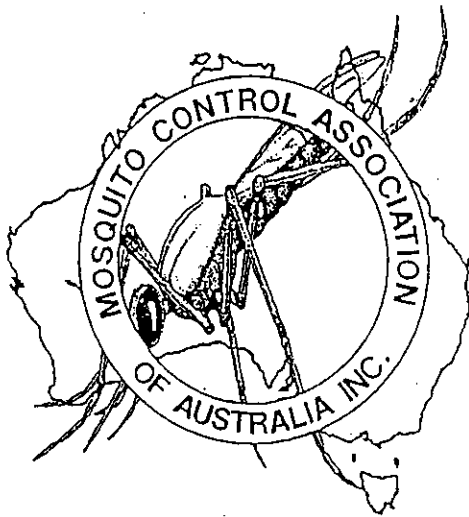


**BULLETIN**  
**OF THE**  
**MOSQUITO CONTROL ASSOCIATION**  
**OF AUSTRALIA INC.**



**VOLUME : 17**  
**NUMBER : 1**  
**March 2005**

## Dengue mosquito eradication project Tennant Creek.

### End of January 2005 progress report

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#### Introduction

The Medical Entomology Branch (MEB) of the Centre for Disease Control (CDC) in the NT Department of Health and Community Services (DHCS) is currently at the forefront of an eradication program to rid the town of Tennant Creek and the NT of the dengue mosquito. The dengue mosquito *Aedes aegypti* is capable of transmitting the dengue virus that causes a serious and potentially fatal illness. Dengue outbreaks caused hundreds of deaths in South East Asia last year, and at least one death in north Queensland. The NT has been free of *Aedes aegypti* and hence dengue disease since the late 1950s. This is despite many instances of importations from overseas into port areas of Darwin and their immediate elimination by AQIS and MEB using larval control, chlorination of receptacles to kill eggs, and adult fogging.

The dengue mosquito was discovered breeding in Tennant Creek in February 2004, after being detected in a routine mosquito-trapping program using carbon dioxide baited EVS traps. An initial survey and control program was started immediately after detection, and ran until April 2004. The field aspects of an eradication program were begun in late November 2004 and are now well under way. This report describes the results of the program to date.

Dengue outbreaks were common in the early history of the NT, and which have become a regular feature of tropical north Queensland in recent years. The reappearance of dengue mosquitoes in Tennant Creek raises the possibility of dengue disease in Tennant Creek and the spread of the mosquito to other towns in the NT. If the mosquito becomes entrenched in other towns and rural areas in the north of the NT, there could be a reappearance of regular outbreaks of dengue disease.

#### Initial control program

An initial survey and control program was implemented by DHCS immediately after the detection, and received widespread community support. The initial control program involved surveys by officers of the MEB in cooperation with;

- the local Environmental Health officer in Tennant Creek.
- other CDC staff in Tennant Creek and Darwin.
- personnel from the Australian Army.
- medical students,
- staff from the Health Department of Western Australia.
- local town and community councils.
- local pest control operators.
- The general public of Tennant Creek.

The initial program was enormously supported by the director of CDC, the local MLA in Tennant Creek, the Commonwealth Department of Ageing and Disability, the Arbovirus and Malaria Advisory Committee.

The aim of the initial survey was to identify and eliminate *aegypti* mosquitoes, and involved surveying the town of Tennant Creek and inspecting water-tanks. The survey team also set mosquito traps, including impregnated lethal egg traps (lethal ovitraps) for *aegypti* mosquitoes. Initial surveys also involved the nearby towns or localities of Ali Creek. A comprehensive public relations and information campaign to seek assistance from local residents, a community service was established. Posters were put up in local schools. Newspaper news items and NT wide newspapers.

The control program initially involved:

- a door-to-door education campaign
- the distribution of cans of aerosol insecticide to householders with instruction to spray their yards and premises.
- treating most premises by the control team.
- a fogging operation of the town of Tennant Creek by the Council using a Leco heavy-duty fog machine.
- a survey and treatment of transport facilities.
- a hard rubbish roadside collection by the Tennant Creek Town Council with all rubbish.

The distribution of the spray and initial elimination team, in conjunction with the Tennant Creek Town Council and the Tennant Creek Town Council assisted with control in the industrial park.

The latter phase of the control program

- revisiting, inspecting and treating premises in Tennant Creek.
- collecting samples of larvae from a range of receptacles.
- treating all receptacles with larvicide methoprene pellets, depending on the results of the survey.

The initial program was enormously supported by the executive of the DHCS, the director of CDC, the local MLA in Tennant Creek, and in principle support from the Commonwealth Department of Ageing and Health (DOAH) and from the National Arbovirus and Malaria Advisory Committee (NAMAC)

The aim of the initial survey was to determine the presence and extent of the *Aedes aegypti* mosquitoes, and involved surveying urban and semi-rural areas throughout Tennant Creek and inspecting water-holding receptacles for mosquito larvae. The team also set mosquito traps, including sticky traps and bifenthrin insecticide impregnated lethal egg traps (lethal ovi traps) designed for detecting or killing *Aedes aegypti* mosquitoes. Initial surveys also involved inspection of water receptacles in the nearby towns or localities of Ali Curung, Three Ways, Mataranka and Elliot. A comprehensive public relations and information program was initiated to inform and seek assistance from local residents, councils and authorities. A hot line advisory service was established. Posters were put up at supermarkets and talks were given at local schools. Newspaper news items and notices were regular features in the local and NT wide newspapers.

The control program initially involved;

- a door-to-door education campaign on how to eliminate breeding sites.
- the distribution of cans of aerosol insecticide surface spray to all Tennant Creek householders with instruction to spray all potential water holding receptacles in their yards and premises.
- treating most premises by the control team in cooperation with the occupier of the premises.
- a fogging operation of the town with assistance from the Alice Springs Town Council using a Leco heavy-duty fogger dispensing bioresmethrin and diesel 4:1 mix.
- a survey and treatment of transport hubs including the railway, the airport, and bus facilities.
- a hard rubbish roadside collection from all residences organised with the Tennant Creek Town Council with all rubbish collected buried at the local tip.

The distribution of the spray and initial treatment of premises was carried out by the elimination team, in conjunction with the Julalikari Council, the Anyinginyi Congress and the Tennant Creek Town Council. A private pest control company assisted with control in the industrial premises.

The latter phase of the control program involved the control team;

- revisiting, inspecting and treating every receptacle in all premises in Tennant Creek.
- collecting samples of larvae from any receptacles holding water.
- treating all receptacles with lambda cyhalothrin pressure pack spray or methoprene pellets, depending on the type and use of the receptacle.

- applying temephos liquid in certain side entry pits of roadside drains receiving run off from irrigated lawn areas.
- applying methoprene pellets on roof gutters with obvious dips and in Telstra inspection pits and manholes.
- applying methoprene briquettes in septic tanks, and bifenthrin spraying of the side of the tanks.

Other towns further north of Tennant Creek including Renner Springs and Mataranka were also surveyed and treated, while a standard ovi trap system was instituted in a number of towns in the NT not already in the ovi trap program, including Alice Springs, Jabiru and Katherine.

There was an excellent public response in Tennant Creek, with only 8 refusals to enter or treat premises, and these were later progressively inspected and treated. During the latter stages of the control program there was ample evidence of residents emptying receptacles and storing receptacles upside down, although it was also obvious that not all occupiers were able to locate and treat every receptacle on their property. Progressively fewer breeding sites were evident in the later stage of the control program, but this also coincided with the seasonal reduction in rain.

#### Results of initial control program

During the initial eight-week control program from February to April 2004, a total of 1087 of 1107 properties in Tennant Creek were visited and treated by the team. This included occupied residential blocks, vacant blocks, vacant houses, and industrial, business and rural blocks. The rest of the premises were progressively inspected by ad hoc visits by MEB during the dry season.

The survey found 91 different premises breeding *Aedes aegypti* mosquitoes. This represented over 8% of premises positive for *Aedes aegypti* larvae. The range of receptacles with dengue mosquitoes includes bird baths, dog bowls, old tyres, buckets, pot plant drip trays, ice cream containers, jars, disused evaporative air-conditioners, plastic trays, sheets of plastic, machinery, an unkempt spa, a vase, a compost bin, a boat, a tarpaulin, an old car body, and a range of other artificial receptacles that held water.

Of the 58 premises with rainwater tanks, 53 were successfully treated during the period and the rest were followed up later in the dry season for inspection and treatment.

There were 15 EVS traps positive for *Aedes aegypti* out of 77 traps set in Tennant Creek over the period, with 23 adults collected, including 4 males. The sticky and lethal ovi traps did not detect many adult dengue mosquitoes or their eggs respectively, with only the one lethal ovi trap positive for *Aedes aegypti* eggs, although this low result was partly due to the ready availability of alternate breeding sites and the limited number of traps used.

**Conclusions from initial control program**  
The extent of the infestation indicated from at least December 2003 when present in a considerable area of the industrial area and a relatively isolated town in the wet season of 2002/2003. It is probable that infestation was direct from Cairns or another town or via drinking containers, pot plant drip trays, mosquitoes can be readily transported in dry, water holding receptacles.

Genetic analysis of specimens from the Institute for the Biology of Infectious Diseases showed specimens were identical to those in East Timor. It is probable that infestation was direct from Cairns or another town or via drinking containers, pot plant drip trays, mosquitoes can be readily transported in dry, water holding receptacles.

By the end of the control program, there were few receptacles with water. It was deemed feasible and preparations were well in place. It was clear that any eradication program would require premise-by-premise inspections and treatments in Tennant Creek.

#### Organisation for the eradication program

During the dry season a reduced program of

- ad hoc inspections and treatments
- setting a number of fixed and roving ovi traps
- setting a number of lethal ovi traps
- public awareness by regular news releases and community meetings
- erecting roadside signs advising treatment

Very few adults were detected during the dry season, and all were successfully traced to nearby key receptacles.

The National Arbovirus and Malaria Eradication Program was initiated in 2004. A formal request and a request for funding was made in May 2004 after receiving

In June 2004 the Commonwealth Government provided one million dollars towards the eradication program. In November there was progressive reduction in the number of breeding sites and the program was set up. The eradication team comprises;

### **Conclusions from initial control phase**

The extent of the infestation indicated that the *Aedes aegypti* have been in the town from at least December 2003 when the seasonal rains began. While they were present in a considerable area of the town, they were under represented in the industrial area and a relatively isolated residential area on the east side facing prevailing dry season winds. It is probable eggs in a receptacle were brought into the town in the wet season of 2002/20003 possibly in domestic receptacles such as pet drinking containers, pot plant drip trays, or spare vehicle tyres. *Aedes aegypti* mosquitoes can be readily transported as drought resistant eggs stuck to the sides of dry, water holding receptacles.

Genetic analysis of specimens from Tennant Creek by Dr Nigel Beebe of the Institute for the Biology of Infectious Disease in NSW have revealed that the specimens were identical to those in Cairns but not identical to those in Townsville or East Timor. It is probable that infested receptacles came into Tennant Creek either direct from Cairns or another town on route from Cairns.

By the end of the control program, the rainy season had finished and there were very few receptacles with water. It was decided that a full-scale eradication program was feasible and preparations were well under way to put an eradication program in place. It was clear that any eradication would need a team of trained people making premise-by-premise inspections and treatments to cover every premise in Tennant Creek.

### **Organisation for the eradication program**

During the dry season a reduced program was maintained including;

- ad hoc inspections and treatments by MEB staff from Darwin.
- setting a number of fixed and roving EVS traps weekly.
- setting a number of lethal ovi traps at key premises.
- public awareness by regular news stories and advertisements to prevent mosquito breeding.
- erecting roadside signs advising travellers "Don't move mosquito eggs".

Very few adults were detected during the dry season and those detected were successfully traced to nearby key receptacles and treated.

The National Arbovirus and Malaria Advisory Committee (NAMAC) discussed the infestation in a national meeting in March 2004 and supported the concept of eradication. Formal request and a budget submission for Commonwealth funding was made in May 2004 after receiving earlier in principal support.

In June 2004 the Commonwealth Department of Health and Ageing agreed to provide one million dollars towards an eradication program. From June to November there was progressive recruitment and on the job training of staff, and setting up the program.

The eradication team comprises;

Darwin based:

- the Project Director Peter Whelan, a week every month in Tennant Creek.
- the Project Manager Bill Pettit, a week every fortnight in Tennant Creek.
- a technical officer who identifies larval samples from Tennant Creek and other towns.

Tennant Creek based:

- field operations supervisor,
- 9 technical field staff,
- an administrative/data entry officer.

The Tennant team is backed by MEB staff in Darwin, including an MEB IT officer for database and mapping support for recording the data from the project, and other MEB professional, technical and administration staff variously involved in the Tennant Creek project or in surveys in other areas of the NT.

The organisation for the eradication project involved setting up facilities, and organising and training staff. Aspects organised included;

- staff duty statements and staff recruitment.
- vehicle hire and housing.
- provision of office and laboratory space including computer and phone connections.
- provision of an insecticide storage shed.
- preparation of a range of publicity material including newspaper advertisements and forms such as "Not at home" notices.
- setting up a public information hotline.
- writing field and laboratory protocols.
- organising an initial rubbish clean up campaign.
- liaison and clearances for inspections of roadside entry pits and Telstra underground facilities.

Public relations included regular weekly newspaper ads in the local paper. A number of newspaper stories and radio interviews kept the issue alive for residents in Tennant Creek.

Existing TV advertisements targeting backyard mosquito breeding began in November and covered the entire NT.

#### **The eradication plan**

The eradication plan involves the two elements of surveillance and control conducted simultaneously. The plan primarily involves premise-by-premise inspection of every premise in Tennant Creek and nearby camps and communities for receptacles with larvae, and treatment of every receptacle with bifenthrin, chlorine bleach, or methoprene pellets. Rainwater tanks are a special issue and involve initial treatment with methoprene pellets and complete sealing by the eradication team.

Other tasks include;

- inspection and excavation of blocked drains.
- treatment of Telstra pits.
- treatment of all roadside entry pits.
- a rubbish collection.
- cover of collected rubbish and tyre

#### **Surveillance**

Surveillance for dengue mosquitoes includes:

- larval sampling of receptacles in areas where larvae were present. This is done by setting a CO2 trap set on a weekly basis, which attracts female mosquitoes in the process of laying eggs. The placement of the traps is determined by information by indicating location of receptacles when rain filled receptacles are present after rainfall.
- adult mosquito sampling by CO2 trap set on a weekly basis, which attracts female mosquitoes in the process of laying eggs. The placement of the traps is determined by information by indicating location of receptacles when rain filled receptacles are present after rainfall.

#### **Inspections and control.**

The main part of the program is to locate and treat receptacles capable of holding water. The main treatment is the application of bifenthrin to the inside of all receptacles unsuited for application. Receptacles are emptied and sprayed with a house spray. Methoprene pellets are used to treat birdbaths and pet water, together with the application of water to the inside of receptacles with water.

The eradication team began field work in Tennant Creek.

#### **Results to the end of January 2005**

The team has largely completed Round 1 of the eradication program and are now well into the Round 2 of the eradication program.

In Round 1 from 22/11/2004 to 29/11/2004, 198 premises were treated and 198 premises that the team treated with *Aedes aegypti* larvae. The main receptacles with *Aedes aegypti* larvae were septic tanks, a bucket below a dripping receptacle was the rainwater tank in the house. The traps positive for adult *Aedes aegypti* were found in the house.

Other tasks include;

- inspection and excavation of blocked concrete storm drain end points.
- treatment of Telstra pits.
- treatment of all roadside entry pits.
- a rubbish collection.
- cover of collected rubbish and tyre dumps at the rubbish dump.

### **Surveillance**

Surveillance for dengue mosquitoes is by;

- larval sampling of receptacles in the premise-by-premise search, to determine where larvae were present. This is the primary surveillance method.
- adult mosquito sampling by CO2 baited EVS traps. Currently there are 10 EVS trap set on a weekly basis, which includes 3 routine fixed trap positions.
- egg sampling using number of lethal ovi traps, aiming primarily to kill adult female mosquitoes in the process of laying eggs, as well as providing surveillance information by indicating locations where eggs are laid.
- adult sampling with sticky ovi traps designed to trap mosquitoes as they come to lay eggs. The placement of the sticky traps will start in latter part of February when rain filled receptacles are likely to decrease, along with the seasonal rainfall.

### **Inspections and control.**

The main part of the program is to locate and treat all receptacles that either do or are capable of holding water. The main method of eradication will be the application of bifenthrin to the inside of all receptacles using hand held pressure sprayers. Other receptacles unsuited for application including birdbaths pet drinking water will be emptied and sprayed with a household bleach solution by hand held pressure sprayers rinsed and refilled. Methoprene pellets will be distributed to residents to treat birdbaths and pet water, together with advice on regular cleaning and treatment of receptacles with water.

The eradication team began field operations in late November 2004 in Tennant Creek.

### **Results to the end of January 2005**

The team has largely completed Round 1 of property inspections in Tennant Creek and are now well into the Round 2 of inspections.

In Round 1 from 22/11/2004 to 29/12/2004 there were 986 premises entered and treated and 198 premises that the team were unable to enter. There were only 3 receptacles with *Aedes aegypti* larvae, including a grease trap associated with a septic tank, a bucket below a dripping trap, and a rainwater tank. The last positive receptacle was the rainwater tank in the last week of December. There were no CO2 traps positive for adult *Aedes aegypti* mosquitoes in Round 1 or Round 2.

In the Round 2 of inspections from 29/12/04 to 25/01/2005, there were 683 premises inspected and treated, and 188 unable to enter, with no premises positive for *Aedes aegypti*. Premises never entered in either round are now being targeted for inspections.

All rainwater tanks have been inspected and treated initially by methoprene, or kerosene in cases where owners weren't happy with methoprene. Sealing of rainwater tanks begun in December is still ongoing, with the majority of tanks now sealed.

In Round 1 of the eradication phase, 3 properties positive with *Aedes aegypti* to date represents just over 0.3% of the properties positive. This is in contrast to over 8.0% positive premises for the initial control program in February-April 2004. This result vindicates the strategy of the initial control program and confirms that the initial control was very effective in reducing the population of *Aedes aegypti*.

#### Program for next 2 months

The program for the coming months will include;

- completion of Round 2 of premise inspection and treatment, with missed premises being particularly targeted.
- treatment of roadside entry pits and Telstra pits.
- increased surveillance using EVS traps.
- increase in lethal and sticky ovi traps.
- the inspection of rural properties and industrial premises to be specifically targeted.
- rainwater tank sealing to be completed.
- start of Round 3 of inspections and reapplication.

The roadside entry pits and Telstra pits will be treated with bifenthrin using a vehicle heavy-duty sprayer with a pump and a 300-litre tank. The side entry pits have a concrete cover that will be partially lifted by a lever arrangement. A hand held spray gun will apply bifenthrin to the walls of the pits to point of run off, without spraying the water in the base of the pits. Initial trials of this type of spraying have indicated a very good spray pattern. Any water in pits will be treated with Abate 1% granules or methoprene pellets, depending on the end point of drainage from the pits and the presence of fish.

Surveys will be continued in other towns in the NT, including a joint survey of towns with Queensland Health near the Queensland border.

#### Outlook

One of the benefits of the spray of side entry pits and Telstra pits will be cockroach control. During initial inspection of these sites there were very large numbers of American cockroaches present. Another benefit from the program will be a dramatic reduction of other species of domestic mosquitoes including the brown house mosquito *Culex quinquefasciatus*, and the native container breeding and tree hole

mosquito *Ochlerotatus tremulus*, both of which are found in the area of the Creek.

The outlook for eradication is looking good. The number of adults since late December has been reduced, which could have hatched dormant eggs in receptacles stored under cover or in the ground. The reduction to date has been the treatment of receptacles by residents to become potential breeding sites. The use of traps and sticky traps will be useful as additional control. The seasonal rainfall falls after March. This is however not likely to offer any significant reduction in the population.

While the control to date has been achieved, the program will continue over the next few months to achieve the goal.

If this program is successful, it could be a model for other towns in north Queensland where the mosquito is a problem.

#### Dengue Mosquito Eradication



WHY

A

About two months into each summer the mosquitoes have rocks in your head to work in the



mosquito *Ochlerotatus tremulus*, both of which can cause pest problems in Tennant Creek.

The outlook for eradication is looking extremely good. The absence of larvae or adults since late December has been achieved in spite of a number of rain episodes, which could have hatched dormant eggs. However there could still be dormant eggs in receptacles stored under cover or in cryptic places that could be later repositioned by residents to become potential breeding sites. The major method of achieving this reduction to date has been the treatment of receptacles with bifenthrin spray. Lethal and sticky traps will be useful as additional surveillance tools late in the program, as seasonal rainfall falls after March. These other trapping or elimination methods are however not likely to offer any significant additional degree of control.

While the control to date has been apparently very successful, it may be necessary to continue the program over the next financial year to verify that eradication has been achieved.

If this program is successful, it could be a model for the eradication of *Aedes aegypti* in towns in north Queensland where it is still present.

### **Dengue Mosquito Eradication Project, Tennant Creek**

**23/11/04**



#### **WHY AM I HERE?**

Anonymous

About two months into each summer season I have the same thought, you'd have to have rocks in your head to work in mosquito control. I mean, there are those phone

calls that we love so much, you know the ones I mean. They usually start off with "I've just moved up from down south and...", somewhere in the middle there is a line that goes "the real estate agents never mentioned the mosquitoes", and it usually ends up with "if you don't do something I'm going to have to move". Oh, Hello! But as a good public servant you can't even offer to help them pack, let alone ask why they bought a million dollar mansion with pristine mangrove swamp on one side and salt marsh on two others! You can develop a rapport with some of them, but if a larvicide treatment goes pear shaped they'll be back on the phone letting you know that the mozzies are the worst they've been in fifteen years. What's up with that? The estate has only been there for five – I know because I've been working those marshes for thirty!

Then there are the raving looney left winged greenies, I don't mean the environmentally conscious who can accept that people are part of the environment. I mean the ones who live next door to the people in the house I've just described and want no spraying of larvicides, adulticides, pesticides herbicides or deodorant, and will stop at nothing short of holding the estate to ransom by offering to take the local authority to court to have all spraying of the above-mentioned foul smelling things stopped. They're trying to save the black & blue bellied bot fly or they are growing their own vegetables organically and pesticides are like kryptonite to superman. They occasionally call back six months later saying that they've got RRv and why aren't you doing something about it?

And just watch what happens when the local society high roller plan an outdoor afternoon function for the regions movers and shakers, you can see everything go to custard about seven days before the event. The tides will be early, the staff (the ones who are not off work for two weeks with severe viral infections) don't find the skeeters till they are in the fourth instar, every piece of equipment you have control of will fail (Murphy's Law), the wind will howl and the choppers will have to sit on the ground. Then, when all those little suckers have turned to pupae the weather clears and gets real hot and real humid, perfect if you are a mozzie. You've missed them. What do you do? Put in for long service leave only if you dare!

But there are times when everything goes along pretty well. The tides come in when the tide book says they will. The field guys find the larvae in early instars and the weather is cool enough to give you an extra day to organize things. The weather stays fine and calm. No equipment breaks down. All is good with the world. But no one tells you what a good job you are doing because no one is getting bitten. A workmate of mine once said it was like peeing in a wetsuit – gives you a nice warm feeling but no one notices!

But wait, there's more, you have to justify your existence to every man and his afghan. There are government departments coming out of every corner, EPA, DPI, NRM, whatever. We've got to deal with Marine Parks, National Parks, Conservation Parks, Environmental Parks and a lack of car parks. Don't get me wrong, I'm not

advocating we concrete the marshes even mind sending all of our treatment worthwhile like trying to save endan are cute little buggers (the rats, not n value in altering treatment habits to b wading birds, in fact I fully support t aquaculture industry and notify them prawns every now and then.

What really gets me is that we in mo targets painted on our backs – even i when a hail storm rips a swath of des you get a phone call accusing you of from within your own organisation. I had a helicopter up there spraying B. who mixed the B.t.i. with the Agent t nope, that was a drain that was block stopped getting up there, the mangro the result of pesticides, you mozzie p cut a drain that exposed Acid Sulpha

The list of accusations seems to be er the rape of the environment? Yep, w fact the accusers seem to get pissed o majority of the mosquito control peo environment than many of the people the firing line and go out of their way environmentally sustainable. Let's fa is not getting any bigger. Fair dinku bring peace to the Middle East.

Then again, there is a nice peaceful s around in a salt marsh with the mobil that – you can call me anytime) listen cackle of dollar birds or watching the tips to hold station in a stiff breeze. C kingfisher, or walking around the cor grey kangaroo who eyeballs you for a pretty cool to be sitting at the LZ wait load and seeing a marsh harrier patrol wings, or a brown goshawk flash into it wasn't a False Water Rat, or he'll b to meet some great people who enjoy know if it wasn't for the mozzies. We maybe it really is that we have those

advocating we concrete the marshes and use extreme habitat modification. I don't even mind sending all of our treatment data to people who are doing stuff worthwhile like trying to save endangered species like the False Water Rat – they are cute little buggers (the rats, not necessarily the scientists!). I can also see the value in altering treatment habits to lessen the impacts on roosting/feeding migratory wading birds, in fact I fully support this activity. I am willing to work with the local aquaculture industry and notify them of spraying activities, I don't mind a feed of prawns every now and then.

What really gets me is that we in mosquito control seem to be walking around with targets painted on our backs – even if we can't see them. I know they are there! Like when a hail storm rips a swath of destruction across the mangroves and a week later you get a phone call accusing you of killing mangroves, and this sometimes comes from within your own organisation. They know it was mosquito control because we had a helicopter up there spraying B.t.i. a week before. I would just like to know who mixed the B.t.i. with the Agent Orange. Or mangrove deaths along a roadside – nope, that was a drain that was blocked during re-surfacing of the road and the tides stopped getting up there, the mangroves just drowned. Oops, fish kill! That had to be the result of pesticides, you mozzie people are in it now. Wrong again, a developer cut a drain that exposed Acid Sulphate and the fish and crabs died from that.

The list of accusations seems to be endless. And who has to do the investigation into the rape of the environment? Yep, we do. And we do it without thanks or apology, in fact the accusers seem to get pissed off when they find that we aren't to blame. The majority of the mosquito control people I know are probably more in tune with the environment than many of the people who criticize them. They know that they are in the firing line and go out of their way to do a good job while keeping it environmentally sustainable. Let's face it the inventory of larvicides in our armoury is not getting any bigger. Fair dinkum, sometimes I think that it would be easier to bring peace to the Middle East.

Then again, there is a nice peaceful side to the job. It is kind of nice to be out putzing around in a salt marsh with the mobile phone turned off (not that I would ever do that – you can call me anytime) listening to the song of mangrove warblers, the inane cackle of dollar birds or watching the way a whistling kite twists its tail and wing tips to hold station in a stiff breeze. Or catching the colourful flash of a sacred kingfisher, or walking around the corner of a track and coming face to face with a grey kangaroo who eyeballs you for a brief moment before bounding away. Its also pretty cool to be sitting at the LZ waiting for the helicopter to come back for the next load and seeing a marsh harrier patrolling the cane fields on beautifully upswept wings, or a brown goshawk flash into the cane after some unsuspecting rodent (hope it wasn't a False Water Rat, or he'll be in big trouble!). On top of all that, you do get to meet some great people who enjoy the same sort of things and you'd have never know if it wasn't for the mozzies. We all seem to be a little bit touched by the sun, or maybe it really is that we have those rocks up there in the attic, and we all have this

arcane sense of humour that is somewhere a bit left of centre – OK it is usually a bloody long way from the centre but that’s a whole story in itself.

Yeah, I guess I’ll stick it out for a couple more seasons.

MO  
F  
*Ochlerotatus*  
CHECK

P. Mottram , Communicable Disease  
Mark Fraser, Health Services, Warw

The salt marsh mosquito, *Oc. vigilax*  
approximately 162 km from the near  
metre breeding site is in Rosenthal H

Following the complains of mosquito  
breeding site, the larvae were first co  
forwarded to Queensland Health (QH  
unusually high numbers of RRv cases  
who live in that suburb. A subsequen  
Shire Council in December 2004 four  
Adult *Oc.vigilax* were also collected

Control measures have been carried o  
planned.

A full report will be published in the

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**Bistar® Barrier Treatments<sup>PP</sup> – a**  
**Human Settlements Program, an**  
**Enviro**

By M. Brown (FM

Hervey Bay City Council believe that  
of importance to worldwide communi  
mosquito disease vectors. In an initiat  
method was submitted to the UN-Hab  
of the methodologies scientific merit  
months of receiving entries and valid  
the Bistar® Barrier Treatment method