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# Conservation easements – project selection criteria for quarries in Europe

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The paper highlights the potential for the extractive industry to advance the EU Green Deal's biodiversity objectives. It argues that well-managed quarries can serve as vital habitats for endangered species, particularly near Natura 2000 sites. The paper introduces conservation easements as a financial incentive for quarry operators to invest in ecological restoration. These legal agreements limit specific land uses, making conservation a more financially predictable business venture. In the US, tax benefits have made conservation easements popular tools for private land conservation; however, their application in Europe remains nascent. The paper also provides a comprehensive set of 12 selection criteria to help identify optimal quarry sites for such easements. These criteria consider various factors, from location and size to ecosystem services and stakeholder. By aligning economic incentives with conservation goals, the paper offers a pragmatic blueprint to incorporate the extractive industry into Europe's biodiversity strategy. Conservation easements could be pivotal in creating a symbiotic relationship between commercial interests and ecological preservation, expanding the scope of partnerships to other stakeholders like water companies or insurance firms.

## 1 Introduction

Private sector support is essential to achieve the EU Green Deal's biodiversity goals, given that a significant portion of Natura 2000 and potential restoration sites are privately owned ([European Commission](#), no date).

The extractive industry is a prime example of how private business impacts biodiversity policy implementation.

Historically, European land has often been altered or degraded by agriculture, forestry, and other land uses. While resource extraction can lead to further destruction, well-managed former quarries and reclamation sites can provide vital habitats for endangered species, including those adjacent to Natura 2000 sites. This presents an opportunity to rehabilitate habitats that have suffered significant loss ([European Commission, 2019](#)).

New, enhanced reporting requirements will intensify public scrutiny of private firms' biodiversity impact, demanding inventive and proactive approaches to harmonise resource extraction with nature preservation. Conversely, voluntary efforts to maximise long-term biodiversity value in quarries could spawn new business models by leveraging current and future fiscal incentives linked to nature restoration and promoting biodiversity-friendly land use.

It's relevant to explore how the extractive industry can proactively surpass legal norms for net biodiversity gains. A dual case—both communicative and financial—is essential to persuade firms to invest in conservation voluntarily. Often, companies seek public recognition, align such efforts with their ESG goals, and justify them through public and private financing options.

Conservation easements could help make nature conservation a more appealing investment for mineral extractive companies by bridging existing gaps.

- A conservation easement restricts specific land use rights via a voluntary legal agreement, transferring these restrictions to an easement holder, often a public agency or land trust.
- These limitations become part of the property title and are thus running with the land.

Unlike Europe, conservation easements are a widely recognised conservation mechanism in many parts of the world, like the USA, Australia, and South Africa. In the US, they've become a favoured means for landowners and interest groups to permanently preserve conservation values on private lands. While not all agreements are designed to be perpetual, they typically prioritize long-term protection. This aspect would complement more conventionally employed conservation tools, like stewardship agreements, in Europe well (Johnson, 2014).

Tied to financial incentives, conservation easements are attractive to landowners while providing conservation organisations with a flexible, enduring tool: a usually perpetual agreement connected to the land, not the owner. Their adaptability for site-specific land use stipulations and allocation of rights and responsibilities makes them widely popular among the contracting parties.

Although the legal framework for their use is present in most EU member states, conservation easements have only recently gained traction in Europe (Racinska and Vahtrus, 2018; Račinska et al., 2021).

Wilker et al. (2016) argue that the mining industry typically underinvests in high-quality restoration since it doesn't directly benefit from this. Restoration budgets are kept low as future benefits are more complex to estimate than costs. In the long term, conservation easements could offer more financial predictability by accumulating data on valuations for "given-up" quarry rights. These easements safeguard biodiversity while permitting private ownership and economic activities (Kiesecker et al., 2007).

To protect a property against nature-harming land use, a conservation easement can limit the right of the landowner to

exercise them. This can include mineral rights and potentially reopening the quarry (Adams and Moon, 2013).

Maintaining ownership of a repurposed quarry as a natural area can serve multiple goals for quarry owners. It can offset the company's environmental impacts elsewhere ("insetting"), enhance its eco-friendly reputation, and foster positive community relations. Additionally, retaining ownership allows for potential property value appreciation and the monetisation of site-specific features or services. Conservation easements enable landowners to undertake green energy, carbon, or biodiversity credit-linked conservation projects.

Given their requirements for additionality and permanent protection, conservation easements are especially suited for initiatives involving carbon and biodiversity credits (Chiang et al., 2020). These easements can also solidify agreements with other stakeholders interested in the ecosystem services from a restored site. For example, insurance firms might invest in a quarry that serves as flood protection for a neighbouring city.

To assess the viability of conservation easements in quarries, we suggest choosing test sites with the most significant potential for conservation success.

This paper proposes selection criteria to accelerate the adoption of conservation easements throughout Europe. It guides quarry operators who may lack the expertise to identify optimal sites for such initiatives.

## 2 Selection criteria

The Land Trust Alliance, the US land trusts' umbrella organisation, offers guidance for its members through its *Land Trust Standards and Practices*, with Standard 8 focusing on best practices for project evaluation and selection. Standard 8 emphasises the need for criteria aligning with conservation goals, providing a framework for assessing potential sites. Conservation goals targeting key species and habitats based on robust ecological practices serve as the basis for site identification. These land protection criteria enable a transparent system for prioritising potential locations (Little Traverse Conservancy, 2004).

We reviewed nine sets of selection criteria from US Land Trusts including those in "The Conservation Easement Handbook" by Byers and Marchetti Ponte (2005) and more recent examples provided by the Land Trust Alliance from the Marin Agricultural Land Trust and the North Florida Trust as well as their guide to creating selection criteria for conservation easements.

In conclusion, we suggest 12 criteria for evaluating if a quarry in Europe is a suitable candidate for a conservation easement. We elaborate on these criteria in the sections that follow, in no order.

### 2.1 Location

A site should be considered favourable if it's proximate to or part of a protected area network, such as Natura 2000 or a regional network like the Flemish Ecological Network. A quarry under a

conservation easement can enhance the cohesion of these conservation networks, broaden their scope, act as a buffer for adjacent protected zones, or support species migration. In these instances, the site's size may be less relevant.

When choosing a quarry site for a conservation easement, surrounding land uses are pivotal. The scarcity of nearby natural areas boosts the conservation's value for biodiversity and the local community. Sites that can link or buffer existing natural vegetation fragments are particularly valuable. They can expand rare habitat patches, offer complementary habitats for local species, or serve ecological functions—like trapping nutrients from adjacent farmlands to protect valuable wetlands. A site's clear, identifiable landscape enhances its suitability for a conservation easement.

## 2.2 Size

Cost-benefit is a function of size. A conservation easement must cover a sufficient area to ensure monitoring and enforcement costs don't outweigh the conservation benefits. Transaction and monitoring efforts are nearly the same for small and modestly sized plots of land. However, context factors—like the ecological quality of the area or its location, especially in densely populated regions like the Netherlands—can significantly affect the importance of size in the cost-benefit equation.

## 2.3 Habitat

The habitat selection at a quarry site should align with overarching conservation goals, whether regional, national, European, or global. For a site to be considered favourable, habitats existing there should be of Annex 1 of the Habitats Directive or otherwise deemed valuable – e.g., biodiversity-rich, important for species or relevant for a conservation target - seen as valuable by local stakeholders, on a regional or national level like those of a Red List or protected by law. Quarries often house unique features—cliffs, caves, ponds, screens—that offer valuable habitats for diverse species like bats, birds, reptiles, and amphibians. These settings can be ecologically distinctive and uncommon in surrounding landscapes.

## 2.4 Species

A site's potential for achieving or maintaining good conservation status for a particular key species should be a key factor. Specifically, the presence of classified as endangered or threatened species would make a site a high-priority candidate for a conservation easement. Like habitat types, regional, national, European, or global conservation targets, such as those outlined by the IUCN Red List or Birds and Habitats directives, can guide species prioritisation.

For quarries, the presence of endangered species, whether flora or fauna, may be a compelling reason for choosing nature-based after-use and can significantly impact ongoing management

practices. Evaluations should be case-specific, determining which species are most relevant and could offer solid arguments for long-term protection.

## 2.5 Archaeological/Geological value

Quarries can contain fossils and be valuable historical or geological archives. Quarrying itself Quarries may house valuable historical or geological features, such as fossils, with tourist, educational, or scientific significance. The mining industry itself may have historical importance in a given region. In such cases, a conservation easement could be a suitable mechanism to protect the site's archaeological and geological assets.

## 2.6 Ecosystem services

Quarries can offer unique ecosystem services beyond the typical benefits of healthy ecosystems, such as carbon sequestration. For instance, quarry ponds or wetlands may serve as water retention areas or flood barriers. These benefits can be enabled by linking the quarry to nearby rivers or floodplains. Ecosystem services that align with conservation goals could make a site a strong candidate for a conservation easement.

## 2.7 Threats

Threats such as invasive species or pollution should not significantly displace native flora, fauna, or habitat or disrupt ecosystem functioning. Site disqualification depends on the threat's severity, manageability, rate of change, trend (declining, stable, increasing) and the degree to which it changes (slow versus rapid).

## 2.8 Environmental damage

Conservation easements prioritise a site's current and future conservation potential over its past conditions. While past resource extraction and landscape modifications are generally less relevant, lasting negative impacts such as soil contamination or groundwater disruption can still disqualify a site for consideration.

## 2.9 Time

Extraction creates new habitats through disturbance. The time factor evaluates both the habitat's age and its future prospects. Optimal habitats should have matured to their ecological climax, aligning with conservation goals. Since habitats are dynamic, their future value can shift based on restoration and management plans. A site's suitability should be assessed through its restoration potential over a specific timeframe, grounded in a well-formulated restoration and management hypothesis.

## 2.10 Stakeholders

Given the voluntary nature of conservation easements, key stakeholders who can influence its implementation must be supportive. Relevant parties include quarry operators, authorities, site managers, local communities, and potential easement holders, typically NGOs.

## 2.11 Public Access

Sites that offer public access to living nature are deemed favourable. This can be facilitated through the construction of trails, observation hides, viewpoints, or other recreational amenities.

## 2.12 Cost

Easement holders and landowners should consider the financial implications of establishing and maintaining a conservation easement. This includes initial setup costs and ongoing stewardship and monitoring expenses, such as changing management costs over time, especially for dynamic habitats that may require more intensive care in the long term. For example, maintaining transient pioneer habitats often necessitates active management, potentially escalating costs, unless natural hydrological conditions or large herbivores are reintroduced.

## 3 Discussion

It should be emphasised that these criteria are interrelated, influencing each other and should be evaluated collectively. Their relative criteria significance may vary from one site to another. Quarry operators are encouraged to customise their criteria list in collaboration with relevant local interest groups to address the unique aspects of each site.

Considering selection criteria from US Land Trusts, we found that the requirements outlined by the Little Traverse Conservancy, as featured in *The Conservation Easement Handbook* by Byers and Marchetti Ponte (2005), align closely with our proposed list. This resource proved invaluable in shaping our criteria for the European context.

In our review of various land trust selection criteria lists, specific criteria consistently appeared. These include 1) location, 2) size, 3) habitat, 4) species, 10) stakeholders, 11) public access, and 12) cost.

Criteria that emerged from our discussions, notably 5) Archaeological/Geological Value, 6) Ecosystem Services, 7) Threats, 8) Environmental Damage, and 9) Time, are especially relevant for quarry conservation.

It should be highlighted that financial compensation for quarry easements is hard to gauge and competes with alternative after-uses. Currently, European landowners may find conservation easements less financially rewarding than other after-uses. Nonetheless, alternative revenue streams like carbon offsetting could make conservation easements financially viable for quarry owners. The

perceived value of nature in the future may also change. Moreover, intangible benefits like an enhanced brand image could indirectly boost a quarry owner's revenue, making a cost-benefit analysis compared to other after-uses essential for informed decision-making.

Additionally, the landscape of conservation easements as a private land conservation tool is quite fragmented across Europe (Racinska and Vahtrus, 2018). While theoretically applicable in most nations, the tool is underutilised. For instance, legal barriers hamper its use in countries like Slovenia. In contrast, others, like Portugal, lack a formal legal framework. Which makes the establishments of easements more difficult as these countries follow a civil law legal system (Johnson, 2014).

Conversely, some European nations have analogous systems in place. Finland's METSO programme and Belgium's nature management plans serve similar purposes. The French "real environmental obligations" (ORE) and Scottish and English conservation covenants mirror the US model more closely.

Given this uneven legal terrain, piloting conservation easements in European countries with more developed frameworks makes sense. Doing so would provide a testbed for refining and adapting the model for broader European implementation. It could help upscale the use of conservation easements in Europe and incentivize the extractive industry to go above and beyond legal requirements in quarry restoration.

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CH: Writing – original draft. TS: Writing – review & editing. SS: Supervision, Writing – review & editing.

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## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

## References

- Adams, V. M., and Moon, K. (2013). Security and equity of conservation covenants: Contradictions of private protected area policies in Australia. *Land Use Policy*, 114–119.
- Byers, E., and Marchetti Ponte, K. (2005). *The conservation easement handbook* Vol. 2 (Washington, DC: Land Trust Alliance).
- Chiang, C., Remucla, J., and Wescott, S. (2020). Carbon offsets in conservation easements. Washington, DC: Land Trust Alliance. Available at: <https://landtrustalliance.org/resources/learn/explore/digital-download-carbon-offsets-in-conservation-easements?queryID=0853dd0130cdcd361a00cf2989698a53>
- European Commission. *Natura 2000 - Environment - European Commission*. Available at: [https://ec.europa.eu/environment/nature/natura2000/index\\_en.htm](https://ec.europa.eu/environment/nature/natura2000/index_en.htm).
- European Commission. (2019). *Guidance document on non-energy mineral extraction and Natura 2000*. Available at: [https://ec.europa.eu/environment/nature/natura2000/management/docs/NEEI\\_Summary\\_EN.pdf](https://ec.europa.eu/environment/nature/natura2000/management/docs/NEEI_Summary_EN.pdf).
- Johnson, L. A. (2014). *An open field: Emerging opportunities for a global private land conservation movement*. Cambridge MA: Lincoln Institute of Land Policy.
- Kiesecker, J. M., Comendant, T., Gray, E., Hall, C., Hilsenbeck, R., Kareiva, P., et al. (2007). Conservation easements in context: a quantitative analysis of their use by the nature conservancy. *Front. Ecol. Environ.* 5 (3), 125–130. doi: 10.1890/1540-9295(2007)5[125:CEICAQ]2.0.CO;2
- Little Traverse Conservancy. (2004). Little Traverse Conservancy Land Protection Policy. In E. Byers, & K. Marchetti Ponte, *The conservation easement handbook*. Washington, DC: Land Trust Alliance.
- Račinska, I., Halevy, C., and Tilmann, D. (2021). *The current and potential use of easements as a nature conservation tool in the European Union* (Berlin: NABU Federal Association).
- Racinska, I., and Vahtrus, S. (2018). *The Use of Conservation Easements in the European Union* (Berlin, Germany: NABU Federal Association).
- Wilker, J., Rusche, K., Benning, A., MacDonald, M. A., and Blaen, P. (2016). Applying ecosystem benefit valuation to inform quarry restoration planning. *Ecosyst. Serv.* 20, 44–55. doi: 10.1016/j.ecoser.2016.06.003

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