

14 Tasman's Ecological Footprint

14.1 Profile of the region

The Tasman region covers the top northwest corner of the South Island. The total land area of the Tasman region is 969,120 ha, making it the 11th largest region in New Zealand. Much of the region is mountainous with large parts inaccessible. Abel Tasman (22,541 ha) and Nelson Lakes (101,753 ha) national parks are found within the region with part of the Kahurangi National Park also within the region. The coastal areas of the Tasman region have high annual sunshine hours and are fertile, making them suitable for horticultural activities.

The population of the Tasman region was only 39,599, making it the second lowest of all regions. Only the West Coast has fewer people. The population is much more rural than other regions – the March 1996 Census recorded 43.1 percent of the population as rural. The main urban populations are small, including the townships of Motueka, Takaka, Richmond and Collingwood, all of which have population below 10,000. Tasman consequently has the fourth lowest population density at 4.09 people/km².

Horticulture is the key industry in the region. It includes the growing of apples, pears, berry fruit and specialty crops such as hops. The intensive use of land for horticulture has resulted in smaller than average farm sizes in the region. The location quotient for horticulture is very high at 8.16. Other land uses such as dairying (LQ 1.60), sheep and beef farming (LQ 1.82) and forestry and logging (LQ 4.94) are also above the national average as reflected in their location quotients.

Fishing also makes an important contribution to the local economy. A large fish processing plant is located at Port Motueka and Golden Bay's port is located at Tarakohoe which houses a fish processing plant.

The manufacturing sector, although small by national standards, is also relatively strong in the Tasman economy and is based on the further processing of primary products. The region contains the world's largest single-site medium-density fibreboard mill, located in Richmond. Cement manufacturing in Golden Bay as well as food manufacturing, are also important. As a result, the location quotients for many manufacturing sectors are above the national average: other food manufacturing (LQ 2.29), beverage, malt and tobacco manufacturing (LQ 1.66), wood and wood products (LQ 3.08) and non-metallic minerals (LQ 2.13). The region's Cobb River power station complex also makes a significant contribution to the regional economy.

The level of employment in the service sector is notably well below the national average with services tending to be provided by businesses in Nelson City which is outside the region.

14.2 Overall ecological footprint and comparison with other regions

Tasman has an ecological footprint of 82,180 ha, only 0.76 percent of New Zealand's ecological footprint. It is the second smallest of any region in New Zealand; only neighbouring Nelson City has a lower ecological footprint.

On a per capita basis, Tasman has the second lowest ecological footprint of all of the regions, at 2.08 ha per person. It is marginally larger than Auckland's per capita ecological footprint which

is the lowest. This low per capita footprint is partly explained by the relatively productive land in the Tasman area. This means that less agricultural and horticultural land is required to produce the same amount of product, thus lowering the numerical magnitude of Tasman’s ecological footprint. This particularly applies to horticultural land required for food production in Tasman. There is also some evidence to suggest that the per capita energy use is lower in this region thereby reducing the energy component of the footprint.

According to the ecological footprint calculation, 82,180 ha of land is required to produce commodities that the Tasman population consumes. There are in contrast 332,906 ha of useful land available, meaning that the Tasman region has more than enough land to sustain its current level of consumption. In fact, the Tasman region would need to increase its consumption, 4.05 times before it would overshoot the availability of useful land. Overall, in net terms, Tasman region is ecologically self-sufficient and actually has an ecological surplus of 250,730 ha of useful land. This situation is to be anticipated as Tasman is the most rural of all New Zealand regions.

14.3 Ecological footprint disaggregated by land type

The agricultural land component of the ecological footprint consists of 13,110 ha (refer to Table 14.1). This represents 49.8 percent of Tasman’s ecological footprint. Most (25,550 ha) of this land is sourced within the Tasman region. A considerable amount of agricultural land (13,110 ha) is however embodied in international goods imported to the Tasman area. Some (2230 ha) agricultural land is also embodied in goods imported from other regions in New Zealand particularly those in the South Island. Overall, the Tasman region’s appropriation of agricultural land is low, both on a percentage and per capita basis, compared with the national average. This appears to be primarily because the land is relatively productive in Tasman, meaning less is required.

Table 14.1 Tasman’s ecological footprint by land type, 1997–98

Land type	Within region land (ha)	Land from other New Zealand regions (ha)	Land from other nations (ha)	Total land (ha)	Total land (ha per capita)	Total land (% of total)
Agricultural land	25,550	2,230	13,110	40,890	1.03	49.8
Forest land	9,640	240	1,140	11,020	0.28	13.4
Degraded land	11,990	640	850	13,480	0.34	16.4
Energy land	11,820	760	4,170	16,750	0.42	20.4
Total	59,000	3,870	19,270	82,140	2.07	100.0

The forest land component of the ecological footprint consists of 11,020 ha. This represents 3.4 percent of Tasman’s ecological footprint, significantly above the national average of 6.4 percent. Not surprisingly, most (9640 ha) of the forest land is appropriated from within the Tasman area. Because of Tasman’s abundant forestry stocks, there is little need to appropriate forest land from outside the region. Nevertheless, inevitably some forest land (1140 ha) is embodied in products imported from overseas.

The degraded land component of the ecological footprint consists of 13,480 ha. This represents 16.4 percent of Tasman’s ecological footprint. This is significantly higher than the national average of 8.2 percent. Most of this degraded land (11,990 ha) is sourced within the Tasman region. The largest amount of degraded land imported from other regions is the degraded land embodied (430 ha) in the imported mineral products from the West Coast region.

The energy land component of the Tasman ecological footprint is 16,750 ha. This represents 20.4 percent of Tasman’s ecological footprint. On a per capita basis (0.42 ha energy land/person) it is below the national average (0.50 ha energy land/person). This indicates that because Tasman has a lower than average per capita energy land, the region is relatively energy efficient.

14.4 Ecological footprint disaggregated by goods and services purchased

14.4.1 Purchase of Tasman produced goods and services ($P_1+P_2 \dots P_n$)

The purchase of manufacturing products accounted for 72,180 ha of embodied land in Tasman’s ecological footprint (refer to Table 14.2). This amounts to 27.1 percent of the entire ecological footprint of the Tasman region. Most (18,930 ha) of the land embodied in these manufacturing products comes directly from within the Tasman region. That is, these manufacturing products are made in the Tasman region using land from within the region. The outside-region land embodied in these manufacturing products is relatively small.

Table 14.2 Tasman’s ecological footprint by economic products, 1997–98

Economic products consumed	Within region land (ha)	Land from other New Zealand regions (ha)	Land from other nations (ha)	Total land (ha)	Total land (ha per capita)	Total land (% of total)
Agriculture	6,360	20	200	6,580	0.17	8.0
Forestry	620	0	10	630	0.02	0.8
Fishing and hunting	0	0	0	0	0.00	0.0
Mining and quarrying	20	0	10	20	0.00	0.0
Manufacturing	18,930	1,670	1,680	22,280	0.56	27.1
Utilities and construction	7,390	40	870	8,300	0.21	10.1
Services	19,730	360	3,850	23,940	0.60	29.1
Domestic final demand	5,930	1,820	12,670	20,430	0.52	24.9
Total	58,990	3,910	19,280	82,180	2.08	100.0

There is a much lower percentage (27.1 percent) of land embodied in manufacturing products in this region compared with the national average (44.5 percent). The reason is that Tasman residents directly purchase a considerable amount of manufacturing products from outside the region – most notably from Nelson City. Tasman residents will shop in Nelson, technically outside the region, and purchase products from there.

The purchase of service sector products accounts for 23,940 ha of the embodied land in the Tasman ecological footprint. Most of these service sector products (insurance, finance, retail margin) are directly and indirectly drawn from land from within the Tasman region. Much smaller amounts of land which are associated with the purchase of service sector products are appropriated from other regions (360 ha) and other nations (3850 ha).

The land embodied in other products purchased by Tasman residents is much smaller than that for manufacturing and service sector products: agricultural products (6580 ha), forestry products (630 ha), mining and quarrying (20 ha) and utilities and construction products (8300 ha).

14.4.2 Purchase of goods and services produced outside Tasman (D₁+D₄)

Tasman residents also purchased products made outside the region, which account for 14,410 ha of land. Most of these purchases are of overseas products such as imported motor vehicles, computers, foodstuffs and various household items (12,670 ha). There is also 1820 ha of land embodied in purchases of products imported from other regions (13,370 ha).

14.5 Ecological Balance of Trade and ecological interdependencies

The land embodied in imports into the Tasman economy is 37,730 ha (refer to Table 14.3) whereas, the land embodied in exports from the Tasman economy is 242,510 ha. This results in the Ecological Balance of Trade of the Tasman economy of 208,780 ha, meaning it is an overall provider of land to other regions and nations.

Table 14.3 Tasman's Ecological Balance of Trade by economic sector, 1997–98

Economic sector	Imports purchased by the economic sector (embodied ha)	Exports sold by the economic sector (embodied ha)	Balance of Trade (embodied ha)
Interregional trade			
Agriculture	390	20,830	20,440
Forestry	0	18,200	18,200
Fishing and hunting	20	700	680
Mining and quarrying	10	30	20
Manufacturing	3,370	3,650	280
Utilities and construction	40	630	590
Services	410	40	-370
Domestic final demand	1,820	0	-1,820
Interregional Balance of Trade	6,060	44,090	38,030
International trade			
Agriculture	3,820	97,910	94,090
Forestry	500	39,630	39,130
Fishing and hunting	620	1,050	430
Mining and quarrying	50	150	100
Manufacturing	4,560	56,710	52,150
Utilities and construction	930	30	-900
Services	4,520	2,930	-1,590
Domestic final demand	12,670	0	-12,670
International Balance of Trade	27,670	198,420	170,750
Total Balance of Trade	33,730	242,510	208,780

14.5.1 Exports and imports by economic sectors

Measured in terms of embodied land, imports of products into the regions are very low, amounting to only 37,730 ha. The low population base results in comparatively few consumer products being imported into the region as well as the small number of secondary and tertiary sector industries means that there are also comparatively few imports by these industries.

Overall, the most important sectors for appropriating land through these purchases of imports are: domestic final demand (14,490 ha), manufacturing (7930 ha), services (4930 ha) and agriculture (4210 ha).

The Tasman region is oriented towards exports particularly to international markets. The embodied land of exports (242,510 ha) outweighs the embodied land of imports (33,730 ha) by a factor of 7.19 times. This is the fifth largest ratio of any region in New Zealand. Exports by the agriculture sector (114,530 ha) are the largest with most embodied land (94,070 ha) being exported overseas – particularly in the form of exported apples. The export of forestry sector products (57,330 ha) is also important, again with the exports to international markets (39,130 ha) dominating. The exports of further processed forestry and agricultural products is also critical, resulting in 52,430 ha of manufacturing sector product being exported out of the region almost entirely to overseas markets.

14.5.2 Exports and imports by land type

Tasman is a significant net exporter of agricultural land to other regions (17,080 ha) and more importantly to other countries (117,000 ha) (refer to Table 14.4). In overall terms, 134,080 ha of Tasman's agricultural land is appropriated by other regions and countries. This is in the form of agricultural land embodied in primary sector products (eg. apples) or primary sector products that have been further processed (eg. foodstuffs).

Table 14.4 Tasman's Ecological Balance of Trade by land type, 1997–98

Economic sector	Land embodied in imports (ha)	Land embodied in exports (ha)	Balance of Trade (ha)
Interregional trade			
Agricultural land	4,220	21,300	17,080
Forest land	250	20,710	20,460
Degraded land	710	500	-210
Energy land	890	1,580	690
Interregional Balance of Trade	6,070	44,090	38,020
International trade			
Agricultural land	19,000	136,000	117,000
Forest land	2,140	51,740	49,600
Degraded land	1,680	1,450	-230
Energy land	4,840	9,230	4,390
International Balance of Trade	27,660	198,420	170,760
Total Balance of Trade	33,730	242,510	208,780

Tasman is also a net provider of forest land to other regions and countries amounting to 70,000 ha. The net exports of forest land to other regions is 20,460 ha and to other countries 49,600 ha. This land is embodied both in the export of logs and processed factory products (eg. fibreboard).

The Ecological Balance of Trade for degraded land (-440 ha) and energy land (5080 ha) is in comparison small.

14.5.3 Overall picture

Figure 14.1 provides a summary of the overall flows of embodied land through the Tasman economy. This diagram indicates that the Tasman economy is very much dominated by the exports of Agricultural and forest land. This is far greater than land channelled into household consumption within Tasman. Exports of embodied land (242,510 ha) is far outweighed by imports of embodied land (33,730 ha). This gives Tasman a positive Ecological Balance of Trade of 208,780 ha. Tasman is therefore a net provider of ecological capital to other nations and to a lesser extent other regions within New Zealand.

Figure 14.1 Flows of embodied land through the Tasman economy

