

Environmental impact of exploration activities

Activity	Source of impact	Type of impact	Object of impact	Environmental activities
Preparatory works: <ul style="list-style-type: none"> • Drilling site lay-out • Equipment transportation and storage • Construction of storage facilities for chemicals, fuel and lubri-cants 	<ul style="list-style-type: none"> • Road transport • Exhaust gases of motor vehicles, construction and road machinery • Excavated soil • Materials for site construction and preparation of drilling mud and ce-ment slurries 	<ul style="list-style-type: none"> • Physical disturbance of the fertile soil layer, natural landscapes, thermal abuse, degradation of topsoil layers. • Ecosystem disturbance, changes in the flora and fauna habitats 	<ul style="list-style-type: none"> • Fertile soil layer on drilling equipment sites, routes of linear facilities • Flora and fauna, atmospheric air, soil, ground, sur-face water, land-scape 	<ul style="list-style-type: none"> • Compliance with land allotment standards • Land rehabilitation • Construction of trays and platforms at machinery parking lots • Soil protection measures • Fire safety measures
Well drilling	<ul style="list-style-type: none"> • Mud mixing unit • Drilling waste circulating system • Chemicals used for drilling and plugging • Waste products (mud spills, slime) • Domestic wastewater • Solid domestic waste • Crossflows inside the annulus and damaged casing string 	<ul style="list-style-type: none"> • Ecosystem disturbance and changes in habitats of certain plant and animal species • Machinery-generated noise 	<ul style="list-style-type: none"> • Flora and fauna, soils, subsoil, surface and underground water, snow cover, air • Animal and human habitats 	<ul style="list-style-type: none"> • Compliance with the requirements for the completeness of the study and use of subsoil • Planning protective measures based on the results of hydrological, geotechnical and environmental monitoring • Well plugging
Well abandon-ment and mothballing	<ul style="list-style-type: none"> • Leaks in casing, casing pipes, wellhead equipment, mineralised water 	<ul style="list-style-type: none"> • Ecosystem disturbance and changes in habitats of certain plant and animal species 	<ul style="list-style-type: none"> • Flora and fauna, soils, surface and underground water, air, animal and human habitats 	<ul style="list-style-type: none"> • Plug and abandonment operations • Rehabilitation

Biodiversity

Biodiversity impact management

SASB EM-MM-160a.1

Nornickel recognises the need to protect the environment and seeks to prevent net biodiversity losses caused by the Company's operations.

The Company's activities in this area are guided by the following principles:

- biodiversity impact management;
- sustainable use of natural resources;
- conservation of key biodiversity values;
- recognition of the importance of biodiversity conservation in preventing climate change;
- protection and promotion of the sustainable use of terrestrial ecosystems;
- protection of freshwater and marine ecosystems;
- assistance in preventing the extinction of threatened species;
- transparent operations and open dialogue with local communities on biodiversity impact management;
- prohibition of exploration and mining at World Heritage sites and in all protected natural areas.

In 2021, the Company committed to preserve biodiversity by issuing a Position Statement on Biodiversity¹. In 2022, Nornickel started to deliver on its commitments, with the first step being a baseline biodiversity research.

The project on the baseline biodiversity research called the Big Scientific Expedition was the jump-off point for the development of the Company's biodiversity impact

Nornickel's biodiversity goals

- Ensure preservation, recovery and sustainable use of terrestrial ecosystems
- Ensure sustainable management and protection of marine and coastal ecosystems
- Ensure protection and restore biodiversity of water bodies
- Protect, restore and promote sustainable use of terrestrial ecosystems and their biological resources
- Take measures to stem the degradation of habitats, biodiversity loss, and extinction, protect endangered species
- Ensure that the value of ecosystems and their biodiversity is taken into account when planning new and expanding current operations of the Company.

management system. The expedition included a comprehensive study of ecosystems in the areas where the Group companies operate, which helped identify the main aspects necessary to develop a biodiversity impact management system:

- historical data on ecosystems;
- boundaries of areas with a negative impact on ecosystem biodiversity;
- negative factors and threats to biodiversity;
- indicator species reflecting the ecosystem condition;
- key biodiversity values in the negative impact areas;
- reference areas;
- biotic and abiotic indicators of the present state of ecosystems in the identified areas of negative impact and in reference areas.

In 2023, the Company plans to continue its biodiversity research, aiming for continuous monitoring of biodiversity. This approach will help capture changes in the state of ecosystems, while changes in the deviation targets of the impacted areas as opposed to reference areas will help assess the effectiveness of the Company's initiatives.

The data on biodiversity indicators obtained in 2022 following the expedition² helped form the basis for determining the Company's biodiversity conservation target.

To effectively manage the negative impact at the Head Office level, a draft corporate standard for ecosystem biodiversity conservation and monitoring was developed and is expected to be finalised in 2023–2024.

¹ Publicly available at Nornickel's website.

² For more details, please see the presentation on the results of the Big Scientific Expedition at Nornickel's website.

In addition, the Company's divisions and some remote assets that have a negative impact on biodiversity are developing and adopting their own local biodiversity conservation programmes.

Nornickel's biodiversity impact management system covers all stages of the project life cycle, from pre-FEED to post-liquidation. The system provides for mandatory pre-project biodiversity research.

Impact on biodiversity in terms of value chain and life cycle stages

Nornickel's mining facilities include mines and open pits operated by mining enterprises of the Company. Processing facilities include mills and factories. Logistics facilities comprise marine and river transport companies. Energy facilities consist of fuel and energy enterprises.

Nornickel's mining, processing and energy facilities are interconnected into production clusters that are located in the shared areas and have both an individual and cumulative impact on ecosystems. When it comes to biodiversity monitoring, it is not practical to break down enterprises along the value chain into categories as they are connected in terms of location. For such conglomerates, biodiversity impacts are managed through unified biodiversity conservation and monitoring programmes in unified areas of cumulative impact.

Water transport companies develop separate programmes for biodiversity conservation taking into account their specifics.

Biodiversity conservation issues are also included in the supplier management system as part of the relevant section in the Supplier Code of Conduct, which the contractors are required to follow.

Most of Nornickel's assets are in operation, and they also have the greatest impact on biodiversity. In the reporting year, all existing mining, production, energy and logistics assets saw biodiversity studies, training of specialists, and drafting of biodiversity impact management system documentation.

In 2022, the Company's asset in Nickel was prepared for liquidation. Biodiversity monitoring continues around the shutdown workshop.



Assessment of Nornickel's impact on biodiversity

GRI 304-1

The features of the areas affected by the Company's operations for more than 80 years were studied during the 2022 big scientific expedition. The expedition was conducted by Nornickel jointly with the Siberian Branch of the Russian Academy of Sciences to identify the Company's impact area and assess the current state of ecosystem biodiversity within the proposed impact areas. The Siberian

Branch of the Russian Academy of Sciences was selected as an institution capable to attract a large number of experts from relevant scientific institutions in a variety of regions. The expedition also involved experts from specially protected natural areas situated nearby in view of their comprehensive knowledge of the local context.

The research covered three regions: Trans-Baikal Territory, Murmansk Region, Krasnoyarsk Territory (including water transport companies' ports), and a section of the Northern Sea Route.

Boundaries of impact areas, km

Division	Impact			Updated impact area
	Significant	Medium	Low	
Trans-Baikal Division	1	1-5	5-10	10
Norilsk and Energy divisions	1-2	1-5	2-10	10
Kola Division	2-3	3-10	10-16	16

The most significant changes manifested in the reduction of most of the recorded biodiversity parameters are observed in the area of significant impact of the Company and have clearly delineated boundaries marked as sanitary protection areas, which

in some cases may extend up to 1–3 km beyond the territory where Nornickel operates. The boundary between medium and low impact areas is conventional as the differences in biodiversity parameters

between these areas are generally insignificant, and a comparative analysis reveals almost no statistically significant differences.

Main biodiversity threats

GRI 304-2

The research identified negative factors and threats to biodiversity. The main negative factors affecting biodiversity due to the Group's operations:

- habitat fragmentation caused by withdrawal of territories, including transport and energy infrastructure;
- landscape transformation due to overburden and rocks, and hydraulic facilities (tailing dumps);
- contamination of the environment with emissions and discharges;
- human activities.

The most obvious threats to biodiversity following the expansion or lack of timely upgrade of the production facilities:

- man-induced transformation of habitats of typical and rare animal species;
- fragmentation of species and communities' habitat;
- mediated expansion of certain vector species' distribution;
- introduction of non-native species;
- increased frequency and scale of fires.



Ecosystems of the Norilsk Industrial District (Norilsk and Energy divisions)

According to the research results, emissions have a significant impact on ecosystems, getting lower with distance. In some areas, utility effluents from production facilities also affect water bodies. In the surroundings of Norilsk to the south along the Medvezhy Ruchey valley, impact on vegetation cover in the form of chemical burns on leaves can be traced up to 15 km from production facilities, while a reliable decrease in species diversity is observed at a distance of up to 3–4 km. At longer distances, no credible impacts on vegetation biodiversity are observed.

A specific feature of the Norilsk Industrial District is the proximity of production facilities and their common cumulative impact zone. Norilsk Division comprises mining, processing and energy companies, as well as the city of Norilsk and other associated facilities, collectively referred to as the Norilsk Industrial District. Their impact on biodiversity is of a cumulative nature and therefore viewed as a single area of negative impact.

The specially protected natural area located closest to the Company’s facilities is the Putoransky State Nature Reserve, which

is over 50 km away from Norilsk Division’s enterprises and, according to the research, does not suffer a negative impact on biodiversity.

Ecosystems in the vicinity of Kola Division enterprises

The soil cover of the Monchegorsk District (Murmansk Region) is dominated by podzols and peat swamp soils of low fertility and high acid content. Due to natural geochemical anomalies associated with the occurrence of ore bodies, there are labile Ni, Cu, Co, Cr, Cd, and As found in more than a 20 cm deep layer of soil, which are most likely to cap biodiversity and productivity of plants and animals. The second major factor limiting biodiversity is man-induced contamination. Nornickel deposits in Zapolyarny and Nickel fall within the natural geochemical anomaly areas.

The results of hydrobiological surveys show that Lake Arvaldemlompolo, which is located in the significant impact area as compared to the Eastern Ore Cluster, is most affected by human impact. According to the results of test catches and collection of ichthyoplankton, there is no ichthyofauna in this water body. A potential

negative factor reducing hydrobiont and ichthyofauna communities’ biodiversity is utility effluents (in addition to industrial sewage) from urban enterprises containing many organic pollutants. It should be noted that the Company is not the only user of this water body cumulatively affected by many facilities.

The bird fauna boasting the largest number of species and specimens can be found in the area of significant impact from production facilities and near residential areas. The high numbers of certain bird species in the significant impact area do not mean it is a low-pressure area; rather, they are driven by the high concentration of wintering birds near human habitation. In this particular case, the increase in the bird number and species diversity is also supported by non-freezing water bodies, and trees and shrubbery.

Ecosystems in the vicinity of Trans-Baikal Division enterprises

The most significant decline in species diversity is observed in the significant impact area in the immediate vicinity of the

Company’s facilities. The boundary of the significant impact area runs approximately 1–2 km from Nornickel facilities.

Soils near the Company’s Trans-Baikal Division enterprises are naturally of low fertility, have a subacid or medium acid reaction and high concentrations of arsenic. The main factor potentially limiting biodiversity in the area is low soil fertility. Because of this, plants and animals may experience a lack of biophilic macro- and micronutrients. The second major factor potentially limiting biodiversity is man-induced soil contamination.

The analysis of floristic and coenotic diversity showed that there are two sites suffering from the Company’s operations:

- extensive wetland area (floodplain of the Bystraya River, supported by spurs of the Uryumkansky ridge from the north, west and south). A nearby tailing dump may influence the floristic composition and diversity of plant communities due to groundwater inflow;
- woodland is represented by a variety of larch, birch, and mixed larch and birch forests. The area was heavily influenced during the period of gold mining. Currently, waste dumps are being overgrown with vegetation, with no visible changes in the forest vegetation due to Bystrinsky GOK.

All bird communities in the vicinity of Bystrinsky GOK are very diverse. Species diversity is the lowest in the significant impact area and the highest (over 30

species) in the areas of medium and low impact. All communities are aligned; there are no species with too high an abundance compared to the others. Faunal diversity and bird density have little dependence on the level of impact from the Company’s facilities, but are more related to the diversity of biotopes on a particular reference site.

The Uryumkan Nature Reserve in the Gazimuro-Zavodsky District (Trans-Baikal Division) is located closest to Trans-Baikal Division facilities and its area of impact and is the most important for biodiversity maintenance and restoration. The distance between the Nornickel site and the Uryumkan Nature Reserve is 22 km. Thus, it appears that Trans-Baikal Division enterprises do not have a significant impact on biodiversity and the ecosystem of specially protected natural areas in the region.

Ecosystems of port areas of river transport enterprises

The research showed that all three segments of Krasnoyarsk River Port and Lesosibirsk Port are only minor elements of the overall urban agglomeration. Based on a number of facts, it can be said that Nornickel’s enterprises in Krasnoyarsk River Port and Lesosibirsk Port have no specific impact on bird populations and microbiological parameters of water bodies. A biodiversity conservation programme was developed to manage the impacts

on the biodiversity of river transport industry, focusing specifically on preventive measures to minimise the pollution of water bodies during the operation of vessels and port facilities possessed by the Company.

Specific impacts of branches using the Northern Sea Route

According to the bird fauna research results, the minimal impact of the ports’ berthing facilities is inseparable from the overall impact of the ports and the urban territory as a whole. Therefore, it is not the operation of the berths that has a significant impact on biodiversity of the ornithocomplexes and marine mammals but the shipping traffic on the Northern Sea Route as a whole. To manage the biodiversity impact from vessel operations, a programme of measures has been developed that include preventing the pollution of the water body from the operation of berths and minimising the negative impacts from shipping. Population monitoring of birds and marine mammals was carried out along the Northern Sea Route in 2022.

Key biodiversity values identified in the impact areas of Nornickel's operations

GRI 304-1

Key biodiversity values include protected species as well as critical habitats and key biotopes¹.

For the information on protected species found in the impact areas of the facilities see the [Appendix GRI Quantitative Indicators Disclosure](#).

Norilsk and Energy divisions

In the Norilsk Industrial District, a habitat critical for the conservation of a rare plant species, northern spikemoss (*Selaginella selaginoides*), was identified. The plant has an extensive Holarctic distribution, but is far from being of universal occurrence. The identified habitats are considered as critical and should be used for multi-year monitoring of the species' local populations.

In addition to rare species' habitats, highly threatened and/or unique ecosystems were identified within Energy Division's footprint, in particular the steppe-tundra habitats on the boulder trains in the Medvezhy Ruchey valley. This steppe-tundra is a relic of the Last Glacial Period – a period of cold and dry climate, when mammoths existed. It is of scientific interest as a living witness of past geological epochs and is a valuable resource for species occupying newly emerging habitats amid global climate change.

Norilsk Division also includes habitats of plant communities with a high level of diversity, specifically, larch forests and alder thickets with an extensive grass cover, as well as the abundance of herbaceous perennial species that are rare or absent in other types of communities.

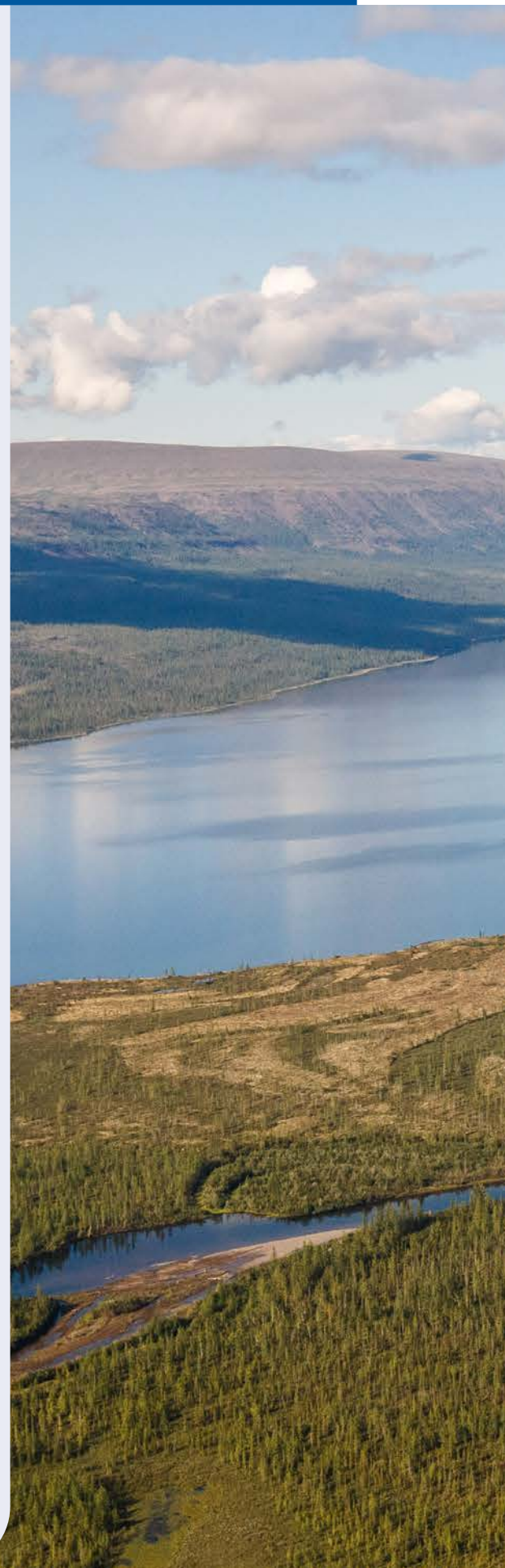
Kola Division

There are two state nature reserves whose territories and buffer zones are partly located within the identified areas of medium and low impact of Kola Division: Pasvik and Lapland nature reserves. They are home to endemic species and/or species with a limited distribution area as well as critically endangered and/or unique ecosystems.

These reserves can be viewed as critical habitats requiring continuous monitoring. Nornickel will pay particular attention to areas falling within the proposed footprint of the former smelting shop which was decommissioned by 2022.

Trans-Baikal Division

As far as Trans-Baikal Division is concerned, the research area did not exceed 1% of the protected species' (birds and plants) habitats in the Trans-Baikal Territory. Under IFC Performance Standard 6 dated 1 January 2012, the area of Trans-Baikal Division facilities' operations cannot be classified as critical habitat for any of the protected bird species identified. Based on observations made during the warm season of 2022, it was not possible to identify key biotopes.



Biodiversity conservation efforts

Nornickel is developing initiatives to reduce the pressure on ecosystems taking into account the mitigation hierarchy, i.e., the **avoid – reduce – restore – compensate** principle. These initiatives seek to:

- avoid direct and indirect negative impacts on ecosystems (e.g., closure of Nickel Plant);
- reduce and minimise direct and indirect negative impacts on ecosystems (e.g., the Sulphur Programme, construction of local wastewater treatment plants, bigger share of water recycling ecosystems);
- restore ecosystems (e.g., disturbed land rehabilitation);
- compensate (e.g. restore fish populations by releasing fish fry).

Nornickel's Environmental and Climate Change Strategy groups the above measures in categories depending on negatively impacted natural environments targeted.

In 2022, Nornickel invested
RUB 90 mln
in biodiversity conservation.

Cooperation with the government on biodiversity conservation

In 2022, Nornickel entered into two agreements with the Russian Ministry of Natural Resources and Environment as part of the federal Biodiversity Conservation and Ecotourism Development project.

The first agreement is to protect the population of an endangered bird species of the Falconidae family, the gyrfalcon¹. The project is expected to be implemented in 2023.

The second one is for the conservation and restoration of the polar bear population². As part of the project to cooperate with the Umka 2022 expedition of the Russian Geographical Society and the Russian Navy Headquarters, a drone survey of polar bears on Wrangel Island was conducted in August and September 2022. The survey also focused on polar bears' food sources, namely walruses, whales, seals, bearded seals, as well as muskoxen and semi-aquatic birds. Data was collected on animal deaths.

In addition to recording the number of polar bears on Wrangel Island, the survey helped clarify their distribution on the island and assess the state of the polar bear and their habitats. 67 samples (sea and river water, snow, soil and biota, including samples of liver, wool and feathers of dead animals and birds) were taken for further analysis to determine heavy metal and persistent organic contaminants.

2022 surveys show that the population of polar bears is currently estimated

at **1,910**

¹ Habitats of rare and endangered plants, fungi, or animal species, or large populations of rare and endangered species; areas of special significance for vertebrate animals' life cycles (reproduction, rearing of the young, fattening, rest, migration, etc.).

¹ Over the past 20 years, the gyrfalcon population in Russia has fallen by almost three times due to poaching. Now it is estimated at 3,500–5,000 breeding pairs.

² Polar bear is one of the 13 wildlife species included in the list of rare and endangered animal species that require priority recovery measures.



Cooperation with specially protected natural areas and tourism development

Cooperation with nature reserves represents one of the ways for Nornickel to help conserve and restore biodiversity.

Our cooperation with nature reserves primarily focuses on developing research and technology and supporting their social, volunteering and environmental awareness programmes.

Following a special request, in 2014–2022 Nornickel provided RUB 9.8 mln to the Joint Directorate of Taimyr Nature Reserves to update infrastructure involved in the directorate’s core activities. Among other things, the funds were used to:

- acquire construction materials;
- buy equipment: a boat, boat motors, and satellite communication sets;

- finance a flight to deliver a prefabricated mountain home to the Kureyka River area;
- carry out facility repairs;
- hold anniversary events.

The Joint Directorate of Taimyr Nature Reserves is an active participant of the Company’s Socially Responsible Initiatives Competition. Between 2013 and 2020, it

won eight grants totalling RUB 26.5 mln. The funds were used to implement socially significant projects.

2022 saw the creation of a roadmap for implementing Nornickel’s Environmental and Climate Change Strategy, which includes fostering systemic work and partnerships with the Joint Directorate of Taimyr Nature Reserves related to biodiversity monitoring

and conservation, development of nature reserves, support for research work, and environmental education. To this end, the Company donated RUB 20 mln to the Joint Directorate of Taimyr Nature Reserves. The research will be carried out by the Directorate in 2023. In 2022, the allocated funds were used for preparatory work and procurement of research equipment.



Biological species living on the territory of the Pasvik Nature Reserve and the Lapland Nature Reserve, listed in the Red Books and the Red List of the International Union for Conservation of Nature¹

GRI 304-4

Indicator	Pasvik	Lapland
On the IUCN Red List	4	1
On Russia’s Red Data Book	22	24
On the Murmansk Re-gion’s Red Data Book	117	163

¹ The nature reserves are located in a relative proximity to the Kola MMC operations