

INVASIVE PLANTS AND ANIMALS

Data-sharing discussion paper

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ACRONYMS

ANZLIC	Australian and New Zealand Spatial Information Council
APDS	Annual Pest Distribution Survey
APLC	Australian Plague Locust Commission
MOU	Memorandum of Understanding
DCDB	Digital Cadastral Database
DEEDI	Department of Employment, Economic Development and Innovation
DERM	Department of Environment and Resource Management
GILF	Government Information Licensing Framework
GIS	Geographic information systems
GPS	Global positioning systems
LGAQ	Local Government Association of Queensland
NGO	Non Government Organisation
NRM	Natural Resource Management
NRMGC	Queensland Natural Resource Management Groups Collective
OAIC	The Office of the Australian Information Commissioner
PDA	Personal Digital Assistant
QVAS	Queensland Valuation and Sales System
SPAS	Spatial Pest Attribute Standard

DRAFT

1. Forward

This discussion paper forms part of a project to develop data sharing protocols within the Pest Central system. The project was funded by the Queensland Government Chief Information Office under an ICT Innovation Funding Scheme. The project explores different options for sharing data on invasive plants and animals across government, community and industry groups.

The paper is currently in draft form.

In order to explore various options for sharing pest data, stakeholder workshops were held in Toowoomba and Townsville. Attendees included representatives from Local and State Government, NRM groups, utility agencies and industry. Workshop outcomes are included in this paper.

Biosecurity Queensland seeks your input on data sharing. Comments can be submitted to Moya Calvert on (07 340 55549) or via email: moya.calvert@deedi.qld.gov.au, by 31 August 2011.

Once comments have been received, a final paper will form the principal guideline for sharing data on invasive plants and animals across the State.

2. Purpose

This paper aims to develop a range of options for sharing spatial pest data between people involved in the management of invasive plants and animals across Queensland. A range of benefits, challenges and options are explored. This paper seeks to provide the reader with sufficient information to make their own decisions about whether and how they would like to share spatial information on invasive plants and animals.

2.1.1. Audience

This paper is intended for stakeholders involved in invasive plant and animal research and management (as described in section 3.1.3), and specifically for officers from state and local government and from Natural Resource Management (NRM) groups.

2.1.2. Where to next

In the latter half of 2011, Biosecurity Queensland will conduct a short survey of stakeholders to find out if they are willing to share data, and whether they would consider using one or more of the options discussed in this paper. The purpose of the survey is to develop a clearer picture of spatial pest information and sharing activities across Queensland.

3. Spatial information on invasive plants and animals

3.1.1. What it is, and what it is used for

Spatial pest information is information on the location of pests, their impact and control (where, when and how much?); areas that are surveyed for pests; and the location and status of strategic management areas (such as containment lines and eradication zones). The specific attributes of this information have been defined in the Spatial Pest Attribute Standard (SPAS) (Queensland Government, 2010). SPAS aims to ensure that the essential aspects of pest management are captured in a consistent manner. The SPAS attributes list is described in Appendix A.

3.1.2. Spatial information about invasive plants and animals

Spatial information about invasive plants and animals is information that can be geographically referenced, and contains measurable information about pests, such as their location and management. Modern technologies used to collect such spatial information include satellite based global positioning systems (GPS) and geographic information systems (GIS).

Spatially referenced information can be (reasonably) precise, such as a weed that has been collected using a GPS and is accurate to within ± 5 meters; alternately, it can be reasonably imprecise, by aggregating the spatial component so that it tells the user the approximate location but does not reveal exact whereabouts. Two examples of aggregation are i) the use of a grid layer, where each grid cell is assigned a presence or absence value for each pest; and ii) generalisation of the location coordinates to decrease precision (discussed in Section 5.3.2 and 5.4.4).

3.1.3. Stakeholders

'Stakeholders' refers to any entity involved in the management of invasive plants and / or pest animals, and includes government, industry, and community groups including landholders. Stakeholders include people that need spatial information on invasive plants and animals, to fulfil their obligations under legislation or as part of official duties or contractual obligations.

Various agencies and stakeholders have a responsibility or interest in the control of invasive plants and animals. This includes Local and State governments who are authorised to conduct certain activities aimed to control declared pests under the *Land Protection (Pests and Stock Route Management) Act 2002*; landholders who are required to take reasonable steps to ensure their land is free from pests; any stakeholder for the purpose of preventing weed seed spread; as well as NRM groups, Landcare and other groups that commit to reducing or minimising the impacts of pests.

4. Workshop outcomes

4.1. Current data uses (from workshops)

A range of stakeholders attended two workshops in Toowoomba and Townsville in late May / early June 2011, to discuss sharing spatial information on invasive plants and animals. Approximately 30 people attended, representing Local and State Government, NRM groups, utilities and industry.

The workshops examined current data collection practises to find out why various groups collect data. Groups were also asked why they share data. They were also asked to supply a wish list of data not currently collected or shared from other sources, and what the data would be used for. During this exercise it became clear that some groups have more capacity towards data management than others. This meant that some groups are already collecting and using data that remains on the 'wish list' for other groups. The following data uses were indentified:

- i. Planning:
 - Operational planning at catchment / local / property level; including determining upcoming inspections, monitoring the spread of infestations; wild dog management campaigns; develop property management plans for landholders; prioritise control activities according to species and area; contracting; forward planning;
 - Planning strategic management at local / regional / State level (e.g. washdown locations, containment lines, management zones); development of shire and regional Pest Management Plans; and
 - Program development – strategic direction.
- ii. Improve efficiency and effectiveness, improved management decisions, more strategic management, better time management, improved understanding of trends, better able to assess success of treatment.
- iii. Record keeping (succession planning / centralised collection provides easier access for regional personnel) and for various requirements:
 - *Health (Drugs and Poisons) Regulation 1996* require accurate records of vertebrate pesticide use;
 - the *Agricultural Chemicals Distribution Control Act 1966* (ACDC Act) require accurate chemical application records where pests are controlled by agricultural chemicals; and
 - Under some circumstances, landholders may prepare pest or property management plans (for example, plans may be prepared to improve accreditation status when preparing Environmental Risk Management Plans (Wet Tropics sugarcane over 70ha); or to delineate pest areas when clearing remnant native vegetation under the *Vegetation Management Act 1999*).
- iv. Create maps, graphs tables for reporting and planning, including reporting or notification to other agencies and stakeholders.
- v. Funding applications: better information for estimating control costs.
- vi. Research: predictive habitat modelling and risk assessment for undeclared species.
- vii. Improved awareness and better knowledge:
 - More detailed information;
 - Would like to know what the trends are, state-wide perspective;
 - Control and treatment information, and currency of information;
 - Extent of infestations; density data as well as presence /absence;
 - Knowledge about former infestations;
 - Knowledge of areas that are 'clean' from pests; areas where a weed is currently absent;

- To warn landholders about emerging pest threats.
- viii. Monitoring purposes:
- Monitor spread of infestations;
 - Monitor incursions of new / emerging species, especially in surrounding jurisdictions;
 - Monitor pest animal movements / locations.

Participants were also asked if they share data, and why; for those that share data, the following reasons were given:

- i. To co-ordinate management programs;
- ii. To foster and encourage cross border collaboration;
- iii. To become more proactive rather than reactive, and enable more strategic planning and management;
- iv. To provide better information when preparing Pest Management Plans, and for writing funding applications;
- v. To demonstrate co-operation and a willingness to operate collaboratively which is more likely to attract external funding;
- vi. To foster co-operation between stakeholders and enable prioritisation - specific issues can be targeted;
- vii. To provide an "alert" to warn surrounding stakeholders about emerging pest species.

4.2. Benefits of sharing data

The workshops explored benefits and challenges associated with sharing spatial data on pest locations and control activities. The benefits were examined from the dual perspectives of benefits to the organisation as well as general benefit to the community at large.

Organisational benefits were identified as follows:

- i. Improves awareness and knowledge about invasive plant and animal issues at a regional scale; and provides the ability to strategically plan for emerging threats in surrounding areas, for example, the placement of wash-down facilities.
- ii. Provides ability to benchmark activities by 'comparing notes', providing opportunities for improved performance; for example, comparing effectiveness of control techniques.
- iii. Improves opportunities for accessing joint funding sources and builds a better case for funding.
- iv. Assists with justification for developing joint budgets for specific control or local eradication programs, and has flow on benefits > joint effort reduces resource costs, saves time and labour and makes better use of finite budgets.
- v. Provides opportunities for improving co-ordinated control or local eradication programs, which leads to efficiencies and achieves more strategic management.
- vi. Enables improved monitoring and recognition of achievements in pest management; improves ability to assess reduction in pest impact due to collaborative effort. This boosts morale (measuring achievement); and provides a means to demonstrate success to others.
- vii. Reduces duplication of effort, especially in planning and surveying activities.
- viii. Enables data transparency, which in turn improves confidence in the value of the data, and increases the knowledge base at a local and regional level.
- ix. Corporate knowledge can be retained and "passed on" if the corporate structure changes.
- x. Fosters a culture of co-operation and better communication between stakeholders.
- xi. Information can be accessed by all interested parties in a timely manner.

xii. More detailed information is available for research purpose

Public / community benefits were also identified:

- i. Improves efficient use of public money by better utilisation of resources, and improves transparency in the use of funding.
- ii. Better public awareness, and improved ability to recognise emerging threats.
- iii. Increases ability of landholders to comply with a general 'duty of care' when managing invasive pests (i.e. obligations to minimise weed seed spread).

4.3. Challenges and concerns associated with sharing data

Challenges and concerns about sharing data were explored, and a variety of issues raised, as summarised below:

4.3.1. Methods and means

- i. Uncertainty about 'standard' methods for collecting and sharing data.
- ii. How would data sharing be managed? Is there a central data-base? (Who looks after it? What are the processes? Is ongoing funding available to maintain a system? What about data security?).
- iii. No formal arrangements or requirements exist to share data.
- iv. Lack of resourcing and ongoing funding to achieve a workable 'data sharing' environment.
- v. The spatial scale of data affects willingness to share ("fuzzed" or gridded data is easier to share compared to 'raw' locational' data).
- vi. Inconsistency and incompatibility of current information collection systems.
- vii. Lack of internal Information Technology (IT) support for sharing data, and other IT issues (skills, training, software, hardware, firewalls, compatibility).
- viii. Depends on a local or regional champion or co-ordinator to ensure that data is regularly shared.
- ix. Investment in invasive plant and animal management is perceived as a low priority in large agencies.
- x. No existing culture of sharing, requiring a change in attitude and a willingness to share. Related to this is the perception that the recipients obtain more benefits than the donors, and a 'what's in it for me' attitude. Personal relationship issues can also create problems when sharing data.

4.3.2. Legal and confidentiality issues

- i. Protecting Intellectual Property or copyright of data, and maintaining control over the potential uses of data.
- ii. Concerns over privacy of information, the potential ability to identify ownership, and the release of potentially confidential information.
- iii. Risk of litigation or the threat of liability or blame if the data becomes publicly available; related to this are concerns that land values may be affected if the data becomes publicly available.
- iv. Landholders may lose confidence with an agency if information related to their landholding is passed on.
- v. Concern over sharing data with large government departments with many business units with different objectives (concern that data might be used for other purposes).
- vi. Stakeholders may be coerced to using and managing data effectively.
- vii. Concern about providing information about declared pests to authorised inspectors.
- viii. Concerns about using data for possible commercial purposes (eg preparation of property management plans for landholders by a commercial agency).

4.3.3. Other issues

- i. Data is a resource that can be used to negotiate funding, providing a disincentive for sharing.
- ii. Concerns about confidence in the consistency, currency and validity of data.
- iii. One agency cited that the information is managed for landholders via an agreement and they are therefore not allowed to pass the information on.
- iv. Concern that sharing data may create unrealistic expectations of eradication or control.

5. DISCUSSION

5.1. Trends towards collaboration, openness and sharing

The workshops showed that stakeholders recognise that sharing data is an important component of making the most of limited resources. This is strongly re-iterated in the Australian Weeds Strategy and the Australian Pest Animal Strategy, which states that combating invasive plants and animal problems requires a culture of "shared responsibility"; with coordination and cooperation between stakeholders (Natural Resource Management Ministerial Council, 2006, Natural Resource Management Ministerial Council, (2007). This is reiterated in the Queensland Biosecurity Strategy (Queensland Government, 2008), which says that, in relation to managing established pests and diseases:

"With so many stakeholders and so many established pests and diseases, a more co-ordinated and collaborative approach is needed".

Moreover, the Australian Weeds Strategy states that '*Information on weed distribution, impacts and management is readily available and used to improve management practises*' (Natural Resource Management Ministerial Council, 2006).

In Australia, the economic impact of weeds and pest animals is around \$4 billion and \$0.7 billion respectively (Natural Resource Management Ministerial Council, 2006, Natural Resource Management Ministerial Council, (2007). ACIL Tasman (2008) cited the Australian Plague Locust Commission (APLC) as a case study to demonstrate the investment value of strategic control. Whilst the APLC average expenditure was \$4.5 million over 6 years to 2004-05, the average cost saving was \$29 million. The spatial component employed in APLC's operations, in forecasting, early detection and planning contributes around 20% to production savings.

More generally, a global trend towards collaboration, openness and sharing is emerging. The Commonwealth government is encouraging government and community to collaborate, to actively engage and to empower using new technologies enabled by the internet. In 2009, the Commonwealth launched Government 2.0, to promote opportunities presented by the advent of Web 2.0. Web 2.0 is a term associated with web applications that facilitate information sharing, interoperability and collaboration on the internet (Government 2.0 Taskforce Report, 2009). The Government 2.0 Taskforce reported that:

- Sharing information does not diminish its value – typically the value is increased when data is shared.
- The internet has vastly increased the value of information because its can disseminate it at minimal cost, and deliver where it is most useful, hence maximising gains for minimum effort
- Information can drive innovation and if it is freely available can be used by stakeholders to add value in ways that are innovative and transformative.

Various examples were used in the report to illustrate the benefits of sharing information:

- In 2001 the Australian government changed policy so that all fundamental spatial data was made freely available. Growth in the use of this data has risen from 75,000 downloads in 2001-2002 to 863,000 downloads in 2005-6 (an increase from 40% to 200%).
- The United States makes weather data freely available whereas European countries claim government copyright over weather data and charge substantial fees. Whereas Europe obtains a seven-fold economic return on investment, the US obtains a 39-fold benefit possibly because it

produces more valuable products and employs more people, hence generating more social wealth.

- The Australian Bureau of Statistics started making ABS data freely available in 2006, which increased downloads from around a million per year to over four million downloads per year in 2006-07.

These examples demonstrate the value of sharing data by making it freely available and easy to access. In the following sections, the challenges and concerns associated with sharing spatial data about invasive plants and animals are discussed.

5.2. Questions about standards

Biosecurity Queensland has developed a standard for collecting data - the Spatial Pest Attribute Standard (SPAS). The standard was designed to provide a list of attributes to guide data collection, to enable different stakeholders to collect spatial information on invasive plants and animals in a consistent manner. SPAS can be downloaded from the Biosecurity Queensland website (http://www.dpi.qld.gov.au/4790_15470.htm). Whilst SPAS provides the foundation for data to be collected in a systematic way, the workshops highlighted that more work is required, such as the need for a data model or data schema, and development of a data dictionary.

Ultimately, the goal is to create a standard data sharing environment for minimal cost while maximising the benefits for data users. In the majority of cases, stakeholders are providers and users of data. Provision of a standard is a first step towards this goal; developing an understanding of how stakeholders wish to share data is another important step in the process.

5.3. Questions about management of a centralised system

5.3.1. Existing frameworks for sharing data

A Memorandum of Understanding (MOU) exists between DEEDI, Local Government Association of Queensland (LGAQ) and the Queensland Natural Resource Management Groups Collective (NRMGC) which discusses responsibilities and roles for each stakeholder group, including a section about managing and sharing spatial information:

Biosecurity Queensland (DEEDI):

- Lead development of pest management data sharing agreements
- Lead development of standardised data attributes
- Contribute pest data in an agreed format
- Maintain a state-wide dataset
- Share collected data with Regional Natural Resource Management groups and Local government with consideration of privacy legislation

NRM Groups and Local Governments:

- Contribute to the development of pest management data sharing agreements
- Contribute pest data in an agreed format to Biosecurity Queensland
- Maintain a regional or local dataset where required
- Share collected data with Biosecurity Queensland, other Regional Natural Resource Management groups and other Local governments with consideration of privacy legislation

The MOU goes some way towards defining roles for some stakeholders (DEEDI, Local government and NRM Groups); although it does not include all potential stakeholders. The MOU is not a legally binding document, and there are no other contractual obligations to share spatial data about invasive plants and animals.

The MOU could be used to build a business model for sharing data. In business terms, a business model describes the way a company makes money. For data sharing, the business model would determine the benefits and costs for sharing data, and describe how data is shared so that benefits

are maximised and costs are minimised. Ideally, the business model would identify a framework that exploits these goals to satisfy the majority of stakeholders.

The parties to the MOU do maintain and contribute to a the Annual Pest Distribution Survey, a state-wide dataset that is described in the following section. But the parties only share 'collected' data sporadically; and the benefits that can be obtained from sharing data are not exploited.

5.3.2. Annual Pest Distribution Survey

Biosecurity Queensland, Local Government and NRM Groups meet their obligations under the MOU commitments by maintaining a broad-scale dataset called the Annual Pest Distribution Survey (APDS) (DEEDI, 2009, available from http://www.dpi.qld.gov.au/4790_9824.htm). This dataset is collected using 'expert' knowledge supplied by Local Government and NRM Groups, as well as other stakeholders. The APDS describes the distribution of approximately 120 invasive plants and animals using a 10 minute (about 17km x 17km) vector grid. The data is publicly available from the internet either as a downloadable A4 pdf maps for each species, or as electronic files which can be interrogated using a GIS. This survey has been conducted annually since 2003, and is expected to continue on a bi-annual basis in the future.

While the APDS describes broad scale information about pest distribution, it does not provide meaningful information about more precise locations; nor does it describe management effort, nor inform about changes or trends in pest impact. The majority of benefits identified in section 4.2 (benefits of sharing data) cannot be achieved using the APDS (for example, the ability to plan more strategically, to improve coordinated control or local eradication programs, to develop joint budgets for specific control programs, to compare effectiveness of control techniques; and to provide more detailed information for pest research). The APDS simply helps to report on current state-wide distributions at a broad scale.

5.3.3. Pest Central

Biosecurity Queensland is committing to the development of a state-wide 'raw' dataset based on SPAS, which is managed using the Pest Central system. Pest Central enables users to collect detailed data while in the field (using Personal Digital Assistants – PDA's), and then automatically upload the data via the internet into a centralised data-base, managed using 'cloud' technology. The system provides a method for managing shared data in a secure manner, such as by using citrix licensing and providing access via a secure https internet site. Currently users can only access their own data; although development is currently underway to enable users to share data (based on the outcomes from this paper).

Biosecurity Queensland currently contributes annual funding towards maintenance of the Pest Central database housing the datasets, and intends to share data while respecting privacy. However, beyond this, there is no current commitment to provide ongoing funding for maintaining a data-shared system or environment.

5.3.4. Local and regional systems

A number of local governments and NRM groups are developing or have developed their own systems for collecting and using pest data. The majority of these (known) systems have adopted the Spatial Pest Attribute Standard, or have adopted a grid system based on the APDS (see the far north Queensland 1km grid portal, described in the following section). These systems are mostly in-house and are incorporated into other aspects of natural resource management. Because these systems use SPAS, there is potential to 'share' the data with data collected using Pest Central. At the least, data can be compared as 'apples against apples'.

5.3.5. Spatial scales

The spatial scale of the data to be shared affects peoples 'willingness to share'. Data providers may be uncomfortable with sharing data that describes an exact location particularly if it is located on private land (privacy and other confidentiality issues are discussed further in section 5.6 and 5.7). Data location can be downgraded and shared as long as it does not compromise the usefulness of the data, nor impose an undue workload in order to prepare data for sharing.

The Queensland herbarium currently shares records of invasive plant locations via the HerbRecs database. HerbRecs records are available for public download through the Australian Virtual Herbarium (AVH) website at <http://www.chah.gov.au/avh> (Council of Heads of Australasian Herbaria Inc. 2010) or through the Wildlife Online website at http://www.derm.qld.gov.au/wildlife-ecosystems/wildlife/wildlife_online (Queensland Department of Environment and Resource Management, 2010). AVH records have been generalised to approximately 15 mins (as in degrees/ minutes/ seconds, which is about 25km x 25km), which reduces location to a fairly coarse resolution. Wildlife Online is more restrictive as data is returned to the user as a list of species per defined area (for example, the species that can be found within a National Park). HerbRecs is also shared via traditional two-way data share agreements for special interest groups such as environmental consultants, researchers etc; which usually involves a transactional cost (Peter Bostock, Queensland Department of Environment and Resource Management, pers. comm.).

Stakeholders in far north Queensland have developed a method for sharing weed data using a 1km grid portal (Sydes et. al., 2010). The method describes current pest locations and is useful for regional planning (for example, the data was used to inform the current Hymenachne Management Strategy Zones (Grice et. al., in press). The grids are increasingly being used to develop pest prioritisation planning at a sub-catchment to catchment scale, as a method for analysing pests as a threatening process against priority environmental targets, such as biodiversity and connectivity. The grids are available for public viewing as downloadable *.pdf maps, and registered users can update the grids online through a web mapping portal (Travis Sydes, Far North Queensland Regional Organisation of Councils, pers. com).

The concept of using a grid to share data was discussed at the workshops as a possible means for sharing data without compromising the perceived concerns of data sharing, discussed further in sections 5.6 and 5.7.

5.3.6. Information Technology issues

Many agencies find it difficult to share data simply due to internal information technology constraints; in particular the availability of funding is an issue. In addition, many Information Management teams are concerned about security of information. The advent of the internet and particularly cloud technology has facilitated the movement and usage of information that provides many benefits but at the same time causes real problems for these teams in terms of data security and protection of privacy.

5.3.7. Networking between stakeholders and the role of a regional coordinator

The workshops discussed a number of other issues that present challenges in terms of practical considerations. Firstly the workshops discussed an existing culture of 'not sharing' which presents unique challenges, as it requires a change in attitude to develop a willingness to share. A few participants mentioned the "what's in it for me" syndrome, related to this culture; and personal relationship issues can also present obstacles to sharing.

These issues are more difficult to understand and to manage. However, if stakeholders begin to understand the value of sharing data then eventually the 'not sharing' culture may be reduced or eliminated. Once a critical mass starts reaping benefits of sharing data, then the laggards may end up participating due to the pressures and 'missing out' on the benefits.

Related to this is the role of a regional spatial data coordinator. A motivational coordinator will develop and maintain a good network of stakeholders, ensure that data is routinely collected and maintained, and is used effectively and efficiently to maximise pest management outcomes. Post workshop comments noted that data sharing works well where the community is motivated and where good networks are in place; conversely, information stoppages happen when stakeholders do not communicate. The 'key' to effective data sharing lies in a motivational 'social dynamic; where stakeholders come together in groups (physically or virtually) to use shared data for planning and managing improved pest management outcomes. An example of community effort is the Paroo Wild Dog management group; this is a group of landholders/graziers that routinely and effectively manage wild dogs: they have a very big vested interest in the wild dog problem; and they have very good knowledge of the landscape. This group has taken ownership of the wild dog issue and provide

leadership and coordination. They use the data about wild dog impact and control events to make better decisions and hence manage wild dog impact more effectively.

5.3.8. Business requirements and resourcing

Sharing data becomes possible if it is driven by clear business requirements, and is supported through an ongoing funding source. The benefits of sharing data (S4.2) help to define the business requirements, although what may be important to one party may have a low priority to the next. Thus development of a 'clear' business requirement is easier said than done.

Secure funding is a basic requirement to provide ongoing resources to maintain a centralised system. If the benefits identified in section 4.2, are to be comprehensively realised then a strong business case that outlines ongoing funding is needed at State and National levels.

A number of national data management programs support collaboration and data sharing including the Atlas of Living Australia (ALA); Australian Biosecurity Information Network (ABIN); and Australian National Data Service (ANDS). ABIN, for example, aims "*to strengthen Australia's biosecurity research, surveillance, diagnostic and response capability, by enabling researchers, industry and governments, to collaborate, use expertise, share data, information, and generate intelligence using leading edge tools and technologies made available through ABIN's secure online workspace*".

Pest Central is a useful technical solution, and provides a neat way to enable sharing whilst providing data security. However, ongoing funding is not guaranteed, and as a commercial application, can be a significant cost for organisations with modest budgets. Pest Central is also a Queensland-based system. A number of other commercial applications exist (for example, Weed Map Pro, Tr@ceR Mobile Mapping). These may also be viable alternatives for a centralised system.

5.4. Questions about data ownership: Copyright of datasets and databases

Data ownership and management was raised as a concern at the workshops; some people were not clear about data ownership, and how it can be managed in a centralised system.

Copyright is a set of legal rights that attach to an original work when that work is created. Copyright allows the owner to control the use of their material and prevents unauthorised use of their material by others. It is a property right which can be sold and licensed in the same way as other forms of property, and can be owned by individuals, organisations and governments (Fitzgerald et. al., 2008).

In Australia, copyright extends to the protection of compilations of data into a dataset as long as the dataset displays the requisite level of originality under law. As an example of 'requisite level of originality'; the 2002 case *Desktop Marketing v Telstra*, the court ruled that Telstra held the copyright over their Yellow Pages and White Pages directories, even though this is essentially a compilation of names, addresses and phone numbers listed alphabetically. The court made this ruling based partly on the amount of labour or expense required to generate the dataset (Fitzgerald et. al., 2008). Thus, it can reasonably be inferred that the collection of invasive plant and animal data into a data-set by an agency would then confer copyright protection to the agency, as a reasonable amount of expense is required to generate such datasets.

There is an important difference between copyright of a dataset or of discrete data items, and copyright of a database as a whole; in a database, copyright protects the arrangement of collected components. This means that copyright interests can co-exist independently in the components contained in the database, and the database itself, and may be owned by different parties. Multiple users can store their data into a shared database and still exercise their rights as to how they want their data to be used. Copyright enables the owner to determine how their data is i) reproduced; ii) published; iii) performed; iv) communicated to the public; v) adapted (e.g. translated); vi) leased (vi applies only to computer programs or sound recordings). An existing example of co-existing but separate copyright ownership is the Atlas of Living Australia (Atlas of Living Australia website at <http://www.ala.org.au>; accessed 28 June 2011).

Within the Pest Central system, a data provider retains property rights over their data; whilst the database is owned independently by the commercial entity. The data provider enters into an agreement with the commercial entity that clearly states the terms and conditions of management of their data, including security arrangements, and how their data is shared. Classification of spatial

data about invasive plants and animals (government information)

5.4.1. Open public sector information

The Office of the Australian Information Commissioner (OAIC) recently released eight principles on open public sector information, recognising that government information is a national resource that should be published for community access and use. The principles are underpinned by central values of open public sector information, that data is freely available, easily discoverable, understandable, machine readable and reusable (Spatialsource.com.au, accessed 28th June 2011).

The Queensland Government Information Security Classification Framework specifies that official data must only be made available to people with a legitimate 'need to know' to fulfil their official duties or contractual responsibilities; and must only be released in accordance with the policies, legislative requirements and directives of the Government and the courts (Queensland Government Department of Public Works, 2008).

The Information Security Classification Framework provides a framework for classifying invasive plant and animal data. The classification scheme helps to determine whether the data can be shared. Government information falls into 3 broad categories: i) public, ii) unclassified or iii) security classified (figure 1). Public information is official information that is intended for public use or consumption; it has been authorised by the owner for public access and circulation, such as agency publications or web sites. Classified information includes national security information (about espionage, defence plans, international relations, and other national interest items); and non-national security information (highly protected, protected, Cabinet-in-confidence, and x-in-confidence).

Unclassified information comprises the bulk of the information resources used within government and does not need special security controls. Invasive plant and animal spatial information probably falls within the realm of 'Unclassified information' and also possibly 'Public Information' as discussed in sections 5.6 and 5.7.

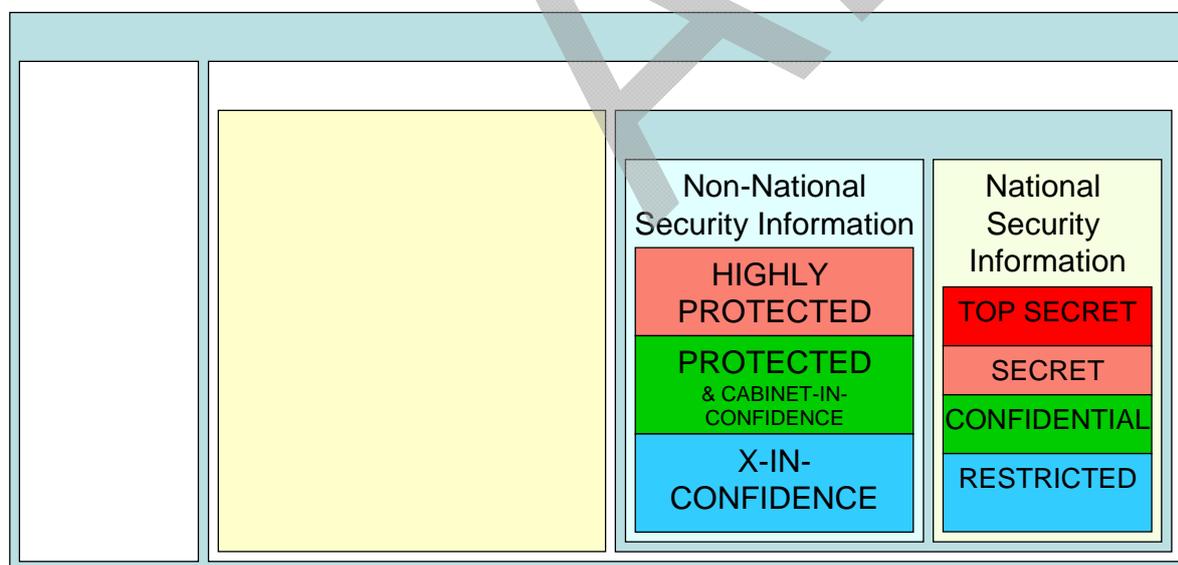


Figure 1: Government information security classifications

5.4.2. Current legislation on data collection

The *Land Protection (Pest and Stock Route Management) Act 2002* (s.241) enables Local or State Governments to collect spatial data about invasive plant and animals on any land within their jurisdiction, as part of a defined pest survey program, and the Act does not restrict data sharing. This Act will be replaced by the proposed Biosecurity Act, and the same powers of entry for the purposes of conducting pest surveys are intended for the new Bill.

The proposed Biosecurity Act provides opportunities for data sharing under s.468, Confidentiality of Information. This section does not allow for disclosure of confidential information, except i) when the disclosure is for a purpose under the Act, or ii) the disclosure is for the purpose of ensuring the

biosecurity of the State or another State and the disclosure is to a) the State, b) a Department c) an entity established under an Act that deals with matters relating to biosecurity; d) a local government or e) the Commonwealth or another State, or an entity of the Commonwealth or another State. Whilst this section enables data sharing for Commonwealth, State and local governments, it falls short of enabling data sharing with other stakeholders, such as NRM groups, utilities, industry and community groups for the purposes of sharing described in section 4.2 and 5.1.

The new biosecurity legislation is available for comment until 2nd September 2011. The draft legislation can be accessed from the Biosecurity Queensland website: http://www.dpi.qld.gov.au/4790_18207.htm (Queensland Department of Employment, Economic Development and Innovation, accessed July 2011).

5.5. Privacy issues

5.5.1. Definition of 'personal information' and 'personal spatial information'

Concerns about privacy and the potential to identify land ownership from pest datasets were raised at the workshops.

'Personal information' is defined under s.12 of the *Information Privacy Act 2009* as: "*Personal information is information or an opinion, including information or an opinion forming part of a database, whether true or not, and whether recorded in a material form or not, about an individual whose identity is apparent, or can reasonably be ascertained, from the information or opinion.*"

Personal spatial information means personal information combined with, linked to, or contained within spatial information. A cadastral parcel linked to a persons name and mobile phone number is an example of personal spatial information. However, cadastral information about the property, when extracted and separated from the information about the person, is no longer 'personal information' (ANZLIC, 2004).

5.5.2. Information describing land, and relation to personal information

Personal information and how it is determined has been canvassed in a recent Information Commissioner decision. In *Mahoney and Ipswich City Council* the Right to Information Commissioner (Office of the Information Commissioner, 2011) explored that two questions are relevant in determining whether information is considered personal information.

1. Can an individual be identified from the information?
2. If so, is the information **about** that individual?

The first question to determine is if the proposed disclosure of the spatial information will enable another entity to reasonably ascertain the identity of another individual. Considering that many agencies and entities have access to powerful GIS systems which enables them to reasonably ascertain or link the identity of an individual with the spatial data provided and their own information holdings, it would be considered that an individual's identity is reasonably ascertainable. For example, Local governments maintain Rates databases; and DERM maintains QVAS and DCDB databases which are shared with other State Government agencies based on restricted 2-way data-share agreements. Therefore the answer to this first question will be yes in the majority of cases.

The second question is whether the information is **about** that individual. In determining whether information is about an individual a contextual view should be taken. In many cases it is clear when information is about an individual such as bank details or medical and health information. However it is not as obvious when information is about land, boats or cars. In these cases it must be determined whether the information will reveal anything **about** the individual.

In regards to the proposed data sharing arrangement the fact that the spatial information relates to a pest animal or weed present on a piece of land, does not actually reveal anything about an individual or property owner. Rather it reveals information about the actual parcel of land. Therefore this would not be considered personal information, as a fact or opinion about an individual is not evident.

5.5.3. Enforcement under legislation

There is an exception to this. This is where spatial information about the presence of a declared pest is disclosed to an authority which has a responsibility under s.78 of the *Land Protection (Pest and Stock Route Management) Act 2002* to enforce the law in relation to a declared pest. The disclosure of spatial information to the authority will ultimately be **about** the individual in that the relevant individual may be penalised in accordance with the relevant legislation. Therefore any data provider that discloses spatial pest information to an authority will need to consider the disclosure in relation to the Information Privacy Principles (IPPs) contained within the *Information Privacy Act 2009*. IPP 11 (1)(e) allows for disclosure to a law enforcement agency for the purpose of enforcing a law involving a penalty or sanction. This relates to disclosure of spatial pest information, because the *Land Protection (Pest and Stock Route Management) Act 2002* (s. 78) does allow Local governments and DEEDI to enforce a law involving a penalty or sanction in relation to declared pests. In practise, it doesn't necessarily follow that the purpose of sharing the data is to enable the agency to enforce a law or sanction. Usually an authority would firstly conduct an inspection to determine whether the pest was present; they may then issue a notice obliging the land holder to remove the pest within a specified period of time.

An authority that wishes to share spatial information on declared pests must take care not to disclose any related information about an individual, as given in the example about cadastral data above.

5.6. Other confidentiality issues: land condition and compliance

Related to the concerns about privacy raised at the workshops, are concerns about information confidentiality regarding invasive plant and animal infestations. Spatial information about invasive plants and animals can indicate land condition, which has the potential to affect land value. A concern raised at the workshops was that a landholder may threaten litigation if an authorised officer were to publicly release information about pest infestations on their landholding, and, by doing so, negatively affect land value. This scenario has not been tested in court; and it is questionable whether such a case would ever arise. Pest control notices are already publicly available for a fee (*Land Protection (Pest and Stock Route Management) Act 2002*, s. 86), and prospective buyers are entitled to inspect the property for land condition as a matter of course. It is also worth noting that land condition is affected by many environmental factors (flooding is a good example; this information is publicly available and is accepted by the community as such). The *Mahoney and Ipswich City Council* case cited in section 5.6.2 also makes clear that information about land such as land condition is not private information; and that publicly releasing such information cannot be contested under the Information Privacy Act 2009.

Concerns were raised about providing information about declared pests to authorised agencies for the purposes of enforcing compliance under the *Land Protection (Pest and Stock Route Management) Act 2002* (s. 78). Undoubtedly, if an authorised entity became aware of a declared pest infestation then they would be obliged to pursue the matter; however, as explained previously, the authorised entity would firstly conduct an inspection to confirm the presence of a declared pest; and then carry out their responsibilities under the Act. The act of sharing data would not automatically result in an act of compliance. Rather, the next step taken is to issue a notice to the landholder to take reasonable steps to remove the declared pest within a reasonable period of time, and the landholder can further negotiate the terms of the notice if they wish. A penalty does exist for non-compliance under the terms of the notice, but this is usually taken in the form of removal by the authority at the expense of the landholder.

6. The data sharing framework

Considering the issues discussed above, a single solution for sharing spatial data about invasive plants and animals is unlikely to suit all stakeholders; instead, a range of options may be developed in order to realise the potential benefits of sharing data discussed in section 4.2. The workshops examined numerous ways of sharing data, which are discussed below.

6.1. Spatial components

Spatially, data can be shared either in its raw mapped form (as collected), or aggregated to some

level so that the spatial component is degraded.

Aggregated data addresses perceived issues related to privacy and compliance, because it resolves linkage with individual land parcels. Two possible methods for aggregating data (discussed in section 5.2, spatial scales) are:

- Summarising the data into grid squares
- Converting any polygon and line data to point form, then generalising the point co-ordinates

Gridded data requires some form of attribute summary in order to display the grids meaningfully if the data is converted from raw (as collected) form. For example, the grid may summarise the number of infestations recorded per pest, the latest date of record, a density statistic (eg mean density), etc. Due to the resources required to process such data, it may be easier to limit the process so that only a few attributes are summarised (such as pest name, pest presence within a grid cell; most recent date of activity; and status level).

Alternately grid data can be created or updated as a collective (workshop-style) process, such as the method used to update the APDS and the 1km grids used in north Queensland. This method captures basic attributes such as presence/ absence and some indication of density and distribution.

Grids require updating, for example on an annual basis. Grid size also requires consideration; the grids need to be small enough to describe distribution in a meaningful way, whilst at the same time not compromising confidentiality issues.

Generalised point data doesn't require attribute summary and hence allows the attributes to be retained in their raw form. An amount of processing would still be required firstly to convert polygons and lines to points and secondly to generalise point coordinates; however, it is an easier task to accomplish technically.

In summary there are 3 options for considering how to share spatial data: i) 'as collected'; ii) grids; iii) generalised points.

From a data management perspective, maintaining 3 datasets containing very similar information with varying degrees of accuracy, is messy and time consuming; and ultimately may confuse the user. Therefore, it is proposed that data can be shared using just 2 methods:

- **'As collected' data**
- **Grid data**

6.2. Attributes

Attribute data is the textual information component, and may be shared in its raw form as long as the spatial component has not been aggregated into a grid format (otherwise it has to be summarised in order to retain some meaning). A number of options for sharing raw attributes were examined at the workshops, based on the attribute importance, and discussed below. Core and desirable attributes from SPAS are highlighted in pink and blue respectively in Appendix A.

i. Core attributes

Raw core data attributes include the pest's name, the date of collection, the agency name (in order to confer copyright), density (for weeds), infestation area, and date of control (when control is recorded).

ii. Desirable attributes

Desirable data attributes include infestation status, confidence level (how confident is the officer that he/she has correctly identified the species), the pest's reproductive status and percentage of mature plants (for weeds), control treatment and evidence and impacts (for pest animals).

6.3. Legal models for sharing data

6.3.1. Registered user model based on 'Need to know' data exchange

Also considered at the workshops, was the feasibility of developing a potential registered user list so

Y:\InfoSystems_Docs\DataSharing\DataSharingDEEDI_Policy\DataSharingDiscussionPaper_BQ_20110930.doc

that data providers place more control over whom their data is shared, and the purpose for which it is to be used. The proposal is to develop multi-way agreements between data providers and data users. An intermediary would be required to facilitate the agreements and data sharing protocol. The data providers would sign an agreement with the intermediary agency, agreeing to share their data according to a set of terms and conditions that describe how the data is to be managed and used. The data users would sign a similar agreement with the intermediary party, which binds them to the same terms and conditions under which the provider agrees to share their data, as shown in figure 2. (Some stakeholders may be both providers and users).

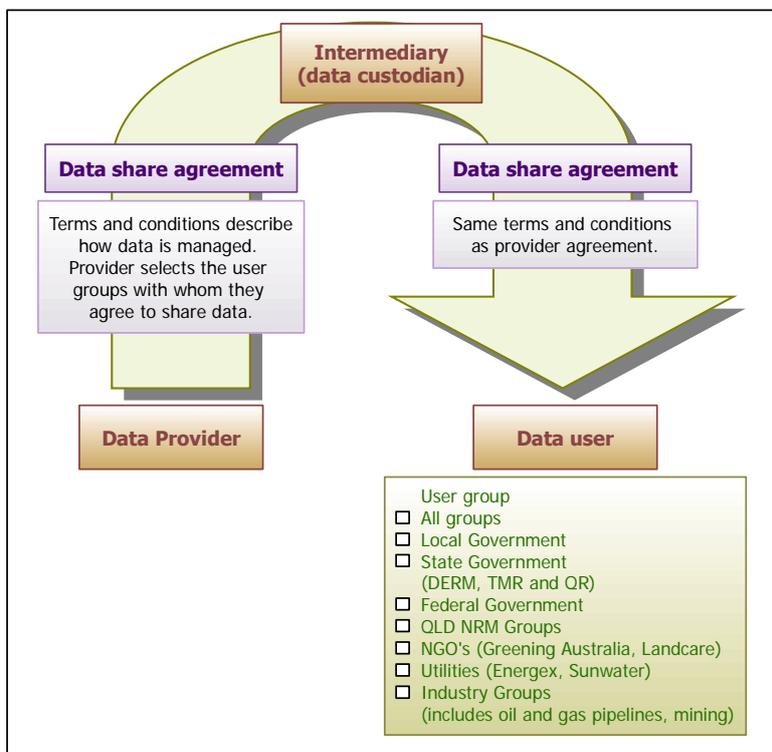


Figure 2: Diagram of a potential registered user model.

The Registered Users list would likely consist of parties that fit the ‘need to know’ category – such as where data exchange would help them improve their management practises, gain efficiencies etc. Examples are Landcare groups, Regional NRM groups, State Govt, public utilities, local govt, private enterprise, NGOs (Greening Australia) and Federal Government.

It would be possible to classify the Registered Users list so that providers can choose the type of user they wish to share with. For example, Local governments could be classified as one type of user; State government or NRM groups, another; etc. Providers can then choose which user type their data will be released to.

In a practical sense this would work best where data is stored in centralised data-base in order to facilitate storage, management and security over the data. This method is likely to be adopted as an option for Pest Central users. However, data providers may still be able to participate in this data sharing arrangement yet maintain their own database without using the Pest Central system.

The advantage of this model is that the participants do not need to organise an agreement whenever they wish to share data with another party.

6.3.2. Two-way data share agreements

An alternative option for data providers is to continue the current ‘traditional’ 2-way data-sharing arrangements. This option also allows for the two contributing parties to ‘swap’ data. The main disadvantage is that an agreement must be drawn up whenever a new party wishes to share data.

6.3.3. Open content and Creative Commons licensing

Open content licensing models enable data providers to share data so that it is readily accessible and available for re-use whilst still reserving some rights over the data, generally the right to be recognised as the originator of the data (Fitzgerald et. al., 2008). Creative Commons (CC) licenses are a form of open content licensing. They consist of i) a legal code; ii) a short 'readable' summary of the code; iii) a digital code that can be understood by computers; iv) a set of internationally recognised icons (Fitzgerald et. al., 2008). The Creative Commons licences all allow for availability and accessibility, including a non-commercial licence (see examples below).

The Government Information Licensing Framework (GILF) is a simple open content licensing framework designed to help manage government intellectual property. GILF provides seven licensing options including six Creative commons (CC) licenses and a restrictive licence. The restrictive licence applies to material that is licensed under some form of limiting or restrictive condition (Queensland Government, 2010). See Appendix B for more information.

The Atlas of Living Australia (<http://www.ala.org.au>) utilises Creative commons licences, and have use three Creative Commons models:

- Creative Commons – Attribution 3.0 Australia (you let others copy, distribute, display, and perform your copyrighted work - and derivative works based upon it - but only if they give credit the way you request).
- Creative Commons – Attribution-Non-Commercial 3.0 Australia (you let others copy, distribute, display, and perform your work - and derivative works based upon it - but for non-commercial purposes only).
- Creative Commons – Attribution Share Alike 3.0 Australia (you allow others to distribute derivative works only under a license identical to the license that governs your work (includes Attribution)).

Open content licensing is possibly the easiest model to adopt in order to share data, as the provider does not need to organise an agreement whenever they wish to share data. In this respect it is a similar agreement model to the registered user model. The main difference is that the data provider is making their data freely available for use by any other person. The GILF is a practical way to implement the policy towards openness and sharing advocated by the Commonwealth government (discussed in section 5.1).

6.3.4. Not sharing data, but letting others know you have a dataset

The workshops also suggested development of a registered "providers list", which does not involve a data sharing process, but allows users to discover the potential data sources available. Such a list would require maintenance by an intermediary (probably Biosecurity Queensland), and would be made publicly available most likely via the web. The registry would include metadata for each agency or stakeholder, as well as contact details, so that some form of data sharing can be negotiated.

6.4. Decision-making process for sharing data

As discussed above, there are a number of options to share spatial data about invasive plants and animals. A decision tree for deciding how or whether a data provider may share data is presented in figure 3. It is designed to help providers decide how to share their data, based on considerations discussed in sections 5 and 6.

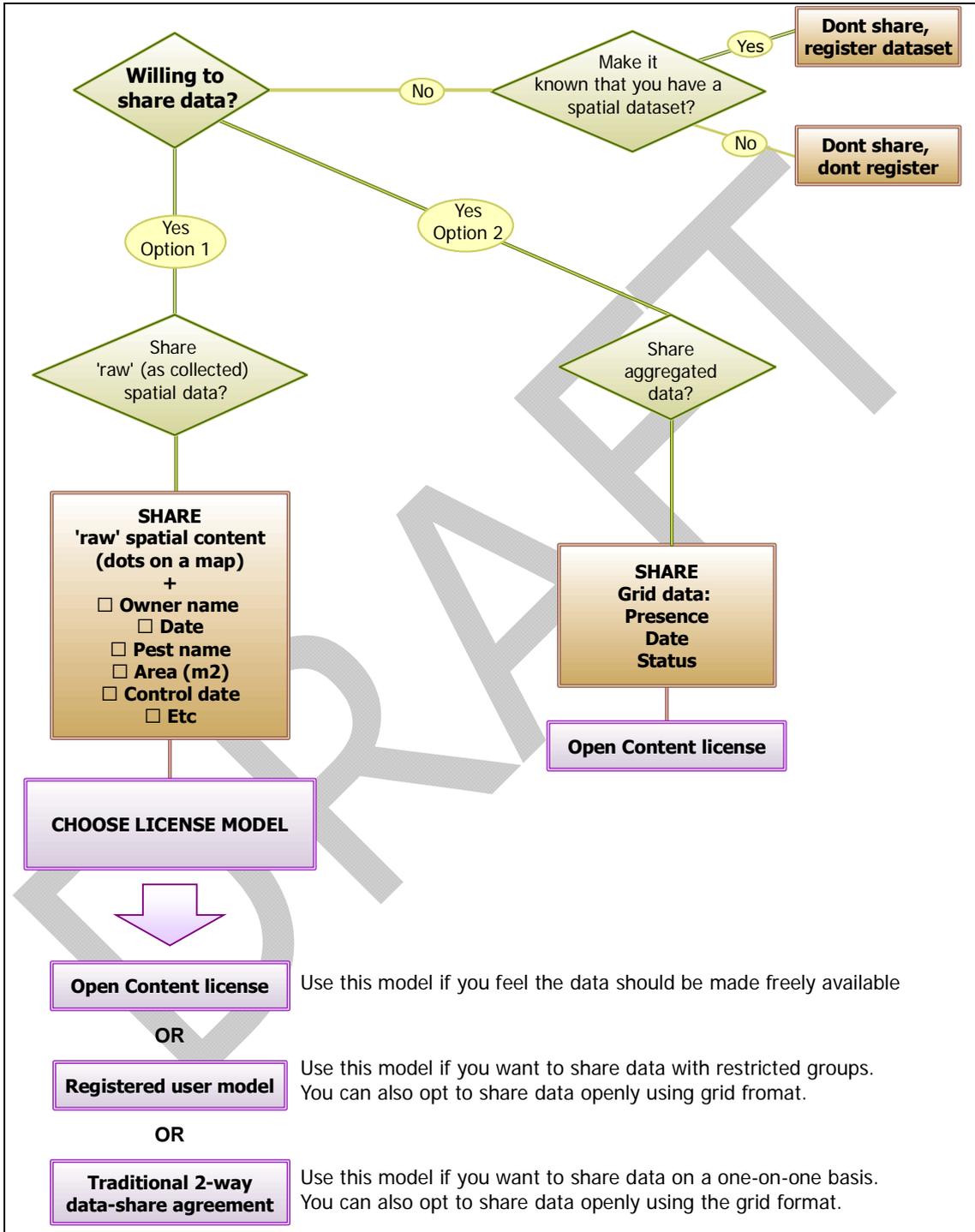


Figure 3: Decision tree diagram that considers i) the spatial content; and ii) the licence model.

7. Conclusion

The capacity to share data about invasive plants and animals provides a solid foundation for more effective and efficient pest management, especially in terms of achieving a more strategic, co-ordinated and collaborative approach that involves multiple stakeholders. This paper has discussed a range of data-sharing options that appear to be feasible, while satisfying various concerns over privacy and confidentiality. A single solution appears unlikely, due to the large number of potential uses and stakeholders. However, a flexible range of options that address each specific data sharing requirement seems more realistic.

From a provider's perspective, a considered approach will take into account the benefits of sharing (including value adding) as well as issues that are arguably unique to invasive plant and animal management. It is to be expected that a broader data sharing environment will bring its own rewards; more co-operative and collaborative working arrangements between stakeholders; richer datasets to use in the decision-making process; and overall, more effective and efficient management processes that will reduce the impacts of invasive plants and animals in Queensland.

8. References

ACIL Tasman (2008), The Value of spatial Information: The impact of modern spatial information technologies in the Australian economy, <http://www.anzlic.org.au/Industry/default.aspx>, accessed July, 2011

ANZLIC (2004), ANZLIC Best Practice Guideline, Spatial Information – Privacy Issues, Discussion Paper, Version 2 (Final), <http://www.anzlic.org.au/Publications/Copyright-Custodianship-Privacy/default.aspx>, accessed July 2011

Council of Heads of Australasian Herbaria Inc. (2010) Australian Virtual Herbarium, <http://www.chah.gov.au/avh>

Fitzgerald A., Pappalardo K. and Austin A. (2008), Practical data management: a legal and policy guide, Legal Framework for e-Research Project, and Open Access to Knowledge (OAK) Law Project,

Queensland University of Technology, <http://www.e-research.law.qut.edu.au>

Government 2.0 Taskforce Report (2009),
<http://www.finance.gov.au/publications/gov20taskforcereport> , accessed July 2011.

Grice A.C., Clarkson J.R., and M. Calvert M., Geographic differentiation of management objectives for invasive species: a case study of *Hymenachne amplexicaulis* in Australia. Environmental Science and Policy (submitted for publication, under review)

Natural Resource Management Ministerial Council, (2006), Australian Weeds Strategy – A National Strategy for Weed Management in Australia, Australian Government Department of the Environment and Water Resources, Canberra, ACT., <http://www.weeds.gov.au/publications/strategies/weed-strategy.html>

Natural Resource Management Ministerial Council, (2007), Australian Pest Animal Strategy – A National Strategy for the Management of Vertebrate Pest Animals in Australia, Australian Government Department of the Environment and Water Resources, Canberra, ACT.,
<http://www.environment.gov.au/biodiversity/invasive/publications/pest-animal-strategy.html>

Office of the Information Commissioner (2011), <http://www.oic.qld.gov.au/decision/mahoney-and-ipswich-city-council>, accessed 29 July 2011

Queensland Government Department of Employment, Economic Development and Innovation (2010), Spatial Pest Attributes Standard, http://www.dpi.qld.gov.au/4790_15470.htm

Queensland Department of Employment, Economic Development and Innovation, Queensland's new biosecurity legislation, http://www.dpi.qld.gov.au/4790_18207.htm, accessed July 2011).

Queensland Department of Environment and Resource Management, 2010, Wildlife Online, http://www.derm.qld.gov.au/wildlife-ecosystems/wildlife/wildlife_online

Queensland Government Department of Natural Resources and Water (2007), Delbessie Agreement (State Rural Leasehold Land Strategy).

Queensland Government Department of Primary Industries and Fisheries (2008), Queensland Biosecurity Strategy 2009 – 2014, http://www.dpi.qld.gov.au/4790_12541.htm

Queensland Government Department of Public Works (2008), Queensland Government Information Security Classification framework v1.0.1 <http://www.qgcio.qld.gov.au/>

Queensland Government (2010), Land Protection (Pest and Stock Route Management) Act 2002, http://www.dpi.qld.gov.au/4790_7655.htm

Queensland Government (2009), Queensland Information Privacy Act 2009, Act No. 14 of 2009, http://www.legislation.qld.gov.au/Acts_SLs/Acts_SL.htm

Queensland Government (2010), Queensland Government Information Licensing Framework, <http://www.gilf.gov.au/>

Spatialsource.com.au, <http://www.spatialsource.com.au/2011/05/31/article/Open-public-sector-information-principles-now-available/VDZZIIGZSE.html>, accessed 28 June 2011.

Sydes Travis A., Lawson Tina and Blakeney Sharlene (2010), What weeds? Is the community really interested? Trials and tribulations of a weed mapping, data sharing and community engagement project in Far North Queensland, Seventeenth Australasian Weeds Conference, pp87-90, 26-30th September 2010, Christchurch, New Zealand, <http://www.caws.org.au/awc/2010/awc201010871.pdf>

9. APPENDIX A: Spatial Pest Attribute Standard (SPAS)*

*DEEDI, http://www.dpi.qld.gov.au/4790_15470.htm

Note: CORE attributes are highlighted pink. DESIRABLE attributes are highlighted blue.

Weed Infestations

	Attribute	Comments
Required	Infestation ID	Unique infestation identification
Required	Area (m²)	
Desirable	Occurrence	Single plant or cluster
Desirable	Width (m)	The width can be recorded if the infestation is linear
Optional	Side of Carriageway	Relevant to infestations on main roads, and specific to Queensland Department of Main Roads personnel.

Weed Inspection and weed details

Classification	Attribute	Comments
Required	Inspection ID	Unique inspection identification number
Required	Infestation ID	Identification of the infestation where the inspection is being carried out
Required	Inspection date	Date on which the inspection was carried out
Required	Organisation	Organisation carrying out the inspection, may be "N/A" for "Report by 3 rd party"
Desirable	Type	Report by 3 rd party / Initial Inspection / Re-inspection / Data collection / Treatment
Desirable	Source	Landowner / Neighbour / Public / Weedspotters / Councillor / Other Government Officer Weeds Officer / Local government Officer / Land Protection Officer / Biosecurity Officer / State Govt Ranger / Pest Mgt Officer / Environmental Officer / Administration Officer / Other
Optional	Officer	Name of inspecting officer
Desirable	Scientific Name	Selected from the Pest Species list, as above
Optional	Common Name	Selected from the Pest Species list, available on the SPA website: http://www.dpi.qld.gov.au/4790_15470.htm
Desirable	Status	New Infestation / Active infestation / Under control / Under monitoring / Closed / No Infestation Present / Unknown
Desirable	Confidence	This is the confidence the inspector has in the species identification: Very certain / Reasonably certain / Unsure
Required	Weed ID	Unique 8 digit code for the weed, composed of the first 4 letters from the genus then the first 4 letters from the species name.
Optional	Form	Groundcover / Shrub / Woody / Aquatic / Vine / Cacti/succulent
Optional	Phenotype	May be entered if known
Optional	Sample Taken	Was a sample taken for subsequent identification?

Classification	Attribute	Comments
Optional	Sample Number	Number allocated by the inspector if a sample was taken, otherwise Null
Optional	Verification	Was the sample verified?
Optional	Verify date	If Verification = yes, date of verification
Optional	Verified By	QLD Herbarium / Biosecurity Officer / Other / N/A
Optional	Verifying Officer	Officer's Name
Optional	Dominance	Choose from the list.
Desirable	Density	Scattered / Low / Medium / High
Desirable	Reproductive Status	Flowering / Seeding / Vegetative & Mature / Immature
Desirable	Mature Plants	Percentage of mature plants within the weed population
Optional	Health	Healthy / Stressed / Dead
Optional	Road Reserve	Relevant to Main Roads: is the infestation confined to the road reserve?
Optional	Adjacent Worse	Relevant to Main Roads. Yes / No
Optional	Treatment evidence	Yes / No
Optional	Treatment Type	Chemical / Physical / Mechanical / Biological
Optional	Treatment Effectiveness	Percent killed
Optional	Recommended treatment	None / Chemical / Physical / Mechanical / Biological
Optional	Recommended method	Aerial spray / Basal barking / Boom spray / Cut stump / Cut and swab / Foliar spray / (hand gun) / Soil applied / Stem scraping / Stem injection / Splatter gun / Wick applicator / Cutting / Fire / Hand removal / Shading (weed suppression) / Fencing / Dozing / Chain pulling / Stick raking / Brush cutter / Slashing / Other
Optional	Proposed re-inspection	None / 1 month / 3 months / 6 months / 12 months / 18 months / 24 months / 36 months

Weed Treatment

Classification	Attribute	Comments
Required	Treatment ID	Unique identification of treatment event
Required	Organisation	The name of the organisation responsible for the treatment
Required	Treat start date	Start date the treatment was undertaken
Desirable	Treatment Type	Chemical / Physical / Mechanical / Biological
Desirable	Treatment Method	Aerial spray / Basal barking / Boom spray / Cut stump / Cut and swab / Foliar spray / (hand gun) / Soil applied / Stem scraping / Stem injection / Splatter gun / Wick applicator / Cutting / Fire / Hand removal / Shading (weed suppression) / Fencing / Dozing / Chain pulling / Stick raking / Brush cutter / Slashing / Other Note that additional information on chemical application may need to be recorded under the record keeping requirements of section 26 of the Agricultural Chemicals and Distribution Control Act 1966 (ACDC Act). See section 5.4.
Optional	Operator	Operator's name
Optional	Treat end date	End date the treatment was undertaken, if more than 1 day

Evidence of pest animals

Classification	Attribute	Comments
Required	Evidence ID	Unique identification of evidence
Desirable	Type	Report by 3 rd party / Initial Inspection / Re-inspection
Desirable	Source	Landowner / Neighbour / Public / Councillor / Other Government Officer / Weeds Officer / Local Govt Officer / Land Protection Officer / Biosecurity Officer / State Govt Ranger / Pest Mgt Officer / Environmental Officer / Administration Officer
Required	Organisation	Organisation carrying out the inspection, may be "N/A" for "Report by 3 rd party"
Required	Evidence date	Date when evidence was gathered
Required	Scientific Name	Selected from the Pest Species list, as above.
Optional	Common name	Selected from the Pest Species list, available on the SPA website: http://www.dpi.qld.gov.au/4790_15470.htm
Optional	Officer	Name of inspecting officer
Desirable	Confidence	Very certain / Reasonably certain / Unsure
Desirable	Sample Taken	Yes / No
Optional	Sample Number	Number allocated by the inspector if a sample was taken, otherwise Null
Optional	Verification	Yes / No
Optional	Verify date	Date of verification if Yes
Optional	Verifying Officer	Officer's Name
Desirable	Evidence	Sighting / Shooting / Trapping / Breeding site / Track / Feed area / Scats / Skeletal remains / Active camera / Passive camera / Stock bitten / Stock killed / Crop damage /

Classification	Attribute	Comments
		Pasture damage / Infrastructure damage / Environmental impact / illegal pet / Other.
Desirable	Type	Calf / Weaner / Steer / Cow / Bull / Lamb / Hogget / Wether / Ewe / Ram / Goat / Grain / Corn / Fruit / Vegetable / Sugar cane / Forest plantation / Soil erosion / Habitat destruction / Reduction in vegetation cover / overgrazing / Water-body contamination / Native animal predation / Native animal toxic ingestion / Other (specify).
Optional	Count	Number of animals if evidence = Sighting, Shooting, Trapping, Active or Passive Camera.
Optional	Stock bitten	Number of animals if evidence = Stock bitten.
Optional	Stock killed	Number of animals killed if evidence = Stock killed.
Optional	Disposal method	Described disposal method if evidence = illegal pet.

Pest Animal Infestation

Classification	Attribute	Comments
Required	Animal Infestation ID	Unique identification of animal infestation
Required	Area (m²)	Area of the polygon
Required	Organisation	The name of the organisation responsible for describing the infestation
Required	Scientific Name	Selected from the Pest Species list, as above.
Desirable	Common Name	Selected from the Pest Species list, available on the SPA website: http://www.dpi.qld.gov.au/4790_15470.htm
Desirable	Status	New area / Active area / Under control / Under monitoring / Closed / Unknown
Desirable	Status date	Date at which the current status was set
Desirable	Officer	Officer's name
Desirable	Infestation type	Breeding site / impact site / movement corridor / other
Optional	Density	The number of animals per km ²
Optional	Count	The estimated animal count for the area
Optional	Population structure	No. males: No females: no. offspring

Pest Animal control

Classification	Attribute	Comments
Required	Animal Control ID	Unique identification of control event
Required	Organisation	The name of the responsible agency.
Required	Control Start / end date	
Required	Scientific Name	Selected from the Pest Species list, as above.
Desirable	Common Name	Selected from the Pest Species list, available on the SPA website: http://www.dpi.qld.gov.au/4790_15470.htm
Desirable	Control Type	Baiting / Fumigation / Trapping / Ground shooting / Aerial shooting / Removal / Mustering / Harbour destruction / Exclusion fencing / Biocontrol / Guard animals / Other (comment)
Optional	Officer	Officer's name
Desirable	Baiting method	Carrot, 180mg/mL / Pellet, 180mg/mL / Grain, 180mg/mL / Other, 180mg/mL / Pindone / Meat – 36mg/mL / Grain – 36mg/mL / Other – 36mg/mL / PIGOUT – 72mg / Meat / injected) – 10mg/mL / Meat (mixing) – 10mg/mL / Meat (injected) – 6mg/mL / Meat (mixing) – 6mg/mL / Doggone – 6mg / De_K9 – 6mg / Strychnine / Meat (injected) – 3mg/mL / Meat (mixing) – 3mg/mL / De-FOX – 3mg / Mouseoff ZP / Mouseoff Bromadiolone
Desirable	Amount	Number of baits used if Control Type = Baiting And Baiting method = Doggone OR De_K9 OR De-Fox or the amount of bait in Kg
Optional	Fumigant	Phosphine / Carbon Monoxide
Optional	No. burrows	The number of burrows treated if the control type is Fumigation and Animal = Fox or Rabbit.
Optional	Trap check date	If Control Type = Trapping enter the date that trap was checked
Optional	Trap type	Break-back / Elliot / Pitfall / Water trap / Collarum / Padded foot-hold / Padded leg-hold / Padded leg-hold strychnine / Cage / Treadle / Soft net / Padded-jaw / Barrel trap / Padded foot-hold / Padded leg hold / Self-mustering / Silo / Other
Optional	No. animals	The number of animals controlled if Control Type = Trapping, Shooting, Removal or Mustering.
Optional	Bio-control	Calicivirus / Myxomatosis, if Control type = Biocontrol and Animal = Rabbit.

Spatial or geographic attributes

Classification	Attribute	Comments
Required	Spatial object	A point, line or polygon stored in Geographical coordinates (latitude and longitude in decimal degrees). The attributes listed in SPAS are usually recorded against a spatial object.
Required	How located	Drawn / GPS / DGPS / Other: indicates accuracy and reliability
Optional	Map base	The name of the map or image base that was used, if How Located = "Drawn" eg State Digital Cadastre or Spot Imagery (2.5m or 10m pixels).
Optional	Locality	A short description of locality that helps to describe the general location of a point, line or polygon.

Pest survey attributes

Classification	Attribute	Comments
Desirable	Survey Name	A short name for the survey, which may include the target species name.
Desirable	Lead organisation	The name of the organisation responsible for the survey.
Desirable	Target species	Name of weed/s or pest animal/s that is the target of the survey.
Desirable	Start / finish date	
Optional	Survey leader	The name of the person responsible for the survey
Optional	Other agencies	The name/s of any other agencies that participate in the survey
Optional	External reference	A reference that might be used or useful to the lead organisation.
Desirable	Survey method	On location / Remote analysis
Desirable	Survey Purpose	Emergency response / Routine management / Research / Other
Desirable	Survey type	Baseline / Delimiting / Monitoring
Desirable	Status of survey	Proposed / Active / Inactive / Closed
Desirable	Survey technique	Aerial / Ground vehicle / On foot / Boat / Other
Optional	Survey stage	Pre-control or post control
Optional	SurveyPartDate	Date the survey part is undertaken.

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