Review of National Vegetation Survey Databank (NVS) Protocol and Data Access Levels

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Summary

Project

A significant proportion of data held in the National Vegetation Survey (NVS) databank are classified as conditional access (Level 2), and that presents apparent difficulties for some data users. The ability to access and process large volumes of electronic data continues to improve. It is timely to review the current protocol regarding access to the NVS databank and restrictions set by data providers and owners to ensure that the protocol is still adequate. For that reason a review of current NVS Protocol Policy is useful, and here we have focused on ways to improve accessibility to Level 2 data.

Main Findings

It is always in the interests of national archives such as NVS to balance the rights of the user and provider to maximise public good. The quantity of data held under Level 2 conditional access control is substantial (currently 41% of 945 datasets), and it is understandable data users find it onerous to make contact with multiple individuals when they have large data requests.

Against that a number of users and providers, as respondents to a questionnaire on the topic, felt the problem was overstated. There was no consensus among data providers regarding allowing open access of Level 2 datasets for some uses but not others, or on how datsets could be sensibly subdivided. This implies that development of a finer access-level scale is not a workable solution. Complications arise in determining at what point multiple-dataset analyses become so large as to make the contribution of any one dataset minor enough to warrant open access and, also, how the anonymity of landowners can be ensured.

A better solution is to develop policies that will encourage owners/providers of Level 2 datasets to change the access to Level 1. The majority of data providers simply wish to know 'who is using their data', and 'what uses are being made of those data'.

It is expected that enacting the recommendations outlined will result in a significant reduction in the proportion of data residing as Level 2 and will, while supporting the interests of data providers, result in improved accessibility and reduced turnaround time for requesters and users of large multiple datasets.

Recommendations

- So that requesting permission to use Level 2 datasets is as easy as possible for data users, the NVS database administrator should ensure that contact details for all data providers/owners are updated annually (see below).
- A simple example form letter could also be provided to data users to illustrate what sort
 of information is typically required by data providers to ensure rapid release of Level 2
 data.
- The NVS website should provide a more complete explanation of why data providers restrict access to some datasets, so data users understand why the request process is required.

- It appears that creating finer divisions of data access levels is not practical and not seen as desirable by data providers, so this option should no longer be explored.
- NVS curators should endeavour to maximise the rate of conversion of datasets having Level 2 Access to Level 1 Access. This could be aided by the following actions:
 - Regular (annual) notices to Level 2 owners offering to shift their data to Level 1 (contact details can be updated at the same time)
 - Targeting the providers of data collected prior to 2000 to see if their primary use has been completed
 - Offer to notify data providers when their data have been requested, even if data have been shifted to Level 1 access, and if this approach meets favour with data providers, develop it as a standard practice for data requests at all levels. This notification would be done annually at the same time as contact details are updated (rather than at every request)
 - Determine whether owners/providers of multiple surveys that have been remeasured would be willing to move some of the earlier survey data to Level 1 access while still retaining Level 2 access for remeasurement survey data collected more recently.
- Propose that DOC develop internal guidelines to address the issue of dataset migration
 from Level 2 to Level 1. Due to the Department's system of responsibility it is possible
 for a Technical Support Manager who has little knowledge of collection or use of any
 dataset to require Level 2 access, but not know when the need for that access level has
 passed.

1. Introduction

Landcare Research was funded by FRST to ensure that, by June 2007, the National Vegetation Survey (NVS) databank IP protocols have been revised and updated, including data sharing and use agreements to encompass consequences of changing technologies. By June 2007, these agreements will give end-users the confidence to store data in NVS. This is funded via FRST Intermediate Outcome 5: National Vegetation Survey Databank within the Ecosystem Resilience Outcome-Based Investment.

2. Background

The National Vegetation Survey Databank (NVS) is a physical archive and computer databank containing records from approximately 45 000 vegetation survey plots—including data from over 12 000 permanent plots. NVS provides a unique record, spanning more than 50 years, of indigenous and exotic plants in New Zealand's terrestrial ecosystems, from Northland to Stewart Island and the Kermadec and Chatham islands. A broad range of habitats are covered, with special emphasis on indigenous forests and grasslands.

The original surveys were conducted by the New Zealand Forest Service, Department of Lands & Survey, and the DSIR Botany Division. Ongoing surveys and research by the Department of Conservation, regional councils, universities and Landcare Research are regularly providing new data to NVS. Such widely sourced information collated in one databank is part of the value of NVS to New Zealand.

In 1998 the Foundation for Research, Science and Technology accorded NVS the status of a Nationally Significant database, and since 1999 has provided funding for its upkeep and maintenance. Additional funding for incorporation of new datasets archived alongside NVS data is provided by the Department of Conservation, Public Good Science Fund research programmes, the Ministry for the Environment and other agencies.

2.1 The NVS protocol

As advances in technology have simplified storage and transfer of electronic data, data access ownership and intellectual property rights have emerged as issues worldwide (e.g. Frankel 1999). In 1998 staff that curate the NVS databank developed a data-access policy that attempted to strike a balance between making data freely available and protecting the rights of data providers. The databank does not 'own' data; rather it serves as an intermediary between data providers and data users (cf. Nash 1993).

Data providers can set conditions of use. These are:

• Level 1 (Open Datasets) No limitation on availability of data. The provider puts no conditions on use of the data.

- Level 2 (Conditional Datasets) The existence of these data will be shown on data listings, but use is restricted by the provider. Written approval must be obtained from the provider before data will be supplied.
- Level 3 (Reserved Datasets) Confidential or commercially sensitive (the existence of data will not be advertised; they will be archived in NVS predominantly for data security).

In turn, data users agree to a set of obligations that govern use of data (e.g. concerning citation, provision of data to third parties).

Since 1998, technology has continued to change at a rapid rate and the ability to access and process large volumes of electronic data has increased substantially. It is timely to review the current protocol regarding access to the NVS databank and restrictions set by data providers and owners to ensure that it is still adequate. A recent survey of the needs of the users of NVS (Burrows et al. 2004) identified a number of issues relating to accessibility of data. In particular, users found the process of obtaining permission from Owners of Level 2 (Conditional Access) data to be cumbersome. This is particularly true for those data users that amalgamate many datasets into broad analyses. In such cases, users must request permission from multiple data providers or owners. Yet as the contribution of any one dataset may be minor, only a small proportion of any one dataset may be being used (e.g. distribution information on an individual species), and data from individual plots, plot sites or owner information will not be able to be identified in presentation of results. It was recommended that the automatic movement of data from more to less restricted access levels be investigated, and that better explanations as to why data access was restricted be provided with the metadata provided on the NVS website.

2.2 Existing legislative framework

Details of the legal status of data deposited to NVS have been reviewed in a case study by Burrows and Mason (2005). Their key findings are summarised below.

In New Zealand, ownership and intellectual property rights to the type of data considered here can be divided into two categories: 'Legal Rights' and what we call 'Associated Party Expectations'.

Legal Rights are mostly addressed in New Zealand law by the Official Information Act 1982, Privacy Act 1993, Copyright Act 1994, and other legal conventions such as the law of Contract.

Associated Party Expectations relate to the expectations of people and organisations with an interest or association with the information and which (for professional reasons) should continue to remain connected with the information in some manner. They are the individuals and organisations who created or collected the data, managed it, and analysed it, who understand it, its context, and its limitations. Their expectations are not recognised in law, other than as owners of any possible 'Intellectual Property', but their support is essential for databasing initiatives to ensure complete metadata and valid reuse of data. It is essential to consider incentives to motivate them to share the data that they control.

Landcare Research is also governed in its requirements to make information publicly available. There is a basic expectation that publicly funded information, including research data, should be in the public domain, but there always remain issues around ownership and

intellectual property rights. Landcare Research is committed under the Crown Research Institutes Act 1992 to provide information/data to improve New Zealand's management and understanding of its environment. As a result, its own data is managed with that understanding, but Landcare Research also recognises it may act as custodian of data owned by other agencies who determine terms and conditions for access (Landcare Research internal policy statement, June 1999).

It is a fundamental basis for managing a databank such as NVS that although there may be an expectation that data, often collected as public-good research by publicly owned organisations, should be made freely available under the Official Information Act, it is important for the sake of trust in the databank, ongoing provision of quality data, and the needs of users, to ensure the interests of data depositors are upheld. Without their goodwill, motivation and support there would be no data and supporting metadata for users to access.

Along with the increase in multiple dataset requests by data users there are increasing complications relating to data ownership and provision arrangements between data collectors and landowners. Datasets from multiple tenures (often public and private), datasets from public land that has become private, and datasets collected by public organisations from private land are all becoming more common.

As landowners become more familiar with the legislation and exercise their rights under the Privacy Act 1993, contractural arrangements and expectations of associated parties become complex. That may become an increasingly important reason to make data access more restricted.

3. Objectives

The objectives of this review were to gather feedback from data providers and owners and data users to allow the following questions to be addressed:

- Why do data providers and owners choose to limit data access?
- Under what circumstances/conditions would data providers/owners allow automatic progression of data from Level 2 (conditional access) to Level 1 (open access)?
- Is it possible to split access Level 2 data into more accessible sub-levels based on how the data are to be used?

Throughout this report, data owners and providers are grouped together although they may or may not be the same person. For instance, data providers in the Department of Conservation (DOC) are normally the individuals responsible for primary data collection. While DOC itself is the owner, the person responsible for approving access to those data will often be the Technical Support Manager in each Conservancy (not necessarily the primary data collector), or their representative. In that case, the identity of the collector, the provider, and the owner are recorded in the NVS metadata.

4. Methods

An analysis of NVS datasets was carried out to determine their distribution across the three access levels.

Then, a subset of Level 2 dataset owners were surveyed and asked to respond to a questionnaire addressing issues related to Level 2 datasets and their promotion to Level 1 (Appendix 1). They represent a number of organisations, but the majority originated from the DOC and Landcare Research. Other owners of Level 2 data from universities, regional authorities and environmental consultancies were also polled. Questionnaires were sent out in April 2006 and answers received by May 2006. A total of 16 individuals surveyed returned questionnaires.

5. Results

The NVS databank currently holds data from 945 surveys. In each survey, multiple aspects of the vegetation may have been measured (e.g. total composition, measurements on individual trees, counts of seedlings and saplings by species) and are stored in separate data tables. Some surveys are remeasurements of permanent plots established in earlier surveys.

Of these, 57.5% (545 surveys) are designated as Level 1 access, 41.0% (387 surveys) are designated as Level 2 access, and 1.5% (13 surveys) are designated as Level 3 access. The breakdown of ownership of Level 2 datasets is 51% owned by DOC, 32% owned by Landcare Research, 6% owned by private individuals, 6% owned by universities or museums, 4% owned by regional and district councils, and 1% owned by the Ministry of Agriculture and Forestry (MAF) or the Ministry for the Environment (MfE).

Respondents to the questionnaire were well represented across the data ownership classes with 50% from DOC, 32% from Landcare Research, 6% private, 6% university, and 6% from a district council. As well, 64% were both data providers and data users, and 25% also considered themselves database managers or database-to-database users—meaning that many individuals who are data providers are well positioned to understand the needs of users.

5.1 Why do data providers and owners choose to limit data access?

Many collectors of primary data (50%) wish to retain control of these data while they are still being used for their primary collection purpose, while 62.5% of respondents to the questionnaire wish to know who is using these data, and for what purpose. One DOC staff member wanted to know who was using a particular dataset to ensure that local conservation managers were made aware of analyses of data collected from areas they manage, particularly if these could inform management decisions.

Forty-four percent of respondents retain Level 2 to avoid these data being incorrectly interpreted. A substantial number (31%) wished to participate in any use of these data.

Because vegetation plot data tend to be complex, raw data often require interpretation by data collectors.

Some respondents also wished to protect the identity of landowners for sites where plots occur (19%). That may become an increasingly important reason to make data access more restricted as landowners exercise their rights under the Privacy Act 1993. A small group (13%) thought a good reason to insist on Level 2 access was that it 'may contain location information of endangered species'. Interestingly, no respondents said they retained Level 2 access because of commercial sensitivity.

5.2 Under what circumstances/conditions would data providers/owners allow automatic progression of data from Level 2 (conditional access) to Level 1 (open access)?

There was no clear consensus among data owners or providers about how, or even whether, data should automatically progress from Level 2 to Level 1 access. Some providers/owners never expect to have their data migrate from one class to another, and only one respondent thought that an automatic progression after a fixed time period should be considered.

Some (31%) agreed that progression from Level 2 to Level 1 should occur after data have fulfilled their initial use, and 25% agreed that the access level could change when their personal circumstances changed (changed position or job etc.).

With DOC data, however, when an individual listed as the owner or person responsible for any data has moved on, another person would fill the equivalent role, so although there is no change to the data ownership, there is a change to the registered name of the DOC person responsible within the NVS metadata.

A number (38%) of respondents felt it was a good idea for NVS staff to distribute annually a list of Level 2 datasets held in their name, to determine whether these datasets could be moved from Level 2 to Level 1.

5.3 Is it possible to split access Level 2 data into more accessible sub-levels based on how the data are to be used?

There was no clear consensus, or majority support for any option proposed in the questionnaire relating to splitting Level 2 into sub-levels. The largest group (38%) of respondents felt that Level 2 datasets should not be partitioned into more or less accessible classes based on the nature of the intended use.

Almost a third (31%) would allow open access if the analyses did not identify individual plots or sites, while 25% would allow open access if only a subset of the dataset was being used in combination with data from other datasets and did not identify individual sites by name or location. In such an instance, the percentage of the dataset that could be provided ranged from 10 to 50%, although the basis for deciding what constitutes any fixed percentage of a dataset was not clear.

Although a large proportion of Level 2 data is owned by DOC, most (80%) of the DOC respondents also held the view that Level 2 datasets should not be partitioned into more or less accessible classes based on the nature of the intended use even if the request was for a

use from elsewhere in the Department. This contrasts with a view among some DOC senior staff that any data collected by DOC should be made freely available within the organisation. Key reasons such as misinterpretation of data or simply an interest in knowing who and for what reason data are being used apply within organisations as well as between them.

Complications in interpretation of a sensible way to split data or ensure anonymity of owner or site are considerable. There was no clear consensus among data providers for supporting the split option.

6. Discussion

It is always in the interests of national archives such as NVS to balance the rights of the user and provider in such a way as to maximise public good. The quantity of data held under Level 2 conditional access control is substantial and it is understandable that with ready access to information over the Internet, data users find it onerous to make contact with multiple individuals when they have large data requests. A number of respondents to the Questionnaire felt the problem was overstated. One respondent stated: '...the applicant usually got a reply on the same day that the request was made. I do not think that this is onerous for the applicant.' NVS staff also noted that the majority of requests for access to Level 2 data are granted within a few days.

NVS staff acknowledge that there may be problems when the contact details of data providers become out of date. One solution is for the NVS database administrator to update these details on a more regular basis.

Only 28% of Level 2 datasets have been collected since 2000, so an external observer might feel the data owner has had ample time to use these data and that now they should be released. In light of this, it was interesting that many of the data providers/owners still wanted to retain control over these data. An important consideration, however, is that many of these surveys are initial measurements or remeasurements of long-term permanent plots and owners may view the multiple surveys as one large dataset.

The lack of consensus among data providers regarding allowing open access of Level 2 datasets for some uses, but not others, suggests that developing a finer access-level scale will not be a workable solution. Complications arise in determining at what point do multiple-dataset analyses become so large as to make the contribution of any one dataset minor enough to warrant open access and, also, how the anonymity of landowners can be ensured.

A better solution may be to develop policies that will encourage owners/providers of Level 2 datasets to change the access to Level 1. That raises the question as to what encouragement is needed to reduce the proportion of Level 2 datasets to a level that will satisfy users? The Global Biodiversity Information Facility (GBIF 2006) recently stated: 'Appropriate attribution is an important benefit to the original data sources and to the providers of biodiversity data. It provides recognition of work and reputational benefits to the organizations (and individuals) participating in GBIF.'

It is probable that a simple solution of appropriate acknowledgement or notification is all that

is required to encourage providers. The majority of data providers simply wish to know 'who is using their data', and 'what uses are being made of those data'. Currently, NVS does not provide data providers/owners of Level 1 data with any summaries of who has requested use of their datasets. If these data providers/owners are provided with periodic summaries of who has requested, and been sent, copies of these data, that may motivate current owners/providers of Level 2 data to convert the datasets to Level 1 access.

NVS staff have not yet explored whether owners/providers of long-term data from permanent plots would be willing to move some of the earlier survey data to Level 1 access while still retaining Level 2 access for remeasurement survey data collected more recently.

When NVS provides Level 1 data to users, there is a requirement to acknowledge that the data were retrieved from the NVS databank (See 2.1 The NVS Protocol). However, unless the users request metadata, they receive no information about who originally collected the data and for what purpose. This level of acknowledgement may encourage owners/providers of Level 2 datasets to convert the access to Level 1.

A large number of Level 2 datasets are owned by DOC. One reason for the large number of DOC datasets held as Level 2 is that the level of responsibility for setting the access level resides with Technical Support Managers who may have little detailed knowledge as a collector or user of the data. For that reason they also do not know when the need for that access level has passed. It is worthwhile for the Department to consider internal guidelines or standard processes for determining the basis for shifting datasets from Level 2 to Level 1.

It is expected that enacting the recommendations outlined below will result in a significant reduction in the proportion of data residing as Level 2, resulting in a reduced turnaround time for requesters and users of large multiple datasets while upholding the interests of data providers.

7. Recommendations

- So that requesting permission to use Level 2 datasets is as easy as possible for data users, the NVS database administrator should ensure that contact details for all data providers/owners are updated annually (see below).
- A simple example form letter could also be provided to data users to illustrate what sort
 of information is typically required by data providers to ensure rapid release of Level 2
 data.
- The NVS website should provide a more complete explanation of why data providers restrict access to some datasets, so data users understand why the request process is required.
- It appears that creating finer divisions of data access levels is not practical and not seen as desirable by data providers, so this option should no longer be explored.

- NVS curators should endeavour to maximise the rate of conversion of datasets having Level 2 Access to Level 1 Access. This could be aided by the following actions:
 - Regular (annual) notices to Level 2 owners offering to shift their data to Level 1 (contact details can be updated at the same time)
 - Targeting the providers of data collected prior to 2000 to see if their primary use has been completed
 - Offer to notify data providers when their data have been requested, even if data have been shifted to Level 1 access, and if this approach meets favour with data providers, develop it as a standard practice for data requests at all levels. This notification would be done annually at the same time as contact details are updated (rather than at every request)
 - Determine whether owners/providers of multiple surveys that have been remeasured would be willing to move some of the earlier survey data to Level 1 access while still retaining Level 2 access for remeasurement survey data collected more recently.
- Propose that DOC develop internal guidelines to address the issue of dataset migration
 from Level 2 to Level 1. Due to the Department's system of responsibility it is possible
 for a Technical Support Manager who has little knowledge of collection or use of any
 dataset to require Level 2 access, but not know when the need for that access level has
 passed.

8. Acknowledgements

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Appendix 1

Questionnaire

Questi	Questionnan e			
Somethi	ing about You. Name:			
1. A	Are you a?			
	NVS Data Owner/Provider			
	NVS Data User			
	Both			
	Other (specify)			
2. A	Are you a?			
	Primary data collector			
	Biodiversity practitioner/Conservation manager			
	Researcher			
	Database manager or Database-to-database user			
	Policy developer and/or IT-level user			
	Other (specify)			
3. V	Who do you work for?			
	Department of Conservation			
	Crown Research Institute			
	Regional Authority			
	Environmental Consultant			
	University			
	Other (specify)			

Reasons for holding data in Access Level 2.

4. What Level	are the most important reason(s) to you that your data is held under access 2?
My	data is still being used for its primary purpose
My	data contains location information of endangered species
My	data may be commercially sensitive
Iw	ish to know who is using my data
	ish to know what uses are being made of my data
I w	ish to participate in any use of my data
Us	ers may need help to correctly interpret my data
Be	cause it is my right as a data owner
Lai	ndowners for sites where plots occur do not want to be revealed
Otl	ner(s) (specify)
Automating	dataset progression to other Access Levels.
5. Do yo	ou know what datasets are listed as Level 2 under your name?
Ye	S
No	
Do	n't know
Otl	ner(specify)
	what conditions would you consider changing the access level of your data Level 2 to Level 1 (Open access)?
Au	tomatically after a fixed time period (if so, how many years?)
Wł	nen I've finished using it for its primary purpose
Wł	nen my employment circumstances and professional interest in the data change
\vdash	NVS asked at regular intervals (if so, how often should NVS ask?)
\vdash	ne, I don't intend to change its access level
\vdash	nen I'm deceased
\vdash	ner(s) (specify)

	do you think there would be datasets that could be moved from Level 2 to Level
Ye	
No.	
\vdash	on't know
Ot	her(s) (specify)
Review of A	ccess Level 2 and splitting into more accessible class.
	r what conditions would you allow your Level 2 data to be made available out your written approval?
Fo	r multiple-dataset analyses that don't identify individual plots or plot locations
	r multiple-dataset analyses that only use part of the data from any one dataset (e.g. ected plots, selected species or selected individual stems)
I d	on't think Level 2 should be partitioned into more or less accessible classes based on use
Fo	r any DOC use of any DOC data
Oti	her(s) (explain)
	vel 2 data were to be made available under an agreed set of rules, what ortion of your dataset information could be made available without your written oval?
10	%
25	%
50	%
An	ny amount as long as it doesn't identify individual plots or plot locations
An	ny amount as long as I'm automatically acknowledged
\vdash	on't think Level 2 should be partitioned into more or less accessible classes based on use
├	her(s) (explain)

Other questions relating to NVS data and Level 2 access.

10. What is the appropriate responsibility level within the Department of Conservation for access approval to Level 2 data*? Currently that responsibility resides with the Technical Support Manager level (or their designated person) in each DOC Conservancy.
Current responsibility level is appropriate
Responsibility should be devolved to field managers/TSOs
Responsibility should be devolved to staff collecting or archiving data
To simplify access responsibility should be moved to a single desk nationally
Other(s) (specify)
* This is a DOC Policy issue that is NOT decided by NVS. It is only included here to gauge the feeling of data owners to help respond to specific user requests.
11. Any additional comments relating to the NVS Protocol or data access Levels?

Appendix 2

Suggested text for inclusion on the NVS website explaining the various reasons that data providers choose Level 2 access

Providers (owners) of data to NVS choose the access level that they believe reflects their interest and ongoing relationship with their particular dataset. As the NVS databank does not "own" data; rather it serves as an intermediary between data providers and data users, it is required to satisfy those interests. It is also in the interest of data users (although it may not be apparent when focused on data to aid analyses), to ensure that data providers' interests are upheld. Appropriate attribution is an important benefit to the original data sources and to the providers of biodiversity data. It provides recognition of work and reputational benefits to the organisations (and individuals) participating.

Some reasons that data owners choose Access Level 2:

- They simply wish to be informed of who is using their data
- They wish to know what uses are being made of their data
- The data are still being used for the primary purpose of collection
- Users may need help to correctly interpret the data
- The data may contain location information of endangered species (this is one of the few reasons under the Official Information Act 1982 that information can be withheld)
- They may wish to participate in any use of their data
- Landowners for sites where plots occur do not want to be revealed (this is sometimes a Privacy Act requirement or contractural undertaking of the original data collection)
- Because it is my right as a data owner
- Data were collected as part of a collaborative study and permission of others may need to be sought
- Data may be commercially sensitive (another reason under the Official Information Act 1982 that information can be withheld)