plant 2 (CUP 2) • Central Utility Plant 3 (CUP 3) • Central Utility Plant 4 (CUP 4) • Glow Energy Phase 1 • Glow Energy Phase 2 • Glow Energy Phase 4 • Glow Energy Phase 5 • Glow Energy CFB 3 • Glow SPP 2, 3, 2 replacement • Glow SPP 11 Project 1, 3 • Glow SPP 11 Project 2 • Rayong Waste to Energy
		EEP – Combustion, Geothermal Energy	Medium	• GHECO-One Power Plant • IRPC-CP Phase 1 • IRPC-CP Phase 2 • IRPC-CP Phase 3
		EEP – Solar, Wind	High	• Glow Energy Solar • Glow Energy Solar PV Rooftop Project 2
	India (7 sites)	EEP – Solar, Wind	Low	• GRSC (AEPL) (7 locations)
	Taiwan (2 sites)	EEP – Solar, Wind	Low	• GRP1 (Shan Yang Energy) • CFXD (Offshore Wind Farm)
Adjacent Areas (1 site)	**Atta pue, Laos**	Other (average of all sectors)	High	• The area which are adjacent between 0 and 2 km from the Huay Ho site
Upstream Activities (2 sites)	**Sangatta Utara, Kalimantan Timur, Indonesia**	Oil, Gas & Consumable fuel	High	• PT. Kaltim Prima Coal (KPC)
	Sirikit Conventional Oil Field, Thailand	Oil, Gas & Consumable fuel	High	• PTTEP - S1 Project (Sirikit)
Downstream Activities (1 site)	**Map Ta Phut Industrial Estate, Thailand**	Chemicals & Other Materials Production	High	• Map Ta Phut Industrial Estate

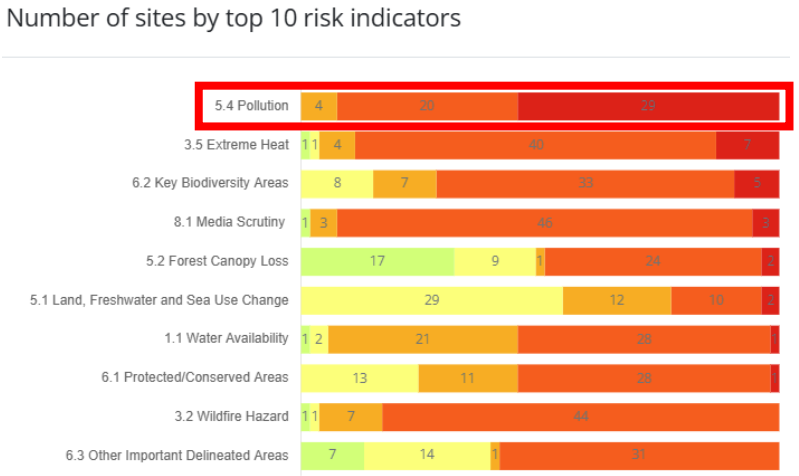
Biodiversity Risk Assessment Results

3 Assessing biodiversity-related risks (1/3)

The results of the assessment can help companies identify areas of high risk and take steps to avoid or mitigate their impacts on biodiversity by Integrating the identified biodiversity risks into multi-disciplinary company-wide risk management processes.

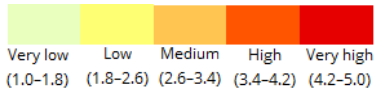






The results show:

- The **Huay Ho** site (the own hydropower-operating site located in Laos) is the representative site where is assessed as the high biodiversity risk level in both reputationally and physically.
- The greatest number of sites fall into the risk category 5, **pressures on biodiversity**, at high level meaning that the company's sites are unequivocally influence biodiversity and ecosystem processes.
- Related with the risk category 5, the risk indicator 5.4, **pollution**, also has the greatest number of sites falling in. It means that the company is facing the risk of biodiversity impacts from pollution emission from industries, especially, air pollution through the use of fossil fuels



WWF Biodiversity Risk Filter levels

Biodiversity Risk Assessment Results

3 Assessing biodiversity-related risks (2/3)

Biodiversity Risk Filter Scape Risk Results	Scape Physical Risk	1. Provisioning Services	2. Regulating & Supporting Services - Enabling	3. Regulating Services - Mitigating	4. Cultural Services	5. Pressures on Biodiversity	Scape Reputational Risk	6. Environmental Factors	7. Socioeconomic Factors	8. Additional Reputational Factors
Site Name	SPH	SRC1	SRC2	SRC3	SRC4	SRC5	SRP	SRC6	SRC7	SRC8
Avaada 1	3	1.7	2.25	3	No dependency or	3.81	2.88	2.5	3	2.75
Avaada 2	3	1.7	2.5	3	No dependency or	3.81	2.88	2.5	3	2.75
Avaada 3	3	1.7	2.25	3	No dependency or	3.77	2.88	2.5	3	2.75
Avaada 4	3	1.5	2.75	3	No dependency or	4	2.88	2.5	3	2.75
Avaada 5	3	1.5	3	2.88	No dependency or	3.67	2.88	2.5	3	2.75
Avaada 6	3	1.6	2.25	3	No dependency or	3.44	3	3	3	2.75
Avaada 7	3.25	1.5	3.25	2.88	No dependency or	3.85	2.88	2.5	3	2.75
BIC-1	3.38	3.95	3.25	3.38	No dependency or	2.98	3.31	3	3	3.62
BIC-2	3.38	3.95	3.25	3.38	No dependency or	2.98	3.31	3	3	3.62
CFXD (Offshore wind farn	2.75	No dependenc	2.27	NA	No dependency or	4.17	2.62	3	NA	1.5
CHPP	3.38	3.9	3.25	3.38	No dependency or	2.98	3.06	3	3	3.12
CHPP (solar)	2.77	1.45	2	3.38	No dependency or	2.77	3.51	4	3.02	2.78
CUP1	3.4	3.4	2	3.25	No dependency or	4.06	3.31	3.5	3	3.12
CUP2	3.4	3.4	2	3.25	No dependency or	4.06	3.31	3.5	3	3.12
CUP3	3.4	3.4	2	3.25	No dependency or	4.06	3.31	3.5	3	3.12
CUP4	3.4	3.4	2	3.25	No dependency or	4.06	3.31	3.5	3	3.12
Chonburi Clean Energy (C	3.4	3.4	2	3.25	No dependency or	4.06	3.31	3.5	3	3.12
GHECO-One	3.4	3.4	2	3.25	No dependency or	4.06	3.31	3.5	3	3.12
GIPP	3.4	3.4	2	3.25	No dependency or	4.06	3.31	3.5	3	3.12
GRP (NPS1, WXA1, WXA2,	3.38	1.4	3	3.38	No dependency or	3.42	3.25	3.5	3	2.75
GRP (NPS1, WXA1, WXA2,	3.38	1.4	3	3.38	No dependency or	3.42	3.25	3.5	3	2.75
GRP (NPS2)	3.38	1.7	2.25	3.38	No dependency or	3.38	3.25	3.5	3	2.75
GRP (NPS3)	3.38	1.5	3.25	3.38	No dependency or	3.6	3.25	3.5	3	2.75
GRP (PPS1, PPS2, PPS3)	3.42	1.35	3	3.5	No dependency or	3.42	2.88	2.5	3	2.75
GRP1 (Shan Yang Energy)	2.81	1.15	2.25	3.62	No dependency or	2.81	3.56	4	3.12	2.75
Glow Energy CFB 3	3.4	3.4	2	3.25	No dependency or	4.06	3.31	3.5	3	3.12
Glow Energy Phase 1	3.4	3.4	2	3.25	No dependency or	4.06	3.31	3.5	3	3.12
Glow Energy Phase 2	3.4	3.4	2	3.25	No dependency or	4.06	3.31	3.5	3	3.12
Glow Energy Phase 4	3.4	3.4	2	3.25	No dependency or	4.06	3.31	3.5	3	3.12
Glow Energy Phase 5	3.4	3.4	2	3.25	No dependency or	4.06	3.31	3.5	3	3.12
Glow Energy Solar PV Roc	3.23	1.45	2.75	3.38	No dependency or	3.23	3.5	4	3	2.75
Glow Energy Solar PV Roc	3.19	1.4	2	3.25	No dependency or	3.19	3	3	3	2.75
Glow Energy Solar Plant	3.19	1.4	2	3.25	No dependency or	3.19	3	3	3	2.75
Glow SPP 11 Project 1 & 3	3.4	3.4	2	3.25	No dependency or	4.06	3.31	3.5	3	3.12
Glow SPP 11 Project 2	3.4	3.4	2	3.25	No dependency or	4.06	3.31	3.5	3	3.12
Glow SPP 2 & 3	3.4	3.4	2	3.25	No dependency or	4.06	3.31	3.5	3	3.12
Huay Ho	3.88	1.5	2.5	3.88	No dependency or	3.94	3.69	3.75	3.62	3.12
Huay Ho adjacent	3.5	2.75	3	3.88	3	3.5	3.38	3.5	3.25	3.12
IRPC-CP Phase 1	3.4	3.4	2	3.25	No dependency or	4.06	3.31	3.5	3	3.12
IRPC-CP Phase 2	3.4	3.4	2	3.25	No dependency or	4.06	3.31	3.5	3	3.12
IRPC-CP Phase 3	3.4	3.4	2	3.25	No dependency or	4.06	3.31	3.5	3	3.12
Map Ta Phut Industrial Es	3.15	3.15	2.5	3.25	No dependency or	2.94	3	2.5	3	3
NL1PC	3.5	1.8	3	3.5	No dependency or	4.06	3.56	3.5	3.62	3.12
NNEG	3.38	3.95	3.25	3.38	No dependency or	2.98	3.31	3	3	3.62
NNEG Expansion	3.38	3.95	3.25	3.38	No dependency or	2.98	3.31	3	3	3.62
PT. Kaltim Prima Coal (KP	2.95	2.95	2.5	2.88	No dependency or	4.25	3.81	4	3.62	3.38
RPCL	3.45	3.45	3.25	3.25	No dependency or	3.73	3.56	3.5	3	3.62
Rayong Waste to Energy	3.4	3.4	2	3.25	No dependency or	4.06	3.31	3.5	3	3.12
S1 Project (Sirikit)	3.75	3.65	3	3.75	No dependency or	4.29	3.75	3.5	4	3.38
SRC	3.4	3.4	2	3.25	No dependency or	4.06	3.31	3.5	3	3.12
TSR (SSE1) - 1	3.38	1.7	3	3.38	No dependency or	3.42	3	3	3	2.75
TSR (SSE1) - 2	3.38	1.8	2.75	3.38	No dependency or	3.42	3	3	3	2.75
XPCL	3.88	1.65	3	3.88	No dependency or	4	3.62	3.12	3.62	3.62

The results show:

Own operations/subsidiaries/joint ventures

- The **Huay Ho** site (the hydropower-joint venture site located in Laos) has a high biodiversity risk level in both reputationally and physically.
- The **Huay Ho** and **XPCL** sites are the highest physical risk with a 3.88 score.
- The **Huay Ho** site (located near Phou Kathong area, which is an Alliance for Zero Extinction (AZE) and Key Biodiversity Area (KBA)) is the highest reputational risk with a 3.69 score.

Adjacent area

- The **adjacent area** within 0-2 km of the Huay Ho site (high reputation and physical risk level) has a high physical risk level and a medium reputational risk level.

Upstream

- The **PT. Kaltim Prima Coal (KPC)** (the representative coal supplier based in Indonesia) has a medium physical risk level and a high reputational risk level.
- The **S1 Project (Sirikit)** (the representative natural gas supplier based in Thailand) has both the reputation and physical risk at the high-risk level

Downstream

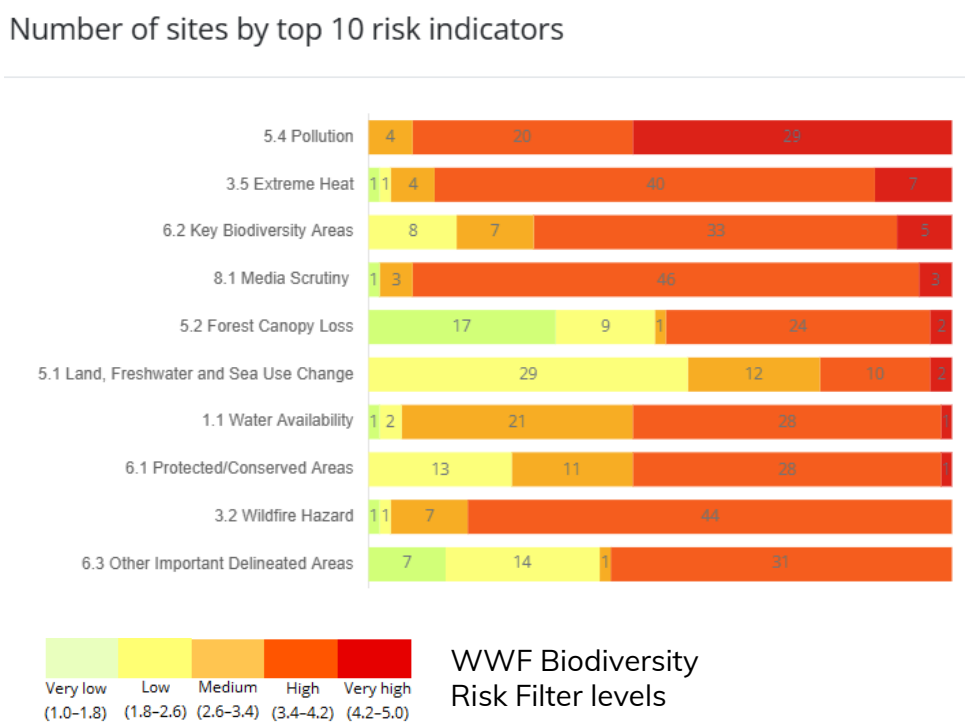
- The **Map Ta Phut Industrial Estate** (the representative customer based in Thailand) has both the reputation and physical risk at medium risk level

Very low	Low	Medium	High	Very high
(1.0–1.8)	(1.8–2.6)	(2.6–3.4)	(3.4–4.2)	(4.2–5.0)

WWF Biodiversity Risk Filter levels

Biodiversity Risk Assessment Results

3 Assessing biodiversity-related risks (3/3)



WWF Biodiversity Risk Filter levels

The results show:

- The top 10 biodiversity-related risk indicators are recognized as the identified risks, which are mainly in the physical risk category (7 physical risk indicators and 3 reputation risk indicators), as follows:

Physical risk

5.4 Pollution

- Areas of very high risk have high levels of nitrogen and pesticides per hectare of cropland (>77kg/ha; >5.9kg/ha, respectively); high total N concentrations in freshwater (>2.6mg/L); a very high nutrient & chemical pollution impact score in marine areas; experience more than 50 mg/m2 of PM 2.5.

3.5 Extreme Heat

- Areas of very high risk experience a very high (32°C) daily maximum WBGT (wet bulb globe temperature) with a 5-year return period

5.2 Forest Canopy Loss

- Areas of very high risk have experienced high rates of tree cover loss (>8%).

5.1 Land, Freshwater and Sea Use Change

- Areas of very high risk experienced high percentages of cropland expansion (>12%) and a high fragmentation of rivers; or high pressure from shipping and direct human impact.

1.1 Water Scarcity

- Areas of very high location risk are likely to experience very high levels of water scarcity at this location

3.2 Wildfire Hazard

- A high-risk score for this indicator is a result of high dependency of your industry on the absence or mitigation of this natural hazard in combination with high location risk scores. Areas of very high risk have experienced frequent wildfires in the recent past (2017 – 2022).

6.3 Other Important Delineated Areas

- A high-risk score for this indicator is a result of high impact of your industry on other important delineated areas in combination with high location risk scores. For terrestrial sites, areas of very high risk for this indicator overlap with areas classified as intact forest landscapes or WWF Global 200 ecosystems. For marine sites, areas of very high-risk overlap with Ecologically or Biologically Significant Marine Areas, Vulnerable Marine Ecosystems or WWF Global 200 ecosystems.

Reputational risk

6.2 Key Biodiversity Area (KBA) and 6.1 Protected and Conserved Areas (PA)

- Areas of very high risk is located in proximity to KBA and PA, which are urgently needed to prepare corporate and financial safeguards for mitigating the potential impacts

8.1 Media scrutiny

- A high-risk score for this indicator is a result of high dependency of your industry on media scrutiny (due to a high level of negative news stories associated with your industry) in combination with a high location risk score. Areas of very high risk have many incidents with high severity ratings related to environmental or social issues.

6.1 Protected and Conserved Areas

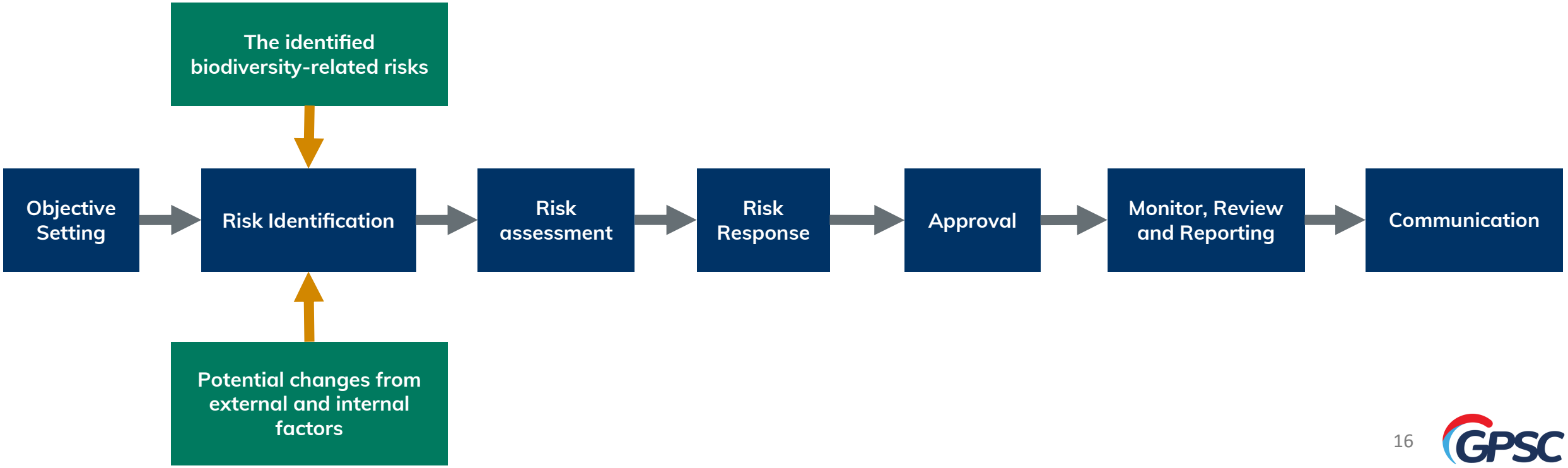
- A high-risk score for this indicator is a result of the high impact of your industry on PAs in combination with high location risk scores. Assessment units with very high risk have >30% overlap with PA Categories I-IV + not categorized PA'

Biodiversity Risk Assessment Results

4 Aggregating biodiversity risk to the company and portfolio level (1/3)

The biodiversity-related risks identified as the results of step 3 (assessing biodiversity-related risks) will be considered with other company's specific criteria for each site, such as revenue generation and production capacity, to identify the potentially biodiversity-related risks contextually for integrating into multi-disciplinary company-wide risk management processes, since step 2 (risk identification). The integration was designed to ensure that GPSC considers all the possible risks that the company is facing, to promote responsible and sustainable business practice. It is additionally used to mitigate the risk of unintentional non-compliance with regulatory frameworks and standards, and to increase stakeholder confidence and organizational reputation.

GPSC multi-disciplinary company-wide risk management processes



Biodiversity Risk Assessment Results

4 Aggregating biodiversity risk to the company and portfolio level (2/3)

According to the identified risks affecting GPSC Group's Businesses, biodiversity-related risks were also considered and integrated into the risk management process as a significant factor in strategic risk category. By this approach, GPSC can strengthen the risk management processes. Integrating various departments, fostering collaboration, and promoting a risk-aware culture measure to enable organizations to proactively identify, mitigate, and adapt to risks effectively will be developed and implemented. Moreover, continuous monitoring and improvement are conducted to maintain the effectiveness of the risk management framework.

Risk type	Topic	Description	Relevance to biodiversity
Strategic Risk	**Investment and Business Growth**	With a strong focus on growing renewable energy business for both domestic and international expansion, GPSC's strategy includes investing in clean energy, new energy technologies, and customer-focused solutions, while also maintaining efficient conventional power for energy stability. Despite economic and global challenges, GPSC has successfully increased renewable energy capacity through strategic partnerships, mergers, and R&D.	This shift towards renewable energy can reduce habitat destruction, lower greenhouse gas emissions, and decrease pollution compared to fossil fuels. However, the positive impact depends on responsible planning and execution of renewable energy projects to minimize potential harm to ecosystems, such as bird and bat mortality from wind farms or habitat loss from solar installations. Careful environmental management is essential for ensuring that GPSC's clean energy transition supports biodiversity conservation.
	Altered Rules and Regulations	Evolving environmental regulations present both challenges and opportunities for GPSC. Compliance may require operational adjustments and resource allocation for environmental protection, with non-compliance leading to penalties and reputational risks.	These regulations necessitate careful consideration of the operational impacts on ecosystems and adherence to rules concerning land use, emissions, and waste. By actively adapting to these requirements and investing in renewable energy, GPSC can mitigate the impact on biodiversity and ensure long-term environmental sustainability.
	Climate Change	GPSC views global GHG reduction efforts and stricter regulations as a key risk and opportunity. GPSC has been investing in renewables, efficiency, and new technologies, achieving lower emissions and higher returns through collaborative efforts, demonstrating their commitment to the climate-related targets and the sustainable future.	Loss of biodiversity can disrupt ecosystem services and affect the resilience of natural systems to climate change impacts. This can indirectly impact the operations, especially if they rely on ecosystem services such as water availability.

Thank you