Current Heifer Research in the NT

Tim Schatz, Livestock Management, Pastoral Production, DBIRD, 8999 2332

Assuming there are no major disease problems, the biggest factor affecting heifer fertility is joining weight (condition). Young heifers don’t reach puberty (start cycling) until they get to a certain weight and while this weight is different for each heifer, it is usually around 275 kg. When a heifer is in poor condition (especially during lactation) she often doesn’t cycle and so won’t be able to get in calf.

When a heifer gets in calf for the first time she uses nutrients for her own growth as well as to grow the calf inside her. After she calves, the nutrition required for lactation and her own growth to occur at the same time are even higher. As a result lactating first calf heifers are often not in good enough condition to start cycling for extended periods of time. This results in low re-conception rates in first calf heifers. Braithwaite and De Witte (1999 AACV conf. proc. p. 237-8.) state that in their experience conception rates in first calf heifers are below 50% in traditional systems in northern Australia.

There are two heifer research projects currently running in the NT which aim to increase heifer fertility. One of the projects is being carried out on commercial properties while the other is on the DBIRD research stations at Kidman Springs (VRRS) and Douglas Daly Research Farm. Both projects are funded by Meat and Livestock Australia (MLA) and will run for 5 years.

Research on commercial properties. There is a major heifer research project at Newry station. A traditional management system (heifers continuously mated from about two years old) is being compared to a system where heifers are mated for a limited time at their first joining, are supplemented at key times and calves are weaned earlier than “normal”. The effectiveness of vaccinating heifers for vibrio is also being examined. The first year group of 700 heifers were joined over the past wet season so only preliminary results are available at this stage. All heifers in the trial are tagged with electronic identification devices (EIDs) and data is recorded electronically. The electronic data recording system at Newry is working very well and could be used as a model for anyone interested in getting into electronic recording. A field day will be held at Newry in mid 2006.

In addition to the major research site at Newry the fertility levels of heifers are being documented on 3 properties in the Katherine/VRD region. The stations involved are Willeroo, Killarney and Riveren. Heifers are tagged and weighed prior to their first joining and then followed for two years to record their fertility over that time. The purpose is to establish what the current fertility levels are, and to determine how much of a problem heifer fertility is in the region, since there is no current information available.

Research on DBIRD research stations. While it is common knowledge that the fertility of heifers improves as their condition (or joining weight) improves, we don’t actually know the specifics of this relationship for Brahman cattle in the NT. The research on DBIRD research stations aims to address this by establishing the relationship between body weight (and/or condition) and conception rates for maiden and first calf heifers. From this it will be possible to produce a simple chart showing the conception rates that would be expected from mating heifers at different weights. This will be a valuable management tool for producers who could use this information to do cost/benefit analyses to determine whether efforts to improve the nutrition of their heifers will be profitable (since they should be able to predict the return on their investment). They could also use this information to identify which heifers (weight range) will reach a target joining weight without being supplemented, which ones it is worth supplementing so that they will reach a target joining weight, and which ones it will be wasteful to feed since they won’t make it anyway (and so can either be culled or held over for another year).
From the Regional Director

The Farm and Garden Day held at Katherine Research Station on the 16th April turned out a wonderful day with fantastic weather and a record attendance. The roll-up was 1900 people through the gates, a huge increase on 1300 last year, not surprising, considering the difference in the weather. Last year, we still had flood-waters in the office and this year it was bright sunshine.

Thank you to all the sponsors, exhibitors and patrons who made it such a successful day. Once again, I need to thank the staff at KRS for putting in such a great effort to showcase their work on the station.

This was our Tenth Farm and Garden Day and was notable in having the Katherine Business Expo held on site on the day. It is a very positive move and one which, hopefully, will continue in the future.

The brilliant weather on the day was a reflection of the wet season we’ve had this year, unfortunately a very dry one. It was lucky that Cyclone Ingrid delivered some late falls to the region as some properties had received only very limited falls up till then. The seasonal prospects are pretty poor over much of the Territory this year and it is hoped that we get an early break to the dry season.

You probably have heard by now that I am leaving the Public Service on the 31st May so this will be my last contribution to the Katherine Rural Review. Contrary to some views, I have only been with the Department for 15 years but will miss the Territory and its people. I’m moving to Queensland to get involved in a newly formed pastoral company as well as run a few cattle of my own. There’s a boat moored over there which is also a factor.

I have been privileged to be a very small part of the Territory and its development and have always felt very much at home here. I will miss you all.

Jack Peart

Huge roll up for Low Stress Stock Handling Course

Forty-two participants came from all over the Territory to attended the Low Stress Stock Handling Course held on the 2nd and 3rd of April at Austasia’s Katherine depot.

The group learnt about basic animal instincts and the principles of low stress stock handling in a combination of classroom learning and practical situations. Everyone was given a chance to practice working cattle with their new skills and to the surprise of many it actually worked!

Trainer, Jim Lindsay, believes that dealing with stock should be a stress-free, painless activity for the cattle and the handlers and considers the business benefits to low stress stock handling include improved production gains and better meat quality.

The participants were able to cover a range of specific areas of interest over the two days including helicopter mustering the low stress way, dealing with weaners and yard design and improvements.

Further information on the Low Stress Stock Handling Course is available on the website at www.lss.net.au.

Other FarmBis eligible courses coming up in Katherine include:

- Breeding EDGE 25-27 May
- Grazing Land Management 27-29 June
- Strategies for Financial Advancement 9-10 July
- Jabiru Management Skills Development July – exact dates TBA

For more information please contact Simone White, FarmBis Coordinator in Katherine on 8973 9792.
Soil Health

Sarah Fea, Agricultural Extension Officer, DBIRD Katherine, 8973 9724

What do we mean by the term ‘Healthy Soil’?

- Biology is balanced (the living component)
- Good nutrient reserves/good fertility (the chemical component)
- Good organic matter levels – ‘humus’
- Good natural nutrient cycling occurring
- A system less dependent on man made inputs. More robust and less prone to stress.

Soil Foodweb Principles

Organisms need to eat:

- Bacterial foods are simple sugars, carbohydrates and proteins
- Fungal foods are complex sugars, fats, and proteins
- Protozoa foods are bacteria
- Nematode foods are bacteria, fungi, protozoa, and nematodes
- Arthropod/Insect foods are all of the above and each other

Balance is maintained by:

- Competition (food, space, moisture)
- Inhibition (antibiotics, secondary metabolites, allelopathic compounds)
- Predation
- Abiotic factors (disturbance, temperature and precipitation (rain))

Complexity increases as the plant type becomes more complex and the system more productive.

There is a lot going on underground and we are still just coming to terms with a lot of this and how it affects the things we grow. It is a very interesting topic and we look forward to helping you explore this underground world.

Thanks must go to Dr Elaine Ingham for providing these photos and diagrams.

What are some benefits of a healthy Soil Foodweb?

- Suppress Disease (reduction of pesticides required)
- Retain Nutrients (stop run-off, leaching)
- Nutrients available at rates plants require (eliminate conventional fertiliser)
- Decompose Toxins
- Build (re-build) Soil structure
- Reduce Water Use, increase water holding capacity and rooting depth

Things that disturb biology and affect the levels sustained in any given soil sample:

- Germs
- Air pollutants
- Clearcutting, thinning
- Compaction
- Fertilisers
- Pesticides, herbicides
- Temperature (Freeze/Thaw)
- Moisture (Wet/Dry)
- Tillage (Intensity, Repetition, Timing)

N Fixing nodules on Clover
Update on TFAP2 Progress in the Territory

Kevin de Witte, Principal Veterinary Officer, DBIRD Katherine, 8973 9758

It is now more than two full years since the last TB detection in the Territory. Current activities are winding down but measures are still in place to deal with further disease.

Recent Northern Territory History

The last TB case was found in buffalo near Darwin in January 2002. Several small herds amounting to about 1,400 head were found to be infected and were totally destocked. The prevalence of TB lesions was about one percent with presumed spread from an old cow with residual infection to younger herd members. The old index cow had been missed in previous culls and was detected at a local slaughterhouse during herd dispersal. Buffalo are difficult to age and can live longer than cattle. There is thought to be very little remaining risk in the buffalo herd.

The second last TB case was from a small cattle herd in 1999 that was probably the result of residual infection in a salvaged animal from an infected feral herd in the late 1980’s. The isolated herd was totally destocked.

The third last Territory TB case was found when an old rogue cow was slaughtered at Katherine abattoir in 1998. This large herd was last infected in 1989 and had Confirmed Free level 2 status awarded in 1992. As a consequence of the 1998 TB case the number 3 to 8 breeders were designated as previously exposed Category B Target Eligible Cattle (TEC B). These cattle were possible weaner cohorts from the infected cow and were retained for testing in an Approved Property Program for Eradication (APPE). Over 15,000 animals have been destocked or voluntarily culled to slaughter and approximately 93,000 TB tests have been performed (4 rounds) with no further disease detection.

Current Programs – Age Culling and Monitoring

Approximately 10,000 Category A (adult cohorts, not destocked) and 60,000 Category B cattle were identified at the start of TFAP1 in 1998 on about 100 properties in the top half of the Territory. Testing and turn off of these recognised risk cattle has taken place without any further disease detection. It is thought that it may take up to 15 years from the last case before total success can be celebrated. Australia has free status and is the only country in the world to have made this degree of progress.

The program continues today as an Approved Property Program for Monitoring (APPM) with turn off of Category B TEC breeders at 10 years age and TB testing every second year in addition to TB monitoring requirements. There are 6 remaining properties with APPM’s due to exposed cattle from TB detection in 1997 and 1998. The Territory’s remaining 30,000 head of TEC B’s are only in these six APPM’s and they represent a low degree of risk.

In addition to the TEC approach, a risk management strategy has been to identify herds with TB infection since 1 January 1988 and subject them to monitoring to detect 1% disease at 99% probability (900 tests per year). This has involved many of the 100 northern herds and has meant extra field testing as most of these properties are devoted to live exports and slaughter very few cattle in Australia. TFAP 2 (2003 – 2006) will conduct about 180,000 tests on these herds and the TEC’s. In 2005 there will be less than 40,000 tests done and many of these will be the final tests for the herds involved.

All remaining Territory herds are assessed to achieve TB monitoring to detect 5% disease at 95% probability (a minimum of 120 head per year). For most herds this is achieved easily by meat

Continued on next page...
inspection at slaughter through the national Granuloma Submission Program (NGSP). Waybill records of store and slaughter movements are used to assess monitoring status.

Meat Inspection
Nationally in 2003/04, 5,809 granulomas suspect for TB were submitted from the slaughter of 8.7 million cattle, 38,000 deer, 600 buffalo and a few camels. None of these were confirmed to be TB. The most common diagnosis is “Actino”, a common bacterial infection of cattle that appears similar to TB. This high rate of cattle slaughter is thought to be reassuringly significant in the context of dry pastoral conditions in much of Australia at this time.

The Territory maintains a laboratory capacity at Berrimah Vet Lab, but less than 1,000 cattle are slaughtered in the NT. A National Reference Laboratory is maintained in Perth WA, where a full range of DNA typing and full identification services are available on a fee for service basis.

In 2005, the standard of meat inspection will generally progress to the next stage of a risk based program where the guideline to meat inspectors is to submit only those lesions they are not sure about (total inspector discretion). This is likely to result in a submission rate of one in 3,000 to 5,000 of cows/bulls slaughtered. The reduced NGSP will be managed by Animal Health Australia and will probably be called the Bovine TB Disease Surveillance Program. Over half the Territory turn off (450,000 head total) is slaughtered interstate.

Additional Monitoring
Fortunately Australia has not been disadvantaged by a feral or wild life reservoir of the bacterium. Pigs are dead end hosts and feral cattle and buffalo were able to be dealt with by removal. TB monitored negative status Buffalo are receiving attention due to the low numbers slaughtered currently. Additional monitoring will take place in 2005 and 2006 by contracted aboriginal ranger groups in association with the North Australian Quarantine Strategy and other limited culling surveys funded by TFAP2.

Post 2006
At this stage there is no printed word on post 2006 arrangements for TB but there is likely to be a TFAP3 agreement. This will enable local industry in the case of a TB detection, to receive guaranteed access to industry funds for various assistance measures yet to be determined. It will also define field and laboratory capabilities and a process for dealing with disease detection. It is unlikely that monitoring activities, apart from standard meat inspection, will be necessary. It is anticipated that this agreement will be settled in 2006.

Nuffield Scholarships
The mission of the Australian Nuffield Farming Scholars’ Association is to promote excellence in all aspects of Australian agricultural production, distribution and management through the adoption of local and international best practice and continuous development of a unique network of industry leaders and innovators.

You are eligible for an Australian Nuffield Farming Scholarship if you are:
- an Australian citizen
- engaged in farming as an owner or manager, or an active member of a farming business
- intending to remain involved in primary production in Australia.

Academic qualifications are not a prerequisite for a scholarship. The preferred age for scholars is between 28 and 40 years, however applicants outside this range may be considered.


For further information contact Bryan Clark, Australian Nuffield Farming Scholars’ Association
Phone: 02 6964 6600
Fax: 02 6964 1605
Email: enquiries@nuffield.com.au

Application forms may be downloaded from the Nuffield website: www.nuffield.com.au or are available from the Association’s office.

Check Your Dates...

27-29 June: Grazing Land Management, Katherine. Contact Simone White on 8973 9792.
1 July: Alice Springs Show Day.
8 July: Tennant Creek Show Day.
13 July: Workshop in Katherine by Fred Provenza (US expert in behaviour of grazing cattle) Details in next edition of KRR.
15 July: Katherine Show Day.
22 July: Darwin Show Day.
**Live Cattle Exports via Darwin Port – MARCH 2005**

# Please note that the “NT CATTLE” figures are NT cattle exported through the Port of Darwin only, some NT cattle are exported through interstate ports.

<table>
<thead>
<tr>
<th>Destination</th>
<th>TOTAL CATTLE (including interstate)</th>
<th># NT CATTLE</th>
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<td></td>
<td>2003</td>
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<tr>
<td>BRUNEI</td>
<td>16,572</td>
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<td>INDONESIA</td>
<td>182,624</td>
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<tr>
<td>SARAWAK</td>
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<tr>
<td>W-MALAYSIA</td>
<td>9,028</td>
<td>6,379</td>
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<tr>
<td>EAST TIMOR</td>
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<tr>
<td>TOTAL</td>
<td>260,618</td>
<td>211,042</td>
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"March at a glance"

- 15,892 head of cattle through the Port of Darwin during March, 5,147 head more than February and 11,156 more than March last year.
- YTD figures indicate 1,655 head in front of the same time last year!
- No interstate cattle through the Port of Darwin for the first 3 months of 2005.

**Live Cattle Exports thru the Port of Darwin**

(last 10 years)

**TOTAL Live Cattle Exports thru Port of Darwin 2004 v 2005**

**NT Live Cattle Exports thru Port of Darwin 2004 v 2005**
Other Livestock Exports via Darwin Port (includes NT and Interstate Stock)

<table>
<thead>
<tr>
<th>Destination</th>
<th>Buffalo</th>
<th>Camels</th>
<th>Goats</th>
<th>Deer</th>
<th>Horses</th>
<th>Sheep</th>
<th>Pigs</th>
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<td>115</td>
<td>0</td>
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<td>0.680</td>
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<td>0</td>
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<td>100</td>
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<td>0</td>
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<td>E-Malaysia</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>217</td>
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<tr>
<td>Total</td>
<td>0.635</td>
<td>672</td>
<td>0</td>
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<td>115</td>
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NATIONAL CATTLE PRICES - W/E 01/04/05

**JAPAN OX**

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<tr>
<th></th>
<th>Estimated dressed weight price (cents/kg)</th>
<th>O.T.HOOKS</th>
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<tr>
<td></td>
<td>Estimated dressed weight price (cents/kg)</td>
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<td>SALEYARDS</td>
<td>O.T.HOOKS</td>
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<tr>
<td></td>
<td>NSW QLD SA AV (Aust)</td>
<td>NSW QLD SA AV (Aust)</td>
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<td>NSW QLD SA AV (Aust)</td>
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<td>This week</td>
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<td>Last week</td>
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<td>307</td>
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<td>Year ago</td>
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<td>306</td>
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**MEDIUM STEER**

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<td>SALEYARDS</td>
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<td>This week</td>
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**US COW**

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<td>259</td>
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<tr>
<td>Year ago</td>
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**TRADE STEER**

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<td>SALEYARDS</td>
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<tr>
<td>Year ago</td>
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**LIVE EXPORT QUOTES**

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<tr>
<td></td>
<td>LIGHT STEERS (280-400 kg)</td>
<td>HEAVY STEERS (400+ kg)</td>
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<td>Darwin</td>
<td>160</td>
<td>145</td>
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<tr>
<td>Fremantle</td>
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<td>155</td>
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<tr>
<td>Year ago</td>
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**CURRENCY EXCHANGE RATES**

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<th>Key Currencies</th>
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<th>Current</th>
<th>Previous week</th>
<th>3 months ago</th>
<th>1 Year ago</th>
<th>Pre-devaluation</th>
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<td>Brunei Dollar</td>
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<td>1.2627</td>
<td>1.2634</td>
<td>1.2693</td>
<td>1.076</td>
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<tr>
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<td>72.3038</td>
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<tr>
<td>Philippine Peso</td>
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<td>41.848</td>
<td>43.865</td>
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<tr>
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Prepared by the NT Department of Business, Industry and Resource Development.

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**Horror-Scopes!**

**Aries (Mar 21 to Apr 20)** What you are about to do is wrong. Of course, you will only find that out much later. For now, enjoy yourself!

**Taurus (Apr 21 to May 20)** A basket of lychees will appear on your doorstep, lined with yesterday's Jakarta newspaper. This could be a sign...

**Gemini (May 21 to Jun 20)** Excellent day, today. Unless it's your birthday, in which case you will have an embarrassing episode involving an accordion.

**Cancer (Jun 21 to Jul 23)** You will have a dream where you will be playing footy, with people all in white cheering you on. Don't go into the light, ok?

**Leo (Jul 24 to Aug 23)** Secret society day, today. Don't join — no matter how much you like the secret handshake. Also, good day to swear off molasses.

**Virgo (Aug 24 to Sep 23)** You will discover that you can wiggle your ears, and will actually become quite good at it. People will invite you to parties.

**Libra (Sep 24 to Oct 23)** Stay home today, with the curtains drawn and the door locked. Trust me on this one.

**Scorpio (Oct 24 to Nov 22)** It will turn out that someone you spend a great deal of time with is actually a horse. This will explain some things you’d been wondering about.

**Sagittarius (Nov 23 to Dec 22)** Excellent day to walk around wearing a white lab coat and carrying a clipboard.

**Capricorn (Dec 23 to Jan 20)** You will have a visit from “The Scourge of the Bovines.” He’ll be wearing a blue shirt and jeans and carrying a needle. You don’t want to cross him.

**Aquarius (Jan 21 to Feb 19)** Stump that travelling salesman by talking about the genealogy of bull ants - he won’t have time to view your collection.

**Pisces (Feb 20 to Mar 20)** You will spend this month pondering your dwindling world. It would pay to start looking for a new billabong really soon.

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Reproduction of Rural Review Articles
The Department of Business, Industry and Resource Development (DBIRD) welcomes the reproduction of articles appearing in this newsletter, but requests that the technical information be confirmed with the editor or Author, prior to publication. The department also requests that acknowledgement be made for any original work sourced from the Katherine Rural Review.
GPS for GIS Workshop

ISA (NT) and SSI (NT) invite you to attend a workshop on:

GPS Data Collection for Integration with Geographic Information Systems (Precision GIS)

Presenter:

Martin Hale is the GPSnet Project Manager, Spatial Information and Infrastructure, Strategic Planning and Policy Group, Department of Sustainability and Environment, Victoria. In addition to leading the development and use of GPSnet in Victoria he is also a contributor to the department's GPS Standards, Specifications and Best Practice for GIS/Mapping data collection. Martin is a foundation member of the Spatial Sciences Institute and a state representative on the ICSM Geodesy Technical Sub Committee and ICSM representative for the promotion and implementation of GDA in Victoria.

Seminar Content

This workshop will provide you with information on:

- GPS Principles: fundamental concepts and definitions, accuracy and precision, error sources and their minimisation, Spatial Data Infrastructures - requirements for sharing data;
- GPS Equipment: basic configurations, hardware and software, communication options, what to look for when purchasing a precision GPS/GIS system;
- Guidelines for precision GPS/GIS data collection: planning, equipment settings, static data collection, dynamic data collection, feature mapping;
- Processing and Quality Control: GPS base stations, automatic processing, quality control, Datum compliance, real-time versus post-processing;
- Future developments and accuracy expectations: new satellite systems, integration with other equipment, Code and Phase positioning.
- Tutorial example: mapping the Australian Alps Walking Track and other local datasets - equipment verification, logistics, data dictionary, attributing, shared uses of high value data sets.
- There will also be a technical exhibit on GIS GPS equipment. Paul Dornbusch from GPS Surveys and a CR Kennedy representative will present the latest GIS GPS equipment.

A set of course notes will be supplied to each participant.

You may also bring GPS/GIS data or case studies to be discussed during the workshop – however please notify the facilitator prior to the workshop so that presenter can organise the topics for discussion.

Note – This workshop is being facilitated by the Department of Infrastructure, Planning and Environment – Land Information Division Survey.
The Northern Territory of Australia does not warrant that the product or any part of it is correct or complete. You are encouraged to notify any error or omission in the material by calling 08 725 749.

For further pastoral property infrastructure detail refer to the property maps created by the Dept. of Infrastructure, Planning and Environment.

LAND RESOURCE DESCRIPTIONS: Natural Systems Division, DIPE
* Northern Territory - A Reconnaissance Land System Survey.
Land Resources of the Sturt Plateau, October 1983.
Technical Memorandum No. 85/7, Land Conservation Unit,
Conservation Commission of the Northern Territory, Darwin, NT, 1984.

Prepared by Pastoral Production Department of Business, Industry and Resource Development Katherine Research Station: Phone: (08) 725 749

CADASTRAL DATA SOURCE: Land Administration Division
Department of Infrastructure, Planning and Environment. Date: August 2002.