Biodiversity Report / 2014 -2017

IBERDROLA

Iberdrola with biodiversity

"We protect ecosystem biodiversity as a source of sustainable development"

This icon refers to related information.
Similarly, it also informs about other specific reports in which you can find more information of interest.

IBERDROLA

Goal:

TO CONSERVE and recover
the ecosystems related to our activities

COORDINATING the Group plans
in the affected environments to halt biodiversity loss

Planet Earth is home to a great treasure: its huge variety of forms of life, which are essential for sustainable development. Iberdrola Group is committed to encouraging ecosystem biodiversity by establishing new and sustainable projects in a way that fosters harmonious coexistence and conserves, protects and promotes the development and growth of natural heritage. It also fosters a culture that heightens society's awareness of the importance of this issue and the actions that help to protect biodiversity.

Approach:

KNOWLEDGE AND AWARENESS-RAISING

ACTION

COMMITMENT

Public information on Iberdrola

Iberdrola makes all its public information available to its shareholders, employees, customers, suppliers and to society in general to provide reliable and relevant information on the Company's performance and its strategic lines for the coming years.

Annual information

Integrated Report
Prepared based on the recommendations of the IIRC (International Integrated Reporting Council).
Financial Report
Prepared according to international regulations on financial information and with an external audit.
Corporate Governance Report
Prepared according to the model of the Spanish Securities and Exchange Commission.
Sustainability Report
Prepared according to the Global Reporting Initiative guide.
Annual Report of activities for the Board of Directors and their costs
Prepared following Iberdrola's own criteria.
Director Remuneration Report
Prepared according to the model of the Spanish Securities and Exchange Commission.
Report on compliance with the Regulation on the separation of regulated activities
Prepared following Iberdrola's own criteria.
Operations related to directors and significant shareholders
Prepared following Iberdrola's own criteria.
Annual Report on the application of the policy on shareholder involvement and the policy on communications and contacts with shareholders, institutional investors and voting advisers
Prepared following Iberdrola's own criteria.
Report on the independence of the accounts auditor with respect to the Auditors' report for 2016
Prepared following Iberdrola's own criteria.

Additional information

Quarterly reports on results
IBE Watch Fact Sheet
Shareholders Quarterly Report
Innovation Report
Corporate Environmental Footprint
Biodiversity Report
Greenhouse Gas Emissions Report

Information on the corporate website www.iberdrola.com

About us
Corporate governance
Sustainability
Shareholders and investors
Suppliers
People and talent
Communication room

Scan this QR code to access FY2016 annual reports FY2016 and associated documentation about the Iberdrola Group

⊙ This icon refers to related information. It also indicates the existence of other specific reports in which you can find more information of interest.

Biodiversity Report

2014 - 2017

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Letter from the Chairman

Ignacio S. Galán
Chairman of Iberdrola
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"The Iberdrola Biodiversity Report from the 2014-2017 period covers the main actions and projects carried out in this regard".

I am delighted to present to you the *Iberdrola Biodiversity Report* corresponding to the 2014-2017 period, which includes the main actions and projects carried out in this regard during this period.

At Iberdrola, a pioneering company in the development of clean energy and in the defence of the environment, we understand that respecting biodiversity and ecosystems must be an integral part of any business activity. We therefore work to ensure that all our projects are carried out in a sustainable manner and integrate conservation and promotion of natural heritage in the company strategy. This initiative also extends to support awareness raising actions that contribute towards promoting biological diversity.

"At Iberdrola we work to ensure that all our projects are sustainable".

Iberdrola has had a *Biodiversity Policy* for years, approved by the Board of Directors, which together with the *Sustainability*, *Environment* and *Climate Change* policies set the Group's basic principles for action in environmental management issues.

In this same regard, the company has incorporated into its strategy the *Sustainable Development Goals (SDG)* defined by the United Nations for 2030. In our case, Iberdrola focuses its efforts on supplying affordable and with clean energy (Goal 7), climate action (Goal 13) and life on land (Goal 15), indirectly contributing towards the remaining goals.

The company carries out a number of projects and activities that ensure full compatibility between its plans for development and conservation and respect for the environment. It has thus received several awards in recent years such as the “European Business Award for the Environment in the Basque Country 2016” in the “Biodiversity” category, and the “Sustainable Development” award granted by the “Nature of Scotland Awards” in 2015 for the work done by ScottishPower in peatland restoration.

"Iberdrola has incorporated into its strategy the Sustainable Development Goals (SDG) defined by the United Nations for 2030".

All actions included in this Biodiversity Report are part of Iberdrola's Social Dividend, a concept incorporated in their Articles of Association, which summarise the company's contribution to society in fields such as training, innovation, social action and art and culture.

Iberdrola also has major future plans to continue contributing towards improving the environment and the fight against climate change. Thus, after having reduced carbon dioxide emissions by 75% in the last fifteen years, we are committed to achieving a reduction of 30% in specific emissions by 2030 with respect to 2007 levels.

Thanks to the professionalism and dedication of our employees, Iberdrola will continue to act responsibly, respecting the environment and promoting the sustainable economic and social development of all regions in which it is present.

Ignacio S. Galán
Chairman of IBERDROLA

"Nature and humanity, threatened by the extinction of species"

1. Introduction

A reduction and deterioration of ecosystem services entail a loss of biodiversity, directly affecting the economic and social system as we know it, which guarantees the availability of food, human health, and a steady supply of healthy air and water.

For Iberdrola, the enhancement of biodiversity value and its sustainable management is a high importance matter from which a wide range of benefits and economic opportunities can be obtained, as stated in the TEEB report - *"The Economics of Ecosystems and Biodiversity"*: "If companies efficiently manage the risks associated with biodiversity through their business management, they may benefit from a competitive advantage when accessing markets, capital and resources".

2.

Background and current situation

The latest message issued by the Secretary General of the United Nations in 2016 regarding Biodiversity, stated that "despite the multiple commitments undertaken, the loss of biodiversity is still accelerating in all regions. Only 15% of countries are in a suitable situation to reach the Aichi Biodiversity Targets before 2020, the date set to achieve them."

Ecosystems have the capacity to adapt to changes and absorb impacts. Throughout history they have been transformed by the action of man, but in the last 100 years this transformation has been faster and more extensive than in any other comparable period. As a result, the Earth's biodiversity has been considerably impoverished. According to the **International Union for the Conservation of Nature (IUCN)**, the extinction rate of species over the last century has been one thousand times higher than its natural rate, as a result of the increasing impact of human activities. The extinction of species threatens not just nature, but humanity itself. All living beings, including humans, depend on biodiversity and the natural resources such diversity provides, and therefore different countries, companies and organisations have come together to try to reach agreements to halt such deterioration.

1992: Rio Earth Summit – Goal: To draft the Convention on Biological Diversity (CBD) / Signature from more than 150 countries.

- The CBD acknowledges that the preservation of biological diversity is a common concern for humanity and is part of the development process.
- The CBD includes all ecosystems, species and genetic resources, defined as all biological material of animal, plant or microbial origin, of actual or potential value, containing inherited functional units.
- The CBD drove the elaboration and implementation of related national strategies and action plans for identifying, preserving and protecting existing biological diversity, as well as for improving it as far as possible.
- Each country that signed the CBD assumed the obligation to draft a national strategy for the preservation and sustainable use of biological diversity.

1994: First Meeting of the Conference of the Parties (COP) in the Convention on Biological Diversity (CBD).

- Since the CBD was adopted in December 1993, the COP has held 13 ordinary meetings and 400 decisions have been made. It is the Convention's highest governing body for decision making regarding biodiversity, and brings together the representatives from the member countries and the key players in charge of promoting the application of the Convention.

2002: Earth Summit in Johannesburg – Goal: to significantly reduce the rate of loss of biodiversity for 2010.

2009: The Secretary General of the United Nations, Ban Ki-Moon, confirms that the goal set for 2010 has not been met.

2010: International Year of Biodiversity - Convention on Biological Diversity in Nagoya. Goal: To approve the Strategic Plan for Biological Diversity 2011-2020

- The Strategic Plan is defined in 5 strategic goals and 20 ambitious but unattainable targets known as the Aichi Targets.
- To inspire large scale actions in all countries and parties interested in supporting biological diversity during the coming decade, declaring the period 2011-2020 as the United Nations Decade on Biodiversity.

2012: Convention on Biological Diversity in Hyderabad. Goal: To promote and review the degree of implementation of the Strategic Plan by the countries in their National strategies and Action Plans for industry.

2015: General Assembly of the United Nations. Goal: To adopt the 2030 Agenda for Sustainable Development.

- "Biodiversity is included as an important cross-sectional issue in the 2030 Agenda for Sustainable Development. Goal fifteen explicitly recognises the importance of halting the loss of biodiversity, and other Goals recognise the importance of biodiversity in eliminating poverty, supplying food and fresh water and improving quality of life in cities."

Despite all these initiatives, this message, issued in 2016 by the Secretary General of the United Nations regarding biodiversity, states that "*despite the multiple commitments undertaken, the loss of biodiversity is still accelerating in all regions. Only 15% of countries are in a suitable situation to reach the Aichi Biodiversity Targets before 2020, the date set to achieve them.*"

Iberdrola is aware of this problem and, consistent with its historic commitment to sustainable development, the defence and protection of the environment, it considers that respect for biodiversity and ecosystem services must assume a leading role within its corporate strategy. Consequently, Iberdrola has followed a *Biodiversity Policy* for years, in which the company not only commits to consider the effects on the natural capital during planning, implementation and operation of our energy infrastructures, but also to create a social culture oriented towards raising awareness on this matter. This policy is applicable throughout all business units and regions in which the Company operates.

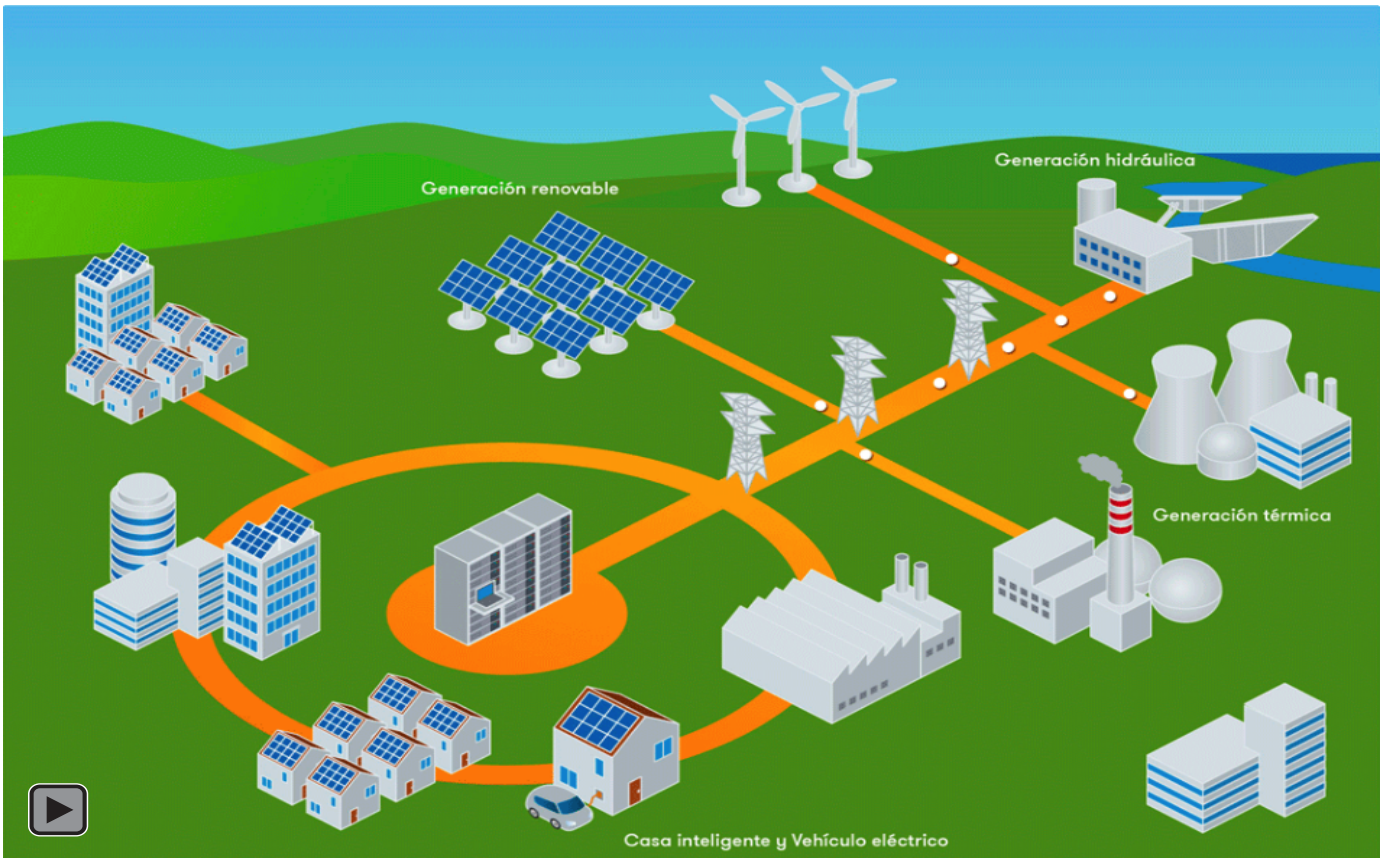
Fostering economic and social development, respect for the environment and promoting biodiversity are Iberdrola's main corporate which are aligned with Sustainable Development goals thirteen, fourteen and fifteen.

3.

Interaction with biodiversity

"To mitigate the impact on the natural capital around existing facilities and to minimise it in any facilities built in the future"

Adequate infrastructures, which must be built, operated and maintained, are needed to generate, transport, distribute and supply energy to meet the needs of the company's customers.



These infrastructures include thermal power stations, reservoirs, hydro plants, wind farms, substations and underground or overhead power lines. These facilities and structures can be located on remote hills, in forests or on coasts, even in the middle of cities.

The company works to minimise the impact that its infrastructures may have on the natural capital and biodiversity.

The Group's main projects in energy infrastructure are performed with the participation of Iberdrola Engineering and Building, which carries out environmental impact studies and the monitoring of the conditions of impacts, and also introduces good environmental practices with a systematic approach and methods:

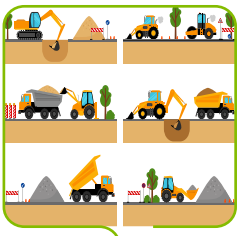
- Before starting the official application for consent.
- During planning process
- While conducting work to carry out the project.
- During the operation and maintenance phases.

IBERDROLA: dentifies, minimises or where possible, prevents the most significant impacts on biodiversity

Effects depending on the life stage of the facilities

In order to correctly prevent, minimise and correct any possible effects that may be generated from each business and globally, we identify the most significant general effects on biodiversity. These effects derive from the activities, goods and services of the Group identified during the different life stages of the facilities:

Construction stage



- Introduction of vehicles and machinery.
- Opening of roads and disturbance of vegetation cover.
- Extended human presence (which temporarily affects the behaviour of wildlife species and is generally reversible).
- Changes to the landscape.

Maintenance and operation stage

- Greenhouse gas emissions.
- Changes to the natural regime of rivers and barrier effect in cases of hydroelectric plants (which affect the ecosystems and habitats of certain species).
- Animal mortality from collisions and electrocution.
- Disturbance to vegetation for maintenance of power line roads, etc.
- Generation of spills and discharges.

Decommissioning phase

- Use of machinery and vehicles for removing and demolition of existing facilities.
- Extended human presence (which temporarily affects the behaviour of wildlife species and is generally reversible).

Analysis of possible environmental impact

In accordance with environmental regulation, we undertake environmental impact assessment and public consultations, working together with the stakeholders and attempting to minimise a project's environmental impact.

An evaluation of the possible environmental impact is made before starting the construction of an installation, focusing on avoiding locating new infrastructures in protected areas or areas of high biodiversity value. If significant effects are identified the project is adapted as far as possible, adopting the best available techniques and measures for minimising and mitigating such effects.

If these effects cannot be entirely eliminated, compensatory measures are taken. The control of environmental impacts does not stop after the installation has been built, but continues during the stages of operation and decomissioning thereof, with environmental monitoring and control plans and management systems being established and implemented, most of these following Standard ISO 14001 Eco-Management and Audit Scheme to prevent and control environmental risks.

Impacts and solutions

The 5 great pressures affecting biodiversity are climate change, habitat loss, over-exploitation, contamination and invasive exotic species. By analysing these pressures and the effects inherent in the Group's activity we can identify significant potential impacts on biodiversity derived from the activities, goods and services of the Group:

Potential impacts

General effects	Effect on birds	Effect on land wildlife	Effect on fish	Effect on flora
• Habitat and species loss. • Climate change. • Contamination of the environment.	• Population loss from electrocution. • Population loss from collisions.	• Population loss from electrocution, trapping, etc.	• Contamination by changes in water quality. • Contamination from discharges/ spills into the water systems.	• Habitat loss from the generation and spreading of fire. • Losses from soil erosion.

Iberdrola is aware of the potential impact of its activity on biodiversity and ecosystem services and thus takes all necessary measures to prevent or minimise such impact.

Knowing the interactions with biodiversity and ecosystem services derived from the impact of our activity has provided an objective tool. This tool allows us to choose specific issues in order to perform a qualitative assessment of any damage and biodiversity loss derived from the Group's activity from the measures listed below:

Global measure: Fight against climate change.

The company has made a commitment in all countries in which it is present to fight against climate change, and work to stay among the largest companies with the least CO_2 emissions per kWh produced. The company focuses its efforts on gradually reducing its greenhouse gas emissions, promoting renewable sources and using the most efficient technology available. Iberdrola has specifically set itself the following environmental goals for the coming decades: to reduce the intensity of CO_2 emissions by 30% by 2020 with respect to the specific emissions of the company in 2007; to place its emissions below 150 grams per kWh in 2030, which figure would be 50% less than the specific emissions of the company in 2007; and to be carbon neutral by 2050.

Local measure: Prevent the loss of habitats and species.

A suitable habitat is critical to ensure the survival success of local species, and thus Iberdrola seeks and implements the best techniques available to preserve or improve the habitats surrounding its facilities. We seek to:

1. Prevent soil acidification, respecting the specific vegetation in areas in which we operate or replanting with local species as an integral part of restoration schemes which respect the characteristics of the affected environment.
2. To minimise the risk of losses from soil erosion via an adequate maintenance of the facilities which might include action to prevent fire, proactive management of vegetation and significant tree loss.

For new projects, we seek the optimal layout from the environmental and operational points of view, avoiding new projects and installations in protected areas or areas of high ecological value and minimising land use as much as possible.

Technology does not have to be in conflict with the presence and survival of species, which is why Iberdrola is studying and adapting its oldest facilities that may directly affect the wildlife and habitats of the surrounding environment, promoting environmentally friendly and safe technologies.

Local measure: Prevent contamination.

Problems of eutrophication and ecotoxicity are derived from contamination. Iberdrola seeks to prevent contamination of soil and water systems which sustain life on earth. Amongst its main environmental goals is to prevent contamination from spills or discharges. To do this, in businesses across the Group implement numerous preventive actions, defined via the organisation and technical manuals, such as safety and containment measures to prevent damage. The yearly plans for each company in the Group include the provision of facilities for oil collection in the event of a massive spill in substations and transformer stations, the waterproofing of vats and/or the installation of containment barriers in sensitive environments.

Iberdrola seeks and implements the best available techniques to preserve or improve the habitats in the surroundings of its facilities

3.1 Projects and infrastructures

Spain

"We ensure environmental success"

Most energy infrastructure projects are subjected to an environmental impact assessment. The studies will also consider the socioeconomic impact of these projects.

Before officially starting any administrative processes, Iberdrola develops the steps required for the correct management of the work within the framework of the Iberdrola Environmental Management System, certified UNE/EN/ISO 14001:2004:

1. It systematically sends a report of the project to a wide group of institutions and NGOs that may be interested in it.
2. It identifies and documents legal aspects and other voluntary recommendations and good practices.
3. It implements the necessary criteria for environmental protection: measures to be applied during construction, demands for contractors and compliance with these measures and checks on site through monitoring.

In addition, the business units responsible for the infrastructure have a defined organisation which track the conditions of the environmental impact declaration throughout the planning and construction stages and during monitoring.

This system ensures a double control of these projects: by the owner (business unit responsible for the infrastructure) and by Iberdrola Ingeniería y Construcción.

United Kingdom

"Joint work with the stakeholders to find the perfect location"

The selection of locations and the administration of land for new projects are critical, and therefore ScottishPower is committed to collaborate with representatives and stakeholders in consultation processes for relevant projects. In this sense, it consults with the communities that may be affected by the activity, providing channels to contribute their point of view, giving them the opportunity to participate in the project's planning process. In large facilities near populated areas, Local Coordination Committees and visitor centres are also set up so that the local population or any person can attend and get to know the activity carried out by the company.

Specific policies have been formulated for the laying of new overhead power lines in the United Kingdom in order to guarantee that the installation of distribution and transmission overhead lines is carried out in an environmentally-friendly manner. This approach includes:

- Consultation with the population, land owners, statutory consultees like Scottish Natural Heritage and NGOs such as the Royal Society for the Protection of Birds (RSPB).
- Ensuring that the projects are carefully planned avoiding areas in which we may deteriorate landscapes that are especially sensitive, or of special ecological or heritage value.
- Reducing the impact of the company's activity in areas of high ecological value and adopting new techniques to result in net positive outcomes.

For the development of wind farms in the UK, there are policies, guidance and advice available from government and regulators which seek to minimise and mitigate the impacts of infrastructure upon sensitive environmental and other receptors.

United States

"Commitment, acting with environmental sustainability"

The Networks Business has a program the main goal of which is to meet and exceed stakeholder expectations in their actions regarding the environment. To achieve this they have established a systematic framework to ensure that this commitment is integrated into existing and future operations in the business functions, communications, associations and infrastructures of the entire organisation, based on:

- Knowledge and training on the environmental impact of works.
- Policies on activities with an impact on compliance and environmental sustainability.
- Establishment of corrective/ preventive action processes.
- Evaluation and analysis of risks through audits.
- Benchmarking with other utilities processes and procedures of the United States through the active participation in organisations such as USWAG (*Utilities Solid Waste Activities Group*).

The Renewable Energies Business integrates the Corporate Policy on Biodiversity and establishes a process for maintaining relationships with agencies and NGOs close to the sites for evaluation of the projects in their different stages. It has participated in the drafting of the guide for the implementation of wind farms of the "*US Fish and Wildlife Service*", which is committed to the protection of biodiversity. For more information, the plan is available on our subsidiary's website ⊙.

Mexico ⊙

"Support, improvement and care of biodiversity for the entire life cycle of the facilities"

In line with the Group policies in Mexico, we promote projects for support of biodiversity protection, such that measures are implemented both in the steps prior to construction of facilities as well as during the operation phase.

In the prior steps of the projects with a strict alignment with the conditions established by the authorities:

1. Biodiversity studies are carried out in the areas in which future facilities will be built in order to have extensive knowledge of the species found in the surroundings of the facilities and their conservation status.
2. Vegetation and wildlife rescue programs are carried out, relocating species of special interest from the point of view of biodiversity.

During the operation phase we take into account specific projects for support of species protection, specifically in the area of Altamira.

Brazil ⊙

"Our motto: to preserve the environment"

In Brazil our environmental impacts are assessed in the development of all operations. Our commitment with preservation of the environment is essential, since 80% of the conservation units of Sao Paolo lie within our license area.

- The projects for the construction of the company's power transmission lines and substations prioritise the definition of roads and lands with the least disturbance to vegetation and wildlife.
- The Company strictly observes all current legislation and does not start any activity without first obtaining all required environmental permits.
- Environmental Management System, certified under standard ISO 14001 since 2003, it also promotes actions related to environmental awareness-raising and conservation, as well as involving employees and communities.

The guidelines imposed by the environmental impact declarations are followed in order to guarantee the preservation of the environment and compliance with environmental legislation and regulations via the implementation of actions to prevent contamination and always seeking to improve environmental performance.

3.2 Occupation of protected areas

The presence of around 23,000 km of electrical distribution lines and 22,500 ha of power generation facilities in protected areas involve direct interaction with several habitats, such as temperate heaths and scrubland, sclerophyll forest, natural and semi-natural grass formations, high peatlands, fens and mires and swampy areas, forests, etc. and species such as the Iberian imperial eagle, the red kite, Bonelli's eagle, the lesser kestrel, the hen harrier, the wood grouse, etc.

Amongst the activities carried out within the Group, the infrastructures that take up most land are reservoirs, the power line layout and wind farms. One of the main criteria in the decision making when choosing an area for locating a new infrastructure is to avoid areas with any kind of conservation restrictions. The presence of any infrastructures in such areas is normally a reflection of the construction date which predates the designation.

Spain

The presence of reservoirs in protected areas entails 68.1% of the total surface occupied by such reservoirs. **Within biosphere reserves, national parks, Ramsar wetlands and natural parks, these reservoirs represent 1.15% of the surface of these protected areas.**

Reservoir occupation in protected areas•

Space type	Site name/surface area (ha)	Autonomous Region	Reservoir	Surface area of the reservoir present in the natural site (ha)	Ratio reservoir/ natural area
Biosphere Reserve	**330,460**			**2,365**	**0.72%**
	Monfragüe/ 116,160	Extremadura	Torrejón-Tajo, Torrejón-Tietar, Alcántara	2,301	1.98%
	Cazorla, Segura and Las Villas mountain ranges/ 214,300	Andalusia	La Vieja, Anchuricas	64	0.03%
National Parks	**18,396**			**1,135**	
	Monfragüe/ 18,396	Extremadura	Torrejón-Tajo, Torrejón-Tietar, Alcántara	1,135	
RAMSAR wetlands	**397**			**298**	**75.00 %**
	Ullibarri reservoir tail bay/ 397	Basque Country	Ullibarri	298	100.00 %
Natural Parks*	**136,965**			**3,696**	**1.97 %**
	Cazorla, Segura and Las Villas mountain ranges / 209.920	Andalusia	La Vieja, Anchuricas	64	-
	Montes Invernadeiro/ 5,722	Galicia	Las Portas	93	1.63%
	Arribes del Duero /106.105	Castile and León	Villalcampo, Castro, Aldeadávila and Saucelle	1,203	1.13 %
	Tajo Internacional /25,088	Extremadura	Cedillo	1,400	5.58 %

• We are not counting the natural areas of the Monfragüe National Park since the largest surface area, which has been declared a Biosphere Reserve, is already reflected.

For other technologies, we highlight that the Cofrentes nuclear power plant is located within the Natura 2000 network. The protected areas are the SCI[1]: Muela de Cortes and Croig and SPA: Sierra de Martés - Muela de Cortes.

In the case of wind farms, we operate in land included within the Natura 2000 network. **Of the 23,120,967 hectares of the Natura network in Spain, wind farms occupy 139.14 hectares of the network, which is 0.0006% of the surface area.** This reflects the small surface area occupied by wind farms in the network.

Because wind farms were built subsequently to the declaration of protected areas at national or regional level, and this circumstance has restricted project development in these areas.

In recent years we have not extended the surface area of facilities in protected areas.

Occupation of protected areas

Facility	Location with respect to the protected area	Affected Surface/ Length	Type of protection[1]
Reservoirs	Inside	18,972 ha	Biosphere reserves, Ramsar Wetlands, Natura 2000 network, National Parks and Natural Parks.
Power lines	Inside	19,334 km (16.93 %)	Natura 2000 network, Ramsar Wetlands, National Parks, Natural Parks, Biosphere Reserves.
Substations	Inside	146 facilities (15.32% of total facilities)	
Transformer stations	Inside	8,395 centres (8.86% of total facilities)	
Wind farms	Inside	139 ha	Natura 2000 network (insignificant presence with respect to the total, and always after construction of the wind farm. There are also some mini-hydro stations).

1. Designations of the main protected areas:
SPA: Special Protection Area for Birds, according to the EC Birds Directive. **SCI**: Site of Community Importance, according to the EC Habitats Directive. **SAC**: Special Area of Conservation, according to the EC Habitats Directive. **Ramsar**: Wetlands of international importance, according to the Convention signed in Ramsar.

United Kingdom

Scottishpower has significant properties in twelve production centres in Scotland and England, from the Ben Cruachan highlands to the Damhead marshlands. Many of the centres are located within or close to areas that have been recognised for their importance for biodiversity and have obtained legal protection for their habitats and species. We estimate that 41% of the land associated to thermal and hydro power plants lies within protected areas. This includes three Ramsar[1] designations, five special protection areas, three special areas of conservation and thirteen sites of special scientific interest. Especially important is the Galloway hydroelectric complex, exposed to 11 protected areas, a reflection of the wide surface area it covers in the south west of Scotland.

There are two wind farms in Scotland adjacent to the Natura 2000 network, Clachan Flats and Arecleoch. In England, the repowered Carland Cross windfarm is located next to an SAC area and an SSSI[1] area. The majority of windfarms within ScottishPower's portfolio are located within peatland habitat. Thirteen of these windfarms have Habitat Management Plans which specifically aim to deliver peatland restoration. Peatland is a habitat that is included within the UK's Priority Biodiversity Action Plan and in Appendix 1 of the EU Habitats Directive.

Occupation of protected areas

Facility	Location with respect to the protected area	Affected Surface/ Length	Type of protection[1]
Thermal and hydro power plants:	Inside or near	3,264 ha (12 production centres)	Ramsar wetlands, SPA, SAC and SSSI.
Power lines	Inside	3,674 km (10.45%)	
Substations and transformer stations.	Inside	8,970 facilities (7.69% of centres)	
Wind farms	Adjacent	3 ha	Natura 2000 network and SAC, SSSI.
	Partially inside	8,734 ha	

1. Designations of the main protected areas:
SPA: Special Protection Area for Birds, according to the EC Birds Directive. **SCI**: Site of Community Importance, according to the EC Habitats Directive. **SAC**: Special Area of Conservation, according to the EC Habitats Directive. **Ramsar**: Wetlands of international importance, according to the Convention signed in Ramsar. **SSSI**: *Site of special scientific interest* **NSA**: *National scenic areas*. **NNR**: *National nature reserve*.

United States

There are no wind farms in protected environments. The extension of high voltage power lines (115 kV or more) from the subsidiaries NYSEG, RG&G and CMP is of 5,832 kilometres, of which 7% lie next to or cross protected areas (402 km). Of which NYSEG has a total of 3,529 km of transmission lines of 115 kV or more. Approximately 382 km (12%) of these are adjacent to or cross protected areas with high biodiversity. These areas include the State of New York Adirondack Park and Forest Preserve (72 km), the State of New York Catskill Park and Forest Preserve (57 km) and Champlain - Adirondack UN Biosphere Reserve (210 km).

The CMP subsidiary has a total of 1,900 km of transmission lines of 115 kV or more. Approximately 18 km (1%) of these are adjacent to or cross protected areas. The RG&E subsidiary has a total of 403 km of transmission lines of 115 kV or more. Approximately 2.1 km (0.52%) of these are adjacent to or cross protected areas with high biodiversity. The only protected area crossed by these power lines is *NYS Letchworth Park*.

Occupation of protected areas

Facility	Location with respect to the protected area	Affected Surface/ Length	Type of protection
Power lines	Partially inside	402 km (7 %)	Protected areas designated by Federal or State governments, which may be Biosphere Reserves, National Parks, forests and national wildlife refuges and those that have a high ecological value without having such protection.

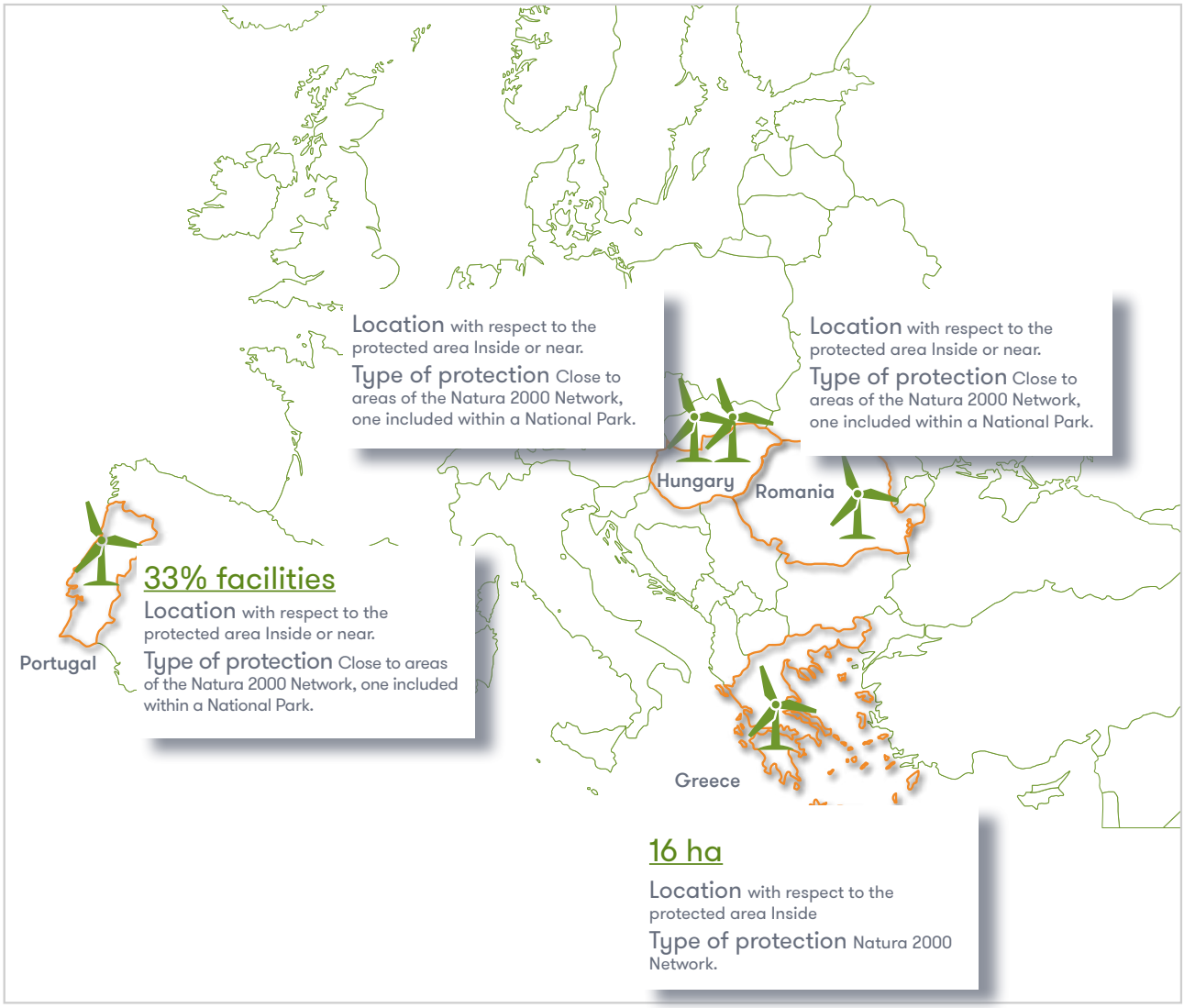
Brazil

For Brazil's electrical distribution business, of the 228 municipalities in Elektro's license area, 24 of these are considered high biodiversity areas, which is about 10%. Amongst these, according to the Ministry for the Environment, the Cerrado is the second largest biome in South America, considered a global biodiversity hotspot, with an extreme abundance of endemic species and occupying a surface of 2,036,448 km^2, approximately 22% of the country.

Occupation of protected areas

Facility	Location with respect to the protected area	Affected Surface/ Length	Type of protection[1]
Power lines	Inside	1,881 Km	Areas of environmental protection
Substations	Inside	19 facilities (13.4 % of total facilities)	
Transformer stations	Inside	4,388 centres (2 % of total facilities)	
Hydroelectric power plants	Inside or near	6,876 ha	Legal Reserve; Private Natural Heritage Reserve (RPPN).

Other countries



Twin Buttes wind farm
/ Colorado
© Iberdrola, S.A.

4.

Conservation principle and management approach

"Iberdrola Group undertakes to protect the biodiversity of the ecosystems, landscapes and species where it operates, and to raise awareness amongst society about the importance of this issue and about how people can help to preserve it."

Main instruments for **BIODIVERSITY** protection

- *Biodiversity Policy*
- Biodiversity Pact
- Monitoring and control plans
- Positive conservation management

The Earth's natural assets are not only essential for the development of biological diversity, but are also fundamental for the economic and social progress of humanity. There is therefore an inevitable direct and indirect interaction between the activity of the Group and biodiversity. As described in the previous chapter, Iberdrola is aware of the possible interactions and impacts that it may have with respect to the environment, and therefore establishes as its goal the sustainable development of its activity and new projects, such that they may coexist in equilibrium, preserving and protecting the natural heritage.

The development of energy generation, distribution and marketing activities produces interactions with several ecosystems, landscapes and species throughout their entire life-cycle. These ecosystems are thus central to the business strategy through four priority lines of action:

- Mediation for the protection, conservation and sustainable use of the natural capital.
- Information via impact assessments and the development and application of biodiversity guidelines for new projects.
- Relationship with the stakeholders.
- Commitment to train, raise awareness and communicate with stakeholders, both internally and externally.

Biodiversity and ecosystems play a leading role in the company's business strategy, for which several instruments are in place:

- The *Biodiversity Policy*, approved and implemented by the company undertakes to integrate biodiversity in its decision-making processes, in particular when designing and building new infrastructures and to include it in our environment management, training, collaboration and information systems. In addition to this policy, whose scope of application is the entire geographical ambit in which Iberdrola operates.
- Environmental management model for the implementation of management systems through procedures, process and action plans, most of these certified according to standards ISO 14001 or EMAS to prevent and control environmental risks.
- The Biodiversity Agreement, of which Iberdrola has been a member since 2013 and which is promoted by the Biodiversity Foundation, dependent on the Ministry of Agriculture, Food and the Environment of Spain, is intended to show our commitment with conservation of the environment and the sustainable use of biodiversity.
- The Organisation Environmental Footprint (OEF), which defines the Group's impact

on biodiversity. The OEF encompasses all our business and allows us to know the effects of each technology on biodiversity. Combined with the methodology for the assessment of ecosystem services (REIS, USAL Project), it allows us to determine goals for improvement:

- Direct effects on biodiversity: plans for the protection of wildlife (Eurasian eagle-owl, Bonelli's eagle, Cantabrian capercaillie, etc.), of flora (Mediterranean forests, indigenous species, etc.) and the management of specific habitats (wetlands, etc.).
- Indirect effects on the ecosystems: management plans for the water environment (effluent control, preventive measures for spills and discharges), for the soil (preventive measures for spills) and specific biodiversity management plans.

- *Policy on relations with stakeholders* approved by the Board of Directors.
- Environmental impact studies before construction, using mechanisms for the analysis and prevention of impacts that take into account several alternatives and establish corrective measures to prevent, mitigate or compensate any possible damage.
- Protection of species and habitats by applying a positive conservation management and research of locations and their surroundings. All actions, both regulatory and voluntary, have the goal of obtaining a positive net balance in our relationship with the environment.

Biodiversity
Velilla Río Carrión Thermal Plant USAL_2015

"Iberdrola has been a member of the Biodiversity Pact since 2013, as evidence of its commitment to conservation of the environment and the sustainable use of biodiversity"

5.

Actions by Iberdrola in the main regions

"Through programs and action plans, together with continuous management, Iberdrola seeks to avoid, mitigate and minimise any impact on biodiversity"

5.1

Action plans

All aspects related to biodiversity are managed through four main lines of action:

- **Mediation** for the protection, conservation and sustainable use of environmental resources (air, water, soils, wildlife, flora and landscape).
- **Information** via impact assessments and the development and application of biodiversity guidelines for new projects.
- Relationship with the stakeholders.
- Commitment to train, raise awareness and communicate both internally and externally.

These lines of action include the basic principles of action defined in the *Biodiversity Policy* and are carried out by specific actions that are classified into the following categories:

- **Impact assessment:** includes pre-construction studies, monitoring during and after construction as well as studies on specific species as explained in the previous chapter.
- **Prevent and/or mitigate the impact** and **restoration** of natural resources: includes preventive, palliative and compensatory actions to contribute towards the fight against climate change, prevent the loss of habitat and species and prevent contamination.
- **Awareness-raising and communication:** includes internal and external training and education, awards, publications, cooperation actions, sponsorship and financing, etc.

The monitoring of wildlife and vegetation, especially of native species, is a key action that allows us to know how successful our work is.

Iberdrola has been carrying out biodiversity programs and plans for many years. **These actions are performed during the entire life cycle of the project,** adapting the actions to be performed during the construction, operation and decommissioning phases.

The goal is to protect the species and habitats or to mitigate the damage caused to such species and habitats. Iberdrola carries out different actions depending on the needs of each project, such as monitoring of wildlife and vegetation, especially for protected or vulnerable species, forestry treatments, forest restoration with native species, landscape integration and adaptation, etc. These actions follow the lines of action described above and may be organised into a set of plans:

Biodiversity plans

Cross-sectional plan	Sub-plan for knowledge of the environment
	Sub-communications plan
Main plans - Reduction of direct impacts on biodiversity	Plan for the direct protection of wildlife
	Plan for the direct protection of vegetation
	Plan for the improvement of habitats
Main plans - Reduction of indirect impacts on biodiversity	Plan for soil management
	Plan for water management

New England cottontail (*Sylvilagus transitionalis*)

Actions by Iberdrola

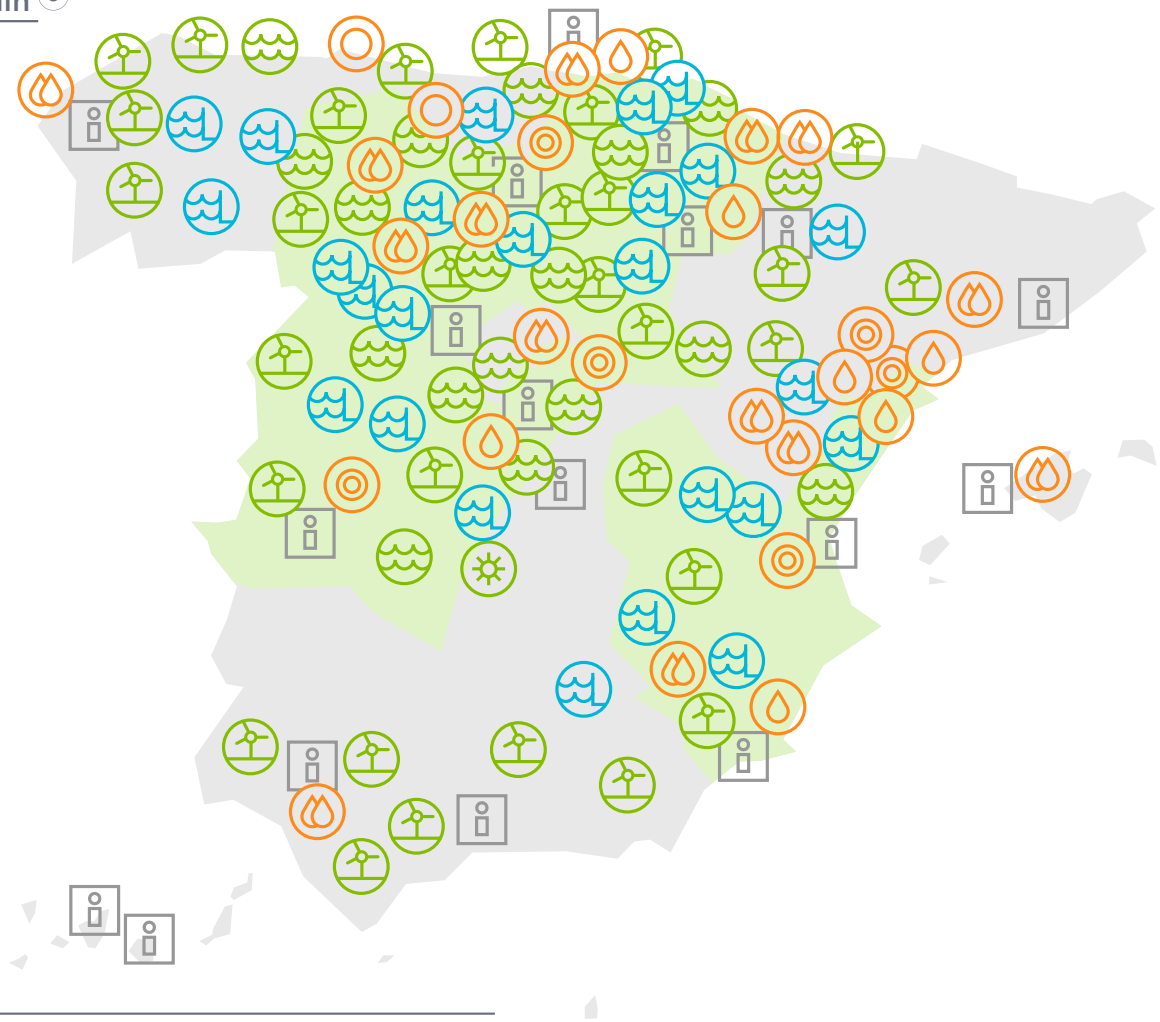

United Kingdom
Portugal
Spain

5.2

Restoration of habitats and protection of species

Iberdrola carries out different actions in order to protect or restore the different habitats affected or in the surroundings of the Group's facilities represented by different categories of the **Action plans**. Some of the most important milestones are included below:

5.2.1 Spain



Main facilities

195 **Wind farms**
5,751 MW

89 **Mini-hydroelectric plants**
303 MW

1 **Thermosolar plant**
50 MW

8 **Gas-fired combined cycle power plants**
5,695 MW

20 **Cogeneration plants**
364 MW

6 **Nuclear power plants**
3,410 MW

2 **Thermal power stations**
874 MW

79 **Hydroelectric plants**
9,715 MW

Main offices

Area of influence

Electricity distribution

Actions

- Implementation of actions to avoid and mitigate the impact of possible spills and construction of reservoirs in substations.
- Implementation of preventive actions for the protection of wildlife (modification and adaptation of supports).
- Implementation of actions for improvement of the vegetation protection network.
- Management of km^2 of planted surface area to reduce the risk of fire in our facilities.

Goals

- To reduce the impact on soil and water systems.
- To reduce the impact on wildlife.
- To reduce the impact on vegetation.
- To prevent impact on habitats.

Vegetation management work

Protective elements installed for birdlife

As an example of the safety and contention measures to mitigate damage from spills, we highlight those carried out in Spain, where more than 1000 preventive actions have been executed to prevent and mitigate the impact of possible spills. These include the building of 41 reservoirs for oil collection in the event of massive spills in the substations and transformer stations, or the waterproofing of basins.

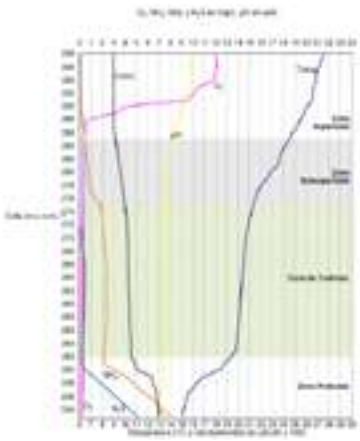
"To avoid and/or mitigate the impact and to restore the natural capital through preventive, and compensatory measures"

Actions

- Limnological control of the most eutrophicated reservoirs (contaminating loads inputed by agents other than Iberdrola that travel along these river courses before reaching the reservoirs) in the Duero and Tajo catchments.
- Ensure that the water that passes through the turbines contains the minimum essential concentrations of dissolved oxygen required for aquatic life.
- Forest restoration in the affected areas. During expansion of the hydro plant of San Esteban, the old quarry and slag heap were recovered with native species such as yew (*Taxus baccata*), oak (*Quercur robur*), birch (*Beluta celtibérica*), heather (*Erica arborea*), mountain ash (Sorbus aucuparia), etc., monitoring of habitat and wildlife loss and the monitoring of birds of prey, among other actions.

Goals

- To prevent possible impacts on the wildlife located downstream from the reservoirs.
- To avoid harmful values for fish.
- To avoid impact on habitats.



Limnological control graph

Limnological control - Valdecañas 1

Forest restoration - San Esteban

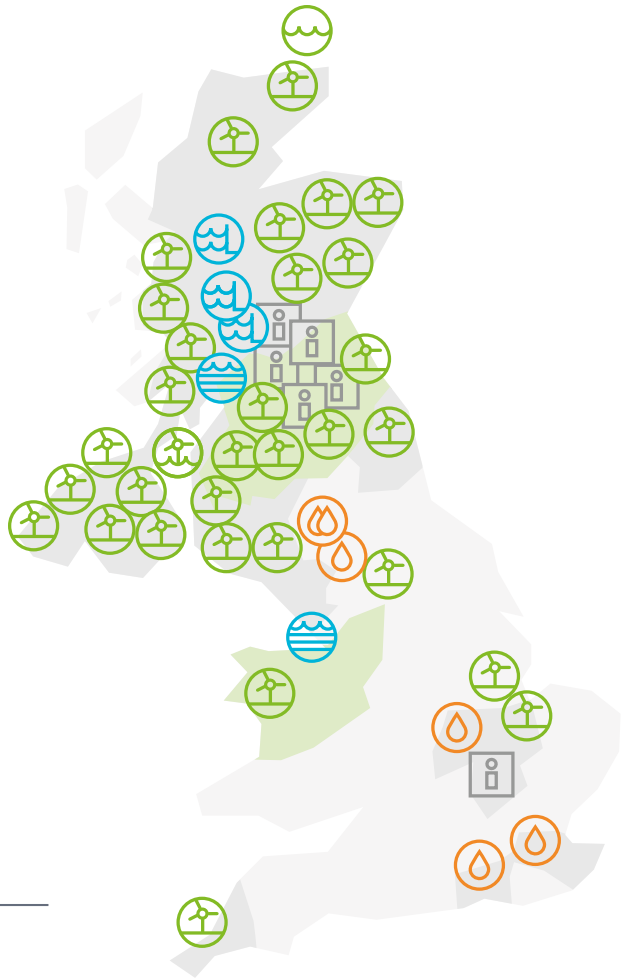
Actions

- Tracking of land wildlife, birds and bats, as well as restoration at the wind farm sites.
- Monitoring of high voltage evacuation power lines.

Goals

- To prevent possible impacts on wildlife.

5.2.2 United Kingdom



Main facilities

32 Wind farms
1,811 MW

1 Offshore wind farm
194 MW

1 Cogeneration power plant
1 MW

4 Gas-fired combined cycle power plants
1,967 MW

3 Hydroelectric power plants
563 MW

1 Submarine power line
425 Km

Main offices

Area of influence

Electricity distribution

In the UK there are specific *Biodiversity Action Plans* (BAP) for each generation facility and we work in close partnership with NGOs and volunteer programs. These BAPs define the goals for maintaining and improving wildlife habitats in adjacent lands, aiming to:

- Provide natural and artificial refuges for several types of birds and bats and to favour the availability of food.
- To promote habitat conservation for the development of singular species of flora and fauna.
- To improve the management of tree species and forests.
- To develop aquatic habitats.
- To control animal pests and diseases.
- To limit and implement good practices in the use of herbicides.
- To schedule work minimising impact during the breeding season.
- To educate personnel about environmental issues.
- To facilitate passage of fish (fish steps, installation of counters to monitor the number of specimens using them...).

"Wrexham Industrial Estate Living Landscape" Project

Actions

- Treatment of an area of up to 10 ha by the establishment of a suitable plant cover to promote the survival of the Grizzled Skipper (*Pyrgus malvae*) and Dingy Skipper (*Erynnis tages*) butterflies, which have been observed in the restored areas. Species such as the water vole (*Arvicola terrestris*), otter (*Lutra lutra*) and the crested newt (*Triturus cristatus*) have also been observed.
- Installation of nest boxes for woodpeckers, bats and owls through volunteer programs.

Goals

- To improve the habitat, favouring the establishment of native species and to raise social awareness regarding the high biodiversity.

Project:
"Wrexham Industrial Estate Living Landscape"

Grizzled Skipper butterfly *(Pyrgus malvae)*

Dingy Skipper butterfly *(Erynnis tages)*

Nesting boxes for woodpeckers

"Meres and Mosses Nature Improvement Area (NIA)"

Actions

- Preparation of improvement plans for four areas of interest to mitigate road landslide.
- Creation of wetlands in an area in which another type of restoration was unsuccessful.
- Records of several species, such as dragonflies, crayfish, mammals, aquatic beetles, etc. in order to improve knowledge of the project area.
- Detection of the proliferation of several specific species of the area such as the black poplar (*Populus nigra*), otter (*Lutra lutra*), viper (*Vipeira berus*) and the great crested newt (*Triturus cristatus*).

Goals

- To improve the habitat, favouring the establishment of native species and to raise social awareness of the rich biodiversity of the environment.

Project: **"Meres and Mosses Nature Improvement Area (NIA)"**

Viper (*Vipeira berus*)

Great crested newt (*Triturus cristatus*)

Project: "Beauly Denny"

Actions

- Recovery of 190 ha of peatlands in collaboration with different local stakeholders.
- Elimination and removal of weeds and invasive species.
- Recovery of local species such as cottongrass (*Eriophorum angustifolium*), moss (*Sphagnum fimbriatum*), and fire-resistant species.
- Creation of ponds, favouring the accumulation of water.
- Recording of 650 species (mainly invertebrates) including the *Heliophanus damfi* spider.

Goals

- To improve the habitat, favouring native species and to raise social awareness of the rich biodiversity of the environment.
- To restore a cost-effective carbon sink to combat climate change, improve water retention and a reduction of fire risk.

Project: **"Beauly Denny"**

Moss (*Sphagnum fimbriatum*)

Surroundings of Damhead Creek

Actions

- Adaptation of 32 ha in the surrounding environment of the plant.
- Cleaning of a drainage channel known as the Berry Wiggins drain.
- Conduction of surveys and presentation of findings, successfully concluding the works of channel clearance and the restoration of areas.

Goals

- To improve the condition of wetlands, coastal pastures and forest and scrubland areas.
- To create a suitable habitat for the water vole.

Water vole

Surroundings of Galloway

Actions

- Study of the habitat and movement of fish along the riverbed.
- Installation of antennas at the Loch Doon fish pass to monitor the migration of marked Atlantic Salmon.
- Works for controlling the colonies of invasive non-native signal crayfish (*Pacifastacus leniusculus*), a species with the capacity to displace native species.

Goals

- To eliminate possible obstacles, favouring the migration of Atlantic salmon and other species.
- To promote the presence of the European eel (*Anguilla anguilla*).

Galloway Project:
Tongland fishpass - Fish passes

Many of ScottishPower Renewables' windfarms have associated Habitat Management Plans which aim to provide nature conservation benefits. This is usually to mitigate effects of the windfarm, with the overall aim of providing additional biodiversity enhancements. We work together with administration bodies, including Scottish Natural Heritage, the Royal Society for the Protection of Birds and the Forestry Commission, to ensure that proposed management activities complement national strategies and goals and follows the best work practices in conservation.

The main themes of ScottishPower Renewables' Habitat Management Plans are:

- Bird monitoring - Peatland restoration.
- Creation of native woodlands.
- Creation of Internationally rare Dorset heath habitat
- Planting of hedgerows.
- Creation of reptile and amphibian hibernacula.
- Provision of bird boxes.

Actions

Key actions included in ScottishPower Renewables' Habitat Management Plans include: with actions in more than 93 km².

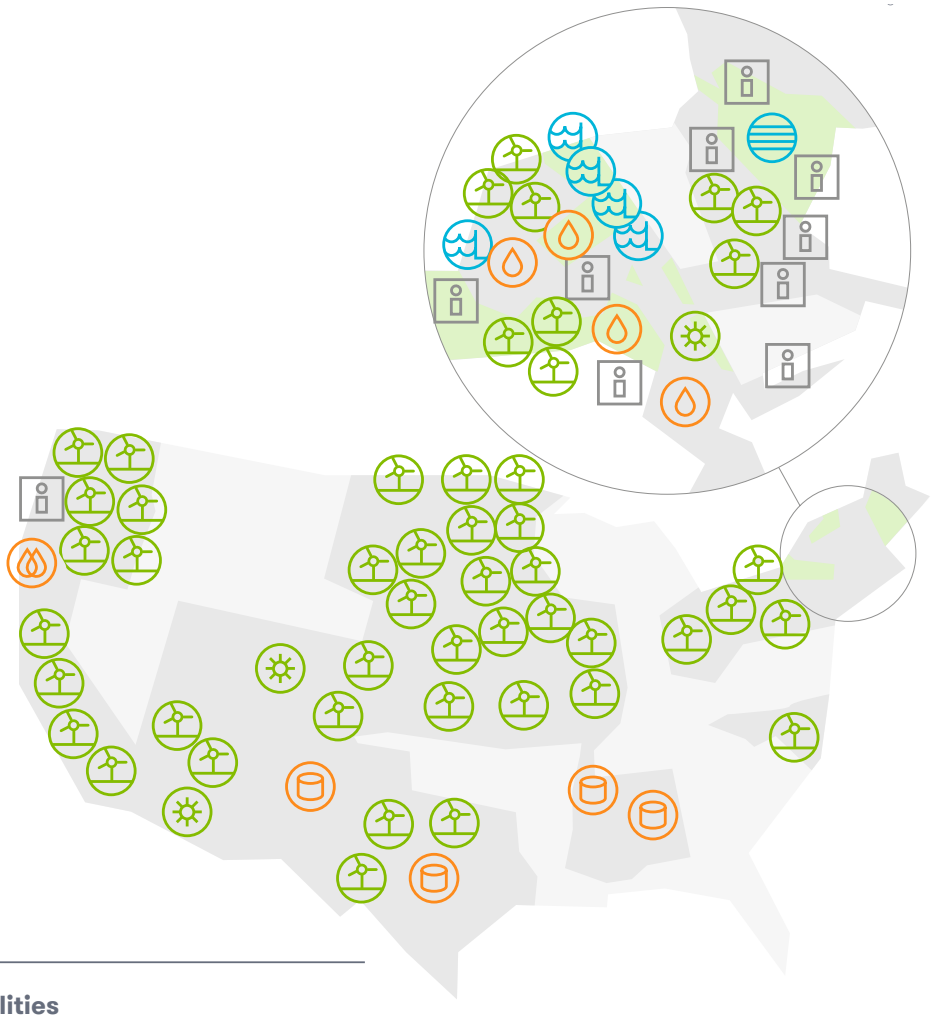
- Monitoring of species such as golden eagle (*Aquila chrysaetos*), short-eared owl (*Asio flammeus*), black grouse (*Tetrao tetrix*), hen harrier (Circus cyaneus), merlin (Falco columbarius), bats, and of restored habitats such as peatlands or native forests.
- Establishment of appropriate management measures in the restoration of peatlands, and tree planting.

Goal

- To promote biodiversity conservation, promoting sustainable management and research in the surroundings of the facilities.

Coal Clough wind farm

5.2.3 United States



Primary facilities

55
Windfarms
5,855 MW

2
Photovoltaic energy
50 MW

1
Cogeneration plant
636 MW

4
Gas storage facilities

4
Combined cycle gas plants
209 MW

9
Hydro power plants
118 MW

1
Power transmission line
United States-Canada / 708 Km

Offices

Area of influence

Electricity distribution

In the areas in which the Network Business operates we avoid high biodiversity areas for new lines, whether or not they are protected. We also seek to gain knowledge on the environment and work with the best available practices in order to minimise any impact on the environment, both for new projects and for any facilities already in operation.

Actions

- Implementation of preventive actions to prevent and mitigate the impact of possible spills by the construction of reservoirs in substations.
- Conditioning and waterproofing of two watersheds for the treatment of runoff water before it enters the main riverbed in conjunction with the land owners.

Adaptation of power lines:

- Special care is taken not to work during reproduction and breeding periods.
- Installation of bird diverters on the crossarms of supports in the shape of owls or turkeys to prevent nesting.
- Relocation of nests to safer prepared platforms.

- Identification of favourable habitats (beneath the lines) for the New England cottontail (*Sylvilagus transitionalis*). Work performed in collaboration with the *US Fish and Wildlife Service*.
- Building and placing of appropriate burrows under the power lines for the New England cottontail together with the *Maine Department of Inland Fisheries & Wildlife*.

Goals

- To minimise the impact on soil and water systems.
- To improve water quality and enhance the aquatic and riverbank habitats.
- To minimise impact on the osprey (*Pandion haliaetus*) in its nesting and reproduction processes.

- Promotion of the recovery of dwindling species.

Actions	Goals
• Development of an "Integrated management of vegetation" program with the best practices available via the signalling of protected areas, the protection of ponds and streams, adequate planning of works to prevent impact on vernal pools and the use of lighter vehicles in forested areas.	• To improve adjacent habitats and protect the associated wildlife.
• Collaboration in obtaining wetlands together with the organisation *Ducks Unlimited* by financial collaboration with the Auburn Transmission Project.	• To protect aquatic habitat and favour the species.
• Placing of 24 acoustic monitoring stations for locating bats in the surrounding area of the *Auburn Transmission Project*, with the detection of up to 8 different species of bat, including the Indiana bat (*Myotis sodalis*) and the northern long-eared bat (*Myotis septentrionalis*).	• To minimise the impact on wildlife.
• Drafting of a development and monitoring plan for the control of invasive species within the MPRP Transmission upgrade project and *TL 48 Rebuild*.	• To reduce the impact on vegetation. • To recover and improve land affected by construction activities.
• Protection of endangered species such as the common sanddragon (*Progomphus obscurus*) near the new substation in North Limington, Maine.	• To minimise the impact on wildlife.

Gray long-eared bat (*Plecotus austriacus*)

Common sanddragon (*Progomphus obscurus*)

Action	Goal
• Implementation of preventive actions to prevent and mitigate the impact of possible spills and construction of reservoirs in substations.	• To minimise the impact on soil and water systems.

The Renewable Energies Business continues implementing the Avian and Bat Protection Plan (ABPP), which is in line with the new guidelines and recommendations on biodiversity for wind farms of the US Fish and Wildlife Service, organisation with which we have a very active partnership.

We have also carried out broad studies of birds and bats and have provided support to the execution of scientific research. Every year we carry out activities for biodiversity conservation related directly or indirectly with wind farms, as required by law in the United States. The actions carried out include studies on the effects on fauna of facilities, these works are always validated by expert biologists with the participation of NGOs, with monthly monitoring of biodiversity indicators.

Actions

- For the Manzana windfarm we cleaned the Mojave desert and restored more than 10 ha with native vegetation.
- In the surrounding environment of the Juniper Canyon, study of the species Cryptantha Rostellata and commitment to conservation of the habitat along 65 ha of pastures, riverside forests, highlands and shrub steppe.
- Blue Creek wind farm: Tree planting and monitoring along 15 creeks to mitigate the impact generated during construction of the Blue Creek wind farm.

Enhancement and use of conservation banks:

- By obtaining credits such as:
  - The Desert Wind windfarm, non-riverside wetlands of the *Great Dismal Swamp Mitigation Bank* in the catchment of the Pasquotank river in North Carolina.
  - The Shiloh windfarm, a habitat conservation bank to prevent the loss of habitat for birds of prey along 407 areas with the planting of riverside vegetation and the installation of nesting boxes.
- By the creation of conservation banks:
  - The future Montague windfarm will create 32 ha of environment suitable for populating with birds of prey and local wildlife.

Goals

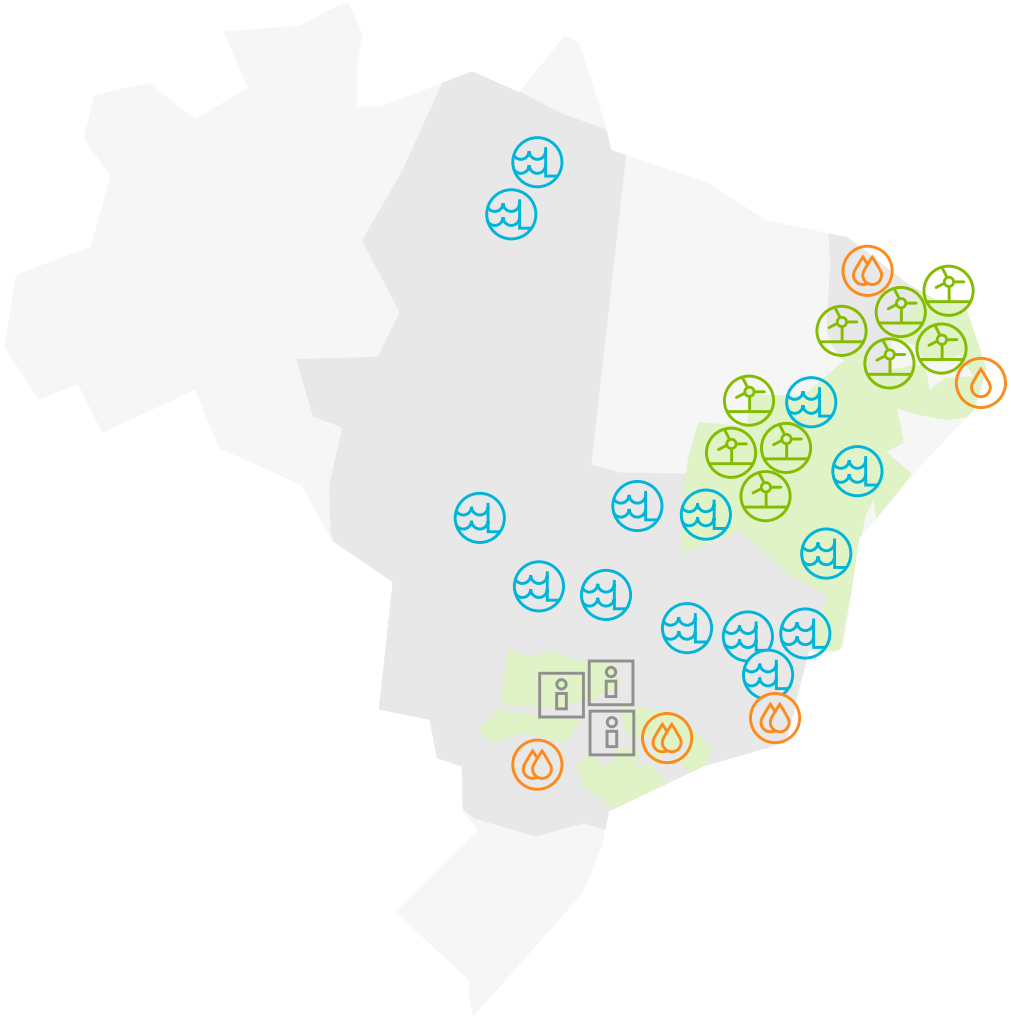
- To recover and promote the regeneration of natural habitats and prevent the displacement of native species, to monitor the species, raise awareness and train the local communities through more than 161 actions.

Lempster windfarm /United States
© Iberdrola, S.A.

"Every year we carry out activities for biodiversity conservation related directly or indirectly with wind farms"

Bald eagle (*Haliaeetus leucocephalus*)

5.2.4 Brazil



Primary facilities

11 Windfarms
337 MW

4 Cogeneration plants
78 MW

1 Combined cycle gas plant
533 MW

14 Hydro power plants
1,978 MW

Offices

Area of influence

Electricity distribution

Actions

- Compensatory reforestations, rescue and relocation programs for wildlife, wildlife monitoring, limnological studies, recovery programs for degraded areas, etc.
- Planting of more than 150,000 seedlings along 70 ha along the path of power lines, equivalent to more than 150,000 seedlings of native species.

Goals

- To succeed in the recovery and compensation programs in Permanent Protection Areas (PPAs) and degraded areas such as quarries or slag heaps.
- Recovery of degraded areas.

Brazil Mudas for the urban reforestation project of Juazeiro in Bahia

Planting of mudas catingueira (*Poincianella pyramidalis*) on public land of the city of Juazeiro, in Bahia.

Termopernambuco combined cycle plant

Action

- Environmental monitoring of wastewater, waste, air emissions, etc.
- The wildlife and vegetation are monitored through the "Social Environmental Management Plan - Patagonia Gold", both in the area of seawater intake and in that of the outfall.

Goal

- To minimise the impact on biodiversity and ecosystem services.

CC Power Plant of Termopernambuco /Brazil
© Iberdrola, S.A.

In order to achieve success in the recovery and compensation programs in Permanent Protection Areas (PPAs) and degraded areas (quarries, slag heaps, pastures) we have carried out environmental biodiversity conservation programs in the surrounding environment of the power stations depending on the impacts caused by their operation:

- Reforestation of affected areas.
- Wildlife monitoring (fish, reptiles and amphibians, birds, mammals, insects, etc.)
- Vegetation monitoring in reforested areas.
- Control of water quality
- Action and monitoring to avoid erosion processes.
- Establishment of social communication and environmental training programs.

The goal is the recovery of these areas through teaching about the biodiversity of the environment and adequate restoration by introducing local species. The physical structure of the land is thus improved and enriched by the chemical decomposition of fallen tree leaves, an increased capacity to absorb rainfall and a reduction of soil erosion, etc.

Actions

- Development of recovery plans for areas degraded as a result of the installation of temporary structures in the surroundings of the Dardanelos, Afluente, Itapebi and Baguarí power stations.
- Reforestation of close to 100 ha with local species and maintenance of approximately 180 ha more for the recovery of an area degraded by livestock farming, achieving an area of great ecological value in the surroundings of the Goiás Sul power station.
- Planting of 231,313 seedlings, introducing 45 native species in the surroundings of the Corumbá power station.
- Reforestation of 53,7 ha with native species, achieving an area of great ecological value in the surroundings of the Bahía PCH power station.
- Reforestation of more than 100 ha with native species by planting 150,000 seedlings for the recovery of an area degraded by livestock farming in the surroundings of the Rio PCH power station.
- Restoration of 25 ha with 26,000 seedlings of native species for the recovery of the Atlantic forest in the surroundings of the Pirapetinga PCH power station.

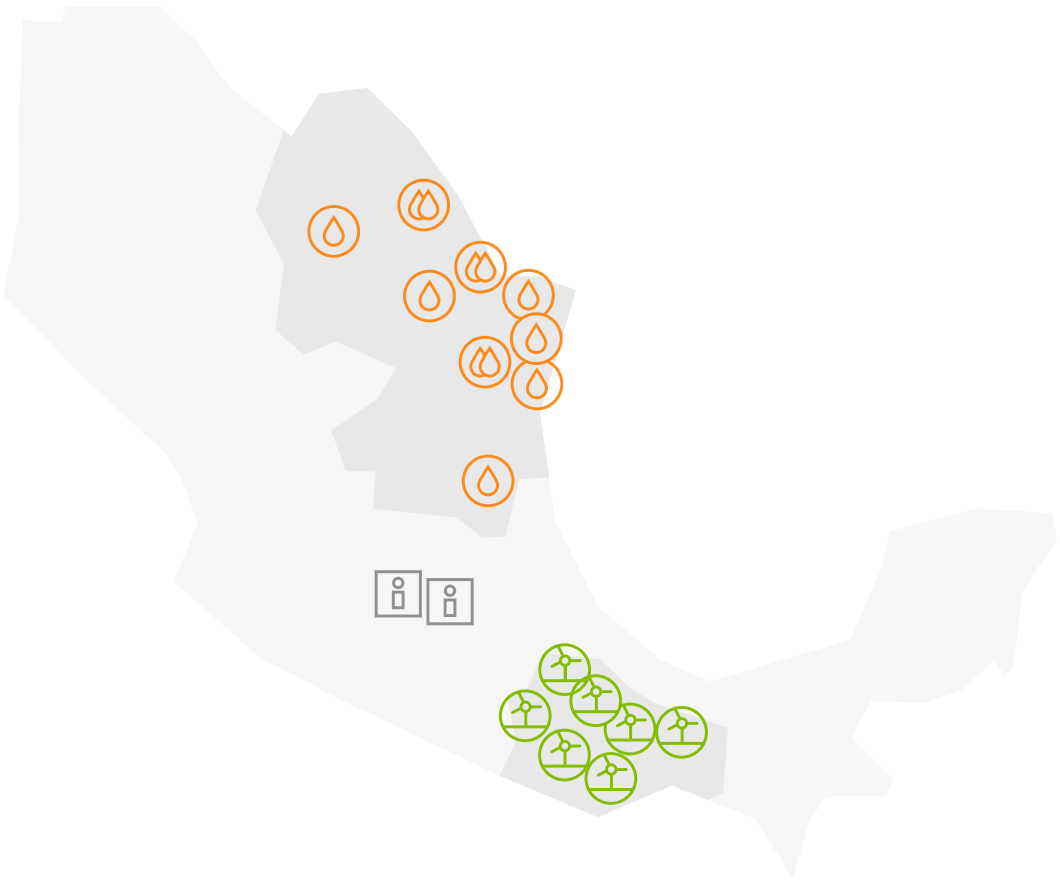
Goals

- Recovery of degraded areas, providing them with a greater ecological value.

As additional information we would like to highlight that Elektro has several environmental programs in the communities in which it operates, developing associations with the management units of the Parks, Ecological Stations, Research Reserves, among other conservation units and the communities, seeking the recovery and preservation of the environment, and the education and development of the local population. The environmental programs are based on the follow-up and presentation of reports recording the changes affecting biodiversity and the environmental benefits achieved.

ITAPEBI Hydro Plant

5.2.5 Mexico



Primary facilities

7
Windfarms
367 MW

3
Cogeneration plants
237 MW

6
Combined cycle gas plants
5,200 MW

Offices

Area
of influence

Actions

- Development of the rescue project for the Garrapatas estuary.
- Development of the project for support of felines in the Altamira region.

Goals

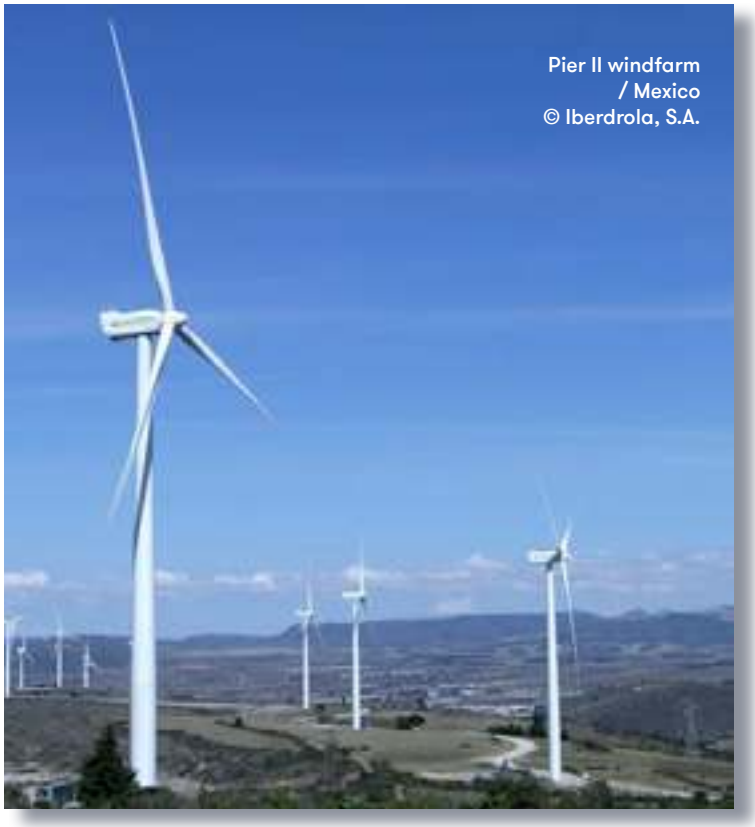
- To improve the habitat, favouring native species and to raise social awareness of the rich biodiversity of the environment.
- To improve the habitat, favouring native species and to raise social awareness of the rich biodiversity of the environment.

Iberdrola Mexico participates in an ambitious project for recovery of the mangrove forest in the Garrapatas estuary in partnership with the Autonomous University of Tamaulipas and the Altamira port authorities. The mangrove forest suffered the consequences of a loss of sea water after construction of a gas pipeline and Iberdrola has actively participated in the restoration and recovery of the ecosystem since 2002. See award-winning video.

Environment of the Garrapatas estuary /Mexico
© Iberdrola, S.A.

Actions	Goals
• Monitoring of the reforestation carried out during construction of the "La Ventosa" windfarm.	• To ensure success of reforestation works.
"*Storm water management plan*" • Implementation of a Plan for Preventing the Contamination of Rainwater with prevention and mitigation measures against any contamination and the reduction of the adverse effects of entrained sediment on the water cycle and the soil during the construction process in the PE SAN MARCOS Y CERRO DE HULA project (PHASE 2).	• Prevent impact on the water systems.
• Rescue and relocation for each wildlife group found during the construction activities for Phase 2 of the Cerro de Hula windfarm project.	• Protection and conservation of species.
• Application in progress for the reforestation of an approximate area of 83 ha in the surroundings of the La Venta III windfarm. • Application in progress for the reforestation of an approximate area of 25.5 ha in the surroundings of the Línea La Venta III windfarm. • Integral management for the protection of the wildlife and vegetation present in the PIER II windfarm (State of Puebla).	• To improve the habitat.

Information panel for the protection of flora and fauna in the Pier II windfarm



Pier II windfarm / Mexico © Iberdrola, S.A.

Other countries: Portugal

5.2.6 Portugal

Iberdrola Generation is in the midst of the construction process for the hydro complex of Alto Támega, in the North of Portugal, one of the biggest developed in Europe in the last 25 years, with an installed capacity of 1,135 MW. This large construction work comprises three hydrological exploitations (Gouvaes, Daivoes and Alto Tâmega), with their corresponding evacuation lines, substations and auxiliary facilities (accesses, quarry, dumps, installation areas, etc.).

The development and construction of these infrastructures requires detailed Environmental impact studies with associated specific studies on wildlife, flora, habitats, water systems, etc. in order to determine the possible impact on biodiversity and thus prevent, mitigate or if necessary to compensate for any damage caused.

Many of these studies have been carried out and submitted with the Portuguese Administration and others will be finished "before filling" (according to Consent requirements). Moreover, since the start of the construction work two complete biological cycles of the monitoring programs for ecological systems for all species have already been executed, providing detailed information on the presence and density of wildlife and vegetation in the area surrounding the project. These works are being carried out by specialised companies of biologists in parallel to the construction of the exploitations and shall continue during the entire construction and filling phases.

Finally, certain general lines for action were defined during the environmental licensing phase for projects implementing compensation measures for ecological systems. These lines (table) are being reviewed and adapted to the current situation of the environment and set the bases for defining the execution projects to be performed in coming years.

TÁMEGA COMPLEX

BIRD'S EYE VIEW

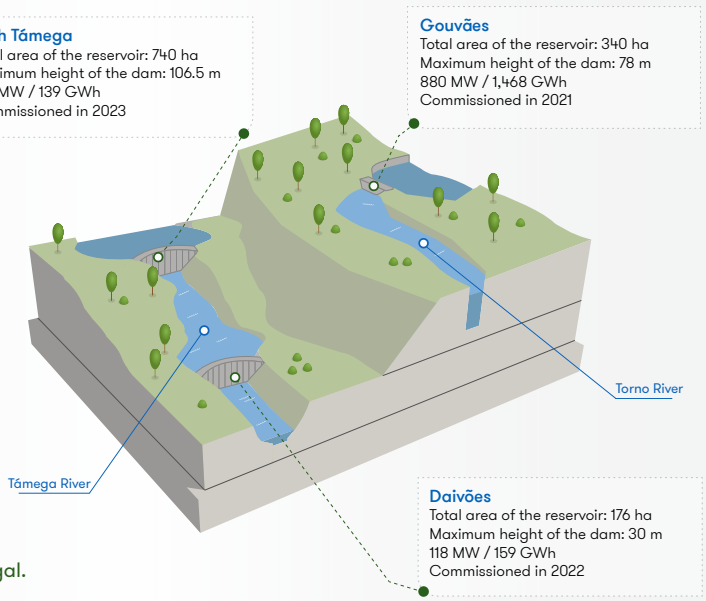
Location
Támega River, Northern Portugal

Installed capacity:
1,158 MW

Power Production
1,760 GWh per year

Job creation
13,500 direct and indirect jobs

Investment
More than 1,5 billion euros



Támega represents 6% of the power production in Portugal.

IBERDROLA https://www.iberdrola.com/te-interesa

Planned compensation measures

Flora

- Improvement of biodiversity in forest masses for the regeneration of pine trees
- Improvement of the wildlife carrying capacity in areas of dense shrubland
- Improvement of trophic availability in areas of dense shrubland and forests
- Conservation of mature seedlings of native species
- Recovery of native forests
- Creation of nurseries for native species
- Creation of seed banks for plant species of interest
- Control of invasive species
- Conservation of threatened vegetation: relocation of populations of singular species

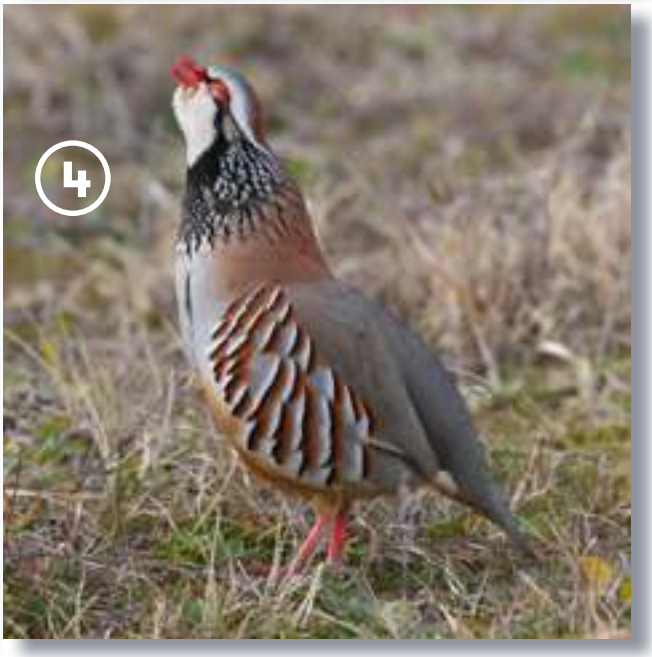
Fauna

- Restoration of spawning grounds
- Repopulation of the brown trout
- Conservation of threatened wildlife: relocation of *Maculinea alcon* populations
- Conservation of threatened wildlife: relocation of nymph populations
- Conservation of threatened wildlife: muskrat
- Conservation of threatened wildlife: Iberian wolf
- Conservation of threatened wildlife: otter
- Conservation of threatened wildlife: *Macromia splendens*
- Conservation of threatened wildlife: hen harriers
- Habitat creation for reptiles and amphibians
- Creation of microhabitats for threatened forest invertebrates
- Creation of habitats for threatened insects (*Maculinea alcon*)

Special

- Improvements in linear connectivity in agroforestry areas
- Improvements in cross connectivity with adjacent riversides/forests
- Creation of wildlife corridors
- Recovery of riverside woodlands and improvements in longitudinal connectivity
- Stabilisation of riverside embankments by bioengineering
- Improvements in the longitudinal connectivity of rivers
- Installation of nesting platforms for birds of prey
- Forestry management for the conservation of birds of prey
- Installation of nesting boxes for passerines
- Installation of nesting boxes for owls
- Installation of nesting boxes for bats
- Adaptation of anthropogenic refuges for bats
- Protection of bat colonies in caves and galleries
- Reforestation and introduction of red-legged partridges
- Improvements in aquatic ecosystems: creation of ponds, adaptation of slow waters

In total the project has a budget of more than 20 million Euros for environmental monitoring programs and the implementation of compensatory measures during the construction and commissioning phases.



1 Pyrenean desman (*Galemys pyrenaicus*)

2 Cork oak (*Quercus suber*)

3 Otter (*lutra lutra*)

4 Red-legged partridge (*Alectoris rufa*)

5 Iberian wolf (*Canis lupus signatus*)

5.3

Knowledge, communication and awareness raising

5.3.1 Knowledge and communication

Iberdrola considers it essential to have quality information in order to establish an adequate line of work and thus ensure continuous improvements in actions related to biodiversity. This is achieved through knowledge of the environment and species, both at the local and global levels. As well as promoting internal knowledge, collaboration agreements are established with prestigious universities and specialised organisations to obtain the best results in the studies performed.

Through knowledge, we also want to encourage and facilitate information transfer both internally and externally. We are not seeking to change or alter the environment or the facilities of the Group, but to understand the behaviour of the species and ecosystems and have a solid basis for our internal decision making process.

Spain

- Study for characterisation of the Biodiversity existing in the environment of the thermal power plant of Velilla by the University of Salamanca.
- Study for characterisation of the Biodiversity existing in the environment of the combined cycle thermal power plant of Arcos de la Frontera by the University of Salamanca.
- Study of the behaviour of the lesser krestel (*Falco naumanni*) in the surrounding environment of the Iberdrola facilities by the University of Salamanca.
- Study of the behaviour of the Eurasian eagle-owl (*Bubo bubo*) in the surrounding environment of the power lines in Eastern Spain by the University of Salamanca.
- Sponsorship in Castile and León of prospecting actions in the land within the 4th national census of the Eurasian otter (*Lutra lutra*), work carried out by the University of Salamanca.
- Study on the Risk of Accidents for Birds on Power lines: Application of Predictive Models by the University of Salamanca.

The Velilla Power Station

Eurasian eagle-owl (*Bubo bubo*)

Eurasian otter (*Lutra-lutra*)

- Study on the impact of the power transmission lines in the centre of Spain on the imperial eagle (*Aquila adalberti*) and Bonelli's eagle (*Aquila fasciata*) carried out by the University of Salamanca.

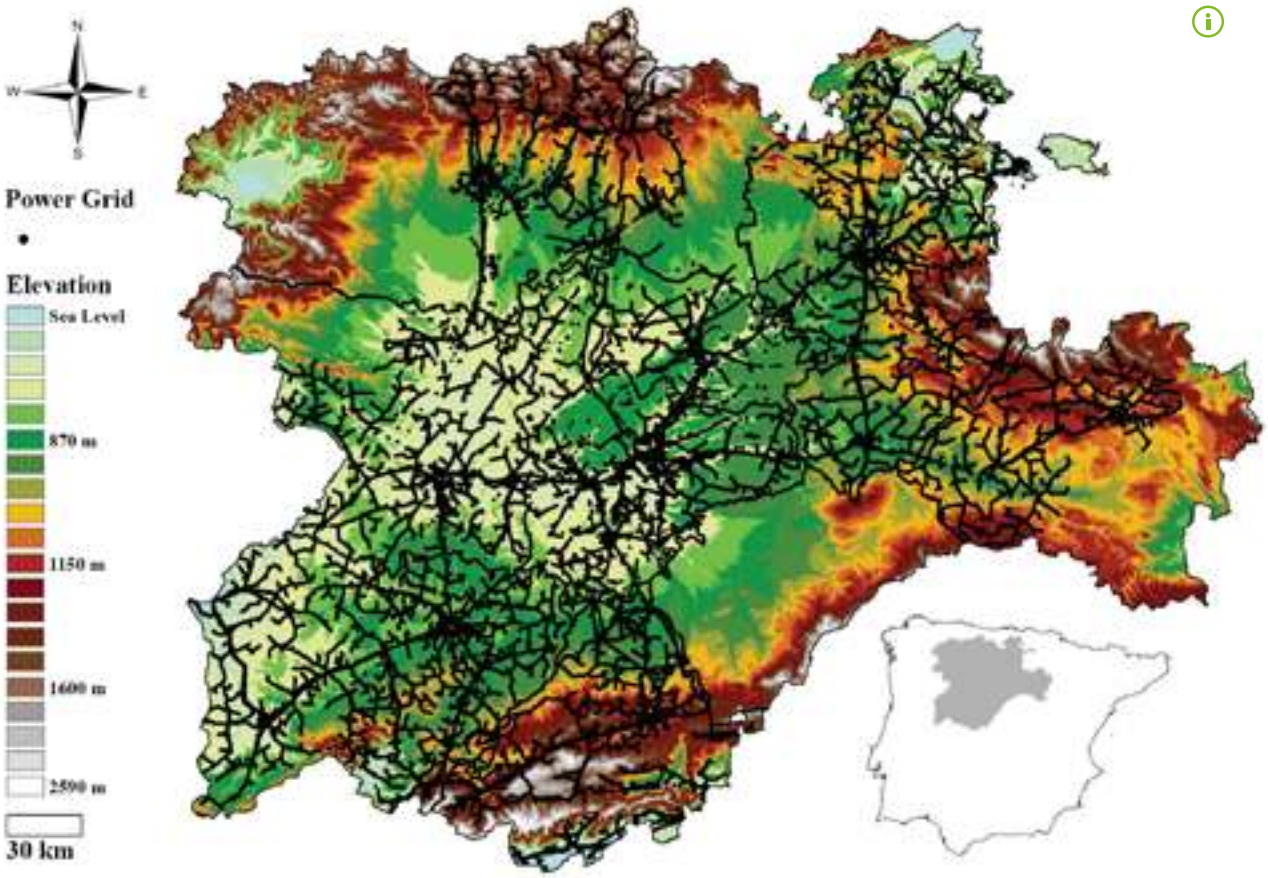
- Technical support from the University of Salamanca to assess the incidence of the zebra mussel in the hydro plant of La Muela and the Cortes II reservoir (Júcar river).

- Study on the effects of the Dos Pueblos windfarm on the habitat and population of the Dupont lark (*Chersophilus duponti*).

- Yearly celebration in the Basque Country (since 2008) of the Environmental Volunteer Day and for the extension of the "Iberdrola Forest" (reforesting with native species, favouring the conservation and management of the natural heritage), together with the Lurgaia Foundation (www.lurgaia.org) and the Gorabide Association for the Disabled.

Spanish imperial eagle (*Aquila adalberti*)

Detection of the presence of zebra mussels (*Dreissena polymorpha*)



Area of study for risk of accidents for birds on power lines.

United Kingdom

- Study of interferences to the passage of fish through the *Black Water of Dee* (using GIS mapping, electrical fishing, habitat monitoring, etc.), in the surroundings of the Galloway power station.
- Study of habitat and wildlife by installing camera traps in the surroundings of the Cruachan power station with special monitoring of the pine marten (*Martes martes*). Work in collaboration with NGOs and the local population.
- Study of habitats and associated biodiversity in the *Musselburgh Ash Lagoons*, with a special focus on invertebrates, particularly butterflies, spiders and beetles.
- Monitoring of the presence of the northern crested newt in the surroundings of Coal Clough windfarm and use of a new monitoring system for detecting its presence or absence in the ponds.
- 20 years' worth of data on golden eagle located adjacent to Beinn an Tuirc windfarm. The results show that eagle territories avoid the windfarm and pairs are breeding successfully.
- Testing and identification of most appropriate technique for Dorset heath restoration in the surroundings of Carland Cross windfarm.

Study of interferences to the passage of fish, Galloway Study

Pine marten
(*Martes martes*)

Study of the flight, reproduction and breeding of the golden eagle
(*Aquila chrysaetos*)

Carland Cross windfarm

United States

In general, numerous monitoring and significant wildlife studies have been carried out in the last three years according to the CWP, as well as many specific operating permits in the surroundings of the wind farms. These studies are linked to the possible impact that may be caused, considering the conservation of birds and bats:

- California condor (*Gymnogyps californianus*): Manzana.
- Golden eagle (*Aquila chrysaetos*): Juniper Canyon, Big Horn I / II, Manzana and Dry Lake.
- Bats: Blue Creek and South Chestnut.
- Bald eagle (*Haliaeetus leucocephalus*): MinnDakota, Barton, Top of Iowa and Winnebago.
- Common nighthawk (*Chordeiles minor*): Lempster.
- Green salamander (*Aneides aeneus*): South Chestnut.
- Bushy-tailed woodrat (*Neotoma cinerea*): South Chestnut.

- Study and analysis with the US Fish & Wildlife Service to mitigate impact on the bald eagle (*Haliaeetus leucocephalus*) by improvement of adjacent habitats, protection of associated wildlife, recovery of species and knowledge of its environment.

- Study and analysis with the US Fish & Wildlife Service to mitigate impact on the northern long-eared bat (Myotis septentrionalis) by improvement of adjacent habitats, protection of associated wildlife, recovery of species and knowledge of its environment.

- Study and analysis in collaboration with the Wildlife Division and the US Fish & Wildlife Service to mitigate impact on protected species such as the bald eagle (Haliaeetus leucocephalus) and the northern long-eared bat (*Myotis septentrionalis*), through habitat recovery.

- Study and analysis in collaboration with a biologist specialised in bog turtles (*Glyptemys muhlenbergii*) from the US Fish and Wildlife Service to select adequate access sites in the surroundings of the "*Station 218 to Clyde New Transmission*" project to avoid disturbing the species.

- Study for characterisation of the Biodiversity existing in the environment of the Hutchinson reservoir along 33 ha in the Kennebec river basin and in Merrymeeting Bay.

- Study for characterisation of the Biodiversity existing in the environment of the Nonesuch river, along 37 ha in the Presumpscot river basin and in Casco Bay.

- Study for characterisation of the Biodiversity existing in the environment of the Nonesuch river, along 25.5 ha in the port of Portsmouth and the beach area of Salisbury.

- Study for characterisation of the Biodiversity existing in the environment of the Nonesuch river, along 482 ha in the Kennebec river basin in the Merrymeeting Bay catchment.

California condor (*Gymnogyps californianus*)

Golden eagle (*Aquila chrysaetos*)

Green salamander (*Aneides aeneus*)

Bald eagle (*Haliaeetus leucocephalus*)

Bat (*South Chestnut*)

Bog turtle (*Glyptemys muhlenbergii*)

5.3.2 Awareness raising

Iberdrola's commitment with biodiversity extends to important actions such as support to conservation programs for threatened species and the restoration of protected habitats, and also collaboration with and membership in environmentally friendly organisations, etc.

The different businesses of the Group and the Iberdrola Foundations of the different countries in which we operate sponsor several projects developed together with the collaboration of different NGOs, amongst which we can highlight:

The Migra program

This ambitious project aims to preserve Spanish birdlife by expanding knowledge of bird migratory and breeding habits. In order to obtain details on the migrations of thousands of birds, their duration, routes, speed and altitude at which they fly, places where they rest and feed, different species have been marked with GPS devices, which enable their movements to be available to everyone at www.migraciondeaves.org and which also help to prevent possible threats that may endanger them as well as providing essential information for relevant scientific studies.

Marking of European roller (*Coracias garrulus*)

There are currently 783 birds marked from 32 different species. 447 birds from 31 species have provided useful information, which constitutes the largest available database in this regard.

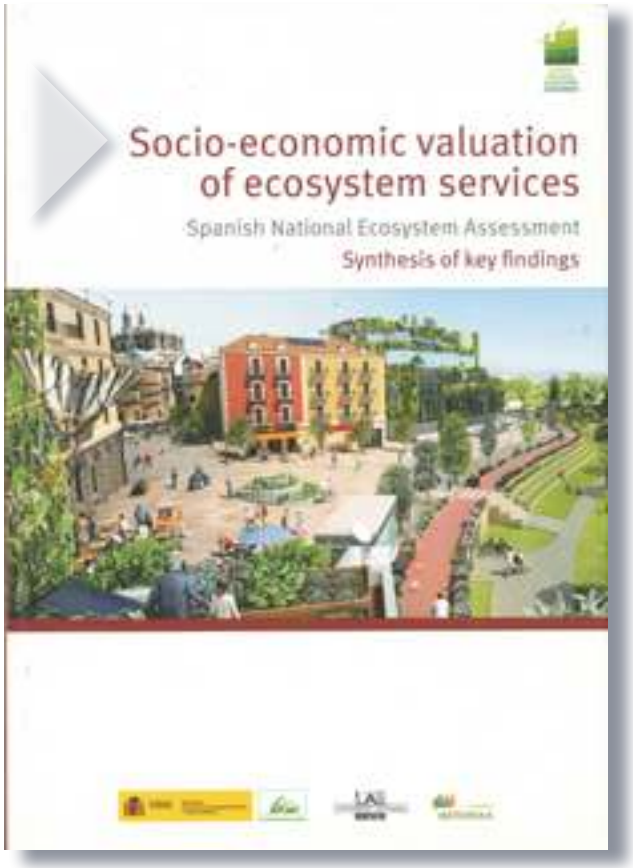
Common swift (*Apus apus*)

The Migra program by SEO/Birdlife has published a case study on the Audouin gull, a species with a relatively small population endemic to the Mediterranean, which during its breeding season gathers 90% of its population in Spanish territory.

This ambitious project, developed since 2011 by the Iberdrola Spain Foundation in collaboration with SEO/Birdlife, comes from Iberdrola's commitment to working towards bird-friendly energy.

Millennium Ecosystems of Spain

This initiative was part of the Millennium Ecosystem Assessment of Spain carried out by the United Nations with the goal of drafting a project for ecosystem research and analysis in Spain. This initiative was carried out in collaboration with the Autonomous University of Madrid and the Biodiversity Foundation. The conclusions of the project revealed substantial transformations in some of these ecosystems. The findings were presented in the World Wilderness Congress "WILD10: Make the World a Wilder Place" (international forum of reference for the environment and biodiversity). An information guide was published called "The assessment of Millenium Ecosystems in Spain".



Publication of "Socio-economic valuation of ecosystem services"

Project for the creation of wetlands in the north of Burgos

Cooperation with the Natural Heritage Foundation of Castilla and León in an interesting project for habitat improvement. The project consists in the creation of a resting area for birds in the Páramos district in the north of the province of Burgos for the numerous birds that every year cross the migratory corridor between Northern Europe and the lagoons of Villafáfila, la Nava and the south of the Iberian peninsula. These wetlands will also serve as a refuge and watering area for other wildlife in the area.

LIFE Project + Cantabrian capercaillie

UROGALLO CANTÁBRICO

The conservation programme for this endemic, emblematic and endangered species of the mountains of Cantabria worked actively between 2010 and 2016 with the dual goal of halting its decline and encouraging its recovery.

At the start of this project about 400 specimens were estimated to remain between Asturias, Castile and León (León) and Cantabria. To contribute towards its recovery, **the European project LIFE + Cantabrian capercaillie**, coordinated by the Biodiversity Foundation of the Ministry of Agriculture and Fishing, Food and the Environment, and supported by the **Iberdrola Foundation Spain** and the Autonomous National Park Body, has carried out a series of urgent conservation, social participation, awareness-raising and dissemination actions.

Amongst the main measures carried out since 2010, we can highlight:

- Forestry treatments in more than 500 hectares in order to favour the capercaillie habitat.

- Removal or signalling of 60 km of dangerous electric fences to eliminate the risk of electrocution.
- Controlling and tracking deer populations due to a direct effect on the availability of food for the capercaillie.
- Captive breeding program as a supplementary measure to habitat management and reintroduction of capercaillie into the wild.
- 19 projects of land stewardship as a result of 29 voluntary agreements between owners, non-profit organisations and other public and private agents.
- Environmental education and awareness-raising actions with school workshops with the participation of more than 2,000 students.

This project has allowed us to lay the foundation for the future conservation of the species based on the experience and technical knowledge acquired during the actions performed.

Cantabrian capercaillie

Conditioned learning program for the reintroduction of the Spanish imperial eagle

The programme's goal was to help reduce deaths from electrocution of rehabilitated or captive-bred imperial eagles through conditioned learning. To achieve this, an aviary was built at the facilities of "Eagles of Fuente Empedrada" Holistic Centre in Lagartera, Toledo, dedicated to research on how to improve pathological diagnosis and maintain the genetic variability of endangered species. An electricity pylon equipped with an electric fence has been installed at the aviary to facilitate conditioned learning by means of low-voltage electrical impulses.

Aviary at the Eagles of Fuente Empedrada Holistic Centre facilities

The eagles thus learn to reject such structures as potential perches once they have been freed. The rehabilitation and reproduction of these birds is a laborious process that requires considerable effort and science. This system increases the efficiency of reintroduction results, which in turn benefits the species and its preservation.

Fundación Aquila, in partnership with Fundación Iberdrola, has undertaken this pioneering project in Spain thanks to its expertise and to the collaboration of its researchers in other international projects where this method has been successfully used on such symbolic species as the California Condor or the Philippine Eagle. In

the case of the California Condor Recovery Program, this method has been successfully used for over 12 years.

Conditioned support for the aviary

Fundación Premios Rey Jaime I. Environment Protection Award

The award ceremony is presided by TRH the King and Queen of Spain

The Foundation collaborated for one more year and supported presentation of the Rey Jaime I Award for Environmental Protection, which this year went to Josep Peñuelas Reixach, Professor of Research at the CSIC (Spanish Research Council) for his work on the effects of atmospheric contamination and global climate change on the structure and operation of ecosystems and the biosphere, especially on land ecosystems. The award ceremony was presided by TRH the King and Queen of Spain.

Program for Recovery of Bonelli's Eagle in Arribes del Duero

In partnership with the Castile and León Natural Heritage Foundation, the "Conservation plan for the Bonelli's eagle in Arribes de Duero" aims to improve habitats in the game reserves in the territory inhabited by these birds in order to maintain and recover the species. The plan contemplates the provision of food resources in order to guarantee reproductive success and the monitoring of the nesting population. Six chicks were marked to monitor reproductive success. Other actions to improve habitats were also implemented, with the goal of maintaining and recovering the most important species of prey such as the wild rabbit. Tasks basically focused on clearing land, planting and improving water points and traditional grazing areas.

Chick marking

Programme for marking protected species in the International Tajo Natural Park

In partnership with the Ministry of Agriculture, Rural Development, Environment and Energy of the Regional Government of Extremadura, the project for monitoring the black stork (Ciconia Nigra) and Egyptian vulture (Neophron Percnopterus) aims to study these two threatened species whose migratory habits are not well known. Studies monitoring juvenile specimens of these species have shown that there is a very high rate of mortality among the young. One of the goals of this project is to obtain information regarding the causes of this high mortality rate.

Conservation of protected species in the Tajo International Natural Park (1)

Conservation of protected species in the Tajo International Natural Park (2)

Flyways Brazil

In partnership with SAVE Brazil (Brazilian Society for Bird Conservation), the Elektro Institute is carrying out the migratory routes of Brazil project, which aims to guarantee the conservation of shorebirds and their habitats, which contributes towards the conservation of species in that hemisphere. This project leads actions for controlling the population size of five endangered species from some areas of the South and the Northeast of Brazil.

Ruddy turnstone (*Arenaria interpres*) and willet (*Tringa semipalmata*)

The birds stop in these areas for a few days or stay for the entire non-breeding season to rest and/or gather energy for the next stage in their life cycle. The protection of these resting areas and understanding of their dynamics of use are of critical importance to the conservation of migratory birds in Brazil and worldwide. The project also works with local communities to reduce impacts and to assess the effects of wind farms considering specific regional features.

SAVE Brazil is a social organisation with 15 years of experience in the country, which focuses on the conservation of birds and their habitats. It is part of BirdLife International, an alliance of conservation organisations that is present in 110 countries.

The following actions have been carried out in this first round:

- 8 censuses in the Secar mangrove in Bahia.

- 7 censuses in Restinga island, Paraíba.
- 9 censuses in the Potiguar basin, Rio Grande do Norte.

Conservation of shorebirds

Cuida Colmeia - Hive Keepers

This work is being carried out in partnership with AEHDA Araras, and promotes awareness raising on environmental issues in vocational training, thus supplementing the knowledge of the participants. The initiative is supported by the Beekeeper Association of the Araras area (Aaar), which markets the honey produced during the classes, as well as providing an expert beekeeper for training during the course.

The project currently has three species of native stingless bees:

- 12 hives of angelita or yatei stingless bees (Tetragonisca angustula): Probably the most common of all native bees, small in size and with an aggressive behaviour towards other bees. The honey production is of about 500 ml per year, and is easy to handle and maintain.
- 4 hives of Mirim Droriana (Plebeia droryana): A usually small bee that is sometimes mistaken for a mosquito. This type of honey has a very characteristic flavour, which is more acidic than that of other varieties.
- 23 hives of mandaçaia (Melipona quadrifasciata): Commonly mistaken for the Apis mellifera bees. It has a very calm behaviour, both in its relationship with other bees and during handling. In a favourable environment they may produce up to 2.5 litres of honey per year. It is the most admired of the stingless bees.

Meninos Ecologicos (Ecological Children) Program

This program is implemented in the cities of Araras, Pariquera-Açu and Eldorado. This is a training program that assists 30 youngsters between 16 and 17 years of age, who are prepared by a trained professional to promote good environmental practices. They also produce seedlings for donations to forestation and reforestation projects. Since the start of this project, 701,677 seedlings have been produced, and 58,077 units have been donated for free to the local governments, NGOs and local schools in the concession area.

Production of seedlings

Riverkeeper Project

The Iberdrola Foundation sponsors the Riverkeeper Project, which has been designed to safeguard the environmental, recreational and commercial integrity of the Hudson river and its tributaries and ensure the quality of the drinking water for nine million New Yorkers. Its mission focuses on the three global challenges affecting the Hudson river:

- Recovery of the river ecosystem and minimising fish mortality and water contamination.
- Protecting New York's supply of drinking water.
- Improving public access to the river.

Royal River Conservation Trust

Iberdrola partners financially with the Royal River Conservation Trust, organisation that strives to preserve the natural, recreational, landscaping, agricultural and historical resources of the Royal River region in the State of Maine. In the past decade, the Trust has conserved more than 1,336 ha of land in eight communities.

Protecting Canco Woods

In 2013, Iberdrola signed an agreement with a coalition of organisations dedicated to conservation. The goal is to protect an area of 5 hectares in Portland known as Canco Woods, an urban forest of great importance for the community.

Some partnership agreements

Iberdrola has signed several partnership agreements with Spanish entities. Of these, the agreement signed with the Environment Agency of the Regional Government of Castile-León for preserving the natural heritage is worth highlighting. As a partner of the Natural Heritage Foundation it has financed a number of projects, for example:

- Development of the Conservation Program for Bonelli's eagle in Castile and León. Information available from the project's website http://www.aguilaperdicera.org/:
- Monitoring study on the Dupont lark in the areas of influence of several wind farms in the province of Soria.
- Removal of stork nests from the San Esteban church (Castromocho) and relocation of the colony.
- Signposting of trails in the Hoces del Duratón, Cañón del Río Lobos and Sierra de Gredos.
- Building of the hunting theme park in Batuecas, in the Sierra de Gredos mountain range.
- Trail in the Garagüeta holly tree forest.
- Reforestation on the slopes of Castrojeriz castle.
- Conditioning of the house in the Cañón del Río Lobos Natural Park.
- Improvement of accessibility at the Arribes del Duero Natural Park.

In the United States, Iberdrola stands out for its active partnership with institutions, workgroups and NGOs, as well as its participation in several meetings, conferences and workgroups:

- Cofounder and Member of the Board of Directors of the American Wind Wildlife Institute (AWWI). AWWI is a partnership of environmentalists, conservationists, State wildlife agencies and leaders of the wind power industry.
- Cosponsor of the Bat Wind Energy Cooperative (BWEC), contributing towards the treatment of white-nose syndrome and other research activities.
- Member of the Wind Energy Whooping Crane Action Group (WEWAG) to work on the Habitat Conservation Plan (HCP) for the whooping crane (*Grus americana*), lesser prairie chicken (*Tympanuchus pallidicinctus*), least tern (*Sternula antillarum*) and mountain plover (*Charadrius montanus*) in Regions 2 and 6 of the United States.
- Member of Wind Energy Indiana Bat Action Group (WEBAT) to work on the Habitat Conservation Plan (HCP) related to the Indiana bat and with up to 29 threatened species within Region 3 in the United States.
- Member of the South Western Golden Eagle Management Committee, which works with State and Federal agencies, tribes, public services and other stakeholders to help conserve the Golden eagle (*Aquila chrysaetos*) population in Arizona.
- Contributions and coordination support for the Oregon Eagle Foundation to assess nesting populations of Golden eagle (*Aquila chrysaetos*) in the wind resource regions of Oregon.
- Tehachapi Operator Working Group for the minimisation of risks affecting wildlife and the handling of the wildlife regulations proposed with respect to the operation of wind farm projects in the Tehachapi Wind Resource Area.
- Half-yearly meeting of the Golden Eagle Work Group of CA NV to review State and Research needs.
- Wind Wildlife Research Meeting of the National Wind Coordinating Collaborative as sponsor, contributing to a number of technical presentations and posters.

- Conference on Wind energy and Wildlife Impacts (CWW) to incorporate international practices and innovations into our activities in the United States.
- Workgroup of the wind trade association for the AWEA SITING committee to examine biodiversity and other matters related to the location of permits.
- Partnership with independent research groups and studies of Pacific Southwest Research Station to improve the preconstruction and operation of the monitoring efforts on bats and birds in the IR wind farms in California.

5.3.3 Protected species

IUCN Red List

The Group carries out activities in some areas in which endangered species may be present that are included in the IUCN Red List ⊙ (International Union for Conservation of Nature) and in other national lists such as the UK BAP, ⊙(*UK Biodiversity Action Plan*), the USFW ⊙, (*US Fish & Wildlife Service*) and the Sao Paolo list of endangered species, without this meaning any impact or threat derived from the activity.

IUCN Red List Classification	Number of species
Critically endangered (CR)	24
Endangered (EN)	58
Vulnerable (VU)	122
Near Threatened (NT)	26
Least Concern (LC)	198

Some of the species are:

- Critically endangered: California Condor, Eskimo curlew, Lear's macaw, channel-billed toucan; mammals such as the Iberian lynx, woolly spider monkeys, brown titi; fish such as the European eel, etc.
- Endangered: birds such as the Iberian imperial eagle, the red kite, the black stork, the Egyptian vulture, the wood grouse, the Dupont lark and the squacco heron; bats such as the long-fingered bat, the Indiana bat; insects such as the American burying beetle.
- Vulnerable: birds such as Bonelli's eagle, the osprey, Montagu's harrier, the red-tailed amazon, the neotropical bellbird; bats such as Geoffrey's bat, Mehely's horseshoe bat, the greater mouse-eared bat, the common bent-wing bat and the common noctule; insects such as backswimmers, the hairy canary fly, and the river jelly lichen.

6. Appendix

Map of ScottishPower wind farm facilities

Cruach Mhor windfarm
/United Kingdom
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Restoration of peatlands:

Upland environments in Scotland comprise a rich mosaic of grassland, heathland, woodland and bog habitats. Many areas are subject to high rainfall and cool annual average temperatures which, when combined with suitable topography, lend themselves to the formation of peat. The uplands are also where the wind resource is greatest in Scotland, which has led to many windfarms being located in these same areas. As a result of the planning process, many of ScottishPower Renewables' upland windfarms have a commitment to restore areas of damaged peatland, often through the implementation of a Habitat Management Plan. Degradation has occurred through drainage to aid agricultural use or afforestation for commercial forestry purposes. Iberdrola has committed to restore approximately 9,000 ha of peatland, in the UK.

Few practical examples of peatland restoration from commercial forestry exist, therefore Iberdrola has carried out several research projects to understand how peatland damaged by forestry works at a functional level and from there develop new restoration techniques. This has resulted in the development of a restoration technique termed 'ground smoothing'. This method uses an excavator to turn over remaining tree stumps in the peat. The area is then tracked over and compressed to bring the peat surface closer to the water table. This results in the colonisation of specialist bog plants and also the suppression of unwanted conifer trees.

Black Law ground smoothing +5yrs

We have also tried to improve the methodology for the restoration of peatland damaged by drainage using an innovative technique called “wave damming”. This method uses an excavator to form peat dams along the length of a drain without the need to create peat borrow pits elsewhere on site. A distance of about 4 m is left between the dams and they are built in 45 seconds (compared to conventional peat dams which take about 15 mins to build).

Black Law wave damming +0yrs

Approximately 650ha of peatland has been treated to date including approximately 55km of drainage ditches. We are studying new areas in which to implement these treatments in the future. Articles have been written about these techniques in notable publications such as the *Chartered Institute*

of Ecology and Environmental Management (CIEEM) or the IUCN's monthly newsletter *Peatland Programme*. The efforts of *ScottishPower Renewables* to develop an effective and practical method for peatland restoration were recognised in 2015 by the *RSPB Nature of Scotland Awards* with the Sustainable Development award after being nominated by the RSPB for their peatland restoration work carried out at Black Law and Whitelee wind farms. In 2016 *ScottishPower Renewables* was nominated for the *Green Energy Award* for Sustainable Development for its peatland restoration work.

"In 2015, Scottish Power was recognised by the RSPB Nature of Scotland Awards and received the Sustainable Development award for its excellent work on peatland restoration."

AVIAN Power Line Interaction Committee (APLIC)

As Avangrid Renewables has developed new wind farm projects there has been a need for more overhead power lines. This new situation made us recognise the potential impacts on birds (electrocution, collisions) and the correct operation of the facilities (interruptions). Avangrid Renewables became the first wind industry (non-utility) member of the APLIC, a partnership of public service companies that establish safe design principles for birds on new power lines. It became involved in this initiative in order to develop a practical guide with safe configurations of windfarm-related power lines for birds. In 2015, AR started an operational evaluation of wind farms in order to assess the different risk levels. The following examples show work published as a result of such efforts:

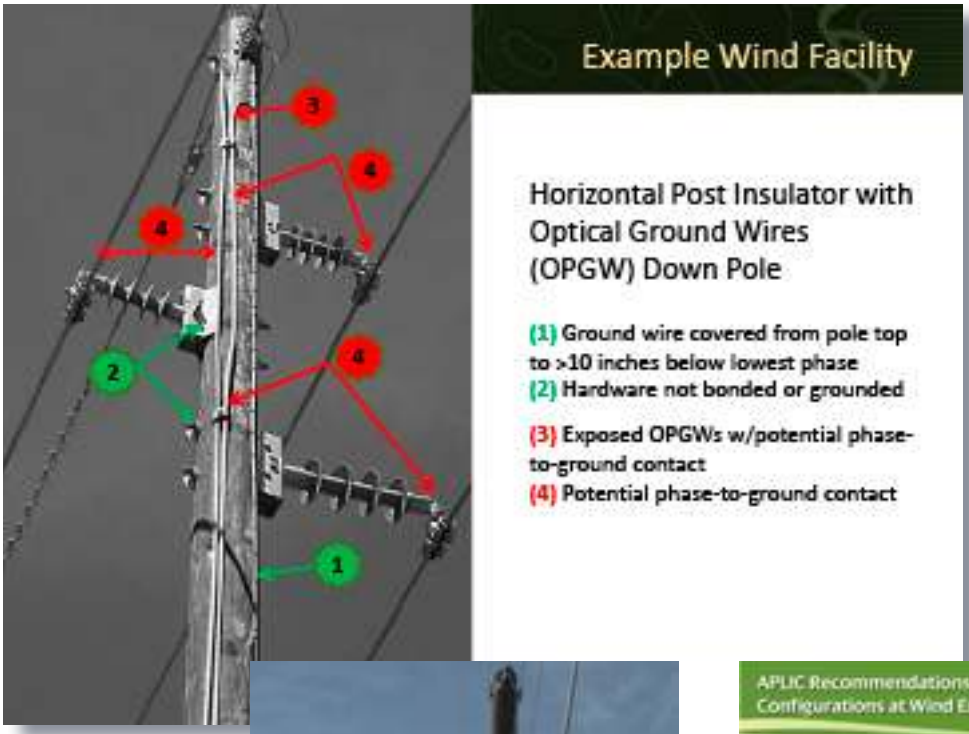


Photo: APLIC

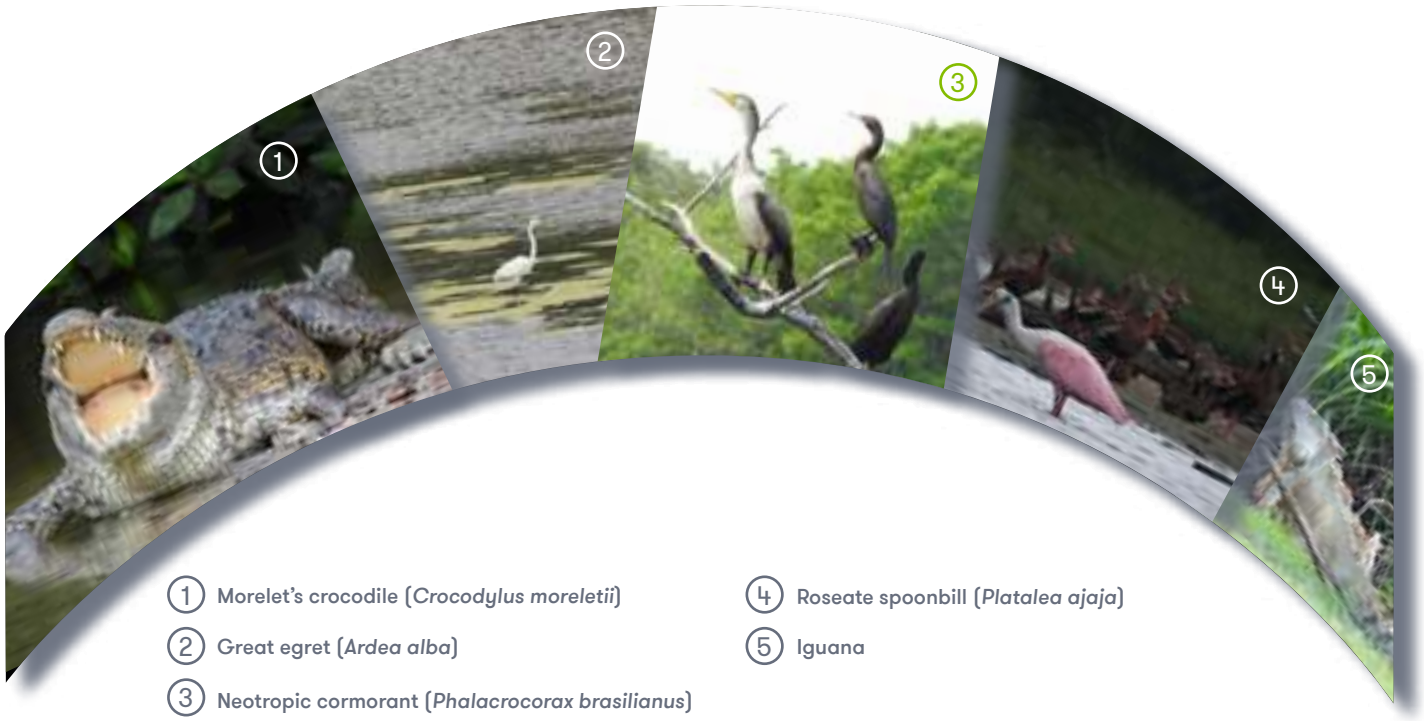
Device data sheets

Garrapatas Estuary Project

Several extremely fragile ecosystems currently coexist within the grounds of the Industrial Port of Altamira. Actions are being carried out to protect these ecosystems. This is the case of the Arroyo Garrapatas estuary.

The Arroyo Garrapatas estuary is a body of water that was originally an estuary and now forms a wetland system in the coastal strip of southern Tamaulipas, which islocated within the perimeter of the Integral Port Administration of Altamira. The Garrapatas estuary used to receive a significant input of salt water which supported a coastal mangrove community and a water community. These communities were affected when communication with the sea was shut off for the construction of a gas pipeline, which prevented tidal exchanges and the entry of salt water with a predominance of fresh water year round. This caused changes in the water community with serious impacts on the local mangrove vegetation and with a proliferation of fresh water vegetation. In 2003 the Altamira III and IV Combined Cycle Power Plants, property of Iberdrola Energy Altamira S.A. DE C.V., were commissioned under Acts DGIRA-DIA-840/02, SGPA-DGIRA-DIA.1119/09 and SGPA-DGIRA-DIA 1938/02. This project also saw the birth of the Ecological Rehabilitation, Protection and Conservation Strategy for the Garrapatas estuary by redirecting the cooling water discharges of the power plant towards the estuary. Said discharge was authorised by the SEMARNAT and CONAGUA environmental agencies as the Garrapatas Estuary Rescue Project, which started its first phase in June 2003.

This project proposed the recovery of the initial brackish conditions of the waters of the Garrapatas estuary, and gradual changes in the vegetation of its banks and the fauna associated with the mangrove communities. Iberdrola carried out all necessary work to redirect the discharge from the Altamira III and IV plant towards the estuary, paying all costs of analytical campaigns that enable monitoring and analysis of the project's progress. Since then the estuary has recovered its wetland system, with all that this implies, with the reappearance of local wildlife species such as iguanas and herons, among others.



1. Morelet's crocodile (*Crocodylus moreletii*)
2. Great egret (*Ardea alba*)
3. Neotropic cormorant (*Phalacrocorax brasilianus*)
4. Roseate spoonbill (*Platalea ajaja*)
5. Iguana

Wild Cat Support Project

Another one of the projects carried out by Iberdrola Mexico to protect the environment in the areas in which it is active is the Wild Cat Support Project in the Altamira region.

This project consists in species monitoring via camera traps and scent lures in the surroundings of the Altamira III and IV and Altamira V power plants in the state of Tamaulipas.

Thanks to this monitoring system several species of wild cats have been spotted such as the ocelot and the jaguarundi (eyra cat) and the presence of other species of native fauna has been confirmed at different points in which camera traps were set, such as armadillos, raccoons, badgers and white-tailed deer. Both these projects reaffirm the commitment of Iberdrola Mexico to studying and protecting the habitat surrounding their generation plants and to ensuring the survival of the local wildlife.

Monitoring of species

Footprint of an Onza (*Herpailurus yagouarondi*).

Photograph of a badger or coati (*Nasua narica*) captured with a camera trap

Photograph of a white-tailed deer (*Odocoileus virginianus*) captured with a camera trap

Photograph of a badger or coati (*Nasua narica*) captured with a camera trap

Photograph of a collared peccary (*Pecari Tajacu*) captured with a camera trap

"Iberdrola México wins the Environmental Excellence Award of PROFEPA, thanks to the effort made with Estero Garrapatas projects and Support for Felines"

The Urban Tree Project

In Brazil we are strengthening our commitment with sustainability and environmental conservation. The goal is to increase the quality of life in the cities by planting trees that are compatible with the power grid. This is achieved by replacing large trees that frequently cause interruptions in the power supply by coming into contact with the lines and thus require frequent trimming. The Urban Forestry Plan indicates suitable species for any environment and those that can be replaced or eliminated due to incompatibility with the urban environment.

The pilot project was carried out in the city of Juazeiro, where seedlings of native species of the Caatinga biome were produced in a nursery and the pilot area chosen for the planting was the Cajueiro district. The actions of this project establish correct technical guidelines for the planning and selection processes for planting urban trees in order to prevent future conflicts with the power lines, thus minimising the trimming work required.

Stingless bee keeping

In association with the Terra Mirim Foundation, the Coelba subsidiary has managed to improve the bee keeping business by reintroduction of the uruçu bee (Melipona scutellaris) in the Itamboatá Valley region, within the Environmental Protection Area of Joanes-Ipitanga in the metropolitan area of Salvador.

More than 165 families have benefited from this project, which to date has managed to raise the number of healthy hives from 20 to 83, and the forecast is to obtain more than 160 hives. Within the framework of the partnership with the Terra Mirim Foundation, we sought to consolidate the actions geared towards the processing, storing, bottling and marketing of the honey produced by the uruçu bees. The project highlights the importance of beekeeping as an alternative for sustainable management in Atlantic forest areas, which together with the management and participation of small producers can guarantee the correct conservation of the native forests, their biodiversity and protection of the uruçu bee, a native species of the region that is currently endangered.

The Terra Mirim Coelba Foundation promotes bee keeping through reintroduction of the uruçu stingless bee (*Melipona scutellaris*)

Characterisation of biodiversity in the surroundings of the Velilla Thermal Power Station on the Carrión river

The Velilla Thermal Power Plant is located in the beautiful natural environment of Velilla del Río Carrión, located in the valley that runs from the north plateau towards the southern foothills of the Fuentes Carrionas massif (central Cantabrian mountain range). This area is considered to be one with a degree of environmental conservation despite the heavy hand of man in the area in previous decades and the hydraulic projects causing alterations of the entire Carrión headwaters, almost from the very source.

Within the context of a partnership between the Chair of Iberdrola and the University of Salamanca improvements have been made to the natural features in the surroundings of the plant as well as to the banks and the riverbed of the Carrión river in the municipality of Velilla del Río Carrión.

The overall biodiversity of a territory is largely owed to the wealth and variety of its vegetation, since plants are the primary ecological substrate that allows the remaining biological and even human components inhabiting such a space to subsist.

The floral composition of the area has been compiled in 20 inventories and their associated transects, resulting in the identification of 253 different plant species. The presence of 25 basic plant communities has been verified in the territory, some of which can be assigned to Habitats of Interest within the specific protection regulations (Directive 97/62/EC).

During the wildlife censuses, 202 taxons of invertebrates and 152 taxons of vertebrates were found within the set of 34 UTM 1×1 grid squares.

Despite the limitations, we can consider that the results of a number of taxons found during the selective sampling for some groups is high. The largest presence found was for insects (especially Lepidoptera or butterflies; 32% of the 224-230 species present in Spain were found in Velilla) and some birds, such as passerines (48.5% of Iberian birds) and also Falconiformes.

With regard to protected species, we found a total of 11 mammals, 7 amphibians, 9 reptiles, 1 fish and 78 birds included within the National Catalogue for Endangered Species.

From the data obtained it is possible to deduce that the biodiversity in this area of the Palencia Mountains has very acceptable levels and can be used as an active resource.

Detection of the presence of bee-flies (*Bombyliidae*)

Detection of the presence of *Aeschna sp*

Characterisation of the Biodiversity in the surroundings of the Combined Cycle plant of Arcos de la Frontera.

The combined cycle plant of Arcos de la Frontera is located within the municipality of Arcos de la Frontera in Cádiz, near the Alcornocales mountain range. The environment surrounding the facilities of this plant is heavily humanised, since it is of a marked agricultural nature, with extensive crop lands that have relegated the natural vegetation to small spots of Mediterranean scrub forests. There are occasional river formations crossing through these environments, which are also strongly altered, associated both to the Majaceite river and its small tributary streams.

Within the context of the Chair of Iberdrola's partnership with the University of Salamanca we have studied and brought new value to the natural heritage found in the surroundings of the power plant, which has been brought to the attention of citizens by publishing material that can be used in environmental awareness-raising campaigns. We aim to achieve the following goals:

- To increase our knowledge of the level of biodiversity in the surrounding environment of the Arcos de la Frontera power plant.
- To assess the quality of these ecosystems and biological populations in the surrounding environment of the power plant.
- To publish educational material for use in awareness-raising campaigns.

Monthly surveys were performed in the surrounding environment of the power plant during this project, producing a list of the daytime and night-time bird populations (1,500 m buffer) as well as patterns of abundance, diversity and distribution of the species.

After collating the information from the surveys and sightings, we obtained a list of 99 species of birds from 34 different families. The order with the greatest number of species is that of the passerines, with 53 species, followed by Falconiformes with 14 species. The most diverse families are those of the Acciipitridae, Silviidae and Turdidae.

The inventory showed a total of 20 species of mammals detected (half of these being bats). We also detected the presence of 12 species of reptiles and 6 species of amphibians within the area of study, and with respect to relevant invertebrates due to their level of protection two species stand out, a beetle Thorectes hispanus and a spider Macrothele calpeiana, since they both appear as vulnerable species (VU) in the Red Data Book of invertebrates of Andalusia (2008).

With respect to the flora, 24 inventories have been performed to characterise the habitats, with numerous transepts covering the entire work area. We thus obtained a first estimate on the existing botanical composition, with 280 different plant species. In the area of study in the surroundings of the Arcos de la Frontera Combined Cycle plant we located 21 exotic species that are not native to the territory of study.

Presence of the common blue butterfly (*Polyommatus icarus*)

Study on the behaviour of the lesser kestrel in the surroundings of the Iberdrola facilities

The project on the lesser kestrel (Falco naumanni) was developed within the context of the Chair of Iberdrola's partnership with the University of Salamanca. It is a multiple year program that started in 2013 in the area of the facilities of the Sisante wind farm complex (Cuenca). The purpose of the project consisted in determining the population levels of this species in the area, as well as studying their interaction with the wind farms at said site, in order to mitigate the impact of these facilities on the species. Population censuses were carried out during the first phase of the project and the trophic resources on which this species depends were analysed, finishing with a proposal for mitigation based on habitat management. The second phase of the project focused on the implementation and validation of the measures proposed in order to assess their efficacy on the populations of lesser kestrel in this environment.

In parallel with this work, artificial nesting boxes were installed in the basilica of Villanueva de la Jara (Cuenca) and educational panels on the species were installed in partnership with the Administration of Castilla-La Mancha to aid the settlement of lesser kestrel colonies in the region.

Study of impact on the Eurasian eagle-owl (*Bubo bubo*) of the power lines in eastern Spain.

A research study on the East of the Iberian peninsula was developed within the context of the Chair of Iberdrola's partnership with the University of Salamanca **to study the factors causing the high rate of electrocution of Eastern eagle-owls in power lines as well as a proposal for the reduction of such events.**

The main points to be dealt with to improve this problem affecting the species and the identification of some aspects as alternatives for improvement were determined over a one year period. A study was thus developed to identify the relationships between the power lines and the Eastern eagle-owl to help in the decision making process regarding new power lines and/or the correction of certain lines or towers for conservation of this particular species and of birds in general.

A complete database of critical towers has been compiled, detailing their technical features on the one hand and analysing the influence of their interaction with birds and reviewing the criticality of each of the elements in said interaction. On the other hand, the terrain in which the towers are located, the habitat of the Eastern eagle-owl and of their prey were also all analysed. The results of this study help towards decision making on the actions to be performed regarding power lines.

Eurasian eagle-owl (*Bubo bubo*)

IV National Survey of the Eurasian otter (*Lutra lutra*)

Through the participation of the University of Salamanca, Iberdrola contributed towards the fourth edition of the National Survey of the Eurasian otter (Lutra lutra) coordinated by the Spanish Society for the Conservation of Mammals (SECEM) through its partners, especially the group established for the specific study of semiaquatic mammals called the "Otter Group".

Prospection area grids

The following variables were analysed:

- Analysis of its distribution in provinces: The presence of otters throughout the entire fresh water network of Castilla y León with permanent watercourses is a fact that was established since the third survey, but with current data we can also verify regularity in the seasonal occupation of other seasonal watercourses.
- Analysis of their distribution in the watersheds: the data by watersheds, the natural land distribution unit for these mustelids, show very similar values of presence/absence to the provincial values. The main watershed was that of the Duero river (with 433 files), with a success rate of 69.3%. In the Ebro watershed (only 32 files) the values were 68.8% of positive locations, and for the remaining watersheds the values are very similar.
- Analysis of altitude distribution of Lutra lutra: The species has been detected up to an elevation of 1,820 MASL in the Segundera mountain range (Zaragoza) and 1,795 MASL in the Curavacas massif (Palencia); although with specific surveys in spring they are also found above 2,000 MASL (Morales 2016, Morales et al. 1998b).
- Analysis of some factors of the habitat of Lutra lutra: The mass presence of invasive American crayfish (red and signal) is one of the most relevant environmental factors of recent decades both for the ecology of mammals and fish-eating birds and for rivers and other watercourses in general.

Generally, the main conclusion of the study is that the recovery of the species in the last decade, from a geographical point of view, has been determined in previous studies and is reflected in this 4th National Survey. Wide territories of the Northern plateau that were empty some decades ago are now occupied by the species. The goal for coming years is to establish whether or not the increase in spatial distribution is related to a possible stable recovery of the population and a final favourable state of conservation for the species. Although we currently observe a greater surface coverage by the species in the last decade, this cannot be considered a definitive factor of otter settlement, due to the presence of American crayfish as a food source.

Detection of remains of crabs during the survey

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