Sustainable development indicators – making biodiversity measurable

Thanks to improvements in the stripping plan and mining technology, raw materials quarrying has become more environmentally compatible. In 2000, post-quarrying land was transformed into nature conservancy in approximately 54 % of the former quarrying sites, which can also play an important role in protecting nature during operations through succession areas. In these areas, which move around within the site during the course of quarrying, high-quality habitats can emerge, which are significant for the flora and fauna that add value to the surrounding cultural landscape and thus, these areas play a vital role in recovering this biodiversity.

So far, however, suitable and, in particular, universally recognised instruments are lacking to comprehensibly measure the nature conservancy value of quarrying sites.

Project description

In August 2005 HeidelbergCement, together with the German Cement Association (BDZ), Socio-political Working Group of German Cement Industry (SPADZ) and the environmental planning office AG.L.N., started a pilot project to develop and test sustainability indicators in the German cement industry. The project was sponsored by the German Federal Ministry of Education and Research (BMBF). Within the scope of the project, a close cooperation with the University of Applied Sciences Bingen was also taking place. The project was being implemented in the quarry of HeidelbergCement Schelklingen cement works on the Swabian Alb in Baden-Württemberg, Germany.

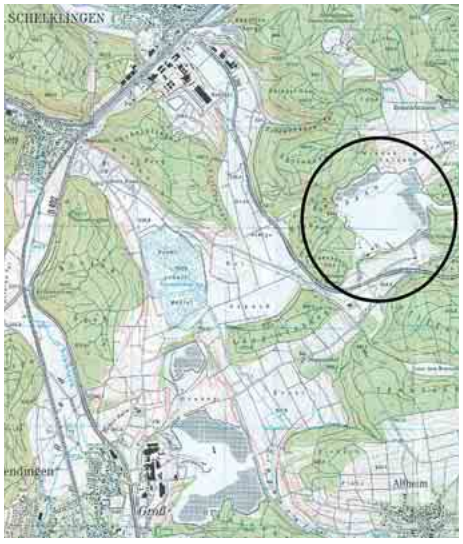
Aims and tasks

The aim of the project was to develop and test indicators for the measurement of the biodiversity. They should allow determining and forecasting the ecological value of quarrying sites and the effects of nature conservancy measures by quantitative and predictable criteria. The whole period before, during and after quarrying was taken into consideration. The indicators had to be adapted to specific conditions and capability of quarrying sites in order to fulfil the demand of business practices and nature conservation in an equal way.

Monitoring

The development of a significant and practicable monitoring program was another central component of the pilot project, as only a long-term application of the developed indicators allows to draw conclusions regarding the development of the biodiversity of a surveyed area and thereby a data-supported prognosis about

Quarry of HeidelbergCement in Schelklingen



Model domain of the pilot project

the development of plant and animal species. In the course of the project, different methods of monitoring were discussed and it was decided to monitor the complete mining site and its surrounding area. With the advantage of the most comprehensive and statistically secured data base, it is the recommended monitoring method despite the higher expenditure.

Biodiversity indicators

A central component of the project was the development of a meaningful and practicable indicator set, with which the biodiversity and its dynamics can be measured and evaluated. As such, the potential indicators could be arranged according to the three organisational levels: The "Ecological System Level" ("Habitat" indicator set), the "Organism Level" ("Biodiversity" indicator set) and the "Genetic Level" ("Genetic Diversity" indicator set).

10 indicators could be selected due to extensive data analyses and discussions; these indicators are classified as suitable and should therefore be tried in the context of a test phase. In the "habitats" indicator set, they contain three indicators, whereupon every single indicator originates from the "habitats", "reuse" and "migratory biotope" portions. The "species diversity" indicators set contains a total of seven indicators, of which four indicators are assigned to the "species figures" portion and three indicators are assigned to the "valuable species portion". Now, at the end of the project, the results will be integrated into "Biodiversity Action Plans". Each Action Plan includes monitoring, renaturation measure planning including cost estimations, maintenances for the species and habitats and the nature conservation management in quarrying sites.

Conclusions and benefits

The results and experiences of the project show that indicators and monitoring programmes based on these indicators can be a suitable instrument to measure and value biodiversities and their development in quarries of the stone and earth industry, as long as these are adapted to the specific conditions of such mining sites.

Nevertheless, the need for further research exists. As such, the developed and selected indicators have to pass a trial period in different mining sites. Furthermore, the achievement of objective values has to be verified for each indicator. Actually, what remains is a further differentiation and adjustment of the developed methods for the transmission to other plants or even other stone and earth industries with their own specific conditions.

Therefore, HeidelbergCement uses these results to develop a Group wide management guideline on biodiversity and the recultivation of its mining sites. The comprehensive project work will be supported and monitored by an NGO. The management guideline is to be published by the end of 2008 and will successively be implemented in the German and European mining sites of HeidelbergCement. Later on, the recultivation guideline will find application within HeidelbergCement mining sites worldwide.

Hyla arborea

Papilio machaon