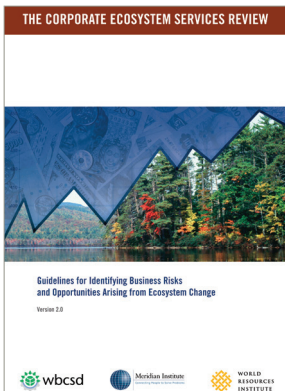




# THE CORPORATE ECOSYSTEM SERVICES REVIEW CASE STUDY: LAFARGE

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*The Corporate Ecosystem Services Review (ESR) is a proven method to help managers identify business risks and opportunities arising from their dependence and impacts on ecosystem services. This case study describes one company's experience and results in applying the ESR.*

This case study is an accompaniment to The Corporate Ecosystem Services Review Version 2.0 (2012). Available online at <http://www.wri.org/ecosystems/esr>

Lafarge North America, a cement and aggregates company, used the Corporate Ecosystem Services Review (ESR) in combination with ecosystem valuation tools at a cement quarry on the Michigan shores of Lake Huron. The ESR informed mining design and rehabilitation plans, identifying ways the company could reduce costs and enhance the company's land asset values over a 45-year period.

Lafarge partnered with ecosystem services teams at the World Wildlife Fund, Wildlife Habitat Council, and World Resources Institute to help implement the assessment. A step-by-step description of their ESR process follows.

## STEP 1: SELECT THE SCOPE

The ESR's scope of assessment was Lafarge's Presque Isle Aggregates Quarry (PIAQ), which is located in the northern portion of Michigan adjacent to Lake Huron. PIAQ's limestone quarrying operations occupy 5,000 acres. Lafarge ships the quarried products by barge to its customers throughout the Great Lakes region. The limestone aggregates are used by various end users in concrete applications and steel manufacturing.

## STEP 2: IDENTIFY PRIORITY ECOSYSTEM SERVICES

During step 2 of the ESR, Lafarge used the ESR's dependence and impact assessment tool to systematically evaluate the degree of the company's dependence and impact on more than 20 ecosystem services, and determine the highest "priority" ecosystem services most relevant to the quarry's performance. Lafarge identified the main ecosystem services dependencies and impacts at the PIAQ site to be:

- *Freshwater.* The quarry depends on and impacts freshwater for washing products and other quarry operations.

- **Regulation of water timing and flows.** Lafarge’s quarry water runoff passes through a soil settlement system that modifies normal water flows, slightly impacting the local hydrology.
- **Erosion control.** Lafarge depends on the ecosystem service of erosion control because the company ships quarried products by barge through Lake Huron canals, which are susceptible to sedimentation. Lafarge does not contribute to sedimentation problems in Lake Huron and is in compliance with all water quality regulations.
- **Water purification and waste treatment.** Water quality is important to Lafarge’s regional stakeholders. The PIAQ site is mostly denuded; there is a small wetland and forested area that may contribute to some water purification, but Lafarge’s impact on this ecosystem service is negligible.
- **Ecotourism and education.** Lafarge brings school and community groups to PIAQ’s nature education center, which is situated on a protected wetland and fish hatchery adjacent to Lake Huron.

### STEP 3: ANALYZE TRENDS IN PRIORITY SERVICES

Lafarge and its partners conducted step 3 of the ESR to evaluate the condition and trends in the priority ecosystem services, and to better understand drivers of these trends. The ESR team researched trends in ecosystem services using Lafarge’s corporate data, interviewing local experts, and reviewing university and government-commissioned economic and environmental assessments. The assessment uncovered regional trends, beyond Lafarge’s own impacts, of uncontrolled erosion that threatens water quality in Lake Huron’s tributaries and the navigability of the lake’s canals. The assessment also highlighted regional trends in commercial growth, increased tourism, and land use change that could increase demand for protected natural habitat.

#### **Trends analysis: Erosion control**

Erosion control plays a vital role in maintaining the water quality, habitat health, and navigability of Lake Huron and the surrounding watershed. However, uncontrolled erosion and sedimentation in streams and other water bodies is an increasing problem in the region due to commercial growth and land use change. Besides degrading water quality, sedimentation in Huron’s tributaries smothers aquatic habitat and reduces commercial fish populations.

Lafarge’s quarry water runoff passes through a soil settlement system and is in compliance with all applicable water regulations. The site is presently considered to have a negligible impact on the water quality and sedimentation of Lake Huron. However, Lafarge strongly depends on the provision of erosion control because the company transports its product through Huron’s canals, which are susceptible to sedimentation. Any reduction in erosion control thus poses risks to society and to Lafarge’s operations.

### STEPS 4 AND 5: IDENTIFY BUSINESS RISKS AND OPPORTUNITIES, AND DEVELOP STRATEGIES

In order to quantitatively understand risks and opportunities related to ecosystem change and observed trends in ecosystem services, the ESR team applied ecosystem valuation tools during step 4 of the ESR. The tools applied were:

- The Natural Capital Project’s [integrated valuation of environmental services and tradeoffs](#) (InVEST), which spatially analyzes ecosystem services and associated economic values
- The Defenders of Wildlife’s [wildlife habitat benefits transfer toolkit](#), which estimates the monetary value of ecosystem services based on an analysis of valuation studies conducted at similar sites.

#### **Risks and opportunities for the ecosystem service of erosion control**

Because PIAQ is located at the bottom of the watershed, the site can provide a service to society and safeguard business performance by intercepting runoff from surrounding areas and reducing tributary and lake sedimentation. The InVEST erosion control module analyzed the future cost of dredging Huron canals for transporting quarry products. It revealed that Lafarge’s soil settlement system at PIAQ, which essentially substitutes for the ecosystem service of erosion control, in addition to the site’s small natural wetlands, prevent lake sedimentation and avoid as much as \$2 million in potential dredging costs. The site presently incurs actual erosion mitigation costs of only \$13 per year.

To avoid future sedimentation of Lafarge’s water transport routes, Lafarge can maintain the erosion control services provided by the site and encourage local entities to also protect this ecosystem service through improved watershed management.

## Risks and opportunities for water purification and waste treatment

The InVEST nutrient retention module estimated that the site provides up to \$51,000 annually by absorbing nutrient pollution and thereby avoiding the need to invest in the infrastructure that would be required for more stringent water treatment technology. Lafarge can communicate the economic value of this ecosystem service to local stakeholders and government in order to improve external relationships.

## Risks and opportunities for recreation and educational values

Lafarge could restore more natural areas after mine closure to enhance local ecotourism and education opportunities. The ESR team used the wildlife habitat benefits estimation toolkit to estimate the economic value of educational and recreational services associated with the site. The toolkit estimated that potential monetary values related to fishing, hunting, wildlife viewing, and education services at PIAQ could be between \$2 million and \$31 million over 10 years. Lafarge could tap into these values in order to finance top-notch ecosystem restoration activities at PIAQ after the mine closes.

## FOR MORE INFORMATION

World Business Council for Sustainable Development (WBCSD). 2011. *Guide to Corporate Ecosystem Valuation*. Available at: <<http://wbcسد.org/work-program/ecosystems/cev.aspx>>. See also the Lafarge case study in the *Guide to Corporate Ecosystem Valuation*, which is available at: <<http://wbcسد.org/work-program/ecosystems/cev/roadtesters.aspx>>.

InVEST: <<http://www.naturalcapitalproject.org/InVEST.html>>.

Defenders of Wildlife and Colorado State University. *The Habitat Benefits Estimate Toolkit*. Available at: <<http://www.defenders.org>>.

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