NVS ANNUAL REPORT FOR THE 2005-06 YEAR

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1. Number of new records accessed

A total of 43 new data sets were added electronically to NVS in 2005–06 (11 months to end of 30 June 2006; Fig. 1a) with a total of 1455 plots added (Fig. 1b). Major providers of data (Fig. 1a) and types of data (Fig. 1b) are shown over the past 5 years. The large number of data sets added in 2004 (total of 438 data sets) was unusual – this was because of the inclusion of a large number of data sets from grasslands, previously curated by DTZ, in a joint project between Landcare Research and DTZ and funded by the Terrestrial and Freshwater Biodiversity Information Systems (TFBIS) programme.

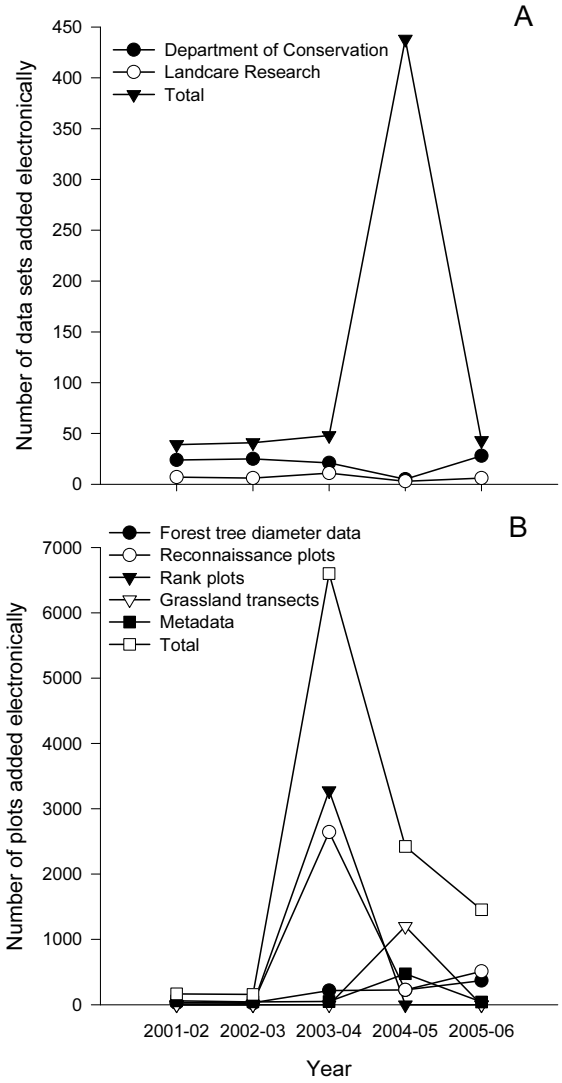

Fig 1. (A) Number of data sets included electronically in the National Vegetation Survey databank per year for the past five years; total and from two major data users. (B) Number of vegetation plots included electronically in the National

Vegetation Survey databank per year for the past five years; total and of four major data types.

2. Significant revisions of data

The National Environmental Research Council (NERC) of the United Kingdom and Landcare Research are funding the three year project 'Tests of competition theory in forests using neighbourhood modelling'. Key Collaborators in this project are Drs. Sabrina Russo and David Coomes (Cambridge University), Drs. Richard Duncan and Susan Wiser (Landcare Research), Dr Richard Barker (Otago University) and Dr. Charles Canham (The Institute for Ecosystem Studies, USA) The funded research relies heavily on permanent forest plot data held in the NVS databank. To allow tree neighbourhoods to be quantified, this project has funded the capture of subplot identity for ~200,000 tagged trees on ~2000 permanent plots. It has also funded a substantial effort to identify and correct errors in recording of tags, species, and tree diameters. This work has resulted in a major increase in the quality of the forest permanent plot data stored in NVS that will benefit not only this project, but all future users of these data.

Through TFBIS project 176 'Enhance existing metadata of the alpine grassland datasets', Claire Newell and Alan Rose have checked and updated the metadata for the alpine grassland transect datasets in NVS that have been measured more than once (42 datasets from 14 alpine areas). During this process they have developed a standard set of key words and resources & methods checklist to use when updating grassland metadata. The checks should ensure that the metadata references all key resources (e.g. base maps, location slides, plot description sheets) and all key citations associated with each dataset. Checks on other alpine grassland transect datasets (the remaining 30 of the 72 datasets) have begun.

3. Maintenance and development activities

New web-based mapping of NVS plots and species distributions has been delivered through a new GeoSpatial Data Integration Portal. The GeoSpatial Data Integration Portal has been developed to bring together the many different types of scientific information about New Zealand's natural environment held by Landcare Research. NVS plot and species distributions can be viewed through the portal at both fine and coarse scales, accommodating varying end-user Internet capabilities. The NVS web site has been further enhanced with a names search mechanism which links NVS species names to the Ngā Tipu o Aotearoa – New Zealand Plants database to provide comprehensive taxonomic details for a particular plant.

A generalised data model for vegetation data has been adapted to meet the needs of the NVS data management system. This allows NVS to readily store a wide range of data structures. The model is publicly available on the NVS website (jointly funded in the FRST OBI "Ecosystem Resilience" with one-off database development project).

4. Web statistics

From 6 July 2004 to 12 June 2006, the NVS web site (http://nvs.landcareresearch.co.nz) was hit 133 784 times: of those that could be traced to origin 33.7% were from New Zealand and Australia, 24.0% were from North America and 7.8% were from Europe. Of an annual total of 43 710 hits on individual pages within the NVS web site, metadata forms that inform browsers about individual

data sets (when, where, how data were collected and by whom, how many plots, etc.) were by far the most frequently sought (23.3% of all page visits). Unsurprisingly the index page to the site was viewed frequently (12.0% of all page visits). Detail about field techniques, manuals and field forms constituted 3.3% of page visits. Pages to facilitate data requests from NVS constituted 2.5% of visits. Pages with information on protocols for use of NVS data and proprietary ownership of data received 1.3% of visits and those concerned with data standards 1.1% of visits. Various documents are available to download from the NVS web site and during 2004–05 and 12 320 documents, listed in Table 1, were downloaded.

Table 1 Number of downloads of documents available on the NVS web site during 2004–05 (compiled using Funnel Web).

Document	Number of hits
Forest permanent plot manual	2460
Reconnaissance plot manual	2102
Grassland survey manual	1867
Maintaining biodiversity information (Wiser *et al*. 2001. *New Zealand Journal of Ecology*)	914
Field guide to use of GPS	743
Adding value to the NVS databank (reprint of Landcare Research contract report)	399
An assessment of the quality of data stored in the National Vegetation Survey database (reprint of Landcare Research contract report)	270
Reconnaissance plot pro-forma data sheet	244
Data standard guidelines for improving the quality of permanent plot data archived in the National Vegetation Survey database (reprint of Landcare Research contract report)	227
Forest tree diameter plot pro-forma data sheet	226
Forest seedling plot pro-forma data sheet	202

5. Data sharing agreements

No new agreements negotiated during 2005–06.

6. Bulk data requests

A total of 47 requests for NVS data were made during 2005–06 (11 months to end of 30 June 2006; Fig. 2a) and a total of 643 data sets were supplied (Fig. 2b). The principal agencies from which there were requests for data (Fig. 2a) and number of data sets supplied (Fig. 2b) are shown over the past 5 years. Bulk data requests have increasingly become a feature of NVS use over the past three years. Large data requests during 2005–06 included:

- Permanent forest plot data, requested by Ministry for the Environment and its contractors to support the national Carbon Monitoring System. This continues a series of requests of a similar nature throughout this project, although scaled down compared with previous years (Fig. 2b);
- Species composition data from throughout low rainfall areas of New Zealand, requested by staff of Landcare Research to support aspects of the "Sustaining and restoring biodiversity" Outcome-based Investment, funded by the Foundation for Research, Science and Technology.

It is possible to interrogate the entire data sets, for example for species distributions. A request of this type during 2005–2006 was from a PhD student requesting distributions of all tree fern species in NVS plots.

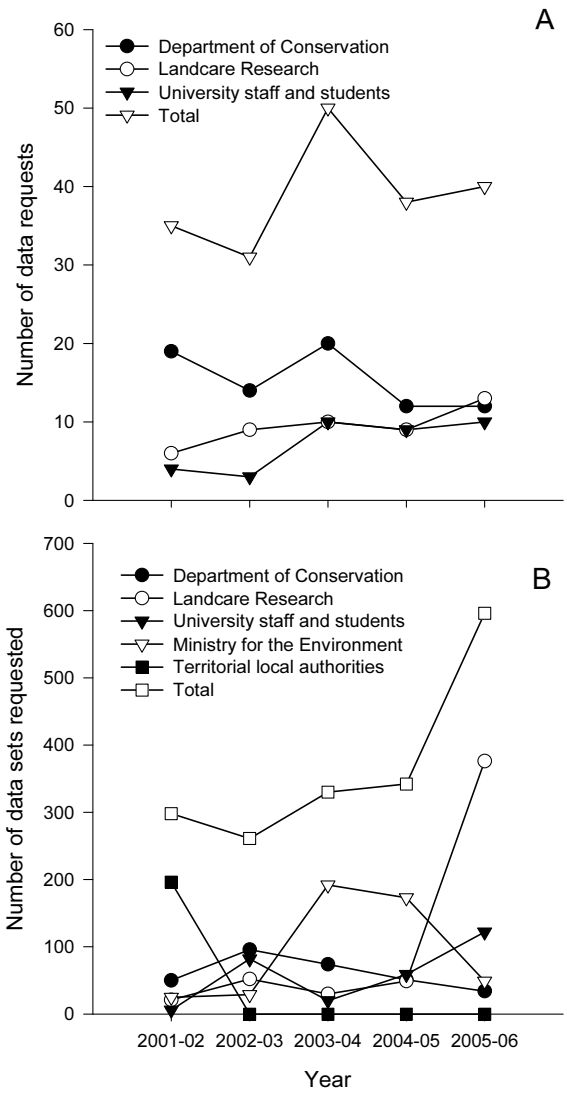

Fig 2. (A) Number of requests for data from the National Vegetation Survey databank per year for the past five years; total and from three major data users. (B) Number of requests for data from the National Vegetation Survey databank per year for the past five years; total and from five major data users.

7. Publications directly associated with the NVS databank

The following publications during 2005–2006 used data derived from the NVS databank:

Bellingham, P.J. & Lee, W.G. 2006. Distinguishing natural processes from impacts of invasive mammalian herbivores. In: Allen, R.B. & Lee, W.G. (eds.) *Biological Invasions in New Zealand*, pp. 323–336. Springer, Berlin.

Bellingham, P.J. & Richardson, S.J. 2006. Tree seedling growth and survival over 6 years across different microsites in a temperate rain forest. *Canadian Journal of Forest Research 36*, 910–918.

Coomes, D.A., Allen, R.B., Bentley, W.A., Burrows, L.E., Canham, C.D., Fagan, L., Forsyth, D.M., Gaxiola-Alcantar, A., Parfitt, R.L., Ruscoe, W.A., Wardle, D.A., Wilson, D.J. & Wright, E.F. 2005. The hare, the tortoise and the crocodile: the ecology of angiosperm dominance, conifer persistence and fern filtering. *Journal of Ecology 93*, 918–935.

Coomes, D.A., Mark, A.F. & Bee, J. 2006. Animal control and ecosystem recovery. In: Allen, R.B. & Lee, W.G. (eds.) *Biological Invasions in New Zealand*, pp. 339–353. Springer, Berlin.

Franklin, J., Wiser, S.K., Drake, D.R., Burrows, L.E. & Sykes, W. 2006 Environment, disturbance history and rain forest composition across the islands of Tonga, Western Polynesia. *Journal of Vegetation Science 17*, 233–244.

Hurst, J.M., Broadbent, H. & McKay, M. 2006. Dealing with common RECCE and Permanent Plot data quality issues during data entry or checking. Version 1. *Landcare Research Internal Report LC0506/128*. At http://nvs.landcareresearch.co.nz/html/0506-128Hurst.pdf.

Husheer, S.W. 2005 Vegetation monitoring, Tararua Forest Park, New Zealand, 1958–85. *Department of Conservation Research & Development Series 212*.

Husheer, S.W., Allen, R.B. & Robertson, A.W. 2006. Suppression of regeneration in New Zealand mountain beech forests is dependent on species of introduced deer. *Biological Invasions 8*, 823–834.

Husheer, S.W. & Frampton, C.M. 2005 Fallow deer impacts on Wakatipu beech forest. *New Zealand Journal of Ecology 29*, 83–89.

Husheer, S.W., Hansen, Q.W. & Urlich, S.C. 2005 Effects of red deer on tree regeneration and growth in Aorangi Forest, Wairarapa. *New Zealand Journal of Ecology 29*, 271–277.

Jiménez-Castillo, M., Wiser, S., Lusk, C.H. Liana representation in woody floras of temperate rainforests declines with increasing altitude. *Journal of Biogeography*, in press.

Newell, C.L. & Leathwick, J.R. 2005. Mapping Hurunui forest community distribution using computer models. *Science for Conservation 251*. 43 p.

Peltzer, D.A., Allen, R.B. & Rogers, G.M. 2005. Dieback and recruitment of the forest dominants *Nothofagus fusca* and *Libocedrus bidwillii*, central North Island, New Zealand. *Science for Conservation 255*. 33 p.

Rogers, G. & Walker, S. 2005 Is *Pittosporum patulum* Hook. f. threatened by pest herbivory in eastern South Island, New Zealand? *New Zealand Journal of Ecology 29*, 11–28.

Wiser, S.K. & Allen, R.B. 2006. What controls invasion of indigenous forests by alien plants? In: Allen, R.B. & Lee, W.G. (eds.) *Biological Invasions in New Zealand*, pp. 195–209. Springer, Berlin.

8. Other significant developments

The standardized methods for vegetation sampling and electronic data storage promoted by NVS have provided examples for assessing the feasibility of New Zealand's national bird monitoring network (Spurr 2005), providing guidelines for data

storage for shoreline sampling in Ministry for the Environment's "*Lake Manager's Handbook*" (James *et al*. 2005), and providing a basis for indicators in the Department of Conservation's National Heritage Management System (Lee *et al*. 2005).

Appendix 1. Listing of new data sets incorporated into NVS, July 2005 – June 2006.

Boundary Stream 2006; Recces (electronic and plotsheets)
Boundary Stream Mainland Island 2004-05 Mixed; -diameters and understorey (electronic and plotsheets)
Boundary Stream Scenic Reserve 1999; - recce, diameters and understorey (electronic and plotsheets)
Chatham Id – Pitt Id Excl 2002; Recce, Diameter, Understorey (plotsheets only)
Coastal Turfs of New Zealand 2003- 2004; Recces (electronic and plotsheets)
Cold Creek 2001; Recce, Diameter, Understorey (plotsheets only)
Cold Creek 2005; Recce, Diameter, Understorey (plotsheets only)
EBEX – Cape Jackson 2005; Recce, Diameter, Continuous Cover, Text File
EBEX – Hinewai 2005; Recce, Diameters, Continuous Cover, Text file (electronic)
Franz Josef Chronosequence 2002; Recce (plotsheets only)
Hurunui 2000-01 ; Recce, Diameter, Understorey (electronic)
Lillburn 1998; Recce, Diameter, Understorey, Tree cores (plotsheets only)
Lords River Reconnaissance Survey 2005; Diameters (electronic and plotsheets)
Maharara Exclosure and Control Plots 2003; Diameter, Understorey, Browse (plotsheets only)
Manawahe 2005; Recce, Diameter, Understorey (plotsheets only)
Matemateaonga 1 2004; Diameter, Understorey, Browse (plotsheets only)
Maungatautari, Mount 2004; Recce, Diameter, Understorey
Moutohora (Whale Island) Grassland Plots 1992; (plotsheets only)
Moutohora (Whale Island) Vegetation Plots 1991; Recce, Diameter, Understorey (plotsheets only)
Moutohora (Whale Island) Vegetation Plots 1993; Recce, Diameter, Understorey, Grassland (plotsheets only)
Moutohora (Whale Island) Vegetation Plots 2003; Recce, Diameter, Understorey (plotsheets only)
Mt Bruce kamahi 2005; Recce, Diameter, Understorey, Seedling Ratio Index (plotsheets only).
Palmerston North City Council Exclosures 2005; Recce, Diameter, Understorey (plotsheets only)
Peg Creek Exclosure 2005; Recce, Diameter, Understorey (plotsheets only)
Pencarrow 2004-05; Recce, Diameter, Understorey (electronic and plotsheets)
Pokeka 2003; Diameter, Understorey, Browse (plotsheets only)
Rotorua Lakes 1992; text file update
Rotorua Lakes 1999; text file update
Stafford 20m x 20m plot survey 2005; Recce, Diameter, Understorey, Browse (plotsheets only)
Tararua, Roaring Stag 1985; Recce, Diameter, Understorey (electronic and plotsheets)
Tararua, Roaring Stag 2004; Recce, Diameter, Understorey (electronic and plotsheets)
Tūhoe Rimu Removal Study 2004; Recce, Diameter, Text File
Urewera North 1998; Recce, Diameter, Understorey (electronic)
Waihaha Forest Composition Data 2005; Recce
Waikare Exclosures 1985-86; Diameter, Sapling (plotsheets only)
Waipoua 2004; Recce, Diameter, Understorey (electronic and plotsheets)
Waitaanga Exclosure Plots 2004-05; Recce, Diameter, Understorey (plotsheets only)
Waitutu Landcare Projects - Fertiliser Experiment 2004-2005; Recce, Diameters, Understorey (electronic and plotsheets)
Wakelings Hut Exclosure & Control 2003; Diameter, Understorey and Browse (plotsheets only)
Wellington Exclosures 2004-05; Recce, Diameter, Understorey (electronic and plotsheets)
Wellington Land District 2003-04; Recce, Diameter, Understorey (electronic and plotsheets)
Wellington Land District 2004-05; Recce, Diameter, Understorey (electronic and plotsheets)
Wither Hills 2003; Recce, Diameter, Understorey (plotsheets only)

DOC Nelson (Simon Moore) has provided 2006 remeasurement data for the Molesworth height/frequency transects. They also provided electronic copies of previous measurements from 1985 and 1989.