Mosquito Management Plan





Our community's wellbeing is prioritised



PREPARATION DETAILS

Division	Environmental Health
Responsible Officer	John Darzanos Manager Environmental Health and Community Compliance
Responsible General Manager	Michelle English General Manager City Development
Review Date	July 2026

CORPORATE ALIGNMENT
The City of Salisbury has endorsed the following vision and organisational values:

VISION:
Council's vision is for Salisbury to be a progressive, sustainable and connected community.

The key themes that help us achieve the vision are:

A welcoming and liveable city

A sustainable city

A growing city that creates new opportunities

Innovation and Business Development

We will be a welcoming and liveable city, by:

- having a diversity of housing that meets the needs of our community
- supporting the physical and mental health and wellbeing of our community
- welcoming people of all ages, backgrounds and abilities, and recognising First Nations peoples
- making our city attractive and safe.

We will be a sustainable city, by:

- valuing our biodiverse green spaces and natural environments
- being carbon responsible
- ensuring our city, community and infrastructure are climate resilient
- managing our waste and water resources sustainably and responsibly.

We will be a growing city that creates new opportunities, by:

- supporting our local businesses to be successful
- planning our city's growth that is supported by infrastructure
- making our city centres active and prosperous.

We will focus on our organisation's innovation and business development, by:

- delivering effective and efficient Council services, exceptional community experiences and quality outcomes
- making our organisation a great place to work
- engaging and connecting with our community
- providing value for our community through our commercial operations.

Corporate and Legislative Alignment

The following are the Corporate Directions and Objectives associated with the Mosquito Management Plan

Key Directions and Foundations	Strategic Intent
We will be a sustainable city, by: • valuing our biodiverse green spaces and natural environments • ensuring our city, community and infrastructure are climate resilient	Our city's biodiversity is protected Our city's assets are managed and planned to be resilient to a changing climate and provide capacity for growth.
We will be a welcoming and liveable city, by: • supporting the physical and mental health and wellbeing of our community	Our community's wellbeing is prioritised. Our open spaces and recreation centres support community wellbeing. Our public spaces, residential areas and environs are safe and inviting
We will focus on our organisation's innovation and business development, by: • delivering effective and efficient Council services, exceptional community experiences and quality outcomes • making our organisation a great place to work • engaging and connecting with our community • providing value for our community through our commercial operations	Our Council collaborates with others to achieve great outcomes Our community is actively engaged in and understands Council's strategies, plans and initiatives.

The following is the legislative alignment with the SA Public Health Act 2011

Legislative Alignment	
Council's legislative responsibilities under the Public Health Act 2011 are specified in Section 37 which states the following:	**37—Functions of councils** (1) A council is the local public health authority for its area. (2) In connection with subsection (1), the following functions are conferred on a council by this Act: (a) to take action to preserve, protect and promote public health within its area; (b) to cooperate with other authorities involved in the administration of this Act; (c) to ensure that adequate sanitation measures are in place in its area; (d) insofar as is reasonably practicable, to have adequate measures in place within its area to ensure that activities do not adversely affect public health; (e) to identify risks to public health within its area; (f) as necessary, to ensure that remedial action is taken to reduce or eliminate adverse impacts or risks to public health; (g) to assess activities and development, or proposed activities or development, within its area in order to determine and respond to public health impacts (or potential public health impacts); (h) to provide, or support the provision of, educational information about public health and to provide or support activities within its area to preserve, protect or promote public health; (i) such other functions assigned to the council by this Act.

Mosquito Management Plan

The City of Salisbury recognises that undertaking a mosquito control program including the surveillance and control of mosquitoes, is a key strategy to manage and minimise the public health impacts and nuisances associated with mosquitoes.

Mosquito control has been traditionally focussed on the coastal environments of St Kilda and Globe Derby Park. These environments are adjacent to an extensive region of both mangrove and samphire environments. This area provides an important environmental habitat, however also provides for significant mosquito breeding activity. The habitats for mosquitoes include samphire and intertidal zones which provide pools of water suited to mosquito breeding. In addition, Globe Derby Park is a low-lying area and environmental factors provide ideal breeding grounds mosquitoes

The Globe Derby suburb has a community of approximately 150 households and a significant horse racing and training industry that is in close proximity to the coastal mosquito breeding habitats. Mosquito breeding within the residential area can contribute to the total number of mosquitoes in the area, providing breeding habitats for numerous nuisance species in locations such as water tanks, containers, tyres, septic tank and effluent disposal systems.

St Kilda has a small population however boasts a large influx of visitors for activities such as fishing, use of the boat ramp, RV friendly zone, bird watchers and the St Kilda Adventure Play-space. The large population increase over the warmer months during peak mosquito activity is why mosquito control is important to this region.

Aedes camptorhynchus and *Aedes vigilax* are the predominate species affecting the area. Both species are known for their biting activity and are most likely responsible for the majority of nuisance biting in the area.

The *Aedes camptorhynchus* species are abundant throughout spring and early summer with a peak in November to December. The high peak numbers are associated with lower temperatures, higher rainfall and increasing day length. These salt march mosquitoes breed in both freshwater and brackish habitats.

The *Aedes vigilax* species are abundant in summer and autumn between January and April, with the peak abundance in February and March. These peak numbers are associated with higher temperatures and decreasing day length. The effect of the king tidal water pools provides the majority of breading habitat that allows the adult mosquitoes to quickly emerge before the next tidal inundation.

The mangrove and samphire swamp areas to the west of Globe Derby is Crown Land and this area provides for a significant mosquito breeding habitat. SA Health manages the mosquito monitoring and treatment in this large area with a dedicated annual program consisting of aerial application of larvicides.

The City of Salisbury's mosquito control program on land under its care and control has expanded to other adjoining suburbs in recent years. The expansion was required due to identified activity and breeding in other localities including water catchments and storm water drains. The other main areas are found in areas of Mawson Lakes, Cavan, Dry Creek, Greenfields, Parafield Gardens, Pooraka, and Burton.

To assist in directing mosquito control activities adult trapping was undertaken across multiple sites of the city. The results showed that there are fifteen (15) mosquito species present in Salisbury. The saltwater and brackish water breeders found in the saltmarshes adjacent to residential areas were found to be dispersing to inner suburbs making these species a major

nuisance and potential disease vector across the City of Salisbury, including suburbs away from the coastal areas.

The additional species that are contributing to the nuisance impacts on the local community and for the potential for disease risk within the City of Salisbury include:

- *Aedes notoscriptus*
- *Annopheles annulipes*
- *Culex annulirostris*
- *Culex globocoxitus*
- *Culex quinquefasciatus*

The presence and dispersal of *Culex annulirostris* across the city meant that a major disease vector associated with freshwater habitats and arboviruses along the Riverland regions was present in the metropolitan Adelaide area. The presence of this species, as well as the coastal species means that the risk for a disease outbreak in the metropolitan area was increasing due to the changing climate, increased rain events, and potential for disease hosts to migrate to the area.

The presence of freshwater vectors meant that the mosquito control program must include a wider area of freshwater habitats as well as adequate control measures in the saltmarsh, mangrove and samphire environment's adjacent to Globe Derby Park and St Kilda. The additional areas along with the traditional high-risk areas are monitored and treated for mosquito breeding activity with an ongoing control program undertaken by a contractor as per the Councils Mosquito Control Services tender.

The City of Salisbury is committed to undertaking mosquito surveillance and control in the area in partnership with the SA Health and local residents.

The Mosquito Management Plan has been developed to provide a strategic approach to mosquito management that provides a responsible balance between community concerns and the environment and aims to improve public health and sustain quality of life.

The City of Salisbury's Mosquito Control Program has the following objectives:

1. To identify and monitor mosquito breeding habitats within the City of Salisbury's high mosquito risk areas**.**
2. To treat and or eliminate mosquito breeding habitats to minimise and control the impact on public health from mosquitoes, whilst minimising the impact on the environment.
3. To monitor mosquito numbers and identify species of mosquitoes within the area, so as to enable effective control measures to be implemented and evaluated
4. To monitor and evaluate environmental conditions affecting mosquito breeding and adult mosquito numbers
5. To educate and inform the community on effective mosquito control and protection practices.
6. To regularly liaise with other agencies so as to provide an effective regional approach to mosquito control within the adjoining areas.
7. To review and evaluate current and alternative mosquito control measures
8. To investigate and respond to community concerns relating to mosquitoes

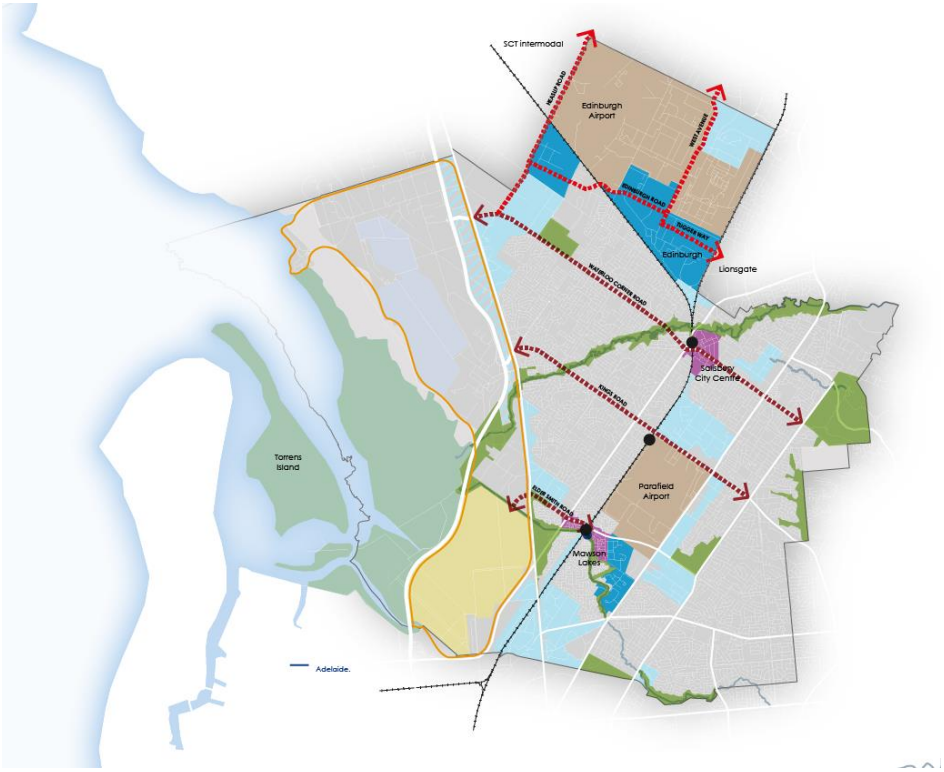
The plan is to be read in conjunction with the Mosquito Control Service specification.

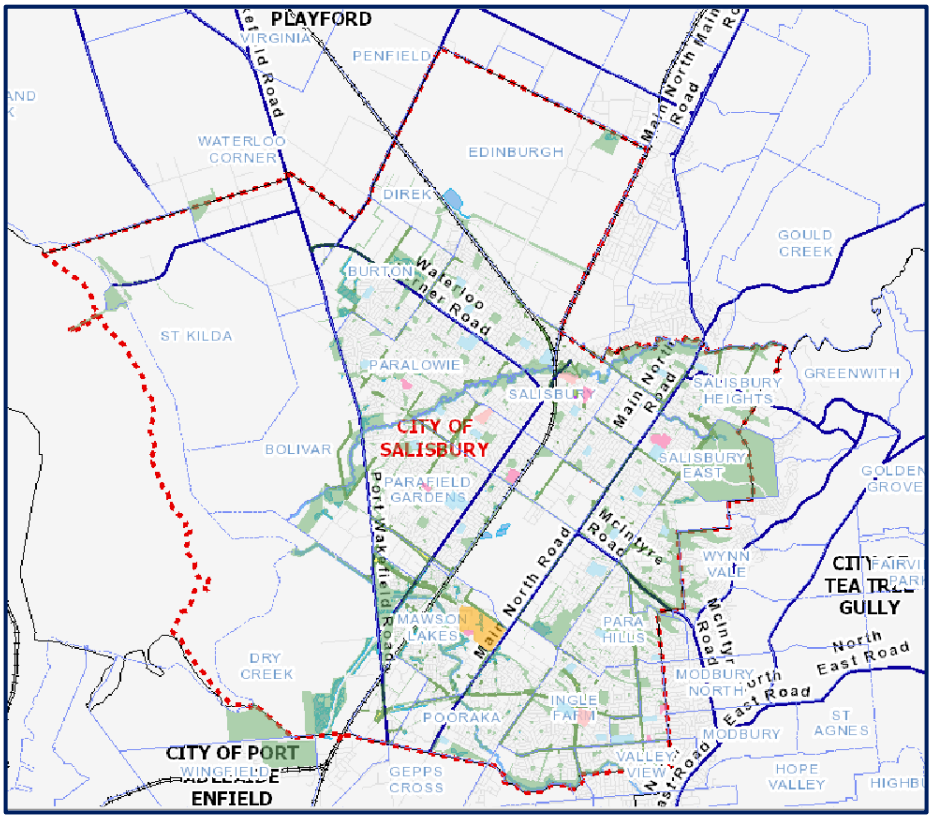
WORK PLAN

CITY PLAN ALLIGNMENT	OBJECTIVES	ACTIONS	WHEN	WHO
Our community's wellbeing is prioritised. Our open spaces and recreation centres support community wellbeing. Our public spaces, residential areas and environs are safe and inviting Our city's biodiversity is protected Our city's assets are managed and planned to be resilient to a changing climate and provide capacity for growth.	**1. Identify and Monitor Mosquito Breeding Habitats** To identify and monitor mosquito breeding habitats within the City of Salisbury's high mosquito risk areas.	1.1 Undertake fortnightly surveillance of high risk areas 1.2 Document identified breeding sites and record electronically with GPS coordinates. 1.3 Record mosquito activity and larval density.	Annually Sept to April	Mosquito Control Contractor as per Tender Documentation
As above	**2. Treat and or Eliminate Mosquito Breeding Habitats** To treat and or eliminate mosquito breeding habitats so as to minimise and control the impact on public health from mosquitoes, whilst minimising the impact on the environment..	2.1 Treat breeding sites with approved larvicides 2.2 Establish permanent larvicide stations and document and record electronically with GPS coordinates. 2.3 Review breeding site and cause of water pooling with a view of eliminating breeding site, or reducing breeding by site modification.	Annually Sept to April	Mosquito Control Contractor as per Tender Documentation Environmental Health Services
As above And Our Council collaborates with others to achieve great outcomes	**3. Monitor Mosquito Numbers and Identify Species** To monitor mosquito numbers and identify species of mosquitoes within the area, so as to enable effective control measures to be implemented and evaluated	3.1 Undertake adult trapping in high risk areas. 3.2 Document and record trapping locations 3.3 Document and record adult mosquito numbers and species as required.	Annually Sept to April	Mosquito Control Contractor as per Tender Documentation Environmental Health Services SA Health
As above	**4. Monitor and evaluate environmental conditions** To monitor and evaluate environmental conditions affecting mosquito breeding and adult mosquito numbers.	4.1 Monitor, record and evaluate environmental conditions, and their impact on mosquito breeding and nuisance	Annually Sept to April	Mosquito Control Contractor as per Tender Documentation Environmental Health Services SA Health
Our Council collaborates with others to achieve great outcomes Our community is actively engaged in and understands	**5. Educate and Inform the Community** To educate and inform the community on effective mosquito control and protection practices.	5.1 Develop and promote local targeted education campaigns for high risk areas 5.2 Promote the SA Health Mosquito Control campaigns, e.g. Fight the Bite campaign	September / October and January / February for high risk areas	Environmental Health Services SA Health

CITY PLAN ALLIGNMENT	OBJECTIVES	ACTIONS	WHEN	WHO
Council's strategies, plans and initiatives.		*Campaigns can be a combination of direct mailouts, online information and social media campaigns.	Annually	
Our Council collaborates with others to achieve great outcomes	**6. Liaise with Other Agencies** To regularly liaise with other agencies so as to provide an effective regional approach to mosquito control within the adjoining areas.	6.1 Provide relevant mosquito trapping and surveillance data to SA Health 6.2 Participate in mosquito control meeting involving SA Health and adjoining Councils as required 6.3 Liaise with adjoining Councils to share information and encourage a regional approach to mosquito control 6.4 Advocate mosquito control concerns and options to State Government and relevant agencies.	Ongoing Annually	Environmental Health Services SA Health Mosquito Control Contractor as per Tender Documentation
Our Council collaborates with others to achieve great outcomes Our community is actively engaged in and understands Council's strategies, plans and initiatives.	**7. Evaluate Mosquito Control Measures** To review and evaluate current and alternative mosquito control measures	7.1 Review and evaluate effectiveness of current control measures by monitoring treated areas and breeding site modifications	September and January for high risk areas As identified	Mosquito Control Contractor as per Tender Documentation Environmental Health Services SA Health
Our Council collaborates with others to achieve great outcomes Our community is actively engaged in and understands Council's strategies, plans and initiatives.	**8. Investigate Concerns Relating to Mosquitoes** To investigate and respond to community concerns relating to mosquitoes	8.1 Investigate and respond to community concerns relating to mosquitoes, through either: • Trapping and identifying adult mosquitoes • Investigating potential breeding sites • Undertake relevant treatment of site if required • Eliminating breeding sites • Educating and informing community on mosquito control and bite prevention	As required	Environmental Health Services Mosquito Control Contractor as per Tender Documentation

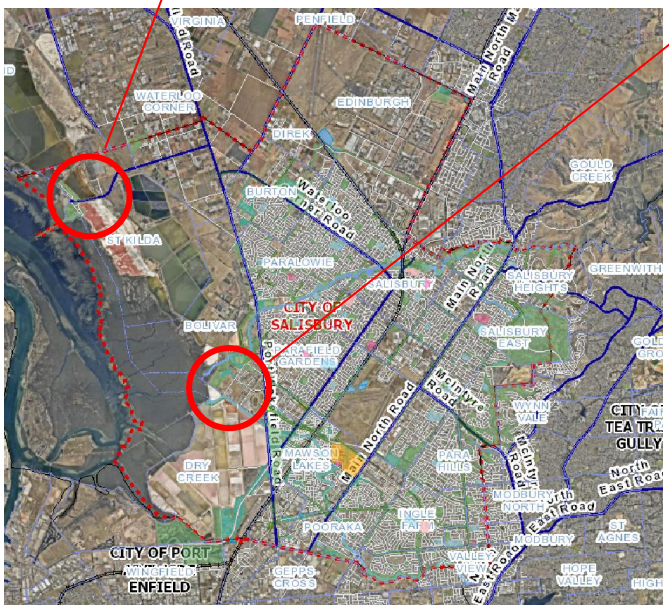
City of Salisbury Overview





High Risk Mosquito Areas - St Kilda and Globe Derby Park





Other localities subject to routine surveillance and treatment



Other localities subject to routine surveillance and treatment

Regular Mosquito Control
The mosquito control program will primarily involve regular mosquito control in public sites identified in attachments located in high mosquito risk areas, including:

- Globe Derby Park and
- St Kilda township and surrounding environments as identified,
- Greenfields,
- Parafield Gardens, and
- Mawson Lakes

Adhoc Surveillance
Adhoc surveillance and treatment can also be requested and implemented at potential breeding sites located in the following suburbs or in areas as identified and directed by the City of Salisbury representatives:

- Bolivar,
- Mawson Lakes,
- Cavan,
- Dry Creek,
- Pooraka

After Rain Events
Treatment of some sites will be subject to rain events and inundation of rain and storm water. For these locations a service "after rain events" would be recommended 5-7 days after rain event has finished to allow for rainwater to subside and opportunity to observe and identify any active mosquito breeding, with appropriate treatment undertaken.

Adjacent Crown Lands
Occasional monitoring on adjacent crown lands in proximity of Globe Derby Park, Bolivar, and St Kilda sites may also be required.

The services are provided *between 1 September and 30 April each financial year*. The control program includes:

- Surveillance and documenting of breeding sites;
- Monitoring of mosquito larvae presence in breeding sites and recording observations;
- Installing, checking and restocking of fixed larval bait stations;
- Reporting of any lost or damaged bait stations and reinstatement;
- Spot treatment of larvae breeding sites with alternate larvicides;

Additional services to facilitate treatment and support in cases of emergency;

Common Mosquitoes in Salisbury



The City of Salisbury is affected by 3 common genus of mosquitoes and each of which contains 100's of different species. These are the Aedes, the Culex and the Annopheles genus. Some of the common mosquitoes creating the most concern for our residents include the following.

Genus - Aedes

Species - Aedes Vigilax

<table>
<tr>
<td>Adult – rests parallel to surface

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<td>Adult – distinct light and straight bands
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<td>Larvae – short siphon, rests at a 45-60 degree angle
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<td>Eggs – laid singularly in water or mud flats
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A mid-sized mosquito of dark appearance with banded legs; proboscis with pale scaling on the abdomen.

Commonly found along the coastal areas and breed in saline habitats on mudflats usually behind mangroves.

Active between January to April and a very aggressive biter of humans and animals. Often described as a small dark mosquito

Common Mosquitoes in Salisbury

Species - Aedes Camptorhynchus

Adult – rests parallel to surface  	Adult – distinct light V shaped bands 
Larvae – short siphon, rests at a 45-60 degree angle 	Eggs – laid singularly in water or mud flats 

A medium sized mosquito of darkish appearance but with banded legs; proboscis extensively mottled, particularly on underside The adults have distinctive pale bands on the legs and triangular patterns on the dorsal surface of the abdomen.

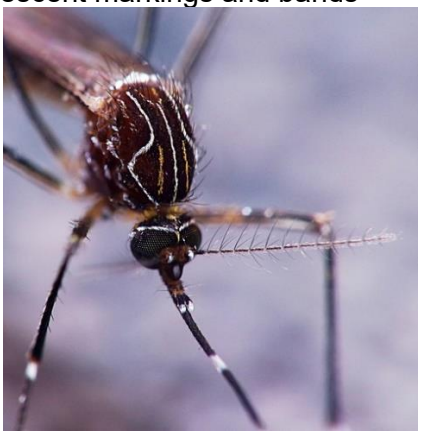
Commonly found along the coastal areas and breed in coastal environments and brackish water and occurs in inland riverine areas with brackish influence.

Active between September to December and a very aggressive biter of humans and animals.

Often described as a large mosquito

Common Mosquitoes in Salisbury

Species Aedes Notoscriptus

Adult – rests parallel to surface 	Adult – distinct lyre pattern and fluorescent markings and bands 
Larvae – short siphon, rests at a 45-60 degree angle 	Eggs – laid singularly in water or mud flats 

A smallish to mid-sized dark species with conspicuous pale markings and banded legs; proboscis with median white band; and a conspicuous 'lyre' shaped pattern on the thorax.

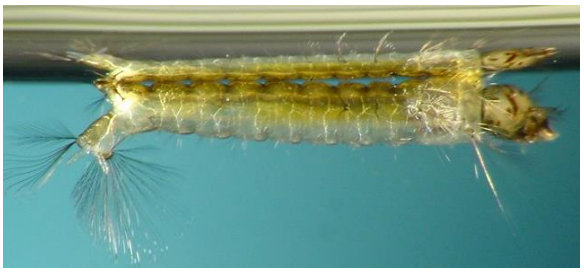
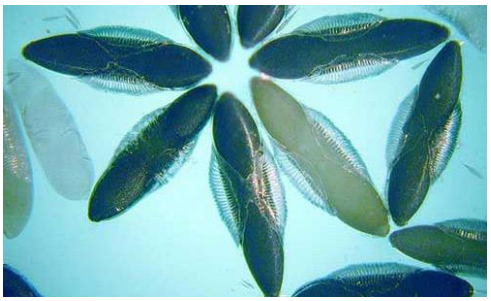
Adults readily attack humans by day in shaded areas but also feed during evening, night and early morning.

Common throughout spring and summer and a major domestic pest found in most gardens and breeds in fresh water and most likely the mosquito that most likely to get you during your evening BBQ.

Common Mosquitoes in Salisbury

Genus - Anopheles

Species Anopheles annulipes

Adult – distinct mottled and speckly appearance 	Adult – rests at a 45 degree angle with head down 
Larvae – short siphon, rests parallel to water surface 	Eggs – laid singularly in water and have floats on sides 

A medium sized mosquito of dark and speckly grey appearance; proboscis and mottled wing appearance.

Feed from humans and other animals, and bite predominantly at night.

The species is rarely a pest even when relatively abundant as it does not preferentially attack humans.

Breeds in freshwater and commonly found in freshwater catchments with grassy environments.

Common Mosquitoes in Salisbury

Genus Culex

Adults of the Culex species are hard to differentiate and have lighter appearance and colour being described and brownish appearance. They are nuisance biters of animals, birds and humans.

Species Culex australicus

Adult – light brown in colour  	Adult – rests parallel to surface 
Larvae – long siphon, rests at a 45-60 degree angle 	Eggs – laid together as a raft and 

A medium sized mosquito of brownish appearance; proboscis dark scaled above with pale scaling underneath.

Adults are active from spring through autumn in many areas and throughout the year in some warmer zones; the species normally does not attack humans and appears to feed predominantly on rabbits and birds.

Breed in fresh and nutrient rich water including septic tanks, rain water tanks, pot plant dishes, drains and anything that can hold water.

Common Mosquitoes in Salisbury

Species Culex quinquefasciatus

Adult - light brown in colour,  	Adult - rests parallel to surface, distinct light bands 
Larvae – long siphon, rests on 45-60 degree angle 	Eggs – laid together as a raft and 

Medium-sized mosquito of brownish appearance; proboscis dark but often with some pale scaling midway on the underside; wings all dark scaled; hind legs with femur pale almost to the tip

Adults are generally active only during the warmer months; they usually attack humans towards the middle of the night indoors and outdoors, but are often more attracted to birds (e.g. poultry).

Commonly the mosquito that you hear in the middle of the night while you're trying to sleep.

Breed in fresh and nutrient rich water including septic tanks, rain water tanks, pot plant dishes, drains and anything that can hold water.

Common Mosquitoes in Salisbury

Species Culex annulirostris

Adult - moderate-sized brown to dark brown mosquito 	Adult - single pale prominent broad band on the middle third of its proboscis, and similar bands on its legs. 
Larvae – long siphon, rests on 45-60 degree angle 	Eggs – laid together as a raft and 

Culex annulirostris, commonly known as the common banded mosquito and is native to Australia, and regarded as a serious pest species.
The female is a moderate-sized brown to dark brown mosquito, with a single pale prominent broad band on the middle third of its proboscis, and similar bands on its legs.

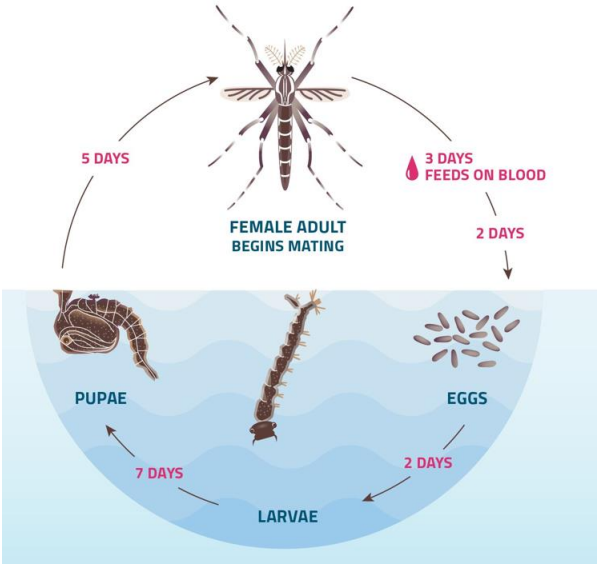
Breeding takes place anywhere there is standing water, from swamps and ponds to all kinds of man-made puddles—irrigation channels, tree stumps and the water can be clean or polluted, in sun or shade, and fresh or brackish.

Culex annulirostris mosquitoes are active between spring and late autumn. During this time, they appear most commonly at dusk, though they can also be active during the day and indoors. They can travel 5–10 km from their place of birth and feed on mammals and birds.

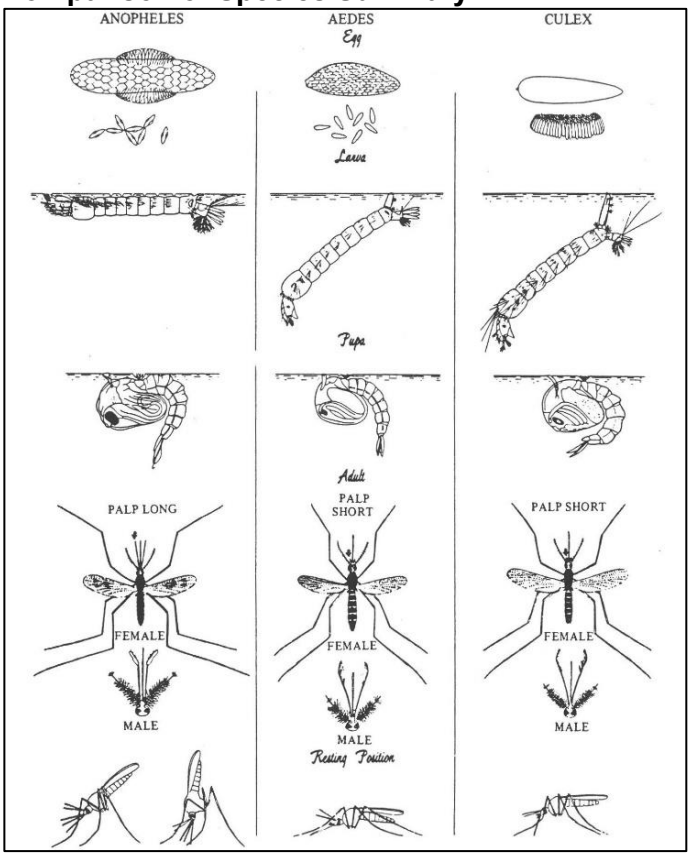
It is an important vector for a number of arboviruses, including Murray Valley encephalitis virus, Ross River virus, Barmah Forest virus, Kunjin virus and Japanese encephalitis, as well as dog heartworm and the roundworm.

Mosquito Lifecycle
Lifecycle stages are average days. These vary depending on species, weather and temperatures. Only the female bites requiring blood meal to produce eggs

Mosquito Larvae in water - https://www.youtube.com/watch?v=j_51M8ewQWM
Mosquito life cycle - https://www.youtube.com/watch?v=wFfO7f8Vr9c



Comparison of Species Summary



Resource materials
https://medent.usyd.edu.au/arbovirus/index.html *(site no longer active)*

https://www.inaturalist.org/