Parliamentary Commissioner for the Environment
Te Kaitiaki Taiao a Te Whare Paremata

Report to Emissions Trading Scheme Review Select Committee: Impact of the ETS on Indigenous Land Cover

Request

On 30 April 2009, the Emissions Trading Scheme Review Select Committee requested that the Parliamentary Commissioner for the Environment provide:

> *Information on the extent to which the Emissions Trading Scheme will, or will not incentivise the planting of exotic species over indigenous species, and any incentives to clear indigenous vegetation in order to replant with exotic species.*

Our Response

Summary

- The Emissions Trading Scheme (ETS) is likely to increase existing incentives for exotic forestry and indigenous land cover losses. Much of New Zealand's indigenous grassland and significant amounts of low stature scrub (such as matagouri, grey scrub and fernland) is particularly vulnerable to exotic plantation expansion.
- Forestry offsetting could significantly increase the losses of indigenous scrub and grasslands.
- The carbon stock tables under the Climate Change Response Act Regulations do not adequately recognise carbon sequestered in indigenous species and so disincentivise indigenous planting or reversion.
- Wilding pines are a serious threat to most of New Zealand's indigenous grasslands and the ETS disincentivises wilding pine control.

1. Introduction

There is no doubt that exotic trees sequester carbon faster than indigenous species. And, depending on how a forest is planted and managed, exotic plantations can contribute to indigenous biodiversity[1]. On the other hand, indigenous forests sequester more carbon than exotic species over the long term. Indigenous land cover provides other services too, such as clean air and water, soil conservation, products like honey and, of course, our unique biodiversity. There is a need to balance the immediate need for fast carbon sequestration against the long term benefits of potentially greater carbon storage and preservation of indigenous biodiversity.

It is generally accepted that New Zealand would benefit from maintaining, or steadily increasing, indigenous land cover. Indeed, we have international[2] obligations to do so and national goals[3] to this end. Presently, there is insufficient data to determine whether New Zealand's net indigenous land cover is stable, increasing or decreasing. The Land Use and Carbon Analysis System (LUCAS) report, expected in July this year, may clarify this. But there are indications that indigenous land cover continues to be cleared despite the Resource Management Act and other regulatory and voluntary protections[4,5]. By increasing the incentives for exotic plantation forestry the Emissions Trading Scheme (ETS) is likely to exacerbate New Zealand's indigenous land cover losses.

This short report identifies indigenous land cover that is at risk, then describes the added pressure to clear indigenous land cover if forestry offsetting is allowed, the bias in the ETS toward exotic planting over indigenous species, and the threat of wilding pines on indigenous grasslands.

2. ETS is not the whole story

The ETS is only a part of the suite of regulatory mechanisms and other influences controlling forestry patterns in New Zealand. Commercial forest owners tend to plant exotic species because they can be harvested sooner than indigenous species. For the same reason, schemes intended to encourage forestry[*], such as the Afforestation Grant Scheme incentivise planting of exotics over indigenous species. The Permanent Forest Sink Initiative, designed to increase economic benefits derived from marginal land, has no quota requirement for indigenous forest. The ETS is likely to incrementally strengthen existing incentives for planting exotic species.

In order to address the likely downward trend of New Zealand's indigenous land cover, policy needs to be both broad, considering the integrated effect of all forestry regulations on environmental, social and economic concerns, and based on a long view. Although the ETS cannot deal with all the issues associated with indigenous land, aspects of the ETS could be amended to ameliorate its own negative impact on indigenous land cover. Three examples are described in this report.

3. What indigenous land cover is at risk?

It is difficult to identify types of indigenous land cover that are at risk from expanding exotic plantation forestry or forestry offsetting. Officials have mapped New Zealand's forest land as of 1990, but the 2008 position is still in preparation and is not expected until mid-July this year[†]. Current estimates of land cover areas are given in Table 1.

The potential impact of the ETS depends on whether or not the land cover is eligible to be included in the ETS.

[*] The AGS does set aside 30% of its funds for slow growing species, although not specifically for indigenous species. To date, the Afforestation Grant Scheme has approved grants to establish forest on 1889 ha, and includes 625 ha of indigenous forest. The Permanent Forest Sink Initiative has approved, or is processing, applications for 2966 ha of indigenous forest, out of a total of 4703 ha (per *priv. comm.*, Ministry of Agriculture and Fisheries, 25 May 2009)

[†] LUCAS will define land by its land-use, assessing whether land is/was managed as forest, regardless of what trees are/were present. Currently, forest land area is estimated visually using satellite imagery.

3.1 Indigenous land cover that is eligible to be included in the ETS

Under ETS rules, which are based on Kyoto obligations, forest land which includes some scrubland* is eligible to be included in the scheme. This includes indigenous species such as kauri, podocarps such as rimu, mata and totara, native beech, and broadleaved species such as tawa and rewarewa, and manuka and kanuka†. The impact of the ETS depends on whether the forest has been designated as existing on 31 December 1989 (pre-1990) or has grown since then (post-1989).

Although eligible under Kyoto rules, the ETS excludes all indigenous forest that existed on the 31 December 1989. This means there is no liability for the deforestation this indigenous forest.

However, if forest land (including indigenous forest) that existed on the 31 December 1989 is deforested after 1 January 2008, the deforested land can never generate carbon credits if it is replanted‡. This significantly reduces incentives to deforest indigenous forest and Kyoto-eligible scrub in order to plant with exotic species.

Additionally, most old growth forest and manuka/kanuka scrub that existed on the 31 December 1989 is in protective tenure or covered by provisions of Part 3A Forests Act 1949. This prevents milling of indigenous timber except under sustainable management regimes, which is a significant disincentive to deforestation. There are also practical difficulties with clearing some of this land. Even for mature scrubland the costs of deforestation are significant, currently likely to be well in excess of $500 per hectare[6]. In recent decades rates of indigenous forest deforestation have been low and declining.

Indigenous forest and manuka/kanuka scrub that existed on the 31 December 1989 are not considered to be at added risk under the ETS.

The small area of post-1989 indigenous forest (~54,000 ha)[5] can be cleared without penalty under the ETS as long as no carbon credits have been claimed for that land. In theory provisions of the Forests Act apply to any indigenous scrub that is not regularly cleared, but poses little disincentive to the clearing of young scrub. In some cases scrubland may be protected by territorial authority plans made under the Resource Management Act 1991, but the extent or effectiveness of such protection is not known.

Some post-1989 indigenous forest could be vulnerable under the ETS.

3.2 Indigenous land cover that is not eligible to be included in the ETS

Indigenous land cover that is not generally counted as forest, and so is excluded from the ETS, includes grasslands and low stature scrub, for example matagouri, grey scrub (a mix of small-leaved, dark twiggy plants including mingimingi[7]), and some fernland. While these land covers may sound unappealing, they are a source of biodiversity in themselves and as a habitat for native species. They also increase local resilience to environmental change and, like manuka/kanuka, can be precursors to native forest. Although not under the ETS, these land types are exposed to indirect impacts of the ETS, primarily via competition for land from expanding exotic plantation forestry.

* Forest land under the ETS is defined as being >1 ha in area, >30 m wide, covered by vegetation reaching >5 m tall at maturity and having >30% crown cover.

† Manuka/kanuka scrub is a necessary first stage in the successional path back to mature indigenous forest.

‡ Legal opinion provided to PCE by KensingtonSwan, 15 May 2009

Approximately 130,000 ha of such scrubland is in private ownership without protective covenant, and most of this is already categorised as a "Threatened Environment"[4], though district plans may offer some protection in some cases.

Low-stature indigenous scrub like matagouri, grey scrub and fernland appear to be at increased risk of replacement by exotic forest under the ETS.

A seventh of New Zealand is covered by indigenous grasslands, principally tussock. This is mostly in the South Island high country and the North Island central plateau. This land is generally well suited to exotic trees, and some is being overrun by wilding pines and other conifers. Currently efforts are being made to maintain this land as grassland at considerable cost and difficulty, within the conservation estate or Crown pastoral leases. However the ETS as it currently stands could reward any failure to control wilding trees (discussed further below).

Most indigenous grassland is at significant increased risk of replacement by exotic forest through both plantation and wilding pines under the ETS.

Table 1. Land currently in indigenous or exotic land cover in New Zealand

Land cover	Pre-1990 Area (1000s ha)	Post-1989 Area (1000s ha)	Vulnerable to Exotic Forestry Expansion
Exotic plantation forest	1,626[8*]	664[9]	
Marginal grassland	1,800 private[10]		
Indigenous old growth forest	1,400 private[11] 5,100 Crown[11,12]	30[5]	
Manuka/kanuka scrub, regenerating indigenous forest	1,000 private[11] 800 Crown[11,12]	24[5]	Minority of private holding
Indigenous matagouri, grey scrub, fernland	130 private[4] 20 Crown[4,12]	<1[4]	Some of private holding
Indigenous grassland	1,600 private[4] 2,000 Crown[13]		Majority

4. The Risk of Forestry Offsetting

Although not provided for currently, domestic forestry offsetting may be allowed in the future. Forestry offsetting would allow pre-1990 forest owners to convert to other land uses and avoid the deforestation liability by establishing a new forest elsewhere. The new forest would have the same inability to earn carbon credits and would carry a liability for deforestation as pre-1990 forest. Presently, about 280,000 ha of existing pre-1990 exotic plantation forestry is on land suitable for conversion to a higher value use[14] such as dairy farming[†]. If forestry offsetting is allowed, this could create pressure on existing low value land to provide up to

[*] *A national exotic forestry description: as at 1 April 2007*, MAF, Wellington gives only 1,100 ha.

[†] While outside the scope of the ETS and this report, there are real risks to water quality in areas where land use intensity increases following a change from forestry to dairying.

280,000 ha, or potentially considerably more* for offset forests. There is more than enough (about 1.8 million ha[10]) marginal pastoral land that would be suitable for this offset forestry. However, the choice of location for an offset forest is likely to be driven by land values, proximity and access concerns. Given its low economic value, indigenous scrub that is not classified as forest under ETS rules, and to a lesser extent indigenous grassland, could be at considerable risk of clearance should forestry offsetting be allowed.

There may be good reasons to allow forestry offsetting. However, additional safeguards for otherwise unprotected valuable indigenous scrub would be required.

5. The Carbon Stock Table Bias

The number of many carbon credits any particular forest is eligible to earn is defined by the Climate Change Forestry Sector Regulations. For exotic plantation species, the Regulation's carbon stocks account for varying growth rates over their life-time, and in the case of *Pinus radiata* they also vary by region. In contrast, the Regulation's carbon stocks for indigenous forests are set at the flat rate of 3 $tCO_2e/ha/yr$ [15], significantly lower than most carbon stock rates for exotic forests.

The single low value for indigenous growth reflects the fact that, at least initially, exotic trees accumulate more carbon that indigenous species. But it also reflects both the poor understanding of carbon storage in indigenous forests and a desire to avoid the fiscal risk to the government of overstating aggregate emissions savings.

For the most common scrubland species, manuka/kanuka, average carbon stock rates averaged over 40 years have been assessed at 7.0 - 9.2 $tCO_2e/ha/yr$, more than double the indigenous rate defined by the regulation[16].

This raises equity concerns for those eligible to earn indigenous forest credits, and may unduly bias planting decisions. In other words, this could undeservedly discourage the planting, or reversion to, indigenous forests.

A considerable amount of land is available for indigenous afforestation or reforestation: more than 1.5 million ha of marginal pastoral land has sufficient indigenous seed sources[5,16]. However, modelling suggests that the current incentives are not enough to halt the (likely) existing trend of declining scrubland, let alone reverse it [5]. Amending the Regulation carbon stock tables to better represent the actual carbon sequestration of indigenous species could help reduce this decline.

6. Wilding Pines: A Threat to Indigenous Grasslands

Wilding conifers are out of control in many parts of the South Island high country, on both private and Crown land.[17] In the central North Island, contorta pine still requires management after 40 years of eradication programmes. This situation has arisen despite the Conservation Act 1987, the Resource Management Act 1991 and the Biosecurity Act 1993. Wilding conifers are capable of rapidly and thoroughly colonising grasslands up to and well above the indigenous treeline.

* * 'Low-value' land may be less productive than the pre-1990 'high value' land, with trees growing at a slower rate and sequestering less carbon. To ensure true 'carbon for carbon' offsetting relatively more low-value land may be required in any offset scheme.

Tussock grasslands in private ownership (including Crown pastoral leases) are presently principally used for low density pastoral farming. Exotic forestry may become a viable alternative. As things stand, this could be pursued at minimal cost on many farms simply by ceasing to control wilding conifers. Any weed tree forest, either planted or wilding, would spread onto adjacent non-forest land, thus increasing the cost and difficulty of controlling wildings, and the risk to indigenous grassland, even on the Crown's conservation estate.

Because ETS currently allows any post-1989 forest to earn carbon credits, it incentivises landowners to allow wildings to establish.

This poses a major threat to indigenous grassland ecosystems in both the North and South Islands. Identifying the appropriate policy response to this perverse incentive requires further analysis.

There is a place for forestry on marginal high country land. But there must be concerns, not just for biodiversity but also for landscape, tourism, fine wool production, and even hydroelectric power generation, if the wrong trees are grown in the wrong places. The ETS increases the risk of this happening, and other legislation does not provide adequate controls.

References

[1] Hock B. et al. 2009. Towards green markets for New Zealand plantations, *NZ Journal of Forestry*, 54(1): 9-18.
[2] United Nations Environment Programme Convention of Biodiversity Conservation: http://www.cbd.int/
[3] Ministry for the Environment 1995. *Environment 2010 Strategy: A statement on the Government's Strategy on the Environment*. Ministry for the Environment, Wellington.
[4] Walker S. et al. 2008 *Science for Conservation* 284, Department of Conservation, Wellington.
[5] Sheppard J. et al. 2008 *Nature and Scale of Eligible Post 1989 Non-planted Forests*, Landcare Research contract report LC0809/033 to MAF.
[6] Ministry of Agriculture and Fisheries, *priv. comm.* by email 15 May 2009
[7] http://www.teara.govt.nz/TheBush/NativePlantsAndFungi/Shrublands/4/en, [Accessed 20 May 2009]
[8] LUCAS (per *priv. comm.*, Ministry for the Environment, 20 May 2009).
[9] http://www.mfe.govt.nz/publications/climate/net-position-report-2009/net-position-report-appendices.pdf
[10] Richardson, B., 2009 *Response to question from Jeanette Fitzsimons as part of the Emission Trading Scheme Review*, Scion.
[11] Ministry of Agriculture and Fisheries, *priv. comm.* to PCE, 11 May 2009.
[12] Land Cover Database, 2002 (LCDB2), e.g. http://www.mfe.govt.nz/environmental-reporting/biodiversity/native-cover/lcdb/index.htm. Note: the total indigenous old growth forest and tall scrub in 1990 is 8,497, 000 ha according to LUCAS (per *priv. comm.*, Ministry for the Environment, 20 May 2009), so LCDB figures for this leave approximately 200 000 ha unaccounted for.
[13] Mark, A. and McLennan, B. 2003. *Conservation status of New Zealand's indigenous tussock grasslands*, http://www.botany.otago.ac.nz/tussockconservation/.
[14] Smith B. and Hogan G. 2006 *Area of forest 'at risk' from deforestation'* Ministry of Agriculture and Fisheries .
[15] Climate Change (Forestry Sector) Regulations 2008 http://www.legislation.govt.nz/regulation/public/2008/0355/latest/DLM1633759.html [Accessed 19 May 2009]
[16] Trotter, C., et al 2005. Afforestation/reforestation of New Zealand marginal pasture lands by indigenous shrublands: the potential for Kyoto forest sinks. *Annal of Forestry Science* (62):865-871.
[17] Parliamentary Commissioner for the Environment, 2009, *Change in the high country: environmental stewardship and tenure review*