



World Business Council for
Sustainable Development

Quarry Rehabilitation Case Study

2009

Quarry rehabilitation: a CEMEX experience

Learning while rehabilitating

This case study is part of a series on quarry rehabilitation practices by WBCSD Cement Sustainability Initiative member companies. [Read about what other companies are doing.](#)

Location and situation

Exploited by CEMEX from 1973 to 1990, the Chambeon aggregate quarry is located in the Forez plain, in the Loire department of southeastern France. Four million tonnes of aggregates were extracted. The operated and restored surface is 45 hectares and the water surface is 33 hectares.

Spread over 50km along the river Loire, the Forez plain is an essentially agricultural region. It is an important migratory area with a great ecological interest, remarkable thanks to its 300 ponds and to the wetlands connected to the Loire and its tributaries.

Known biodiversity

In the Forez plain, the Loire shores are characterized by a high diversity of habitats: the river and its tributaries, islets, sand and gravel ridges, river branches, reeds, meadows and forests. The result is an important biodiversity and the presence of remarkable animal and vegetal species. This is a site of particular importance for birds: Little Egret (*Egretta garzetta*), Purple Heron (*Ardea purpurea*), Whiskered Tern (*Chlidonias hybridus*), Common Kingfisher (*Alcedo atthis*), Red-crested Pochard (*Netta rufina*), Northern Shoveler (*Anas clypeata*), Common Terns (*Sterna hirundo*), Red kite (*Milvus milvus*)...

However, the river has to face a morphological, hydrological and quality malfunctioning due to the human activities since the beginning of the 19th century: canalization for navigation and the prevention of floods, aggregate extraction in the stream channel of the river, dams. The streambed is sinking, with consequences on the fluvial ecosystem, for example the disconnection from the Loire of some secondary river branches.

Targets and aims

- To contribute to the restoration of the morphological and hydrological functioning as well as the ecosystem of the river Loire.
- To create the "Ecopôle du Forez", a 150ha area with a scientific and educational focus, dedicated to the preservation of plants and wildlife diversity of the Loire.

To achieve these goals, the rehabilitation works were carried out according to a methodological approach, based on the knowledge of local biodiversity issues.



Restoration activities

- Creation of 2 ponds generated after the extraction of aggregates in order to create a water surface large enough for birds.
- Creation of connections between the ponds and the Loire so as they can play the role of secondary branches of the river.
- Structuring of three islets far away from the banks to ensure the necessary peace for wildlife.
- Structuring of meandering banks in a gentle embankment to increase the biodiversity of the pond shores. One of the peculiarities of this site is the creation of triple banks which make up shelter, feeding and breeding areas for birds, amphibians and fish.
- Diversification of the biotopes thanks to the use of several different materials: sandy fronts for nest-building for the Kingfisher, mineral islets for the Little Ringed Plovers or the Common Terns, and old decantation basins to grow reeds.
- Restoration of the original alluvial forest thanks to the planting of 20,000 trees of local essences, (oaks, maples, ash, etc.). The forested areas provide shelter for the cormorants.
- Public information centre: building for exhibitions and animations, a 6km trail full of information panels for signals, interactive limits and observatories, etc.



Partners

All the rehabilitation works have been performed with technical advice from FRAPNA (Fédération Rhône-Alpes de Protection de la Nature), the ecological NGO that initiated the project of the Ecopôle du Forez. A partnership has been established between CEMEX and FRAPNA since 1987 and today FRAPNA is a member of the CEMEX France Coalition of Partner Associations. This partnership fits in the framework of the corporate partnership between CEMEX and BirdLife International as FRAPNA is a member of the Ligue pour la Protection des Oiseaux (League for the Protection of Birds), the BirdLife Partner in France.

Results

Since 1991, the Ecopôle du Forez has been managed by FRAPNA which has received financial support from the European Community to create a 750ha "Ecozone du Forez", of which Ecopôle is the heart. The Ecozone has been designated as a Natura 2000 site.

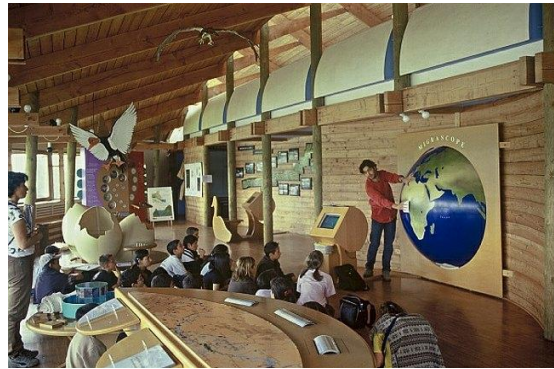


In 1996, an ecological expertise study, undertaken in the framework of a national research program on the wetlands generated by former aggregates operations, demonstrated the ecological interest of the site. This survey identified:

- 240 species of vascular plants, of which 6 are protected – Hampshire Purslane (*Ludwigia palustris*), Golden Dock (*Rumex maritimus*), Cursed Buttercup (*Ranunculus sceleratus*), Cyperus michelianus, Swamp Meadow-grass (*Poa palustris*) Small Fleabane (*Pulicarias vulgaris*) – and 19 are rare at the local scale
- 55 species of nesting birds, of which the Red-crested Pochard, the Gadwall (*Anas strepera*) and the Common Pochard (*Aythya ferina*), and 87 species of migratory birds, of which some are of national or regional interest (Great Cormorant, Northern Shoveler)

- 301 lepidoptera (1 protected)
- 9 reptiles (7 protected)
- 7 amphibians (6 protected)
- 24 fish
- 36 mammals; among them Beaver.

Every year, more than 70,000 visitors, of which 20,000 are school children, walk the trails of the site. They come to watch the plants and the wildlife of the wetlands or to participate in the nature workshops organized by FRAPNA.



Innovations/highlights

Exceptional for Europe, the Ecopôle du Forez is the object of many field research programs focusing on topics as diverse as ecology, hydraulics, hydrogeology or sociology, especially with the Ecole des Mines de Saint-Etienne (Engineering School of Saint Etienne), and an annual scientific convention is signed between the different partners. For instance, the Ecopôle du Forez takes part in a study to test the use of biodiversity indicators on several CEMEX quarries in France. Many improvements to the ecological and management techniques are also regularly applied, monitored and evaluated, which gives the site a unique experimental character.

Lessons learned

During the rehabilitation works, some technical issues were faced. The variations of the level of the water plains, under the influence of the fluctuations of the alluvial layer and by the direct relationship of the site with the Loire had to be understood and mastered. Today, the management of the water levels between basins and the connection with the Loire are being studied on a continuous basis.

Further information

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