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Horne and Hickey (1991) raised some matters which may warrant further clarification. Although about 50% of the rainforest between Cooktown and Ingham in north Queensland is reserved as State Forest or Timber Reserve, it should not be assumed that all of this area is managed for timber production. In 1988 most of this area was inscribed on the World Heritage List and further logging was banned. Prior to this, a gross area of about 20% (of total rainforest area or 40% of SF & TR) was selectively logged. Within this gross area, about 4% (of the total or 20% of gross logged area) was contained in buffer strips, etc. and was not actually logged over.

Horne and Hickey (1991) reported results from Preston and Vanclay (1988) indicating that timber yields decline with repeated harvesting. Whilst their cutting cycle analysis reported smaller yields for the second and third cycles than in the initial cycle, it is important to understand the assumptions and implications. Cutting cycle analysis is a "short-cut" method for estimating future harvests, and assumptions necessary for computational ease may introduce bias. In particular, the first harvest is simulated only after a half-cycle of growth simulation, effectively allowing a 20-year moratorium on logging and inflating the yield in the initial cycle (Vanclay and Preston 1989). If this bias was negligible, such a decline in forests with little previous exploitation would indicate that the climax biomass cannot be replaced within a single 40-year cutting cycle, but need not imply that a non-declining harvest cannot be sustained from rainforest.

Further studies contribute evidence that sustainable timber harvests from rainforests are possible. Vanclay (1990) found that growth rates of individual trees (adjusted for competition), did not decline after repeated selection logging, indicating that the productive potential of these forests does not decline after some forms of harvesting. Vanclay and Preston (1989) demonstrated computer simulations of a non-declining harvest for 500 years. Their study focussed on the timber harvest, but some observations on stand structure can be made. Such harvesting may affect the proportional representation of major canopy species, and will alter the structural composition of the forest. Merchantable trees of commercial species exceeding 100 cm diameter will be eliminated from areas zoned for harvesting, but unmerchantable trees and non-commercial

species of these dimensions will remain, as will all trees in buffer strips and other areas excluded from logging.

References

Horne, R. & Hickey, J. (1991) Review: Ecological sensitivity of Australian rainforests to selective logging. *Aust. J. Ecol.* **16**, 119–29.

Preston, R.A. & Vanclay, J.K. (1988) Calculation of Timber Yields from North Queensland Rainforests. Qld Dep. For. Tech. Pap. No. 47.

Vanclay, J.K. (1990) Effects of selection logging on rainforest productivity. *Australian Forestry* **53**, 200–14.

Vanclay, J.K. & Preston, R.A. (1989) Sustainable timber harvesting in the rainforests of northern Queensland. In: *Forest Planning for People*, Proceedings of 13th biennial conference of the Institute of Foresters of Australia, Leura, NSW, 18–22 September 1989, pp. 181–91. Institute of Foresters of Australia, Sydney.