

Insight

To mine or not to mine ...

The government's proposal to remove 7,058 hectares of land from Schedule 4 restrictions on mining under the Crown Minerals Act, and to investigate further mineral resources on conservation land stirred a strong public response. It pitches the tangible potential gains of mining against the less tangible values of conservation.

Those in favour of mining talk the language of economic development, exports, GDP contributions, and jobs. Those opposed to mining conservation lands talk of ineffable harm to the environment and New Zealand's clean and green reputation, of any violation of conservation lands.

What both sides lack in the debate so far is a way to express and weigh up the consequences for national well-being when considering conservation or mining in particular locations. An informed debate and decision needs to draw on economic tools to reveal and compare the value of both use and conservation of natural resources of land, water and what lies above and below them.

How green is New Zealand?

Over 30% of New Zealand's land area is currently managed by the Department of Conservation, a proportion that has increased in recent years with new acquisitions through the tenure review of the Crown's high country pastoral leases. However, not all such lands are equally important for conservation.

About a third of that landholding, 10% of national land area, is stewardship land, which is Crown land given to the Department to manage since the reorganisation of government's land and resource management agencies in the 1980s. While stewardship land provides some conservation benefits, they are not as great as on lands specifically designated as reserves, conservation areas or national parks.

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The table below covers a selection of Anglophone OECD countries with which New Zealand commonly compares itself, but also two Nordic countries that more closely resemble it in geography and population density. Among these countries, New Zealand has the highest proportion of its land area in major protected areas, substantially higher than the OECD average. It also has the lowest GDP per capita, rather below the OECD average. Its protected area per capita is also relatively high and substantially greater than those of the Nordic countries, although less than in the much larger, lower density countries of Australia and Canada.

Cross-country comparison of protected areas

	Population density <i>per sq km</i>	Major protected areas <i>% of total</i>	GDP/ capita <i>US\$ppp</i>	Protected area per capita <i>hectares/head</i>	National parks only <i>% of total</i>
New Zealand	15.8	19.5	27,247	1.24	11.4
Australia	2.7	13.0	37,761	4.78	3.1
Canada	3.3	6.7	38,506	2.03	2.3
USA	31.3	19.5	46,503	0.62	
UK	249.9	18.3	34,957	0.07	9.0
Ireland	62.0	0.5	44,572	0.01	
Finland	15.6	8.2	35,319	0.52	
Norway	14.5	4.6	53,769	0.32	4.1
OECD total	33.6	12.4	33,149	0.37	

Source: NZIER, using OECD data for 2007 (*OECD in Figures 2009*)

International comparisons of protected areas are fraught with definitional differences.¹ Nevertheless, the comparison shows New Zealand to be relatively well provided with protected areas but relatively poorly endowed with the income to maintain them.

¹ For example, the OECD’s New Zealand figure of 19.5% roughly equates to the combined areas of national parks and conservation areas, excluding other reserves which would add another 2% and also excluding stewardship lands (<http://www.doc.govt.nz/about-doc/role/maps-and-statistics/protected-area-statistics/>). The figure for Norway equates to the proportion of area in national parks alone, but excludes a large number of other smaller special purpose reserves that cover another 1.2% of the country (<http://www.nationalparks-worldwide.info/norway.htm>). And in the UK, where there is very little area set aside for conservation of the sort found in New Zealand, the OECD’s proportional figure covers protected areas including national parks (9% of land area) which are neither “national” nor “park” but rather special planning designations over tracts of working countryside in mostly private ownership (<http://www.nationalparks.gov.uk/press/factsandfigures.htm>).

No such thing as a free lunch (in a protected area)

Increases in the areas managed by the Department of Conservation increase demand for expenditures to manage them, 90% of which are covered by general taxpayers. But the long-term fiscal outlook means that the Department is unlikely to be able to rely on taxpayers for funds to cover its expanding area. This suggests the Department will have to spread its resources more thinly over wider areas, to the detriment of its conservation outcomes, unless it can:

- increase the efficiency with which current funding is used
- find new ways of raising revenue
- rationalise the area managed.

In such circumstances a private estate manager or conservation trust without recourse to the public purse would consider raising revenue by increasing returns on services it provides and seeking more from concession activity, within conditions that did not compromise its overall objectives. It would also consider rationalising its asset base to improve its overall operation.

In New Zealand's situation, the stewardship lands in particular could be worked harder or sold to provide funding for improving conservation outcomes. If more funding were available, the additional revenue could be used to acquire new lands of greater priority for protection and to shift the portfolio of conservation lands away from the current preponderance of mountain, rock and forest to include more of the scarcer and more vulnerable lowland habitats.

A change in mindset is required

To do this, however, requires moving away from the notion that once land is acquired for conservation it is closed for all future development other than the most low impact tourism or recreation uses that are deemed compatible with conservation. That approach ossifies the conservation estate and is ultimately unsustainable, both economically and environmentally. For as climate changes, whether through human or natural causes, species range and habitats shift, and the pattern of national parks and reserves will need to be reconfigured if it is not to become functionally obsolete for its conservation purpose.

Given New Zealand's history of introduced species which, free from natural predators, flourish to become pests unless actively controlled, New Zealanders more than most should recognise that conservation is a dynamic process and needs to adapt in response to changes in the natural and economic climate. Making the most of resources and assessing the relative value gains and costs from changes in resource uses are essentially economic problems. These are difficult choices, but can be informed by a wide range of valuation and assessment techniques.

Costing the earth?

The public debate on mining and conservation has yet to examine the respective opportunity costs of restricting mining over such a large proportion of New Zealand's land area, or of encroaching on conservation lands.

The opportunity cost for mining is reasonably easy to count as the foregone income from leaving mineral resources unutilised. But the opportunity cost to conservation is much less apparent, due to the absence of ready means to measure its value. Economists have tools to uncover the hidden values, and these need to be employed to better inform the available choices.

Conservation lands provide a number of "outputs", though many are not traded in markets. These include space and settings for recreation, tourism, film-making and low impact produce extraction (e.g. eels, sphagnum moss). These outputs generate revenues for businesses in the locality and the nation at large, although not enough to fully fund the pest control and provision of visitor facilities necessary to maintain large tracts of land.

The lands provide habitat for New Zealand's distinctive wildlife. That may have a long term pay-off if components of biodiversity prove to have future commercial use in pharmaceuticals or food, but it also enriches people's lives by just being there.

Biodiversity also contributes to ecological functioning which supports other human activities, for instance moderating the flows and quality of water in ways that reduce costs for those who use water, or live near it, downstream. These "ecosystem services" are worth at least as much as the next best alternative of obtaining them, or maybe more if they have multiple outputs and lower costs and risks than the alternatives.

In principle these attributes of conservation land can be valued in economic terms. The mix of attributes will not be the same for all landholdings. This is already recognised in the different designations of specific purpose reserves for recreation, scenic or scientific interest, and the multi-purpose designations such as conservation parks and national parks.

Any commercial activity on the conservation lands is required to obtain a concession from the Department of Conservation, which may attach conditions to minimise environmental risk and also collect a concession fee from the activity. Activities with significant effects on land or water are also required to obtain consents through the Resource Management Act, which provides another means of ensuring the activity's adverse effects are avoided, mitigated or remedied.

Weighing up the costs and benefits

So in the value comparison, current uses of conservation lands make some contribution to GDP and incomes but at a low rate per unit area conserved. These uses are also regarded as having a low environmental impact and high contribution to the non-market outputs of those lands. In

contrast, mining makes a higher contribution to GDP over limited mineral-rich areas, but is also regarded by opponents as creating big environmental impacts and detracting from non-market outputs of conservation lands.

Implicitly, mining's opponents assume that the concession and RMA consenting processes are inadequate to control the adverse effects of mining, or that there are unacceptable risks from letting them try. Opponents also argue that *any* encroachment of mining onto conservation lands will damage New Zealand's international reputation, to the detriment of its tourism and other exports. There is little evidence to support these claims. A single study commissioned by the Ministry for the Environment nine years ago found that a survey of consumers and tourists presented with some images of clean environment and poor environment would buy less or spend less time in New Zealand if the poor environment prevailed. But this was not informative of how much mining, pollution, smog or erosion would be necessary to tip their perception of environment from clean to poor.

In 2002 NZIER applied its general equilibrium model of the New Zealand economy to estimates of recoverable reserves under conservation lands from the Institute of Geological and Nuclear Sciences to examine the opportunity cost of restricting access. It covered both the direct impacts on the mining sector and also the indirect effects on other sectors that depend on mining because they supply its inputs or process its outputs. That study found that fuller utilisation of mineral resources under conservation lands could increase the level of GDP by 1.3% or more, depending on how much area was opened up to mining. In today's dollars, that equates to around \$2.3 billion of additional national income per year or over \$550 per person.

The biggest incremental gain was in increasing utilisation on stewardship land, with smaller incremental gains from successive extensions of mining onto conservation designated land such as forest parks and conservation parks, and again into national parks where mining is restricted under the Crown Minerals Act. The higher the conservation designation, the lower the level of utilisation because of more difficult terrain and higher costs of extraction and meeting conditions. Since then assessments of minerals prices and potential of different geologic zones have changed, and economic recession has focused minds on how to make more of these resources.

Moving the debate along requires cold hard facts

A similar study could be done now, reflecting updated data on prices and improved technologies in exploration and utilisation, to compare the relative impacts through the local and national economies of mining and the current non-mining uses of conservation lands. However, the critical questions in the mining debate are not just how much value is at stake in conservation lands, but also how much encroachment of mining would change those values.

It could also be useful to undertake "stated choice" surveys to identify how much modification of the current environment international and domestic tourists would tolerate before reducing their

willingness to pay to experience New Zealand's conservation lands. Such surveys could also find out how much New Zealanders value the various non-market outputs of conservation.

Rather than arguing about whether mining on conservation lands is incompatible with the clean green image and the 100% Pure brand, the question is how much value to the brand would be lost, if any, by encroachment of developments onto conservation land. In sophisticated markets inured to advertising hype, if tourists know there is mining on specific conservation lands, would they stay away from New Zealand or simply visit other destinations within New Zealand?

Ultimately the economic question about making the most of resources is about how much land to conserve and how much to allow to be used and modified, taking full account of the relative opportunity cost and value in all uses. The tools for modelling economic choices, revealing the sources of value and identifying their effects on the wider economy can inform that question, but so far in the mining and conservation debate they have yet to be seen.