Akabane Virus – Risk Management in Australia

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Akabane virus epidemiology

Understanding the epidemiology of Akabane virus is the key to:

- Disease control
- Risk management
- Disease diagnosis

Akabane virus epidemiology

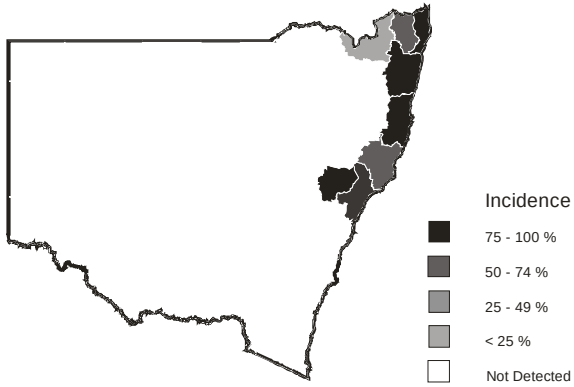
Key aspects:

- Regular, annual transmission of Akabane virus within range of C. brevitarsis
- Annual transmission patterns regular and ‘predictable’
- High prevalence of Akabane virus infection in young cattle;
- High level of herd immunity
- ? Some cross protection from infection with related viruses

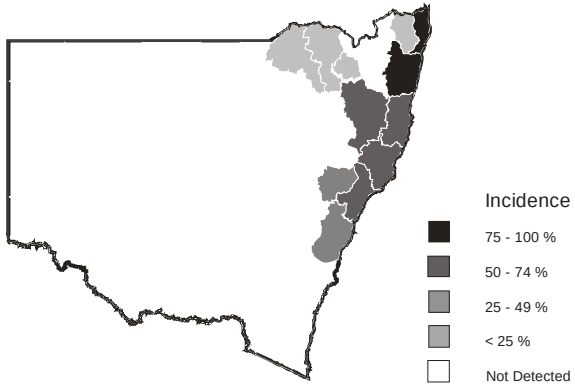
Akabane virus epidemiology

- Annual transmission patterns regular and ‘predictable

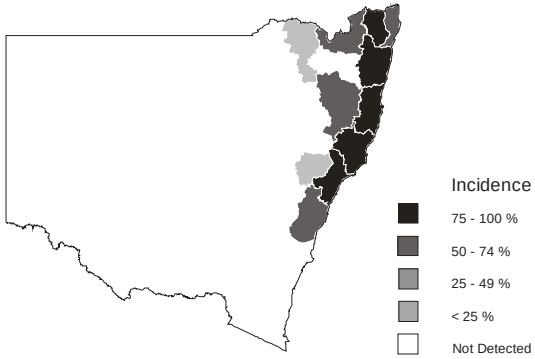
Distribution of Akabane Virus: 2004-2005.



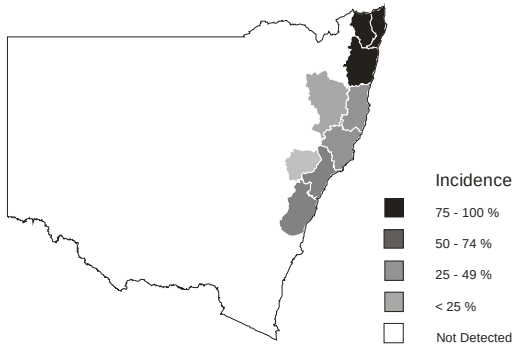
Distribution of Akabane Virus: 2005-2006.



Distribution of Akabane Virus: 2006-2007.



Distribution of Akabane Virus: 2007-2008.



Akabane Disease

- Disease is ONLY observed with a disruption or alteration to the endemic cycle (females become immune prior to breeding age);
- Disease can occur as a result of:

  - a reduction in the size of the ‘normal’ endemic zone (eg following adverse climatic conditions - drought) due to reduced vector activity;

  - an expansion of the distribution of vectors (following favourable climatic conditions).

  - the introduction of susceptible animals into the endemic zone

Akabane disease outbreaks

- Disease outbreaks have occurred at long intervals (10-15 years);
- Most due to favourable conditions resulting in an expansion of the vector range into susceptible livestock populations;
- Occasionally disease due to a temporary contraction in the vector range.
- Movement of pregnant animals into vector area during transmission period presents a high risk

Akabane virus surveillance

- Vector distribution and virus transmission patterns well known;
- Vector-borne viruses have been systematically monitored for >30 years
- Research projects for virus-vector surveillance resulted in the development of the National Arbovirus Monitoring Program (NAMP)

What is NAMP and how is it managed?

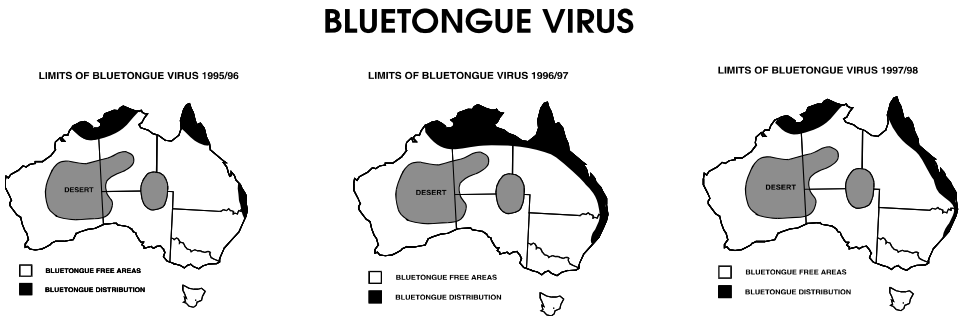
- NAMP is a nationally co-ordinated program for the monitoring of selected vector-borne viruses of importance to animal health in Australia
- The monitoring program is managed by a group representing state and federal governments and the major livestock industries and co-ordinated by Animal Health Australia (AHA)
- AHA is a company owned by the livestock industries in partnership with the state and federal governments.

How is NAMP funded?

- NAMP is funded through AHA by the company members in proportion to the benefits that are gained from NAMP.
- Collectively the livestock industries pay 50% of the direct operating costs;
- The federal government meets 25% of the cost
- Collectively the states pay 25% with an individual state share determined by cattle and sheep numbers

What are the objectives?

- Trade support – to define the distribution of viruses and their insect vectors to assist the development of export protocols and meet certification requirements
- Early warning – to detect incursions of new viruses and vectors into Australia
- Risk management – to detect changes in virus and vector distribution that may lead to disease outbreaks

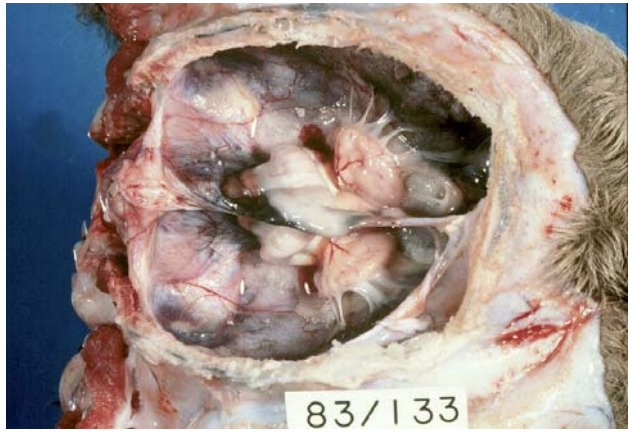


Which viruses and insects are monitored?

There are 3 main virus groups that are monitored:

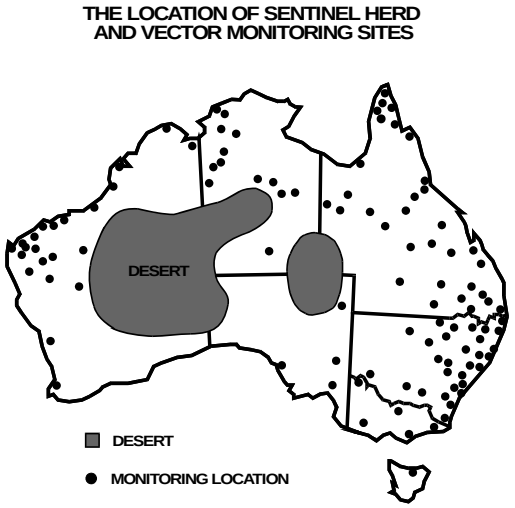
- Akabane virus
- Bluetongue – 10 different serotypes have been detected in Australia
- Bovine ephemeral fever virus

Vector monitoring of the biting midges – *Culicoides* spp



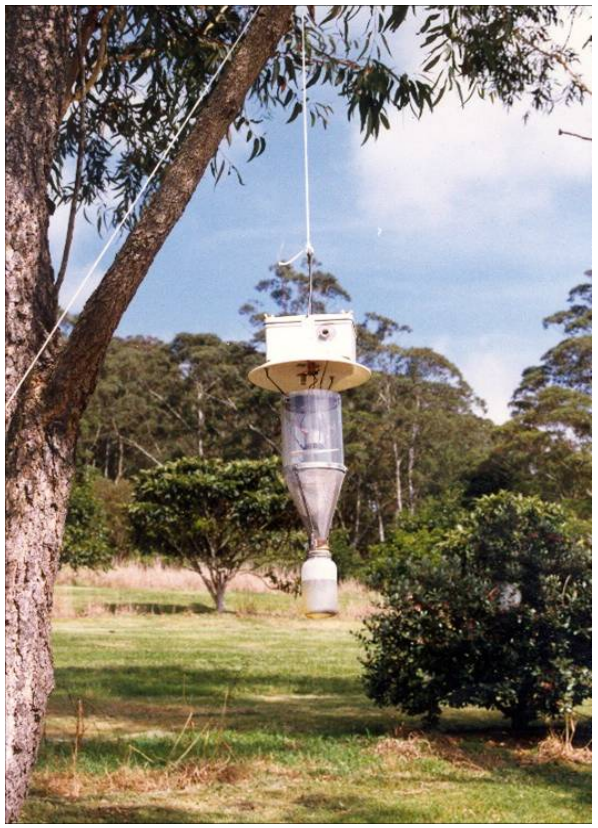
How and where is monitoring conducted?

- Groups of young cattle are strategically located around Australia throughout the known range of the principal Culicoides species
- Insects are collected in light traps



What testing is carried out?

- 10-15 animals (6-9 mths in spring)
- Blood samples collected regularly (monthly in coastal locations – weekly at CPRS, NT)
- Synchronised sampling between sites
- Tested for Akabane, Bluetongue and Ephemeral Fever virus antibodies – ELISA and VNT
- Bluetongue virus isolation – ID of serotype and topotype
- Insects sorted to species

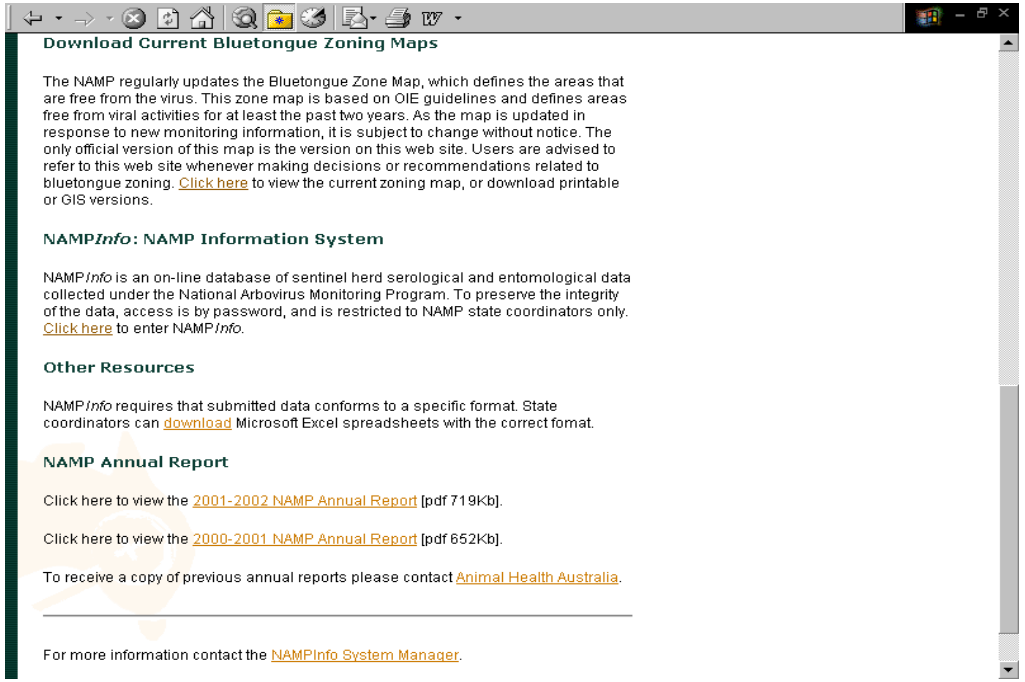


Management of NAMP data

- AHA website
- Unique property identifiers
- Web-based data submission – interactive error checking

Outputs from NAMP

- BTV zone maps (static and interactive)
- Zone maps dynamic, auto-notification system
- Synoptic annual reports



Download Current Bluetongue Zoning Maps

The NAMP regularly updates the Bluetongue Zone Map, which defines the areas that are free from the virus. This zone map is based on OIE guidelines and defines areas free from viral activities for at least the past two years. As the map is updated in response to new monitoring information, it is subject to change without notice. The only official version of this map is the version on this web site. Users are advised to refer to this web site whenever making decisions or recommendations related to bluetongue zoning. Click here to view the current zoning map, or download printable or GIS versions.

NAMP*Info*: NAMP Information System

NAMP*Info* is an on-line database of sentinel herd serological and entomological data collected under the National Arbovirus Monitoring Program. To preserve the integrity of the data, access is by password, and is restricted to NAMP state coordinators only. Click here to enter NAMP*Info*.

Other Resources

NAMP*Info* requires that submitted data conforms to a specific format. State coordinators can download Microsoft Excel spreadsheets with the correct fomat.

NAMP Annual Report

Click here to view the 2001-2002 NAMP Annual Report [pdf 719Kb].

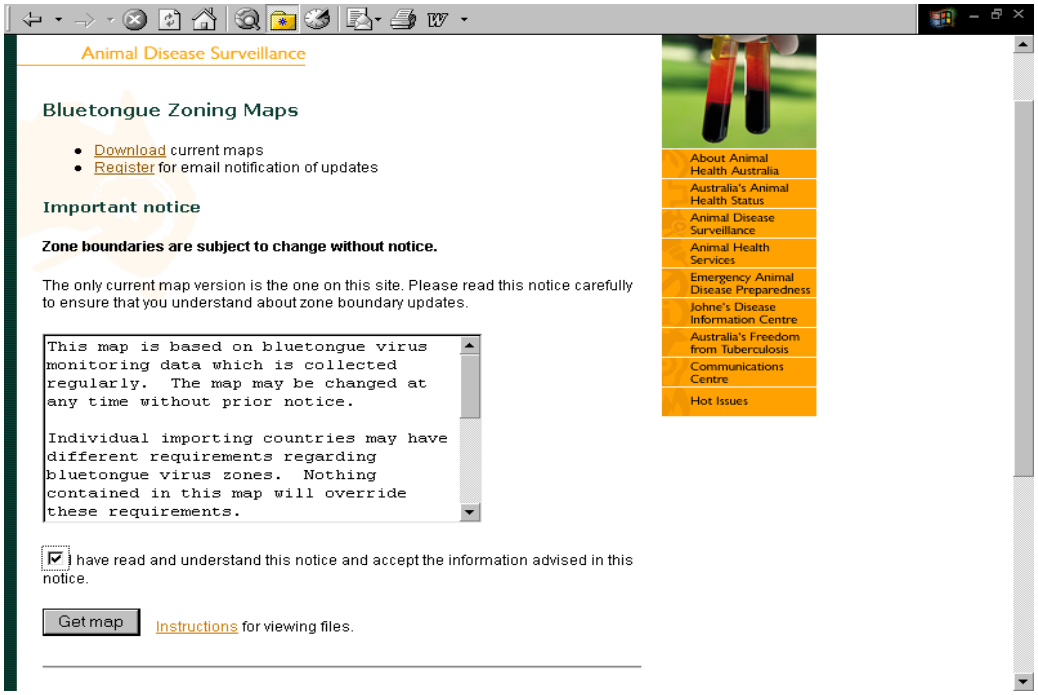
Click here to view the 2000-2001 NAMP Annual Report [pdf 652Kb].

To receive a copy of previous annual reports please contact Animal Health Australia.

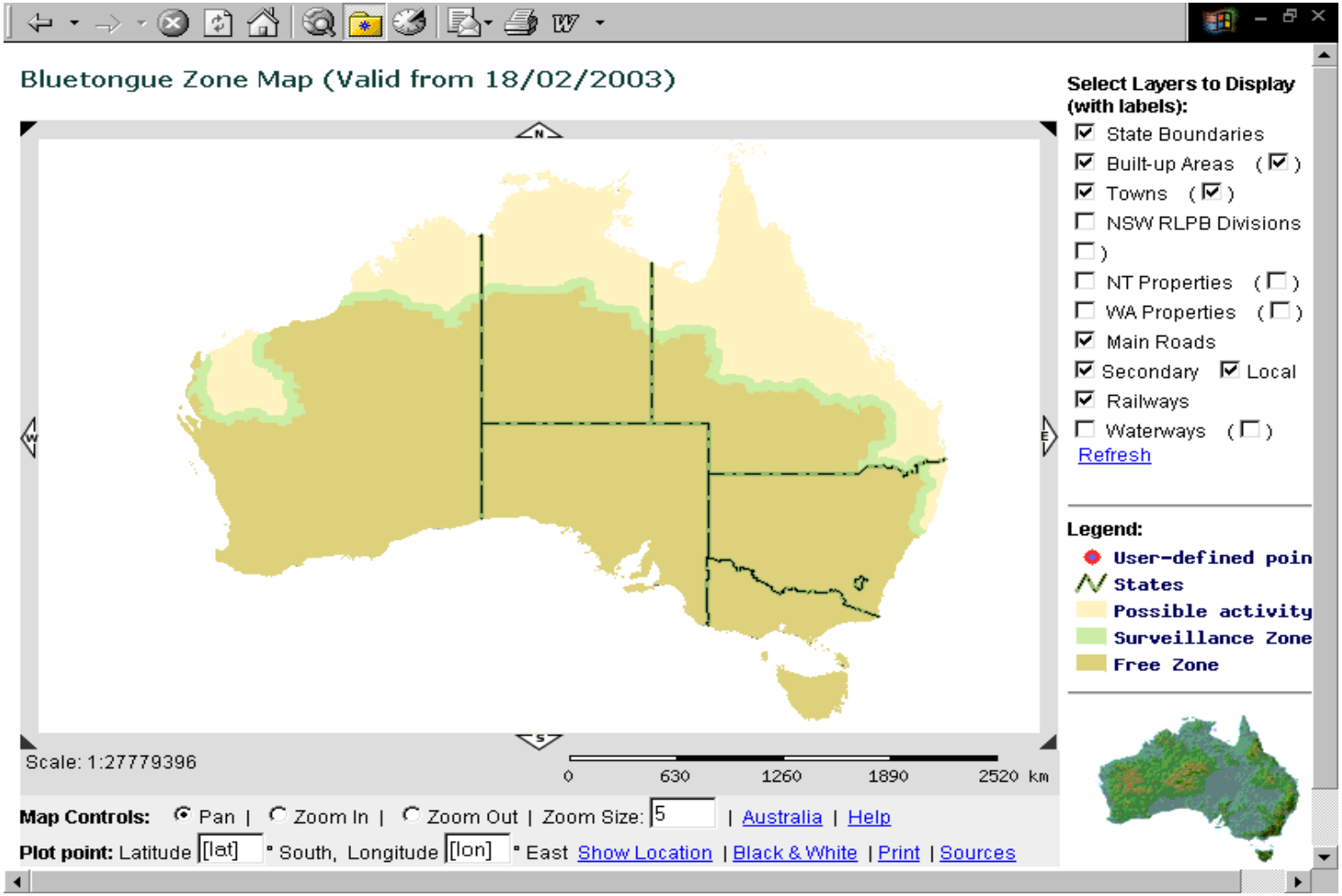
For more information contact the NAMPInfo System Manager.

Availability of NAMP data

BTV zone maps and reports available on line

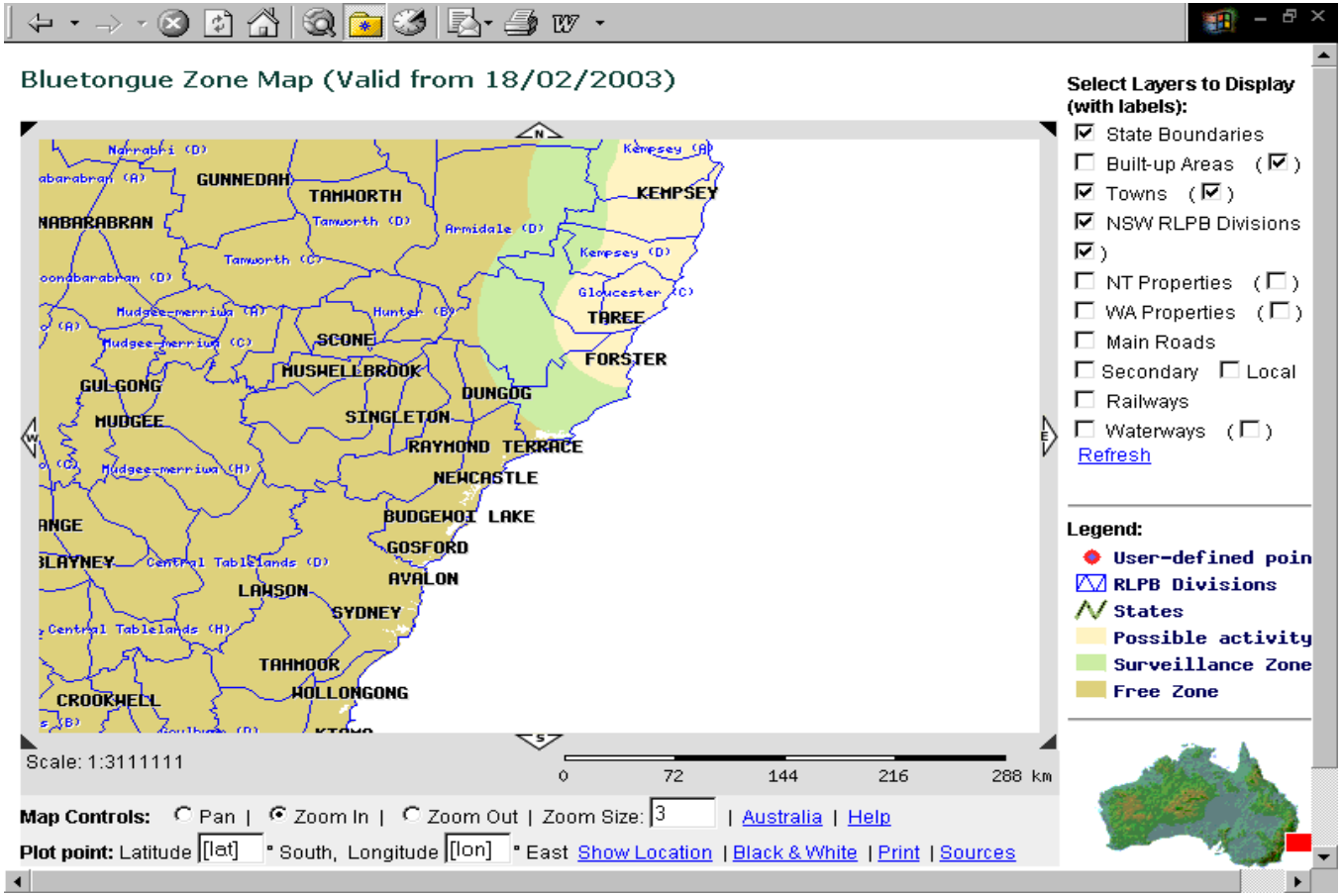


BTV free zones



BTV free zones - interactive

NAMP data can be used to define Akabane or BTV distribution



Akabane disease control

- Vector distribution and virus transmission patterns well known;
- Impact of infection can be managed:
- Farmers limit movement of pregnant animals into vector regions during virus transmission period;
- Joining delayed if new stock introduced in vector season;
- Vaccine was used at & beyond margins of endemic area;
- Vaccine not commercially available any longer.

Akabane virus impacts

Although vector distribution and virus transmission patterns well known and disease is absent:

- Farmers still experience economic loss due to export restrictions arising from:

  – need for testing of live animals;

  - testing of semen and embryo donors;

  - Vector free regions not recognised;

  - Seasonal freedom not recognised;

- Very short viraemia should provide safety for the movement of seropositive animals.

Schmallenberg virus – will it continue to be a problem?

Many obvious parallels with Akabane, however (a personal opinion):

- An evolving situation at present – may take some years to reach equilibrium
- Different vectors to Akabane – more tolerant to adverse climatic conditions; capacity to survive indoors;
- Probably much more difficult to eradicate than BTV;
- Origins and annual epidemiology not yet known;
- Can stable endemic patterns become established?
- Should not be a major obstacle to trade

Thank you for your attention