

# Pest Management

## A HOLISTIC APPROACH

Couran Cove Island Resort has recognised that to be effective in pest management, we need to study our surrounding environment and approach any problem with the view that whatever action is undertaken, we are totally responsible for the consequences. As people are attracted to South Stradbroke Island for the sake of experiencing and enjoying nature, no other method would be applicable to the resort's philosophy other than a holistic approach. Our pest management is an ongoing sustainable program and hopefully the results will lead the way and influence our guests and governments into new ways of thinking about our environment and our role within it.

Couran Cove Island Resort is undertaking a large scale, environmentally friendly approach to pest management on South Stradbroke Island. This holistic approach to pest management involves:

1. Identifying pest species.
2. Researching what natural predators are available and feasible.
3. Investigating environmentally friendly solutions.

Solutions and management strategies include:

- Denial of feeding opportunities.
- Denial of reproductive opportunities.
- Encouraging natural predators.

### MOSQUITO MANAGEMENT

An example of one Couran Cove Island Resort initiative of pest management, is the mosquito management strategy. This involves monitoring the behaviour of the water table and pooling areas, which are the breeding areas of mosquitoes. Wind direction is also taken into account, as this is a consideration in discovering their sources. Additionally, the structural development of the resort's facilities are considered in terms of harbourage sites (where the mosquitoes may be hiding).

### THE LIVING RESOURCES MOSQUITO LIGHT TRAP

A major innovation is the use of light traps. These traps were developed by our pest management consultant and have proven to be a great success. They are battery operated (with solar recharge) and utilise carbon dioxide, together with light, a suction fan and a net.

They provide a great alternative to the traditional 'zappers' that are not species selective and burn the insect, which makes any remains indistinguishable. Most mosquito species are attracted to carbon dioxide, which is why they are attracted to humans. So for this reason, the light traps are baited with carbon dioxide, which also makes these devices extremely species specific. The pest management team can then identify the type of mosquito caught in the traps, (some 30 traps are scattered throughout the resort) and its particular breeding ground. A bio-organic or natural predator (Pacific Blue-Eye Fish, a native fish) can then be utilised to counter the eggs or larvae.

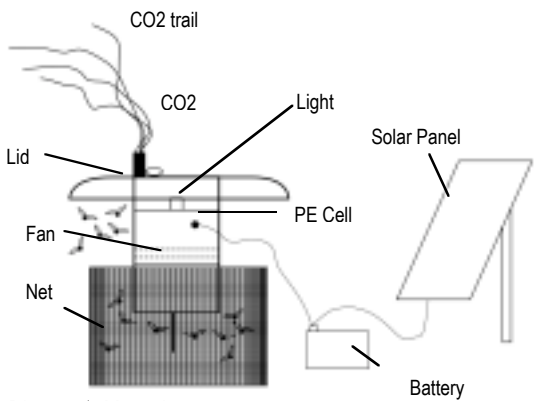


Diagram1: Mosquito trap

### MANAGEMENT OF COMMONLY ENCOUNTERED MOSQUITOES ON SOUTH STRADBROKE ISLAND

**Source** – Containers such as tanks, old saucepans, etc.

- *Aedes notoscriptus*
- *Culex quinquefasciatus*
- *Culex halifaxii*
- *Toxorhynchites speciosus*

**Action** – Resort ensures no breeding opportunities are made available

**Source** – Salt Marsh

- *Aedes vigilax*
- *Aedes alternans* (Scotch Grey)
- *Culex sitiens*
- *Culex halifaxii*

**Action** – Monitoring

**Source – Temporary Groundwater and Ponds**

- *Culex annulirostris*
- *Anopheles annulipes*

**Action – Monitoring of drainage, introduction of bio-organic larvicide**

**Source – Permanent Ponds**

- *Aedes notoscriptus*
- *Toxorhynchites speciosus*
- *Culex annulirostris*
- *Anopheles annulipes*

**Action – Introduction of Pacific Blue-Eye Fish**

**Source – Drains**

- *Aedes vittiger*

**Action – Resort drains are all covered**

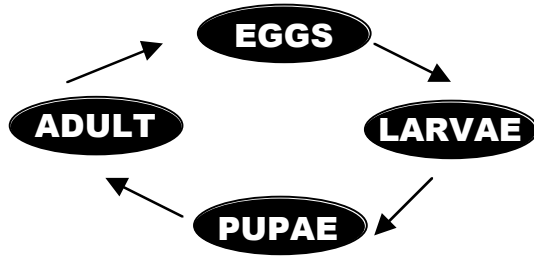


Diagram 2: Mosquito Life Cycle

**CONTROLS APPLIED DURING MOSQUITO LIFE CYCLE**

**Egg Stage (oviposition)**

- Females lay up to 300 eggs.

**Control – Avoidance, denial of breeding opportunities**

**Larval Stage**

- The larvae go through four size changes.
- The time it takes to go through these changes depends on water temperature.

**Control – Application of hormonal larvicide**

**Pupae Stage**

- Final metamorphic stage into adult form.
- This final change takes a minimum of 1 day.

**Control – bio-organic larvicide**

**Adult Stage**

- Once mated, the female will seek a host to extract a blood meal from to incubate her eggs.
- The male only feeds on flower nectar.

**Control – Light traps, natural predators (microbats)**

**MANAGEMENT AT HOME**

The ovi-position site is chosen carefully as it must contain water for the duration of the aquatic stages, but also be reasonably safe from predators. If the investigating female detects the presence of predators such as fish, at the site, she will not lay her eggs there, but seek a more suitable site. This situation can change if the female is desperate to ovi-posit and no other

suitable site can be located, she may then decide to take the risk, adding native fish to backyard ponds can act as an effective deterrent (predator). Colour may well play a role as an attractant for egg laying with container species, as black and other dark colours are certainly attractive to them. Avoid leaving potential breeding sites such as buckets and pot plant trays to fill up with water.

**CANE TOADS**

One of the island’s major pest species is the Cane Toad (*Bufo marinus*). The Cane Toad was first introduced from South America to North Queensland in 1935 as a means of controlling a grub that was eating the sugar cane. They didn’t succeed in controlling the grub, however they did succeed at becoming one of Australia’s biggest ecological disasters.



Cane toad

One of the major problems associated with the Cane Toad is that there are next to no natural predators here in Australia. Everything that attempts to eat this large amphibian is poisoned by its toxins (in their native country there are several species of reptiles that can tolerate this poison). Because of this and their breeding capabilities<sup>1</sup>, Cane Toad populations have exploded. This is having a disastrous impact on our native frogs that are being displaced and out competed by this large introduced pest.

At Couran Cove Island Resort, staff members are undertaking a continual collection process in an attempt to keep numbers of this pest to a minimum. However, it has recently been reported that crows have been eating the Cane Toad, indicating that nature is finding a way to rebalance itself.

<sup>1</sup> It has been reported that Cane Toads are capable of laying up to 40,000 eggs during one breeding season.

Botanical Illustrations by Louise Sanders®