

BIODIVERSITY MANAGEMENT AT FCX

This document summarizes our approach to biodiversity management across our operations, and specifically, at Cerro Verde, El Abra, Grasberg Minerals District and Morenci. For additional information, please see our [Annual Report on Sustainability](#).

TABLE OF CONTENTS

About FCX.....	3
Our Approach.....	3
Voluntary Commitments.....	5
Regulatory Framework.....	6
Risk Identification and Management	6
Cerro Verde – Biodiversity Management Plan Summary	12
El Abra – Biodiversity Management Plan Summary.....	22
Grasberg Minerals District – Biodiversity Management Plan Summary	30
Morenci – Biodiversity Management Plan Summary	40



BIODIVERSITY MANAGEMENT AT FCX

CAUTIONARY STATEMENT

This document contains forward-looking statements. Forward-looking statements are all statements other than statements of historical facts, such as plans, projections, expectations, targets, objectives, strategies or goals relating to our biodiversity management, biodiversity and nature-related risks and projects, and the underlying assumptions and estimated impacts on our business and stakeholders related thereto; future risk mitigation; regulatory developments; our biodiversity and nature-related commitments; and our overarching commitment to deliver responsibly produced copper and molybdenum, including plans to implement, validate and maintain validation of our operating sites under specific frameworks. The words "anticipates," "may," "can," "plans," "believes," "efforts," "estimates," "expects," "initiatives," "seeks," "goals," "strategy," "objective," "opportunities," "projects," "targets," "intends," "likely," "will," "should," "could," "to be," "potential," "assumptions," "guidance," "forecasts," "future," "commitments," "initiatives," "opportunities" and any similar expressions are intended to identify those assertions as forward-looking statements. We caution readers that forward-looking statements are not guarantees of future performance and actual results may differ materially from those anticipated, expected, projected or assumed in the forward-looking statements. Important factors that can cause our actual results to differ materially from those anticipated in the forward-looking statements include, but are not limited to, the factors described under the heading "Risk Factors" in our Annual Report on Form 10-K for the year ended December 31, 2023, filed with the U.S. Securities and Exchange Commission (SEC), as updated by our subsequent filings with the SEC, and available on our website at fcx.com.

Many of the assumptions upon which our forward-looking statements are based are likely to change after the forward-looking statements are made. Further, we may make changes to our business plans that could affect our results. We undertake no obligation to update any forward-looking statements, which speak only as of the date made, notwithstanding any changes in our assumptions, changes in business plans, actual experience or other changes.

While certain matters discussed in this document may be significant and relevant to our investors, any significance should not be read as rising to the level of materiality for purposes of complying with the U.S. federal securities laws and regulations or the disclosure requirements of the SEC. The goals and projects described in this document are aspirational; as such, no guarantees or promises are made that these goals and projects will be met or successfully executed.

BIODIVERSITY MANAGEMENT AT FCX

ABOUT FCX

Freeport-McMoRan Inc. (FCX) is a leading international metals company with the objective of being foremost in copper. Headquartered in Phoenix, Arizona, FCX operates large, long-lived, geographically diverse assets with significant proven and probable mineral reserves of copper, gold and molybdenum. FCX's portfolio of assets includes the Grasberg minerals district in Indonesia, one of the world's largest copper and gold deposits; and significant mining operations in North America and South America, including the large-scale Morenci minerals district in Arizona and the Cerro Verde operation in Peru.

FCX is a leading responsible copper producer – supplying approximately 9% of the world's mined copper. As global decarbonization accelerates, demand for copper is expected to increase. FCX is committed to meeting growing demand through our sustainability strategy – **Accelerate the Future, Responsibly**. Our strategy is underpinned by the recognition that our products are key contributors to global progress, including the acceleration of decarbonization around the world. **Accelerate the Future, Responsibly** guides us to deliver on our company's business strategy of being **Foremost in Copper** by reinforcing our dedication to continuously advance the responsible production of our products.

OUR APPROACH

Our [Environmental Policy](#) states our commitment to contribute to the conservation of nature and biodiversity, implement the mitigation hierarchy to assess risks and impacts to nature, and commit not to explore or mine at any United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Sites.

As part of our mining and processing activities, we are responsible for management of our land and the associated biodiversity. We are committed to proactively identifying and managing the potential impacts of our operations on biodiversity, land and surrounding ecosystems and, where adverse impacts cannot be avoided, mitigating them. This includes effectively identifying and managing biodiversity-related risks.

BIODIVERSITY MANAGEMENT AT FCX

We focus on biodiversity and land management across the life cycle of our operations. Our sites and subject matter experts on our corporate team collaborate to evaluate each potential project area in order to identify and share mapping of key features related to biodiversity, cultural resources, water resources and various other environmental factors before a project proceeds. In some cases, these measures may be completed to fulfill regulatory requirements governing project authorizations. Biodiversity, habitat restoration and conservation are also key components of our reclamation plans and activities at our sites.

By applying the mitigation hierarchy, we aim to manage biodiversity risks and potential impacts with the long-term ambition of No Net Loss for new mines and major expansion projects at existing mines. We recognize the mitigation hierarchy is most effective when implemented during the earliest phases of project planning to help maximize opportunities for avoidance and minimize impacts. We have integrated the hierarchy into our existing development process for new projects and trained our environmental teams to routinely apply it to all projects at operating sites that may disturb natural habitats. Through the Copper Mark assurance process, our third-party assurance provider reviews project-specific documentation for avoidance evaluations and mitigation plans when avoidance cannot be incorporated into a project plan.

We also are committed to promoting opportunities to contribute to the conservation and enhancement of biodiversity both within and beyond our operational boundaries. Our conservation initiatives aim to produce benefits for both biodiversity and people, in order to foster collaboration with our communities and build trust. We implement habitat restoration and conservation work through partners such as The Nature Conservancy and Trout Unlimited. We also partner with wildlife recovery and rehabilitation groups such as Liberty Wildlife and Wild at Heart Raptors, both in Arizona, and we made a corporate pledge to support a wildlife recovery center through the Phoenix Zoo. We seek to engage our employees, local communities, and other interested stakeholders in conservation work.

BIODIVERSITY MANAGEMENT AT FCX

VOLUNTARY COMMITMENTS

International Council on Mining & Metals

FCX is a founding member of the International Council on Mining & Metals (ICMM), an organization dedicated to enhancing the contribution of mining to sustainable development. As a member company, FCX has committed to implementing the ICMM Sustainable Development Framework which consists of 10 Mining Principles and 39 supporting Performance Expectations (PEs). The ICMM commitments include independent third-party validation and annual reporting on site-level performance against the PEs. ICMM Principle 7 (Contribute to conservation of biodiversity and integrated approaches to land use planning) includes two supporting PEs:

- ▶ **PE 7.1** – Neither explore nor develop new mines in World Heritage Sites, respect legally designated protected areas, and design and operate any new operations or changes to existing operations to be compatible with the value for which such areas were designated.
- ▶ **PE 7.2** – Assess and address risks and impacts to biodiversity and ecosystem services by implementing the mitigation hierarchy, with the ambition of achieving no-net-loss of biodiversity (for new mines and major expansion projects).

We actively contributed to the development of ICMM's Nature: Position Statement, which aims to enhance the industry's collective action and contribution towards a nature-positive future. Through the position statement, member companies commit to focus their efforts within five spheres of influence. Through the position statement, member companies commit to focus their efforts within four spheres of influence – direct operations, value chain, landscapes and systems transformation – supported by governance and transparency. These commitments also apply to activities across all four realms of nature: land, freshwater, oceans and atmosphere.

The Copper Mark & Molybdenum Mark

All of our eligible copper producing sites have been awarded the Copper Mark, and our primary molybdenum mines and copper mines that produce by-product molybdenum and our molybdenum processing facilities have been awarded the Molybdenum Mark. The Copper Mark is a comprehensive assurance framework that promotes responsible production practices. FCX uses the Copper Mark and Molybdenum Mark designations to meet downstream customer needs regarding various aspects of responsible production. The Copper Mark requires an independent

BIODIVERSITY MANAGEMENT AT FCX

external assurance process, including external stakeholder interviews, to assess conformance at each site. To achieve the Copper Mark and Molybdenum Mark, sites are committed to adhering to internationally recognized responsible operating practices and specifically to a detailed framework now covering 33 issues, including Biodiversity and Productive Land which are parallel to the ICM Performance Expectations requirements.

Wildlife Habitat Council Programs

All active FCX operations participate in the Wildlife Habitat Council (WHC) Conservation Certification program. WHC is a global organization dedicated to recognizing, inspiring, engaging and supporting businesses to conserve nature. The WHC Conservation Certification program, which is the only voluntary sustainability standard designed for broad-based biodiversity enhancement and conservation education, recognizes meaningful voluntary wildlife habitat management and conservation education initiatives. WHC awards three different tiers of certification (certified, silver, and gold) based upon standardized criteria.

REGULATORY FRAMEWORK

All active operations comply with environmental regulations, including those that pertain to the assessment of environmental impacts, endangered species, and the protection and conservation of biodiversity resources.

RISK IDENTIFICATION AND MANAGEMENT

All active FCX operations implement multiple systems that promote the comprehensive, systematic assessment of potential risks/impacts and opportunities at each stage of the project lifecycle, including biodiversity risks/impacts and opportunities. These systems are initiated in the early stages of project planning to incorporate biodiversity considerations into project design and maximize opportunities to avoid impacts on important biodiversity resources. The following summarizes the primary programmatic risk management tools implemented at the site level across the portfolio.

BIODIVERSITY MANAGEMENT AT FCX

Sustainability Risk Register

We translate our responsible production commitments to everyday work through the use of our sustainability risk register process (risk register) which identifies, prioritizes, manages and tracks sustainability risks and actions at the corporate and site level. Defined in a global standard operating procedure, the process uses a risk assessment matrix to prioritize risks by both their likelihood and consequence, based on customized impact definitions by functional area to drive action. All our sites review risks at least annually and prepare detailed action plans for risks rated as actionable.

Sites use the risk register to identify risks and opportunities in relation to their operation and stakeholders. Additionally, sustainability-related risks identified outside the risk register process are integrated into the registers. The risk register prioritizes risks that could have negative consequences to our business and our stakeholders in areas such as health and safety, human rights, environmental management, community development and economic impact. It also enables sites to identify and prioritize opportunities that could have positive consequences. Once the risks and opportunities are prioritized, action plans are developed. The risk register and these plans are the foundation of internal and external assurance processes at both the corporate level and operating sites.

Project Development Sustainability Review

For larger projects, sites implement the Project Development Sustainability Review process (PDSR) through which biodiversity and other sustainability considerations are systematically integrated into project design. The PDSR is administered by a multi-disciplinary project team during the early project planning phase to identify and evaluate potential risks, consequences, trade-offs, and opportunities associated with a proposed project. Our sites use the PDSR as a mechanism to minimize potential biodiversity risks and promote conservation opportunities for new development projects.

BIODIVERSITY MANAGEMENT AT FCX

Management of Change

For projects not subject to the PDSR, sites implement a management of change (MOC) process to evaluate potential project-related impacts to biodiversity resources and other sustainability issues. As part of this process, proposed land disturbance projects require sign off by the site environmental department prior to project initiation. Upon receiving an MOC request, environmental staff conduct a desktop review and site visit to evaluate potential impacts to biodiversity resources, document any significant resources in the project area, evaluate potential project-related impacts, and identify project modifications or mitigation measures to minimize adverse impacts. In conjunction with the mitigation hierarchy, the MOC process helps to minimize project-specific biodiversity impacts.

Project-Specific Mitigation

FCX implements project-specific mitigation measures and environmental controls to minimize impacts to biodiversity resources during construction and operation. These include measures identified by external agencies where applicable through environmental and social impact assessment (ESIA) review and project permitting as well as through the internal MOC and mitigation hierarchy processes. While the measures are project-specific, some common measures include fugitive dust control, erosion and sediment control, wildfire management, measures to protect migratory birds, and invasive species control. Depending on the biodiversity resources in the project area, sites may also conduct pre-construction clearance surveys and implement measures to spatially or temporally avoid important features or relocate plants and animals to suitable habitats outside the project area.

General Wildlife Protection Measures

Our sites evaluate wildlife risks associated with facilities and operations and implement protection measures to reduce or eliminate significant risks. Some common measures are identified in the table on the next page. When wildlife incidents do occur on our sites, site environmental personnel implement a formal wildlife incident procedure that includes investigating, assessing and documenting each incident, and implementing measures to reduce the potential for future incidents when necessary.

BIODIVERSITY MANAGEMENT AT FCX

Table 1: General Wildlife Protection Measures¹

SOURCE OF RISK	MEASURE
New Land Disturbance	Mitigation measures required for ESIA and permitting
	Risk register review, management of change and mitigation hierarchy processes
	Baseline surveys, pre-construction plant and wildlife surveys
	Relocation of low-mobility flora and fauna
Vehicles and Equipment	Site personnel and contractors are required to comply with posted speed limits and are prohibited from using cell phones while operating a vehicle
	Site personnel and contractors are prohibited from feeding wildlife and leaving food available to wildlife
	Site personnel and contractors are required to report wildlife on/near roads and other potentially hazardous locations
Process Solution Ponds, Stormwater Impoundments, and Tailings Storage Facilities	Avian protection measures, including routine inspection of impoundments and active and passive bird hazing techniques
	Site personnel and contractors report observations of birds or wildlife on impoundments and tailings storage facilities
	Construct and maintain fencing to prevent wildlife access to lined facilities and high-risk impoundments
	Eliminate high-risk impoundments no longer needed for mining operations
Electrical Systems	Site personnel and contractors report and investigate wildlife fatalities and bird nests on or near electrical systems
	Site environmental personnel manage bird nests to minimize potential risks to birds and mine operations
	Construct fencing around substations and seal energized substation components to reduce wildlife access and electrocution potential
	Install anti-perching devices on power poles with high potential for avian electrocution

¹Specific wildlife protection measures determined through assessment of site-specific biodiversity resources and risks.

BIODIVERSITY MANAGEMENT AT FCX

Environmental Training Programs

All FCX operations conduct mandatory environmental training programs for site staff and contractors to review corporate biodiversity policies and commitments, site-specific biodiversity programs and important biodiversity resources that occur on the site. These trainings, such as initial onboarding, site-specific safety training and site-wide environmental communications, help make site personnel and contractors aware of the site biodiversity resources and programs, and their responsibilities in support of those programs. Some typical training topics include:

- ▶ obligation of site personnel and contractors to report wildlife observations/incidents to the environmental department;
- ▶ description of reportable incidents, including avian and terrestrial wildlife mortalities;
- ▶ prohibition on feeding wildlife and approaching, harassing or handling animals; and
- ▶ identifying priority wildlife species that could be encountered on the site.

Stormwater Management and Spill Prevention and Containment Systems

All FCX operations employ multiple systems to prevent contaminated stormwater and accidental releases from leaving mine sites, thereby protecting biodiversity resources on the site and in adjacent waterways. These systems typically include stormwater pollution prevention plans, spill prevention control and countermeasure plans, and secondary containment systems for larger containers and hazardous substances. Several sites are also “zero-discharge facilities” which maintain a hydrologic capture zone around mining operations to prevent any stormwater that contacts processing activities from leaving the site.

Closure Planning

Reclaiming or reestablishing self-sustaining ecosystems on lands disturbed by mining activities is a primary component of FCX’s long-term biodiversity management strategy. Every active mining operation has prepared a mine closure plan which provides the framework for post-closure reclamation and the re-establishment of self-sustaining ecosystems that support native vegetation and diverse ecological functions. Most of our mines operate for several decades or longer, due to the geological nature of the deposits and large resource bases. As a result, implementation of closure plans may not occur for several decades in the future after the initial impact. While opportunities for concurrent reclamation are limited, we plan for, continually evaluate and carry out concurrent reclamation when possible. Reclamation planning actions that

BIODIVERSITY MANAGEMENT AT FCX

occur during operations may include constructing and monitoring test plots, characterizing materials for eventual closure work and designing new stockpiles or tailings facilities for closure prior to construction. Furthermore, given uncertainty regarding future ecological capacity due to climate change related factors, we utilize an adaptive approach in which all aspects of the final reclamation plan, including methods, materials, and specific vegetation communities, are developed based upon regulatory requirements and results of multi-year, on-site reclamation test plots conducted in consultation with qualified experts immediately prior to closure. Closure plans are periodically updated to incorporate new learnings and additional disturbances associated with new development and expansion projects. It should be noted that all new projects are subject to the mitigation hierarchy process which includes an assessment of post-closure restoration potential and possible compensation of residual impacts through future biodiversity offsets. For more information on our mine closure planning, please see our [Annual Report on Sustainability](#).

Biodiversity Management Plans

In 2023, we committed to disclose the biodiversity management plans for Cerro Verde, El Abra, Morenci and PT-FI's Grasberg operations. The summaries of these plans are included in this document. We selected these four sites based on their physical footprint, local biodiversity resources and/or proximity to biodiversity resources. Each biodiversity management plan includes an overview of relevant FCX corporate policies and commitments and the applicable regulatory framework, identifies the primary terrestrial and aquatic ecosystems and "priority" biodiversity resources on the site and adjacent areas, and summarizes the programmatic biodiversity management systems and targeted conservation programs the site implements. The plans also assess potential impacts of operational activities and facilities on areas that are legally protected or formally designated for the purpose of biodiversity conservation. The biodiversity management plans are living documents that are reviewed annually and updated as needed to incorporate new biodiversity information.

BIODIVERSITY MANAGEMENT AT FCX

CERRO VERDE - BIODIVERSITY MANAGEMENT PLAN SUMMARY

Site Description

The Cerro Verde Production Unit (Cerro Verde) is an open pit copper mine located approximately 30 kilometers southwest of the city of Arequipa, Peru (Figure 1). Mining has occurred at Cerro Verde since the late 1860s. Cerro Verde consists of a mining concession and processing plant, Cerro Verde currently produces copper cathodes and copper and molybdenum concentrates. Primary mine facilities include an open pit, leach pads, process solution collection ponds and sumps, a solvent extraction and electrowinning plant, rock stockpiles, crushing and concentrating facilities, tailings storage facilities, electrical systems, and various infrastructure and support facilities.

Cerro Verde is situated along the western slope of the Andes Mountains in the Andean Foothills physiographic region. A ridge of hills called the Coastal Batholith separates the Arequipa valley from the coastal prairie. The Río Chili, the main river in the region, flows through Arequipa just north of the concessions (Figure 1). The climate is typical of arid montane desert with annual precipitation averaging 40 millimeters and average monthly temperatures ranging between 13°C and 15.6°C.

Relevant Regulations

Cerro Verde complies with relevant national environmental regulations, including those that pertain to the protection and conservation of biodiversity resources including:

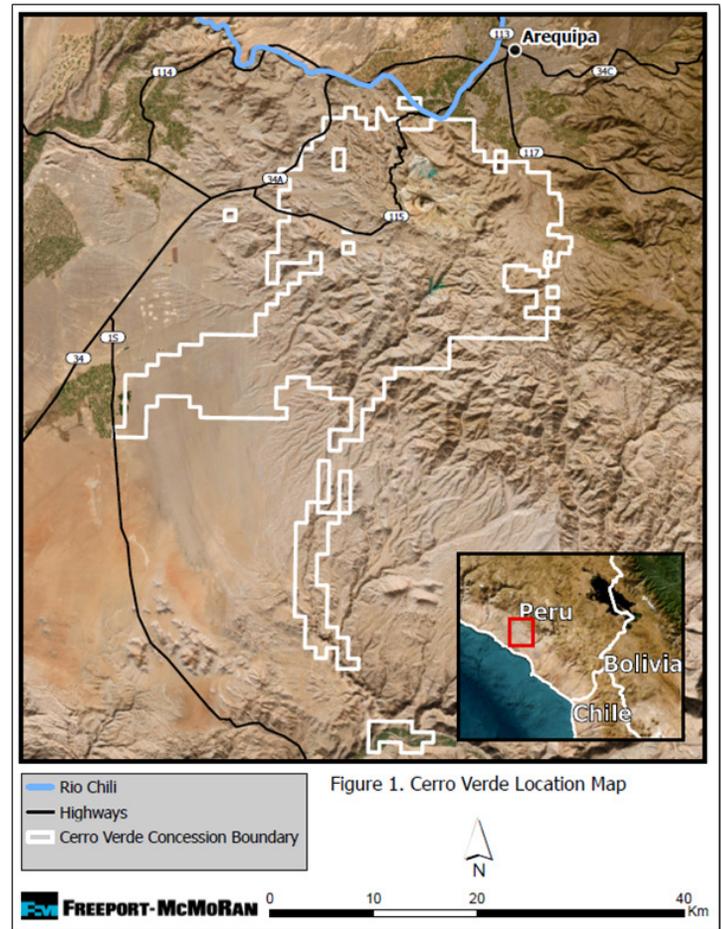


Figure 1. Cerro Verde Location Map

BIODIVERSITY MANAGEMENT AT FCX

- ▶ **General Environmental Law (Act N° 28611 of 2005)** – provides the main environmental guidelines and principles applicable in Peru to ensure the right to a healthy, balanced and appropriate environment for the full development of life, and environmental management systems to protect the environment and improve quality of life in a sustainable manner.
- ▶ **Organic Law on the Sustainable Use of Natural Resources (Act N° 26821 of 1997)** – regulates the sustainable use of natural resources by seeking a balance between economic growth and preservation of natural resources and the environment.
- ▶ **National Environmental Impact Assessment Law (Act N° 27446 of 2001)** – establishes the National Environmental Impact Assessment National System (SEIA) and the environmental impact assessment process for private projects and governmental actions.
- ▶ **Law on the Conservation and Sustainable Use of Biological Diversity (Act N° 26839 of 1997)** – in conjunction with Executive Order N° 068-2001-PCM of 2001, regulates the conservation and sustainable use of biological diversity, including requirements for Environmental Impact Assessments and Environmental Management Programs to conserve biological diversity and maintain ecosystem integrity.
- ▶ **Forestry and Wildlife Law (Act N° 29763 of 2011)** – promotes conservation and sustainable use of forest and wildlife resources through implementation of regulations on Forest Management, Wildlife Management, Management of Forestry and Agroforestry, and Forest and Wildlife Management in Native and Agricultural Communities.
- ▶ **Threatened and Legally Protected Wildlife Species (Executive Order N° 004-2014-MINAGRI of 2014)** – establishes national lists of threatened species and ecosystems based on International Union for Conservation of Nature² (IUCN) criteria and current knowledge of population trends and threats.
- ▶ **Guidelines to Identify a Critical Habitat and to set up Conservation Measures (Executive Management Resolution N° 223-2018-MINAGRI-SERFOR-DE of 2018)** – establishes guidelines for the conservation of critical habitats that are essential for species survival.
- ▶ **Regulation on Environmental Protection and Management of Mining Exploitation, Beneficiation, General Work, Transport and Storage Activities (Executive Order N° 040-2014-EM of 2014)** – requires that mining operations be performed in a balanced and appropriate environment for the development of life.
- ▶ **Law of Protected Natural Areas (Act N° 26834 of 1997)** – regulates the designation and conservation of protected areas and buffer zones to protect ecological and evolutionary processes.
- ▶ **Environmental Remediation Measures (Executive Order N° 078-2009-EM of 2009)** – requires mining companies to prepare an Environmental Remediation Plan to re-establish functioning ecosystems disturbed areas.

²Established in 1964, the International Union for Conservation of Nature's Red List of Threatened Species has evolved to become the world's most comprehensive information source on the global extinction risk status of animal, fungus and plant species.

BIODIVERSITY MANAGEMENT AT FCX

Biodiversity Resources

Vegetation in the Cerro Verde concessions is extremely limited due to the climate and soil conditions. The primary vegetation communities are Cardonal (cactus belt), which is sparsely vegetated and dominated by various cactus species, and Desierto Costero (coastal desert), which is largely devoid of vegetation except for sparse shrubs and grasses (Figure 2). No invasive plants have been documented at Cerro Verde and there are no natural perennial aquatic or riparian habitats within the concessions. Wildlife at Cerro Verde includes species representative of the Atacama Desert including Guanaco (*Lama guanicoe*), vizcacha (*Lagidium peruanum*), Darwin’s leaf-eared mouse (*Phyllotis darwini*), Andean fox (*Lycalopex culpaeus*), South American gray fox (*Lycalopex griseus*) and greenish yellow finch (*Sicalis olivascens*).

Priority Habitats and Species

Cerro Verde has evaluated priority habitats and species within and adjacent to the concessions. Priority habitats are areas that: support priority species; are designated critical habitat or fragile ecosystems by the Peruvian government; are rare or unique; or are important breeding habitats, nesting sites or movement corridors. Priority species include plants and animals that are listed as threatened or endangered pursuant to the IUCN Red List and/or the Peruvian government, considered to be keystone species, or are classified as restricted-range or endemic species. These definitions of priority habitats and species are consistent with International Finance Corporation (IFC) critical habitat criteria.

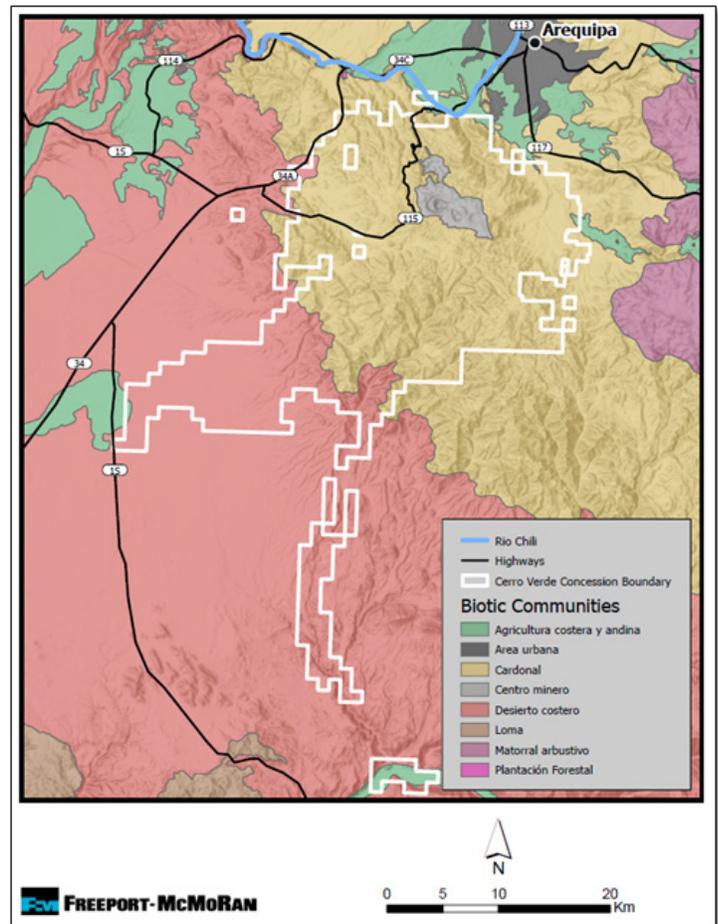


Figure 2. Primary Biotic Communities

BIODIVERSITY MANAGEMENT AT FCX

No areas within the Cerro Verde concessions meet priority habitat criteria or have been designated as fragile ecosystems of high biodiversity value by the Peruvian government.

There are 12 priority plant and animal species that are known to occur or are likely to occur in the Cerro Verde concessions based on species distribution and habitat requirements (Table 2). Cerro Verde is located within the Peru-Chile Pacific Slope Endemic Bird Area (EBA). Two restricted-range bird species associated with this EBA (Cactus Canastero and White-throated Earthcreeper) are classified as priority species (Table 2).

Protected Areas

The Cerro Verde concessions are not within or adjacent to any designated Peruvian protected areas or buffer zones. The nearest protected area is the Salinas and Aguada Blanca National Reserve buffer zone approximately 13 kilometers north of Cerro Verde.

BIODIVERSITY MANAGEMENT AT FCX

Table 2: Priority Species in the Vicinity of Cerro Verde

Common Name	Scientific Name	IUCN Red List	Supreme Decree N° 043-2006-AG ¹	Where Species Occurs
Plants				
No common name ²	Weberbauerocereus weberbaueri	Least Concern	-	On Mine Site
Frutilla de Campo	<i>Ephedra breana</i>	Least Concern	Critically Endangered	On Mine Site
Chilean Mesquite	<i>Prosopis chilensis</i>	Least Concern	Endangered	On Mine Site
No common name	<i>Kageneckia lanceolata</i>	Vulnerable	Critically Endangered	On Mine Site
No common name ²	<i>Krameria lappacea</i>	-	Endangered	On Mine Site
No common name ²	<i>Senecio yurensis</i>	-	Critically Endangered	On Mine Site
No common name ²	<i>Euphorbia apurimacensis</i>	Vulnerable	Critically Endangered	On Mine Site
Mammals				
Guanaco	<i>Lama guanicoe</i>	Least Concern	Critically Endangered	On Mine Site
Long-Snouted Bat	<i>Platalina genovensium</i>	Near Threatened	Endangered	On Mine Site
Birds				
Raimondi's Yellow Finch ²	<i>Sicalis raimondii</i>	Least Concern	-	On Mine Site
Cactus Canastero ^{2,3}	<i>Pseudasthenes cactorum</i>	Least Concern	-	On Mine Site
White-Throated Earthcreeper ^{2,3}	<i>Upucerthia albigula</i>	Least Concern	-	On Mine Site

¹ National endangered species list, the Peruvian government has assigned a more conservative status than the IUCN Red List

² Species endemic to Peru

³ Species classified as restricted-range

BIODIVERSITY MANAGEMENT AT FCX

BIODIVERSITY PROGRAMS

Cerro Verde implements several programs to promote the conservation of specific biodiversity resources. These programs, which are included in the Cerro Verde Biodiversity Management Plan, are listed and briefly summarized below:

Table 3: Primary Biodiversity Conservation Programs at Cerro Verde

PROGRAM	CONSERVATION ACTIONS
Wildlife Habitat Enhancement	Enhance habitats and resource availability for taxonomic groups impacted by mining activities including birds, mammals, reptiles and invertebrates
Wildlife Habitat Protection	Implement measures to protect wildlife species and their habitats
Evaluation, Rescue, Tagging and Release of Herpetofauna	Conserve local reptile populations by relocating them out of disturbance areas and monitoring post-relocation survival and habitat use
Propagate Plant Species	Promote conservation of plant species by propagating in greenhouses, developing seed banks and using propagated plants to supply ecological restoration programs
Rescue and Relocate Plants	Salvage and translocate individual plants from project areas prior to ground disturbance
Monitor Species of Interest	Monitor plant and animal species of interest to assess the effectiveness of habitat enhancement projects
Strategic Alliances and Environmental Education	Establish strategic alliances with national and international institutions to advance wildlife conservation and management strategies at Cerro Verde
Exotic Species Management	Manage non-native rodent and hare populations within the concession to reduce potential for disease transmission, direct competition and predation on native wildlife species
Research Species of Interest	Conduct studies on species distribution, coverage and phenology to inform conservation strategies and mitigate potential impacts of mining operations
Hydrobiological Monitoring	Monitor water quality and aquatic taxa in the Río Chili to assess potential impacts of the Enlozada wastewater treatment plant (WWTP) on ecological integrity of the river

BIODIVERSITY MANAGEMENT AT FCX

Wildlife Habitat Enhancement

This program enhances habitat quality and resource availability for various taxa (birds, mammals, reptiles and arthropods) impacted by mining activities through a variety of projects including:

- ▶ conservation, propagation and management of plant species that are important food sources for native wildlife, including *Weberbauerocereus weberbaueri*, *Ephedra americana* and *Cumulopuntia sphaerica*;
- ▶ providing irrigation in plant relocation sites as a contingency for extreme drought; and
- ▶ constructing supplemental water sources for wildlife ("drinkers").

Wildlife Habitat Protection

This program implements protection measures in areas where wildlife species of interest are present including:

- ▶ restricting vehicle and foot traffic;
- ▶ protecting caves occupied by the Long-Snouted Bat by installing bat gates, which allow bat ingress and egress, but prevents access by people or potential predators;
- ▶ relocating Guanaco wallows and dunghills prior to ground disturbance activities;
- ▶ prohibiting hunting and animal husbandry within the concession;
- ▶ establishing and enforcing vehicle speed limits and promoting defensive driving behavior to protect wildlife on roadways;
- ▶ installing warning systems on roadways to alert drivers of the presence of Guanacos near roads and mining facilities;
- ▶ establishing a wildlife deterrent brigade who deter Guanacos from entering roadways and production areas to minimize potential for human-wildlife conflicts and to protect Guanacos on roadways; and
- ▶ installing mechanical and sound deterrents on tailings ponds to reduce bird use.

BIODIVERSITY MANAGEMENT AT FCX

Evaluation, Rescue and Relocation of Herpetofauna

This program evaluates the population status of reptiles in project areas and relocates individuals out of the area prior to the initiation of ground disturbing activities. Focal species include lizards (*Microlophus tigris* and *Liolaemus spp.*) and the South American leaf-toed gecko (*Phyllodactylus gerrhopygus*). Cerro Verde assesses the distribution, density and habitat conditions for these species in the project area and uses the information to identify suitable relocation sites based on ecological characteristics and the existing reptile community. Once a relocation site is selected, reptiles in the project area are rescued and transported to the site where they are released. Cerro Verde monitors relocated reptiles to assess survival, microhabitat preferences and species abundance.

Plant Propagation Program

This program promotes conservation for plant species of interest by propagating seeds and cuttings, which are then used to supply plant reintroduction and habitat impact mitigation programs. Cerro Verde has also developed a conservation seed bank for several species of interest.

Plant Rescue and Relocation

This program salvages and relocates individual plants from project areas prior to the initiation of ground disturbance. Rescue efforts focus on cacti (*Cumulopuntia sphaerica* and *Browningia candelaris*), but also include other species, such as *Tecoma fulva arequipensis*, *Escallonia resinosa*, and *Mulguraea arequipensis*. Relocation sites have similar species composition and habitat characteristics to the impacted area. Cerro Verde fertilizes and irrigates relocated plants to improve survival and monitors the survival of relocated plants.

Research and Monitoring Species of Interest

This program studies and monitors plant and animal species of interest and evaluates the effectiveness of habitat enhancement projects. The program design and methodologies have been approved by the Peruvian National Wildlife Service in accordance with regulation 026-2020-SERFOR-DE. Monitoring is conducted either quarterly or biannually pursuant to SEIA requirements. The main components of this program include:

BIODIVERSITY MANAGEMENT AT FCX

- ▶ monitoring population structure and recruitment of *Weberbauerocereus weberbaueri*;
- ▶ monitoring survival of relocated flora;
- ▶ monitoring success of plant propagation in the greenhouse;
- ▶ monitoring birds (census, banding, habitat plots and use of drinkers);
- ▶ monitoring native lizard populations and survival of relocated lizards;
- ▶ monitoring *Platalina genovensium* population dynamics and foraging behavior; and
- ▶ monitoring Guanaco population dynamics/structure, diet, habitat use and use of wildlife drinking stations.

Strategic Alliances and Environmental Education

This program establishes strategic alliances with national and international institutions, including academic organizations, government authorities and environmental education organizations, to improve strategies to manage and protect biodiversity at Cerro Verde.

Exotic Species Management

Non-native animal species, including the house mouse (*Mus musculus*), black rat (*Rattus rattus*) and European hare (*Lepus europaeus*), pose risks to native wildlife through competition for food resources, disease transmission and predation. Cerro Verde implements a program to control and eradicate exotic species within the concession through trapping and removing them in accordance with local government guidelines.

Research & Development Strategies for Conservation of Species of Interest

This program involves studies on wildlife distribution and plant cover and phenology to inform the development of appropriate conservation strategies that mitigate project impacts. Study design and methodologies, including variables and metrics, have been approved by the Peruvian National Wildlife Service pursuant to 026-2020-SERFOR-DE. Information and data obtained through this program are publicly disseminated in various venues including biological conferences scientific meetings and conventions.

BIODIVERSITY MANAGEMENT AT FCX

Hydrobiological Monitoring

Cerro Verde has conducted hydrobiological monitoring in the Río Chili since the Enlozada WWTP initiated operations in 2016. The WWTP treats domestic wastewater from the City of Arequipa that was historically discharged directly into the river. The WWTP infrastructure intercepts and treats the wastewater, thereby improving the local water quality, enhancing agricultural production and reducing the risk of waterborne illnesses. Monitoring of water quality, plankton, macroinvertebrates, benthos and fish, which is conducted at nine permanent sampling stations, indicates there has been a significant improvement in the Río Chili aquatic ecosystem since 2016.

Wildlife Habitat Council Programs

Cerro Verde is currently certified at the top WHC certification tier (gold) based upon the following conservation program elements:

- ▶ Peruvian Long-Snouted Bat research and management;
- ▶ management of non-native wildlife species;
- ▶ Guanaco conservation and management;
- ▶ reptile conservation and management; and
- ▶ avian conservation program (rescuing and rehabilitating marine birds that become stranded on site).

Cerro Verde has also received multiple WHC awards including the 2014 Bat Conservation Action Award, 2017 Bat Project Award, 2017 Mammal Project Award for Guanaco management efforts, 2017 Desert Project Award, 2021 Bat Project Award, and 2021 Species of Concern Award for Guanaco management and conservation.

BIODIVERSITY MANAGEMENT AT FCX

EL ABRA – BIODIVERSITY MANAGEMENT PLAN SUMMARY

Site Description

Sociedad Contractual Minera El Abra (El Abra), is an open pit copper mine located in the Antofagasta Region of Chile, approximately 80 kilometers northeast of the city of Calama (Figure 3). The El Abra mine includes an open pit, leach stockpiles, process solution and stormwater impoundments, solution extraction/electrowinning plant, and associated infrastructure and ancillary facilities including a water supply pipeline from groundwater wells in the Salar de Ascotán to the plant site.

El Abra is located along the western slopes of the Andes Mountains at elevations between approximately 3,900 meters above sea level (masl) at the mine site to 3,300 masl at the plant site. The Salar de Ascotán wellfield is at approximately 3,800 masl. El Abra facilities are situated within two biogeographic provinces, Puneñas and Altoandina, and three geomorphological zones including foothills of the upper Río Loa, the upper Río Loa canyon and mountain foothills. Annual average precipitation is approximately 42 millimeters. The primary vegetation communities within the El Abra concession include High Andean Xeric Puna Bunch Grassland and Sechura Atacama Semi-Desert Scrub (Figure 3).

Relevant Regulations

El Abra complies with relevant national environmental regulations, including those that pertain to the protection and conservation of biodiversity resources including:

- ▶ **Law No. 19.300 – *General Environmental Law*** – as modified by Law No. 20.417, is the basis of Chile’s environmental regulatory framework. The law requires the evaluation of potential environmental impacts associated with new projects through the Environmental Impact Assessment System (EIA) process that requires preparation of an Environmental Impact Study (EIA) for projects likely to result in significant environmental impacts or an Environmental Impact Declaration (DIA) for non-significant projects. The law also establishes national air emission and water quality standards, and conservation categories for wild species (Law 20.417 revised the list to align with the IUCN Red List species classification system).
- ▶ **Supreme Decree No. 40/2012 – *Environmental Impact Assessment System Implementing Regulations*** – establishes procedural and documentation requirements for the SEIA.

BIODIVERSITY MANAGEMENT AT FCX

- ▶ Law No. 19.473 – *Hunting Law* – regulates the conservation and sustainable use of terrestrial wildlife and prohibits hunting or capturing native species without a permit.
- ▶ Decree No. 29 of 2011 – *Regulation to Classify Species According to Conservation Status (RCS)* – updated the conservation status for wild species presented in Law No. 20.417.
- ▶ General Water Directorate Resolutions No. 529/2003 and No. 87/2006 – establishes protection for important aquifers throughout Chile, including the “Southeastern Ascotán Border” aquifer that encompasses portions of the Salar de Ascotán.

Biodiversity Resources

Species diversity within the El Abra concession is low and typical of high-altitude desert environments in the Andes Mountains. The distribution of plants and animals in the region is largely determined by water availability, which is a major limiting ecological factor and led to the occurrence of several endemic species and restricted-range species in the region. There are no natural aquatic habitats in the El Abra concession. The Río Loa is a major regional river that flows north to south approximately one kilometer east of the concession boundary.

Priority Habitats and Species

El Abra has evaluated priority habitats and species in the concession and the Salar de Ascotán. Priority habitats are areas that support priority species, are rare or unique, are important breeding nesting sites, or are important migratory pathways. Priority species include plants and animals that have formal conservation status under RCS, are rare or endemic, are of local/regional conservation concern, or have cultural significance. These definitions are consistent with IFC criteria for critical habitat.



Figure 3. El Abra Location Map

BIODIVERSITY MANAGEMENT AT FCX

Azonal (wet meadow) communities, wetlands and aquatic habitats are rare in the Atacama Desert and support several endemic and endangered species. El Abra has classified small, isolated patches of azonal habitats in ravines within and adjacent to the concession as priority habitats. Azonal communities are restricted to hydric (or saturated) soils that occur near groundwater springs and seep in ravines. As hydric soil conditions are limited by proximity to a spring or seep, azonal habitats are small and only extend 40 to 160 meters along the ravines. They are dominated by grasses and small shrubs (Figure 4). There are three small azonal communities within the concession southwest of the pit and six outside the concession boundary.

Spring 11 in the Salar de Ascotán is also considered to be a priority habitat. The Salar de Ascotán is a hyper-saline high Andean salt flat that contains 11 distinct springs and associated aquatic and wetland ecosystems. The Salar de Ascotán and associated springs have high biodiversity value and represent a rare, regionally unique ecosystem that supports a diversity of rare and endemic plants and animals. Spring 11 supports several native plant species that are ecologically important and representative of high Andean wetland ecosystems. Spring 11 also supports several highly specialized endemic animal species, including *Telmatobius philippii* (Philippi's Toad), *Orestias acotanensis* (Karachi) and *Heleobia ascotanensis* (a type of snail).

Table 4 presents a list of the priority species that occur within the El Abra concession and in the Salar de Ascotán.

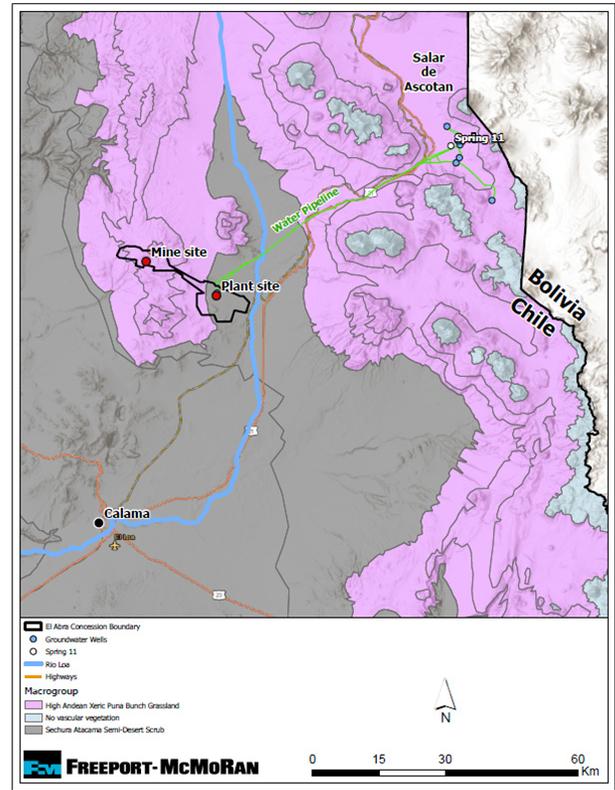


Figure 4. Primary Biotic Communities (Source: Luebert and Plissock 2022)

BIODIVERSITY MANAGEMENT AT FCX

Table 4. Priority species in the vicinity of the El Abra mine and Salar de Ascotán

Common Name	Scientific Name	IUCN Status ¹	Where Species Occurs
Amphibians			
Philippi's Toad	<i>Telmatobius philippii</i>	Endangered	Spring 11 in Salar de Ascotán
Mollusks			
No common name	<i>Heleobia ascotanensis</i>	Data Deficient	Spring 11 in Salar de Ascotán
Reptiles			
Constanza's Lizard	<i>Liolaemus constanzae</i>	Least Concern	Concession and adjacent areas
Hajek's Lizard	<i>Liolaemus hajeki</i>	Near Threatened	Concession and adjacent areas
Isluga Lizard	<i>Liolaemus isluguensis</i>	Least Concern	Concession and adjacent areas
James' s Jararanco	<i>Liolaemus jamesi</i>	Least Concern	Concession and adjacent areas
Multiple Colored Lizard	<i>Liolaemus multicolor</i>	Data Deficient	Concession and adjacent areas
Mammals			
Silky Feet Mouse	<i>Eligmodontia puerulus</i>	Least Concern	Concession and adjacent areas
Vizcacha	<i>Lagidium viscacia</i>	Least Concern	Concession and adjacent areas
Andean Fox	<i>Lycalopex culpaeus</i>	Least Concern	Concession and adjacent areas
Guanaco	<i>Lama guanicoe</i>	Vulnerable	Concession and adjacent areas
Vicuña	<i>Vicugna vicugna</i>	Vulnerable	Salar de Ascotán
Birds			
Andean Gull	<i>Chroicocephalus serranus</i>	Least Concern	Salar de Ascotán
Giant Coot	<i>Fulica gigantea</i>	Least Concern	Salar de Ascotán
Andean Flamingo	<i>Phoenicoparrus andinus</i>	Vulnerable	Salar de Ascotán
James's Flamingo	<i>Phoenicoparrus jamesi</i>	Vulnerable	Salar de Ascotán
Chilean Flamingo	<i>Phoenicopterus chilensis</i>	Near Threatened	Salar de Ascotán
Northern Nandu	<i>Rhea pennata tarapacensis</i>	Vulnerable	Concession and adjacent areas
Puna Tinamou	<i>Tinamotis pentlandii</i>	Least Concern	Concession and adjacent areas
Fish			
Karachi	<i>Orestias ascotanensis</i>	Endangered	Spring 11 in Salar de Ascotán
Plants			
Llaretá	<i>Azorella compacta</i>	Vulnerable	Azonal communities
Conoidea	<i>Maihueuopsis glomerata</i>	Near Threatened	Concession and adjacent areas
Puskayo	<i>Maihueuopsis boliviana</i>	Least Concern	Concession and adjacent areas

¹ Per Chilean regulations, RCS conservation status aligns with IUCN Red List classification.

BIODIVERSITY MANAGEMENT AT FCX

Protected Areas

El Abra defines protected areas as sites legally protected, formally designated or recognized for the primary purposes of biodiversity conservation. El Abra does not conduct mining activities within or immediately adjacent to any protected areas. The Borde Sureste Ascotán aquifer is one of several aquifers that were legally protected pursuant to Resolution DGA No. 87 in 2006, which delimits the aquifers that feed wetlands in the Arica y Parinacota, Tarapacá and Antofagasta regions. The aquifer is in the south-east portion of the Salar de Ascotán and, although it is within 1 kilometer of Spring 11, there are no restrictions or prohibitions for Spring 11 or the groundwater wells. El Abra does not currently have any environmental commitments associated with the aquifer.

BIODIVERSITY PROGRAMS

El Abra implements several programs to promote the conservation of specific biodiversity resources within the concession and in the Salar de Ascotán. The key programs are listed and are briefly summarized below.

Table 5. Primary Biodiversity Conservation Programs at El Abra

Feature	Conservation Actions
Spring 11 in Salar de Ascotán	Construction of a greenhouse to support propagation of native plants and revegetation of Spring 11
	Enhance <i>Telmatobius</i> habitat by creating artificial shelters
	Genetic study of seven species of <i>Telmatobius</i> that inhabit the Salar de Ascotán, Salar de Carcote and surrounding areas
Research & Monitoring	Conducted several research studies, in collaboration with scientific experts on the ecology of plant and animal species in Spring 11 to inform future conservation actions for priority wildlife species
	Genetic study of <i>Heleobia ascotanensis</i> (an endangered freshwater snail)
	Study the ecology and reproductive biology of <i>Orestias ascotanensis</i> (a small endemic fish) in collaboration with researchers from the University of Chile
Relocation of Flora & Low Mobility	Annual census of three flamingo species in the Salar de Ascotán
	Capture and relocate plants and animals to suitable habitat outside the disturbance area prior to the initiation of ground disturbing activities

BIODIVERSITY MANAGEMENT AT FCX

Spring 11 Management Plan

El Abra has implemented an Environmental Management Plan for Spring 11 for more than a decade, with the primary goal of promoting the gradual recovery of the spring by ensuring stable hydrogeological conditions and increasing vegetation cover. The management plan includes monitoring of the biotic and abiotic conditions, monitoring flora and fauna in the spring, and operating a water recharge system to maintain ecological processes in Spring 11. The local Indigenous communities are actively involved in the implementation of the management plan. In 2020, El Abra constructed a greenhouse that is used to propagate two plant species native to the Salar de Ascotán: *Zameioscirpus atacamensis* and *Puccinellia frigida*. The 2,100-square-foot greenhouse accommodates up to 15,000 plants. Seedlings from the greenhouse will supply the Spring 11 revegetation program.

Amphibian Conservation Program

El Abra has implemented a conservation program for the Philippii toad (*Telmatobius philippii*), an endangered species that is endemic to Chile and important to local Indigenous communities. Lack of adequate shelter was identified as a limiting factor for the toad in Spring 11, and the program enhances habitat quality by creating artificial shelters throughout the spring to protect these endangered amphibians from the extreme environmental conditions that exist in the surroundings of the Salar de Ascotán. The conservation program has been successful as several artificial shelters were occupied within months of installation which has expanded the distribution of toads in Spring 11.

The genus *Telmatobius* consists of seven toad species that are endemic to northern Chile. While El Abra has long known that a toad in the genus *Telmatobius* inhabits Spring 11, there has been uncertainty among the scientific community as to the specific species that inhabits the spring. El Abra is collaborating with scientific experts from the Instituto de Ecología y Biodiversidad on a genetic study to determine the *Telmatobius* species that inhabit the Salar de Ascotán, Salar de Carcote and surrounding areas. Results of this research study will improve the scientific understanding of *Telmatobius* species distribution and interaction between populations and will inform future species conservation efforts in the Salar de Ascotán and Spring 11.

BIODIVERSITY MANAGEMENT AT FCX

Evaluation of Plant-to-Plant Interactions of *Zameioscirpus atacamensis* in Salar de Ascotán

Z. atacamensis is one of the native plant species that is the subject of El Abra propagation and revegetation efforts in Spring 11. This study is evaluating the interaction between *Z. atacamensis* and other plant species that occur in Spring 11 to determine whether the other species positively or negatively influence the establishment of *Z. atacamensis*. The results of this study will be used to inform the Spring 11 revegetation and restoration program.

Flamingo Census

As a partner in the Chilean national flamingo conservation program, El Abra conducts an annual census of three flamingo species (*Phoenicoparrus andinus*, *Phoenicoparrus jamesi*, and *Phoenicopterus chilensis*) in the Salar de Ascotán in support of assessing flamingo population dynamics across northern Chile.

Genetic Study of *Heleobia ascotanensis*

Heleobia ascotanensis is an endangered freshwater snail that is endemic to Salar de Ascotán. This study is investigating population structure and connectivity using genetic markers from specimens obtained throughout the species range. In addition, the study will evaluate genetic divergence and differentiation based upon shell morphology. The knowledge gained from this research will improve the scientific understanding of the interaction between *Heleobia ascotanensis* populations and inform future conservation efforts.

Orestias ascotanensis Research

Orestias ascotanensis is a small, endangered fish that is endemic to the springs in the Salar de Ascotán. El Abra collaborated with researchers from the University of Chile to investigate *Orestias* species ecology, including habitat characteristics, life cycle, reproductive biology and food habitats. The study expands the scientific knowledge about this species and will inform future conservation actions.

BIODIVERSITY MANAGEMENT AT FCX

Relocation of Flora and Low-Mobility Fauna

El Abra has established a program to capture and relocate plants and animals located within project areas to suitable habitat outside the disturbance area prior to the initiation of ground disturbing activities. Relocation efforts focus on cacti (*Maihueniopsis glomerata* and *Maihueniopsis boliviana*) and small animals with limited mobility including vizcacha (*Lagidium viscacia*) and lizards (*Liolaemus hajeki*, *Liolaemus jamesi*, *Liolaemus contanzae*, and *Eligmodontia puerulus*). The relocation program protects individual plants and animals and promotes the conservation of genetic variability in local populations of several species of conservation interest. El Abra conducts the relocation program in collaboration with local specialists and monitors relocated plants and animals to evaluate survival of relocated individuals. Through 2023, more than 5,000 cacti and 1,000 animals have been relocated and monitoring results indicate high rates of survival and reproductive success among translocated individuals.

Wildlife Habitat Council Programs

El Abra is currently certified at the top WHC certification tier (gold) based upon the following previously described conservation program elements:

- ▶ biannual flamingo census in the Salar de Ascotán;
- ▶ genetic research on *Heleobia ascotanensis* which is endemic to *Salar de Ascotán*;
- ▶ rescue and relocation of cacti and low mobility fauna;
- ▶ greenhouse propagation of *Zameioscirpus atacamensis* and *Puccinella frigida* to supply Spring 11 revegetation program; and
- ▶ participation of Indigenous Peoples from Ascotán community in management and operation of greenhouse.

BIODIVERSITY MANAGEMENT AT FCX

GRASBERG MINERALS DISTRICT – BIODIVERSITY MANAGEMENT PLAN SUMMARY

Site Description

PT-Freeport Indonesia's (PT-FI) Grasberg operations are located in Mimika Regency, Central Papua, Indonesia, in a region of western New Guinea formerly referred to as Irian Jaya. The government-approved operational license area consists of two main components: the mine site and a supporting area. It should be noted that this document refers to mileposts (MP) along the main roadway to identify locations of Grasberg facilities and features from MP 0 along the coast of the Arafura Sea northward to the mill at MP 74. The mine site is approximately 3 kilometers north of the mill.

The mine site is located within a 9,946 hectare special mining license area between 3,200 and 4,000 meters above sea level in the Sudirman Mountain Range approximately 70 kilometers north of the city of Timika (Figure 5). Grasberg transitioned from an open pit mining operation to an underground mine in 2019, and the mine area currently includes the old Grasberg open pit, an underground mining complex with three mining units (Grasberg Block Cave, Deep Mill Level Zone and Big Gossan), overburden stockpiles, a milling complex and concentrator, processing facilities and various supporting infrastructure.

Ore excavated from the underground mine is transported to the mill and concentrator where it is ground into a sand-like consistency, mixed with a reagent and subjected to a floatation process which separates the economically valuable minerals (concentrate) from finely ground rock particles (tailings). The concentrate is conveyed via pipeline approximately 110 kilometers to the Port of Amamapare, where it is dewatered, dried and stored prior to shipment. The tailings are conveyed to an approved tailings deposition area referred to as the Modified Ajkwa Deposition Area (ModADA) which encompasses approximately 23,000 hectares within the Otomona River floodplain. Fine tailings and natural sediments pass through the ModADA and are deposited in the Ajkwa estuary. Prior to disposal, tailings are specifically managed to be geochemically benign by adding limestone to neutralize potential acid generation.

For more information please see: [Tailings - Indonesia | Freeport-McMoRan \(fcx.com\)](https://www.fcx.com/en-us/indonesia-tailings).

BIODIVERSITY MANAGEMENT AT FCX

Relevant Regulations

PT-FI complies with relevant national environmental regulations, including those that pertain to the protection and conservation of biodiversity resources including:

- ▶ **Indonesia Mining License** - PT-FI was granted an initial license to operate within the concession by the Indonesian government in 1967 through a Contract of Work which was replaced with a special mining license (IUPK) to replace its former Contract of Work, enabling PT-FI to conduct operations in the Grasberg minerals district through 2041. Under the terms of the IUPK, PT-FI has been granted an extension of mining rights through 2031, with rights to extend mining rights through 2041, subject to PT-FI completing the construction of additional domestic smelting and refining capacity in Indonesia and fulfilling its defined fiscal obligations to the Indonesia government. Indonesian Environmental Law requires an assessment of environmental impacts (Analisis Mengenai Dampak Lingkungan or AMDAL) for projects likely to result in significant impacts. The AMDAL consists of an Environmental Impact Statement (AMDAL), an Environmental Management Plan (RKL) and an Environmental Monitoring Plan (RPL). PT-FI conducts biodiversity baseline studies for new projects that require revision of the AMDAL and has established numerous biodiversity monitoring programs pursuant to the RPL.
- ▶ **Government Regulation No. 22 of 2021** - requires businesses that adversely impact the environment to obtain an Environmental Approval and outlines requirements for the protection and management of water quality, air quality, marine quality and waste.

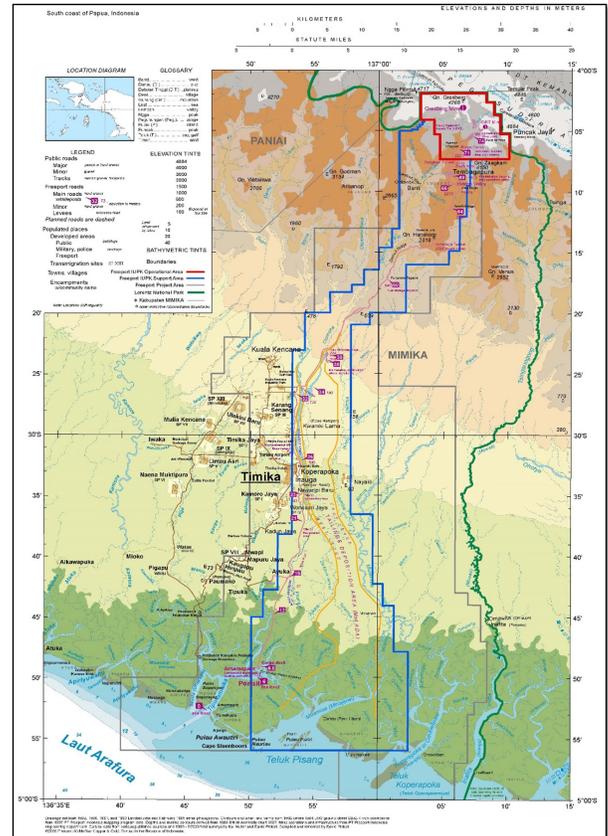


Figure 5. Grasberg Location Map (red = mine site boundary, blue = supporting area boundary, yellow = tailings deposition area boundary, green = Lorenz National Park boundary)

BIODIVERSITY MANAGEMENT AT FCX

- ▶ Law No. 5 of 1990 on Protected Animal and Plants - defines protected and unprotected flora and fauna and establishes prohibitions for protected species.
- ▶ Forestry Law No. 41 of 1999 - regulates the management of forests in Indonesia and provides for the use of forest areas for non-forestry activities, including mining, through a Borrow to Use permit administered by the Ministry of Environment and Forests. Ministerial Regulation No. 27 of 2018 requires Borrow to Use permit holders to reclaim forests within their concession and to complete forest rehabilitation projects outside the concession.

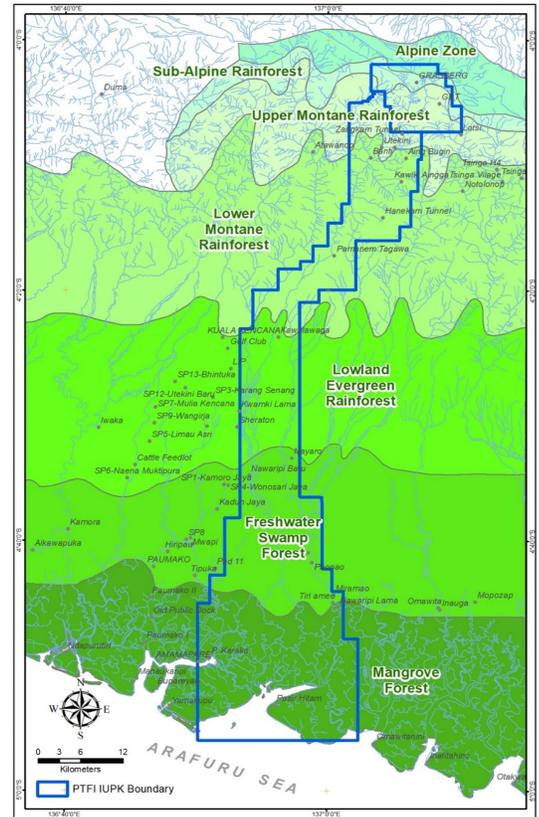


Figure 6. Primary Biotic Communities

BIODIVERSITY RESOURCES

Ecological Setting

The southern portion of the concession, including the ModADA, is located within the Southern Coastal Plain physiographic region (lowlands) with relatively flat terrain and elevations ranging from 0 meters above sea level (masl) at the coast to approximately 600 masl at MP 50. The primary biotic communities in the lowlands are mangrove forest, freshwater swamp forest and lowland rainforest (Figure 6). The Central Mountain Ranges region (highlands) extends from MP 50 to Grasberg in the Sudirman Mountains and is characterized by mountainous terrain with elevations ranging from 600 masl to over 4,000 masl. The primary biotic communities in the highlands include lower montane rainforest, upper montane rainforest, and alpine and subalpine communities (Figure 6). The regional climate is tropical monsoon, but temperature and precipitation within the concession are strongly influenced by elevation and physiography. Maximum mean monthly temperatures occur in January and range from 27.5°C at portsite to 22.5°C at MP 5 to 7°C at the mine site. Average annual precipitation is approximately 380 cm at portsite, 1250 cm at MP 50, and 280 cm at the mine site.

BIODIVERSITY MANAGEMENT AT FCX

PT-FI has conducted numerous biodiversity studies and inventories within the concession. The initial comprehensive biodiversity baseline studies in the concession were completed in 1997 by internationally recognized scientists from PT Hatfindo Prima, Indonesian Institute of Sciences, Cendrawasih University, Bishop Museum, Western Australian Museum, Smithsonian Institute, and other Indonesian research institutions and organizations. The baseline studies involved surveys of plant communities and all major taxonomic groups including birds, mammals, reptiles and amphibians, freshwater fish, and terrestrial and aquatic invertebrates. Pursuant to the RPL, PT-FI conducts numerous monitoring programs to evaluate the potential impacts of its operations on local biodiversity resources.

Priority Habitats and Species

PT-FI has evaluated the occurrence of priority habitats and species within and adjacent to the concession. Priority habitats are areas that are important for priority species, are ecologically unique or significant, or support critical behaviors such as breeding and nesting. Priority species include plants and animals that are listed as Endangered or Critically Endangered by the IUCN, rare or endemic, or otherwise of significant conservation interest. These definitions are generally consistent with IFC criteria for critical habitat.

There are no areas that qualify as priority habitat in the concession. The priority wildlife species that occur within the concession are listed in Table 6.

Table 6. Priority Species in the vicinity of Grasberg

Common Name	Scientific Name	IUCN Status ¹	Where Species Occurs
Birds			
Great Knot	<i>Calidris tenuirostris</i>	Endangered	Not resident, but may occur along the coast during seasonal migrations
Eastern Curlew	<i>Numenius madagascariensis</i>	Endangered	Not resident, but may occur along the coast during seasonal migrations
Long-Bearded Honeyeater	<i>Melionyx princeps</i>	Vulnerable	Highlands
Macgregor's Honeyeater	<i>Macgregoria pulchra</i>	Vulnerable	Subalpine forest
Pesquet's Parrat	<i>Psitttrichas fulgidus</i>	Vulnerable	Lower montane forest
New Guinea Eagle	<i>Harpyopsis novaeguineae</i>	Vulnerable	Lowland rainforest
Scheepmaker's Crowned-Pigeon	<i>Goura scheepmakeri</i>)	Vulnerable	Lowland rainforest
Fly River Grassbird	<i>Poodytes albolimbatus</i>)	Vulnerable	Swamp forest

BIODIVERSITY MANAGEMENT AT FCX

Mammals			
Spectacled Flying Fox	<i>Pteropus conspicillatus</i>	Endangered	Lowland rainforest, swamp forest and mangrove
Glacier Rat	<i>Rattus richardsoni</i>	Vulnerable	Alpine
Doria's Tree-Kangaroo	<i>Dendrolagus dorianus</i>	Vulnerable	Mid-montane forest
New Guinea Highland Wild Dog	<i>Canis dingo hallstromi</i>	None ¹	Alpine habitats in vicinity of Grasberg mine
Herpetofauna			
Pig-Nosed Turtle	<i>Carettochelys insculpta</i>	Endangered	Lowland rivers

¹ No IUCN status, but the species is ecologically significant as it represents the most ancient, primitive canids currently living.

Protected Areas

The mine site borders Lorentz National Park, the largest protected area in Southeast Asia and the only protected area in the world that incorporates continuous intact tracts of ecosystems from alpine to tropical marine environments, including extensive lowland wetlands. Lorentz National Park was established in 1997 and designated as a UNESCO World Heritage Site in 1999. It encompasses approximately 2.5 million hectares immediately east of the concession. Since the concession boundaries were established by the Indonesian government several decades prior to the creation of Lorentz National Park, the park boundary excludes the mine site (Figure 5). PT-FI has not and will not conduct any mining or exploration activities within the park and has committed to not explore nor mine at any World Heritage Sites and to respect legally designated protected areas.

BIODIVERSITY PROGRAMS

PT-FI implements several conservation programs for important biodiversity resources at Grasberg and adjacent areas which are listed and briefly summarized on the next page.

BIODIVERSITY MANAGEMENT AT FCX

Table 7. Primary Biodiversity Conservation Programs at Grasberg

FEATURE	CONSERVATION ACTIONS
Ecological Risk Assessment	PT-FI evaluates potential ecological and human health risks associated with the tailings management system and potential mine releases
Ecological Monitoring	PT-FI conducts numerous environmental monitoring programs across a variety of taxa in terrestrial, freshwater, estuarine, and coastal/marine ecosystems throughout the concession.
Biodiversity Research	PT-FI biodiversity research studies have significantly contributed to the scientific knowledge of local flora and fauna in the concession and Mimika region
Reclamation and Restoration	PT-FI conducts progressive reclamation of overburden stockpiles around the Grasberg and mangrove habitats in the ModADA
Natural Succession Discovery Park (NSDP)	PT-FI established the Natural Succession Discovery Park on historic tailings to monitor natural succession processes and better understand the mechanisms of terrestrial ecosystem recovery
MP 21 Reclamation and Biodiversity Center	PT-FI established the MP 21 Reclamation and Biodiversity Center to conduct research on the use of tailings deposition areas for agricultural production, contribute to biodiversity conservation and promote environmental education and outreach, and to support the wildlife reparation program in collaboration with government agencies
Environmental Education and Outreach	PT-FI conducts numerous environmental education and outreach programs every year to raise community awareness of conservation issues and engage students, teachers, government officials and other local stakeholders
Scientific Collections and Publications	Biodiversity studies at Grasberg have been used to support museum and herbarium collections and numerous scientific publications and biodiversity books

BIODIVERSITY MANAGEMENT AT FCX

Ecological Risk Assessment

In 2002, PT-FI completed a comprehensive Environmental Risk Assessment (ERA) to evaluate potential ecological and human health risks associated with the tailings management system and potential mine releases. PT-FI is currently conducting an additional Ecological Risk Assessment to evaluate aquatic and terrestrial wildlife risks associated with mine operations, which is expected to be completed in 2025. PT-FI also previously completed a human health risk assessments to evaluate the potential health risks associated with possible exposure to tailings and other mining waste constituents around our concession. To learn more about this work, please refer to the [FCX Annual Report on Sustainability](#).

Ecological Monitoring

PT-FI currently conducts numerous environmental monitoring programs including 25 that focus on terrestrial and aquatic flora and fauna. The monitoring programs are conducted in terrestrial, freshwater, estuarine and coastal/marine ecosystems throughout the concession. Most biodiversity monitoring is conducted in the baseline study plots established by Hatfindo in 1997. Each monitoring program has an associated standard operating procedure that includes a program description, methods and protocols, and requirements for data collection and management. PT-FI submits monitoring results to the Indonesian government in the semiannual RKL/RPL report.

PT-FI conducted Biodiversity Workshops in 2015 and 2022 to review and conduct a gap analysis on the biodiversity monitoring programs. Workshop attendees included staff from Hatfield (previously Hatfindo) and scientists from various research institutions including the Indonesian Scientist Institution, University of Papua, and University of Cendrawasih as well as independent experts and consultants.

Biodiversity Research

Since 1994, PT-FI has collaborated with national and international scientists on research studies which have contributed significantly to the scientific understanding of local biodiversity. PT-FI has collected more than 5,000 plant and animal specimens, many of which reside in scientific collections in Indonesia, Australia, the United States, England and other countries. Numerous flora and fauna species new to science have been discovered through PT-FI's biodiversity research programs, including 50 insect species and 21 crab species. Most of the new species have been formally documented in baseline study reports, PT-FI's biodiversity book series and scientific publications.

BIODIVERSITY MANAGEMENT AT FCX

PT-FI has collaborated with external scientists to research the New Guinea highland wild dog (HWD), a species believed to be extinct until individual HWDs were documented near the concession in 2016. The research has included genetic analyses which verified the HWD is dissimilar from all modern domestic dog breeds, documenting local packs, and studying HWD movements and habitat use.

Reclamation and Restoration

PT-FI conducts progressive reclamation of overburden stockpiles around the now depleted Grasberg open pit in accordance with the 5-Year reclamation plan approved by the Indonesia Ministry of Energy and Mineral Resources. Monitoring results indicate high plant survival but relatively slow growth rates, which is expected given the soil and climatic conditions in the alpine area. PT-FI has a commitment to utilize only indigenous plant species in highland reclamation, necessitating a program that propagates native species in greenhouses for use in reclamation. PT-FI established a wastepaper vermi composting program to supplement soil nutrients.

PT-FI also has an ongoing mangrove restoration program. Deposition of fine tailings and natural sediments have created two islands in the estuarine portion of the ModADA as well as new land in the intertidal zone. While the islands were naturally colonized by mangrove and other freshwater swamp vegetation, PT-FI has planted more than 2 million mangrove trees to accelerate mangrove colonization and reclaimed more than 1,000 hectares in the Ajkwa estuary. Research has indicated that these new ecosystems support many native species including more than 500 plants, 100 birds, 60 butterflies, 20 reptiles, and 11 mammals. PT-FI has committed to restore approximately 500 hectares of mangrove forest annually with a goal of 10,000 hectares by 2032.

Natural Succession Discovery Park

PT-FI established a NSDP on historic tailings in the Double Levee where tailings were last deposited in 1997. The NSDP represents an outdoor education classroom where PT-FI monitors the natural succession processes to understand the mechanisms of terrestrial ecosystem recovery in tailings deposition areas. Monitoring results indicate that mature forest ecosystems develop on historic tailings without human intervention through five primary stages of succession over 30 years. Research conducted by the University of Papua documented an

BIODIVERSITY MANAGEMENT AT FCX

increase in plant diversity in the NSDP from approximately 500 species in 2005 to more than 900 species in 2022. Additionally, researchers have documented more than 150 bird species, 40 amphibians and reptiles, 90 butterfly species and 10 mammal species in the NSDP.

MP 21 Reclamation and Biodiversity Center

In 1995, PT-FI established the MP 21 Reclamation and Biodiversity Center (MP 21) on approximately 100 hectares of historic tailings deposition adjacent to the Ajkwa River. MP 21 is a reclamation research and demonstration area that supports research on the use of tailing deposition areas for agricultural production, contributes to biodiversity conservation, and promotes environmental education and outreach. PT-FI conducts research trials at MP 21 to evaluate the growth and viability of various agricultural crops and forest plantation species and to assess metal uptake in food crops grown on historic tailings. MP 21 also supports an animal husbandry program to assess the feasibility of livestock production and aquaculture on historic tailings. Finally, MP 21 supports the wildlife repatriation program that PT-FI conducts in collaboration with various governmental agencies. Enclosures at MP 21 are used to temporarily house endemic animals, including endangered pig-nosed turtles, that have been confiscated from the illegal wildlife trade prior to releasing them back into the wild in Lorenz National Park, Wasur National Park and surrounding areas.

Environmental Education and Outreach

Environmental education and raising community awareness of conservation issues are a focus of PT-FI's biodiversity efforts. The NSDP and MP 21 facilities support a variety of environmental education programs and activities for students and teachers from more than 75 schools in Mimika Regency as well as the general public. The NSDP contains an interpretive trail and associated brochure that explains the natural succession process on a historic tailings deposition area. Visitors to MP 21 are taught about the local ecosystems and associated flora and fauna through several facilities, including an ecosystem diorama, butterfly sanctuary, botanical garden and herbarium. MP 21 also hosts environmental awareness programs, team building activities and camping trips. Local students are able to conduct research on native plants, pest management, reclamation and biodiversity. PT-FI also hosts several offsite conservation outreach and education programs each year that engage students, teachers and other local stakeholders including employees, government officials, NGOs and the media.

BIODIVERSITY MANAGEMENT AT FCX

Scientific Collections and Publications

The biodiversity studies conducted by PT-FI have contributed greatly to the scientific knowledge of flora and fauna in the concession and broader Mimika region. PT-FI's scientific contributions include numerous museum collections, scientific publications, research bulletins and a biodiversity book series. More than 5,000 plant specimens collected during botanical surveys conducted by Kew Royal Botanic Gardens and Indonesian academic institutions are housed in several internationally recognized herbariums and documented in major flora databases including the Aarhus University Herbarium Database and Harvard University Herbaria and Libraries.

Wildlife Habitat Council Certification

PT-FI's conservation programs at Grasberg have been certified by WHC since 2011 and received awards in 2012 and 2014 for their environmental education programs. In 2014, PT-FI received the prestigious Corporate Lands for Learning of the Year award for outstanding environmental education, stewardship, and voluntary employee efforts at Grasberg, and in 2016, they received the WHC Gold Tier Program award for the program with the highest score among its cohorts. PT-FI conservation education programs have also been recognized by other groups, including receiving the Indonesia Green Award by La-Tofi School of Social Responsibility in the biodiversity conservation program category. PT-FI currently has achieved WHC's Gold Certification tier based on its conservation activities related to the Natural Succession Discovery Park, mangrove revegetation and restoration, Grasberg reclamation, repatriation of pig-nosed turtles and other endangered species, and education and community engagement programs.

BIODIVERSITY MANAGEMENT AT FCX

MORENCI – BIODIVERSITY MANAGEMENT PLAN SUMMARY

Site Description

The Morenci Mine is located in Greenlee County, Arizona, approximately 80 kilometers northeast of Safford on U.S. Highway 191 (Figure 7). The Morenci operation encompasses approximately 61,700 acres, comprising 51,300 acres of free lands and 10,400 acres of unpatented mining claims held on public mineral estate and numerous state or federal permits, easements and rights-of-way. FCX owns the Morenci townsite, a small community of approximately 5,000 residents located immediately east of the mine. The Morenci Water and Electric Company, an FCX subsidiary, provides water and electricity to the Morenci townsite and owns approximately 32 kilometers along the lower Eagle Creek adjacent to the mine site (Figure 7).

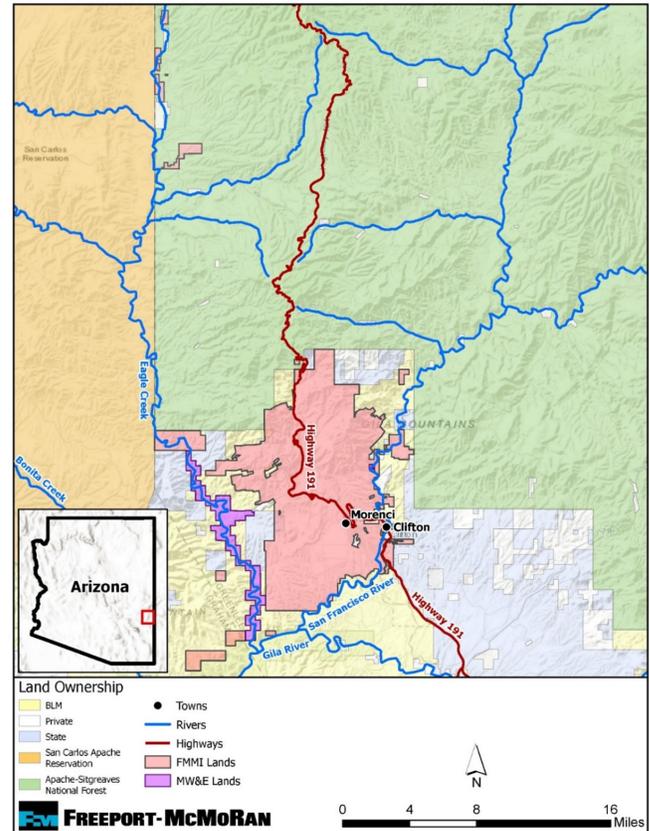


Figure 7. Morenci Location Map

Morenci is an open-pit copper mine that has been in continuous operation since 1939 and is currently one of the largest copper mines in the world. Morenci produces copper concentrate, copper cathode and molybdenum concentrate through mining, milling, concentrate leaching and solution extraction/electrowinning processes. Mine facilities include multiple open pits, development rock and leach stockpiles, process solution and stormwater impoundments, tailings facilities, concentrators, processing plants, and associated infrastructure and support facilities.

Morenci is situated within the Madrean Lower Montane Woodland and Lower Montane Woodland ecoregions and contains varied topography including flat grasslands, rolling hills and steep canyons. Elevations range from 1,000 meters to 1,900 meters above sea level. Annual average precipitation is approximately 340 millimeters, the majority of which occurs

BIODIVERSITY MANAGEMENT AT FCX

during high-intensity monsoonal storms between July and September. Average daily low temperatures range from 0.5°C in January to 30°C in July and average daily high temperatures range from 15.4°C in January to 37.8°C in July.

Relevant Regulations

Morenci complies with relevant federal and state environmental regulations, including those that pertain to the protection and conservation of biodiversity resources including:

- ▶ **Endangered Species Act** – a federal statute administered by the U.S. Fish and Wildlife Service (USFWS) for listing species as endangered or threatened and designating critical habitat for listed species.
- ▶ **Migratory Bird Treaty Act** – a federal statute administered by the USFWS that protects over 1,000 migratory bird species and their nests, eggs and parts.
- ▶ **Bald and Golden Eagle Protection Act** – a federal statute administered by the USFWS that protects bald and golden eagles and their nests, eggs and parts.
- ▶ **State of Arizona Regulations** – a state statute that prohibits the taking, possession and transportation of any wildlife species unless expressly permitted by Arizona state law.
- ▶ **National Environmental Policy Act** – a federal statute that requires federal agencies to evaluate the environmental consequences of actions they approve, authorize or fund, typically through preparation of an Environmental Impact Assessment.

SITE-SPECIFIC PLANS

Avian Protection Plan

Primary risks to migratory birds at Morenci are impoundments containing process-affected solutions with a pH ≤ 5.0 which are occasionally used as temporary resting habitat by waterfowl during spring and fall migration periods. Morenci has implemented measures to minimize avian risk on the site since 2000 and, in 2013, developed a formal Avian Protection Plan in consultation with the USFWS that outlines specific measures implemented to minimize avian risk associated with process-affected waters, electrical infrastructure and ground disturbing activities including:

BIODIVERSITY MANAGEMENT AT FCX

- ▶ **Active bird hazing** – Trained crews conduct daily inspections and actively haze birds off impoundments containing process-affected solutions using a variety of techniques including loud horns, propane cannons, and pyrotechnics. Hazing crews complete a daily log to record the number and types of birds observed and hazed and hazing techniques employed.
- ▶ **Passive bird hazing** – Install passive hazing technologies (e.g., Bird Avert™ on-demand radar systems and propane cannons) to deter birds from landing on larger impoundments containing process-affected solutions.
- ▶ **Physical barriers** – Install physical barriers (e.g., monofilament and polypropylene Bird Balls®) to prevent birds from landing on high-risk impoundments.
- ▶ **Impoundment management** – Eliminate high-risk impoundments no longer needed for operations and construct “avian safe” impoundments outside the active mine that are supplied with fresh water.
- ▶ **Electrical infrastructure** – Inspect and manage bird nests on power lines and substations, install perch prevention devices on power poles, and design new power lines in accordance with Avian Powerline Interaction Committee protection standards.
- ▶ **Documentation and reporting** – Maintain electronic database of daily hazing information, document all bird fatalities and injuries that occur on site, and voluntarily report bird mortalities that occur within 100 yards of any impoundment containing process-affected solutions to the USFWS.
- ▶ **World Bird Sanctuary assessment** – The World Bird Sanctuary conducts an annual site visit to evaluate Morenci’s avian protection program and prepares a summary report with recommendations.

Wildlife Protection Plan

Morenci has a Wildlife Protection Plan that outlines strategies and actions to minimize wildlife risks associated with mining operations and facilities. The plan includes a summary of the ecological setting, a risk assessment and measures to minimize wildlife risk. Primary sources of wildlife risk at Morenci include new land disturbance, vehicle and equipment traffic, impoundments containing process-affected solutions, tailings storage facilities and electrical infrastructure. The Morenci Environmental Services Department is responsible for ensuring the wildlife protection measures are implemented and annually reviewing and updating the plan to address new wildlife risks.

BIODIVERSITY MANAGEMENT AT FCX

Biodiversity Resources

Morenci is situated in an ecological transition zone between desert and montane ecoregions and contains six different terrestrial biotic communities. The primary community is Semidesert Grassland intermixed with patches of Interior Chaparral, with smaller areas of Madrean Evergreen Woodland and Petran Montane Conifer Forest at higher elevations in northern portions of the property and Sonoran Desertscrub and Chihuahuan Desertscrub at lower elevations along the southern property boundary (Figure 8). All six communities are relatively common in Arizona. There are no natural aquatic habitats on Morenci property, but the mine site is adjacent to three perennial rivers (Gila River, San Francisco River and Eagle Creek) that support a variety of aquatic and terrestrial wildlife, including several endangered species.

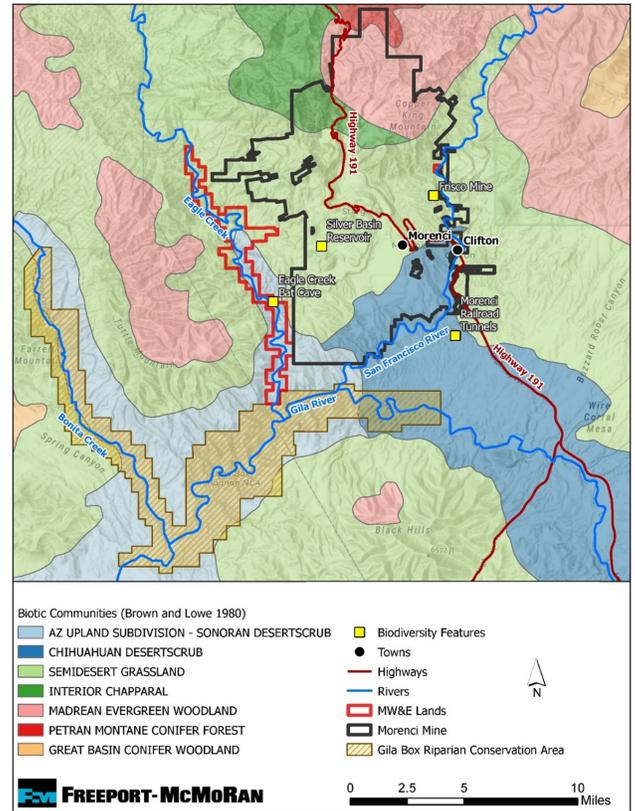


Figure 8. Primary Biotic Communities

Priority Habitats and Species

Morenci has evaluated the potential occurrence of priority species and habitats within and adjacent to the mine property. In the U.S., Morenci defines priority habitats as areas that support priority species, are formally designated as critical habitat, are ecologically unique or significant, are essential for critical behaviors such as breeding, or represent important movement corridors or migratory pathways. These definitions are consistent with IFC criteria for critical habitat. Priority species are plants and animals that are listed as threatened or endangered under the Endangered Species Act (ESA), of significant conservation interest, rare or endemic, or culturally important to local Indigenous Peoples.

BIODIVERSITY MANAGEMENT AT FCX

There are no areas or features on mine property that qualify as priority habitat. Morenci has classified four adjacent areas as priority habitat including Eagle Creek, San Francisco River, and Gila River which support several endangered species (Table 8) and the Eagle Creek Bat Cave which represents an important maternity roost for a regionally significant population of Mexican Free-Tailed Bats (*Tadarida brasiliensis*).

No priority plant or animal species inhabit Morenci property; however, there is the possibility of transient monarch butterflies during seasonal migrations and transient Mexican wolves (Table 8).

Protected Areas

Morenci does not conduct operations within or adjacent to any areas that are legally protected, formally designated, or established for conservation purposes. There are two protected areas in the general vicinity of the mine site. The Gila Box Riparian National Conservation Area, which was established to conserve aquatic and riparian habitats and associated wildlife, encompasses 23,000 acres along the Gila River approximately 2.4 kilometers south of Morenci property (Figure 8). The Eagle Creek Bat Cave, located along lower Eagle Creek, has been designated as an Area of Critical Environmental Concern by the Bureau of Land Management (BLM) due to its ecological importance.

BIODIVERSITY MANAGEMENT AT FCX

Table 8. Endangered Species Act (ESA)-listed Species in the vicinity of the Morenci Mine¹

Common Name	Scientific Name	IUCN Status ¹	Where Species Occurs
Mammals			
Mexican Wolf	<i>Canis lupus baileyi</i>	Experimental	No resident population at Morenci, but transient individuals may occasionally pass through the property
Reptiles			
Narrow-Headed Gartersnake	<i>Thamnophis rufipunctatus</i>	Threatened	No suitable habitat on mine property, but species has been documented on Eagle Creek
Birds			
Mexican Spotted Owl	<i>Strix occidentalis lucida</i>	Threatened	No suitable habitat on mine property, but species has been documented on U.S. Forest Service lands north of Morenci
Southwestern Willow Flycatcher	<i>Empidonax traillii extimus</i>	Endangered	No suitable habitat on mine property, but transient individuals may occur along Gila River, Eagle Creek and San Francisco River
Yellow-Billed Cuckoo	<i>Coccyzus americanus</i>	Threatened	No suitable habitat on mine property, but species has been documented on Eagle Creek and the San Francisco River
Fish			
Gila Chub	<i>Gila intermedia</i>	Endangered	No suitable habitat on mine property, but species is known to occur in upper Eagle Creek
Loach Minnow	<i>Tiaroga cobitis</i>	Endangered	No suitable habitat on mine property but, species has been documented in Eagle Creek
Spikedace	<i>Meda fulgida</i>	Endangered	No suitable habitat on mine property, but species has been documented in Eagle Creek
Invertebrates			
Monarch Butterfly	<i>Danaus plexippus</i>	Candidate	No suitable habitat on mine property, but transient individuals may temporarily be present during seasonal migrations

¹ Source: U.S. Fish and Wildlife Service Information for Planning and Consultation (<https://ecos.fws.gov/ipac>).

BIODIVERSITY MANAGEMENT AT FCX

BIODIVERSITY PROGRAMS

Morenci implements several conservation programs for important biodiversity resources on the mine site and adjacent areas which are listed and briefly summarized below.

Table 9. Primary Biodiversity Conservation Programs at Morenci

FEATURE	CONSERVATION ACTIONS
Endangered Fish	Spikedace and Loach Minnow Management Plan (annual fish surveys and construction of a fish barrier)
Endangered Birds	Yellow-Billed Cuckoo Management Plan (exclude cattle from cuckoo habitat, provide supplemental livestock water source, periodic monitoring of cuckoo population and riparian vegetation condition)
Eagle Creek Bat Cave	Construction of bat gate and annual monitoring of local bat population
Frisco Mine and Railroad Tunnel Bat Habitats	Annual population monitoring and scientific research on bat species inhabiting these features
Rocky Mountain Bighorn Sheep	Eliminate food and water sources along Highway 191, install motorist warning signs and construct fencing to prevent bighorn sheep from crossing high-risk segments of Highway 191, periodic capture and relocation of bighorn sheep from Morenci
Adjacent Aquatic and Riparian Habitats	Evaluate potential direct and indirect impacts to adjacent waterways through the sustainability risk register, project development sustainability review, management of change, and mitigation hierarchy to proactively ensure facilities are designed and operated in a manner that minimizes potential downstream impacts
	Implement best management practices including erosion and sediment control measures to prevent potential downstream impacts during construction and operation
	Implement measures to prevent potential downstream impacts associated with seepage, accidental releases, and stormwater runoff during all stages of the project lifecycle including secondary containment systems, collection systems, surface and groundwater monitoring programs, routine inspections, and appropriate closure design
	Adhere to the GISTM and corporate tailings policy including standards for tailings storage facility design, construction, operation, monitoring and closure

Rocky Mountain Bighorn Sheep Conservation Program

Since 2006, Morenci has collaborated with the Arizona Game and Fish Department (AZGFD), Arizona Department of Transportation and BLM to conserve the Rocky Mountain bighorn sheep population that inhabits the mine site and adjacent lands. The primary elements of the Morenci bighorn sheep conservation program include:

BIODIVERSITY MANAGEMENT AT FCX

- ▶ Eliminating food and water attractants along Highway 191 (irrigated grass lawns, ornamental yard plants and water sources);
- ▶ Constructing fencing to prevent bighorn sheep from crossing at high-risk locations along Highway 191;
- ▶ Establishing vehicle speed limits and installing signage on Highway 191 to warn motorists of the presence of bighorn sheep on the roadway; and
- ▶ Capturing and relocating bighorn sheep from Morenci to reduce local population densities and to augment or reestablish bighorn sheep populations elsewhere in Arizona.

Bat Conservation Program

Since 2010, Morenci has collaborated with scientific experts from Bat Conservation International (BCI) and governmental agencies on a bat conservation program. The Morenci area contains maternity roosts for several bat species including the Mexican free-tailed bat, Townsend’s Big-Eared Bat (*Corynorhinus townsendii*), California Leaf-Nosed Bat (*Macrotus californicus*) and Cave Myotis (*Myotis velifer*). Maternity roosts require very specific microclimatic conditions and are relatively rare and critical for bat reproduction. The primary elements of the Morenci bat conservation program include:

- ▶ **Eagle Creek Bat Cave** – The Eagle Creek bat cave, located along lower Eagle Creek (Figure 8), historically represented one of the largest Mexican Free-Tail Bat maternity roosts in the southwestern U.S., but fewer than 9,000 bats remained after a human-caused fire inside the cave in 2001. FCX collaborated with BCI, WHC, AZGFD and BLM to construct a bat gate to prevent public access into the cave. Following installation of the bat gate, Morenci initiated annual population monitoring with recent counts exceeding 1 million bats. BCI estimates that insects consumed by bats inhabiting the Eagle Creek bat cave provide more than \$1,000,000 annually in pest control services for agricultural producers in the region.
- ▶ **Frisco Mine** – The Frisco Mine is a historic mine complex on Morenci property near the San Francisco River (Figure 8) that consists of multiple domes and vertical shafts which possess the necessary microclimatic conditions for bat maternity roosts. Morenci has monitored the Frisco Mine bat population annually since 2013. While initial investigations discovered a large maternity colony of Townsend’s Big-Eared Bat in the mine, subsequent studies determined that it also supports maternity colonies of two other bat species (California Leaf-Nosed Bat and Cave Myotis) and that the three species coexist through spatial and temporal partitioning of the mine.

BIODIVERSITY MANAGEMENT AT FCX

- ▶ **Morenci Railroad Tunnels** – Morenci monitors Mexican Free-Tailed Bat populations in several abandoned railroad tunnels along the San Francisco River (Figure 8). Researchers hypothesize that the tunnels may represent alternative roosts for the population that utilizes the Eagle Creek bat cave. Genetic analysis of guano collected from the tunnels indicates four other bat species also inhabit the tunnels including Cave Myotis, Big Brown Bat (*Eptesicus fuscus*), Pallid Bat (*Antrozous pallidus*) and California Myotis (*Myotis californicus*).

Spikedace and Loach Minnow Management Plan

Spikedace (*Meda fulgida*) and Loach Minnow (*Tiaroga cobitis*) are two small endangered native fish that historically occurred in Eagle Creek and the San Francisco River. In consultation with the USFWS, Morenci developed the Spikedace and Loach Minnow Management Plan which establishes a public-private partnership between Morenci and multiple government agencies (USFWS, Bureau of Reclamation, and Gila River Basin Native Fishes Conservation Program) to promote the conservation of spikedace, loach minnow and other native aquatic species in Eagle Creek and the San Francisco River. The Management Plan outlines a series of voluntary conservation measures that Morenci implements including:

- ▶ **Annual fish surveys** – Morenci conducts annual fish surveys at 15 permanent sampling sites on both Eagle Creek and the lower San Francisco River.
- ▶ **Eagle Creek fish barrier** – Physical barriers that prevent the upstream movement of non-native fish has become a primary strategy for native fish conservation in Arizona. Morenci is collaborating with the Bureau of Reclamation on constructing a fish barrier in upper Eagle Creek which is expected to be completed in 2025.
- ▶ **Exotic species removal study** – Morenci is implementing a program to determine the presence of non-native species (crayfish and American bullfrog) in upper Eagle Creek and to evaluate the efficacy of measures to control the distribution and abundance of these species.

BIODIVERSITY MANAGEMENT AT FCX

Yellow-Billed Cuckoo Management Plan

The Yellow-Billed Cuckoo is a threatened migratory bird that breeds and nests in dense riparian woodlands along perennial waterways in North America. In collaboration with USFWS, BLM, and U.S. Forest Service, Morenci is developing a Yellow-Billed Cuckoo Management Plan that outlines voluntarily conservation measures for the yellow-billed cuckoo and riparian habitats along Eagle Creek. The principal elements of the Management Plan include:

- ▶ **Livestock management** – construct fencing to restrict cattle access to Eagle Creek and riparian habitats.
- ▶ **Supplemental drinking water** – develop supplemental drinking water sources for livestock in upland areas outside the Eagle Creek corridor.
- ▶ **Survey and monitoring programs** – annual inspections of fencing and supplemental water source infrastructure, periodic monitoring of riparian vegetation and periodic population surveys.

Wildlife Habitat Council Certification

Morenci is currently certified at the top WHC certification tier (gold) based upon the following previously described conservation program elements:

- ▶ **Rocky Mountain bighorn sheep and Eagle Creek Bat Cave conservation programs.**
- ▶ **Monarch butterfly waystation program** – Morenci collaborated with the Gila Watershed Partnership, Southwest Monarch Study and teachers to establish waystations at local high schools that contain native plants used as food by migrating monarch butterflies.
- ▶ **Education and outreach programs** – Morenci collaborated with teachers in Graham and Greenlee Counties to develop a curriculum related to bat conservation, sponsor annual community-wide Bat Week events (recently expanded to Biodiversity Week), and engage several hundred local students and community members annually to commemorate Earth Day in partnership with the San Carlos Apache Tribe, Eastern Arizona College, AZGFD, Gila Watershed Partnership and WHC.