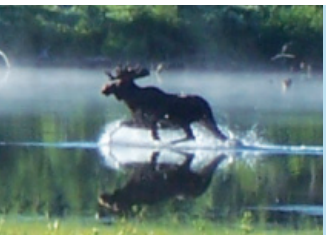
Industry: Metals and mining

Duration: 2007 – ongoing

Location: National

Case study type: Management and policy

The biodiversity challenge at Xstrata Canada Operations



Xstrata plc is a global diversified mining company, with operations and projects in 19 countries. Xstrata's activities are organised into five global commodity businesses and a technology business, each of which operates with a high level of autonomy. Xstrata Nickel, Xstrata Copper and Xstrata Zinc have significant interests in Canada, including exploration, development, mining, mineral processing, smelting and recycling operations and projects. In Canada Xstrata operates 8 mines, 7 metallurgical sites (including smelters and refineries) and manages 9 closed sites.

Xstrata's perspective on biodiversity

In Canada and globally, an increasingly powerful business case is being made for biodiversity conservation. Today, it is understood that companies demonstrating an understanding and leadership in addressing biodiversity issues will likely attract more public support for their development initiatives. In response to this trend, Xstrata's Canadian operations have implemented a comprehensive operating standard developed by Xstrata Plc for environment, biodiversity and landscape functions management for all of their sites.

The ecological footprint of mineral exploration, extraction and transformation arises mainly from opening up remote areas, open pits, tailings and waste rock disposal areas and water consumption. Mining, milling and smelting can also impact the surrounding biodiversity through atmospheric emissions and aqueous discharges.

Xstrata's Canadian operations have been monitoring the effects of their activities on the surrounding environment for many decades, but more recently have considered those potential impacts from a broader, biodiversity perspective. Through its Sustainable Development Policy, Xstrata operations aim to preserve the long-term health, functions and viability of the natural environment affected by its operations through:

- reducing harmful emissions to air, water and land;
- eliminating, mitigating or remediating environmental impacts;
- avoiding net losses or degradation of natural habitats, biodiversity and landscape functions;
- reducing waste quantities and toxicity;
- working with stake-holders to mitigate the environmental impacts of product life cycles and supply chains.

Xstrata's Sustainable Development (SD) Policy (Xstrata Plc, 2008) articulates its overall commitment to Biodiversity Conservation. To assist operations in its implementation, Xstrata plc has developed a comprehensive SD Framework consisting of 17 standards based on a corporate policy of operating to the highest international standards. A specific standard related to environment, biodiversity and landscape functions specifies that all potential and actual negative impacts of Xstrata's activities (from exploration to mine closure) on the environment, biodiversity and landscape functions are identified, analysed, evaluated and eliminated or otherwise treated.

Xstrata plc has been named as the Mining Sector Leader in the Dow Jones Sustainability Index for the third consecutive year for 2009/2010.

Xstrata biodiversity program

Rationale

Today's challenging economic climate, the growing public awareness of ecological values and issues, coupled with emerging expectations for the protection of the environment, mean that recognition and acceptance of the importance of healthy ecosystems is becoming the norm for many progressive businesses. Xstrata recognizes that it makes sense to build and implement biodiversity conservation standards into their operating plans.

Description

In 2007, Xstrata Canada initiated studies to assemble site-specific biodiversity and land use information in order to:

- establish existing biodiversity conditions and land use;
- assess the potential risks and impacts on biodiversity related to the presence of their sites and activities, and
- identify biodiversity conservation opportunities.

This information was used to develop and implement site-specific biodiversity conservation plans all for Canadian sites by the end of 2008.

This initial task was accomplished in a broad information sweep using government and regional information that encompassed the sites and surrounding areas. Protected area management and species recognition is an important part in determining future management strategies along with the assessment of habitat fragmentation and land use identification.

At certain locations, a greater emphasis is put on the development of a site-specific GIS database integrating the habitat characteristics and biological information available for the site.

The knowledge gained for the site can be generally grouped as follows:

- impacts/risks on aquatic life from effluent;
- impacts/risks on terrestrial ecological receptors from atmospheric emissions;
- loss of habitat due to land occupation, disturbance or fragmentation;
- other potential effects (light, noise etc.).

As stipulated in Xstrata's SD Policy and Biodiversity standard, a hierarchy of mitigation measures is generally used, in order of desirability, to address biodiversity impact and risks:

- **Avoidance**: find alternate sites or technologies to avoid predicted impacts.
- **Reduction**: undertake actions to reduce impacts during all phases of mining.
- **Rehabilitation**: undertake actions to rehabilitate or restore the affected environment.
- **Compensate**: actions (generally habitat improvement projects) used as a last resort to offset previously identified biodiversity impacts.

To ensure that biodiversity offsets remain pertinent in a local and regional context, workshops are organized with various biodiversity specialists to develop a list of biodiversity conservation opportunities that would provide tangible benefits to local ecosystems and communities.

At Xstrata's Canadian operations, site-specific Biodiversity Conservation Plans were developed in 2008 and are currently being implemented. These Biodiversity Conservation Plans are reviewed annually and typically include the following type of actions to:

- address critical knowledge gaps;
- develop programs to monitor
  - ✓ site – relevant impact indicator species;
  - ✓ more generic biodiversity performance indicators.
- avoid or reduce significant impacts on local biodiversity;
- rehabilitate habitats affected by its activities;
- implement, when needed, cost-effective and locally relevant biodiversity conservation opportunities;
- identify and involve key local/regional stakeholder groups in biodiversity conservation projects.

A few examples of biodiversity conservation actions are described below.

Addressing remaining knowledge gaps on biodiversity and environmental issues

A Caribou study done by Laval University researchers and sponsored by Raglan (Xstrata Nickel) examined the effects of climate change and mining activities (from exploration to closure) on migratory caribou. Warmer weather may delay the formation of ice over hydroelectric reservoirs and in doing so disrupt migration routes or cause mass drowning if caribou attempt to cross thin ice.
www.caribou-ungava.ulaval.ca

During the last decade, the most recent Ecological Risk Assessment (ERA) tools have been used at many sites to assess the ecological risks of historical metal enrichment in aquatic ecosystems nearby Xstrata Copper operations (eg, Sediments of Montreal Harbour Sector 103, Gaspé port). Also, the Sudbury Soils Study was conducted from 2001 to 2008 over a 40,000 km^2 area (near Xstrata Nickel operations), to determine risk to residents and ecosystems (www.sudburysoilsstudy.com). Similar ERA studies at Xstrata Zinc Operations are being done prior to, or in preparation of, closing various mining related activities in order to define areas where unacceptable risks to local ecosystems would remain following closure and define proper remediation plan, when warranted.

Biodiversity monitoring programs and performance indicators

Environmental Effects Monitoring studies performed at mine sites focus on target fish populations and benthic communities to measure the magnitude, extent, significance and cause of the effects from mining. This information is necessary for the development of site-specific strategies to reduce impacts on aquatic ecosystems.

Avoidance and reduction of impacts to local biodiversity

Favour the use of previously disturbed areas for underground access to ore bodies in current Xstrata Zinc mining projects, in order to reduce the ecological foot print of its future mining activities on local ecosystems.

Site rehabilitation and closure

The opening of an old quarry near Xstrata Copper Horne site has been used to securely deposit reactive tailings (no dam construction needed) and rehabilitate the site and surroundings, allowing recolonisation by local biodiversity.

- At the Xstrata Zinc Heath Steele Mine closed site in New-Brunswick, nearby aquatic ecosystems were rehabilitated by construction of a fish ladder for salmon and removal of a dam for wetland restoration.
- Various bird and fish rehabilitation projects were implemented in the Sudbury region by Xstrata Nickel in the past decades.

Implementation of biodiversity conservation opportunities

- Xstrata Zinc sites in New-Brunswick donated land and created, in collaboration with local stakeholders, two nature areas: the Daly Point Nature Reserve, (80 ha) in Bathurst and the French Fort Cove Nature Reserve (60ha) in Miramichi.
- The 2007 renovation of the Xstrata Nickel Raglan wharf at Deception Bay, Nunavik, increased its total oceanic footprint by 0.9 ha. A fish habitat compensation program will provide access for arctic char (*Salvelinus alpinus*) to new habitat consisting of a network of 17 ponds and 21 creeks, totalling 8.6 ha and 1.6 km of waterway.

Challenges

Development of the site specific biodiversity conservation plans was not accomplished without some challenges:

- scarcity of recent site-specific biodiversity (fauna and flora) data;
- scarcity of data on true exposure to metal contamination (i.e., bioavailability) in the surrounding environment;
- translating potential toxicological effects on single species into biodiversity impacts;
- assessing the ecological significance of potential or actual biodiversity impacts in a regional context;
- assessing the resilience of nearby ecosystems affected by metals.

Communication

Communications has been built into the process and can play a very important role in the development of the conservation plan. It will be critical to maintain awareness of scientific data and to make this information available to all who are involved from company personnel to affected parties and stakeholders. In addition, stakeholder engagement is a routine component of site assessments and remedial actions.

Outcomes

Benefits

Biodiversity

Significant negative effects are avoided, reduced, rectified, eliminated or otherwise treated. There are many examples where looking at the management of mining activities through a biodiversity "lens" provides win-win opportunities that achieve local regional or national biodiversity conservation goals and, at the same time, meet local community needs, in a cost-effective manner.

Economic

Companies that demonstrate leadership on biodiversity issues will facilitate their social licence to operate and be seen as both an investor and investment of choice. Active monitoring programs for biodiversity issues, including ecological effects monitoring, can help companies anticipate and avoid potential negative – and costly – impacts.

Lessons learned

It is always easier, less costly and more effective to be able to identify potential conservation issues in advance through internally-driven risk management processes. This ensures that appropriate mitigation and monitoring programs can be put in place. It also reduces the reputational risk associated with negative external campaigns that are the result of not meeting the expectations of local communities, regulators and other interested parties

Dependable data are of critical importance. Collaborative monitoring and data management programs should be instigated and supported. Baseline assessments provide a historical context to the monitoring and data management programs. Where none exist, it is still advantageous for already operating plants to produce a "point in time" assessment. Broad, collaborative engagement in the terms of reference and execution plan is an important component of this process.

Management

The explicit Biodiversity Conservation commitment expressed in Xstrata's Sustainable Development Policy and specific Biodiversity Standard triggered a rapid and integrated response by its Canadian operations. Implementing a pro-active program to manage risks and impacts enables timely planning and budgeting of required remedial actions, on a no-surprise basis.

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