

The Value of Nature: Victoria

Final report

Prepared for

The Wilderness Society

October 2026

mosaic insights

natural capital & climate



Mosaic Insights and Natural Capital& Climate recognise and acknowledges the unique relationship and deep connection to Country shared by Aboriginal and Torres Strait Islander people, as First Peoples and Traditional Owners of Australia. We pay our respects to their Cultures, Country and Elders past and present.

Artwork by Melissa Barton. This piece was commissioned by the Alluvium Group, and tells our story of caring for Country, through different forms of waterbodies, from creeklines to coastlines. The artwork depicts people linked by journey lines, sharing stories, understanding and learning to care for country and the waterways within.

This report has been prepared by Mosaic Insights Pty Ltd and Natural Capital Economics Pty Ltd for The Wilderness Society under the contract titled *The Value of Nature: Victoria*.

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Executive summary

Nature underpins Victoria's economy and the wellbeing of Victorians. Forested catchments supply Melbourne's drinking water, soils and pollinators sustain the state's farms, and Victorian quarries supply materials for construction. Parks, forests, rivers and coasts support health, recreation and liveability. Yet the natural assets that provide these services are in decline, and very little of their value is recorded in the economic statistics that guide public and private decisions.

This report sets out current estimate of what nature is worth to Victoria's economy and to Victorians. It was commissioned by The Wilderness Society (TWS) as Stage 1 of a staged program and draws together the best available Victorian and Australian evidence. We updated the economic data to 2023-24 and refreshed published valuation estimates to March quarter 2026 dollars.

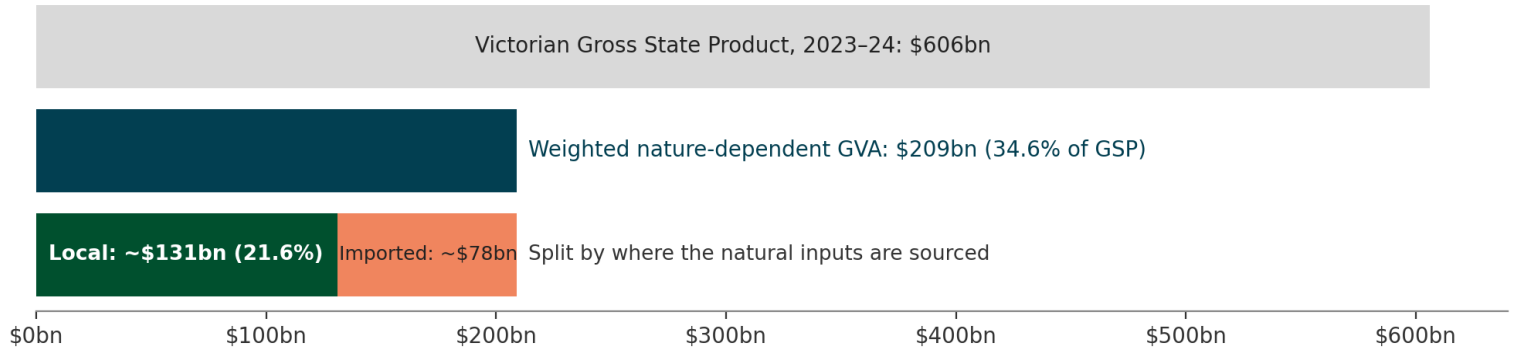
We used two lenses. The first, value chain dependency, estimates how much of Victoria's economic output relies directly on ecosystem services. The second, welfare and use value, estimates what nature is worth to Victorians directly, across health and wellbeing, disaster risk reduction, agriculture and biosecurity, water supply, tourism and recreation, and property and amenity. The two lenses answer different questions, so their results cannot be added together.

What we found

We found that around $209 billion of Victoria's economic output in 2023-24 depends directly on nature, equivalent to 34.6% of Gross State Product ($606 billion). This is a weighted measure of direct dependence on ecosystem services, built from the ENCORE framework and ABS national and state accounts. About 41% of the state's modelled sector output comes from

industries with a moderate to very high direct dependence on nature, consistent with the 42.9% the Australian Conservation Foundation (2022) estimated for Victoria in 2018-19.

Figure 1: Victoria's economic dependence on nature, 2023-24



Source: Natural Capital & Climate analysis of ENCORE ratings and ABS Input-Output Tables and State Accounts, 2023-24. See Appendix A.

We found Victoria's nature exposure is growing. Nature dependent output rose by $42 billion (25%) in nominal terms between 2018-19 and 2023-24. After adjusting for inflation (consumer prices rose 20% over the period), the real increase was $8.7 billion (4.3%) in 2023-24 dollars, while the dependency share increased marginally at 33.5% to 34.6%. As the economy grows, so does the value of economic activity that would be disrupted if the natural assets behind it were degraded.

Most of Victoria’s nature dependency sits with Victoria's own ecosystems. About $131 billion of output (21.6% of GSP) relies on natural assets located in the state. That exposure is concentrated in four systems that have no practical substitute at the scale required - the Yarra, Thomson and Macalister catchments; quarries in Cardinia Shire, the Macedon Ranges and the Great Dividing Range; agricultural soils and pollinators in the Western District, Gippsland and Sunraysia; and coastal systems including Port Phillip Bay, the Gippsland Lakes and Bass Coast.

We found construction, agriculture and food manufacturing carry the strongest direct exposure, together accounting for about 39% of Victoria's weighted Nature dependent output. Construction alone accounts for $54 billion. Real estate and transport add a further $47 billion, mainly through their reliance on water, stable land and climate regulation.

Nature also delivers direct benefits to Victorians worth billions of dollars each year. Forested catchments provide water worth $1.0 to $1.7 billion a year, based on updated estimates from previous studies. Honey bee pollination contributes $3.8 to $11.4 billion a year to Victorian agriculture, also based on previous assessments. Victoria's forests sequester carbon worth about $3.2 billion a year and generate $1.2 billion a year in recreation value. Nature-based physical activity avoids at least $356 million a year in healthcare costs, and forests protect 646 Victorian localities from at least $123 million a year in flood damage.

Many of these estimates are conservative. They cover only part of the state, such as Regional Forest Agreement regions or the parks network, or rely on minimum damage values. Because they were derived using different methods and for different areas, we report them individually and do not add them into a single total.

What the evidence means

The evidence in this report highlights what Victorians know intuitively. Nature underpins production across the Victorian economy, avoids costs that would otherwise fall on households, businesses and government, and creates public value through recreation, amenity, cultural connection and wellbeing. Because these contributions are largely unpriced, their loss is rarely recorded as an economic cost in any systematic way. Degradation of Victoria's catchments, soils, lands and coastal systems would flow through to the cost and reliability of production in most sectors, including construction, real estate and food manufacturing.

Gaps in the evidence remain, and we understand the later stages of this TWS research program are designed to close them. While those gaps affect the precision of individual estimates the overall finding that Victoria's prosperity depends on the condition of its natural assets, holds across both lenses and every domain we examined.

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Abbreviations

Abbreviation	Meaning	Abbreviation	Meaning
ABS	Australian Bureau of Statistics	GSP	Gross State Product
ACF	Australian Conservation Foundation	GVA	Gross value added
CPI	Consumer Price Index	I-O	Input-output (tables)
DEECA	Department of Energy, Environment and Climate Action (Victoria)	NCC	Natural Capital & Climate
DELWP	Department of Environment, Land, Water and Planning (Victoria, former)	RFA	Regional Forest Agreement
ENCORE	Exploring Natural Capital Opportunities, Risks and Exposure	SEEA EA	System of Environmental-Economic Accounting - Ecosystem Accounting
GOR	Great Ocean Road		

1 Context

Every part of Victoria's economy draws on nature, from the farms and food processors that depend on soils, water and pollinators to the households and businesses that rely on clean water and air, and protection from floods and heat.

1.1 Nature underpins the Victorian economy, and it is in decline

Nature provides inputs that every sector relies on including water, soils, pollination, timber and other materials, and the regulation of climate, floods and erosion. It also provides places for recreation, health and cultural connection. Globally, an estimated US$44 trillion of economic value, more than half of world GDP, is moderately or highly dependent on nature (World Economic Forum, 2020). In Australia, 49.3% of GDP ($892.8 billion) in 2018-19 was estimated to have had a moderate to very high direct dependence on nature (Australian Conservation Foundation, 2022).

The natural assets that supply these services are in decline. Australia's environment is in poor and deteriorating condition, under increasing pressure from climate change, habitat loss, invasive species, pollution and resource extraction (Cresswell et al., 2021). Nineteen Australian ecosystems are showing signs of collapse, including Victoria's mountain ash forests, alpine and sub-alpine systems and the kelp forests of the Great Southern Reef (Bergstrom et al., 2021). The World Economic Forum ranks biodiversity loss and ecosystem collapse as the second most severe global risk over the next decade (World Economic Forum, 2026).

Despite this, the economic statistics that guide public and private decisions record the output nature helps produce but not the value of the natural assets themselves or their depreciation (Dasgupta, 2021). The decline of Victoria's natural assets is therefore largely invisible in the information used to set budgets, approve projects and allocate investment.

1.2 Victoria lacks an up-to-date picture of nature's value

Victoria has a record of measuring the economic value of Nature. Valuing Victoria's Parks (Varcoe et al., 2015) applied the United Nations System of Environmental-Economic Accounting to the parks network more than a decade ago. Since then, the Victorian Government has valued ecosystem services from forests in Regional Forest Agreement (RFA) regions (DELWP, 2019), for Greater Melbourne (DEECA, 2023), from the Great Ocean Road coast and parks (DEECA, 2024), while other studies have valued individual systems such as the Yarra River (Natural Capital Economics, 2018). What has been missing is a single, current synthesis of what nature is worth to Victoria as a whole. This current report for TWS begins to fill that gap.

1.3 About this report

TWS commissioned Mosaic Insights and Natural Capital & Climate to establish a clear, credible and policy-relevant account of the value nature contributes to Victoria's economy and society. The work aims to inform investment and protection decisions, provide a current and defensible evidence base, support policy development, build toward a national comparison, and communicate the value of nature to government, the community and the philanthropy sector.

This report has been developed as a rapid and high-level evidence synthesis. We drew on existing datasets and published valuation studies and did not collect primary data. We updated values from earlier studies to March quarter 2026 dollars using the Consumer Price Index, which corrects for changes in price levels but does not update the underlying physical quantities or study scope. The project was delivered in three stages, with input from TWS throughout: inception and scope review; literature review, value updating and synthesis; and reporting.

1.4 How to read this report

Section 2 explains how we assessed the value of nature. Section 3 sets out how much of Victoria's economy depends on nature, and Section 4 sets out what nature is worth to Victorians across six domains. Section 5 draws conclusions, describes the limits of

the evidence and outlines the next stages. Appendices A to D provide the detailed methods, derivations, source values and CPI adjustments.

All dollar values are Australian dollars. Dependency results are in current (nominal) prices for the year shown. Welfare and use values are in March quarter 2026 dollars unless stated otherwise. Each value is labelled with its geographic scope (Victoria-wide, parks network, RFA forests, regional or national) and whether it is an annual flow or an asset (stock) value.

2 How we assessed the value of nature

We used two lenses to answer two different questions about the value of nature in Victoria and for Victorians. The first asks how much of Victoria's economy would be disrupted if the ecosystem services it relies on were degraded. The second asks what nature is worth to Victorians directly.

Dependency describes how much an industry relies on ecosystem services such as water supply, pollination, soil quality and protection from floods and storms. An industry that is highly dependent on nature is exposed to financial and operational risk when those services decline. Value describes what those services are worth to people, measured as the benefits they receive or the costs they avoid.

While this report measures both, it is important to emphasise they are different quantities: a dependency estimate describes the economic activity exposed to nature loss, while a value estimate describes the benefits nature provides. Importantly, the two sets of values cannot be added.

2.1 Approach A: value chain dependency

For Approach A (how much of Victoria's economy would be disrupted) we adapted and then extended the method used by IDEEA Group for the ACF (2022) report, which follows the World Economic Forum (2020), applied it to Victoria and refreshed it with the latest ABS data. Our approach used four steps and used the same outcome measures (GSP and GVA) as the ACF (2022) report for consistency.

Step 1: ENCORE mapping

Each of 26 industry sectors was mapped to the production processes in ENCORE (Natural Capital Finance Alliance and UNEP-WCMC, 2022). ENCORE rates each process's dependence on 21 ecosystem services, such as water flow regulation, soil quality, pollination and climate regulation, on a scale from very low to very high.

Table 1: Two complementary assessment lenses

	Approach A: Value chain dependency	Approach B: Welfare and use value
Policy question	If this ecosystem service degrades, which parts of Victoria's economic value chain face the most disruption?	How do people benefit from nature beyond the economic value chain?
What it measures	The structural exposure of conventional measures of production (GVA) to ecosystem services	Benefits to people, including health, recreation, water, amenity and avoided costs
Unit	Share and dollar value of GVA that depends directly on nature	Dollar value of benefits (welfare, avoided cost, replacement cost), as annual flows or stocks
Method	ENCORE dependency ratings applied to ABS input-output and state accounts data, adapted from ACF and IDEEA Group (2022), with a Victorian local-exposure adjustment	Review of Victorian and Australian valuation studies; values refreshed to 2026 dollars and grouped into six domains
Output	An estimate of how much of Victoria's economy depends on nature	A picture of the value nature provides directly to Victorians
Best suited to	Treasury, economic development, infrastructure and industry audiences	Health, community, planning and philanthropy audiences

Step 2: Assigning a dependency rating

Each sector is assigned the highest dependency rating found across its ecosystem services. A single very high rating places the sector in the very high band, so that material exposures are not hidden by averaging. Each band is given a weight: very high 0.90, high 0.65, moderate 0.40 and lower 0.15.

Step 3: GVA weighting

Each sector's banded GVA is multiplied by the band weight and summed across sectors to give weighted Nature dependent GVA. Sector GVA is taken from ABS Input-Output Tables (2018-19 baseline and 2023-24 update) and State Accounts. Expressed as a share of GSP, this is the weighted dependency score. We note that it would also be possible to estimate dependency based on State-wide GVA (which would adjust for taxes and subsidies) but we did not use this approach in order to align with the ACF (2022) approach.

Step 4: Local exposure adjustment

ENCORE identifies dependence on ecosystem services but does not identify where those services are located. Using ABS input-output coefficients adjusted for Victoria's known trade patterns, our analysis for TWS extends the ENCORE approach to separate dependency on Victorian natural assets from dependency embedded in imported inputs. To our knowledge this is the first time this approach has been developed and applied in Australia.

Appendix A provides the rating scale, sector mapping, data and calculations.

2.2 Approach B: welfare and use value

For Approach B (what nature is worth to Victorians directly) we reviewed published Victorian and Australian valuation studies for method, scope and year, updated their values to 2026 dollars and assigned each to one of six domains. Table 2 summarises the valuation methods these studies use.

2.3 Adjusting values for inflation

As noted above, welfare and use values were adjusted to March quarter 2026 dollars by multiplying the original value by the ratio of the ABS All groups CPI in March 2026 to the CPI in the source year (Appendix B, Table 22). For example, a 2015 value is multiplied by 1.360 and a 2019 value by 1.272.

Approach A compares Victoria's economy in 2018-19 and 2023-24. The ABS reports GSP and sector GVA for each year in current prices, so a change between the two years is a nominal change that includes price inflation. Wherever we compare the two years, we report both the nominal change and the real (inflation-adjusted) change. Real changes express 2018-19 values in 2023-24 dollars using the ratio of financial year average All groups CPI, weighted average of eight capital cities (136.9 in 2023-24 and 114.1 in 2018-19, a factor of 1.200) (ABS, 2026c). Consumer prices rose 20.0% over the period, so most of the nominal growth in Nature dependent output reflects inflation. Deflating by the CPI measures the change in purchasing power. It is not a measure of the change in the volume of production, which would require chain volume measures or the GSP implicit price deflator.

2.4 Avoiding double counting

A credible account of nature's value has to avoid counting the same benefit twice. We sought to count each value once, in the domain that best captures it, by using the rules in Table 3. Summing across all domains without these controls would overstate the value of nature in Victoria.

Two further rules apply throughout our analysis. Firstly, asset (stock) values, such as capitalised property premiums or the value of soil retained, are never added to annual flows. Secondly, values for nested geographic scopes (for example, the parks network within Victoria) are not added to the larger area that contains them.

Table 2: Economic valuation methods used in Approach B

Method	How it works	Used in this report for	Main limitation
Benefit transfer	Applies value estimates from comparable studies to the site in question, adjusted for local population and prices	Pollination, property premiums, heritage values	Uncertainty grows the less the study site resembles the policy site
Avoided cost	Values the costs that nature averts, such as flood damage, treatment costs or healthcare costs	Health, flood mitigation, water purification, stormwater	Requires reliable cost data for the counterfactual
Replacement cost	Values a service at the cost of providing it by engineered means	Water provision, soil erosion prevention	An upper or lower bound depending on whether the replacement would actually be built
Travel cost	Infers recreation value from what visitors spend in money and time to reach a site	Forest and park recreation	Depends on the quality of visitation and trip-origin data
Hedonic pricing	Isolates the amenity premium embedded in property prices after controlling for dwelling characteristics	Green space property premiums	Requires a large, consistent sales dataset
Social cost of carbon	Values carbon sequestered or stored at the estimated damage cost of a tonne of emissions	Carbon sequestration by forests	Sensitive to the carbon price chosen
Market price	Values marketed products at their market price	Timber, firewood, honey	Measures revenue, not always net benefit

Table 3: Rules to avoid double counting between value domains

Potential overlap	Why it arises	Rule applied
Water provisioning	Catchment water provision value overlaps with GVA (water as a production input) and household water supply savings	Report water provision once, in the water domain only
Health and recreation	Park visitation generates both recreation value and avoided health costs, which partly reflect the same visit	Keep recreation value separate from health cost-avoidance estimates; decompose composite values before use
Carbon and flood mitigation	The same vegetation stores carbon and buffers floods; valuing each separately can overstate a single intact ecosystem	Flag co-benefits explicitly; do not add without accounting boundaries
Property premiums and recreation	Green space property premiums already capitalise some recreation value	Use the hedonic premium as a cross-check only
Dependency and welfare values	Approach A measures exposure of market output; Approach B measures benefits to people	Never added Approach A and Approach B results

3 How much of Victoria's economy depends on nature?

We estimate that around $209 billion of Victoria's economic value in 2023-24, equivalent to 34.6% of Gross State Product, depends directly on nature. That dependency was shared across the construction, agriculture, food manufacturing, real estate, water and transport sectors, and most of it relies on natural assets within Victoria.

3.1 More than a third of Victoria's economic value depends directly on nature

Victoria's GSP was $606 billion in 2023-24 (ABS, 2025a). Our analysis applies ENCORE dependency ratings to Victoria's sector mix and gives weighted Nature dependent GVA of $209 billion, equivalent to 34.6% of GSP. In 2018-19 the corresponding figures were $167 billion and 33.5% of a $500 billion economy (Table 4). These dollar values are nominal (current prices). Expressed in 2023-24 dollars, the 2018-19 figures are equivalent to $200 billion of nature dependent GVA in a $600 billion economy.

A second way to describe the same results is the share of output produced in sectors rated as having moderate, high or very high direct dependence. This measure matches the headline measure used by ACF (2022). On this measure, 40.9% of Victoria's modelled sector GVA ($239 billion) was in these sectors in 2023-24, compared with 42.4% in 2018-19. We note that ACF (2022) estimated a comparable 42.9% for Victoria in 2018-19.

The ENCORE ratings reflect how production processes rely on ecosystem services and do not change with commodity prices or seasonal conditions. Changes between years therefore reflect changes in the size and mix of the economy.

Table 4: Victoria's direct dependence on nature, 2018-19 and 2023-24, nominal and real change

Measure	2018-19	2023-24	Nominal change	Real change (2023-24 dollars)
Victorian GSP (current prices)	$500bn	$606bn	+$106bn (+21.2%)	+$6.2bn (+1.0%)
Weighted Nature dependent GVA (current prices)	$167bn	$209bn	+$42bn (+25.1%)	+$8.7bn (+4.3%)
Weighted dependency score (% of GSP)	33.5%	34.6%	+1.1 pp	+1.1 pp
Modelled sector GVA in moderate to very high bands	$192.5bn (42.4%)	$238.6bn (40.9%)	+$46.1bn (+23.9%)	+$7.7bn (+3.3%)
Net local Victorian dependency (% of GSP)	n/a	21.6% (~$131bn)	n/a	n/a

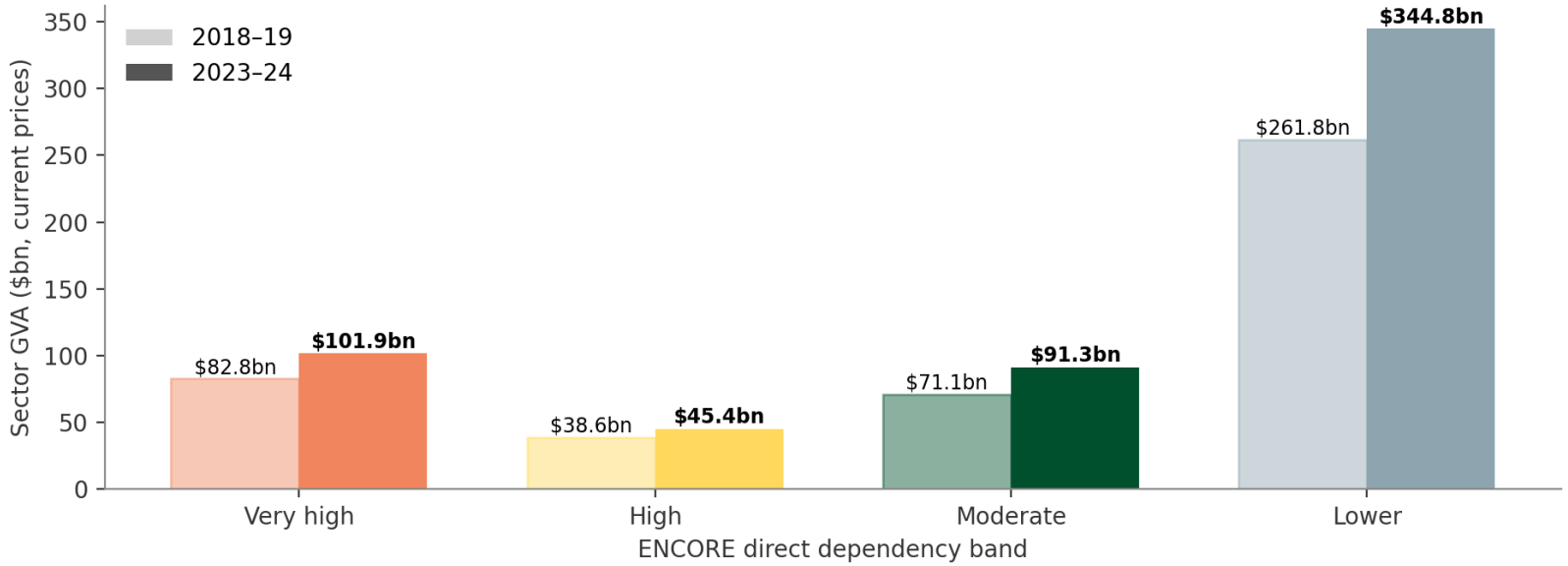
Source: Natural Capital & Climate analysis of ENCORE ratings, ABS Input-Output Tables (cat. 5209.0) and ABS State Accounts (cat. 5220.0). Band shares are of modelled sector GVA ($454.3bn in 2018-19; $583.4bn in 2023-24). Values for each year are in current prices (nominal). Real change expresses 2018-19 values in 2023-24 dollars using the ratio of financial-year average CPI (136.9 / 114.1 = 1.200; ABS, 2026c). pp = percentage points. See Appendix A.

3.2 Exposure is growing in nominal and real terms

Our evaluation shows Victoria's nature dependent output grew by $42 billion (25.1%) in nominal terms between 2018-19 and 2023-24 (Table 4). Consumer prices rose 20.0% over the same period, so most of that increase reflects inflation. In real terms (2023-24 dollars), Nature dependent output grew by $8.7 billion (4.3%), while GSP grew by $6.2 billion (1.0%). Nature dependent output therefore grew slightly faster than the economy as a whole, consistent with the small rise in the dependency share from 33.5% to 34.6%.

In nominal terms, GVA increased in every dependency band (Figure 2). The largest increase in dollar terms was in the 'lower' band (up $83 billion nominal, or $30.8 billion (9.8%) in real terms), driven by health care, financial services, professional services and retail. The 'very high' band grew by $19 billion nominal ($2.6 billion or 2.6% in real terms), mainly through construction, and the 'moderate' band by $20 billion nominal ($6.0 billion or 7.0% in real terms), mainly through real estate and transport. In real terms, GVA in the 'high' band fell by $1.0 billion (2.2%). Sectors in the lower band also depend on nature indirectly through their supply chains.

Figure 2: Victorian sector GVA by direct nature dependency band, 2018-19 and 2023-24 ($bn, nominal)



Source: Natural Capital & Climate analysis of ENCORE ratings and ABS data. Values are sector GVA in each band, before weighting, in current prices (nominal). Real changes are reported in the text.

3.3 Construction, agriculture and food value chains carry the strongest direct exposure

Construction stands out as the largest source of nature dependent output in Victoria, at $54 billion of weighted GVA. ENCORE rates construction ‘very high’ because it depends on stable ground, surface and groundwater, and protection from floods and storms. Construction draws on Victorian quarries and catchments for aggregate and water.

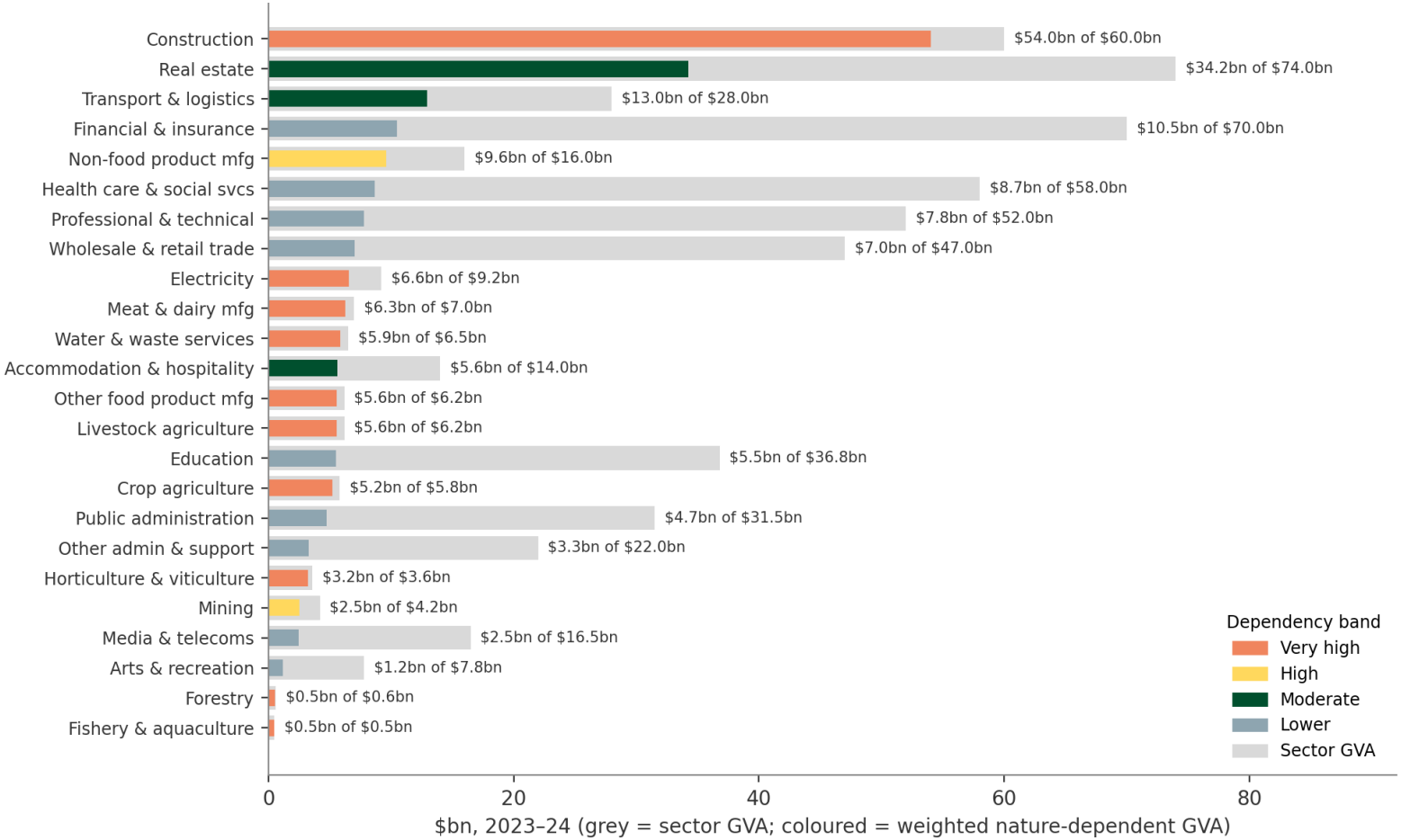
Agriculture (crops, livestock, horticulture, forestry and fisheries, $15 billion weighted) and food manufacturing ($12 billion weighted) follow among ‘very high’ dependency sectors. Together with construction, these value chains account for about 39% of Victoria's weighted nature dependent output.

Real estate ($34 billion weighted) and transport and logistics ($13 billion) are rated ‘moderate’ to ‘high’. Their dependence relates mainly to water, land stability, flood protection and climate regulation, which protect the value and operation of their assets. Sectors rated lower, such as financial services, health care and retail, contribute through the 0.15 band weight (about $52 billion in total). Their larger dependence on nature is indirect through the goods and services they purchase.

3.4 Most of Victoria's dependency rests on Victorian natural assets

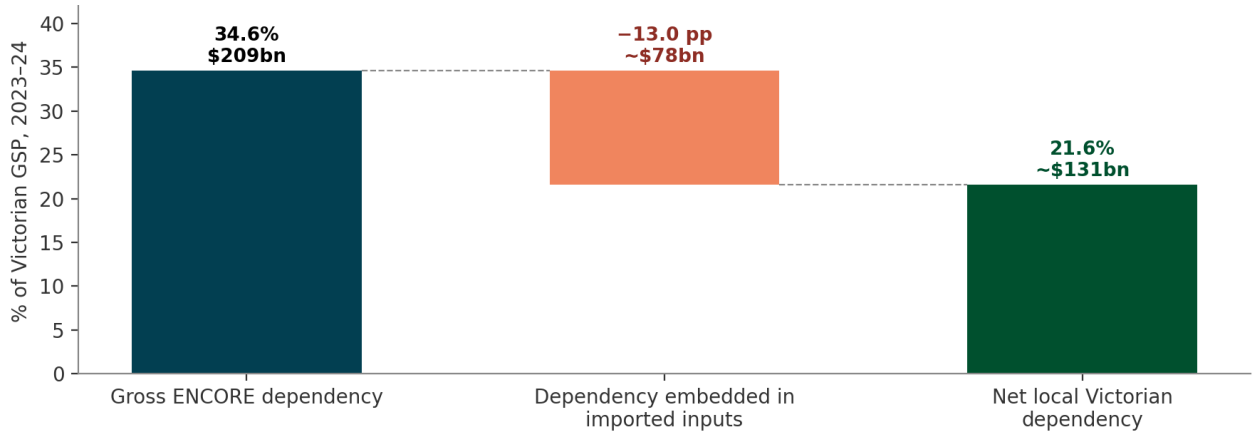
ENCORE ratings describe dependence on ecosystem services and do not identify where those services are located. Steel imported from Port Kembla carries its nature dependency outside Victoria, whereas aggregate quarried in Cardinia Shire carries it inside Victoria. Adjusting for the share of nature-based inputs sourced from outside the state reduces Victoria's dependency from 34.6% to an estimated 21.6% of GSP (Figure 4). About $131 billion of output is therefore tied directly to Victorian natural assets, and about $78 billion (37% of the gross dependency) is embedded in imported inputs. Note that the adjustment uses ABS 2023-24 input-output coefficients adjusted for Victoria's trade patterns and should be treated as an indicative order of magnitude.

Figure 3: Sector GVA and weighted nature dependent GVA, Victoria, 2023-24



Source: Natural Capital & Climate analysis of ENCORE ratings and ABS Input-Output Tables 2023-24 and State Accounts. Colour shows the sector's overall dependency band; mixed sectors are split across bands in the calculation (Appendix A, Table 17).

Figure 4: Gross and net local nature dependency, Victoria, 2023-24 (% of GSP)



Source: Natural Capital & Climate analysis. Import adjustment uses ABS 2023-24 I-O intermediate input coefficients, adjusted for Victoria's known trade patterns. Indicative order of magnitude.

3.5 Local exposure is concentrated in four natural asset systems

Our analysis shows that most of the $131 billion in local nature dependent output is spread across sectors where some substitution is possible. However, for four natural asset systems, the natural asset is either the only viable source of supply at the scale required or would be prohibitively expensive to replace with built infrastructure (Table 6).

3.6 Victoria in the national context

Victoria is less directly dependent on nature than the national economy, because its economy is weighted toward services and its mining sector is small. In 2023-24, 40.9% of Victoria's modelled GVA was in ‘moderate’ to ‘very high’ dependency sectors,

compared with 45.9% nationally on the same method (Figure 6). Victoria has a higher share in the 'very high' band (17.5% compared with 13.2% nationally), reflecting the size of its construction, food manufacturing and agricultural sectors.

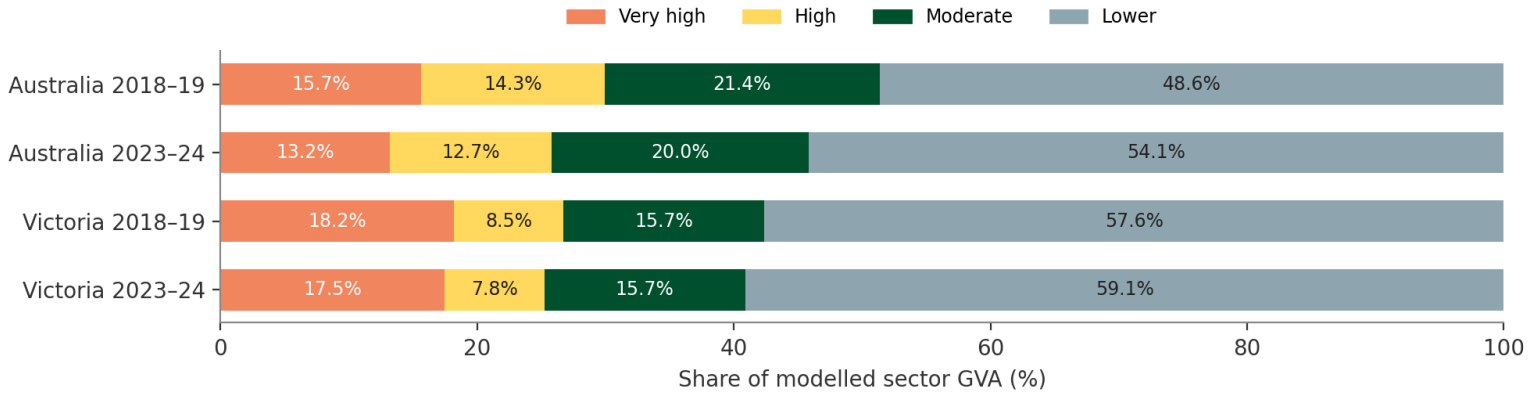
ACF (2022) found Western Australia to be the most nature dependent state economy, with 66.9% of state GVA in 'moderate' to 'very high' dependency sectors in 2018-19, followed by the Northern Territory (55%), Queensland (53.8%) and Tasmania (50.6%).

Table 5: Victorian natural asset systems with concentrated local exposure

Natural asset system	Locations	Sectors supported	Why substitution is limited	Main pressures
Water catchments	Yarra, Thomson and Macalister catchments	Water supply, construction, food processing, households	No infrastructure alternative delivers equivalent volume at comparable cost	Bushfire, reduced inflows, invasive species, disease
Quarries and geology	Cardinia Shire, Macedon Ranges, Great Dividing Range	Construction and infrastructure	Haulage costs make imported aggregate unviable at scale	Land-use conflict, urban encroachment, regulatory access
Agricultural soils and pollinators	Western District, Gippsland, Sunraysia	Agriculture, food manufacturing	No cost-effective engineered substitute at farm scale	Soil acidification and compaction, pollinator habitat loss, feral deer and weeds
Coastal systems	Port Phillip Bay, Gippsland Lakes, Bass Coast	Fisheries, tourism, residential amenity	Long recovery times and limited restoration options	Ocean warming, acidification, sedimentation, coastal development

Nationally, nature has a weighted dependency score of 39.2% in 2018-19 and 36.2% in 2023-24. The fall reflects faster growth in lower dependency service sectors and lower agricultural GVA in 2023-24. It does not indicate any improvement in the condition of nature. Weighted dependent GVA nationally grew from $615 billion to $772 billion over the period in nominal terms (25.4%), or by $34 billion (4.6%) in real terms (2023-24 dollars).

Figure 5: Share of modelled sector GVA by direct dependency band, Australia and Victoria



Source: Natural Capital & Climate reconstruction of the ACF and IDEEA Group (2022) method using ABS Input-Output Tables 2018-19 and 2023-24. National modelled sector GVA: $1,567.7bn (2018-19) and $2,130.9bn (2023-24), current prices.

3.7 Interpreting the dependency results

It is important to recognise that the dependency results describe reliance on nature, and they do not measure the monetary value of ecosystem services. A sector that is 100% dependent would be severely impaired without the relevant services, but the analysis does not estimate how much output would be lost under a given level of degradation.

The results also capture direct dependency only. Sectors with lower direct dependency, such as retail, have substantial indirect dependency on nature through the food, materials and energy they buy. Dependence through cultural, spiritual and aesthetic values is not captured. The analysis uses the 2022 version of ENCORE, which was current when the ACF analysis was prepared.

4 What is nature worth to Victorians?

Nature delivers benefits to Victorians that are largely not traded in markets or fully reflected in input-output relationships: cleaner water, avoided flood damage, better health, productive farms, recreation and liveable neighbourhoods. Across six domains, the current available evidence shows these benefits are worth hundreds of millions to billions of dollars a year.

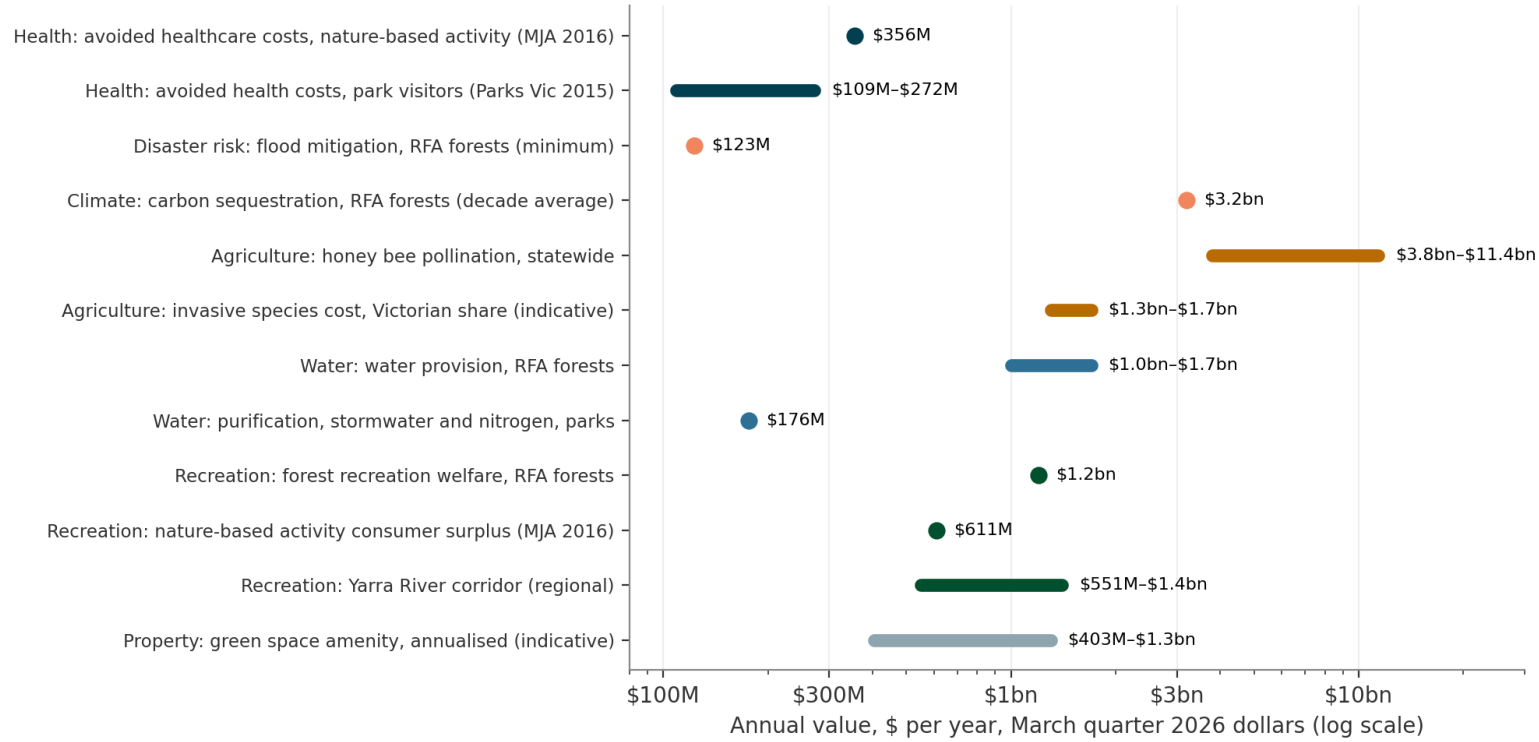
Table 7 and Figure 7 summarise the headline values we drew from for this analysis. Most are annual flows of benefits; some are asset (stock) values. Several are lower-bound estimates because the underlying studies cover only part of Victoria, such as RFA forest regions or the parks network, or use minimum damage estimates. The evidence for each domain is described in the following sections, and the source values, methods and CPI adjustments are set out in Appendix B.

We note that the values in this section should not be added together because there are overlaps in what they include. For example, Melbourne's water supply comes mainly from forest catchments that include the highest-yielding parks, and property premiums near parks capitalise part of their recreation value.

Table 6: Headline welfare and use values by domain (March quarter 2026 dollars)

Domain	Headline value	Type	Scope	Method	Source
Health and wellbeing	$356M+ a year avoided healthcare costs	Annual flow (lower bound)	Victoria, nature-based outdoor activity	Avoided cost	MJA (2016)
Disaster risk reduction	$123M+ a year avoided flood damage	Annual flow (minimum)	Victoria, RFA forests (646 localities)	Counterfactual avoided damage	DELWP (2019)
Climate regulation	$3.2bn a year carbon sequestration (decade average)	Annual flow	Victoria, RFA forests	Social cost of carbon	DELWP (2019)
Agriculture and biosecurity	$3.8-11.4bn a year honey bee pollination	Annual flow	Victoria-wide	Benefit transfer	Karasiński (2018) in DELWP (2019)
Water supply	$1.0-1.7bn a year water provision	Annual flow	Victoria, RFA forests	Replacement cost	DELWP (2019)
Tourism and recreation	$1.2bn a year forest recreation	Annual flow	Victoria, RFA forests	Travel cost	DELWP (2019)
Property and amenity	$6.9-20.7bn green space premium	Stock (annualised $403M-1.3bn a year, indicative)	Victoria, residential stock	Hedonic pricing (benefit transfer)	Evidence base; see Section 4.6

Figure 6: Selected annual welfare and use values of nature in Victoria (March quarter 2026 dollars)



Source: Appendix B and Natural Capital & Climate analysis. Points are single estimates and bars are ranges. Values differ in scope and method and must not be summed. Log scale.

4.1 Health and wellbeing

Victorians who walk, cycle, swim and play in nature are healthier, and the health system spends less as a result.



Parks along the Yarra River support walking, running and rowing within minutes of Melbourne's CBD. Alexandra Gardens. Image: Dominic Kurniawan Suryaputra via Unsplash

Physical activity

Parks, trails, beaches and waterways support walking, cycling, swimming and sport, reducing cardiovascular disease and obesity. Nature-based outdoor activity in Victoria avoids at least $356 million a year in healthcare costs (MJA, 2016), a conservative estimate that is net of injury costs. Across the parks network, avoided health costs for physically active visitors are estimated at $109 million to $272 million a year (Varcoe et al., 2015).

Inactivity costs

Eliminating physical inactivity among Victorian adults would deliver $317 million in lifetime healthcare savings and $4.0 billion in lifetime workplace productivity benefits (MJA, 2018). These lifetime values indicate the cost of inactivity and are not annual nature values.

Mental health, heat and cooling

Green space exposure is associated with reduced stress, anxiety and depression, and urban tree canopy reduces heat island effects and heat-related presentations. Valuing Victoria's Parks reported a combined health and recreation value of $2.6 billion a year across the parks network; this composite must be decomposed before it is used alongside separate health or recreation estimates.

Table 7: Key values: health and wellbeing

Value (2026 dollars)	Description	Scope	Source
$356M+ a year	Net avoided healthcare costs from nature-based outdoor physical activity (lower bound)	Victoria	MJA (2016)
$109-272M a year	Avoided health costs for physically active park visitors	Parks network	Varcoe et al. (2015)
$317M lifetime; $4.0bn lifetime	Healthcare savings and workplace productivity benefits from eliminating physical inactivity	Victoria, all adults	MJA (2018)
$2.6bn a year (composite)	Combined recreation enjoyment and physical health value of parks; decompose before use	Parks network	Varcoe et al. (2015)

4.2 Disaster risk reduction and climate regulation

Forests, wetlands and floodplains protect Victorian communities from floods and erosion, and store carbon at a scale that matters for the climate.



Flood buffering

Forests in Victoria's RFA regions regulate the flow of water and provide flood mitigation benefits to 646 localities. Avoided damage to property and infrastructure is estimated to be at least $123 million a year, which is a minimum based on hydrological modelling of a forest-loss counterfactual and minimum damage values (DELWP, 2019).

Erosion control

In 2018, forests in RFA regions prevented 382 million tonnes of soil from eroding into major waterways. On a replacement cost basis this service is valued at $3.9 billion to $10.2 billion; this is a stock-type value and is not added to annual flows (DELWP, 2019).

Forested catchments such as the Otways slow floodwaters and hold soil in place. Gellibrand River at Dandos Campground.

Carbon and climate

Victoria's RFA forests sequestered 41 million tonnes of CO_2-e in 2017. Valued at the social cost of carbon, sequestration averaged about $3.2 billion a year over the previous decade (DELWP, 2019). Nationally, wetlands, forests and urban green space help to reduce the effects of extreme weather. This benefit is worth an estimated $28.8 billion to $41.1 billion a year (Thompson et al., 2025).

Table 8: Key values: disaster risk reduction and climate regulation

Value (2026 dollars)	Description	Scope	Source
$123M+ a year	Flood mitigation: avoided damage to 646 localities (minimum)	RFA forests	DELWP (2019)
$3.9-10.2bn (stock)	Soil erosion prevention: 382 Mt of soil retained in 2018	RFA forests	DELWP (2019)
$3.2bn a year	Carbon sequestration, decade average (single-year 2017 estimate $3.8bn; use one or the other)	RFA forests	DELWP (2019)
$726K (single event)	Dredging of the Barwon River rowing course in 2017 due to reed encroachment and reduced flows; illustrative cost of degraded flows	Barwon River, Geelong	RMCG (2021)
$28.8-41.1bn a year	Extreme weather moderation by wetlands, forests and urban green space (national)	Australia	Thompson et al. (2025)

4.3 Agriculture and biosecurity

Victoria's farms rely on healthy soils, reliable water and pollinators. Invasive species are eroding that base.



Productive farmland depends on soil health and natural pest control that have no cost-effective engineered substitute.

Pollination

Honey bee pollination, by managed and wild honey bees, is estimated to contribute $3.8 billion to $11.4 billion a year to Victorian agricultural production (Karasiński, 2018, as reported in DELWP, 2019). Valuing Victoria's Parks estimated that the parks network supports $167 million to $227 million a year in consumer and producer surplus from pollination of 30 crop types (Varcoe et al., 2015); this is a subset of the statewide value.

Soil health

Healthy native vegetation retains soils and sustains productivity. The soil retained by RFA forests (Section 4.2) protects waterways and downstream users; degraded soils impose long-run costs across dryland and irrigated farming systems.

Invasive species and biosecurity

Invasive species cost Australian agriculture an estimated $6.6 billion a year, of which weeds account for $5.3 billion and vertebrate pests $1.3 billion (Bradshaw et al., 2021). Victoria's share is approximately $1.3 billion to $1.7 billion a year. Feral deer cause a further $53 million to $106 million or more a year in damage in Victoria (indicative).

Table 9: Key values: agriculture and biosecurity

Value (2026 dollars)	Description	Scope	Source
$3.8-11.4bn a year	Economic value of honey bee pollination to Victorian agriculture	Victoria	Karasiński (2018) in DELWP (2019)
$167-227M a year	Consumer and producer surplus from pollination attributable to parks (subset of statewide value)	Parks network	Varcoe et al. (2015)
$1.0-1.3M a year	Forest pollination contribution to the apiary industry	RFA forests	DELWP (2019)
$6.6bn a year	Cost of invasive species to Australian agriculture (Victorian share ~$1.3-1.7bn)	Australia	Bradshaw et al. (2021)
$53-106M+ a year	Feral deer damage (indicative)	Victoria	DELWP (2019)

4.4 Water supply

Victoria's forested catchments are water supply infrastructure that no engineered system could replace at comparable cost.



Water provision

Forested catchments in Victoria's RFA regions supplied 6,432 gigalitres of water in 2018. Valued at a replacement cost of $0.12 to $0.20 per kilolitre, this service is worth $1.0 billion to $1.7 billion a year (DELWP, 2019). Using desalination as the replacement benchmark would imply materially higher values. The Yarra catchment alone provides $21 million to $35 million a year in water provision value (Natural Capital Economics, 2018).

Water purification

Non-metropolitan parks retain 4,165 tonnes of sediment a year, avoiding water treatment costs of $68 million a year (Varcoe et al., 2015).

Protected catchments supply about 70% of Melbourne's drinking water.

Stormwater and nutrients

Metropolitan parks provide $63 million a year in avoided stormwater infrastructure costs and $45 million a year in avoided nitrogen removal costs (182,000 kg of nitrogen a year). Together with purification, these parks services total about $176 million a year (Varcoe et al., 2015).

Table 10: Key values: water supply

Value (2026 dollars)	Description	Scope	Source
$1.0-1.7bn a year	Water provision from RFA forest catchments: 6,432 GL at $0.12-0.20/kL	RFA forests	DELWP (2019)
$332M a year	Water supply from Victoria's nine highest-yielding parks (overlaps with RFA forests value)	Nine parks	Varcoe et al. (2015)
$68M a year	Water purification: 4,165 t of sediment retained	Non-metropolitan parks	Varcoe et al. (2015)
$63M a year	Avoided stormwater infrastructure costs	Metropolitan parks	Varcoe et al. (2015)
$45M a year	Avoided nitrogen removal: 182,000 kg a year	Metropolitan parks	Varcoe et al. (2015)
$21-35M a year	Water provision value of the Yarra catchment	Yarra catchment	Natural Capital Economics (2018)

4.5 Tourism and recreation

Victorians and visitors make tens of millions of trips to the state's forests, parks, rivers and coasts each year, and value those experiences highly.



Victoria's forests receive about 34 million visits a year.

Forest recreation

About 34 million visits a year to state forests and parks in RFA regions generate $1.2 billion a year in recreation welfare value, estimated with the travel cost method (DELWP, 2019). This consumer surplus is separate from recreation spending, which measures economic activity.

Nature-based outdoor activity

Nature-based outdoor activity generates $611 million a year in consumer surplus, at about $50 per activity day (MJA, 2016). This partly overlaps the forest recreation value and the two should not be added.

Rivers, coasts and regions

The Yarra River corridor provides an estimated $943 million a year in benefits (range $551 million to $1.4 billion), led by recreation and aesthetic values (Natural Capital Economics, 2018). On the Great Ocean Road, 3.9 million tourism visits a year attributable to the region's ecosystems are valued at $520 million a year (DEECA, 2024).

Table 11: Key values: tourism and recreation

Value (2026 dollars)	Description	Scope	Source
$1.2bn a year	Recreation and tourism welfare value: 34 million visits a year (travel cost)	RFA forests	DELWP (2019)
$611M a year	Consumer surplus from nature-based outdoor activity (~$50 per day)	Victoria	MJA (2016)
$943M a year ($551M-1.4bn)	Benefits of the Yarra River corridor, including recreation, aesthetics and water provision	Yarra corridor	Natural Capital Economics (2018)
$520M a year (2024 dollars)	Travel cost value of 3.9 million ecosystem-attributable tourism visits	Great Ocean Road coast and parks	DEECA (2024)
$104M a year	Timber and firewood provisioning value	RFA forests	DELWP (2019)

4.6 Property and amenity

Homebuyers pay more to live near parks and green space, and that premium is a measure of the way nature adds to Victoria's liveability.



Property premiums

Studies in Australia find that proximity to green space adds 3% to 10% to residential property values. Applied to Victoria's residential stock (about $2.5 trillion), this implies $6.9 billion to $20.7 billion in capitalised amenity value, or an indicative $403 million to $1.3 billion a year at a 5% to 6% yield.

Melbourne parks

The underlying Melbourne study reported premiums of 4% to 10% within 400 metres of major parks, declining to about 2% at 800 metres, and an aggregate amenity value of $10.2 billion to $17.8 billion for Melbourne's parks system. This is a subset of the statewide figure and is not additive to it.

Melbourne's historic gardens add to the value of nearby homes and to the city's liveability.

Heritage and cultural value

Park heritage assets, including cultural sites, historic landscapes and Aboriginal heritage, have a willingness-to-pay value of $8.2 million to $31 million a year (Varcoe et al., 2015). We note that this is a lower-bound non-use value and a primary Victorian stated preference survey would strengthen the estimates.

Table 12: Key values: property and amenity

Value (2026 dollars)	Description	Scope	Source
$6.9-20.7bn (stock)	Green space property premium: 3-15% applied to Victorian residential stock	Victoria	DEECA (2023)
$403M-1.3bn a year	Annualised amenity flow at a 5-6% yield (indicative)	Victoria	Derived
$10.2-17.8bn (stock)	Aggregate amenity value of Melbourne's parks system	Melbourne	DEECA (2023)
$8.2-31M a year	Willingness to pay for park heritage conservation	Parks network	Varcoe et al. (2015)

5 Conclusion

Victoria's economy and communities depend on the condition of the state's natural assets. That dependency is large, it is growing in both nominal and real (inflation-adjusted) terms, and most of it relies on ecosystems located within Victoria.

5.1 Nature supports the economy and creates public value for Victorians

The evidence in this report highlights what Victorians know intuitively. Nature underpins production across the Victorian economy, avoids costs that would otherwise fall on households, businesses and government, and creates public value through recreation, amenity, cultural connection and wellbeing. Table 14 summarises this.

Table 13: Nature supports the economy and creates public value for Victorians in three main areas

Underpins production	Avoids costs	Creates public value
Nature provides essential inputs to agriculture, construction, food production, water supply, tourism and regional industries, including water, soils, pollination, quarry materials, forests, rivers and coastal systems. In 2023-24, about $209 billion of Victoria's output depends directly on these inputs, $131 billion of it on Victorian natural assets.	Nature reduces costs that would otherwise fall on households, businesses and government, including water treatment, flood damage, heat-related health impacts, soil loss and disaster recovery. Forested catchments alone provide water worth $1.0 billion to $1.7 billion a year. In addition to avoiding costs today, nature also reduces potential future liabilities.	Nature creates value for households and communities by supporting recreation, tourism, amenity, cultural connection, wellbeing and the liveability of Victorian places, including $1.2 billion a year in forest recreation value. In short, nature improves everyday quality of life.

5.2 Limitations of the Stage 1 evidence base

This report rapidly draws together the best available Victorian and Australian evidence to demonstrate the value of Victoria's nature and its services.

Gaps in the evidence remain, and we understand the later stages of TWS' research program are designed to address them. As noted earlier in this report, while the gaps affect the precision of individual estimates, the overall finding that Victoria's prosperity depends on the condition of its natural assets holds across the two lenses and multiple domains we examined.

The main limitations of this report are:

- Value transfer from existing studies only. Welfare values come from studies of different ages (2015 to 2025) and use different methods and scopes. CPI adjustment updates price levels but not physical quantities, visitation or study coverage.
- Partial geographic coverage. Many values cover RFA forest regions or the parks network only, so statewide values are likely to be higher.
- Overlaps. Values cannot yet be combined into a single defensible total without a scope reconciliation across studies.
- Scope of the dependency measure. The dependency analysis measures the exposure of output. It does not estimate the monetary value of ecosystem services or the losses under a given level of degradation.
- Indicative local adjustment. Victoria-specific inter-regional input-output tables are not published by the ABS. As a result, the local dependency adjustment relies on national coefficients adjusted for Victoria's trade patterns.
- Non-use values. Existence and bequest values are represented only by a lower-bound heritage estimate.

5.3 Looking ahead

Victoria's economy is already exposed to the condition of its natural assets, and that exposure grows with the economy. The evidence in this report shows that protecting and restoring catchments, soils, forests, quarry lands and coastal systems is a matter of economic as well as environmental importance.

The next stages of this program can improve the estimates, fill the gaps in geographic coverage and place Victoria alongside the other states and territories. The task for decision-makers is to bring what is already known about nature's value into the budget, planning and investment decisions that determine its condition.

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Appendix A Value chain dependency: method and derivations

A.1 Overview

This appendix documents Approach A. The method replicates the ACF Nature Dependency Report 2022 (IDEEA Group) for 2018-19, then extends it to 2023-24 using updated GVA weights from ABS national and state accounts. The ENCORE dependency ratings are held constant between periods, because the structural relationship between production processes and ecosystem services does not change from year to year. What changes is the GVA weight of each sector.

A.2 Data sources

The data sources are listed in Table 15. The latest available ABS input-output tables are for 2023-24, released on 25 March 2026. ABS Australian Industry 2024-25 includes revised 2023-24 figures used as a cross-check.

Table 14: Data sources for the dependency analysis

Source	Role in the analysis
ACF and IDEEA Group (2022)	Baseline method, 26-sector classification and 2018-19 sector dependency splits
NCFA and UNEP-WCMC, ENCORE (2022 version)	Materiality ratings of production processes against 21 ecosystem services
ABS Input-Output Tables 2018-19 (cat. 5209.0)	2018-19 GVA by input-output industry group, aggregated to 26 sectors
ABS Input-Output Tables 2023-24 (cat. 5209.0)	2023-24 sector GVA splits; intermediate input coefficients for the local adjustment
ABS Australian Industry 2024-25 (cat. 8155.0)	Industry value added cross-checks; revised 2023-24 figures
ABS State Accounts 2024-25 (cat. 5220.0)	Victorian GSP and industry GVA, 2018-19 and 2023-24

A.3 Step 1: ENCORE production process mapping

Each of the 26 report sectors was mapped to one or more of ENCORE's 92 production processes (2022 version). ENCORE provides materiality ratings of very high, high, medium, low or very low across 21 ecosystem services. Where a sector maps to several processes, ratings were combined with equal weight. The 2024 ENCORE update, which expands coverage to 271 economic activities, was not applied, so that results remain comparable with ACF (2022).

A.4 Step 2: Ceiling aggregation and dependency bands

A sector's dependency band is set by the highest materiality rating across its ecosystem services. If any single service rates very high, the sector rates very high overall, reflecting that disruption of a single critical service can materially impair production regardless of lower ratings elsewhere.

Sectors with internal heterogeneity, such as electricity and non-food manufacturing, are split across bands. The 2018-19 splits were back-solved from the ACF report's stated aggregate totals, explicit percentages in the report text and ABS sub-industry GVA. The same splits are applied in 2023-24.

A.5 Step 3: GVA weighting and calculation

Weighted Nature dependent GVA (D) is calculated for each year as:

$$D = \Sigma_s \; GVA_s \times \Sigma_b \left(share_{s,b} \times w_b \right)$$

where GVA_s is the GVA of sector s, $share_{s,b}$ is the share of that sector's GVA in band b, and w_b is the band weight (Table 16). The weighted dependency score is D divided by GSP.

Worked examples for 2023-24: construction, 100% very high, contributes $60.0bn × 0.90 = $54.0bn. Real estate, 25% high and 75% moderate, contributes $74.0bn × (0.25 × 0.65 + 0.75 × 0.40) = $34.2bn. Financial and insurance services, 100% lower, contributes $70.0bn × 0.15 = $10.5bn.

Table 15: ENCORE rating scale, band weights and example sectors

ENCORE rating	Band weight	Report band	Interpretation	Example sectors
Very high	0.90	Very high	Production impossible or severely impaired without this service	Agriculture, forestry, fisheries, construction, water and waste, food manufacturing
High	0.65	High	Production materially affected if the service is disrupted	Metal ore mining, electricity (75%), non-food manufacturing (60%)
Medium	0.40	Moderate	Operational challenges, but production can adapt	Real estate (75%), transport (75%), accommodation, oil and gas
Low or very low	0.15	Lower	Marginal direct dependency; indirect dependency via supply chains	Financial services, retail, education, public administration

Summed over the 24 Victorian sectors, D is $209.4bn in 2023-24 and $167.3bn in 2018-19 in current prices, a nominal increase of $42.1bn. Expressed in 2023-24 dollars (CPI factor 1.200, Section 2.3), the 2018-19 value is $200.7bn, so the real increase is $8.7bn (4.3%). Of the 2023-24 total, $51.7bn (24.7%) comes from the lower band through its 0.15 weight; excluding the lower band, D would be $157.7bn.

Dividing D by GSP ($606bn in 2023-24; $500bn in 2018-19) gives scores of 34.6% and 33.5%. Modelled sector GVA ($583.4bn and $454.3bn) is lower than GSP because not all components of GSP are allocated to the modelled sectors; as a share of modelled sector GVA, D is 35.9% in 2023-24 and 36.8% in 2018-19.

Table 16: Victorian sector GVA, dependency bands and weighted Nature dependent GVA (current prices)

Sector	GVA 2018-19 ($bn)	GVA 2023-24 ($bn)	Band split	Effective weight	Weighted 2018-19 ($bn)	Weighted 2023-24 ($bn)
Construction	48.0	60.0	VH 100%	0.900	43.2	54.0
Real estate	58.0	74.0	H 25% / M 75%	0.463	26.8	34.2
Transport & logistics	22.0	28.0	H 25% / M 75%	0.463	10.2	13.0
Financial & insurance	55.0	70.0	L 100%	0.150	8.2	10.5
Non-food product mfg	14.0	16.0	VH 20% / H 60% / L 20%	0.600	8.4	9.6
Health care & social svcs	40.0	58.0	L 100%	0.150	6.0	8.7
Professional & technical	38.0	52.0	L 100%	0.150	5.7	7.8
Wholesale & retail trade	38.0	47.0	L 100%	0.150	5.7	7.0
Electricity	7.8	9.2	VH 25% / H 75%	0.713	5.6	6.6
Meat & dairy mfg	5.8	7.0	VH 100%	0.900	5.2	6.3
Water & waste services	5.2	6.5	VH 100%	0.900	4.7	5.9
Accommodation & hospitality	10.0	14.0	M 100%	0.400	4.0	5.6
Livestock agriculture	5.5	6.2	VH 100%	0.900	5.0	5.6
Other food product mfg	5.2	6.2	VH 100%	0.900	4.7	5.6
Education	28.0	36.8	L 100%	0.150	4.2	5.5

Sector	GVA 2018-19 ($bn)	GVA 2023-24 ($bn)	Band split	Effective weight	Weighted 2018-19 ($bn)	Weighted 2023-24 ($bn)
Crop agriculture	4.2	5.8	VH 100%	0.900	3.8	5.2
Public administration	24.0	31.5	L 100%	0.150	3.6	4.7
Other admin & support	18.0	22.0	L 100%	0.150	2.7	3.3
Horticulture & viticulture	3.2	3.6	VH 100%	0.900	2.9	3.2
Mining	5.5	4.2	H 80% / M 20%	0.600	3.3	2.5
Media & telecoms	12.5	16.5	L 100%	0.150	1.9	2.5
Arts & recreation	5.5	7.8	L 100%	0.150	0.8	1.2
Forestry	0.5	0.6	VH 100%	0.900	0.5	0.5
Fishery & aquaculture	0.4	0.5	VH 100%	0.900	0.4	0.5
Total (modelled sectors)	454.3	583.4			167.3	209.5

Source: Mosaic Insights and Natural Capital Economics analysis. VH = very high, H = high, M = moderate, L = lower. Effective weight = Σ share × band weight. 2023-24 sector GVA from ABS Australian Industry and State Accounts.

Table 17: Victorian modelled sector GVA by dependency band (current prices)

Band	2018-19 GVA ($bn)	Share	2023-24 GVA ($bn)	Share	Weighted 2023-24 ($bn)
Very high	82.8	18.2%	101.9	17.5%	91.7
High	38.7	8.5%	45.4	7.8%	29.5
Moderate	71.1	15.7%	91.3	15.7%	36.5
Lower	261.8	57.6%	344.8	59.1%	51.7
Total modelled	454.3	100%	583.4	100%	209.4
GSP (ABS State Accounts)	500		606		34.6% of GSP

A.6 Step 4: Local Victorian dependency adjustment extension

Standard ENCORE ratings capture structural dependency on ecosystem services but not where the services are drawn from. The adjustment estimates a net local Victorian dependency as:

Net local rate = gross ENCORE rate × (1 − share of nature-based intermediate inputs sourced from outside Victoria)

Import shares were estimated from ABS 2023-24 input-output intermediate input coefficients, cross-referenced with ABS trade statistics. Because the ABS does not publish Victoria-specific inter-regional input-output tables, national coefficients were adjusted for Victoria's known trade patterns. The results should be treated as indicative orders of magnitude.

At the economy-wide level, the adjustment reduces the dependency score by 13.0 percentage points, from 34.6% ($209bn) to 21.6% (about $131bn). Based on this approach, this means about 37% of Victoria's apparent nature dependency is therefore carried by inputs produced outside the state.

Table 19 shows the indicative sector rates. Agriculture, water and food manufacturing are almost entirely locally dependent; construction is the sector most affected by the adjustment, because steel and cement clinker are largely imported while aggregate, sand and water are local. The sector rates are illustrative and do not by themselves reproduce the 21.6% headline.

Table 18: Indicative gross and net local dependency rates by sector, Victoria, 2023-24

Sector	GVA ($bn)	Gross rate	Net local rate	Sector	GVA ($bn)	Gross rate	Net local rate
Forestry	0.6	100%	95%	Electricity (incl. renewables)	9.2	81%	72%
Crop agriculture	5.8	100%	97%	Mining (Victoria)	4.2	76%	65%
Livestock agriculture	6.2	100%	95%	Real estate	74.0	25%	22%
Horticulture and viticulture	3.6	100%	94%	Transport and logistics	28.0	25%	18%
Fishery and aquaculture	0.5	100%	96%	Accommodation and hospitality	14.0	40%	35%
Meat and dairy manufacturing	7.0	100%	88%	Financial and insurance	70.0	0%	0%
Other food product manufacturing	6.2	100%	82%	Wholesale and retail trade	47.0	0%	0%
Water and waste services	6.5	100%	98%	Professional and technical	52.0	0%	0%

Sector	GVA ($bn)	Gross rate	Net local rate	Sector	GVA ($bn)	Gross rate	Net local rate
Construction	60.0	100%	42%	Health and social services	58.0	0%	0%
Non-food product manufacturing	16.0	58%	28%	Public administration; education	68.3	0%	0%

Source: Natural Capital & Climate analysis. Gross rate here is the share of sector GVA in moderate to very high bands.

Table 19: Construction: local and imported nature-based inputs (indicative)

Input	Share of inputs	Victorian share	Notes
Sand and gravel	18%	95%	About 73.6 Mt a year extracted in Victoria; haulage distances mean virtually all is locally sourced
Hard rock and crushed aggregate	14%	90%	Basalt from the Western District, granite from the Central Highlands; quarry hydrology depends on Victorian groundwater and catchments
Timber and engineered wood	8%	55%	Softwood from Victorian plantations; hardwood increasingly interstate or imported after 2024
Steel and reinforcement	22%	8%	Port Kembla (NSW), Whyalla (SA) and imports
Cement and concrete products	12%	35%	Clinker largely from SA, QLD and overseas; Victorian aggregate in batching
Labour, machinery and services	26%	0%	No direct ecosystem dependency

A.7 Limitations

The following limitations apply:

- ENCORE ratings are global and process-based and they were adjusted only lightly for Australian conditions.
- Ceiling aggregation is conservative in the sense of not hiding material exposures, but it rates a whole sector by its most dependent process.
- The band weights (0.90, 0.65, 0.40, 0.15) are a convention adopted in the ENCORE framework. Results are sensitive to the weight assigned to the lower band.
- Victorian sector GVA for 2023-24 combines ABS Australian Industry and State Accounts data, some sectors such as agriculture demonstrate volatility from year to year.

Appendix B Welfare and use value: evidence and derivations

B.1 CPI adjustment

Values used in value transfer were adjusted to March quarter 2026 dollars using the ABS All groups CPI. The adjustment factor is the March 2026 index (101.700) divided by the index for the source year (Table 22). We note CPI adjustment is a price-level correction only. It does not resolve differences in geographic scope, stock and flow treatment, method, or changes in underlying preferences and values for environmental goods and services. Index values for 2017, 2024 and 2025 are derived from the factors applied in the evidence base.

The following sections set out, for each domain, the source values and adjusted values, the scope of each estimate, how it was calculated, and the aggregation caveats that apply.

Table 20: CPI adjustment factors to March quarter 2026

Source year	CPI index	Factor to March 2026	Uplift
2015	74.775	1.360	+36.0%
2016	75.733	1.343	+34.3%
2017	77.05 (derived)	1.320	+32.0%
2018	78.693	1.292	+29.2%
2019	79.945	1.272	+27.2%
2021	82.935	1.226	+22.6%
2022	88.423	1.150	+15.0%
2024	96.31 (derived)	1.056	+5.6%
2025	99.03 (derived)	1.027	+2.7%
March quarter 2026	101.700	1.000	-

B.2 Health and wellbeing

Table 21: Evidence and derivations: health and wellbeing

2026 value	Original value	Scope	Description	Method and source	Aggregation caveat
$356M+ a year	$265M+ (2016$)	Victoria	Net avoided healthcare costs from nature-based outdoor physical activity	Avoided cost; MJA (2016); ×1.343	Lower bound
$109-272M a year	$80-200M (2015$)	Parks network	Avoided health costs for physically active park visitors	Avoided cost; Varcoe et al. (2015); ×1.360	Partial overlap with MJA (2016)
$317M lifetime	$245M (2018$)	Victoria	Healthcare savings from eliminating physical inactivity among adults	Population attributable fraction; MJA (2018); ×1.292	Lifetime value, not addable to annual values
$4.0bn lifetime	$3.1bn (2018$)	Victoria	Workplace productivity benefit from avoided death and disability	Production losses; MJA (2018); ×1.292	Lifetime resource-cost value; not an annual flow
$162M lifetime	$125M (2018$)	Victoria	Home-based production benefits	Production losses; MJA (2018); ×1.292	Cannot be added with healthcare savings
$2.6bn a year	$1.9bn (2015$)	Parks network	Combined recreation enjoyment and physical health value	Benefit transfer (composite); Varcoe et al. (2015); ×1.360	Composite value. Decompose before use with separate health or recreation rows

MJA (2016): net avoided healthcare costs

Physical quantity: estimated participation in nature-based outdoor activities by type (walking, running, cycling, horse riding, surf sports, triathlons, snow sports). Unit value: Department of Transport (2012) health values per hour of activity at low and high intensity. Gross health benefit was calculated by activity and netted of injury costs. The study notes the result is conservative.

MJA (2018): healthcare savings and productivity

Physical quantity: Victorian adults not meeting physical activity guidelines. A population attributable fraction approach estimated deaths, disability-adjusted life years, hospital admissions and GP visits attributable to inactivity. Unit values: AIHW disease costs for healthcare savings and a human capital approach for productivity losses (Deakin Health Economics modelling).

Varcoe et al. (2015): avoided health cost and composite value

Avoided health cost: visitor survey data on physically active park visitors, matched to physical activity guidelines, with avoided treatment costs from Victorian health cost data. Composite value: adds recreation enjoyment (travel cost and willingness to pay) to the physical health benefit; the components are not separately reported consistently.

B.3 Disaster risk reduction and climate regulation

Table 22: Evidence and derivations: disaster risk reduction and climate regulation

2026 value	Original value	Scope	Description	Method and source	Aggregation caveat
$123M+ a year	$97M+ (2019$)	RFA forests	Flood mitigation: avoided damage to 646 localities	Counterfactual avoided damage; DELWP (2019); ×1.272	Minimum estimate using minimum damage values
$3.9-10.2bn	$3.1-8bn (2019$)	RFA forests	Soil erosion prevention: 382 Mt retained in 2018	Replacement cost (sediment removal); DELWP (2019); ×1.272	Stock-type value. Do not add to annual flows
$3.8bn (2017)	$3bn (2019$)	RFA forests	Carbon sequestration: 41 Mt CO_2-e in 2017	Social cost of carbon; DELWP (2019); ×1.272	Single year; overlaps decade average. See carbon price note
$3.2bn a year	$2.5bn (2019$)	RFA forests	Carbon sequestration, decade average	Social cost of carbon; DELWP (2019); ×1.272	Use either this or the single-year row
$726K (single event)	$550K (2017$)	Barwon River	Dredging of the rowing course in 2017 due to reed encroachment and reduced flows	Observed cost; RMCG (2021); ×1.320	Illustrative. Not scalable or annual

2026 value	Original value	Scope	Description	Method and source	Aggregation caveat
$28.8-41.1bn a year	$28-40bn (2025$)	Australia	Extreme weather moderation by wetlands, forests and urban green space	Replacement or avoided cost; Thompson et al. (2025); ×1.027	National value. Not a Victorian figure

DELWP (2019): flood, erosion and carbon

Flood mitigation: hydrological modelling of flood events across 646 localities served by RFA forests, with forest cover as the counterfactual variable and minimum property and infrastructure damage avoided per locality. Erosion: 382 million tonnes of sediment retention modelled for RFA regions, valued at sediment removal cost. Carbon: 41 Mt CO_2-e sequestered in 2017 from public forest inventory, valued at a social cost of carbon. DEECA (2024) applied $73/t CO_2-e, equivalent to about $77/t in 2026 dollars; at that price the 2017 sequestration would be worth about $3.2bn.

RMCG (2021): Barwon River

Observed expenditure on dredging the Barwon River rowing course in 2017 because of reed encroachment and reduced flows. The study also documents blue-green algae closures in 2012, 2013, 2016 and 2020. This is a direct observed cost, not a welfare value.

B.4 Agriculture and biosecurity

Table 23: Evidence and derivations: agriculture and biosecurity

2026 value	Original value	Scope	Description	Method and source	Aggregation caveat
$3.8-11.4bn a year	$3-9bn (2019$)	Victoria	Value of honey bee pollination to Victorian agricultural production	Benefit transfer; Karasiński (2018) in DELWP (2019); ×1.272	Statewide headline; parks and RFA rows are subsets
$167-227M a year	$123-167M (2015$)	Parks network	Consumer and producer surplus from pollination of 30 crops attributable to parks	Consumer and producer surplus; Varcoe et al. (2015); ×1.360	Subset of statewide value
$1.0-1.3M a year	$0.8-1.0M (2019$)	RFA forests	Forest pollination contribution to the apiary industry	Replacement cost; DELWP (2019); ×1.272	Do not add to parks apiary row
$816K-1.4M a year	$0.6-1M (2015$)	Parks network	Direct honey producer benefit from parks	Market value; Varcoe et al. (2015); ×1.360	Overlap with RFA row
$6.6bn a year	$5.4bn (2021$)	Australia	Cost of invasive species to Australian agriculture	InvaCost; Bradshaw et al. (2021); ×1.226	National. Victorian share ~20-25% (assumption)
$5.3bn a year	$4.3bn (2021$)	Australia	Cost of weeds to agriculture	InvaCost; Bradshaw et al. (2021); ×1.226	Component of total
$1.3bn+ a year	$1.1bn+ (2021$)	Australia	Cost of vertebrate pests to agriculture	InvaCost; Bradshaw et al. (2021); ×1.226	Component of total

2026 value	Original value	Scope	Description	Method and source	Aggregation caveat
$53-106M+ a year	$50-100M+ (2024$)	Victoria (indicative)	Feral deer damage to fencing, pasture, alpine vegetation and forestry	Damage estimation; source to be confirmed; ×1.056	Indicative. Not a standalone headline

Karasiński (2018) via DELWP (2019)

Economic welfare model of the contribution of managed and wild honey bee pollination to pollination-dependent crops, using yield uplift and market prices. DELWP (2019) reports the Victorian value. The statewide estimate is the most appropriate headline for this domain.

Varcoe et al. (2015): parks pollination

Partial equilibrium model of 30 pollination-dependent crops, with the parks network as the supplier of wild pollinator habitat. Consumer surplus and producer surplus were calculated by crop; direct apiary benefit is observed market revenue.

Bradshaw et al. (2021)

Compilation of reported and modelled costs of invasive species in Australia from the InvaCost database. The total row is the national headline; the weed and vertebrate rows are components and must not be added to it.

B.5 Water supply

Table 24: Evidence and derivations: water supply

2026 value	Original value	Scope	Description	Method and source	Aggregation caveat
$1.0-1.7bn a year	$0.8-1.3bn (2019$)	RFA forests	Water provision: 6,432 GL in 2018 at $0.12-0.20/kL	Replacement cost; DELWP (2019); ×1.272	RFA regions only. Conservative unit cost
$332M a year	$244M (2015$)	Nine parks	Water supply from the nine highest-yielding parks	Replacement cost; Varcoe et al. (2015); ×1.360	Overlaps RFA forests value
$68M a year	$50M (2015$)	Non-metro parks	Water purification: 4,165 t sediment retained	Avoided cost; Varcoe et al. (2015); ×1.360	Likely additive to metro rows
$63M a year	$46M (2015$)	Metro parks	Stormwater retention: avoided infrastructure cost	Avoided cost; Varcoe et al. (2015); ×1.360	Overlap with nitrogen row
$45M a year	$33M (2015$)	Metro parks	Avoided nitrogen removal: 182,000 kg a year	Avoided cost; Varcoe et al. (2015); ×1.360	Overlap with stormwater row
$21-35M a year	$16-27M (2018$)	Yarra catchment	Water provision value of the Yarra catchment	Replacement cost; NCE (2018); ×1.292	Regional cross-check. Not additive

DELWP (2019): water provision

Hydrological modelling of water yield from RFA forest regions, with 6,432 GL attributed to forested catchments in 2018. Unit value: replacement cost of $0.12 to $0.20 per kL based on infrastructure cost benchmarks. Natural Capital Economics (2018) used

replacement costs of $0.90 to $4.10 per kL (2018 dollars) for diverted Yarra water, which implies materially higher values at the upper end.

Varcoe et al. (2015): parks water services

Water supply: the nine highest-yielding parks identified from catchment modelling, valued at replacement cost. Purification: sediment load reduction in non-metropolitan parks valued at treatment cost. Stormwater: impervious area avoided in metropolitan parks valued at equivalent infrastructure cost. Nitrogen: 182,000 kg reduction valued at unit treatment cost. Valuing Victoria's Parks reports total water filtration services of $83M a year (2015 dollars).

B.6 Tourism and recreation

Table 25: Evidence and derivations: tourism and recreation

2026 value	Original value	Scope	Description	Method and source	Aggregation caveat
$1.2bn a year	$905M (2019$)	RFA forests	Recreation and tourism welfare value: 34 million visits a year	Travel cost; DELWP (2019); ×1.272	Overlap with MJA (2016)
$611M a year	$455M (2016$)	Victoria	Consumer surplus from nature-based outdoor activity (~$50 per day)	Travel cost; MJA (2016); ×1.343	Partial overlap with RFA row
$551M-1.4bn a year	$426M-1.05bn (2018$)	Yarra corridor	Benefits of the Yarra River: recreation, aesthetics, water provision	Travel cost and replacement cost; NCE (2018); ×1.292	Regional. Water component overlaps water domain
$943M a year	$730M (2018$)	Yarra corridor	Base-case Yarra River benefits	As above	Do not add to range row

2026 value	Original value	Scope	Description	Method and source	Aggregation caveat
$520M a year (2024$)	$520M (2024$)	Great Ocean Road	Travel cost value of 3.9 million ecosystem-attributable tourism visits	Travel cost; DEECA (2024)	Regional
$104M a year	$82M (2019$)	RFA forests	Timber and firewood provisioning	Market price; DELWP (2019); ×1.272	Provisioning service
$3.8-8.9M a year	$3-7M (2019$)	Public land	Firewood	Market price; DELWP (2019); ×1.272	Subset of timber and firewood row
$3.8-5.7M a year	$3-4.5M (2019$)	RFA forests	Honey and apiary industry value	Market price; DELWP (2019); ×1.272	Overlaps agriculture apiary rows

DELWP (2019): forest recreation

Physical quantity: 34 million annual visits to state forests and parks in RFA regions. Unit value: travel cost method applied to visitor data; consumer surplus derived from the demand curve and cross-checked against Australian recreation value literature. Economic impact measures such as total recreation spending ($10.7bn) and GVA ($10.5bn) are excluded because they measure sector contribution, not welfare.

Natural Capital & Climate (2018): Yarra River

Recreation and aesthetics valued with the travel cost method, with a hedonic pricing cross-check; water provision valued at replacement cost. The base case of $730M (2018 dollars) is a central estimate across components.

DEECA (2024): Great Ocean Road

SEEA EA-aligned account of the Great Ocean Road coast and parks. In addition to tourism, the account values carbon storage (35 Mt CO_2-e; $60M a year at avoided offset cost or $180M a year at the social cost of carbon) and coastal protection along 240 km of coastline ($3M to $10M a year at seawall replacement cost).

B.7 Property and amenity

Table 26: Evidence and derivations: property and amenity

2026 value	Original value	Scope	Description	Method and source	Aggregation caveat
$6.9-20.7bn (stock)	$6-18bn (2022$)	Victoria	Green space premium: 3-15% applied to residential stock (~$2.5T)	Hedonic pricing via benefit transfer; ×1.150	Stock. Not addable to flows
$403M-1.3bn a year	$350M-1.1bn (2022$)	Victoria	Annualised amenity flow at 5-6% yield	Derived; ×1.150	Indicative. Derived from stock
$10.2-17.8bn (stock)	$8-14bn (2019$)	Melbourne	Aggregate amenity value of Melbourne's parks system	Hedonic pricing; source to be verified; ×1.272	Subset of Victoria
$8.2-31M a year	$6-23M (2015$)	Parks network	Willingness to pay for park heritage conservation	Benefit transfer (contingent valuation); Varcoe et al. (2015); ×1.360	Lower-bound non-use value

Green space premium

Primary study (Melbourne): hedonic regression of residential sales with distance to parks as the explanatory variable, finding premiums of 4% to 12% within 400 m of major parks, declining to about 2% at 800 m. Benefit transfer to Victoria: a 3% to 15% premium range applied to total Victorian residential property value (about $2.5 trillion, 2022). Annualised flow: a 5% to 6% yield applied to the implied stock value.

Varcoe et al. (2015): heritage

Benefit transfer from Australian and international contingent valuation studies of heritage conservation, applied to the Victorian parks network as mean willingness to pay per household per year, aggregated across Victorian households. Valuing Victoria's Parks also estimated amenity for about 97,000 residences adjoining parks at $21M to $28M (2015 dollars).

Appendix C Statement of AI use in this project

Mosaic Insights and Natural Capital & Climate declare AI use. We do this as good practice and for transparency.

This project used an AI-enabled workflow to support rapid evidence synthesis within the Stage 1 timeframe and budget. AI assisted with initial document review, literature synthesis, data organisation, value-domain structuring, and draft reporting logic. AI outputs were treated as working material. Human experts reviewed, validated and refined all material before inclusion in this final TWS report. As part of Quality Control all deadline numbers, value estimates and material claims were back verified against source documents, datasets and professional judgement.

AI-supported artefacts

Two interactive artefacts were developed to support evidence synthesis and visual communication:

- Value chain dependency artefact. Explores how Victorian industry sectors depend on ecosystem services and where economic exposure is concentrated, across sectors, dependency bands and local natural assets.
- Welfare and use value artefact. Organises the valuation evidence across the six domains, with headline values, methods, evidence strength and caveats.

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