workingpaper

Evaluating the Forestry Dataset

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About the Resource Project Team

The Resource Project Team comprises of Jessica Prendergast, Nicola Bradshaw, Chris Aitken, Lisa Bazalo, Jean-Charles Perquin, and Steph Versteeg. Each team member has placed a significant amount of time and effort into each Working Paper and the corresponding datasets.

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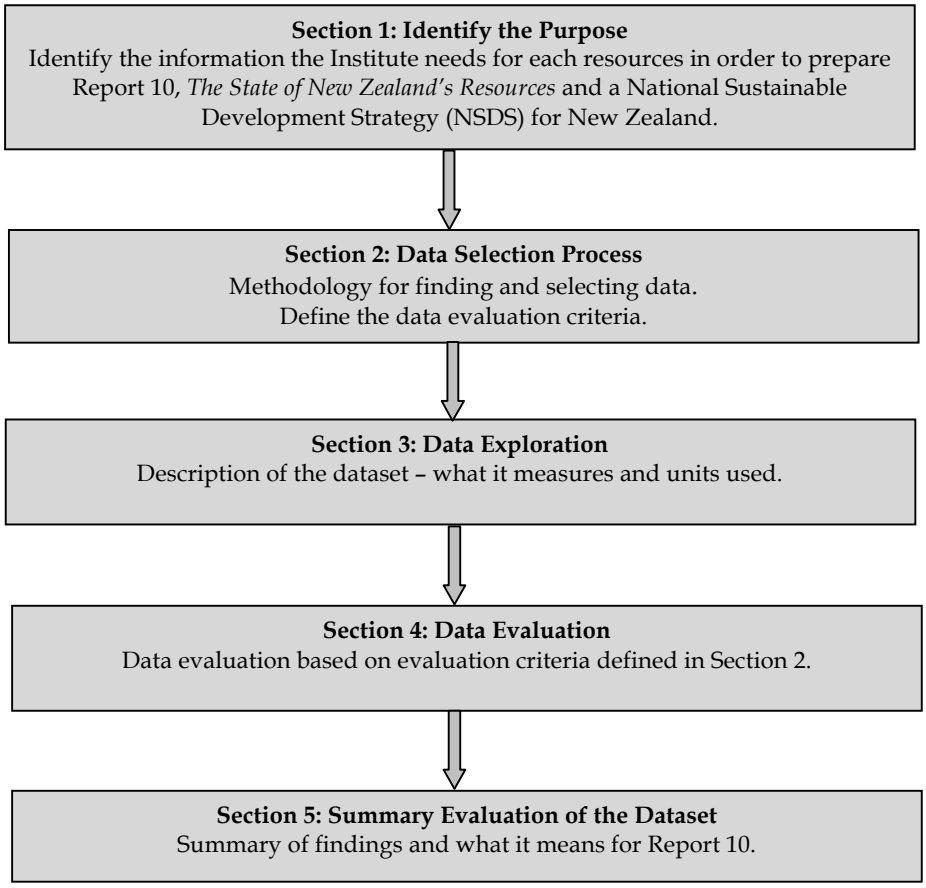
1. Purpose

This Working Paper is one of a series of 11 papers prepared as background to the Sustainable Future Institute's Report 10, *The State of New Zealand's Resources* (SFI, in press). Report 10 aims to provide an overview of available data and information covering a range of resources, and to discuss the use, availability and appropriateness of the data in the preparation of a National Sustainable Development Strategy (NSDS).

The purpose of this Working Paper is to describe the process by which the Institute collected, collated and presented a selection of forestry data. The datasets are summarised and evaluated for completeness, accuracy, relevance, appropriateness of sources and public availability. The paper also discusses the purpose for which the data was collected by its custodians, and why the Institute has selected this data for its reporting. The content of the dataset is not interpreted or analysed; rather, our purpose is to evaluate the usefulness of this dataset for the purposes of Report 10.

Following this evaluation any gaps and resulting limitations in using the selected data are assessed, as well as the data's relevance and reliability in relation to the Institute's purpose of using the comprehensive series of datasets to inform the development of an NSDS for New Zealand. A short glossary is included at the end of the Working Paper.

Figure 1 The Five-step Process for Evaluating the Institute's Datasets



1.1 The Sustainable Future Institute

The Institute is an independently funded think tank based in Wellington, New Zealand. Earlier work by the Institute has indicated that New Zealand is well behind other developed nations on its international obligations to develop and implement a National Sustainable Development Strategy (NSDS) (SFI, 2007). It is hoped that *Project 2058* will help inform ministers, policy analysts and members of the public about key events and trends in New Zealand's past, and alternative strategies for the future. With this in mind, this Working Paper is a step towards the Institute's goal of preparing an NSDS for New Zealand in 2011.

1.2 Project 2058

The strategic aim of *Project 2058* is to promote integrated long-term thinking, leadership and capacity building so that Aotearoa/New Zealand can effectively seek and create opportunities, and explore and manage risks, over the next 50 years. In order to achieve this aim, the *Project 2058* team is working to:

1. Develop a detailed understanding of the current national planning landscape, and in particular the government's ability to deliver long-term strategic sustainability thinking;
2. Develop a good working relationship with all parties that are working for and thinking about the 'long-term view';
3. Recognise the goals of iwi and hapū, and acknowledge te Tiriti o Waitangi;
4. Assess key aspects of New Zealand's society, asset base and economy in order to understand how they may shape the country's long-term future, such as government-funded science, natural and human-generated resources, the state sector and infrastructure;
5. Develop a set of four scenarios to explore and map possible futures for New Zealand;
6. Identify and analyse both New Zealand's future strengths and weaknesses, and potential international opportunities and threats;
7. Develop and describe a desirable sustainable future in detail, and
8. Prepare a *Project 2058* National Sustainable Development Strategy. (SFI, 2009: 3)

The culmination of *Project 2058*, the creation of a National Sustainable Development Strategy, depends on having an accurate assessment of key aspects of New Zealand society. Earlier reports have dealt in particular with points 1, 3, 5 and 6 above,[1] and this Working Paper is designed to help progress the fourth point: 'Assess key aspects of New Zealand's society, asset base and economy in order to understand how they may shape the country's long-term future …'

1.3 Forestry Resources within the NSDS

Below we ask six strategic questions that drive this research. These are then expanded upon to discuss the use, availability and appropriateness of the data in the preparation of an NSDS. Without accurate, comprehensive, relevant and accessible data to answer the following questions, it will be difficult to develop and execute an informed NSDS for New Zealand.

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[1] For a detailed list of published and upcoming reports, see *Project 2058 Methodology: Version 3* (SFI, 2009: 7).

- **What** are the issues facing forestry in New Zealand? Are New Zealanders clear on exactly what these issues are? Does New Zealand have quality data and information to enable us to understand these issues as fully as possible? Are New Zealanders able to establish an informed understanding of the priorities?

- **Why** does New Zealand need to confront issues affecting our forestry? Are there improvements that can be achieved; or practices that need to change? Are current indicators relevant and meaningful to benchmark changes over time? What is the purpose and the benefit in taking action?

- **When** should New Zealand start to address issues which impact on New Zealand's forestry? Is now the right time? Are current economic, social and environmental conditions conducive? Would it be beneficial to wait and monitor events as they evolve? Are current measures and indicators appropriate to monitor developments? Is there a risk of rushing into short-term action when a long-term approach is needed?

- **Where** do New Zealanders most need to concentrate their efforts to address New Zealand's forestry issues? Which aspects of the issue should be focused on first? Where should New Zealanders begin to ensure the most beneficial and sustainable outcome? Does New Zealand have sufficient knowledge, based on accurate and appropriate data, to assess outcomes?

- **Who** must be engaged to effectively address issues facing forestry in New Zealand? Who needs to be involved if New Zealand is going to successfully tackle these issues? Is data on forestry in New Zealand accessible and transparent to allow those interested to be accurately informed? Are data ownership issues affecting public involvement?

- **How** should New Zealand ensure we have effective management of our forestry? What is the best approach? What skills or techniques are needed? Does New Zealand have comprehensive and accurate information to enable effective management? How can New Zealand learn from international experiences to assist in maximising effective and sustainable forestry use?

This working paper does not attempt to answer the above overarching questions. These questions do however inform our purpose for Report 10 and in progressing an NSDS. Data collected for inclusion within this dataset has enabled us to understand the level of accuracy, relevance, comprehensiveness and issues of ownership that exist surrounding publicly available data in New Zealand. The above questions function as a bridge between the dataset, this Working Paper and Report 10; specific questions pertaining to how the selected Institute's dataset will inform the development of an NSDS are outlined in Table 1.

2. Data Selection Process

2.1 Methodology

Report 10a, *Designing a Framework to Monitor New Zealand's Resources* (SFI, 2010a) outlined the process through which the Institute developed the framework for collecting and presenting the data. With this framework in place, the steps towards the completion of Report 10 are: (i) building the datasets for the 11 resource types studied; (ii) evaluating the selected datasets, and (iii) reporting on the findings in relation to the Institute's aim of defining an NSDS for New Zealand. The datasets developed in Step (i) are available on our website.[2] This Working Paper is one of 11 that form Step (ii), the data evaluation. Step (iii) will be published in Report 10.

The source data for the Institute's Forestry Datasets was selected from a variety of static tables, extracted from the National Exotic Forestry Description (NEFD) reporting section on the Ministry of Agriculture and Forestry's (MAF) website. The tables used are listed on the Institute's website under Project 2058 publications and State of New Zealand's Resources. The Institute has taken the original NEFD PDF data and reformatted it in an Excel spread sheet to facilitate use and analysis. The original data values have been preserved.

2.2 Sources of Data

The Institute supports the free availability of data relating to environmental statistics. With this in mind, we deliberately used only openly accessible data so that we were able to report on its availability and identify potential gaps. This enables us to report on the implications of using only freely available data, and to evaluate the information that can be extracted from these data sources.

We acknowledge that many sources of information exist on New Zealand's forestry that may or may not be publicly available or easily discoverable. Crown Research Institutes (CRIs), universities, national and local government, and other private and public organisations also collect and hold data on forestry.

For various reasons including privacy, commercial sensitivity, cost of dissemination or commercial sale price of the data, there are many datasets on New Zealand's resources that are inaccessible to the public. Without extensive research, funding or expertise to assist in the interpretation of the data, many others remain unavailable. The Institute has focused on open data, therefore no efforts have been made to retrieve the other datasets. This is a limitation of this project as gaps identified by the Institute could potentially be filled by these other data sources.

For example, an extensive amount of work is being carried out by MAF and the Ministry for the Environment (MfE) with regards to natural and planted forestry, specifically on monitoring its coverage and changes over time as part of the Emissions Trading Scheme (ETS). There is a wealth of very relevant information that could make the Institute's forestry

[2] www.sustainablefuture.info

dataset more comprehensive, but much of the government's work and supporting datasets relating to the ETS is not published or requires expert advice to interpret.

The Institute searched for and compiled its dataset in 2009. What we have selected for inclusion in this dataset and for discussion within this Working Paper reflects data which fits our purpose and was available within the environmental data landscape at the time of research.

As data availability increases rapidly on an ongoing basis, it would not be practical to include within this Working Paper all datasets relevant to forestry in New Zealand. Report 10 investigates the past, present and future of the environmental data landscape in New Zealand. It also provides a list of alternative sources of information pertaining to New Zealand resources. When appropriate, we have mentioned complimentary data sources in this Working Paper.

Data on New Zealand resources is often produced and targeted to industry experts. This makes a thorough analysis and evaluation of datasets a complex task for the uninitiated. We have referred to the original source documents to support our evaluation of the datasets.

2.3 Forestry Dataset Evaluation Criteria

The Institute has developed a series of criteria to support the effective evaluation of its datasets and to consider the data in the context of our wider work programme. Each criterion is supplemented with questions to direct attention to relevant areas for consideration. The aim is to structure the analysis of each dataset in a way that is consistent and replicable across the 11 datasets. In this Working Paper these criteria are applied to the Forestry Dataset as a whole, and to the different indicators and sources that comprise the dataset.

The criteria and guiding questions are outlined in Table 1 below.

Table 1 Criteria for Evaluating the Institute's Datasets

Criteria for evaluation	Guiding questions
Comprehensive time series	For how long has the data been collected? Are there gaps in the records? Are data/indicators consistent and comparable over time?
Quality data	What is the scope and range of indicators; are there any gaps? Is data comprehensive and detailed? How is data classified/categorised? Is the data local/regional/national? Is the data internationally comparable and valid? Is the data accurate – is there any sampling bias? Are error bars calculated? Is the data relevant and able to be interpreted with meaning?

Appropriate sources	How many sources are drawn on, and what are they? Who owns the data? Why, how and where is data collected/measured? Is the data original data, self-reported/obtained by survey? Is the data collection and analysis informed by sound assumptions? Is data reliable, independent, verifiable and/or of international standard? Is the data subject to (external) review?
Publicly available	Is the data easy to access? Is the data located online, in publicly available reports or databases, or within an institution? Is the data available?

2.4 Selected Sources

In order to find possible sources of data, to establish a baseline portrait of the forestry in New Zealand, websites of agencies and organisations with relevant links to New Zealand's forestry industry were reviewed for all publications which provided information and data on forestry production, exports and imports. A search was undertaken to find online datasets and statistics, documentation on the data collection and its uses, and specific publications on natural and planted forestry, as well as general publications such as annual reports.

The New Zealand organisations whose websites were searched included, but were not limited to, the Ministry of Agriculture and Forestry (MAF), New Zealand Institute of Forestry, Statistics New Zealand and Landcare Research. International websites searched included the Food and Agriculture Organisation of the United Nations (FAO) and the Millennium Ecosystem Assessment (MA).

The data for planted forestry production, exports and imports was obtained from MAF, specifically from the *National Exotic Forestry Description* (NEFD), a publication produced annually by MAF.[3] The report 'provides a detailed description of New Zealand's planted production forests', and 'represents the net stocked area of the planted production forest estate; that is, all forests planted with the primary intention of producing wood or wood fibre' (MAF, 2010a: 1).

A review of data available publicly and online found that the NEFD provided the most complete dataset on exotic forestry production, exports and imports in New Zealand. Importantly, the dataset is publicly available to anyone who is interested. MAF is the government's principal adviser on forestry issues, and plays an important role in working with the sector to look at strategic issues, and identify where there are industry-wide risks and opportunities (MAF, 2009: iii).

[3] National Exotic Forestry Description (NEFD) available online at www.maf.govt.nz.

2.5 Purpose for which the Data was Initially Collected

The NEFD is created by MAF to assist with resource and policy planning as well as to provide information to members of the public involved with the forestry sector. MAF assumes people who use the NEFD report have a reasonable understanding of the forestry sector in New Zealand (MAF, 2010a: 1). The report may be used by the forestry industry to plan future production, and the publication also meets a range of international reporting obligations (ibid.).

The collection and publication of the data is overseen by the NEFD Steering Committee, which is a forestry industry committee with members nominated by New Zealand Forest Owners Association and MAF (MAF, 2010a: 1).

2.6 Additional Resources

The Institute's 11 working papers, prepared as background papers to Report 10, *The State of New Zealand's Resources*, are selective in their use of specific information and data from within a broader pool of information. The boundaries set for these working papers were tightly focused on openly accessible online data available as at February 2009, the original time of data collection for the Institute's accompanying datasets. For further reading and comparisons which fall outside of our collection strategies we suggest the following additional sources. Please note that the findings of these reports have not been included within this working paper due to the reasons outlined above, but that references to these additional sources are included in the reference list at the back of this paper.

The New Zealand Forest Owners' Association (FOA) represents the owners of New Zealand's commercial plantation forests and publish a number of publications including an annually updated *Facts and Figures* (NZFOA, 2010a) and their principles of sustainability brochure *NZ Sustainable Forestry Story* (NZFOA, 2010b).

The Ministry of Agriculture (MAF) produces a range of additional publications such as *Situation and Outlook for New Zealand Agriculture and Forestry,* their annual review and industry forecast (MAF, 2010b).

For information on New Zealand's indigenous forest resource (inventories have been undertaken since the 1950's) those interested can contact the Department of Conservation – New Zealand's largest forest manager (DoC, n.d.).

3. Data Exploration

A comprehensive understanding of the state of New Zealand's forestry resources, and any trends, is vital for future planning. To aid in gaining this understanding the Institute has divided the Forestry dataset into two sub-categories: (a) natural forestry, and (b) planted forestry.

The FAO distinguishes between natural and planted forest as follows:

> Natural forest: Forest stands composed predominantly of native tree species established naturally. This can include assisted natural regeneration, excluding stands that are visibly offspring/descendants of planted trees (FAO, 2002).
>
> Planted forest: Forest stands in which trees have predominantly been established by planting, deliberate seeding or coppicing, where the coppicing is of previously planted trees (FAO, 2002).

MAF distinguishes between natural and planted forest as follows:

> The first is large areas of natural forest made up of species indigenous (and often endemic) to New Zealand and including both virgin and regenerating forest. The second type is a smaller, but still extensive, area of forest that has been planted with mainly non-native, coniferous species (MAF, n.d.).

While 'natural' forestry is a natural resource and is closely related to biodiversity, 'planted' forestry is a human-generated resource. To distinguish between the two types of forestry, different indicators were selected to facilitate evaluation and analysis. 'Natural forestry' comprises one indicator – wood volume harvested over time. 'Planted forestry' is classified into seven indicators: (i) area and standing volume; (ii) exotic planting; (iii) exotic harvesting; (iv) area by species; (v) production and consumption; (vi) exports of forestry products, and (vii) imports of forestry products.

Table 2 Forestry Dataset Summary Table

Dataset Category	Data Custodian	Data Presented	Dates	Measures	Data Reporting Frequency
Natural Forest	Ministry of Agriculture and Forestry	Estimated roundwood removals	1951–2009	Unit: Thousand cubic metres (000 m^3)	Annual
		Sawn timber production			
Planted Forest	Ministry of Agriculture and Forestry	Area & standing volume	Forest production: 1951–2009	Units: Roundwood Equivalent (RE) and hectares (ha).	Annual
		Exotic planting			
		Exotic harvesting			
		Area by species	Exports and imports: 1971–2009		
		Production & consumption			
		Exports of forestry products			
		Imports of forestry products	Forest consumption: 1994–2008		

Natural forest

The natural forest dataset presents information on native forest production in New Zealand. Production is classified according to the source from the Ministry of Forestry and Agriculture. The earliest available data is from 1951, and the latest is from 2009. Natural forest production

is measured by estimated roundwood removals and sawn timber. The unit of measurement used is thousand cubic metres (000 m^3). An excerpt from the natural forest production dataset is provided below in Figure 2, to give an indication of the context and the layout of the dataset. Note that data from 1954 to 2005 is excluded below for representation purposes.

Figure 2 Excerpt from the Natural Forest Production Dataset
Source: SFI, 2010b

Attribute			1951	1952	1953	2006	2007	2008	2009	Data source table #
estimated roundwood removals	saw logs	000m³	1,573.0	1,602.0	1,607.0	23.2	17.9	18.3	16.0	7a
	peeler logs		34.0	37.0	37.0	0.1	0.0	0.0	..	
	small logs		57.0	56.0	54.0	..	..	..	..	
	pulp logs		..	..	..	..	..	..	..	
	export chips		..	..	..	..	..	..	..	
	export logs		..	..	..	..	..	..	..	
	total		1,664.0	1,695.0	1,698.0	23.3	17.9	18.3	16.0	

Planted forest

The planted forest dataset provides information on exotic forest production, exports and imports. Data on planted forest production extends back to 1951, but the earliest collection of export and import data is from 1971. The units of measurement for planted forest are thousand cubic metres (000 m^3), roundwood equivalent (RE) and hectares (ha). Figure 3 shows an excerpt from the planted forest dataset relating to imports; entries prior to 2006 have been omitted for representation purposes.

Figure 3 Excerpt from the Planted Forest Dataset
Source: SFI, 2010b

Indicator	Attribute		2006	2007	2008	2009	Value (NZ$ 000)[S1]	Data source table #
7b.7 Imports of forestry products at 30 June	sawn timber	000 m³	58.39	51.00	55.79	41.58	69,944	7f & 7h
		000 m³ RE	124.80	130.40	119.40	89.80	..	
	wood pulp	000 m³ RE	29.61	35.65	162.74	87.30	7,820	7g & 7h
		tonnes	5,462.00	3,621.00	31,639.00	22,535.00	..	
	paper & paperboard	000 m³ RE	2,250.66	2,217.24	2,381.95	1,885.82	691,492	7h
		tonnes	486,700.00	482,825.00	514,613.00	407,119.00	..	
	panel products	000 m³	35.88	58.83	63.64	38.67	45,045	
		000 m³ RE	75.75	117.25	132.12	78.91	..	
	other forest products		..	..	..	..	628,514	
	all forestry products	000 m³ RE	2,480.82	2,500.54	2,796.20	2,141.83	1,442,815	
	total imports	000 m³	2,507.00	2,478.00	2,755.00	2,373.00	..	7d

4. Data Evaluation

In this section we evaluate the data presented in the Forestry Dataset based on the criteria set in Table 1.

MAF National Exotic Forest Description (NEFD)

Data is sourced from the *National exotic forest description: As at 1 April 2009* report produced by MAF (MAF, 2010a). The document includes sections on data collection and estimation, data description, and data reliability and provides an analysis and overview of the 2009 survey data. It also provides information on exotic forest ownership, breakdowns on the area of forest per Territorial Authorities and summarises some of the numerical data in tables and figures. Similar information is provided in the other NEFD reports posted on the MAF website for the 2000 to 2008 periods.

The Institute has not attempted to reproduce the analysis information contained in these reports as we have focused our evaluation on the Institute's criteria outlined in Table 1 with respect to informing an NSDS for New Zealand. One should refer to the documents cited above for a detailed interpretation of the relevant datasets and the NEFD survey methodology.

Natural forest management
It is necessary to note that the NEFD reports focus on planted forests and do not cover an analysis of natural forests. Natural forestry production has been in continual decline since 1951, most of that which remains is managed for conservation, recreation and regeneration by the Department of Conservation.

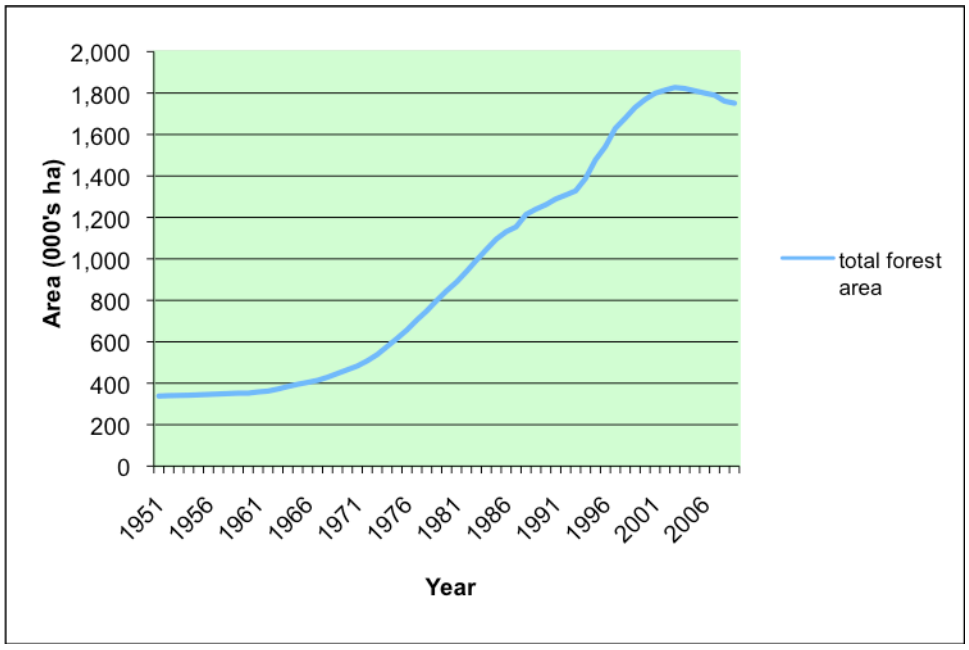
The Forests Act 1949 (Forests Act) was amended in 1993 to bring an end to unsustainable harvesting and clearfelling of indigenous forest. It provides owners with options for managing their forests in order to harvest and mill timber, and it places controls on the milling and exporting of timber from indigenous forests (MAF, 2010c).

As a part of a suite of government initiatives to combat climate change, there are three carbon forestry schemes designed to encourage the establishment of new forests (both indigenous and exotic). Two of the carbon forestry schemes provide the opportunity for landowners to earn revenue from the carbon sequestered by their forest (the NZ Emissions Trading Scheme and the Permanent Forest Sink Initiative). The third, the Afforestation Grant Scheme, provides a grant for forest establishment (MfE, 2008).

4.1 Comprehensive Time Series

Sufficient time frame of forestry industry data
Some of the data on forestry in New Zealand, in particular production data, is available for a 58-year period from 1951 to 2009. This time period is sufficient to show any trends and covers many of the significant changes that have occurred in forestry production in recent history. Figure 4 is an example of how the dataset can be used to examine the area of planted forest in New Zealand over this period.

Figure 4 Area of Planted Forest 1951–2009
Source: SFI, 2010b



Natural forest

Records of export trade by early settlers not available

Exports of native wood commenced in the 1800s with the arrival of the first settlers in New Zealand. To our knowledge no detailed records of trade are available until the mid to late 20th century. The most extensive data available in the NEFD allows analysis of volumes of wood products from 1951 onwards. Those wishing to undertake an historical analysis of forestry in New Zealand are unable to access data from the first 100–150 years of the industry using the NEFD, a period in which wood exports and consumption were significant. Further research is necessary to gain a historical picture of wood trading in New Zealand.

Planted forest

New variables introduced over time

Data on planted forestry is currently available for 25 variables.[4] While this provides comprehensive coverage, collection of data across some of these variables has begun at 1988 and others since 2004.

Although many of the variables for planted forest are only available for a short period of time, the wide range of data available for recent years is strength of the planted forestry dataset providing the NEFD continues to report on these variables in the future. There are generally no temporal gaps once data reporting has begun.

[4] Some data is not available at the time of annual publications owing to commercial sensitivity.

4.2 Quality Data

Comprehensive NEFD Survey with high response rate

Each year, MAF conducts a forestry survey from which data is extracted and compiled in the NEFD. This survey consists of a questionnaire that is sent to all known forest owners and consultants owning or managing planted production forests of at least 1000 hectares (MAF, 2010a: 8). These large-scale owners owned 70 percent of the national forest estate in 2009. (ibid.). Owners that are not known to the Ministry and those with planted production forests smaller than 1000 hectares are excluded from the annual survey as the quality of the data provided by these owners is likely to be more variable in nature, with a higher degree of non-sampling errors (ibid.).

Data provided by large forest owners, especially those with forests over 10,000 hectares, is considered the most reliable segment within the NEFD area dataset. Large forest owner's forests are managed by professional staff and mapping work and forest inventories are conducted regularly in order to make well-informed management decisions. The large forest owners apply relatively consistent definitions of net stocked area (MAF, 2010a: 8).

With a high response rate (96% in 2009) to the survey, the Institute considers that the data presented in the NEFD is reasonably representative of the forestry industry in New Zealand.

Data classification

Data is classified differently within the separate categories of natural and planted forests. Each resource is managed differently, therefore variables are selected appropriately. As mentioned earlier in this section, additional categories are included at times to measure important aspects of the industry. Due to different classifications a direct comparison between the two types of forestry is not possible. Industry expertise and further research are required to assess whether the appropriate variables are currently measured and if new variables need to be included.

Regional breakdown of data available

Data selected by the Institute only refers to national statistics. For the NEFD survey, data is also available from individual territorial authorities. These statistics would provide greater detail on the planted forestry industry across regions within New Zealand however; this data was not used in our research.

4.3 Appropriate Sources

Reliance upon one source

The Institute selected the NEFD data as the sole source of information on New Zealand forestry. We acknowledge that additional information on natural forests, the ETS and the Permanent Forest Sink Initiative, or scientific research as provided by New Zealand CRIs such as Scion and Landcare Research, would add significant value to this research.

General forestry industry data meeting international standards is also available from organisations such as the Food and Agriculture Organisation of the United Nations (FAO). The FAO compiles data that fits within its frameworks in order to standardise the entire database across all countries included within their profiles. As such, data referencing imports

and exports, quantities and values, and production quantities are available on the FAO website and general comparisons with other countries are possible.

Use of the Land Cover Database (LCDB) to assess planted forestry location

The LCDB version 2 dataset produced by the Ministry for the Environment has been used to identify the location of planted forests in New Zealand (MAF, 2010a:7). The LCDB has a range of users and can help identify trends of land use and land cover (MfE, 2009).

4.4 Public Availability

All data publicly available and well documented

It is the aim of this project to assess publicly available data, i.e. data that is able to be accessed by parties independent of those who collect or present it. MAF's reports fit this criterion; the reports are freely available to the public the agency's website.

Accessibility of data

Most of the data for the forestry dataset is easily accessible. Electronic copies of the NEFD from 2000 to 2009 are available, and they are all accompanied by Excel spreadsheets that include data referenced within the document. This allows the user to develop a personalised analysis of the data. Unfortunately, no electronic copies of the NEFD prior to 2000 are available online. However, the MAF data enquiry service was efficient in providing hard copies of previous NEFD publications, which has allowed the Institute to add earlier figures and information to the forestry dataset.

Knowledge and experience with NEFD necessary to perform in-depth analysis as it is targeted at industry experts

It should be noted that to use this database effectively, it is imperative that the NEFD methodology is well understood. Knowledge and experience with the interpretation of NEFD data and forestry sector terminology is also recommended.

5. Summary Evaluation of the Dataset

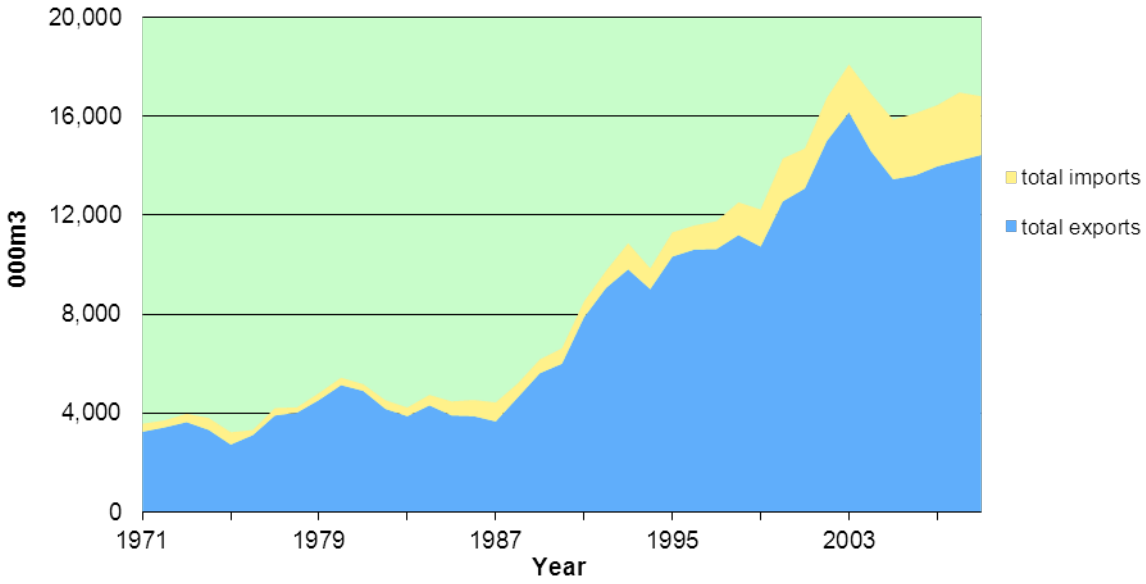
The Institute chose the NEFD dataset to inform its upcoming Report 10 and an NSDS as it was deemed to be comprehensive and the reliable. However, the NEFD has certain limitations, especially as it does not contain information on natural forestry. Table 3 below summarises the Institute's evaluation of the dataset.

Table 3 Summary of Forestry Data Evaluation

	Strengths	Weaknesses
Comprehensive time series	▪ Sufficient timeframe of forestry industry data, covers recent history since 1951 for most variables ▪ NEFD includes a considerable range of data covering planted forestry in New Zealand (25 variables) ▪ New variables included as appropriate – reflects that survey is adaptable to changes in the industry ▪ No temporal gaps since data reporting began	▪ Timeframe for measured variables does not cover historical records from the 1800's at times of significant natural forest extraction ▪ Limited data available for natural forests – to be complemented by other work by agencies such as MAF, MfE, Department of Conservation (DoC), CRIs, etc ▪ Few variables measured for natural forest (7 variables down to 2 in 2009)
Quality Data	▪ Comprehensive NEFD survey with high response rate ▪ Breakdown of data by regional level available	▪ Exclusion of small forestry owners in NEFD survey (representing 30% of total forestry area) ▪ Different classification system used to collect data between natural and planted forest. Representative of the difference in the ways each is managed but does not allow a direct comparison between the two categories.
Appropriate Sources	▪ NEFD reports provide an analysis of the planted forest industry in some reporting areas	▪ Complete reliance on NEFD by the Institute as a single source of information on New Zealand planted forestry industry. Further research required to complement aspects not picked up by the NEFD report and to inform an NSDS, specifically information on natural forests
Publicly available	▪ NEFD is publicly accessible and freely available	▪ Electronic copies of NEFD only available from 2000 onwards on the MAF website ▪ NEFD targeted to industry experts

The Institute acknowledges that other sources will need to be consulted in order to gain a complete and comprehensive overview of natural and planted forestry in New Zealand. The Institute's dataset does not answer the questions outlined in Section 1.3, but can provide background statistics to support reporting, analysis and argumentation, especially in regards to planted forestry. An example of how the data may be used is presented in Figure 5.

Figure 5 New Zealand's International Planted Forestry Trade
Adapted from SFI, 2010b



Glossary

Glossary	
Planted forest	forest of introduced species and in some cases natural species, established through planting or seeding mainly for production of wood or non-wood goods (FAO, 2006: 80).
Natural forests or Primary forests	forests of native species, in which there are no clearly visible indications of human activity and ecological processes are not significantly disturbed (FAO, 2006: 13).
Roundwood	is defined as 'wood in the rough'. Wood in its natural state as felled or otherwise harvested, with or without bark, round, split, roughly squared or other forms (e.g. roots, stumps, burls, etc.). It may also be impregnated (e.g. telegraph poles) or roughly shaped or pointed. It comprises all wood obtained from removals, i.e. the quantities removed from forests and from trees outside the forest, including wood recovered from natural, felling and logging losses during the period - calendar year or forest year. Commodities included are sawlogs and veneer logs, pulpwood, other industrial roundwood (including pit props) and fuelwood (FAO, 2010).
Roundwood Equivalent (RE)	a common unit used in the forestry industry to measure harvested volumes. 'Roundwood equivalent' in New Zealand is a theoretical measurement that gives the total amount of roundwood necessary for the production of one unit of a stated forestry product with existing technology (Statistics NZ, 2006: 12).

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