Cortes Presentation to AGM May 22, 2022

Government website: Timber supply is the volume of timber that is forecast to be available for harvesting over a specified time and under a particular management regime.

It's a combination of:

- *The condition of the existing forest*
- *The growth rate of the existing and harvested forest*
- *How the forest is managed for timber and other resource values*
- *Choices around the rate of harvest*

Timber supply forecasts should be reviewed every 10 years, or sooner if there are significant changes to the forest cover data, yield curves, timber supply model, harvesting practices or management assumptions.

Cortes Community Forest landbase: 3776 hectares
Portion suitable for forestry: 62% (2355 hectares) – called the Timber Harvesting Landbase (THLB) in this presentation.
Mean Annual Increment (MAI): 6 m^3/hectare/year
Sustainable Harvest calculation: 14,050 m^3/year
Culmination Age Range: 54 to 200 years of age – it varies with species and productivity (site index)
Current Annual Allowable Cut (AAC): 13,600 m^3/year

Cortes Community Forest Timber Supply Scenarios for the Timber Harvesting Landbase:

- 13,600 m^3/year (current AAC)
- 3,500 m^3/year (lowest of the proposed AACs)
- Climate impacts scenario – impact of 20% volume reduction at both 13,600 and 3,500 m^3/year

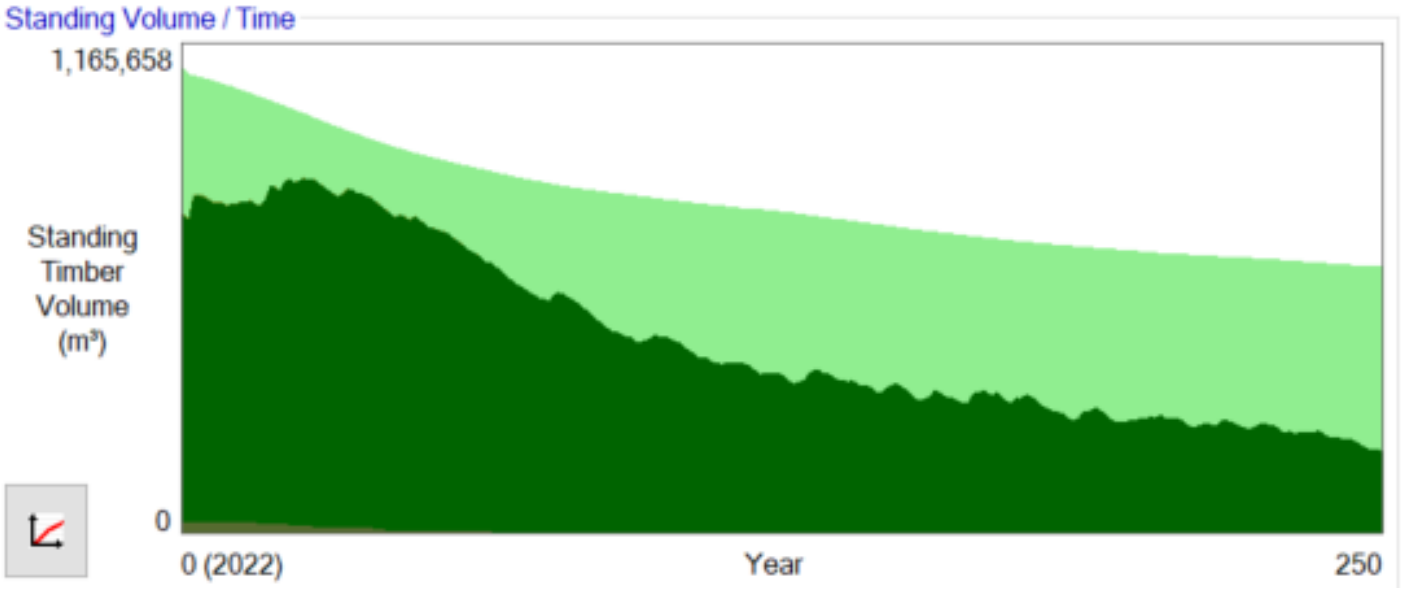
On the harvest forecast graphs the dark green is the area of the THLB forest that meets the minimum harvest age and is available in the model to be cut and regenerated. The light green is the area of forest that is younger than the minimum harvest age and is not available to cut.

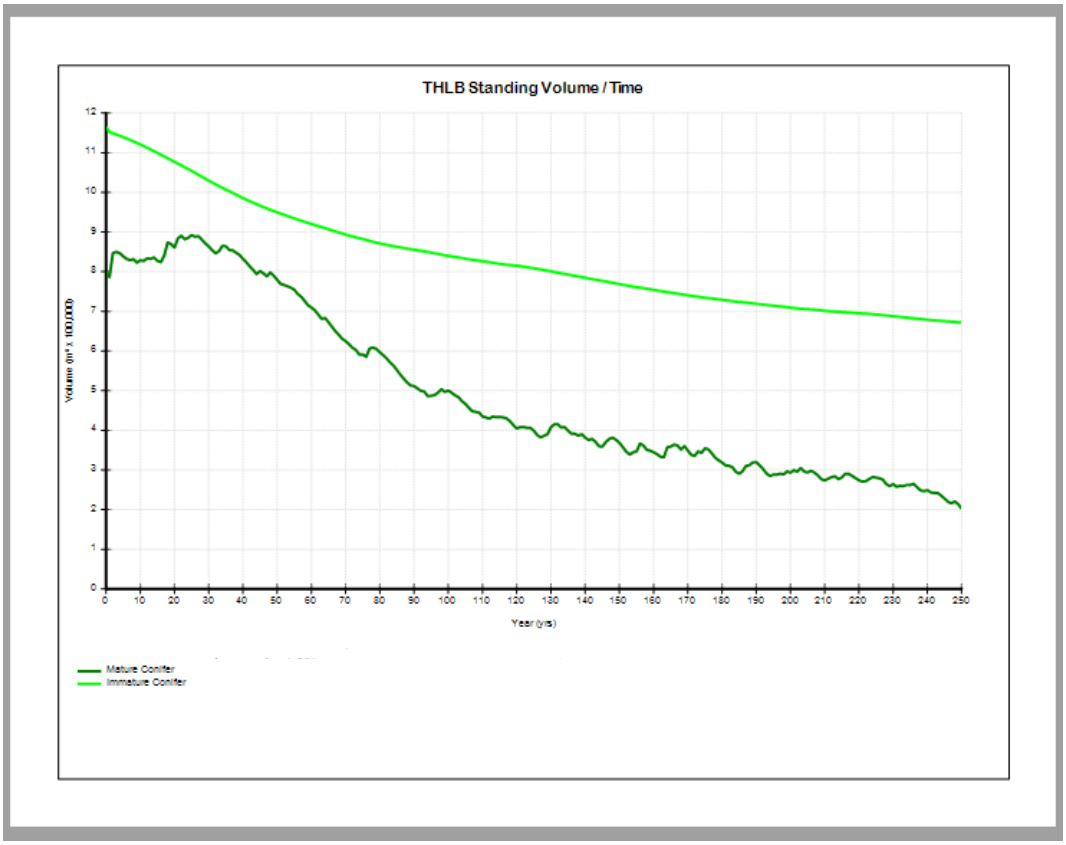
The following forecasts are not meant to be the actual harvest carried out on the ground. They are used to help us understand the impacts of different harvest level choices. The area the model selects to harvest is just one possible harvest regime. The forecast is from now until 250 years in the future.

AAC 13,600 m^3/year on THLB 2355 hectares (out of the total Cortes Community Forest area of 3776 hectares)

Average age of trees harvested: 160 years old for half the forecast, declining to 115 years old in the long term.

Average area harvested: 20 hectares/year

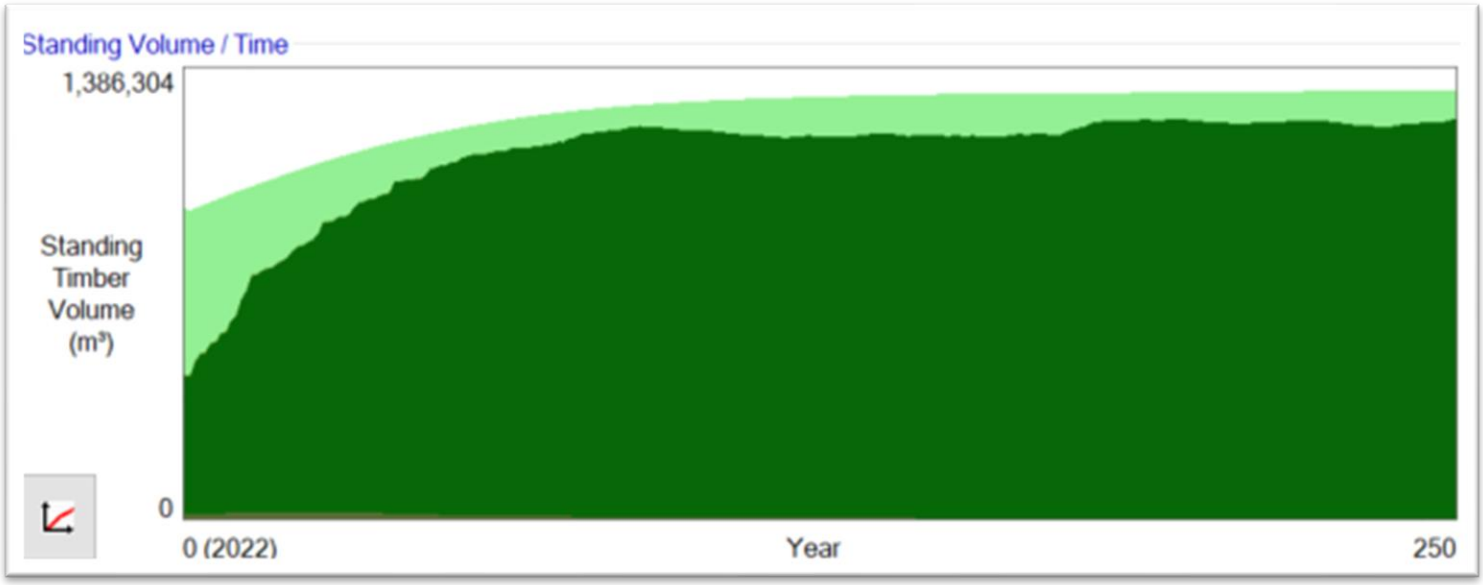


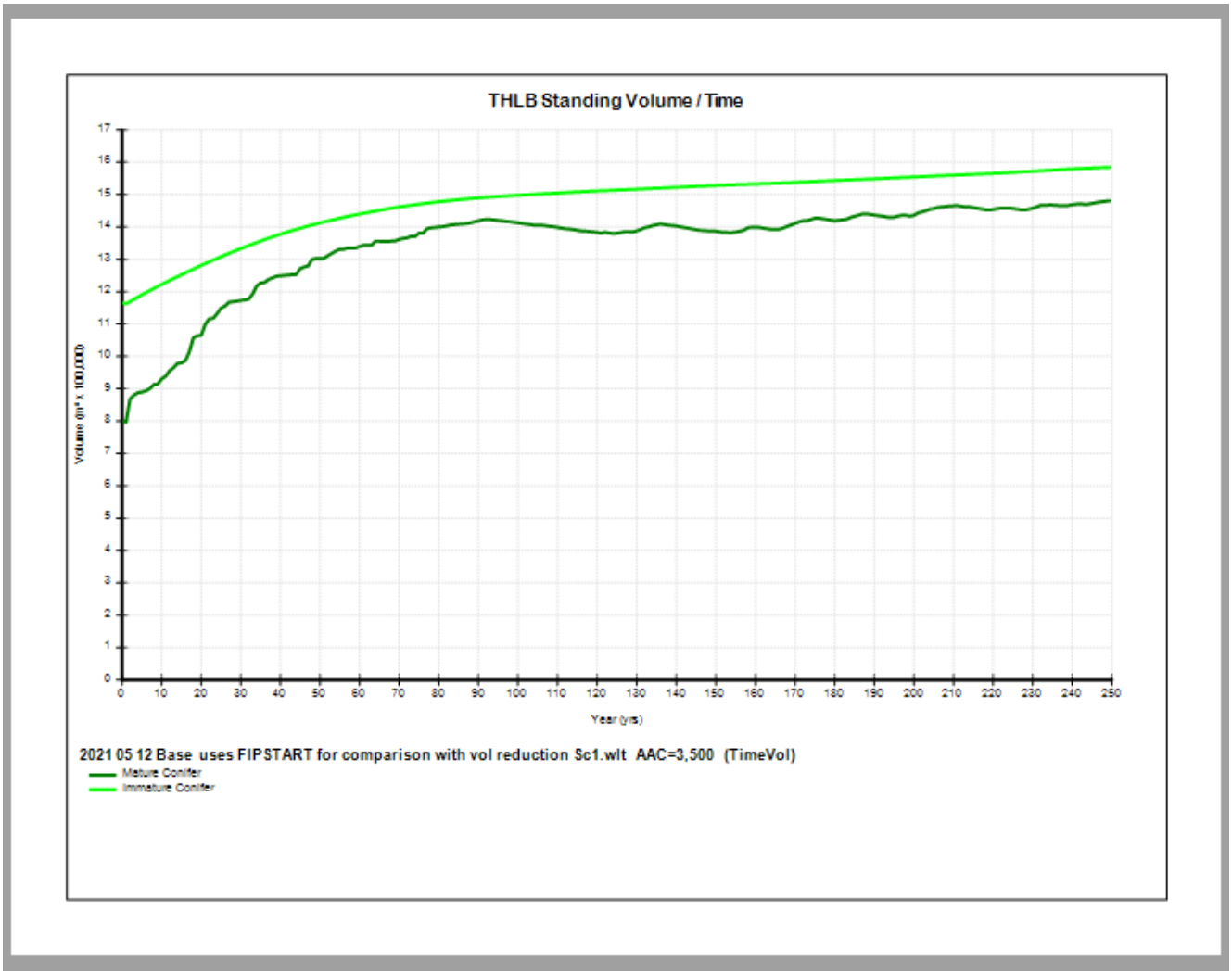


AAC 3,500 m^3/year on THLB 2355 hectares

Average age of trees harvested: starts at 200 years and increases over the forecast to 360 years.

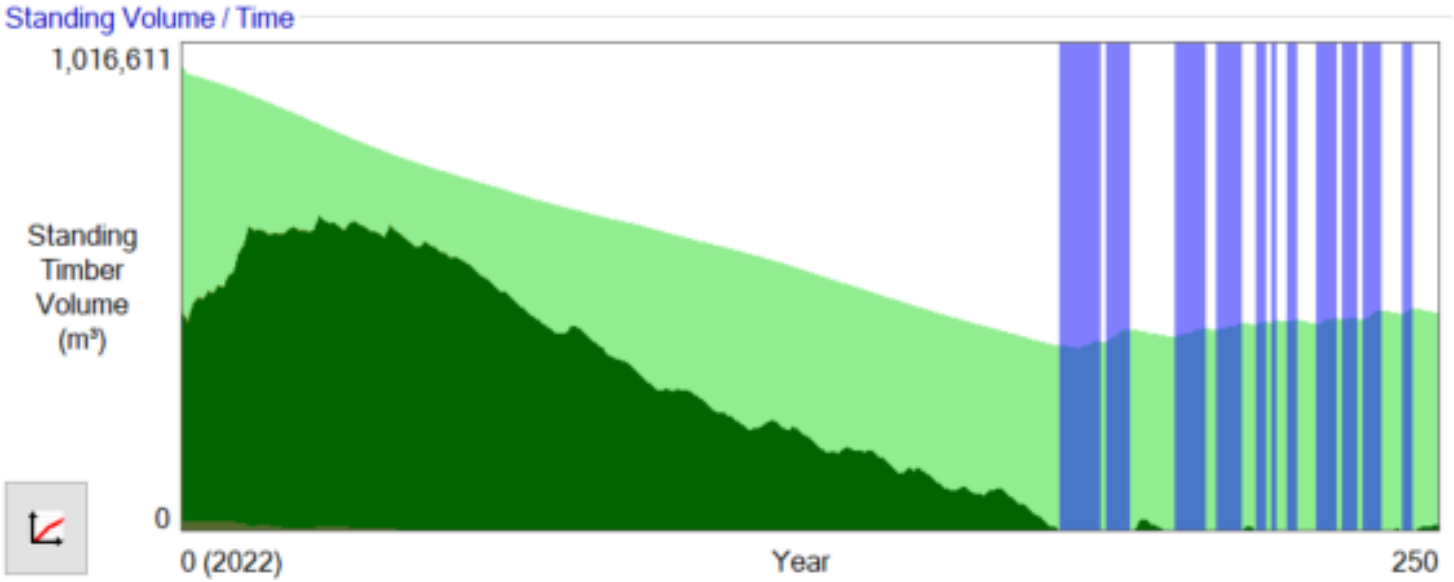
Average area harvested: 5 hectares/year



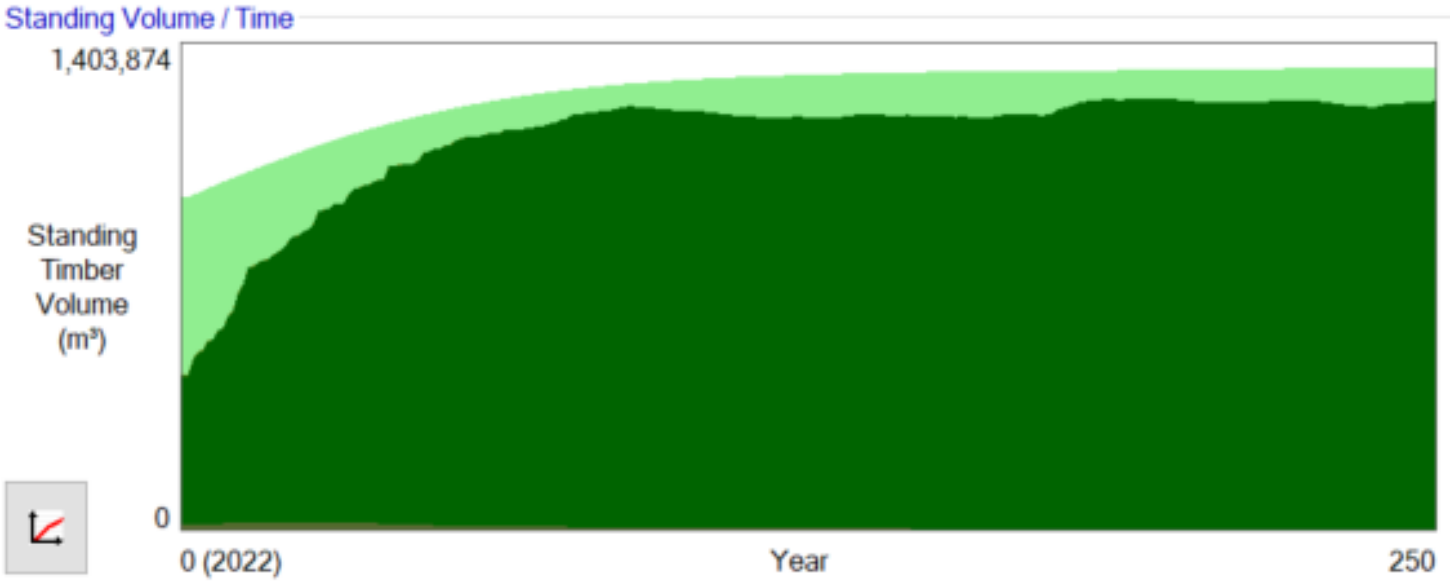


Harvest forecasts with a 20% reduction on existing and future volumes.

AAC 13,600 m^3/year on THLB 2355 hectares
Blue bars are where there are no stands with trees that meet the minimum harvest age criteria.



AAC 3,500 m^3/year THLB 2355 hectares



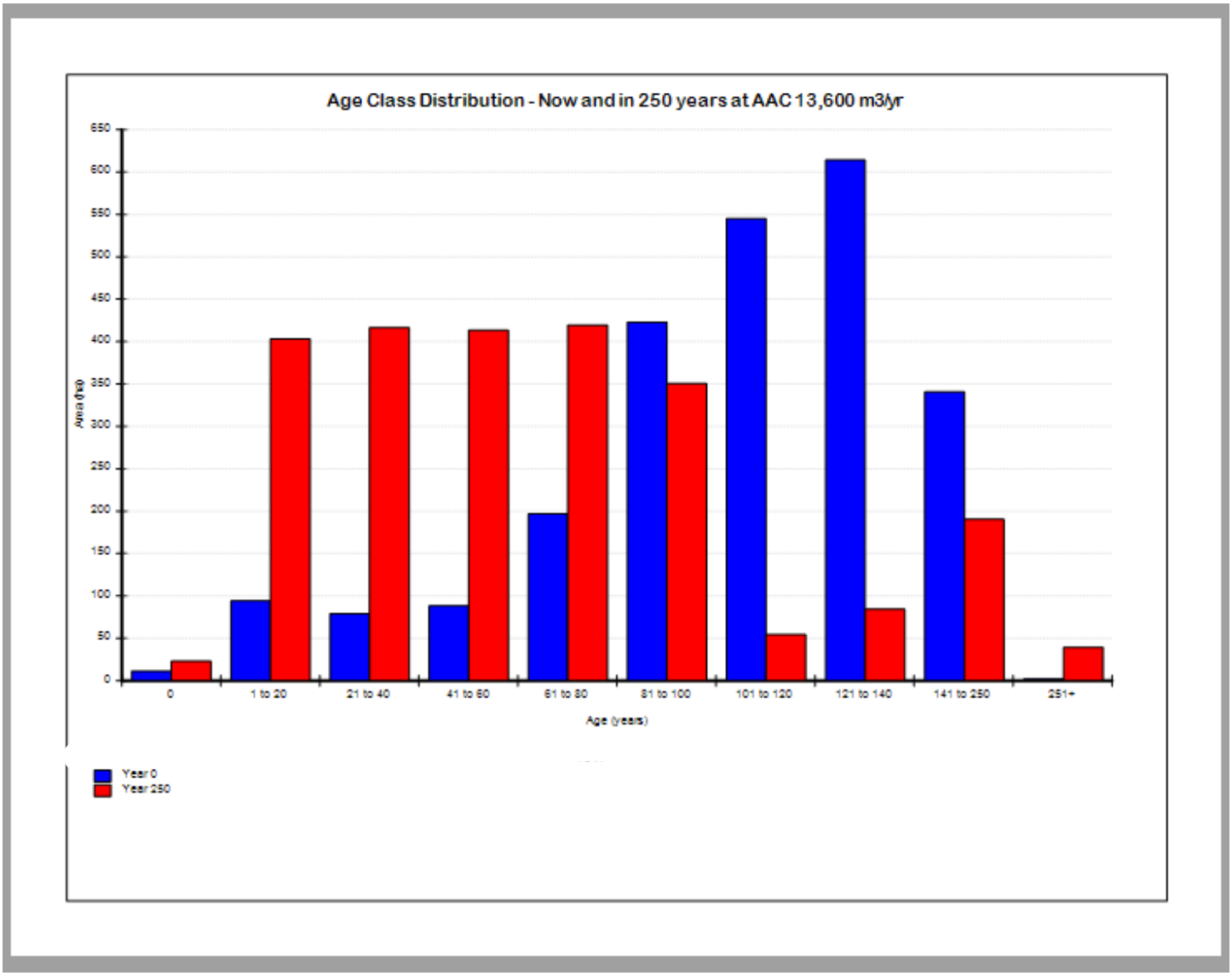
This graph shows how much of the timber harvesting land base is in each age group based on the forest cover inventory data. For example there are 614 hectares that are between age 121 and 140 years of age.

This graph shows the difference in the forest age distribution in 250 years with the two AAC's. The lower harvest (pinkish bars) allows more trees to age into the older age classes because they are not harvested.

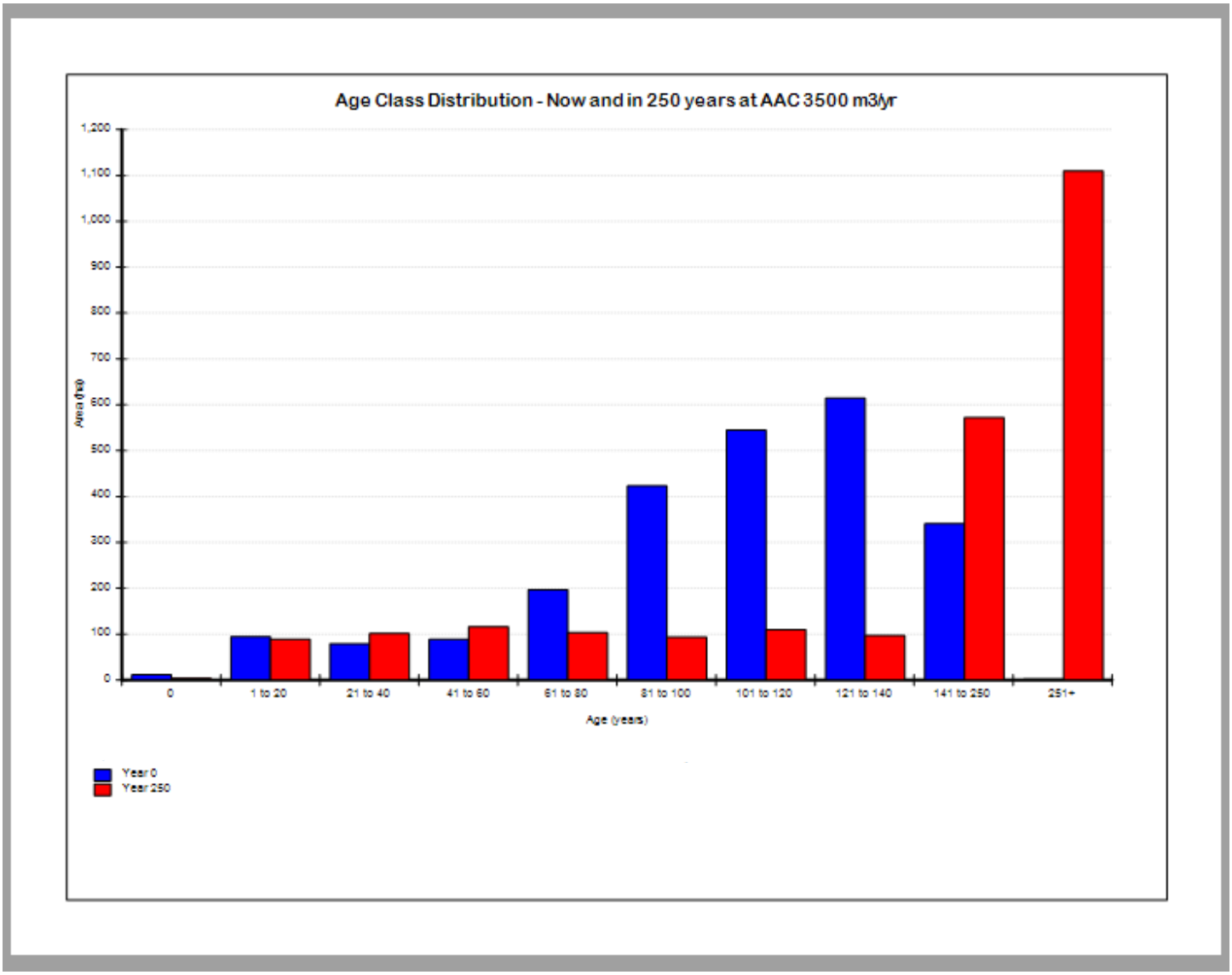
A stand that is 250 years old at the start of the forecast will be 500 years old at the end if it isn't harvested. A 30 year old stand will be 280 at the end. Some stands can be harvested several times in the 250 years and end up at age 10. Of course, keeping in mind that this is a model, and in reality nature could throw insects, disease, fire, wind, drought, flooding, or landslides at a stand! Those possible impacts are not modelled, unless scenarios are created to look at that, like the reduced volume scenario

The age class distribution graphs show the area of forest in each age class at the beginning of the harvest forecast (ie now) in blue, and in red at the end of 250 years of harvest and regeneration at the AAC.

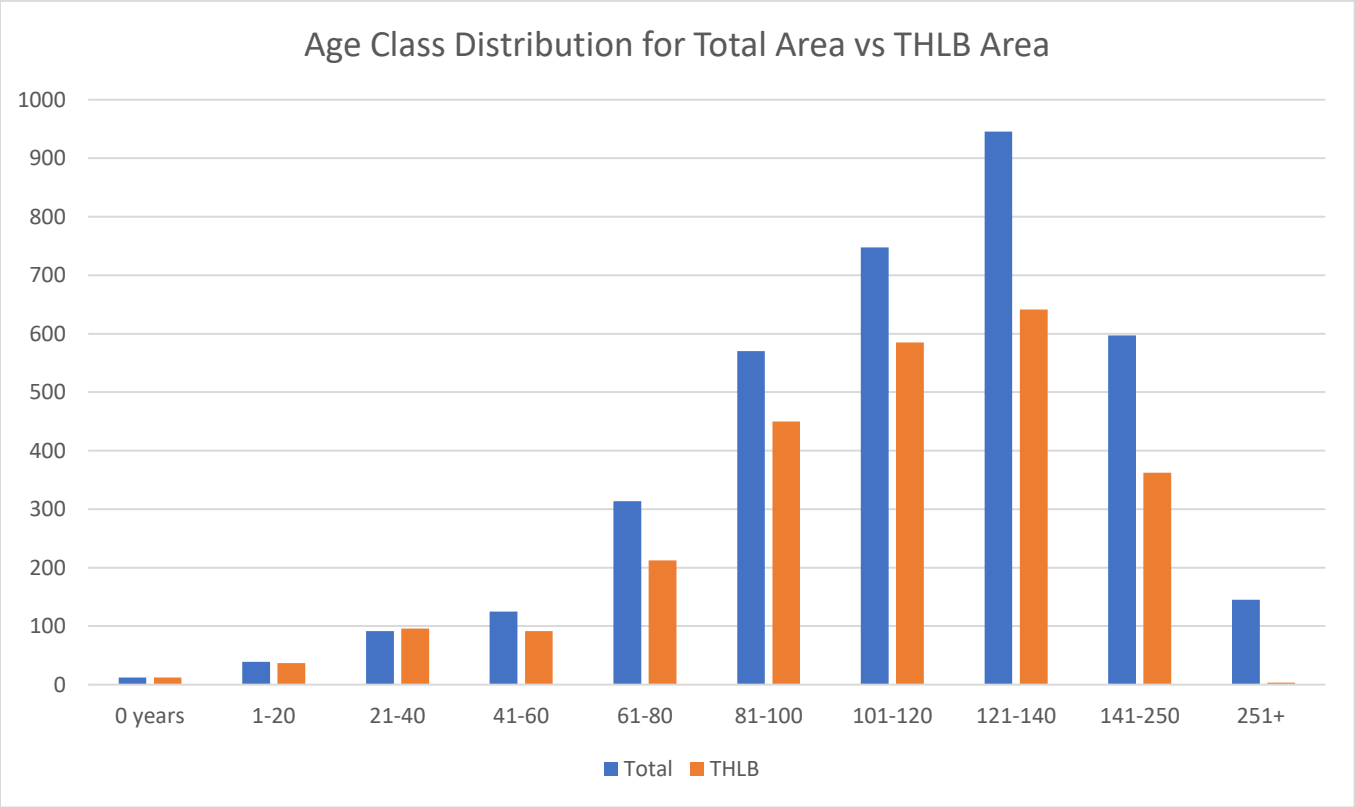
AAC 13,600 m3/year Age Class Distribution - Now (blue) and in 250 years (red)



AAC 13,600 m3/year Age Class Distribution - Now (blue) and in 250 years (red)



The blue bars show the total area of forest at present compared to the area of forest in the timber harvesting land base at present. There are older stands that will continue to grow and age that are not included in the previous bar graphs because they are considered not available for harvest due to other values to be maintained, or because they are not considered productive enough for timber production.



Intro to Woodlot for Windows and Timber Supply Analysis

- Inventory inputs- map of forest cover polygons and table of stand data
- Yield curves – models of tree and stand growth and yield (ie volume) developed from permanent sample plot data and approved for use by the government for timber supply analysis. TIPSY and VDYP. These models predict the growth of managed and unmanaged single species, even-aged stands. Mixed species stand yields are predicted by adding the results
- Assumptions
- Simulation model
- Output – harvest forecast over 250 period – graphs and tables of area harvested each year in the model
- Limitations – yield models lacking in i) yield curves for complex stands including stands with mixtures of species, ages, vertical layers and horizontal arrangements; ii) modelling of growth response to silvicultural treatments including genetic gain, fertilization and patch harvesting; and iii) growth following disturbance agents including fire, insects and disease iv) ability to predict stand development under climate change. This is particularly important information when choosing which species to plant and/or promote following disturbances.
- Importance of "what if" scenarios, and review of analysis at least every 10 years, sooner if there are significant changes in the data or assumptions.

> insert Age class map in 2021 at harvest level 3000m3/yr to show possible outputs created from W4W data
> example of a harvest schedule output

Landbase

The government VRI inventory data has been updated for the harvesting to date, including this year's block. The map called Cortes-ComFor CFA_THLB_Feb2013 (insert this map) was used to designate areas to be removed as not available for harvesting.

Table 1. Cortes Community Forest Landbase

	Hectares (ha)	Volume (m3)
Cortes Community Forest	3776	
Non Forest	195	4527[1]
Forest	3581	
Roads[2]	139	
Forested Land	**3442**	
Forested Land – not available for harvest	1087	
Forested Land – harvest potential	2355	

[1] some rocky, but treed, low site index polygons with non-merchantable volume are called non forest in the inventory

[2] roads are a 4% netdown across all polygons. Not all roads have been built yet. This is a quick approximation of the potential long-term loss of productive land to road building. It may well be lower than this amount. Woodlots average 2% roads.

The forest land that is potentially available for harvest excludes:

- non-forest - wetlands, bare rock, gravel pits
- Roads – existing and future - roughly approximated by a 4% area netdown on all polygons (see note below Table 1)
- Forested but not available for harvest - riparian management areas, old growth management areas, marbled murrelet management units, ungulate winter range, area with visual quality objectives of partial retention, retention and preservation, low site index and rocky areas.

Purpose for which Huock was hired: inventory maps and assessment of inventory accuracy, and timber supply analysis to support a decision on Allowable Annual Cut (AAC) to propose to the government for the Cortes Community Forest.

The scenarios model clearcut harvesting. This doesn't mean there will not be some commercial thinning, and possibly some other types of partial cuts where feasible.
Fact is that the yield curves in the model were developed for even aged stands ie clearcut. And Douglas fir is a species that grows best with lots of light and with similar sized/age trees. Modelling uneven age forests will require collaboration with the ministry experts to come up with some acceptable curves. Given that the intent is to harvest at a relatively low level it is not expected that the impacts will be significant in the short term.

Minimum Harvest age is at culmination age. Culmination varies by site index and species – the range is from about 70 to 130 . Most of the stands are cut at ages much older than culmination in the following runs.

3000 m3/year harvest level – over 250 years the volume builds to 1,322,293m3
Almost all is above culmination age.