

# Managing premise data during an emergency animal disease response with the IRS 2.1 geodatabase application

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## Abstract

The Incursion Response System (IRS) is an integrated geographic information system (GIS), database and web application for the management of exotic disease and pest responses. Effective use of the IRS geodatabase application during an emergency animal disease outbreak is dependent on the accuracy of the available premise data describing the location and ownership of premises with susceptible species.

The IRS 2.1 geodatabase application (IRS 2.1) provides new tools that enable rapid processing of data from two alternative sources should Biosecurity New Zealand be required to respond to an emergency animal disease in a region of New Zealand where premise data is substantially missing or inaccurate.

This paper describes the IRS 2.1 functionality for maintaining premise data and its use in an emergency animal disease response.

## Introduction

Effective use of the IRS application to support a response to an emergency animal disease requires that accurate premise data is loaded into the application. Premise data enables response personnel to readily determine where a premise is, who owns and manages it, how to contact them, and the number and type of susceptible species present. Hence IRS uses premise data to support; the recording and evaluation of reports of suspected disease presence, scheduling and recording field visits, processing contiguous and protection zones, tracing, and movement permitting. The improvements in efficiency that IRS provides these processes is affected by the accuracy of premise data available and the ease with which errors and omissions in the existing premise data can be corrected.

The May 2005 foot-and-mouth disease hoax in New Zealand highlighted the challenges associated with missing premise data. At the initiation of the response only 61% of farms on Waiheke Island with species susceptible to foot-and-mouth disease were recorded in the national premise database, AgriBase<sup>TM</sup>. Many of the 'missing' premises represented small holdings with absentee landowners. During the response it proved difficult to; obtain the required information on the missing premises, process information contained in other databases that may enable identification of missing premises, and enter the missing premise boundaries using the standard ArcGIS 8.3<sup>TM</sup> application. Consequently 'missing' premises experienced significant delays to the initiation of surveillance, tracing and movement permitting processes.

The IRS 2.1 release was specifically developed to address this issue. The new functionality developed enable IRS to; efficiently process large quantities of data stored in two external databases to assist the identification of premises missing from the premise database, and facilitate the completion of key response processes in spite of missing or incorrect premise data. This paper provides an overview of the new functionality included in the IRS 2.1 application and the data sources used to maintain premise data within an IRS database.

## **Overview of data sources used by IRS<sup>2.1</sup> to maintain premise data**

IRS 2.1 has been specifically designed to utilise data from three databases to assist the maintenance of premise data. These databases are national premise database, AgriBase<sup>TM</sup>, Territorial Local Authority valuation databases, and the national register of land parcels, Core Records System (CRS). The design specification enables specific data from each of these databases to be loaded into an IRS database. AgriBase<sup>TM</sup> and CRS data is loaded as part of the database initialisation procedures. Valuation database information may be added later as data is made available to Biosecurity New Zealand by each Territorial Local Authority.

AgriBase<sup>TM</sup>, is the national premise database and is owned and managed by Agriquality Ltd. Registration of premises is on a voluntary basis and records describe the premise including its boundary, ownership and management details including contact names, telephone numbers and addresses, and a description of the type and numbers of animals present on the premises. The coverage includes 88% of agricultural and horticultural land by area, and 80% of premise records have been maintained within the previous three year period. This data represents the best source of premise information available in New Zealand. The data is collected specifically for biosecurity purposes, hence there are no privacy issues that restricting data usage.

Valuation databases are owned by Territorial Local Authorities, and are either managed by the individual authority or by Quotable Value New Zealand Ltd on their behalf. These databases record the names and addresses of ratepayers (property taxpayers) and land valuation units owned by them. These databases do not contain ratepayers' phone numbers or details of the numbers and type of animal species present. As these databases are used to support the collection of property rates (taxes), the data is believed to have very high coverage and currency. Privacy issues do affect the availability of this data, as it is not collected for biosecurity purposes. However, in the event of an outbreak Biosecurity New Zealand can request access to this data for the affected regions of the country.

CRS, is the national register of land parcels and is owned and managed Land Information New Zealand. This database records every land parcel in New Zealand, and sometimes a certificate of title. This database does not store owner addresses, phone numbers or details of the numbers and type of animal species present. This data is freely accessible in the public domain, hence there are no privacy issues affecting data usage.

### **IRS 2.1 functionality for the maintenance of premise data**

IRS utilises AgriBase<sup>TM</sup> is the primary source of premise data used to support emergency animal disease responses. The new premise maintenance functionality included in IRS 2.1 are designed to address the issues that arise when premises are missing from the data loaded from AgriBase<sup>TM</sup>, or when updates to the premises loaded are required. IRS 2.1 provides two basic mechanisms of the maintenance of premise data; either the GIS Officer can proactively populate missing premises using tools that enable the batch creation of multiple premises, or web application users can add or maintain premises on a premise by premise basis, creating jobs for the GIS Officer to process.

Batch creation of missing premises is achieved using an ArcGIS 9.0<sup>TM</sup> extension that enables the GIS Officer to create new premises from either valuation or parcel data. This functionality enables the GIS Officer to: 1) Select the valuation/parcel features within a region where 'missing' premises are to be created, 2) Exclude valuation/parcel features that are within or overlap existing premises, and 3) Create new premises using the selected valuations/parcels.

The new premises created via this mechanism contain premise information including its boundary, ownership details including contact names and addresses. Management information, telephone numbers, and a description of the type and numbers of animals present on the premises can easily be obtained using a call centre and the internet white pages in most instances. Valuation data is preferred over parcel data as it contains superior ownership and address information.

In the event that response personnel discover that a premise is missing from the IRS database, or requires updates, personnel use an xml browser based application to enter or maintain premise information including, ownership and management details, contact names, telephone numbers and addresses, description of the type and numbers of animals present on the premises, and the property boundary. Definition of a new premise boundary or modification of an existing boundary is achieved by providing the user with access to an ArcIMS<sup>TM</sup> map of the premise and allowing the user to create a request to select or deselect the land parcels associated with the premise. Completed requests are made available to the GIS Officer via the 'Maintenance Jobs Panel' included in the IRS extension for ArcGIS 9.0<sup>TM</sup>. Functionality included in the extension and map document file assist the GIS Officer to easily verify the appropriateness of the request, add or remove parcels, cancel or confirm the request as appropriate. Edits to a premise boundary are made only after confirmation by a GIS Officer.

## **Conclusion**

The IRS 2.1 geodatabase application enables Biosecurity New Zealand to efficiently utilise available data to resolve errors and omissions in the national register of premises. The functionality included in the application provides an effective mitigation strategy for the risk that Biosecurity New Zealand may need to respond to an emergency animal disease outbreak in a region where the coverage of the national register of premises is suboptimal.

## **References**

King, C.B., Malcolm, C. W., Keal, D. K., Payne, K., and Davies, D. H. (2003). An integrated geographical information system (GIS), database and web application for the management of exotic disease and pest responses. *ISVEE X, 17 – 21 November 2003, Vina del Mar, Chile.*