how to cope with adjacency regulations. Although many FSC drafts include a maximum clearcut size, many do not include an adjacency requirement. Due mainly to a lack of clearcutting in native forests, a lack of native mammals and a lack of scientific literature, I predict adjacency requirements will not be part of FSC drafts in NZ.

(6) Reserves (areas not managed for timber production): Some FSC standards require reserves while others do not. One current draft from the U.S. Pacific Coast region requires large landowners to leave 20% of the land in protected reserves. However, national FSC guidelines do not require large landowners to have any reserves. Instead, these guidelines require large landowners to keep at least 25% of their forests in a natural or semi-natural condition. The southeastern U.S. guidelines allow wood to be harvested from this land. I predict FSC requirements for reserves in NZ (as opposed to managing native forests) will make some large landowners think about switching to another certification system such as the new “Cross and Globe” brand offered by Scientific Certification Systems (http://www.safnet.org/archive/302_scs.htm).

(7) Name games: I have noticed a range of FSC definitions for words like “plantation” and “retention.” In some drafts, a naturally regenerated stand might be classified as a “plantation.” This may be an advantage to some in countries like Australia. In other cases, plantations may be removed from the plantation area category. I expect some will take advantage of “fuzzy” definitions. For example, some natural forests harvested and planted after November 1994 may be certified by FSC as long as the stands are not designated as plantations on a management map. Recently, FAO was told that Canada no longer has any plantations! I think this was allowed because of the current “fuzzy” FAO “plantation” definition. I predict some countries will follow Canada’s lead and play “name games” to justify reporting a reduction in plantation acreage.

(8) Paying for the certification number: Currently, some NZ companies supply the FSC chain-of-custody certification number free to customers. I predict in the future a higher price will be required if a customer wants the certification number. I predict a cubic metre plus the certification number will be at least 6% higher than for wood without the number.

(9) Energy from non-certified wood: Currently, there are no FSC requirements for the use of fuelwood. About 60% of the wood harvested in the world is used for energy (note: this figure includes black-liquor). Wood that is harvested but not certifiable may be burned as a replacement for fossil fuels. I predict that FSC will not set up a certification scheme for fuelwood.

(10) Finally, I predict FSC will develop a certification program for beef, lamb, goat, and other grazing animals. This program will certify meat and dairy products produced from pasturelands established on ex-forest prior to November 1994. Any meat, milk or cheese products produced on forestlands converted after this date will not be sold with the FSC label.

This process might slow deforestation caused by farmers who intend to export meat and dairy products to developed countries. If this prediction does not come true, there may only be 1700 million ha of natural tropical forests in 2015.

NZIF Kyoto Protocol submission

Focus on carbon sinks and industry’s role

Justin Ford-Robertson1 and Piers Maclaren2

The New Zealand government signed the Kyoto Protocol to the UN Framework Convention on Climate Change, and has now signalled its intent to ratify it by September of this year. If or when certain conditions are met, the Protocol enters into force. Once this happens, New Zealand will be obliged to return its average annual emissions over the first commitment period (2008-2012) to its 1990 emissions level, or take responsibility for the excess emissions. Ratification of the Protocol does not in itself mean anything. It is the domestic policy implemented to achieve the targets that could affect individuals and businesses.

The NZ Institute of Forestry submission to government (available on www.nzif.org.nz) does not question whether climate change is happening, the significance of the NZ role, or what the future value of carbon might be. It instead focuses on the role played by NZ forests as carbon sinks, and the potential role of the entire forest industry.

The Protocol is primarily interested in the forests established since 1990 on land that was not under forest in 1990. The system proposed in many countries is to allocate credits to owners for any increase in carbon stocks (i.e. growth) during the commitment period. When the stand is harvested the stand owner would have to pay for the emissions associated with the loss of carbon (in logs and other biomass) from the site. Essentially this means stand owners could receive credits as their trees grow, but will have to pay them back again on harvest. Owners would not incur more debts than the credits they had received for that unit of land, but most of them would only gain the time-value of money at best. (Although a forest, averaged over time, contains more carbon than a non-forest, the bulk of the carbon accumulation may occur before 2008 and therefore will not be counted.) On top of that there is a high chance that there would be ongoing costs of monitoring, verification, and reporting at least every five years.

Forests or stands standing on 1 January 1990 are

---

1 Forest Research, Private Bag 3020, Rotorua.
2 Piers Maclaren & Associates, 115 East Belt, Rangiora.
ignored unless they are deforested, in which case there would be emissions to account for. In other words these 'non-Kyoto forests' could represent a liability to the owners if they choose to change their land use. Forest management is another activity that could be included under the Protocol, but it is far from clear that this would help the NZ carbon balance (or individual owners). Furthermore it is highly uncertain what future obligations might be placed on land if it is included in the first commitment period.

New Zealand is expected to have an abundance of carbon credits from forest sinks for the entire first commitment period (2008-2012) and for most or all of the second commitment period (2013-2017). In other words, NZ would be able to 'offset' most if not all of the emissions growth until 2017 or beyond. The numbers quoted by government in the Consultation Paper were that emissions in energy and industrial sectors would exceed the allowable level by approximately 50 million tonnes of CO$_2$-equivalent (MtCO$_2$-e) during the first commitment period. If measures suggested in the national energy efficiency and conservation strategy are successfully implemented the excess might be reduced to 40 MtCO$_2$-e. Plantation forests established since 1990 would sequester 110 MtCO$_2$-e during the same period.

It is clear in the above analysis that New Zealand is in a position to meet its obligations and sell the surplus removals. The question is who stands to gain from this sale? As mentioned above, if Kyoto-forest owners are given the credits, they are likely to be accompanied by a list of rules and obligations. Non-Kyoto-forest owners would receive nothing but would be penalised if they change land use.

If all the credits are given to forest owners, the implication is that emitters would have to reduce their emissions, obtain emission permits elsewhere, buy sink credits from forest owners or pay a penalty. This would inevitably impact on the forest processing sector (amongst others) that is trying to expand to deal with the "wall of wood".

Denis Hocking said recently "carbon sequestration is just a hobby and I'd like to be able to continue my business of growing wood fibre unhindered". Can this be achieved? We think it could if a government-appointed agency is left to deal with the international politics and trade in emissions.

If we remove 110 and emit 50 MtCO$_2$-e, New Zealand can offset all our emissions growth and still have 60 MtCO$_2$-e to sell. Even at $10/CO$_2$-e this equates to $600 million over the 5 year commitment period. This money could be used as a generic incentive to encourage sustainable land use and energy practices. For example to facilitate appropriate afforestation, or to enable forest processing plants to improve energy efficiency and to adopt renewable energy, particularly bioenergy. A healthy forest processing sector and additional use of bioenergy would both improve returns to forest growers, which would itself lead to further afforestation. More afforestation and more bioenergy will both increase the credits receivable and reduce the emissions. Pressure on energy-intensive wood substitutes must enhance the attractiveness of wood.

To summarise, we don’t think the New Zealand forest sector need necessarily be afraid of the Kyoto Protocol - at least in the first commitment period - provided that New Zealand adopts an appropriate domestic policy.

What will happen next? By the time this appears in print, we expect government to have outlined its preferred policy approach. This is generally predicted to include Kyoto ratification and government retention of all or most credits. This bill is scheduled for enactment in late August. The second bill, due later in the year, should be far more interesting and important. As they say, the devil is in the detail.

Samoa: interlude - 36 years ago

Peter McKelvey

The Asau Development Block, originally known as the Cornwall Estate, was an irregularly shaped rectangle, approximately 13 km long and 1.6 to 3.2 km wide, straddling the western extremity of Savai'i, the largest Samoan island. It ascended from the northern coast of Savai'i to the watershed ridge at about 900 metres and then dropped down more steeply to the south-western coast on the other side. The area was nearly 2500 ha.

The intention of the Samoan Government in the 1960s was to develop suitable parts of the Block as food plantations and settle more people there. The Government asked for New Zealand technical assistance in making a timber inventory of the extant indigenous forest, for the timber would have to be harvested and sold before the food plantations could be established. Accordingly two New Zealand Forest Service officers, Noel Berryman and the author, travelled to Savai'i in September 1965, over 36 years ago, for this purpose.

Our field procedure entailed systematic line/plot sampling across the contours with one acre (0.405 ha) temporary plots. In all 93 of these were measured. The job was really a mini-National Forest Survey. Fortunately, access to recent aerial photographs made it possible to plan the field work in advance. An assessment of the timber resource was completed, and made confidential to the Samoan Government at the time with advice on logging and timber sale procedure.

The composition of the mixed tropical hardwood forests - there are no indigenous softwood species on Savai'i - on the Asau Block is influenced principally by altitude. There is little site variation around the contour because there is no run-off, due to the porosity of the volcanic basaltic rock, and consequently no land dissection, despite an annual rainfall of at least 2500 mm. The precipitation emerges at the coast as springs. The only distinctive site changes occur where the even slopes of the basalt sheets have been interrupted by several small volcanic cones and a few small scarps, the latter putatively the lower edges of those younger, extruded sheets which did not reach the sea. By far the

1 260A Ilam Road, Christchurch