



## Disused quarries could provide valuable habitat if restored naturally

**Old mining sites**, such as quarries or pits, could provide refuges for endangered species, according to new research from the Czech Republic. Benefits are greater if the sites are allowed to recover naturally rather than being artificially restored with the use of topsoil, ground-leveling and seed planting.

**All over Europe** there are disused mining sites where, for example, coal, rock and clay were extracted for the construction industry. The traditionally negative view of these sites among ecologists is rapidly changing and it seems they can offer valuable habitats for rare species. Restoring these sites could be an interesting conservation strategy that could potentially help implement EU policy on biodiversity<sup>1</sup>. However, they must be restored effectively.

The research is the first to compare the biodiversity of old mining sites that have been technically restored with 'spontaneous' sites that have been restored naturally. Technically restored sites tend to be covered with topsoil and sown with seeds, whereas there is no direct seed sowing in spontaneous sites. The research took place in limestone quarries in the Czech Republic and investigated species of vascular – or 'higher' - plants and arthropods.

692 species were recorded with 10 per cent being rare species (defined as being on the Czech Republic red lists) and 14 per cent were species with specific habitat requirements. This confirmed the large conservation potential of quarries. Naturally restored sites did not differ from technically restored sites in the number of different species but they did support more rare species and species that only live in dry habitats.

The technically restored sites contained less bare ground and more continuous vegetation and litter. The addition of top soil favours ruderal plants or weeds which prevent more sensitive plants colonising. Although more vegetation is expected to increase the diversity of herbivores, such as true bugs, leafhoppers and butterflies, the link is likely to arise from a greater variety of habitats. There is more variety at naturally restored sites. In addition, endangered herbivores often depend on rare sensitive plants that are not supported by technically restored sites.

Among predators, spiders depend on richly structured environments with rocks, cracks and open ground. Technical restoration tends to replace this type of habitat with a more uniform one. However, some species, such as harvestmen, showed no preference between restoration methods.

The results suggested that naturally restored mining sites provide greater biodiversity benefits than those that are technically restored. They are also cheaper. However, this strategy is rarely implemented and none of the huge lignite quarries in the Czech Republic are reserved for natural restoration. Since mining areas represent 1 per cent of the world's land they could contribute to biodiversity if restored sensitively.

The researchers suggest that natural restoration should be the preferred method and could be especially suitable for sites within protected areas. When technical restoration is necessary it should apply near-natural methods, such as mulching with plant material, covering surfaces with hay or sowing targeted species.

1. See: [http://ec.europa.eu/environment/nature\\_biodiversity/index\\_en.htm](http://ec.europa.eu/environment/nature_biodiversity/index_en.htm)

**Source:** Tropek, R., Kadlec, T., Karesova, P. *et al.* (2010). Spontaneous succession in limestone quarries as an effective restoration tool for endangered arthropods and plants. *Journal of Applied Ecology* 47:139-147.

**Contact:** [robert.tropek@gmail.com](mailto:robert.tropek@gmail.com)

**Theme(s):** Biodiversity, Land use