

NVS ANNUAL REPORT FOR THE 2006–07 YEAR

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1. Number of new records accessed

A total of 126 new data sets were added electronically to NVS in 2006–07 (to 30 June 2007; Fig. 1a) with a total of 3870 plots added (Fig. 1b). Major providers of data (Fig. 1a) and types of data (Fig. 1b) are shown over the past 5 years. The increase over 2005–06 is due principally to investment by the Terrestrial and Freshwater Biodiversity Information Systems (TFBIS) programme in two projects: (i) to incorporate outstanding data sets collected by the Department of Conservation, and (ii) to incorporate data sets collected by some pre-eminent researchers, especially from universities and research institutes.

Advances made in the NVS databank resulted in it becoming the repository for all standard vegetation data collected by the Department of Conservation, implemented through a Standard Operating Procedure that became effective in October 2006.

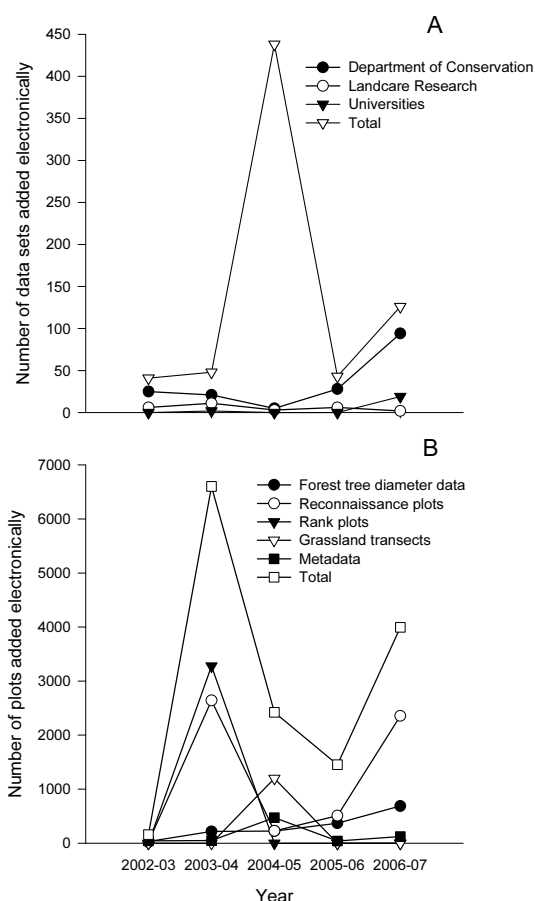


Fig 1. (A) Number of data sets included electronically in the National Vegetation Survey databank per year for the past five years; total and from two major data users. (B) Number of vegetation plots included electronically in the National Vegetation Survey databank per year for the past five years;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

2. Significant revisions of data

We captured the subplot identity for c. 240,000 measurements of tagged trees on c. 3000 measurements of permanent plots. We have continued to identify and correct errors in recording of tags, species, and tree diameters. This work builds on an initiative begun in 2005–06; a three year project ‘Tests of competition theory in forests using neighbourhood modelling’, funded by the National Environmental Research Council (NERC) of the United Kingdom and Landcare Research.

3. Maintenance and development activities

During 2006–07, a purpose-built archive for the physical component of the NVS databank (copies of plot sheets, maps, aerial photographs, slides etc.) was completed and is now in use. This dedicated facility provides restricted and secure access (only NVS IO staff members have access), has high-quality climate control, ample space for expansion as NVS continues to grow (e.g., through TFBIS-funded projects), computer facilities, and ample workspace. Previously, NVS physical records were stored in the Allan Herbarium, where space was limited, the collection was fragmented, and security of access was not guaranteed. The new archive, within the Landcare Research library at Lincoln, represents a substantial improvement in the quality of the facilities used by the NVS databank and was funded by Landcare Research’s capital expenditure budget.

One of the important areas of work associated with the NVS databank IO is to help those who collect plot data to ‘raise their game’. This is especially important for field staff in the Department of Conservation. Use of temporary staff, high field staff turnover and limited budgets often result in the quality of field data being compromised and hence limits its utility. For this reason, a milestone in the NVS IO focusses on developing standards and guidelines for data quality and security and working with DOC to ensure they are implemented. To this end we have made three significant achievements during 2006–07. The first was publication on the NVS website of guidelines for dealing with data quality issues when entering and correcting data. This was motivated by the need to ensure that data entry and corrections carried out by DOC and Ministry for the Environment (MfE; its Carbon Accounting System) is done to the same high standard we use internally. The second was our contracted support to help DOC develop their training module for vegetation monitoring. Formal training has been infrequent in the past and as part of the developments associated with DOC’s Natural Heritage Management System a commitment to regular delivery of training courses has been made. Third, presentations regarding the NVS databank were a significant component of a national plant inventory and monitoring workshop run by DOC in Christchurch in July 2006.

4. Web statistics

From 30 June 2006 to 30 June 2007, the NVS web site (<http://nvs.landcareresearch.co.nz>) was hit 257,401 times. This was a 192% increase over the number of times the web site was hit the previous year. Of the current year’s hits that could be traced to origin 21.8 % were from New Zealand and Australia, 51.3 % were from North America and 4.33 % were from Europe. Various documents are available to download from the NVS web site and during 2004–05 and 15,407 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 downloads
Grassland survey manual	3132
Reconnaissance plot manual	2900
Forest permanent plot manual	2541
Field guide to use of GPS	1038
Maintaining biodiversity information (Wiser <i>et al.</i> 2001. <i>New Zealand Journal of Ecology</i>)	899
An assessment of the quality of data stored in the National Vegetation Survey database (reprint of Landcare Research contract report)	310
Reconnaissance plot pro-forma data sheet	273
Forest tree diameter plot pro-forma data sheet (nvsstemdiam (233) and stemdiam (13))	246
Forest seedling plot pro-forma data sheet	244

An increasing number of websites, both within New Zealand and internationally provide descriptions of, and links to, the NVS databank. Internationally, recently discovered links include INTUTE (a free online service providing access to Web resources for education and research, created by a network of UK universities and partners); Biology Browser (a free web site produced by Thomson Scientific, USA offering resources for the life sciences information community), the metadata portal of NBII (National Biological Information Infrastructure, USA) and Zipcode Zoo, a website that collates biodiversity data internationally to make it available to armchair naturalists.

5. *Data sharing agreements*

Susan Wiser, Jerry Cooper, and Nick Spencer hosted a workshop in North Carolina, USA during April 2007 to initiate the development of a commonly agreed data exchange format for vegetation data between major international vegetation database groups, including those from the Netherlands, Germany, Spain, Australia, New Zealand, and USA. The workshop was hosted by Duke University's National Evolutionary Synthesis Center (NESCent) and travel for the twelve attendees was funded a combination of TFBIS, ITIP, and Capability funding. Good progress was made during the 4 days the group was together with goals, concepts, terminology and a conceptual schema all being agreed upon by the end of the workshop. Two key participants volunteered to finish the first draft of the schema over the next few months. The results of this schema workshop will benefit New Zealand on several levels. First, this solidifies the position of New Zealand as a key player in the international vegetation data community. Second, within New Zealand, this is a

necessary the first step in facilitating data exchange among major databanks that include vegetation data (i.e. PSP of ensis.jv, LUCAS of MfE). Third, this is a necessary first step in sharing of vegetation data internationally with the flow on effect of increased collaborations between NZ vegetation scientists and those elsewhere in the world.

In late 2006, Nick Spencer gave a presentation to DOC head office on NVS and the NVS Metadata system. He also covered NVS TFBIS-related work, such as the vegetation exchange schema and direct access to NVS data for DOC staff.

Larry Burrows and Hazel Broadbent authored the internal report “Review of National Vegetation Survey Databank (NVS) Protocol and Data Access Levels”. This report was reviewed by DOC and by Pam Pye, the Landcare Research legal advisor. This report documents the finding, based on user surveys, that the existing protocol is adequate, but actions could be taken to encourage data providers to be more open about the use of their data (e.g. contacting data providers annually to find if they are willing for their data to no longer require permission to be used; providing an annual report to data providers (regardless of the access level they have set on their data) of who has requested the use of their data). The report is posted on the NVS website and the recommendations are being actioned.

6. *Bulk data requests*

A total of 58 requests for NVS data and metadata were made during 2006–07 (11 months to end of 30 June 2006; Fig. 2a) and a total of 851 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. The major agencies requesting data (Department of Conservation, Landcare Research, and university staff and students) have made similar numbers of requests over recent years; the large increase during 2006–07 derived from requests private contractors.

Bulk data requests have increasingly become a feature of NVS use over the past three years. The MfE made bulk data requests from 2002 in conjunction with the 5-year Carbon Monitoring System project which entailed, in part, remeasurement of existing forest plots with data stored in the NVS databank. This part of the project concluded in early 2006 so no further data request were made during 2006–07 (Fig. 2b); data from permanent plots in indigenous forests and shrublands measured in the Carbon Monitoring System will be stored in, and available from, the NVS databank in the near future. Large data requests during 2006–07 included permanent forest plot data, 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;
- assist the investigation “Does environmental representation indicate species security?” (Cross-departmental Research Pool Project #2, administered by the Department of Conservation).

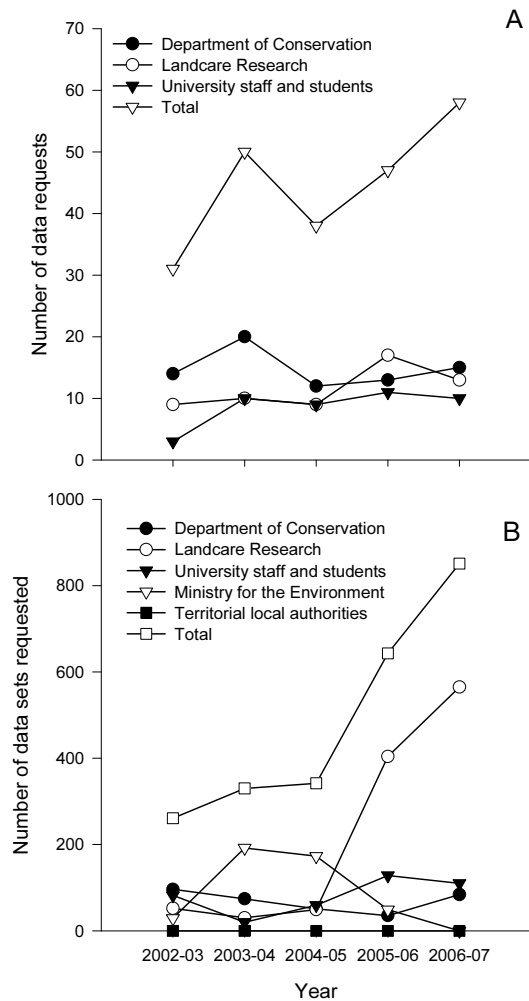


Fig 2. (A) Number of requests for data from the National Vegetation Survey databank per year for the past five years; total and from three major data users. (B) Number of requests for data from the National Vegetation Survey databank per year for the past five years; total and from five major data users.

7. Publications directly associated with the NVS databank

The following publications during 2006–07 used data derived from the NVS databank:

- Brown, C.S., Mark, A.F., Kershaw, G.P. & Dickinson, K.J.M. 2006 Secondary succession 24 years after disturbance of a New Zealand high-alpine cushionfield. *Arctic, Antarctic, and Alpine Research* 38: 325–334.
- Coomes, D.A. & Allen, R.B. 2007 Mortality and tree-size distributions in natural mixed-age forests. *Journal of Ecology* 95: 27–40.
- Duncan, R.P., Ruscoe, W.A., Richardson, S.J. & Allen, R.B. 2006 Consequences of deer control for Kaweka mountain beech forest dynamics. Unpublished Landcare Research contract report LC0607/021. 28pp.
- Elith, J. & Leathwick, J. 2007 Predicting species distribution from museum and herbarium records using multiresponse models fitted with multivariate adaptive regression splines. *Diversity and Distributions* 13: 265–275.

- Guisan, A., Graham, C.H., Elith, J., Huettmann, F. & the NCEAS Species Distribution Modelling Group. 2007 Sensitivity of predictive species distribution models to change in grain size. *Diversity and Distributions* 13: 332–340.
- Hurst J.M. 2006 Temporal and spatial patterns of tree mortality in a montane New Zealand mountain beech forest. A thesis submitted in partial fulfilment of the requirements for the Degree of Master of Science, Lincoln University.
- Husheer, S.W. 2006 Changes to the forests of Egmont National Park 1977–2001. *Department of Conservation Research & Development Series* 257, 1–24.
- 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. 2007 Introduced red deer reduce tree regeneration in Pureora Forest, central North Island, New Zealand. *New Zealand Journal of Ecology* 31: 79–87
- Jiménez-Castillo, M., Wisser, S. & Lusk, C.H. 2007 Liana representation in woody floras of temperate rainforests declines with increasing altitude. *Journal of Biogeography* 34: 163–168.
- Miller, A.L. 2005 Untangling spatial distribution patterns of the invasive herb *Hieracium lepidulum* Stenstr. (Asteraceae) in a New Zealand mountain landscape. Thesis submitted in partial fulfilment of the requirements for the Degree of Ph.D., Lincoln University.
- Novotny, V., Drozd, P., Miller, S.E., Kulfan, M., Janda, M., Basset, Y. & Weiblen, G.D. 2006 Why are there so many species of herbivorous insects in tropical rainforests? *Science* 313: 1115–1118.
- Russo, S.E., Wisser, S.K. & Coomes, D.A. 2007 Growth–size scaling relationships of woody plant species differ from predictions of the Metabolic Ecology Model. *Ecology Letters* 10, in press.
- Steffens, K. & Hawcroft, A. 2006 The impact of red deer (*Cervus elaphus scoticus*) in the Western Ruahines: evidence from enclosure plots. Wanganui Conservancy Monitoring Report. Unpublished report for the Department of Conservation, Wanganui Conservancy.
- Walther, G., Gritti, E.S., Berger, S., Hickler, T., Tang, Z. & Sykes, M.T. 2007 Palms tracking climate change. *Global Ecology and Biogeography*, OnlineEarly Articles).
- Wisser, S.K. & R.P. Buxton. 2007 Context matters: matrix vegetation influences native and exotic species composition on habitat islands. *Ecology* 88, in press.

8. Other significant developments

New Zealand is a member of the Montreal Process Criteria and Indicators Working Group which began in 1993. The first country report on progress made was published in 2003, by MAF. This report was an initial step in reporting on progress covering a small number of indicators. The NVS databank featured prominently in the 'Statistical Reliability' section in regard to Indicator 7.4: Capacity to measure and monitor changes in the conservation and sustainable management of forests. <http://www.maf.govt.nz/forestry/montreal-process/nz-country-rpt-2003.pdf>.

In March 2006, the MFE's Climate Change office produced New Zealand's Fourth National Communication under the UNFCCC. This report updates New Zealand's progress towards its commitments under the UNFCCC and towards implementation of the Kyoto Protocol and includes NZ's Report on the Global Climate Observing System (GCOS). NZ has built up an archive of systematic atmospheric, oceanic and terrestrial observations. Details of these observations are tabulated in this report made in accordance with the UNFCCC Reporting Guidelines on Global Climate

Change Observing Systems. The NVS databank features prominently in Table 14: Available homogeneous data sets for sustained terrestrial and ecological observations. <http://www.climatechange.govt.nz/resources/reports/national-communication-2006/html/page19.html>.

A series of permanent forest plots on and near Mt Fyffe, near Kaikoura, were remeasured in early 2007, for the first time since they were established in 1980. The original data from these plots are in the NVS databank and, once checked, the data from the remeasurement will be entered into the databank. The forests are significant in having high densities of large podocarps, coupled with high soil fertility which has allowed weed invasion. This remeasurement will provide an increase in accessible data from a part of the country and forest type for which little such time-series data exists. This project was jointly funded by the NVS databank IO and the "Increase natural ecosystem resilience to weeds" IO, with additional funding from the Department of Conservation's Research, Development and Improvement Division.

Susan Wiser organised a symposium on Bioinformatics for the 49th annual conference of the International Association for Vegetation Science in Palmerston North, 12-16 February. Speakers included representatives from New Zealand, Czech Republic, Japan, France, Italy, the Netherlands and the United States. This symposium helped raise awareness of NVS internationally and allowed us to further engage with the international vegetation databanking community to extend our user base internationally.

Appendix 1. Listing of new electronic data sets incorporated into NVS, July 2006 – June 2007.

Anchor Island 2001: Diameter, understorey, recce
Aorangi – Kawakawa exclosure 1981: Diameter, understorey, recce
Aorangi – Kawakawa exclosure 1997: Diameter, understorey
Aorangi – Pararaki exclosure 1982: Diameter, understorey, recce
Aorangi – Pararaki exclosure 1997: Diameter, understorey
Blenheim Ecological District PNAP survey 2001: Recce
Central Otago 1967–68: Recce
Chatham Islands: Pitt Island exclosure 2002: Diameter, understorey, recce
Cromel forest exclosures 1975: Diameter, understorey
Cromel forest exclosures 1981: Diameter, understorey
Fescue tussock survey 1988–1989: Recce
Flaxbourne Ecological District PNAP survey 2001–02: Recce
Fox Glacier 2004 (Robin Mitchell PhD data): Recce
George Sound exclosures 1980: Diameter, understorey
Godley River 2003 (Robin Mitchell PhD data): Recce
Grasmere Ecological District PNAP survey 2001: Recce
Hihitahi Forest Sanctuary 2004: Diameter, understorey, recce
Hillersden Ecological District PNAP survey 2001: Recce
Hope River 2000: Recce
Hope River vegetation plot survey 2006: Diameter, understorey, recce
Kapiti Island seedlings 1994–95: Understorey
Kapiti Island seedlings 1995–96: Understorey
Kapiti Island seedlings 1998: Understorey
Kapiti Island seedlings 1999: Understorey
Kaweka – Lotkow exclosure 1982: Diameter, understorey, recce
Kaweka – Mangatainoka forest exclosure 1982: Diameter, understorey, recce
Kaweka – Te Puke exclosure 1982: Diameter, understorey, recce
Lake Thomson 2002–03 (Robin Mitchell PhD data): Recce
Manawahe Ecological Corridor 2005: Diameter, understorey, recce
Mapara 1989: Recce
Mapara 1995: Recce
Maratoto 1982: Recce
Matemateaonga 1 2004: Diameter, understorey
Mokau River: kahikatea bend exclosure 2006: Diameter, understorey, recce
North-west Nelson exclosures 2002: Diameter, understorey
Nihoniho exclosure 2007: Diameter, understorey, recce
No-Man vegetation sequences 1971: Recce
Northern Kaimai–Mamaku Forest Park 2006: Diameter, understorey, recce
Okarito 1992: Recce
Orongorongo 1978: Diameter
Orongorongo 1995–97: Diameter
Orongorongo 2006: Diameter
Orongorongo exclosures 2002–03: Diameter, understorey, recce
Peg Creek exclosures 2005: Diameter, understorey, recce
Pelorus exclosures 1983–84: Diameter, understorey, recce
Pelorus exclosures 2001: Diameter, understorey, recce
Pokeka 2003: Diameter, understorey
Pureora 2001–03: Diameter, understorey, recce
Red Hills forest 1975: Recce
Red Hills scrub 1980: Recce
Red Hills scrub 1987: Recce
Red Hills tussock 1975–81: Recce

Rotoiti Nature Recovery Project communities 1998–99: Recce
Rotoma Forest Health Assessment 2006: Diameter, understorey, recce
Ruahine (Tukituki) 1983: Diameter, understorey, recce
Ruahine exclosures – Maropea Forks exclosures 2001: Diameter, understorey, recce
Ruahine exclosures – Waterfall Hut exclosures 2001: Diameter, understorey, recce
Ruahine North/Kaweka Kaimanawa 1983: Diameter, understorey, recce
Ruahine North/Kaweka Ruahine 1983: Diameter, understorey, recce
Ruahine, North 1983: Diameter, understorey, recce
Southland alluvial floodplain 2002–2003: Diameter
Tawharanui Regional Park 2005: Understorey
Three Kings Islands 1996: Recce
Urewera North exclosures 1997: Diameter, understorey
Waipapa 1983–84: Recce
Wellington Land District 2006–07: Diameter, understorey, recce
Whakapohai permanent plots 2007: Diameter, understorey, recce
Whanganui National Park: Baldy's Clearing Exclosure 2006: Diameter, understorey, recce
Whanganui National Park: Mangapurua 2002: Diameter, understorey, recce
Whanganui National Park: Mangawaiiti East 2006: Diameter, understorey, recce
Whanganui National Park: Mangawaiiti exclosure 2006: Diameter, understorey, recce
Whanganui National Park: Matemateaonga 2001: Diameter, understorey, recce
Whanganui National Park: Tangahoe 2006: Diameter, understorey, recce
Wither Hills Ecological District PNAP survey 2002: Recce