RIPARIAN PLANTING
and the
EMISSIONS TRADING SCHEME

Presentation to Land Owners

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The Kyoto Protocol and Forests

- Trees absorb CO_2 as they grow and this is called sequestration. When trees die, they emit CO_2 as they decompose.

- As an example, a newly planted Radiata plantation is estimated to sequester 44t CO_2 per hectare in the first 5 years and average about 30t CO_2 per hectare per year over a rotation.

- New Zealand signed up to the Kyoto Protocol. Under the Kyoto Protocol, a tree is deemed to have emitted all its CO_2 when it is cut down.

- The Kyoto Protocol draws a line at 1st Jan 1990. Forests are either Pre-1990 or Post-1989.

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What defines a Forest . . .

New Zealand has adopted the following definition of a forest:

- **A minimum land area of one hectare.**
- **Tree crown cover (or equivalent stocking level) of more than 30%.**
- **Trees species that will reach at least five metres at maturity *in situ*.**
- **Canopy cover *at maturity* must be at least 30 metres wide.**

- **A forest may consist either of (a) open forest or (b) closed forest where trees of various storeys and undergrowth cover a high proportion of the ground.**
- **Young natural stands and all plantations which have yet to reach a crown density of 30% or tree height of five metres are included.**
- **Forest areas which are temporarily un-stocked as a result of harvesting or natural events but which will become forest are included.**

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The Kyoto Protocol and Forests continued

Only Post-1989 trees (those planted or regenerating after the end of 1989) can earn carbon credits in the ETS. These same trees can also incur emission liabilities when they are harvested, cut down, die or suffer some catastrophe.

Pre-1990 trees (those existing before the end of 1989) cannot earn carbon credits in the ETS but can incur liabilities if they are cut down, die or suffer some catastrophe and not replanted.

Kyoto Compliant Land

Kyoto Compliant land is land which did not have 'forest' growing on it as at 31st December 1989.

This is the only land which is eligible to earn Kyoto-compliant carbon credits from CO_2 sequestration by trees.

Post-1989 Forests

Post-1989 forests includes both of the following:

- Any species of exotic trees planted on Kyoto compliant land and which meet the definition of a forest.

- Native forest regenerating or planted on Kyoto compliant land and which will meet the definition of a forest.

  Post-1989 forests in the ETS will gain carbon credits from 2008 onwards or the year of planting, which ever is later. Forests planted after 31st December 1989 but before 1st January 2008 will only gain these credits from 2008 onwards. Any growth prior to this does not earn credits.

Obligations and Benefits of the ETS

Benefits:

- Receiving carbon credits (NZUs) from sequestration and the option to sell them.
- Timber harvesting and the sale of timber within the economic constraints of the associated emissions liabilities.

Obligations:

- Voluntary reporting on changes in carbon stocks annually and Mandatory reporting at the end of each 5-year Commitment Period.
- Surrendering NZUs for any emissions liabilities (eg. through harvesting).

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Joining the ETS - The Tasks

1. **Determine what land is Kyoto-compliant.** Trees on non-compliant land cannot earn carbon credits.

2. Join the NZ Emissions Unit Register.

3. Prepare and lodge an ETS Application.

4. Prepare and lodge annual (and 5-yearly) returns.

5. Develop a carbon strategy to avoid liabilities.

6. Decide whether to sell credits and if so, how many.

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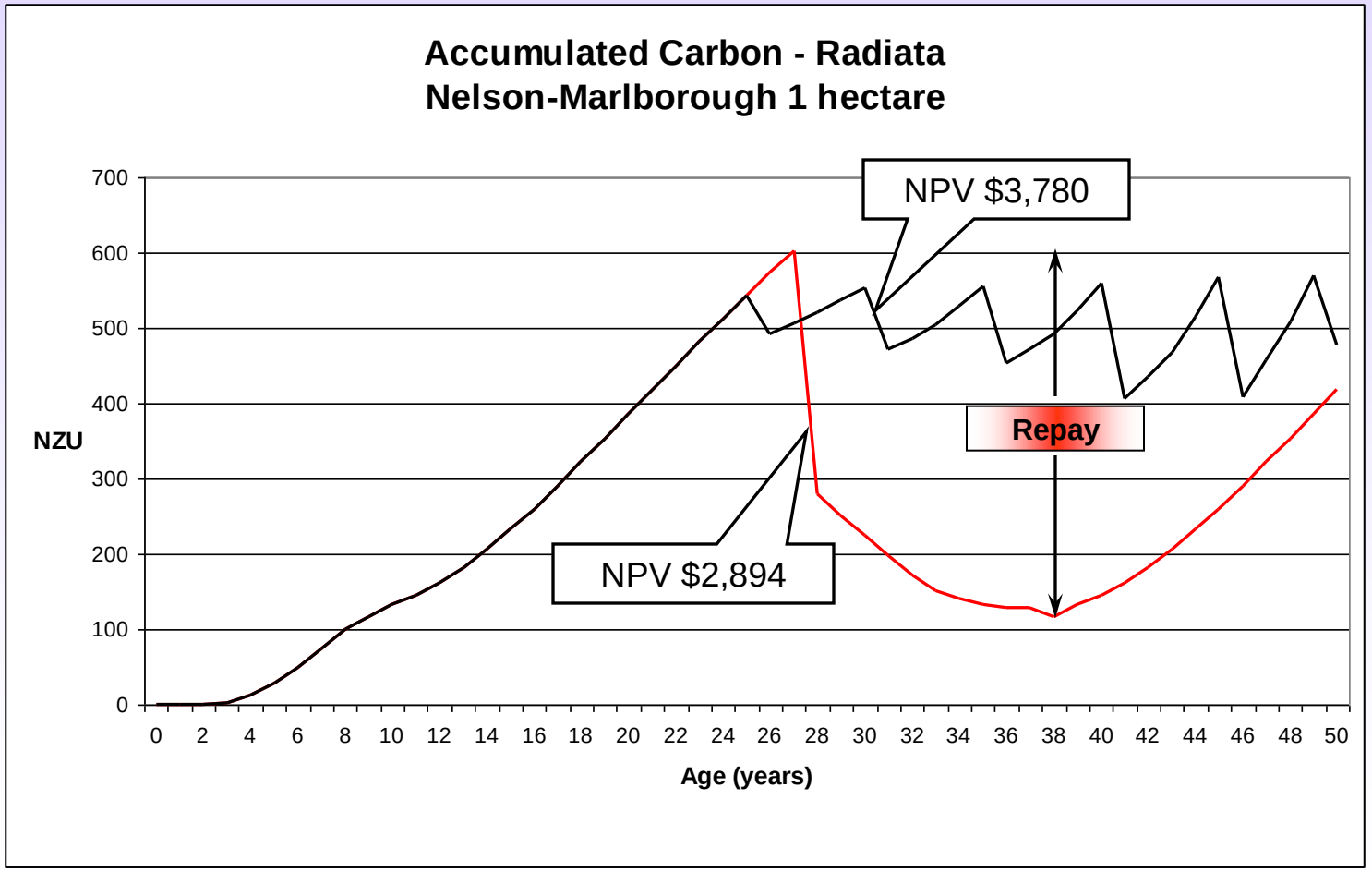
Avoiding Harvest Liabilities

Partial Cutting compared to Clearcutting (NZU)

Based on MAF Tables for Nelson-Marlborough

Indicative NPV at 6% Discount Rate



Wood Density and Carbon

The rate of carbon sequestered by a tree is dependent on its rate of growth and the density of the timber.

Heavy (dense) timbers contain more carbon than light timbers.

A heavier timber growing more slowly may have a similar sequestration rate as a moderately dense timber growing at a medium growth rate.

Fast-growing heavy timbers have the highest sequestration rates.

Wood Density and Carbon cont'd

- Different species sequester carbon at different rates. Slow-growing low density timbers (eg. Totara) are the slowest while fast-growing high density timbers (eg. Eucalyptus) are faster.

- After 25 years: Totara = 75 NZU/ha Douglas fir = 409 NZU/ha

  Radiata = 543 NZU/ha Eucalyptus = 618 NZU/ha

- Select species that meet your objectives and match the site conditions. Natives are best established under existing scrub or exotic shrubs or in canopy gaps of an exotic plantation rather than into pasture.

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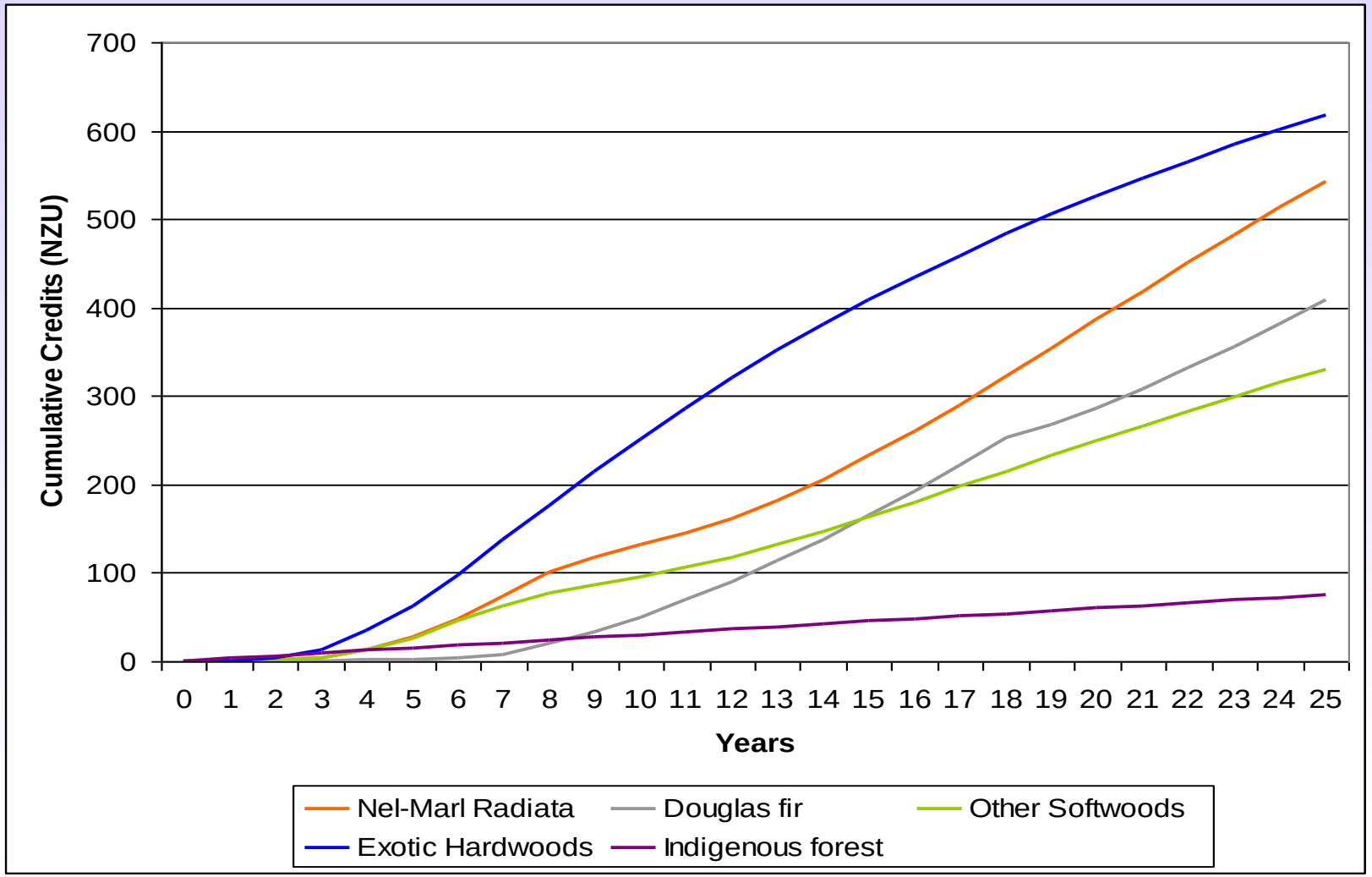
Comparison of Sequestration Rates

Based on MAF Carbon Return Tables



TOMORROW'S FORESTS

TAKE HOME SUMMARY – Post-1989 forest

1. Carbon credits can substantially improve the economics of re-establishing native vegetation, increasing biodiversity, reducing erosion, and growing timber.

2. Kyoto-compliant land, if planted or regenerated as a Post-89 forest, can enter the ETS and earn carbon credits. Note that the Government gets the benefit of the carbon if such a forest is planted but not entered in the ETS.

3. Kyoto-compliant land is land that was NOT forest land as at 31st December 1989.

4. Forest land is defined as being an area of at least one hectare, containing trees that will reach at least 5 metres at maturity, having a forest canopy cover of at least 30% at maturity and being at least 30 metres wide.

5. Joining the ETS to obtain carbon credits from Post-89 forest is voluntary but forest owners in the ETS must account for both carbon gains and losses.

6. To join the ETS, each area of forest needs to be at least one hectare of one species and one age*.

TOMORROW'S FORESTS

TAKE HOME SUMMARY – Post-1989 forest Cont'd

7. The fundamental requirement for planted or regenerated Post-89 forests in the ETS is that they will remain forested. Any future change in land use (deforestation) will incur carbon liabilities.

8. It is important to minimise harvesting liabilities. Any harvest planning needs to ensure that the volume harvested in any 5-year Commitment Period is no more than what will grow in that period. Harvesting more than this will result in carbon liabilities. Harvested areas must be replanted.

9. Avoiding harvest liabilities requires a change in the approach to harvesting by using periodic or partial cutting of the trees rather than clearcutting.

10. It is more economic to grow trees to a greater age when growing trees for carbon and timber. Once the first crop of Post-89 trees has grown to harvestable age or to maturity, the flow of credits will cease. However, with partial cutting and replanting, timber harvesting can continue.

11. The price of carbon (1 NZU or one tonne of CO_2 e) is about NZ$24 as at today.

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THE CONCEPT

Planting wide-spaced exotic hardwoods with a native understorey

- The cost of establishing this sort of plantation can be offset, if not completely covered, by carbon credits gained from the exotic hardwoods.
- Of the various MPI default tables for calculating sequestered carbon, the exotic hardwood table contains the highest carbon sequestration rates.
- Wide-spaced exotic hardwoods (up to 16 m apart) will satisfy the ETS requirement of 30% canopy cover per hectare at maturity.
- Unlike conifers, exotic hardwoods tend to have more open canopies making them more suitable for understorey planting with natives.
- But like some of the conifers, some exotic hardwoods are not suitable due to their wilding potential.

THE PLANTING DESIGN

- **A riparian planting needs to be wide enough to be eligible for the ETS. For streams and rivers up to 10 m wide, a 15 m strip each side is sufficient provided the tree canopy at maturity will extend over the water.**

- **However, enlarging the planted area in suitable places adjacent to the riparian planting improves the economics considerably.**

- **The use of exotics in riparian planting design has significant advantages over pure native planting … exotics grow faster, produce a multi-tiered structure earlier, increase biodiversity and act as shelter and nurse for the natives.**

- **Depending on the exotic hardwood species chosen, they also present the option of future harvesting. These trees often produce very valuable timber which can be harvested using shelterwood harvesting systems. This can also add to the economic viability.**

THE PLANTING DESIGN

- **The site characteristics dictate what is possible in terms of species choice. Rainfall, minimum temperatures, soil type, potential rooting depth, soil moisture, slope and aspect are the main factors.**

- **Management factors include access, adjacent land use, existing vegetation, fencing, labour availability, and potential weed and animal pests.**

- **There is a wide range of exotic hardwood species that could be used. They include oaks (evergreen or deciduous), eucalyptus, Blackwoods, Tagasate, elm, alders, some poplar varieties and other less common species.**

- **Exotic hardwoods not recommended include willow, some poplar varieties, cherry, Sycamore, Robinia, and possibly other wattles.**

HOW TO GET STARTED

- **Contact Annette Litherland at Landcare Trust or Sean Weaver at Ekos.**
- **Post or email a map showing the location of the property and the areas for planting.**
- **We'll do a preliminary assessment to check ETS eligibity and digitise the intended planting areas.**
- **Then using a specially built cost/benefit analysis spreadsheet, we can calculate the internal rate of return (IRR) and the net present value (NPV) of the project.**
- **If the decision is to proceed, more detailed planning follows including species selection, a written establishment and management plan, seedling orders and booking of contractors.**