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# AABR NEWS

Australian Association of Bush Regenerators NSW

## The tick edition

**What is really going on with  
ticks and Lyme disease?**

**How can we work safely in  
tick prone environments?**

**In this edition we consider  
these questions, and bush  
regenerators share their  
personal stories of ticks and  
tick-borne diseases in the  
hope of raising awareness  
and helping others.**



Unengorged adult paralysis tick *Ixodes holocyclus*. The species most commonly encountered by people on Australia's east coast. Head and body about 3.5 mm. Photo: V. Bear

We are happy for this edition of our newsletter to be distributed to anyone who may benefit.

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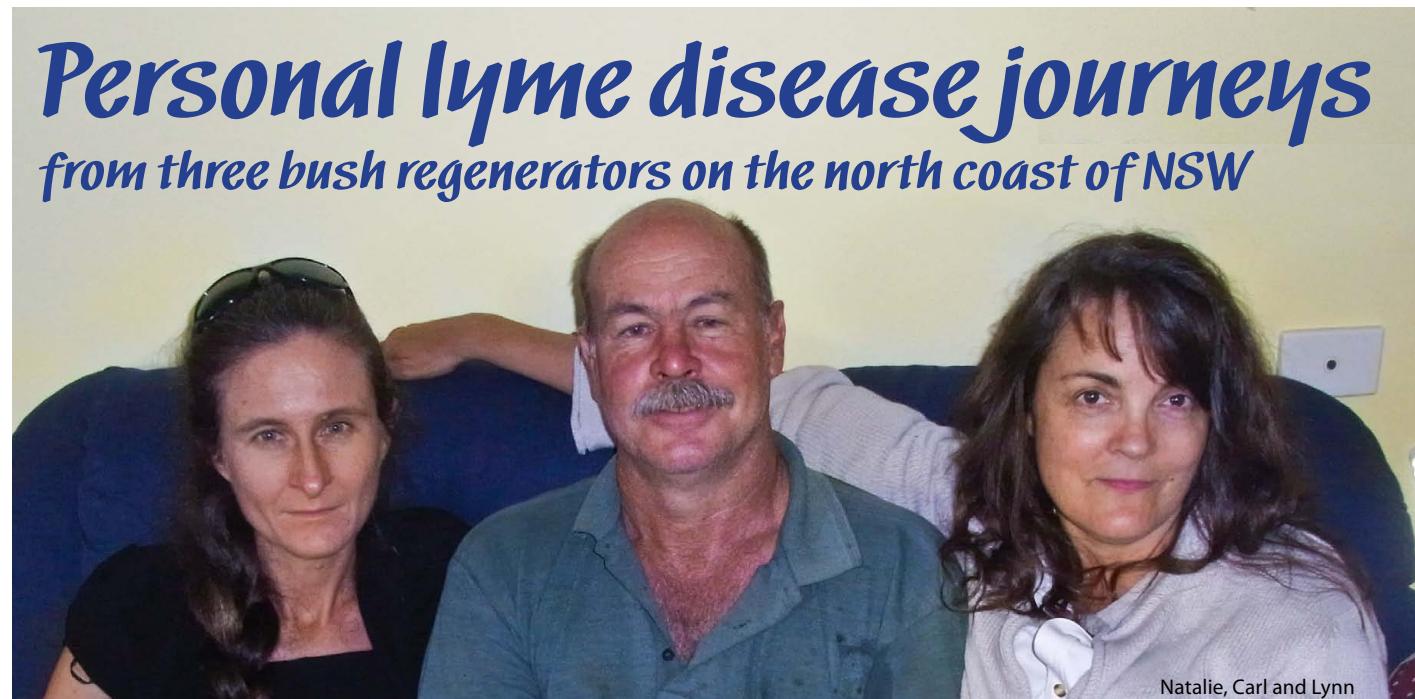
If you have an interest in bush regen, we invite you to take part in our upcoming survey about the industry and AABR's role. Email [enquires@aabr.org.au](mailto:enquires@aabr.org.au)

## President's perspective

This special edition on tick-borne diseases is an important and timely one that hopefully will be appreciated as a valuable resource for bush regenerators and all those who live and work in bushland areas.

It was initiated by AABR member, Lynn Rees, who has been very ill in recent years from undiagnosed Lyme disease and is determined to help others avoid the same fate.

Despite the daily weight of symptoms of the disease, Lynn worked with AABR News editor, Virginia Bear, to coordinate the series of articles presented in these pages—and so our thanks goes to Lynn and the others who have shared their personal stories in this issue, as well as the contributors of technical information.



Natalie, Carl and Lynn

### Lynn Rees

Carl Freeman, Natalie Young and I all contracted Lyme disease in Australia from tick bites. We have been through some very difficult and frightening experiences, but now that we are able to access the correct treatment, the future looks much brighter for all of us.

Carl and I were diagnosed in late 2011 after suffering from a myriad of strange symptoms and illnesses during the past five or six years. Natalie was diagnosed in 2009 after seven years of similar, though far more serious, symptoms that nearly claimed her life. Natalie has seven different tick-borne pathogens, Lynn has four and Carl is awaiting further test results from America.

All three of us were infected during the course of our work with a conservation agency in Coffs Harbour.

After exchanging our stories for this article, what struck me most was that the three of us had regularly read the NSW Health tick and Lyme disease fact sheets and alerts over the years, which consistently advised that ‘... there is no conclusive evidence that it exists in Australia’. Also, a commonly held view is that you need to get the ‘characteristic’ bulls-eye rash. None of us had ever had a bulls-eye rash either. Though, we all have had plenty of other rashes. We all believed what we were being told by NSW Health and our doctors. We were safe.

I started reading more widely on the massive literature on Lyme disease available on Dr Google. I discovered that the many big

football sized rashes that I regularly get after a tick bite is one of the key Lyme rashes. So why does all the Australian literature on Lyme disease only mention the bulls-eye rash? American literature always mentions this rash as well, though acknowledges others.

After my own experiences of trying to prove my case to the insurance company, a photo with a ruler against the rash would have been very helpful. I did however take a very attractive photo (*see next page*) of the reaction I got after a tick bite to my face in May 2011.

Over the past five years I had also suffered many respiratory infections and was regularly put on antibiotics and steroids. So I thought I was safe. I even said as much to my Lyme literate doctor when going through my health history.

No bulls-eye rash and plenty of antibiotics, no ticks were going to get me. Little did I know, they already had!

My health problems over the past five years, together with the hundreds of tick bites and rashes and mystery symptoms, were all telltale signs of Lyme disease!

Now that I know so much about Lyme disease, I realise that my recent health history is a text book case—the same for Nat and Carl. If only I and my doctor knew more about Lyme disease in the first place!

Check these links for a list of typical symptoms:  
[www.drmayne.com/common\\_symptoms.htm](http://www.drmayne.com/common_symptoms.htm)  
[docs.google.com/a/lymedisease.org.au](http://docs.google.com/a/lymedisease.org.au)

Natalie, Carl and I are sharing our very personal stories with you in the hope that you will take ticks more seriously and that you get educated about what Lyme disease is, that it is in Australia and that anyone who gets bitten by a tick is at risk of contracting it.

# Lynn's Story: When you go down to the woods today be sure of your Aerogard, Bug Off, Bushmans, Debugger!

Lynn Rees

Over the past 20 years I have received over 500 tick bites, maybe even more. In that time I have worked in the environmental field predominantly killing weeds or encouraging others to do so, from Sydney to Woolgoolga. I have worked for a conservation agency for the past 18 years. I didn't bother to count the massive larval stage tick bites all over my body on regular occasions. I removed the big ticks without much thought. I sometimes rubbed in a bit of lavender or tea tree oil. I just dealt with the annoying itching. I sometimes took antihistamines if the itching got too much.

Sometimes I would feel a bit sick, a few headaches, swollen glands, a bit tired. Sometimes I would get a big football shaped rash, sometimes just lots of spots. Sometimes I would spray myself with Aerogard if I thought I may be in a tick prone area. Ticks are just part of the equation. Sound familiar?

## We all get them from time to time, no big deal. Or is it?

After five years of slowly declining health, with compounding weird symptoms, I was diagnosed with the infamous Lyme disease on 25 October 2011. This day is to be celebrated. Why? Because it means I will hopefully recover the energy of the 12 cylinder body that I used to have. I will be able to play with my kids again. I will be able to think clearly and live without constant migrating pain in every part of my disease-ridden body, headaches will only be a thing of late night partying rather than a daily menace to be endured. The early onset dementia I have joked about for some years now will fade—I hope.

My test results were positive for *Borrelia burgdorferi*, *Babesia duncani*, *Rickettsia* and *Brucella*. This means I have the **big one** plus three co-infections, which slightly complicate my treatment and recovery. These four pathogens are described as tick-borne diseases. The first two pathogens are not supposed to be in Australia.

I owe my diagnosis to Natalie Young and her Dad, Chris Haine. Chris sent me some information on Lyme disease, requesting that I make it available to my work colleagues. My work mate Natalie received a diagnosis of Lyme disease in 2009 after being misdiagnosed for seven years. She nearly died. Natalie tells her story below.

In his cover letter, Chris had described Natalie's journey into hell and one sentence that struck a chord with me reads, 'The following diseases (plus others) were suggested for causing her health problems: chronic fatigue, fibro myalgia, multiple sclerosis, arthritis, lupus and motor neurone disease.'



Here is the latest reaction I had to a tick bite. I pulled it off at around 2 pm, and this is 8:30 am the next day.

I had been given some of these diagnoses over the years (plus others). So I called Nat to see how she was faring. I told her of how bad I felt and that I had been deteriorating quite quickly over the past 6 months. She made me promise to see a local Lyme literate doctor. I got in within a week and walked out with a scary clinical diagnosis: Lyme disease—multiple infections chronic disease syndrome.

The next two months were spent in a blur: blood tests, doctors, drugs, OHS paperwork, insurance company hassles, a fast draining bank account, and trying to learn as much about Lyme disease and associated tick-borne infections as my poor addled brain would allow.

When my positive blood tests came back from America confirming the clinical diagnosis, it was a tremendous relief because I thought I was heading towards some degenerative auto immune disease. I had long stopped complaining of weird symptoms to my doctor, not wanting to believe that I was a neurotic hypochondriac and not wanting him to think so either.

I have already gone through the shock and denial stages. Now I am in the survival stage, my disease-ridden body trying to cope with the onslaught of high-dose antibiotics and myriad supplements to counteract them and to boost my weakened immune system.

I hope soon to enter into the fighting stage. To fight for the acknowledgement that Lyme disease can be contracted in Australia, and that it can cause chronic, debilitating illness if not recognised and treated promptly.

We bush regenerators need to get educated about protecting ourselves from ticks, recognising the many symptoms (about 100) of tick-borne diseases and taking prompt action. We need to ensure that our precious volunteers and staff are advised of the risks and of how to protect themselves.

I strongly encourage those of you who can to consider donating to the Karl McManus Foundation. They are fighting for recognition and research into Lyme disease and other tick-borne infections in Australia and need our support now.

Watch out, you could be next!

## Natalie's story

Natalie Young

For eight years I worked as a field officer for a conservation agency. In 2002, I was working in the bush and received 110 nymph and two larger tick bites. Due to infection I saw a doctor and he said he didn't have time to remove them all—in short it took days to get them out.

A few months later I noticed my fingers and hands would ache like an extreme arthritic bone ache as did one of my knees and my wrists. Continuing to work, without any warning about tick-borne infections, I would often have three to five tick bites a week, sometimes 20 or 30 at a time.

The birth of my daughter Matilda in 2008 just flattened me. I was so tired I could barely look after her. My mother Vicki stayed with me for three months to help me.

When Matilda was one year old I went back to work. In 2009 I received my last tick bite and had an anaphylactic reaction. The hospital staff administered a steroid and 10 days later I nearly died. I suffered extreme chest pains, dizziness, blacking out, breathing dysfunction, and every muscle in my body began to twitch uncontrollably. The spinal pain was so extreme and the tiredness soon progressed into exhaustion. I had shivers and chills, sore throat, nausea, sensitivity to light, ringing in the ears and extreme migraines.

Over a dozen Australians doctors said it's not Lyme disease, as my serology (ELISA) returned negative from Australian labs. I then sent my bloods to America and Germany both of which showed positive results for borreliosis. I was finally diagnosed in September 2009.

In February 2010 my daughter Matilda started showing symptoms. Her blood was sent to IGeneX labs in California and returned a positive. I now know my daughter caught this insidious disease in utero. So not only am I chronically ill but my daughter is too. We both flew to San Francisco in December 2010 to get expert help.

Tick-borne disease testing in Australia is flawed, and only a handful of doctors have the expertise in diagnosing Lyme clinically. Very few doctors know where to send blood for testing overseas in labs that specialise in tick-borne diseases.

Many Australians who receive a negative blood test result in Australia for Lyme disease and then send blood to USA or Germany return a positive result. Australian testing is in its infancy and has very low accuracy in detecting the many tick-borne diseases. Australian laboratories are extremely inaccurate in detecting the Australian species of *Borrelia*. *Borrelia* is the key bacteria that causes Lyme disease, now more commonly referred to as Lyme borreliosis. There is more than one strain of *Borrelia*, but Australian labs only test for one strain. Also if the ELISA test is negative no further testing is done. ELISA testing was rejected as a reliable Lyme disease test some time ago overseas. The key test overseas is the western blot test plus a number of others which have a much higher degree of accuracy.

This is crucial! Otherwise people will never find out they have Lyme disease if they continue to get tested by Australian labs.

It should also be noted the rise in *Babesia*, *Bartonella* and *Anaplasma* diseases carried by Australian ticks. Many Australians, including Lynn, Carl and I are finding all these co-infections not picked up by Australian testing. I have seven tick-borne infections and Lynn has four. We only found out because we saw a Lyme literate doctor who knew what to test for in America.

Little did I know that each tick bite I got was transferring some nasty little bugs, not only *Borrelia*, but *Rickettsia*, *Anaplasma*, *Babesia*, *Brucella* and *Bartonella*. Many people can harbour these infections for years laying dormant till a trigger or stressful event allows them to start wreaking havoc.

We were forced to travel to the USA to see Lyme literate doctors. I saw Dr Raphael Stricker and Dr Steven Harris independently. Both diagnosed my daughter and I with Lyme disease and the same list of co-infections. It was the first time a thorough physical clinical examination had been carried out. The Australian doctors just had no idea what they were looking for clinically let alone reading the tests. Unfortunately I was diagnosed with cranial and peripheral neuropathy parainfections due to Lyme. I was told it will be many years until I improve.

I will never be cured due to the late stage of the disease. However I must keep up with treatment which reduces the symptoms. It's a daily battle to get through each day. I suffer debilitating fatigue, constant pain, breathing dysfunction and so many more symptoms.

My beautiful daughter Matilda who had never received a tick bite contracted Lyme in utero. My little girl suffers constant leg pain, infections, fatigue, attention problems, headaches, gastro problems, stomach pain, coughing, vomiting, light sensitivity, photophobia. This did not have to happen to her or me or Lynn or any other person in Australia if the disease was recognised and understood and treated appropriately.



Natalie, Matilda and Steve Young—all have Lyme disease acquired in Australia. Steve contracted it from ticks that arrived home on Natalie's work clothes.

## Carl's story: Australian Lyme—a word that is becoming more and more a household word down under.

### Carl Freeman

I share my story of my fight with tick-borne disease (TBD) in the hope that it may help others with diagnosis and treatment. I'd also like to encourage those in the medical fields to take a closer look into this debilitating disease so that persons showing the classic symptoms of TBD can be quickly diagnosed and treated here in Australia, rather than relying on expensive blood tests conducted overseas.

I am an environmental worker who has for the past fifteen years worked extensively in the bush regeneration fields of work on the North Coast of NSW.

Although employed as a project supervisor, I have always been a hands-on person and find myself down in the dirt with everyone else carrying out project works to achieve the desired result.

As a result of being in the bushland environment almost every day carrying out weed control, revegetation and like duties, I have each year been bitten by countless ticks and had accepted this as par for the course—not realising that there was such a thing as TBD and how serious it could be.

My response to being bitten by an adult tick was to remove the tick ASAP, and whenever possible treat the open wound immediately with hydrogen peroxide. This would cause the neurotoxin to fizz up as white foam, and would prevent any

swelling or seeping from the wound as would occur if peroxide was not used.

Juvenile ticks I treated with Lyclear, which killed them almost immediately and prevented the unbearable itching sensation which led to scratching and broken sores.

To me a tick bite was treated no more seriously than the scratches and stings that are an everyday occurrence when bulldozing your way through the bush doing your job—that was until a few years back when colleague Natalie Young was diagnosed with Lyme disease contracted from tick bites.

My first recollection of symptoms that should have alerted me to TBD, if I had known then what I know now, was about five years ago. These were dizzy spells that I began to experience infrequently, but were acute enough to cause concern. I had not long before been off work with what was diagnosed as a viral flu, so thought that this may have been related.

When the dizzy spells persisted and I started to suffer headaches as well, I saw my doctor and asked to be tested for Ross River fever and Barmah virus, which apparently have these symptoms.

I was advised that there was no treatment for these viruses even if diagnosed, so there was no real point in testing. He felt my condition was maybe due to low blood pressure.

*I continued to put up with my symptoms for another year or so until I had had enough and explained to my doctor that I wanted to get to the bottom of what was making me unwell whether it be a virus or possibly even a tumour in my head—this prompted him to send me off for a brain scan, which came back clear.*

My symptoms were now aching joints and muscles, headaches with dizziness, and a sore neck that even with regular exercises and massage would not go away.

So two years later I was seeing a different doctor, who felt that testing for viruses was not the way to go. He instead sent me for an x-ray of the neck, which came back showing degeneration which was in line with my age and the type of physical work I do. Physiotherapy was recommended for my neck.

I had throughout the years kept up-to-date with Natalie Young's treatment for Lyme disease, and when another colleague, Lynn Rees, was diagnosed with Lyme I began to consider the possibility I could be the third.

Lynn had carried out extensive research into the disease on the net as well as contacting Natalie directly. The symptoms I had been suffering for the previous five years lined up almost exactly with the symptoms explained in the literature I was reading on Lyme disease, so I requested my doctor to have blood tests carried out specifically for Lyme.

He agreed to do so but confirmed what I had read: that Lyme testing in Australia was considered to be highly inadequate. If tests came back indicating I may have Lyme I would have had to consider being tested overseas where testing is considered to be far more accurate, but expensive.

My doctor also advised me that, according to NSW Health, Lyme disease was not found in Australia. I already knew this after reading the many reports written by doctors who were going through a frustrating process with patients here in Australia—having to use diagnosis, testing, and treatment guidelines from overseas.

The results that came back to my GP from pathology were not conclusive to Lyme disease. The doctor suggested it was due to the type of test that was run, so I made an appointment to see

a Lyme literate doctor in Bellingen—the closest Lyme literate doctor to where I live.

After my first consultation, the doctor was 98% certain, through clinical diagnosis, that my symptoms were caused by TBD and probably Lyme disease. He ordered two separate blood tests to be carried out in Australia, one by a government pathology lab and one by a private lab, for *Borrelia*, *Mycoplasma* and *Chlamydia*—all tick-borne pathogens.

After considerable discussion, I decided to commence treatment immediately rather than wait for Australian test results which would not be 100% conclusive anyway, as I was very much ready to be rid of the ongoing terrible symptoms I was experiencing.

I felt that it was more beneficial to commence treatment for TBD immediately. From what I had read it would not take long for symptoms to intensify and become evident through what is called a Herx reaction caused from the killing of TBD bacteria, this would further back up the clinical diagnosis.

Sure enough, within a couple of days of starting treatment with the first antibiotics (minocycline), the headaches and dizzy spells intensified, shortly after commencing the second of three antibiotics chosen for my treatment (amoxycillin), I was suffering from increased pain in my muscles and joints.

Shortly after commencing the third antibiotic (simplotan), I was experiencing days where I felt very ill with all muscles and joints aching and headaches that forced me to lie in a dark room and rest. Fortunately this coincided with Xmas and I was on recreation leave so I could rest up without having to go to work.

*Wouldn't it have been so much easier if I could have been tested here in Australia using the western blot test and been diagnosed five years ago? This debilitating disease would not have been given the chance to develop as chronically as it has and myself and my family would not have had to go through such a rough and torturous ordeal that is not over yet.*

If mainstream medical practitioners were more literate about the affects and frequency of this disease and were given the tools to diagnose in Australia, there would be far less misdiagnosis and a very much healthier community. So where is the pressure going to come from to make this happen? Perhaps the general community, or perhaps it will take a politician's family member to need help, or a doctor himself.

I am grateful to those few doctors who have followed their conscience and ignored those who make decisions while having their heads in the sand. These great people of their profession have at least brought a chance of cure to those like me who have otherwise been floundering around within a health system which is not designed to help at all.

How can this situation exist in a country like Australia where we have so much and yet appear to be becoming less and less compassionate towards those who are in genuine need?

# Zoonotic infections in Australia

Dr Mualla McManus, Karl McManus Foundation

Zoonotic infections are caused by pathogens (bacteria, virus, protozoa and parasites) that are transmitted from animals to humans via direct or indirect contact, or by vectors.

Zoonotic infections can be confined to a small area or be widespread. How far the zoonotic infection spreads depends on the reservoir animals that carry that specific zoonotic pathogen.

This article does not intend to raise unfounded fear with people who work in the bush. These zoonotic infections are observed in farms, even in suburbia, so people do not need to abandon their vocation or their residence because of them. Instead we must be aware and learn to live with animals.

People working in the bush can be in contact with various native animals, or feral animals such as rabbits, foxes, rats, mice, and birds. People are also often in contact with farm animals such as sheep, cattle and pigs. There may be direct connections between humans and these animals, indirect contact (faeces, urine), and vectors such as ticks and mites. Hence when working in the bush or enjoying the bush, one should be aware of zoonotic infectious diseases.

This is very pertinent in today's environment with climate change affecting the proliferation of these pathogens and the reservoir animals. Understanding the route of transmission of these zoonotic infections is vital in prevention. The most common route is via urine, faeces and/or by blood sucking vectors like ticks.

Below is a table of some common zoonotic infections known to occur in Australia. All are blood-borne diseases transmitted by blood sucking insects, commonly ticks.

## Some zoonotic infection known to occur in Australia (adapted from Goldsmith 2005).

All transmitted by blood sucking insects, commonly ticks.

Disease	Causative Agent	Reservoir
<i>Actinomyces pyrorogenes</i> abscess	<i>Actinomyces pyrogenes</i>	Cattle
Babesiosis	<i>Babesia</i> spp.	Birds, mammals, cattle
Barmah Forest virus	<i>Alphavirus</i>	Birds, mammals
Bird mite disease	<i>Ornithonyssus</i> spp.	Birds
Brucellosis	<i>Brucella</i> spp.	Goats, cattle, pigs
Campylobacteriosis	<i>Campylobacter</i> spp.	Small mammals, birds
Cat scratch disease	<i>Bartonella</i> spp.	Cats
Cryptosporidiosis	<i>Cryptosporidiosis</i> spp.	Many mammals
Cryptococcosis	<i>Cryptococcus neoformans</i>	Birds
Dog tapeworm	<i>Dipylidium caninum</i>	Dogs
Ehrlichiosis	<i>Ehrlichia</i> spp	Dogs
Eosinophilic gastroenteritis	<i>Ancylostoma caninum</i>	Dogs
Haycocknemiasis	<i>Haycocknema perplexum</i>	Wallabies, kangaroos
Hendraviral disease	<i>Paramyxovirus</i>	Flying foxes
Jap. B. encephalitis	<i>Flavivirus</i>	Birds, pigs
Kokobera infection	<i>Flavivirus</i>	Horses, cattle, macropods
Kunjin infection	<i>Flavivirus</i>	Birds, mammals
Leptospirosis	<i>Leptospira interrogans</i>	Cattle, pigs, rodents, dogs
Lyme disease	<i>Borrelia burgdorferi</i> senso lato	Rodents, deer, dogs, cattle, sheep, horses, bandicoots, wallabies, small marsupials
Lyssavirus	<i>Rhabdovirus</i>	Flying foxes
Murray valley encephalitis	<i>Flavivirus</i>	Birds
Newcastle disease	<i>Paramyxovirus</i>	Fowls
Pasteurellosis	<i>Pasteurella</i> spp.	Dogs and cats
Q fever	<i>Coxiella burnetii</i>	Birds, cattle, sheep, native animals
Relapsing fever	<i>Borrelia recurrentis</i>	Birds
Ross River	<i>Alphavirus</i>	Native animals
Salmonellosis	Non-typhoidal salmonellae	Mammals
Scrub typhus	<i>Orientia tsutsugamushi</i> (Rickettsia)	Blood sucking insects
Spotted fevers	<i>Rickettsia</i> spp	Blood sucking insects
Toxoplasmosis	<i>Toxoplasma gondii</i>	Cats, mammals
Yersiniosis	<i>Yersinia enterocolitica</i>	Pigs and rodents

Most of the zoonotic infections listed in the table are rare and hard to diagnose. Some are emerging diseases that are becoming more prominent. These include Lyme disease.

Some zoonotic infections are hard to differentially diagnose by the clinician, because symptoms can overlap with other diseases and/or an emerging disease.

It's best to avoid the zoonotic infection in the first place. This can be achieved by being aware, and applying the relevant precautionary measures, as described later in this newsletter.

## Lyme disease

The natural reservoir animal of these infectious disease bacteria, *Borrelia burgdorferi* senso lato complex, is most of Australia's native animals and blood sucking insects. The areas that are affected are rapidly expanding due to migratory birds that fly in from Asia and nest in Australian lakes, rivers, beaches. Also, due to climate change, the virulence of these bacteria is increasing rapidly.

Lyme disease can affect any organ in the body, and commonly involves the nerves, joints, muscles and heart.

Lyme disease is a great imitator and it's symptoms are hard to distinguish from common neurodegenerative diseases like motor neurone disease, multiple sclerosis, Parkinson's disease, Alzheimer's disease, fibromyalgia, rheumatoid arthritis, chronic fatigue syndrome, systemic lupus erythematosus, sarcocidosis and psychiatric disorders.

Lyme disease, like syphilis, has three stages:

- Stage I: days and weeks after a tick bite. Stiff neck, sweat attacks, persistent flu-like symptoms, headache, gut problems, swollen glands. Can involve an erythema migrans (EM) rash which can persist for months and years.
- Stage II: weeks or months after a tick bite. Cranial nerves in the neck degenerating, people having problem speaking and swallowing, muscle nerve pain, brain fog, memory problems, muscle wasting, muscle twitches, increased heart rate, blood pressure problems, balance problems, joint pain, mood changes.
- Stage III: months to years after a tick bite. Can include paralysis of muscles of the hands, arms, legs, swallowing, speech; muscle nerve pain; tremors; inflammation of the brain; heart problems; gut problems; hormonal problems such as thyroid, adrenal, abnormal function. For further information see [www.karlmcmansfoundation.org.au](http://www.karlmcmansfoundation.org.au)

If Lyme disease is diagnosed early and preventative antibiotics are taken after a tick bite, it can be prevented. It is a treatable infection, not a death sentence like other neurodegenerative diseases.

*Lyme disease is not a single pathogen disease. A tick bite can deliver many other bacteria, virus, and protozoa. It is complicated because Lyme disease bacteria, like the AIDS virus, creates an immunosuppressed environment and the co-infections, together with opportunistic infections, complicate diagnosis and treatment. Hence prevention is better than a cure.*

Lyme bacteria exist in three different forms: a spiral shape with a cell wall, a cell wall free state inside a cell, and a cyst. Hence three different types of antibiotics are needed to kill all three forms to recover from Lyme disease. Lyme bacteria divide very slowly hence a lengthy antibiotic treatment period is needed to kill all the bacteria. This is in contrast to average bacteria which divide every half hour and require two weeks of antibiotic treatment.

*The treatment is also complicated by the release of toxins by the dying bacteria, called a die-off reaction, which worsens the symptoms. So complimentary medication to remove the toxins is essential in therapy.*

The most common co-infection in Australia is *Rickettsia*. These are also called spotted fevers. Queensland tick typhus (Australian spotted fever) occurs along the East Coast of Australia and Flinders Island spotted fever found in Tasmania and Flinders Island. The symptoms of rickettsia are similar to Lyme disease: fatigue, sweat attacks, fever, muscle aches, headache, nausea, vomiting, confusion, stiff neck and a unique rash, depending on which species of *Rickettsia* cause the infection.

Another common co-infection is *Babesia*—70 to 80% of Lyme disease sufferers are also infected by this protozoa which is related to malaria. The Lyme disease bacteria and *Babesia* sp. form symbiotic relationships to benefit each other. Babesiosis symptoms include sweat attacks, shortness of breath, fatigue, muscle wasting, and muscle twitches—similar to Lyme disease.

Further information can be obtained from [www.karlmcmansfoundation.org.au](http://www.karlmcmansfoundation.org.au)

## Reference

Goldsmith JM (2005) Zoonotic Infections: an overview. Chapter 14: 14.1-14.14. Aust. College of Tropical Medicine

# A request from the Karl McManus Foundation

## Please donate so that thousands in Australia can get appropriate testing, diagnosis and treatment.

Karl McManus Foundation for Lyme disease research and awareness needs urgent donations to isolate the Lyme disease bacteria from Australian ticks and once and for all prove to the health department that Lyme disease bacteria is in Australia and was here all along.

When we have isolated the Lyme disease bacteria we will develop tests that are better suited for testing the

Australian strain of Lyme disease bacteria. This way the testing and hence diagnosis can be more accurate. We also intend to educate doctors about Lyme disease clinical symptoms and treatment. We would like to see Lyme disease diagnosed like any other accepted disease in Australia.

[www.karlmcmansfoundation.org.au](http://www.karlmcmansfoundation.org.au)

# Research into tick-borne diseases

Dr Ann Mitrovic  
Honorary Associate School of Medical Sciences  
(Pharmacology) The University of Sydney

As Dr Mualla Akinci-McManus outlined in her article, very little is known about the pathogens (bacterial, protozoan and viral) that ticks and other vectors carry in Australia. This is an area that is under researched, and as a result we do not have a clear understanding of the potential health risks that may follow an insect bite.

In some cases of tick-borne infection there is an early and obvious physiological response (e.g. tick typhus caused by *Rickettsia* species resulting in a rash and fever) which can lead to a correct diagnosis and appropriate treatment. However, as is the case of some pathogens such as *Borrelia burgdorferi* sensu lato (the

spirochete bacteria that causes Lyme disease), the symptoms may not be obvious for weeks or months, and hence may not be linked with an insect bite. This increases the chance of misdiagnosis, particularly in Australia where tick-borne disease is not well understood.

Currently our research is focusing on ticks and investigating the pathogens they may carry. Our investigations will involve culture techniques and DNA techniques to identify species. We also need to identify which species of tick carry the pathogens, identify regions where infected ticks are found, and calculate what percentage of ticks in any given area are infected with specific microbes.

This research may be of interest to many of you because of your risk of exposure to tick bite when you are in the bush.

If you would like to assist us in our research or if you have any questions please contact me on [ann.mitrovic@sydney.edu.au](mailto:ann.mitrovic@sydney.edu.au) or 02 9351 3217.

## Ticks wanted!

If you are interested there is an opportunity for you to assist us in the research with tick collection. If you happen to return from the bush and find a tick on you or a co-worker, please remove safely and place it in a snap lock sandwich bag and store in your freezer until it is convenient to post them.

Envelopes can be addressed to:

Ann Mitrovic  
School of Medical Sciences (Pharmacology)  
THE UNIVERSITY OF SYDNEY  
Room 294 Blackburn Building D06  
The University of Sydney, NSW, 2006



Female *Ixodes holocyclus*. Photo: Martin Smith

# Ticks—protecting yourself

## Manual and chemical removal and protection options

Lynn Rees and Dr Mualla McManus

### Tick habits

Of the 75 or so species of ticks in Australia, the main tick of greatest concern to human health is the paralysis tick (*Ixodes holocyclus*). These ticks are found right down the east coast of Australia and have been found inland up to 30 km, though there is some evidence to suggest that they are much further inland than previously recorded.

Bush regenerators are most susceptible to tick bite due to the nature of the work. We are often crawling around in dense vegetation, exposing every part of our bodies to the ticks preferred habitat.

Ticks are mostly found in vegetation below one metre in height, where they are most likely to find their preferred host—small mammals. Larvae are more commonly found in the leafy moist ground layers where the eggs are laid, and nymphs and adults are generally found up to one metre in height within moist humid vegetation.

Ticks are described as being geotropic, meaning that they

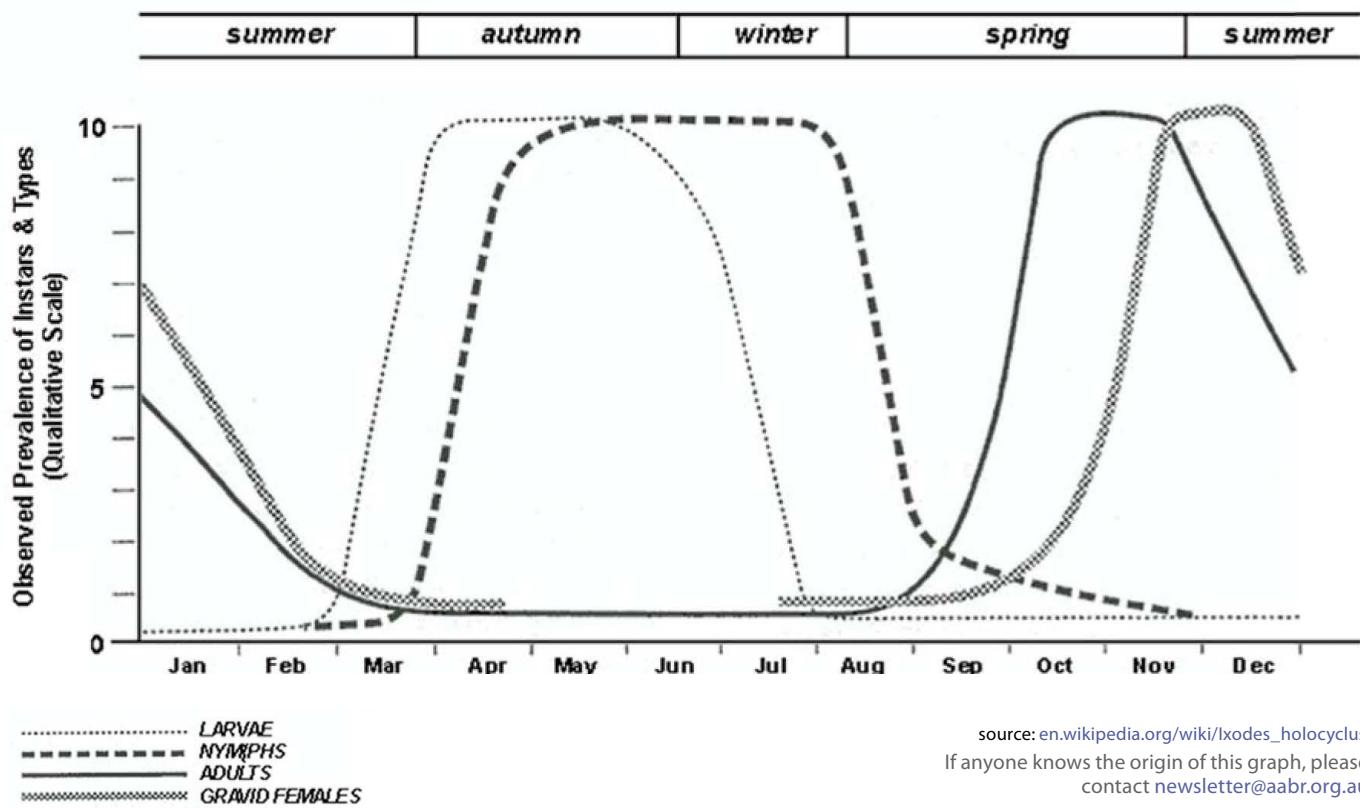
### Tick-borne disease hot spots in east coast Australia

The Karl McManus Foundation advises that 'Hot spots for TBD in Australia are northern suburbs of Sydney, Northern Beaches, Central Coast, Coffs Harbour area, Gold Coast Area, all the way up the coast to Cape York. Plus outer Western Sydney, due to Indian myna birds as a source of mites, ticks, etc.' (pers. com. Mualla McManus, 2011)

instinctively climb to the highest point or in opposition to gravity. They seek a suitable host by climbing onto grasses or low bushes and use one set of legs to grab onto a host as it brushes past (fortunately they can't jump or fly). This behaviour is called questing. When searching for a host, a tick responds mainly to exhaled carbon dioxide, body heat and scent.

As can be seen in the graph below larvae and nymphs are the most active during the cooler months of the year, with the adults becoming more prolific during the warmer months.

Observed seasonal occurrence of life cycle of *Ixodes holocyclus*. Pittwater study area



Check for updates of this article on the AABR website—we hope to keep it current by adding new information as it becomes available.

## Tick life cycle

source: en.wikipedia.org/wiki/Ixodes\_holocyclus)



Engorged Adult (8 legs)  
13.2 mm long, 10.2 mm wide



Unengorged Adult (8 legs)  
3.8 mm long, 2.6 mm wide



Unengorged Nymph (8 legs)  
1.2 mm long, 0.85 mm wide

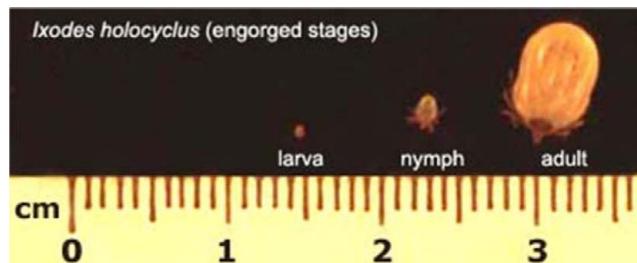


Unengorged Larvae (6 legs)  
0.5 mm long, 0.4 mm wide

(Measurements refer to the body section only (i.e. legs are not included))

### Comparison of engorged ticks

Larval, nymph and adult (female) stages. The adult male tick does not engorge. The larvae and nymphs are neither male nor female.



## Tick diseases

Ticks can spread diseases and disease causing organisms such as *Rickettsia*, *Brucella*, q-fever and Lyme disease. The incidence of tick-borne diseases is an emerging science in Australia. With poor recognition, testing and treatment for various tick-borne diseases, it is imperative that we are vigilant in reducing the impact of tick bites and treating any such bites effectively as soon as possible.

There is some evidence that suggests the larvae and nymph tick is the most infectious. Bush regenerators often get more than one bite from nymphs or larvae and some poor regenerators have had close to 1000 at a time. Larvae, nymphs and females need a blood meal; the adult male tick does not bite. This has potentially serious health implications for the bush regenerator.

If you think you may have symptoms or signs of Lyme disease and co-infections, get tested by the appropriate doctor early. Early detection and treatment leads to better outcomes.

Be aware that your doctor has probably not expected to see Lyme disease during their career (the NSW Department of Health is still advising that it cannot be contracted in Australia), and may have a learning curve ahead of them. The website [www.lymedisease.org.au](http://www.lymedisease.org.au) includes advice on finding a Lyme literate doctor in Australia.

### What is lyme disease?

There appears to be confusion in Australia about what Lyme disease actually is and if in fact it occurs here. Make no mistake, it does occur here.

Dr Burrascano is one of the key Lyme disease doctors in America and offers this revised description of Lyme disease.

*'I take a broad view of what Lyme disease actually is. Traditionally, Lyme is defined as an infectious illness caused by the spirochete, Borrelia burgdorferi (Bb). While this is certainly technically correct, clinically the illness often is much more than that, especially in the disseminated and chronic forms.'*

*'Instead, I think of Lyme as the illness that results from the bite of an infected tick. This includes infection not only with B. burgdorferi, but the many co-infections that may also result. Furthermore, in the chronic form of Lyme, other factors can take on an ever more significant role—immune dysfunction, opportunistic infections, co-infections, biological toxins, metabolic and hormonal imbalances, reconditioning, etc.'*

### Watch that rash!

Bush regenerators from coastal regions are likely to recognise this type of rash. It's a common reaction to a tick bite and while unpleasant, it usually isn't something to be too worried about. But it's worth keeping a photographic record (with a ruler), and monitoring any spread. If there is anything at all unusual or worrying about a rash from a tick bite, show your doctor.

Record all tick bites in a diary and, if at work or volunteering, report the bite to your supervisor. Take note of any symptoms from flu-like illness to headaches for the following month or so. Refer to symptom lists on 'Dr Google'.

In *Top Ten Tips to Prevent Chronic Lyme Disease*, the International Lyme and Associated Diseases Society says 'Show your doctor every rash. The bulls-eye rash is the most famous, but there are many other types of rashes associated with Lyme disease. In fact Lyme disease rashes can be mistaken for spider bites or skin infections. Take photos and make sure a medical professional sees the rash before it fades'.



# *Workplace practices to reduce incidence of tick bites*

Good work place hygiene can assist in reducing the incidence of tick bites and help you avoid taking ticks home to potentially infect your family and pets.

A safe workplace should have a shower, washing machine and clothes dryer. When you return to base, remove all clothing and place in a clothes dryer on the hot setting for at least 10 minutes. This should kill all ticks.

Then have a shower and wash your hair. Run a head lice comb through well conditioned hair. This will help remove any ticks that have not yet found a bite site. Use a scrubbing brush or abrasive type cloth to wash down the skin thoroughly. Make sure the water is running over the areas you are actively rubbing, to help wash off any ticks still looking for a bite site.

If you are still worried about any ticks, particularly the larvae or nymphs that are hard to see, try spraying on a solution of bicarb soda or rubbing down with diluted tea tree oil. The work washing machine can be used to soak work clothes in chemical clothes washes overnight.

Leave work clothes at work to ensure you don't take any hitchhikers home.

If you don't have a work base follow these principles at home. Remove and treat all clothes in the laundry then go straight to the shower.

## **Clothing types and inspections**

The best type of clothing to wear to reduce tick infestations is a light colour with a smooth fabric weave. The light colour allows for easier tick identification and ticks find it hard to hold on to smooth fabrics.

Always tuck long pants into thick long socks, wear long sleeves and put your collar up high around the neck, and tuck in your shirt. Wear a wide brimmed hat. Some people put masking tape around the top of the socks and around the wrists.

Regular inspections of the clothes and hairline are recommended at least every hour. White overalls are a great style to wear when bush regenerating as the design reduces the possible entry points. Sewing up shirt fronts can also reduce entry points.

## **Manual removal of ticks**

There is considerable debate within various bodies about the best or most appropriate ways to remove or deter ticks. This document attempts to highlight the different options. The reader must choose which options suit their personal situation.

The NSW Department of Health recommends removing ticks as soon as possible. However, it is essential that attached ticks be removed in ways which avoid the tick injecting toxins during the removal process.

Never scratch or try to forcibly remove a tick once attached, or kill them with methylated spirits, kerosene, liquid soap, or a flame/hot match. Anything that is an irritant may cause them to inject more toxins. Disturb the tick as little as possible.

## **Recommended techniques**

1. Use fine pointed tweezers to grasp the tick as close to the skin as possible. Gently pull the tick straight out with a steady pressure (do not twist).



Illustration: V.Bear

2. If you have a severe infestation of nymph or larval stage ticks (often referred to as grass ticks), see information in the next section.
3. Apply antiseptic to the bite site.

There is debate in the medical community about whether ticks should be killed prior to removal, to prevent the tick from injecting its saliva. This may be preferable for those who have a known allergy to ticks. The following methods have been identified for killing ticks prior to removal:

1. The University of Sydney Department of Medical Entomology recommends spraying the tick with an aerosol insecticide containing pyrethrin or a pyrethroid or using Lyclear, a scabies cream containing permethrin. The application should be repeated after one minute. The tick should be left in place until it drops off. If the tick is still in place after 24 hours, gently remove it with fine-tipped tweezers. [medent.usyd.edu.au/fact/ticks.htm#remove](http://medent.usyd.edu.au/fact/ticks.htm#remove)
2. The Australian Society of Clinical Immunology and Allergy recommends direct application to the tick of a product marketed as 'Aerostart'. Aerostart freeze dries the tick, killing it instantly. It will then fall out or may be gently scraped with a finger nail or razor blade. However, Aerostart is highly flammable and must be kept away from naked flames or lit cigarettes. In addition, regular use is not recommended as it may have adverse health effects. It is classed as a skin irritant. It is recommended that this method only be used on the advice, and under the supervision, of your treating doctor.

If your doctor has provided you with specific advice about responding to tick bites, follow your doctor's advice.

Various tick removal devices can be purchased from a pharmacy.

# Chemical removal of larval and nymph infestations

(Please note: no brand, product or company is personally endorsed by the authors.)

If you have ever been covered in larval or nymph stage ticks you are likely to never forget it. The itch and discomfort can last for weeks. These ticks can also transmit disease organisms harmful to humans. The faster you can safely kill them the better for your health.

Bicarb soda is good if you have high incidence of infestations, e.g. if you are working in the bush every day.

Bicarb soda baths are OK for babies and for removing larvae or nymphs. But in adults bicarb soda does not remove all larvae and nymphs. Bicarb soda creates an alkaline environment unfavourable to ticks causing the larvae and nymphs to drop off.

One cup of bicarb soda in a bath deep enough to cover the hips should be sufficient. Make sure your whole body is immersed.

Lyclear (a topical cream containing permethrin) is more effective but there is a higher chance that you can develop an allergic reaction to the active ingredient, hence it should be used for less common and very serious infestations. Benzyl benzoate (BB) works well for adults. Apply as per body lice application: leave on for 12 to 24 hours then wash off. All nymphs will be paralysed and drop off. The efficacy of benzyl benzoate is greater than bicarb soda.

If you need to remove the nymphs regularly you are better off using bicarb soda as chances of getting an allergic reaction to BB is greater. For irregular infestation you are better off with BB.

For infestations of the head, a head lice solution containing pyrethrin or pyrethroid is advisable.

contains 20% DEET. I have also used OFF Tropical Strength which contains Picaridin as the active constituent on both skin and clothes. Available evidence suggests that Picaridin is a less toxic substance to humans than DEET.

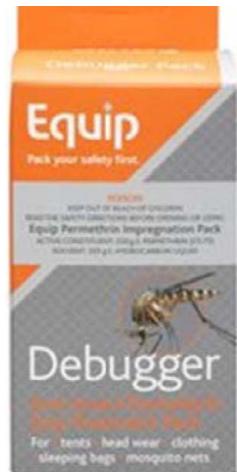
Regular application of these products is advised as repellents evaporate quickly so must be applied frequently.

Don't use DEET over wide areas of bare skin as it can be absorbed causing toxicity.

## Chemical clothes wash

The following information has been copied directly from this web site: [www.equip.com.au/Products/Product.aspx?pid=59](http://www.equip.com.au/Products/Product.aspx?pid=59)

*'Debugger. The Equip DeBugger enables you to treat any material with permethrin. If you require maximum insect protection, you require this product! Suitable for treating clothing, nets, bed sheets etc. Permethrin is an insecticide that kills mosquitoes and other insects when they come in contact with materials which have been impregnated with the substance.'*



**Note from authors.** Some bush regenerators have had very good success using this product. Permethrin can kill ticks on contact, however exposed skin needs to be treated with an insect repellent. The manufacturer states that this product is effective for at least six months and can last up to five washes.

It is advised that bush regenerators set aside one set of clothing that is always worn when in tick infested areas that has been treated with Debugger. Treat clothes as per the manufacturer's directions. However if you are a heavy sweater, check safety with the manufacturer.

## Chemical toxicity

People who perspire greatly may need to think about how to reduce their potential of chemical absorption if using regular insecticidal sprays or washes. All the above mentioned chemicals come with their own risks. Material Safety Data Sheets are available from the manufacturers.

## References:

<sup>1</sup>Burrascano J.J. 2008 *Diagnostic hints and treatment guidelines for Lyme and other tick-borne illnesses*, Sixteenth Edition International Lyme and Associated Diseases Society.

Vanderhoof-Forschner,K.,2003, *Everything you need to know about Lyme disease and other tick-borne disorders*. Second Edition, John Wiley and Sons USA.

Lyme Disease Workshop Foundation 2010, Alternative and Integrative Medicine.

## Australian websites

[www.karlmcmansfoundation.org.au](http://www.karlmcmansfoundation.org.au)  
[www.lymedisease.org.au](http://www.lymedisease.org.au)  
[lymegreenaustralia.blogspot.com.au/](http://lymegreenaustralia.blogspot.com.au/)  
[www.ncbi.nlm.nih.gov/pubmed/20177574](http://www.ncbi.nlm.nih.gov/pubmed/20177574). (see publication about BB).  
[www.ncbi.nlm.nih.gov/pubmed/17439567](http://www.ncbi.nlm.nih.gov/pubmed/17439567) (BB use in pregnancy)  
[www.health.nsw.gov.au/factsheets/infectious/lyme\\_disease.html](http://www.health.nsw.gov.au/factsheets/infectious/lyme_disease.html)  
[www.health.nsw.gov.au/pubs/2004/pdf/tickalert.pdf](http://www.health.nsw.gov.au/pubs/2004/pdf/tickalert.pdf)  
[medent.usyd.edu.au/fact/ticks.htm#remove](http://medent.usyd.edu.au/fact/ticks.htm#remove)

## Other websites

Canadian Lyme Disease Association [www.canlyme.com/](http://www.canlyme.com/)  
Top ten tips to prevent chronic Lyme disease. The International Lyme and Associated Diseases Society. [www.ilads.org/lyme\\_disease/lyme\\_tips.html](http://www.ilads.org/lyme_disease/lyme_tips.html)



# Ticks—a bush regenerator's perspective

Matt Springall

The following account is certainly not the last word in tick management, but I hope it adds to the discussion and provides some advice and options for others. This is my own experience and perspective on how best to deal with them, given the current level of knowledge.

in the nearly 18 years I've been working as a bush regenerator, predominantly in Sydney's Northern Suburbs, I have (unfortunately) amassed a large experience with ticks. While I don't profess to be any expert, I would say I have tried just about every known method to prevent tick bites, to remove ticks and to manage the effects. I have looked through much of the literature and advice that has been written or spoken and, to be honest, I have found the body of work to be confusing, insufficient for effective management, and sometimes unhelpful.

First of all, what are ticks? Ticks are parasites in the same group of creatures as spiders and mites, and likewise have eight legs. Around here the vast majority of ticks encountered in bushland are paralysis ticks, *Ixodes holocyclus*. There are many and various common names for these ticks such as grass ticks, bush ticks and shellbacks which, like all common names, can create the impression that they refer to several species. Generally the various names refer to the larval, nymph and adult stages of the paralysis tick lifecycle.

At each stage the tick requires a blood meal to progress to the next, and that's where we come in. Generally the tick will obtain its blood meal from any of the animals normally found in bushland, including many mammals, birds and reptiles. I have commonly found ticks on bandicoots and blue tongue lizards and have heard of them found on penguins that have been at sea feeding for several days—so they're pretty hardy and not particularly choosy. Once a tick has had a full blood meal it swells and takes on a bluish hue and is known as an engorged tick. Once engorged it drops off and develops to the next stage.

I have never seen an engorged tick on a human and have rarely heard of it as this takes several days, would potentially make the individual quite ill and would usually be discovered before completing its meal.

I've found the term grass tick refers mainly to the very small larval stage which is as small or smaller than a full stop. This name is not particularly accurate as you can get grass ticks from any sort of vegetation. Many larval/grass ticks can be clustered in a very small area, and is the reason why one person will get many of these ticks (I've had up to 150 in one hit and know people that have had over 900 at once—not fun!), while others nearby get very few or none at all. The nymph stage is a bit bigger, maybe a millimetre or so in length, but still usually quite small and often also often referred to as a grass tick. This stage is more recognisable than the larval stage to the naked eye and

appears as a very small version of the adult tick (as does the larval stage but most would need a good hand lens or a microscope to see it). The adult ticks are much easier to see, ranging from anything up to 5 mm when not engorged and are often referred to as shellbacks.

The initial problem with ticks is that they bite into the skin using saw like mouth pieces to latch on and suck the host's blood. To keep the blood flowing they inject saliva containing an anticoagulant that stops the blood clotting.

*They also expel waste from the body via the mouth as they have no anus, so these waste products and any associated bacteria and other pathogens enter the host's body and can cause a variety of health problems.*

These range from a bit of localised swelling and an itch that can last up to two to three weeks, up to serious debilitating and even life threatening diseases such as tick typhus, also known as spotted fever, and Lyme disease. There has been much debate as to whether Lyme disease actually occurs in ticks in Australia, but the bottom line is that some people get very seriously ill following tick bites—although in my experience that is fortunately the rare exception.

About 10 years ago I went through a stage for about three years of occasionally suffering what was then an unexplained and dramatic hives allergic reactions requiring a quick administration of an antihistamine. Over time I suspected it was something to do with eating red meat, something I've always done and still do, though I haven't had a reaction in over eight years now. There are now over 200 confirmed cases of this condition, which specialists at the Royal North Shore Hospital have identified as related to tick bites. I know of some bushcare volunteers that have had this allergy develop and like me have also recovered.

In some rare cases the tick bite itself can cause an allergic reaction which in serious cases can be life threatening, as can any allergic reaction whether it be from a bee sting or from peanut butter.

When I worked at Ku-ring-gai Council there were a few occasions when I looked down to see my shirt covered in what looked like soil, as if someone had thrown a handful of dirt at me, except it was all moving—larval ticks! Some were so small they were burying through the weave of my shirt. In those cases I immediately sprayed the whole shirt and the rest of my body with Rid (an insect repellent containing DEET), removed my shirt, sprayed it and my body again, and made a quick exit back to the depot where I showered and put on fresh clothes. Current advice is that throwing the clothes into a drier kills them, and that would have been a good option had one been available. In each case I only got about four or five tick bites so I feel I made a good escape!

Tucking your shirt into your pants is recommended to reduce entry points. Its not fool proof. Over time I found if I tucked in my shirt I got more ticks around my thighs and groin, if untucked then they'd be higher up around my waist and stomach. I guess it's your choice where you prefer to scratch!

Another method we used at Ku-ring-gai Council to great effect was timing our work in known problem tick areas. We kept a record of tick bites including where we were working when we got them, what we were doing, the type of tick, where we got them on our body and how many. Over a period of about three years an obvious pattern emerged. Larval tick numbers exploded in late February before eventually dropping off in May/June, with more nymphs from about April. In mid to late winter we'd get more nymphs and adults, then late October to the end of the year more adults—the shellback. With each later stage of the lifecycle you would tend to get less. When you got shellbacks you might get one, two or three, with nymphs usually up to a dozen or so at most, but the worst were always the larval ticks—40 or 50 at a time were not uncommon.

*According to our records several sites were extremely high risk, so we'd work those sites more intensively from December to February, then have a break before returning in June.*

It meant having to plan work schedules around tick season but it certainly reduced the numbers of ticks staff were getting.

Of course you could pick up any stage of tick at any time of year but as the records showed it would be more like three or four staff getting one or two ticks in a month, as opposed to late February or March when each day half a dozen staff would get 10, 20, 30 ticks or more.

Once you've got a tick the contradictory advice kicks into overdrive—how to remove it. For me it's just a case of '**get it out**' and the more quickly and cleanly the better. In recent months I've seen written advice from one set of experts saying to use tweezers, and do not apply metholated spirits, kerosene or any other chemical. On the other hand other recent written expert medical advice said do not use tweezers, but to kill the tick before removal using Lyclear or Aerostart (Aerostart contains a warning that over exposure may cause central nervous system effects amongst other things, so I wouldn't advise it for regular use!). Welcome to the world of expert tick advice. The advice seems to focus on preventing the tick from injecting more toxins into you. It appears that applying chemicals agitates the tick and causes it to do this, but other advice claims that the act of agitating it by scratching it or grabbing it with tweezers causes it to inject more toxins. From my experience, by the time you have found the tick on your body, nine times out of 10 it's because you have felt an itch, scratched it and felt the tick—and of course agitated it in the process. In other cases it's already been agitated by the fabric of your clothing rubbing against it, so my advice is to remove it as quickly and cleanly as possible—chances are it's already injected toxins.

For larval ticks and sometimes nymphs I always use Lyclear scabies cream these days. Lyclear is a permethrin based cream available at any chemist for around \$16 a tube and I wish I'd known about it 15 years ago, and especially for the time I got 150 grass ticks. When applied to the tick it kills it (though I'm not sure how quickly) and the tick falls out usually within a couple of hours. For larval ticks I find that if I've got it soon enough it doesn't even itch which suggests to me that it doesn't cause it to inject more toxin, and anything that saves you from 2 or 3 weeks of itching gets a big thumbs up in my book. Many people recommend bicarbonate of soda baths to get rid of larval ticks, though I couldn't get it to work. I tried it when I got about 150 ticks at once about 13 years ago with no result, but perhaps I didn't give it enough time. I did end up tipping an entire packet

of bicarb into the bath, and trust me, in that situation you are ready to try anything.

For adult ticks, and sometimes for nymphs if I don't have a tube of Lyclear handy, I still remove them straight away using tweezers or my fingernails, despite some advice to the contrary. The larger ticks don't seem to be killed straight away by the Lyclear, and when it's applied to them I've noticed a slight increase in pain at the bite, which suggests to me they're injecting more toxin. Bites from adult ticks are often associated with a swelling around the area and sometimes even slight pain in addition to the itch. The longer they've been in the worse it seems, so for my money I just get the tick out, and the sooner the better. Some work colleagues have recently tried and recommended a type of tick removal lasso, and I'll give it a go next time I get one—I've just never had one handy before. Others recommend a type of scoop that levers them out and that could be worth a go as well, as long as it's quick and clean. While it's better if the head of the tick doesn't break off and remain behind, if does it will just work its own way out much like a small splinter and it won't continue to inject toxins.

*It's typical for a tick bite to itch for a couple of weeks, weep a bit for a few days and, especially with adult ticks, for a bit of swelling around the bite. However, if it develops a rash around the site, and especially if it starts to spread, you should go to a doctor as soon as possible and tell them you have had a tick.*

If you're not sure if a rash is spreading then try marking the edge of it with a pen or Texta and check on it over a few hours or so.

Apparently most infections can be treated by a course of antibiotics, and if treated promptly shouldn't have long lasting effects (never had to go on antibiotics yet myself, touch wood). For tick typhus and Lyme disease, if diagnosed and treated within a few weeks, recovery is said to be a relatively quick. If left untreated or undiagnosed they can become very debilitating causing the patient to become bed ridden with flu and chronic fatigue syndrome like symptoms. I have known many people that have contracted tick typhus on the northern beaches including two bush regenerators that were hospitalised on one day after working behind Bilgola Beach many years ago.

Ticks are going to be an ongoing issue for us and I've been extremely frustrated over the years by the inability to get sound, conclusive and non-contradictory advice. So I've always just managed ticks and tick bites in ways that seem to work best for me, and been happy to pass on advice and raise awareness of the issue while taking the 'whatever works best for you and your personal preference' approach.

It's high time there was consensus and better guidance from the medical community, and I know there's many out there that are trying to achieve this. For those working in bushland we need to be part of this discussion and the process as obviously it is in our best interests. Hopefully we can now start to provide advice with more confidence and clarity. In the meantime, please be safe and look after yourselves and your colleagues in the bush.

This is an edited version of an article Matt prepared for a Sydney bushcare newsletter.

Our promised article on the Lord Howe Island 'Weeds of Doom' education program will now appear in News 113

# Other news

## News from the NSW committee

### Proposed separation of accreditation from membership and expansion of AABR's scope.

An important milestone has been reached in the recent appointment of a contractor, Sue Stevens. Sue's tasks include to identify the implications of the proposed changes upon AABR's Rules and to identify what would be needed in terms of an information campaign and membership drive should members opt for change.

**Survey of AABR members.** Sue's first task, however, will be to prepare a web-based survey that the committee will send out in a matter of weeks to all AABR members (and a sample of people we hope might be potential members) to gain feedback on people's views of the proposals and the

role of AABR generally. We hope that when you receive the email link to the survey you will take a few minutes or so to fill in the survey to help this great organization reach its full potential.

**Regeneration 'manifesto'.** Simultaneously, the committee will be working on a draft document that will describe AABR's view of ecological restoration, strongly guided by an understanding of natural regeneration processes. This will be used to guide the organisation's focus and scope and convey to other stakeholders our view about the importance of regeneration as a specific restoration approach where appropriate—and its importance as a goal and measure of success for all ecological restoration. This document will be put to the membership for comment in due course and, ultimately, included as part of the 'change' package to be put to members later in the year.

## Site visit: protecting the saltmarsh of the Kurnell Peninsula

**Friday May 25**

**Meet 9:30 for 10:00 start. Finish 12:30-1:00**

Have you ever needed a backhoe to restore coastal saltmarsh? Ever thought that a grader would unearth a dormant seed bank? Have you ever wished to see friends and colleagues in gumboots? Join us to visit two sites on the sunny Kurnell Peninsula and see two very different methods in restoring EECs.

Even on degraded saltmarsh sites, plants and animals are present and functioning. This is an opportunity to get up close.

A second visit in 2013 will follow progress on these sites.

**Presenters:** Paul Price, Sutherland Shire Council (Bushland/Nursery Coordinator), Nerida Gill Sydney Metro CMA (Kurnell 2020 Project Officer) and Tony Wales (Georges Riverkeeper).

**Bring** Morning tea, lunch and gumboots

**Meet** End of Horning Street, Kurnell, Sydney. Finishing at Bonna Point (Kurnell). **Please RSVP as numbers are limited.**

Co-hosted by AABR, SMCMA, GRCCC and SSC.

Contact Heather Stolle [heatherstolle@hotmail.com](mailto:heatherstolle@hotmail.com)  
02 9547 1692 0425 291 879



### Indigenous land and water management—a special issue of Ecological Management & Restoration

From the reintroduction of threatened wallabies, the return of Aboriginal peoples to their ancient homeland and the discovery of new plant species, inspiring stories about some of Australia's most successful land and water management projects reveal the conservation benefits of cross-cultural partnerships. The projects feature in a special issue of EMR.

Freely available online, the papers showcase how Indigenous and non-Indigenous Australians are working together in remote parts of central and northern Australia to develop innovative land and sea management projects. These projects combine indigenous and non-Indigenous scientific knowledge and methods, highlighting the seldom documented voices and the input of indigenous peoples into conservation work.

### Subscribe to EMR

The affiliate discount subscription rate, available to members of AABR is \$70.40.

Subscribe by contacting Wiley-Blackwell directly. Information on subscription options is available via the journal home page: [onlinelibrary.wiley.com/journal](http://onlinelibrary.wiley.com/journal)

### New EMR Project Summaries

(EMR) invites short summaries (300-700 words) on any interesting ecosystem rehabilitation or restoration project in Australia that is already showing good or promising results.

Formerly published in the print version of the journal, selected summaries are now published on the website so that this content is freely accessible and more easily searchable. Summaries are not peer reviewed, but are checked for clarity and content by the project summaries editor.

[www.emrprojectsummaries.org](http://www.emrprojectsummaries.org)

# What's happening

CHLC Landcare Training Calender 2012

## Where Coffs Harbour

These workshops are targeted at Coffs Harbour Regional Landcare Inc (CHRL) volunteers and members and are made possible through the support of the Northern Rivers CMA, Coffs Harbour City Council and the NSW NPWS.

28th March – Bush Regeneration Techniques

25th April – Coastal Plant ID

27th June – Worksite Health and Safety

29th August – Bush Regeneration Techniques

31st October – Coastal Dune Management

Please RSVP as places are limited.

**Contact** CHRL 02 66511308 [chrl@westnet.com.au](mailto:chrl@westnet.com.au)

## April 5-8

The Sydney Royal Easter Show Bushcare stall

Willoughby City Council, with the support of other councils, organisations and the Sydney Metropolitan CMA are once again organising a Bushcare stall.

We are calling for enthusiastic volunteers to help staff the award winning stall and promote Bushcare and bush friendly gardens in the Sydney region. Volunteers with experience working as part of a Bushcare, Landcare, Coastcare, Streamwatch or other environmental program are encouraged to get involved! Volunteers receive a free ticket to the Show.

## April 16-18

4th National NRM Knowledge Conference

## Where Adelaide

The National NRM Regions' Working Group in partnership with WWF, ACF, and NFF, supported by the Australian Government Land and Coasts Team.

There's a lot happening in our backyard

- applying resilience approaches to NRM
- healthy and productive landscapes/seascapes
- planning for new horizons

An opportunity for planning, policy and on ground practitioners to share successes, experiences and learnings with their colleagues and to see and hear a lot of examples of how programs are being delivered by peers to achieve healthy and resilient landscapes inclusive of productive, cultural and natural systems. A forum to establish and strengthen networks amongst staff of Australia's 56 regional NRM bodies, government agencies and non-government agencies.

**Contact** [www.aomevents.com/NRM2012](http://www.aomevents.com/NRM2012)

## Friday May 25

Protecting the saltmarsh of the Kurnell Peninsula

Co-hosted by AABR, SMCMA, GRCCC and Sutherland Shire Council.

More on page 15.

## Mid 2012

AABR hopes to run more of Van Klaphake's plant identification workshops in mid 2012.

All of the past workshops on eucalypts, grasses and sedges have been sell outs.

More information will be emailed to members and posted on the website. If you are interested please contact Paul via [aabr@aabr.org.au](mailto:aabr@aabr.org.au).

## September 3-9

Landcare Week

Landcare Week is the annual awareness raising activity of the Landcare movement. The purpose of the campaign is to assist groups around Australia build resilience, create awareness in their community and encourage participation.

**Where** Australia wide. Groups can email events to: [events@landcareaustralia.com.au](mailto:events@landcareaustralia.com.au) to be posted on the website.

## September 3-5

The National Landcare Conference

**Where** Sydney Exhibition and Convention Centre Darling Harbour, Sydney.

## Sunday September 9

Bushcare Major Day Out

A National Day to promote the regeneration of native bushland through awareness and engagement of the local community in an enjoyable and sociable way.

**Where** Australia wide.

**Contact** [bushcaresmajordayout.org/](http://bushcaresmajordayout.org/)

## September 17-21

Coast to Coast 2012 Living on the Edge

## Where Brisbane Convention and Exhibition Centre.

The renowned and only National Coastal Management Conference when all with interest in coastal, estuarine and marine matters get together to celebrate Australia's coasts and share knowledge and experiences on management, science, policy, governance, activism and many other topics.

Provides an excellent forum for Australian coastal workers and managers from councils, universities, consulting companies, community organisations and all levels of government.

**Contact** [www.coast2coast.org.au](http://www.coast2coast.org.au)

## October 8-12

18th Australasian Weeds Conference

## Where The Sebel, Albert Park Melbourne.

Recent advances in weed science, extension and policy across Australian and international communities and landscapes.

Valuable information and networking opportunities for anyone with an interest in aspects of weed legislation and development of practical solutions to evolving weed problems.

Poster abstract submission until 30 March 2012.

**Contact** [www.18awc.com](http://www.18awc.com)

## October 29-November 2

Australian Network for Plant Conservation's 9th National Conference. Plant Conservation in Australia—Achievements and future directions.

## Where Canberra

**Contact** [www.anpc.asn.au](http://www.anpc.asn.au)

## December 3-7

ESA12 'Ecology: Fundamental Science of the Biosphere'

## Where Melbourne

**Contact** [esa2012.org.au/index.asp?IntCatId=14](http://esa2012.org.au/index.asp?IntCatId=14)

## Please note: AABR has a new postal address

AABR News is the newsletter of the Australian Association of Bush Regenerators (NSW) AABR Inc.

AABR NSW was established in 1986 out of concern for the continuing survival and integrity of bushland and its dependent fauna in or near bushland areas, and seeks new members and friends for promoting good work practices in natural areas. The Association's aim is to foster and encourage sound ecological practices of bushland management by qualified people.

AABR NSW has regional committees in northeast NSW/Southeast Queensland and the Hunter, and a sister organisation in Western Australia: AABR WA.

**AABR C/O Total Environment Centre Suite 2, 89 Jones Street Ultimo NSW 2007**

**0407 002 921**

**[www.aabr.org.au](http://www.aabr.org.au)**

**[enquiries@aabr.org.au](mailto:enquiries@aabr.org.au)**

**ABN: 33 053 528 029 ARBN: 059 120 802**

To keep in touch and be notified about events, subscribe to Bush Regeneration or Bushcare list servers and check out Solutions: the Bush Regeneration Bulletin Board—see website for detail.

\$20.00 p.a AABR Newsletter Subscription

\$10.00 p.a AABR Newsletter Subscription

(all interested people)

(email for 1 year for students of Certificate III CLM-Natural Area Restoration)

\$25.00 p.a AABR Membership

(appropriately qualified & experienced bush regenerators)

\$50-400 p.a AABR Contractors & Consultants List

(appropriately qualified & experienced bush regenerators)

## Newsletter contributions and comments are welcome

Contact Virginia Bear [newsletter@aabr.org.au](mailto:newsletter@aabr.org.au) 0408 468 442

*Opinions expressed in this newsletter are not necessarily those of AABR NSW*

**AABR**  
**NSW**