



Mining sites: Landscape degradation or Opportunity for Biodiversity?

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Massive biodiversity loss, alarming the scientific community, is a hot topic nowadays. On the other hand, mining sites, active or closed, represent almost 1 percent of Earth's surface. Mine safety imposes physical protection and isolation of mines by high fences, signs and guards in active and sometimes even in closed mines. Human activity, other than extraction, is most often legally restricted in mines, and hence the human disturbance is low; even in active mines, extraction is mostly taking place in one relatively small part of the mine, at one time, while the fence protects the whole mining area. As such, even active mines might present shelters for biodiversity, especially outside the working hours (late afternoon and night) for animal species, or in areas that are not exploited at the moment for plant species.

However, active and closed mines are rarely regarded as an opportunity for biodiversity. They are rather commonly regarded as degradations that require intense fixing actions. Instead of constantly rehabilitating them, in order to make them less dangerous for local populations or making them functional for humans – by giving them back the function they had before mining (i.e. agriculture, forestry) or creating a new one like landfill or industrial zone in quarries or fishing, hiking or other leisure activities in gravel pits – should we keep them protected and look at them as potential biodiversity reservoirs, in nowadays landscapes, overpopulated and generally highly impacted by human activities?

Should we rehabilitate mining sites or let them be biodiversity sanctuaries, where nature will develop itself as it suits her? Should we humans constantly try to “improve” and “help” nature, or should we let it be?

Existing studies showed that spontaneous succession can lead to valuable high-diversity habitats, but the attention given to its effect in mining sites has not yet been extensive. We studied biodiversity in mining sites, and we present empirical evidence suggesting that mining sites where nature has been left to develop on its own should be regarded as opportunities for biodiversity.

We compared the influence of four different rehabilitation techniques - mineral base left to spontaneous succession, mineral base covered with topsoil, mineral base covered with topsoil and planted, and mineral base covered with topsoil, sown and planted - on biodiversity development in quarries and gravel pits, in order to determine the technique that favors the most biodiversity development. We conducted inventories of five taxonomic groups present on-site after application

of those four different rehabilitation techniques. 29 flora plots and 18 fauna transects were thoroughly inventoried, several times, in sites in northeastern France. We recorded 186 species of plants, 14 individuals/2 species of reptiles, 479/11 of amphibians, 91/39 of butterflies and 325/27 of dragonflies. For all five taxonomic groups, natural succession had the most favorable impact, compared to other rehabilitation techniques.

Our results suggest a necessity for a perspective change in favor of regarding mining sites as opportunities for becoming biodiversity shelters.