



**LAFARGE  
AND BIODIVERSITY**



The rehabilitated Bamburi quarry (Kenya) is now a nature reserve.



The sand martin is a migratory bird that likes to nest in the walls of the Rahmstorf quarry (Germany), where it is left undisturbed until it moves on.



10 hectares of limestone grassland, a fragile and endangered environment, were relocated using eco-engineering techniques at Thrislington (UK).

# Lafarge protects biodiversity in its restored quarries

35 years of experience in quarry rehabilitation



More than 400 hectares of land have been restored at the Bernières quarry (France).

## Quarry rehabilitation, an opportunity for biodiversity

- A quarry is but one **phase** in the life of a site. All projects begin with an impact study that takes local biodiversity into account.
- As quarrying activities proceed, specific **habitats**, such as small cliffs, arid environments and ponds are often created. These areas can encourage certain species to become established there.
- Quarry rehabilitation also affords opportunities to **recreate** certain types of **rare or disappearing ecosystems**, such as wetlands.

## Taking active steps to protect biodiversity is a prime objective for Lafarge

- The protection of biodiversity is an objective set out in the Group's **Environmental Policy**, built into its action plans and its management systems.
- That goal is an integral part of the Group's overall approach, because it is a **vital consideration** for successful economic performance.

✓ *Building upon its know-how and experience, Lafarge decided to strengthen its commitment by pursuing its biodiversity strategy within the framework of a partnership with WWF, and developing a Biodiversity Index to provide a scientific means of evaluating the ecological value of its sites.*

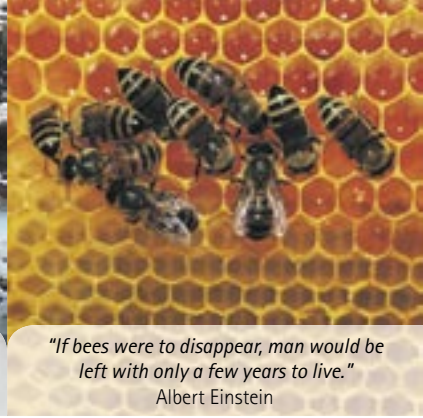
- Lafarge operates nearly 900 quarries in a wide range of ecoregions worldwide.
- Helping quarries blend into their environment, reinstating natural habitats and fostering endangered species have been part of Lafarge's expertise for several decades: the Group's first large-scale quarry rehabilitation projects date to the 1970s.
- Today, 79% of the Group's quarries have a quarry rehabilitation plan that meets Lafarge standards.



*Genetic diversity protects ecosystems and cultures from disease and pests.*



*Species diversity offers a wealth of resources for the human race (e.g., medicinal and edible plants).*



*"If bees were to disappear, man would be left with only a few years to live."  
Albert Einstein*

# Biodiversity: a common heritage, a universal challenge

## **Biodiversity, the diversity of living things and ecosystems, is a heritage that belongs to all mankind**

Biodiversity is essential to our survival:

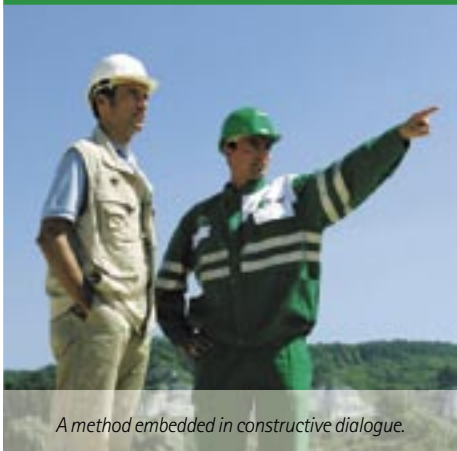
- The diversity of species offers a wealth of resources (e.g., medicinal and edible plants) for the human race.
- Genetically diverse ecosystems are more robust.
- Ecosystems deliver countless benefits to human communities (flood control, soil protection, crop pollination, etc.).

## **There are five main threats to biodiversity:**

- 1- **The shrinkage of natural ecosystems** under pressure from development – especially intensive agriculture and urbanization,
- 2- **Overuse of natural resources** like fish and tropical lumber,
- 3- **Non-native invasive species** whose proliferation is tied to the intensification of human activities,
- 4- **Pollution** of water, soil and air, which harms natural environments,
- 5- **Climate change** because the climate determines the distribution of species and habitats.

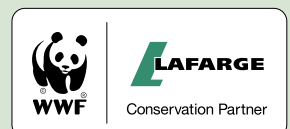
**✓ *Protecting biodiversity is a universal challenge and an objective that can only be achieved through a comprehensive effort on the part of all parties involved.***

## Global partnership with WWF



*A method embedded in constructive dialogue.*

- The Lafarge Group committed to a worldwide partnership agreement with WWF in March 2000.
- In early 2005, on the strength of progress achieved in the areas of CO<sub>2</sub> emissions reduction, quarry rehabilitation and implementation of environmental performance indicators, the partnership was renewed for an additional 3 years.
- The partnership's work revolves around the themes of sustainable construction, climate change, biodiversity and persistent pollutants.



two worlds, one planet



Thanks to ecological monitoring, the development of rare species such as orchids can be encouraged.



A wetland ecosystem at Sandrancourt (France).



A meeting on biodiversity in quarries, with the French national museum of natural history and WWF.

# Lafarge is implementing a comprehensive biodiversity management system

Working closely with the experts



An osprey in Seattle (USA). The site has been restored as a habitat for birds of prey in collaboration with the Wildlife Habitat Council.

- The biodiversity aspects of Lafarge's sites are usually addressed in conjunction with associations or organizations outside the Group.
- France's Muséum National d'Histoire Naturelle, English Nature, the Wildlife Habitat Council (USA) and dozens of other organizations have shared their know-how with Lafarge to create natural habitats in restored quarry sites.

## A strategy to promote biodiversity

- After engaging in efforts to protect biodiversity at its quarries for many years, Lafarge decided to formalize its approach by developing a **comprehensive biodiversity management system**.
- This system is in line with the Group's biodiversity strategy, and is one of the themes of its work with WWF.

## Methodology and tools

- The comprehensive biodiversity management system includes a **toolbox** that enables Lafarge staff to integrate biodiversity into their activities.
- These tools allow **assessment** of a site's biodiversity issues. These can then be described and an improvement program defined. A Biodiversity Index, under development, will allow monitoring of the ecological value of rehabilitated quarry sites.
- **Teams** are encouraged to call upon local conservation organizations for expert input.

## Vital scientific backing

- The systematic involvement of scientists from academia and/or NGOs ensures that sustainable habitats and communities are created.

✓ *An international panel of experts will monitor the deployment of the biodiversity management system. Follow-up indicators will be published annually in the Group's Sustainability Report.*



*The Biodiversity Index was developed at the Mannersdorf quarry (Austria) in partnership with the local office of WWF.*

*A Monarch butterfly at the Marblehead quarry (USA).*

*Hyperolius argus at Bamburi (Kenya).*

# Lafarge is developing a Biodiversity Index for its sites

## A tool for measuring biodiversity

- The development of a Biodiversity Index will give site teams as well as outside partners a **measurement tool** to monitor and manage ecological development.
- Each site will be assigned an **aggregate score** that reflects criteria such as the rarity of species encountered.
- Given the considerable variation in the biogeographical conditions of the nearly 900 quarries operated by Lafarge, the development of this experimental Index marks an **innovative approach**.

## A contribution to improved knowledge

- The **data** collected in the field can be **shared** with the scientific community, thereby contributing to improved knowledge of local biodiversity.

## A full-scale test of the Index

- Since the Index was first developed at the **Mannersdorf** quarry (Austria) and then at the **Sandrancourt** quarry (France), five additional sites have become involved in the project: **Bamburi** (Kenya), **Marfield** (United Kingdom), **Marblehead** (USA), **Yepes** (Spain) and **Cruas** (France). Testing the Index at these new sites is a vital validation step before Lafarge works toward its goal of implementing the Index at 25% of the Group's nearly 900 quarries – more than 200 sites.

✓ *The Lafarge Biodiversity Index is still at an experimental stage; its development is being monitored by a Scientific Committee staffed by experts from outside the Group. Ultimately, the Index could be used in a quarter of the Group's nearly 900 quarries.*

## A scientific approach



*Dr. Sardinero, professor at the University of Castilla-La Mancha, takes an inventory of the flora at the Yepes quarry (Spain).*

- The method is based on subdividing the site into uniform natural environments within which 3 to 5 species groups (e.g., birds, plants, amphibians, beetles) are studied.
- Using a calculation method that integrates the rarity of the species studied and the land area of the environments identified, the site is assigned a final score ranging from 1 (low ecological value) to 7 (exceptional ecological value).
- The first real-life tests of the Index show that a quarry site rehabilitated with high-quality natural ecosystems should achieve a score of between 3 and 4.



Lafarge worldwide ■

- Lafarge, world leader in building materials, operates nearly 900 quarries around the world.
- Quarries are indispensable sources of building materials such as limestone (for cement), clay (for roofing tiles), gypsum (for plaster), sand and gravel (for concrete and rockfill).
- Quarry rehabilitation can provide opportunities to create natural habitats and environments conducive to biodiversity.
- On the strength of its past experience, Lafarge has now included biodiversity in its environmental management system, and is developing a Biodiversity Index for use in rating its sites.



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