The net benefits of multiple use management of native forests:

a cost-benefit analysis in South & Central Queensland

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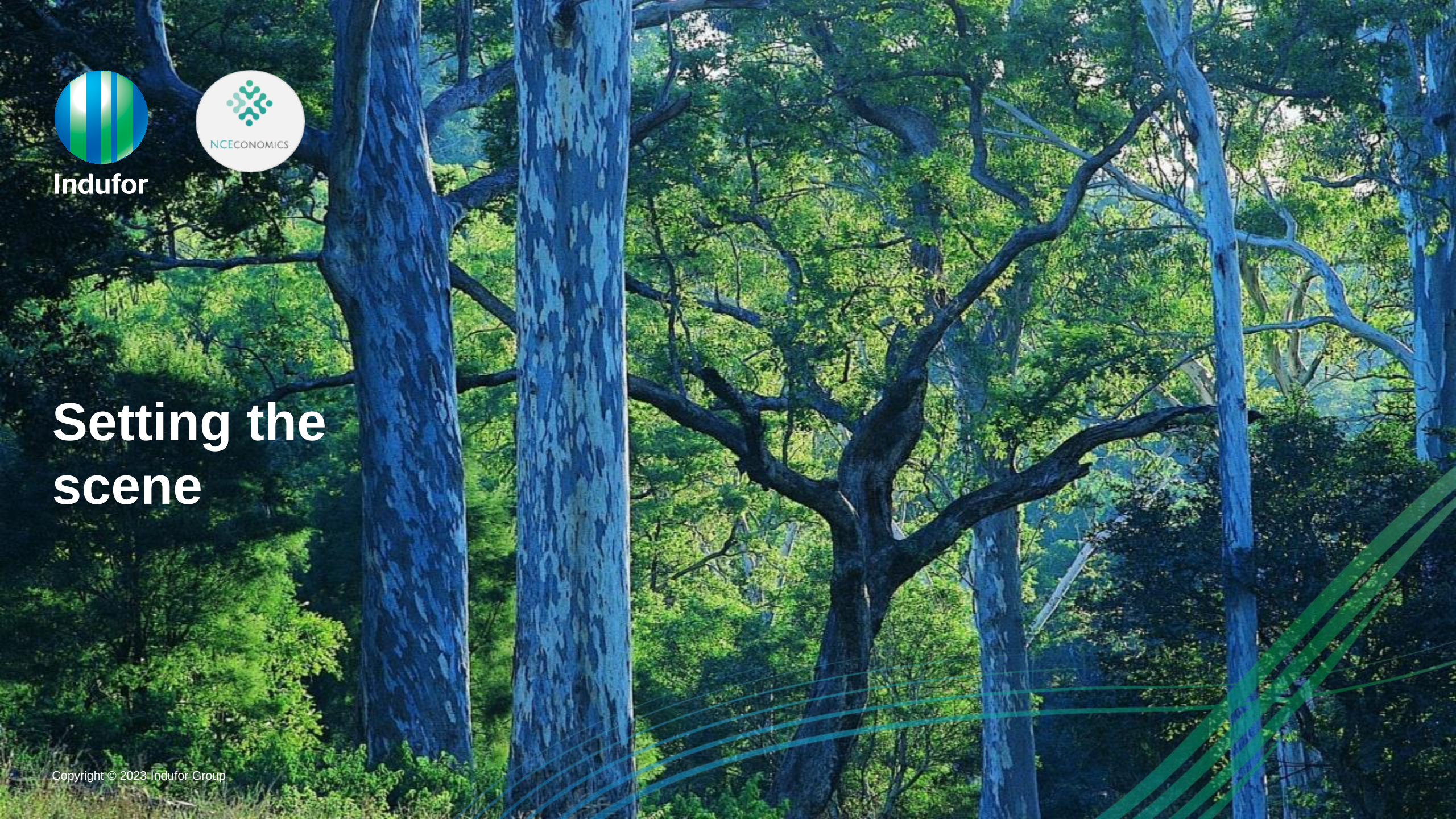
Presentation to
2023 ANZIF Conference

Structure

- Setting the scene
- Approach
- The bottom line
- Lessons and challenges going forward
- Questions

Benarkin State Forest. Image credit: Queensland Government



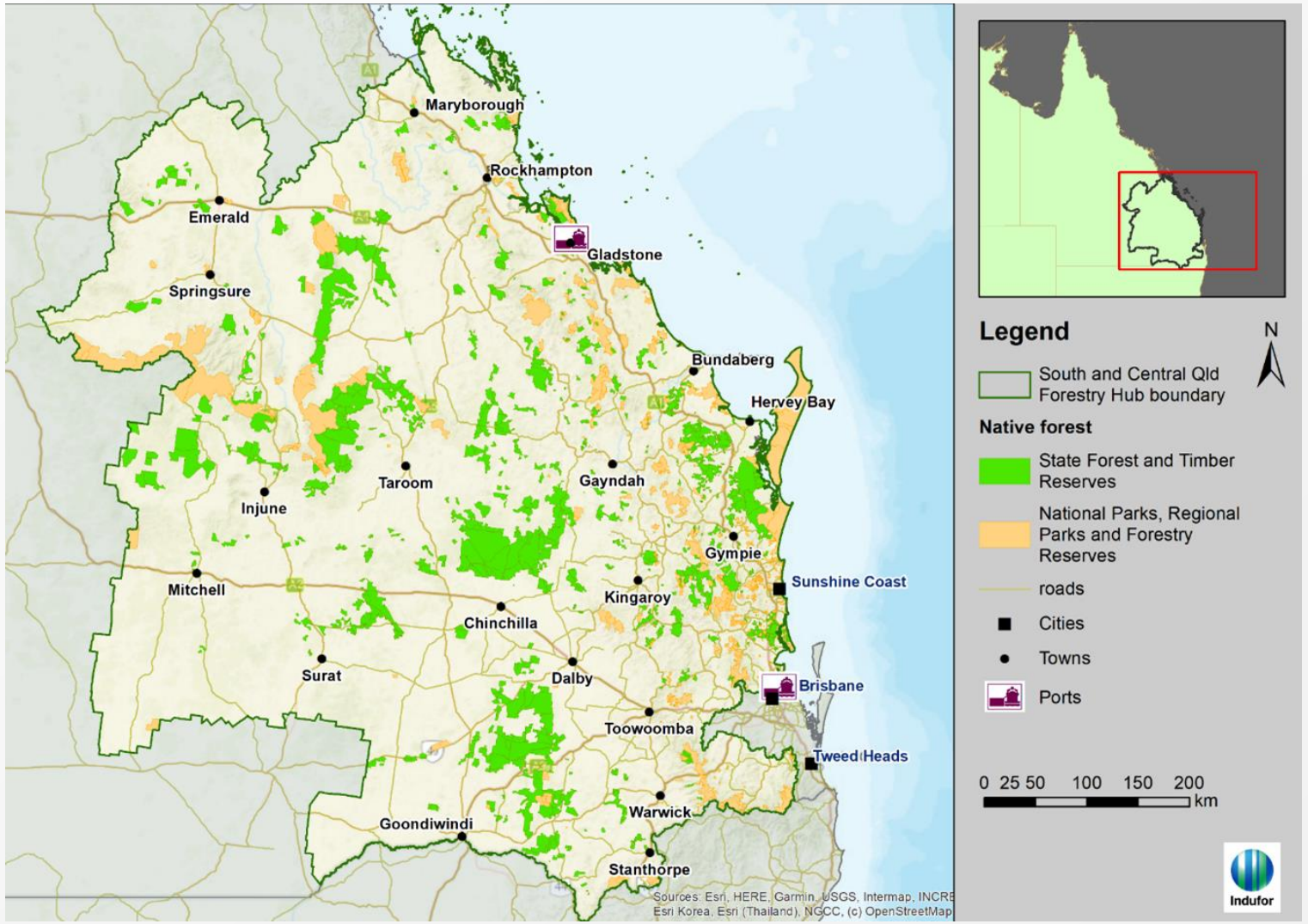
Setting the scene

- *Tenure question:* Continuous discussion on the future of forests – often a conversion to protection.

Comparison of two alternative scenarios for the region:

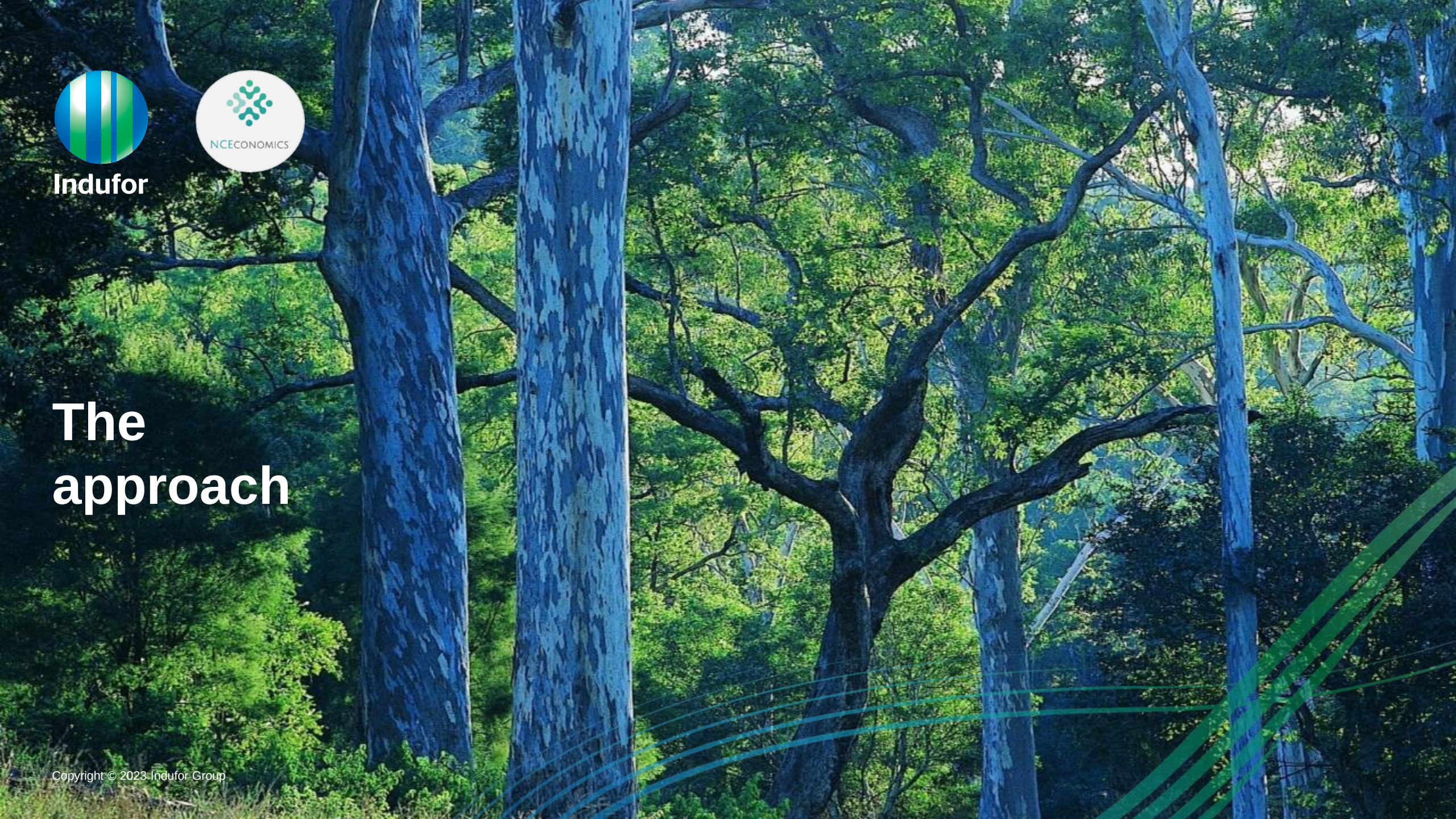
- *Multiple use option*: effectively status quo option, of continuing with State forests and timber reserves, and management for multiple values.
- *Protection option*: cessation of hardwood timber harvesting, and areas of State forest and timber reserves are managed with the objectives of national parks and conservation reserves.

What are the differences in benefits realised under different tenures?



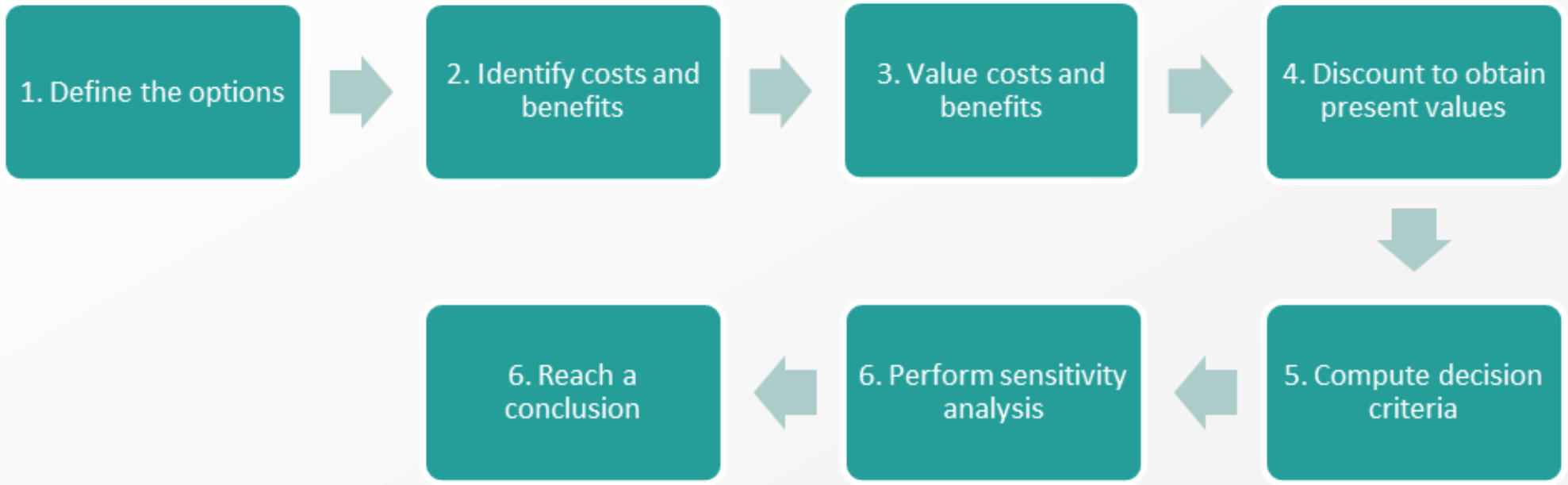
Decisions have consequences for benefit realisation

Components	Multiple Use Forest	Formally Protected Forest
Management activities typical to tenure:		
Ecological thinning	✓	×
Active fuel load management (including extensive planned burning)	✓	Variable
Pest and disease management	✓	✓
Provisioning services:		
Timber harvesting for industrial wood (raw materials)	✓	×
Fuelwood production (raw materials)	✓	×
Extractive industries - Gravel / stone / minerals (raw materials)	✓	×
Non-wood forest products – e.g., honey	✓	×
Non-wood forest products - grazing and livestock feed	✓	×
Clean water supply	✓	✓
Genetic resources	✓	✓
Regulation services:		
Biological control – e.g., pests and diseases	✓	✓
Water regulation & purification	✓	✓
Air quality regulation	✓	✓
Climate regulation – e.g., carbon sequestration	✓	✓
Soil protection	✓	✓
Pollination – including beekeeping services	✓	✓
Biodiversity repository	✓	✓
Hazard regulation	✓	✓
Cultural services:		
Spiritual	Recognised as values but limited by data availability	
Cultural		
Historical	✓	✓
Tourism	✓	✓✓
Recreation – e.g., hiking, camping, cycling & MTB	✓	✓
Sport – e.g., fishing, hunting, motorised sport etc.	✓	×
Education	✓	✓
Ecological functions (supporting services):		
Nutrient cycling	✓	✓
Primary production	✓	✓
Soil formation	✓	✓



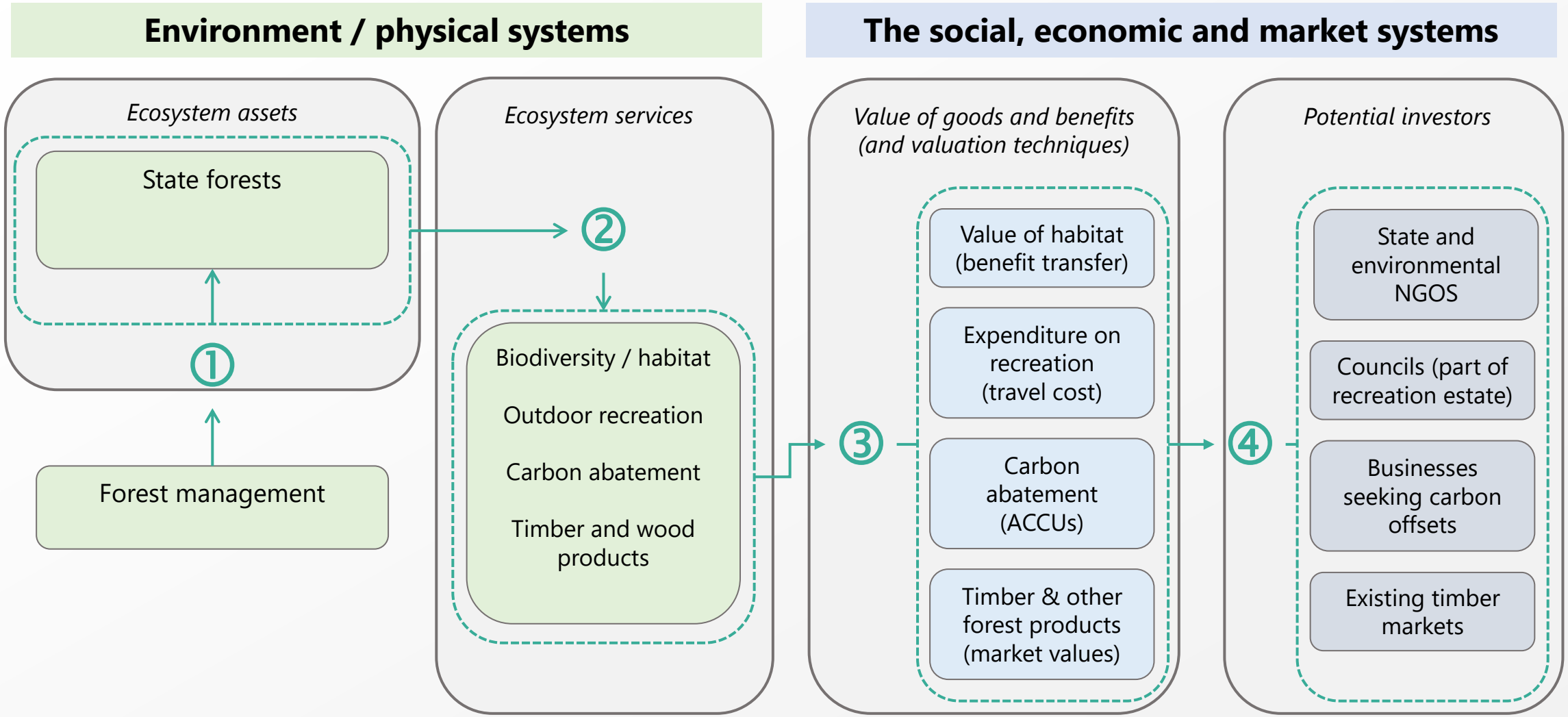
Cost benefit analysis to compare tenure options

- The research question…. ***Does a change in tenure provide a benefit for society over time?***
- CBA is preferred approach to underpin policies, regulations and investment.
- Considers *net benefits* to society (beyond commercial). Marginal change is the focus with a long-term analysis.



- Desktop approach necessary due to data and resource limitations, focussing on where there are likely to be material differences in values between tenures.

Linking the forest estate to economics & markets

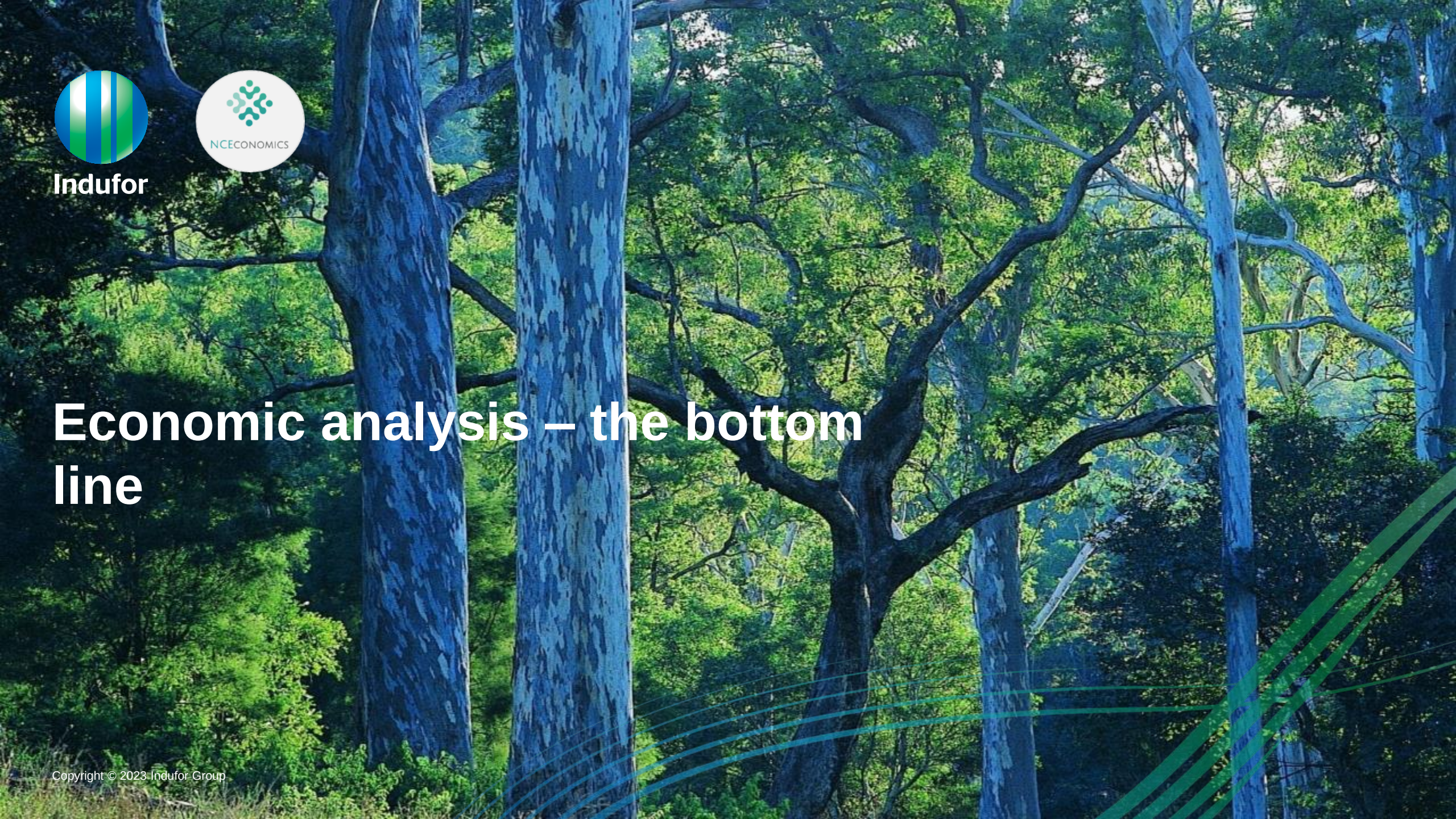


Step 1: Identify assets (extent & condition)

Step 2: Identify flow of ecosystem services from the assets

Step 3: Measure flow contributions to changes in socio-economic benefits

Step 4: Identify markets for ecosystem services

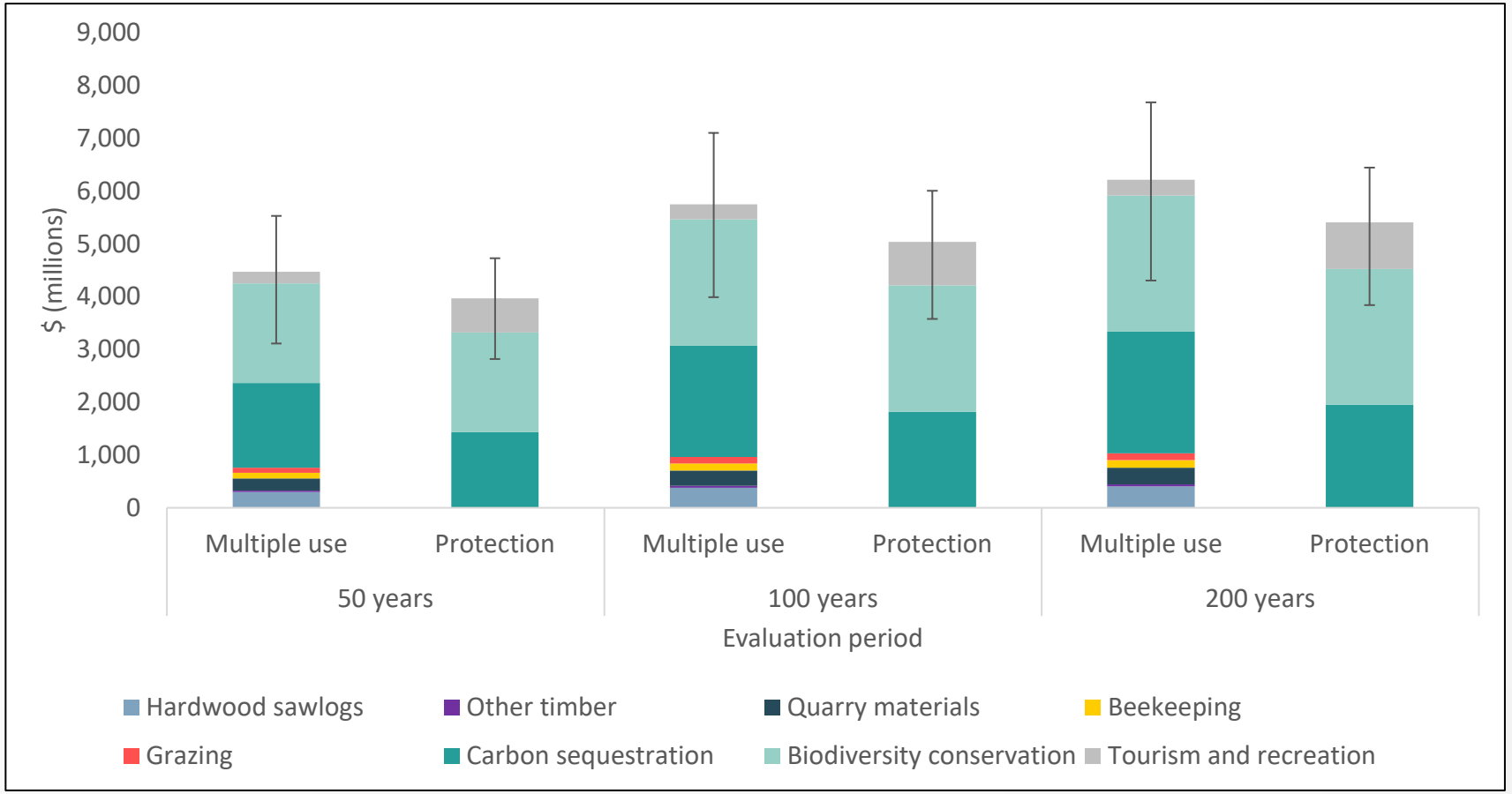


Economic analysis – the bottom line

Net value of benefits

The multiple-use forest scenarios resulted in consistently higher benefits across all evaluation periods and discount rates, based on most likely outcomes. This is attributed to the significant benefits derived from provisioning services.

Present value of benefits under alternative evaluation periods (discount rate of 2.65%)



Note: Indufor & Natural Capital Economics, 2022

Note:

- No economic studies available to value differences in biodiversity values attributable to tenure.
- Similarly, impacts of management such as fire regimes on benefits and costs not well understood.
- But values would need to be very high to tip the scales.

Estimated present values for costs and benefits

The multiple-use forest scenarios resulted in consistently higher benefits across all evaluation periods and discount rates, based on most likely outcomes. The median net benefit from state forest management was equal to an extra $1.2 billion in social benefits over the next 100 years, which is 30% higher than if the areas were managed as national parks.

Estimated present value of management costs and ecosystem services (100 years, discount rate 2.65%)

Management costs & ecosystem services	Estimated annual value ($M)					
	Multiple use forests			Protection forests		
	Low	Mid	High	Low	Mid	High
Management costs	(422)	(377)	(335)	(1,299)	(865)	(560)
Hardwood sawlogs	280	379	501	0	0	0
Other timber	19	35	55	0	0	0
Quarry materials	204	291	429	0	0	0
Beekeeping (honey production and permit values)	36	135	300	0	0	0
Grazing	48	120	220	0	0	0
Carbon sequestration[1]	1,101	2,111	2,533	948	1,817	2,181
Biodiversity conservation[1, 2]	2,131	2,396	2,660	2,131	2,396	2,660
Tourism and recreational[1]	169	281	404	499	822	1,161
Total ($M)	**3,566**	**5,371**	**6,767**	**2,279**	**4,170**	**5,422**

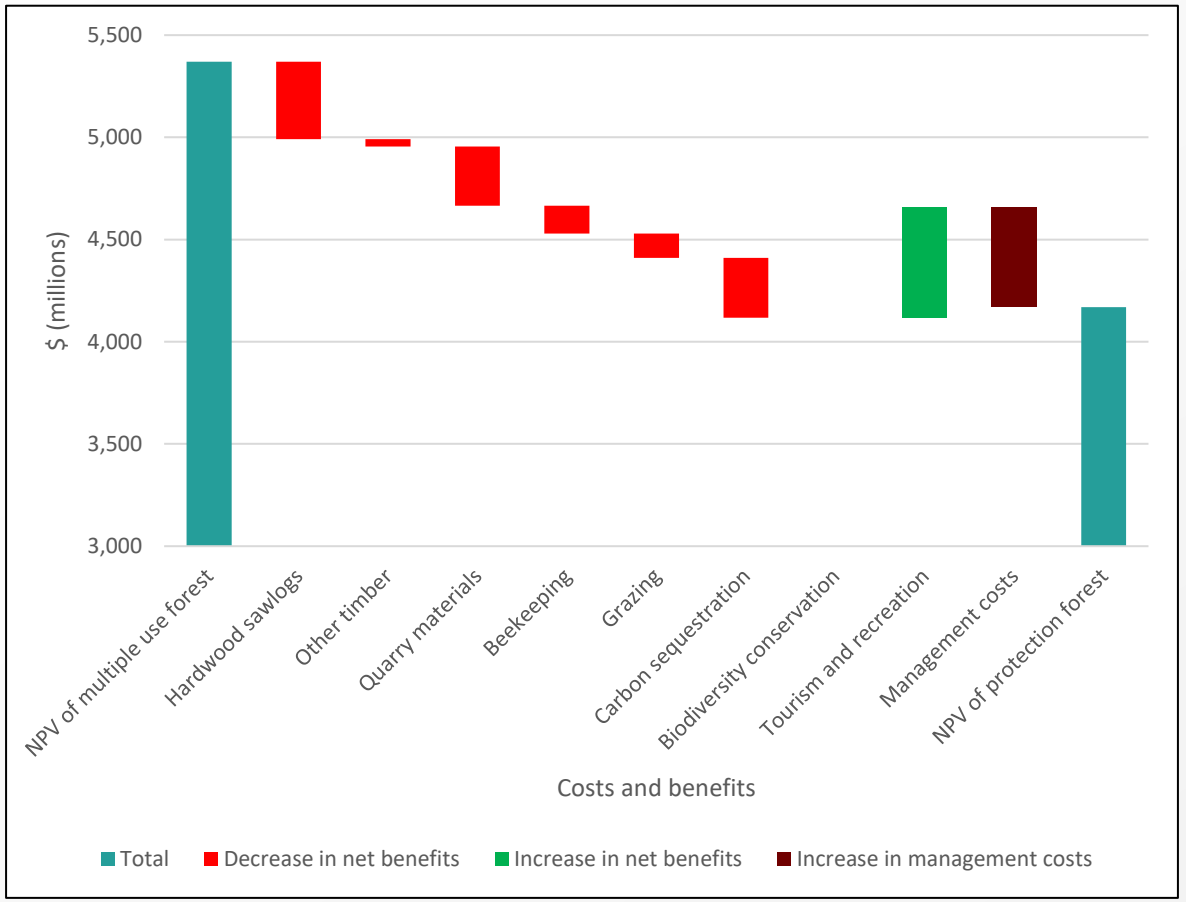
Note: Indufor & Natural Capital Economics

1. Non-market valuation approaches have been used to estimate the values of these ecosystem services noting that this is only the case for the upper bound estimate of beekeeping.
2. No established markets currently exist to capture the value of biodiversity conservation or carbon sequestration under the multiple use or protection scenarios in the study region.

Key differences between the scenarios

A waterfall analysis shows that net benefits from tourism and recreation in protection forests would not make up for the loss of provisioning services; and increased management costs in protection forests contribute further to the value gap.

Change in NPV between multiple use and protection forests (over a period of 100 years, discount rate of 2.65%)



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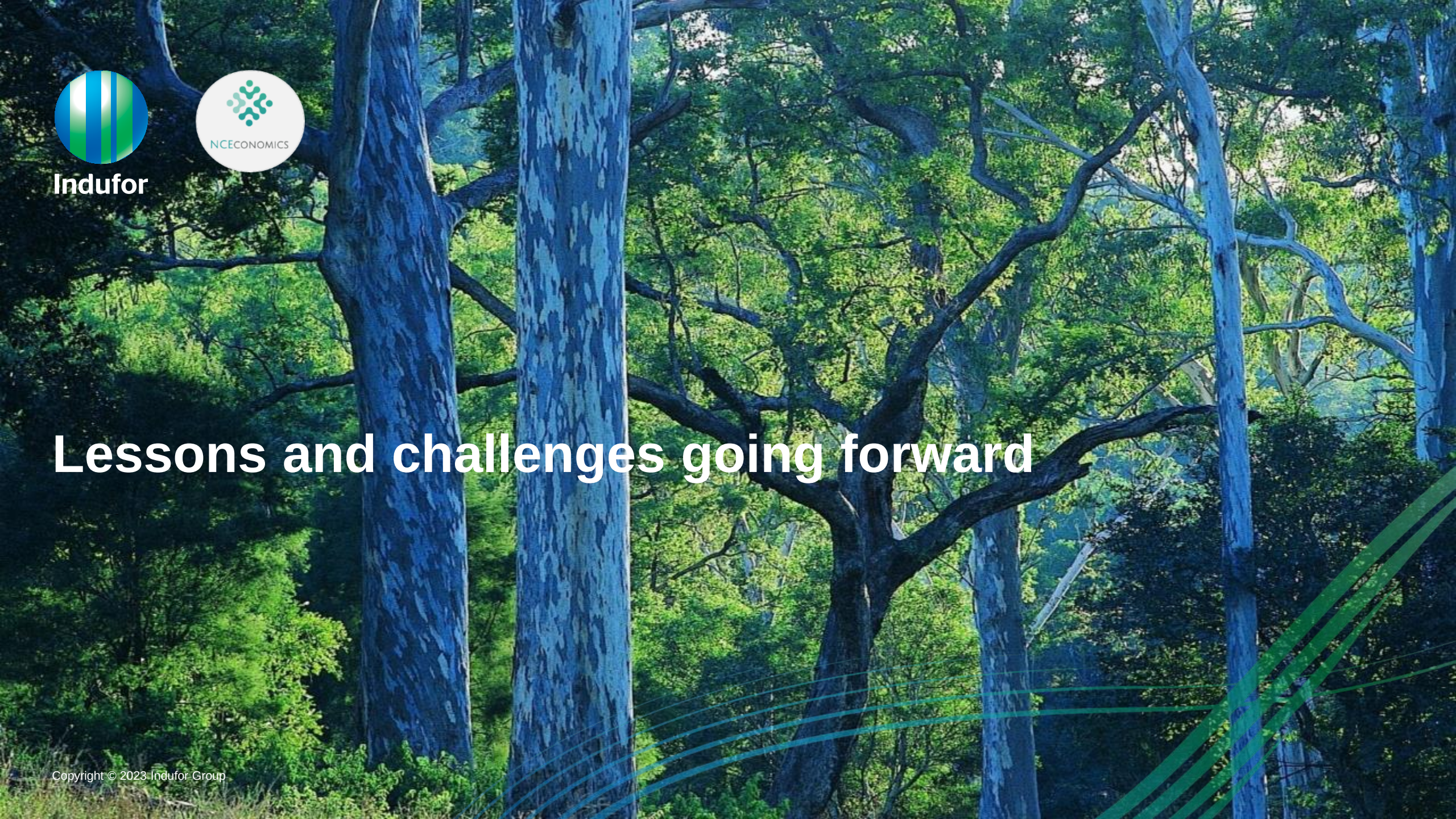

Lessons and challenges going forward

Lessons and challenges

Lessons:

- Multiple use forests support a broader range of ecosystem services.
- Assessment of the ecosystem services and use of a CBA can be used to inform decision-making.
- There is evidence to suggest multiple use forests may in fact provide higher net benefits, particularly if managed well.
- Information base can take time to establish. Get started early.

Challenges:

- Ensuring decisions are properly informed and based on robust analysis.
- Data (availability, scope and quality).
  Data can be progressively improved.
- Understanding the distributional impacts of decision-making - who benefits & who bears the costs?
- Links to co-investment.

Further information

Report:

The full report is available via the Queensland Regional Forestry Hubs website:

https://www.qldforestryhubs.com.au/

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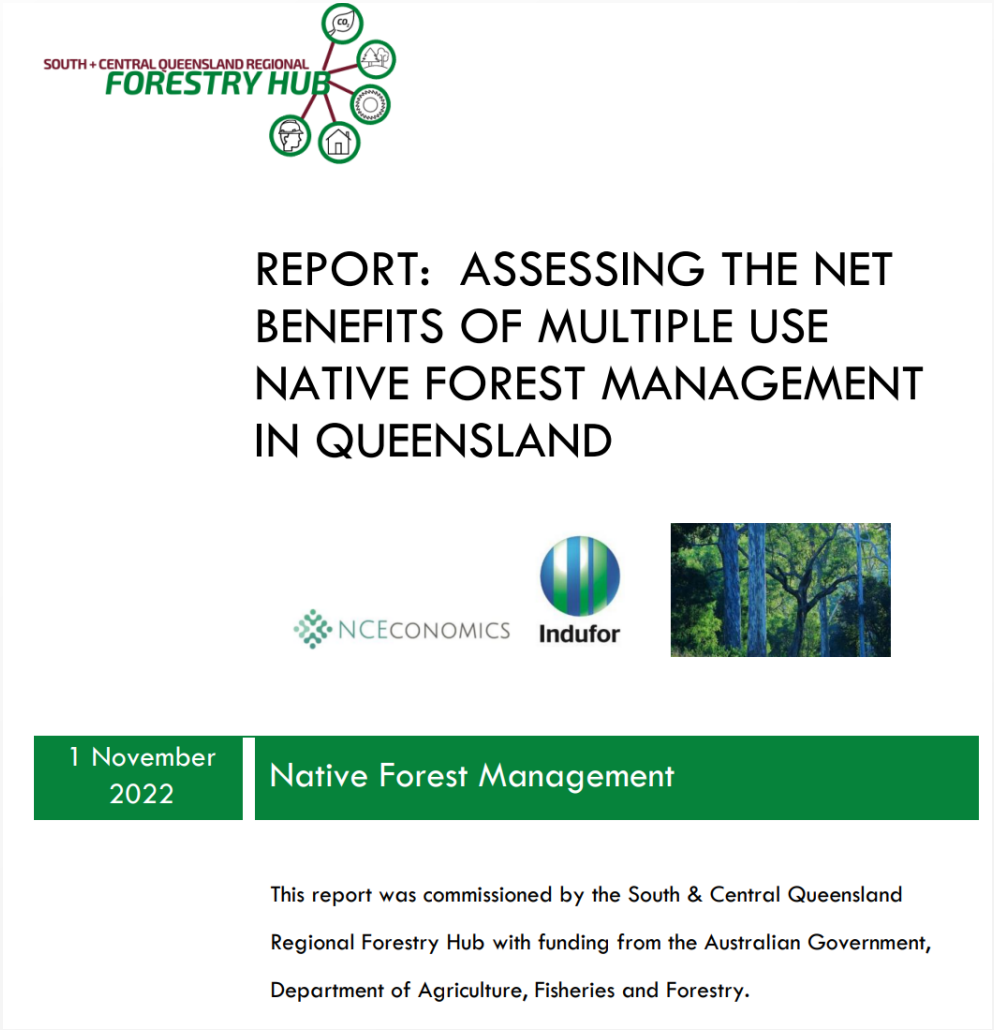

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Thank you!

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