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| Mosquito and mosquito-borne disease weekly report 2022/2023 |
| Report number: 23  Reporting week: 02/04/23 - 08/04/23  Report issued date: 12/04/23 |
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Contents

[Summary 2](#_Toc132199188)

[Human mosquito-borne diseases notifications 2](#_Toc132199189)

[Notifications 2](#_Toc132199190)

[Murray Valley encephalitis virus 3](#_Toc132199191)

[Japanese encephalitis virus 4](#_Toc132199192)

[Ross River virus 4](#_Toc132199193)

[Mosquito surveillance 6](#_Toc132199194)

[Mosquito abundance 6](#_Toc132199195)

[Mosquito species of concern 9](#_Toc132199196)

[Mosquito viral detections 12](#_Toc132199197)

# Summary

This report contains a range of indicators relating to mosquito-borne diseases actively monitored by the Department of Health (the department). The department conducts mosquito surveillance throughout the Victorian mosquito breeding season, which in inland areas typically occurs from early November through to late April the following year, with coastal areas typically starting earlier and ending later. For reporting purposes, the 2022/2023 season is defined as commencing from 1 July 2022.

The indicators used in this report are sourced from the following surveillance systems:

* Human surveillance (notified confirmed and probable cases and/or modelled predictions of vector-borne disease)
* Mosquito surveillance (adult mosquitoes)

The report will be issued weekly. Some indicators may not be updated for every report. The report contains information collected in the week prior. There is a time delay from mosquito field collection to reporting. This is due to the cumulative time between trap collection, specimen transit time to Melbourne, and from individual mosquito species identification to polymerase chain reaction (PCR) testing within the laboratory.

# Human mosquito-borne diseases notifications

In 2022/2023 there are five mosquito-borne viruses which have been identified to pose public health risk in Victoria with the potential for local transmission. These are Japanese encephalitis virus (JEV), Murray Valley Encephalitis virus (MVEV), Ross River virus (RRV) and Barmah Forest virus (BFV), West Nile virus Kunjin strain (WNV/kun) (otherwise known as Kunjin virus). Cases of infection with these viruses are notified to the department by pathology services and in some cases medical practitioners under the Victorian Public Health and Wellbeing Regulations 2019. The laboratory diagnosis of mosquito-borne diseases is complex, and often requires follow up testing at several weeks interval before the confirmed or probable case definition is met.

RRV and BFV are endemic to parts of Victoria, and cases of infection with these viruses are expected every summer. The department closely monitors case numbers and geographical distribution to identify areas of increased risk.

## Notifications

| Human mosquito-borne disease notifications from the previous week | | | |
| --- | --- | --- | --- |
| **CONDITION** | **Confirmed** | **Probable** | **YTD** |
| Japanese encephalitis virus infection | 0 | 0 | 1 |
| Kunjin virus infection | 0 | 0 | 0 |
| Murray Valley encephalitis virus infection | 0 | 0 | 5 |
| Ross River virus infection | 0 | 0 | 177 |
| Barmah Forest virus infection | 0 | 0 | 5 |

**Note:** a YTD: Year to date total cases (confirmed/probable) reported since 1/7/2022. Cases notified to the department in previous reporting weeks but only confirmed in the latest reporting week are counted in ‘YTD’ but not the ‘Confirmed’ column.

## Murray Valley encephalitis virus

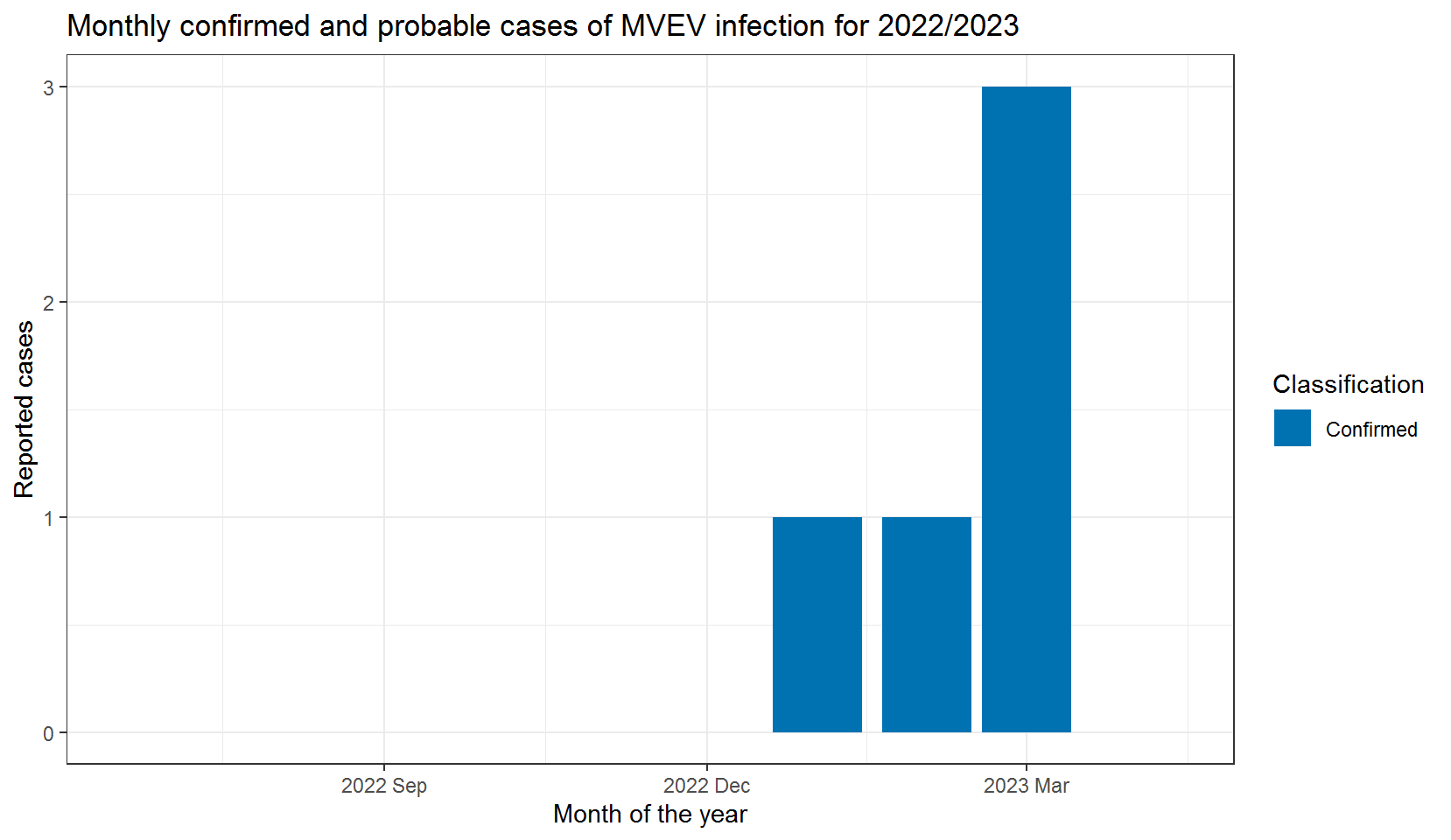
A fifth case of MVEV infection for this mosquito breeding season was confirmed in the last week. The case was a man in his 60s with encephalitis. The case was likely exposed to infected mosquitoes in Northern Victoria in February. 

Figure . Murray Valley encephalitis cases by month of notification.

## Japanese encephalitis virus

There were no cases of JEV infection reported last week.

### JEV infection epidemic curve

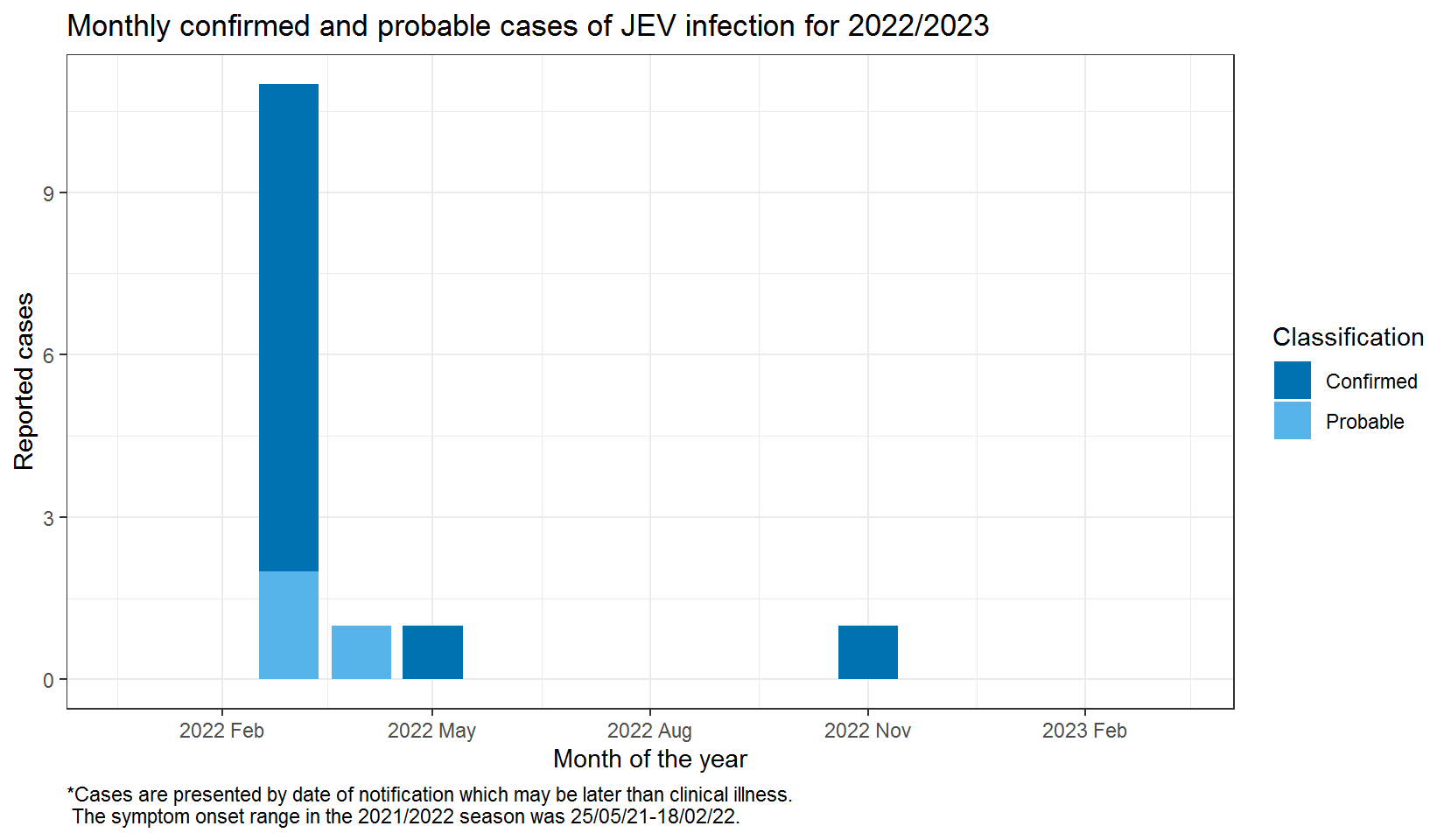


Figure 2: Japanese encephalitis cases by month of notification.

## Ross River virus

There were no cases of RRV infection reported last week.

### .

### RRV infection epidemic curve

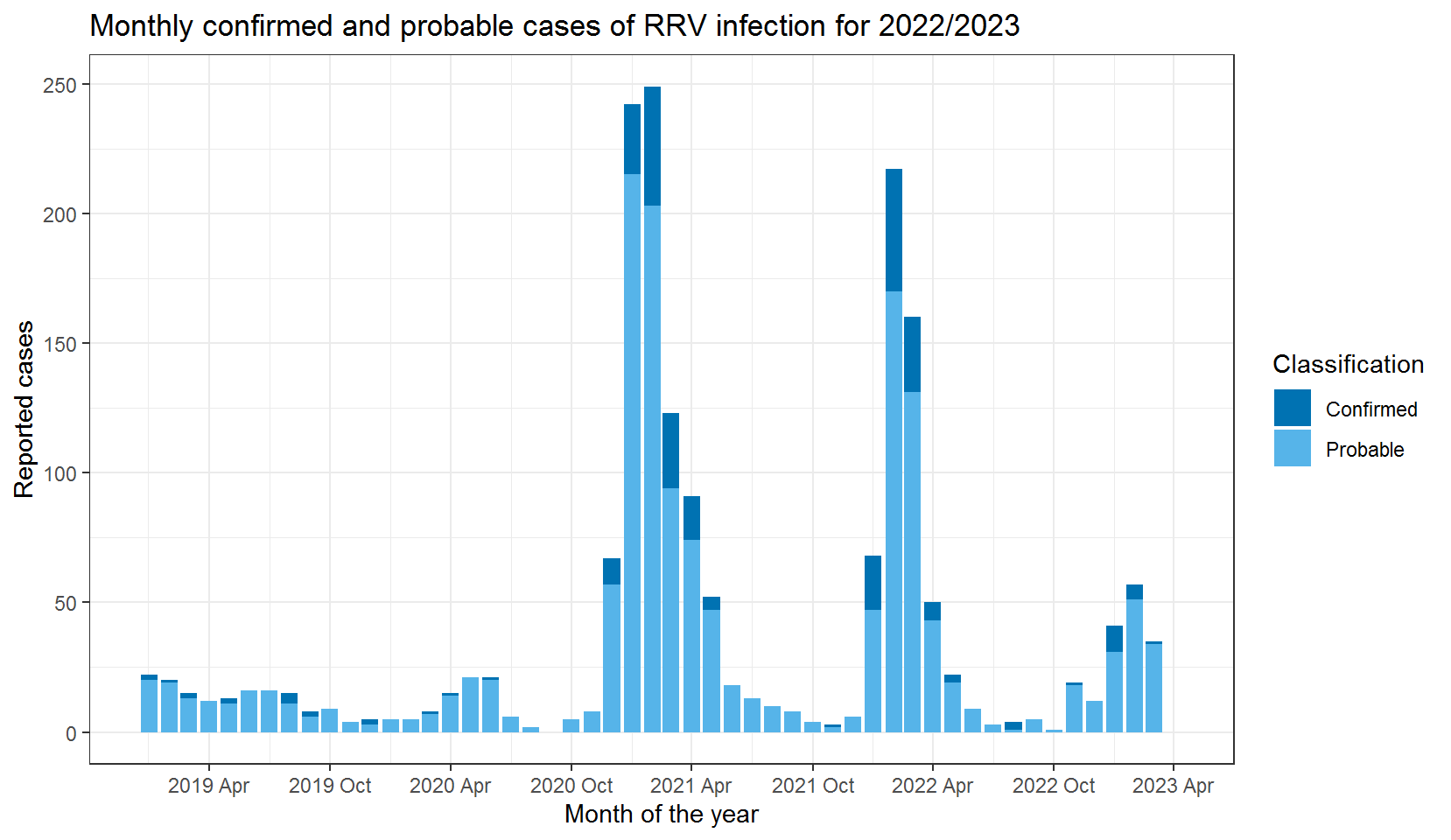


Figure 3: Ross River virus epidemic curve

# Mosquito surveillance

Approximately 15 councils in **high-risk** areas for mosquito-borne diseases currently participate in the state-wide mosquito surveillance program. Mosquitoes trapped as part of this program are submitted to the Agriculture Victoria Research laboratory at the Department of Energy, Environment and Climate Action (DEECA) for mosquito species identification, counting and viral testing. These data are reported to the department for monitoring and analysis.

## Mosquito abundance

This section details the abundance of mosquitoes in Victoria by LGA. The count average for all trapping sites within the previous week is reported by LGA.

Table : Average number of mosquitoes per trap site per week by LGA, 2022-2023

| Average number of mosquitoes per trap site per week by LGA, 2022-2023 | | | | | | | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **LGA by week** | | **2022** | | **2023** | | | | | | | | | | | | | |
| **w51** | **w52** | **w1** | **w2** | **w3** | **w4** | **w5** | **w6** | **w7** | **w8** | **w9** | **w10** | **w11** | **w12** | **w13** | **w14** |
| **Greater Shepparton** | | **170** | **57** | **93** | **231** | **663** | **135** | **78** | **104** | **31** | **82** | **35** | **36** | **75** | **27** | **27** | **19** |
| **Horsham** | | **294** | **254** | **69** | **176** | **203** | **54** | **82** | **72** | **61** | **24** | **10** | **3** | **48** | **18** | **4** | **3** |
| **Moira** | | **113** | **77** | **43** | **70** | **42** | **14** | **19** | **6** | **10** | **7** | **2** | **10** | **32** | **1** | **0** | **5** |
| **Mildura** | | **4,833** | **1,000** | **1,306** | **1,663** | **874** | **136** | **133** | **139** | **61** | **173** | **75** | **55** | **34** | **47** | **9** | **4** |
| **Greater Bendigo** | | **1,519** |  | **44** | **126** | **229** | **71** | **41** | **66** |  | **59** | **10** | **11** | **23** | **23** | **16** |  |
| **Greater Geelong** | | **425** |  | **56** | **40** | **52** | **61** | **36** | **15** | **56** | **104** | **141** |  | **28** | **60** | **23** | **28** |
| **Campaspe** | | **1,214** |  | **20** | **181** | **660** | **278** | **86** | **128** | **47** | **92** | **71** | **35** | **75** | **54** | **15** | **9** |
| **Wodonga** | | **658** | **171** | **95** | **108** | **72** | **43** | **174** | **95** | **100** | **144** | **16** | **25** | **45** | **32** | **5** |  |
| **East Gippsland** | | **80** | **60** | **40** | **20** | **2** | **6** | **4** | **10** | **3** | **13** | **30** | **9** | **4** | **8** | **75** | **20** |
| **Frankston** | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Swan Hill** | | **1,958** | **400** | **176** | **175** | **134** | **41** | **28** | **25** | **2** | **9** | **5** | **8** | **31** | **8** | **9** | **14** |
| **Gannawarra** | | **659** | **8** | **9** | **447** | **49** | **42** | **146** | **62** | **24** | **17** | **14** | **18** | **21** | **14** | **5** | **17** |
| **Wellington** | | **207** | **1,355** | **2,235** | **1,438** | **196** | **159** | **38** | **24** |  | **52** | **127** | **78** | **68** | **102** | **63** |  |
| **Loddon** | | **1,681** |  | **156** | **368** | **631** | **300** | **126** | **76** | **23** | **33** | **20** | **18** | **36** | **30** | **5** |  |
| **Surf Coast** | | **129** |  |  | **62** |  | **23** |  | **20** |  |  | **21** |  | **13** |  | **38** |  |
| **Yarra City** | |  |  |  |  |  |  |  | **50** |  |  |  |  |  |  |  |  |
| **Wangaratta** | | **100** | **60** | **32** | **69** | **59** | **70** | **28** | **33** | **32** | **20** | **7** | **13** | **5** | **5** | **9** | **56** |
| **Indigo** | | **561** |  | **170** | **669** | **895** | **270** | **139** | **113** | **64** | **58** | **15** | **7** | **17** | **13** | **14** | **14** |
| **Buloke** | |  |  |  |  |  |  |  | **10** | **7** | **22** |  |  | **17** | **6** | **0** |  |
| **Northern Grampians** | |  |  |  |  |  |  |  | **0** | **0** | **2** |  |  | **20** | **1** | **3** |  |
| **Casey** | |  |  |  |  |  |  |  |  |  | **5** |  |  |  |  |  |  |
| **Mitchell** | |  |  |  |  |  |  |  |  |  | **4** |  |  | **10** |  | **2** |  |
| **Macedon Ranges** | |  |  |  |  |  |  |  |  |  |  |  |  | **28** | **5** | **3** | **10** |
|  |  |  | | |  | | |  | | | | |  | | | | |
| Key | Low (<50) | Moderate (50-99) | | | High (100-999) | | | Very high (1,000-9,999) | | | | | Extreme (10,000+) | | | | |

## Mosquito species of concern

In inland areas *Culex annulirostris* is considered the major species of concern for transmission of RRV, BFV, WNV/Kunjin, and MVEV. It is also believed to be a major vector for JEV.

*Aedes camptorhynchus* is the major vector of RRV and BFV in coastal saltwater habitats.

A sample of trapped mosquitoes are examined to estimate the proportion of different species. The availability and accuracy of this representative sample is influenced by the number of mosquitoes captured, the condition of the mosquitoes at time of examination, and other factors.

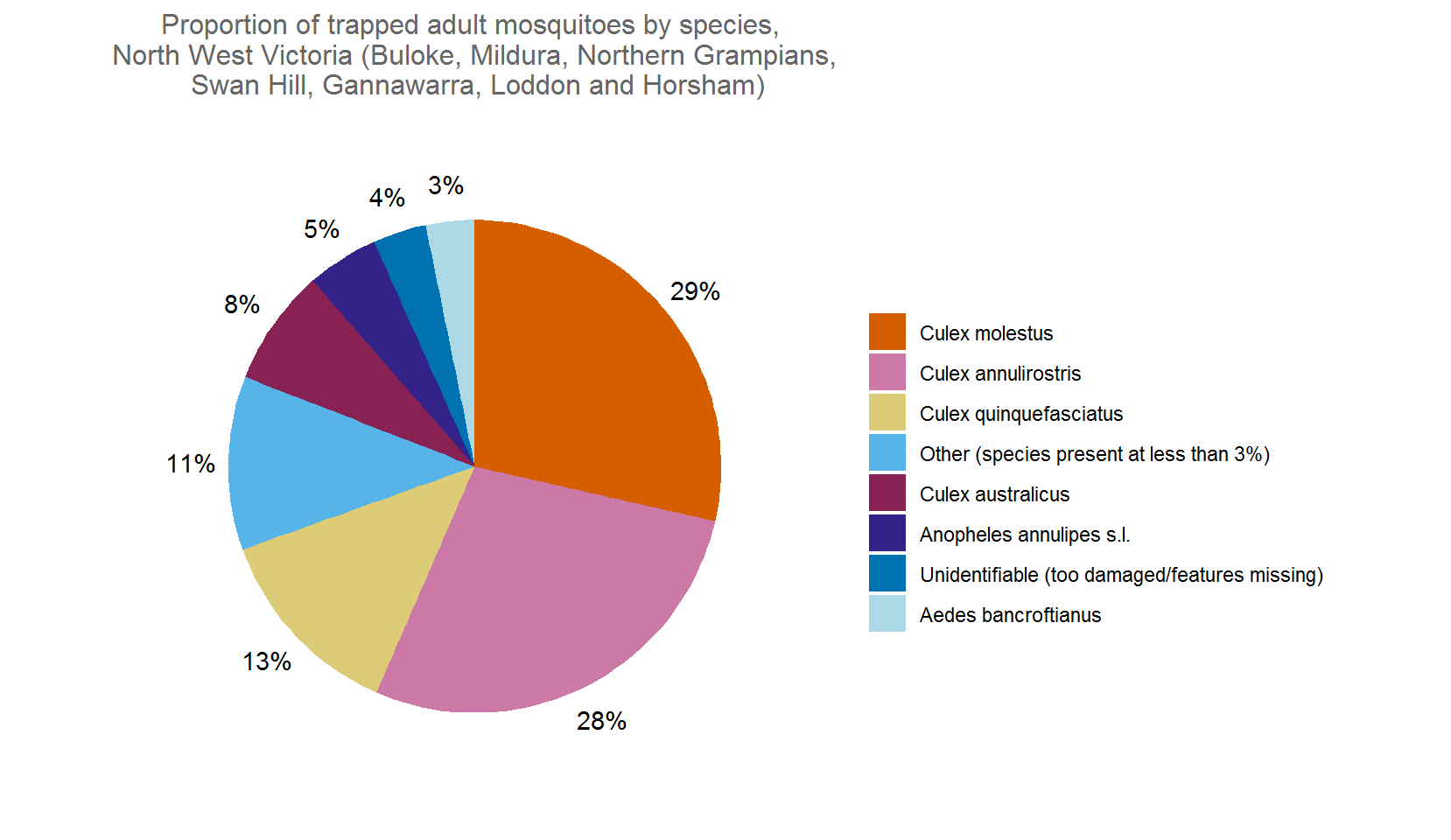


Figure 4: North West Victoria - proportion of trapped adult mosquitoes by species

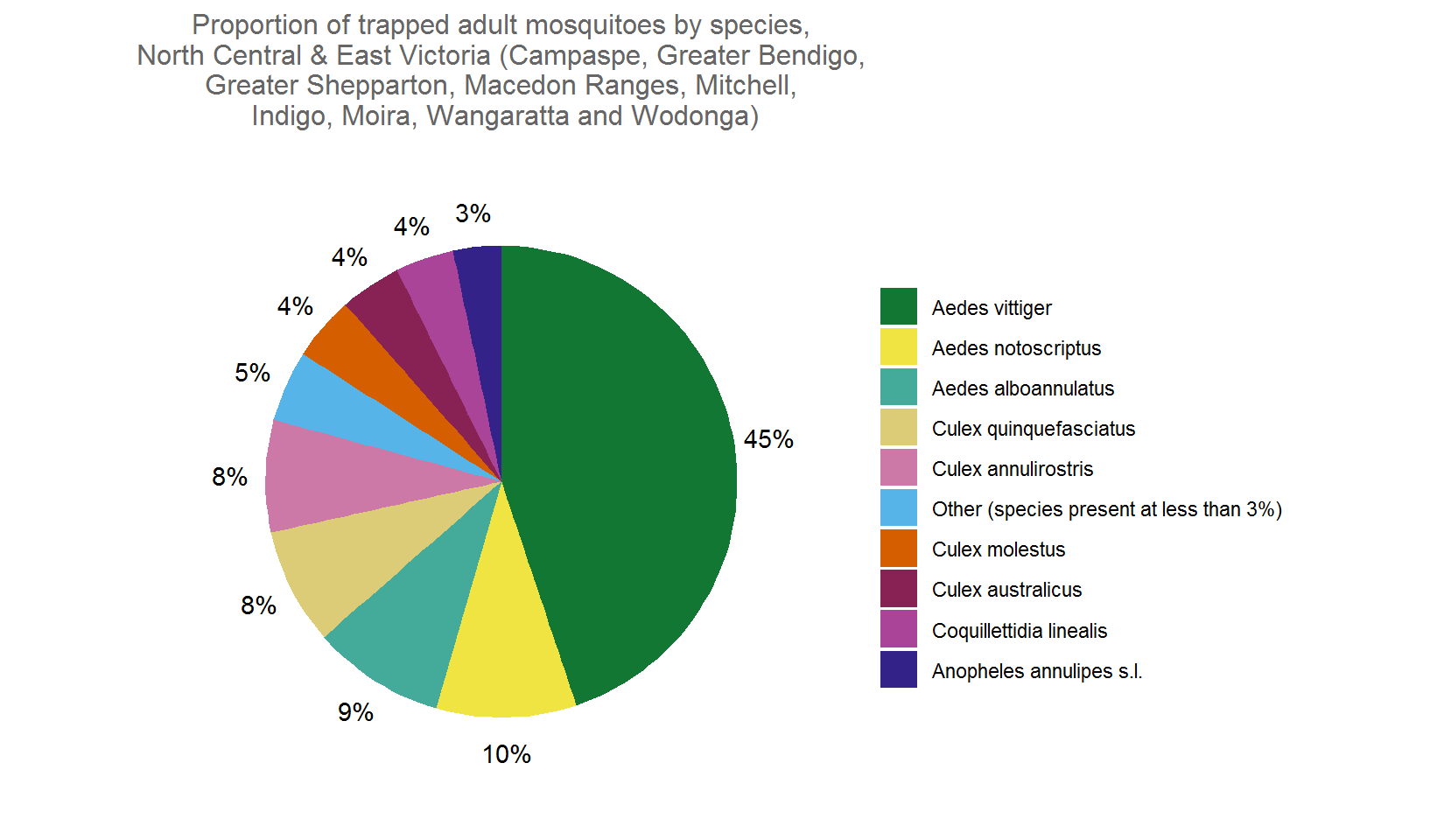


Figure 5: North Central & East Victoria - proportion of trapped adult mosquitoes by species

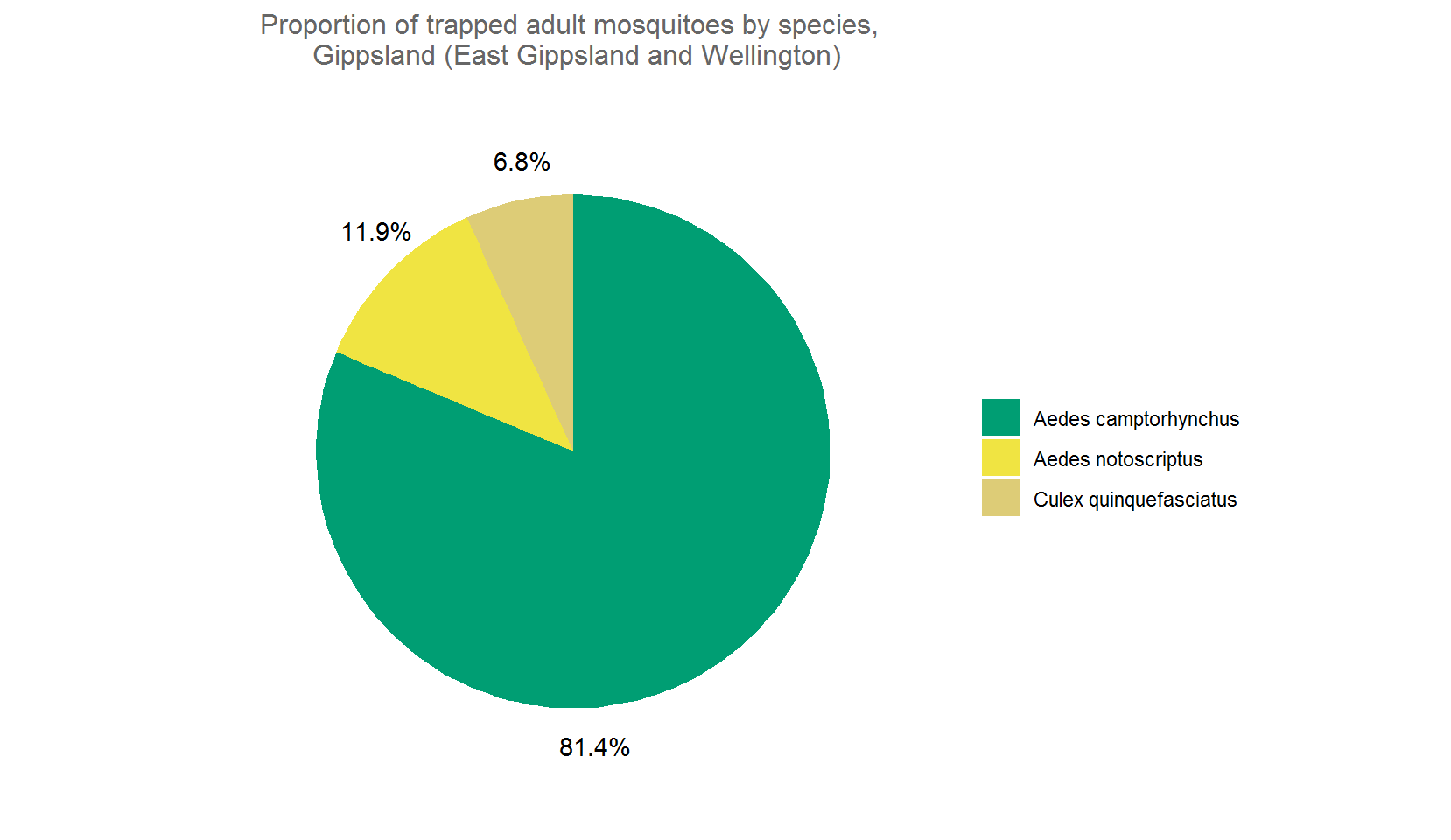


Figure 6: Gippsland - proportion of trapped adult mosquitoes by species

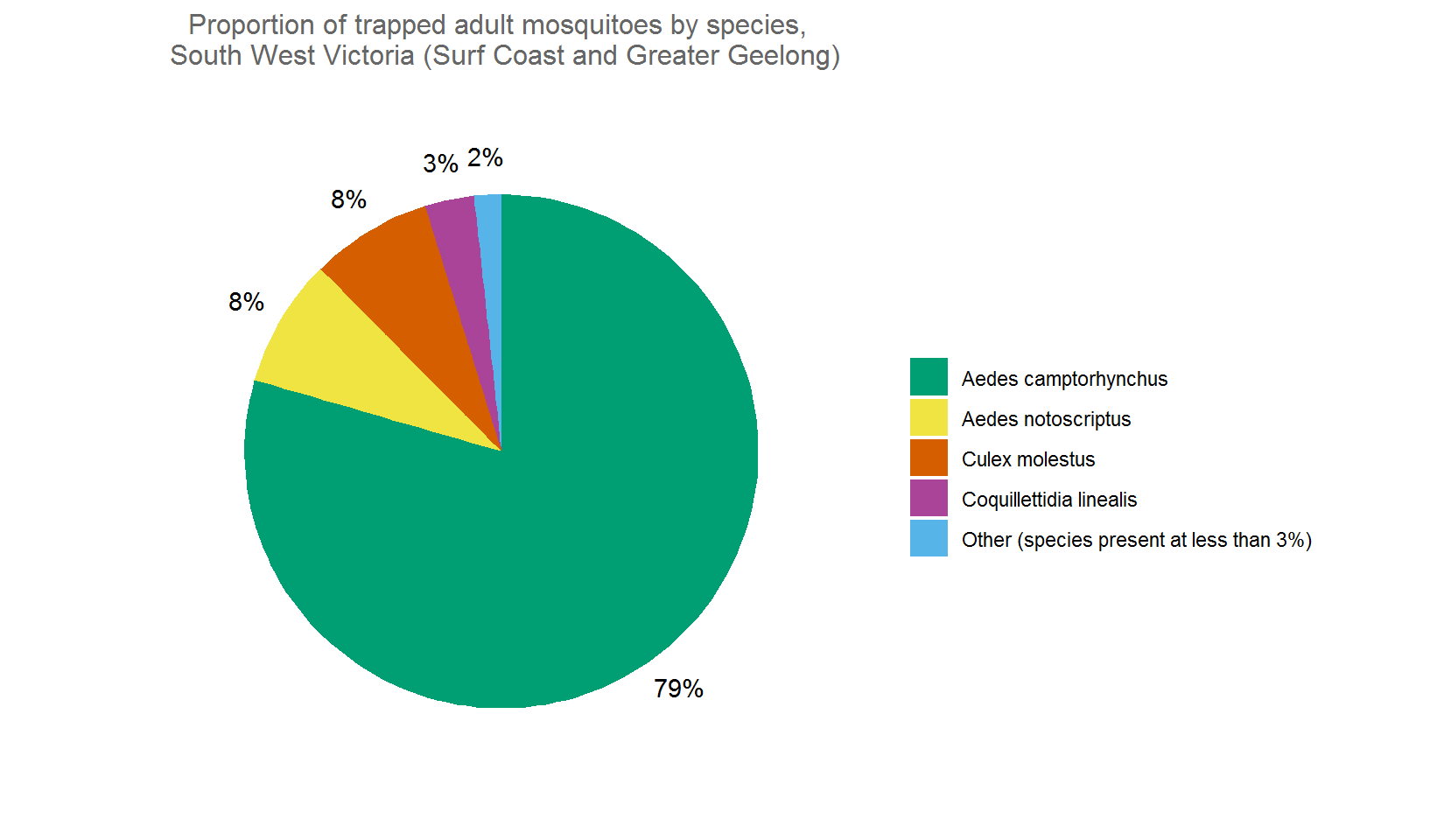


Figure South West Victoria - proportion of trapped adult mosquitoes by species

## Mosquito viral detections

Captured mosquitoes are submitted for PCR testing to detect RRV, BFV, MVEV, JEV and WNV/Kunjin.

This section lists all viral detections in trapped mosquitoes for the 2022/2023 season.

**Table 2:** Viral detections in trapped mosquitoes

| **Trap collection date** | **Notification date** | **LGA** | **Virus detected** |
| --- | --- | --- | --- |
| 29/11/2022 | 6/12/2022 | Loddon | BFV |
| 29/11/2022 | 6/12/2022 | Campaspe | BFV |
| 30/11/2022 | 6/12/2022 | Horsham | RRV |
| 6/12/2022 | 9/12/2022 | Gannawarra | BFV |
| 6/12/2022 | 12/12/2022 | Mildura | BFV |
| 7/12/2022 | 16/12/2022 | Campaspe | BFV |
| 7/12/2022 | 16/12/2022 | Campaspe | BFV |
| 20/12/2022 | 22/12/2022 | Greater Bendigo | RRV |
| 20/12/2022 | 22/12/2022 | Campaspe | RRV |
| 20/12/2022 | 22/12/2022 | Mildura | RRV |
| 20/12/2022 | 22/12/2022 | Mildura | BFV |
| 20/12/2022 | 29/12/2022 | Swan Hill | BFV |
| 20/12/2022 | 29/12/2022 | Swan Hill | BFV |
| 21/12/2022 | 29/12/2022 | Campaspe | RRV |
| 28/12/2022 | 4/01/2023 | Mildura | RRV |
| 20/12/2022 | 6/01/2023 | Loddon | RRV |
| 4/01/2023 | 6/01/2023 | Loddon | RRV |
| 4/01/2023 | 6/01/2023 | Loddon | RRV |
| 4/01/2023 | 6/01/2023 | Swan Hill | RRV |
| 3/01/2023 | 6/01/2023 | Wellington | RRV |
| 20/12/2022 | 6/01/2023 | Loddon | BFV |
| 30/12/2022 | 10/01/2023 | Horsham | RRV |
| 4/01/2023 | 10/01/2023 | Mildura | RRV |
| 5/01/2023 | 10/01/2023 | Greater Bendigo | RRV |
| 4/01/2023 | 10/01/2023 | Mildura | MVEV |
| 5/01/2023 | 10/01/2023 | Greater Bendigo | MVEV |
| 10/01/2023 | 13/1/2023 | Mildura | MVEV |
| 10/01/2023 | 13/1/2023 | Mildura | MVEV |
| 10/01/2023 | 13/1/2023 | Indigo | MVEV |
| 10/01/2023 | 13/1/2023 | Loddon | MVEV |
| 10/01/2023 | 13/1/2023 | Indigo | RRV |
| 10/01/2023 | 13/1/2023 | Greater Geelong | BFV |
| 10/01/2023 | 17/1/2023 | Wodonga | WNV/Kunjin |
| 17/1/2023 | 20/1/2023 | Mildura | WNV/Kunjin |
| 17/1/2023 | 20/1/2023 | Mildura | WNV/Kunjin |
| 17/1/2023 | 20/1/2023 | Mildura | WNV/Kunjin |
| 17/1/2023 | 20/1/2023 | Mildura | MVEV |
| 17/1/2023 | 20/1/2023 | Mildura | MVEV |
| 17/1/2023 | 20/1/2023 | Mildura | MVEV |
| 17/1/2023 | 20/1/2023 | Mildura | MVEV |
| 17/1/2023 | 20/1/2023 | Mildura | MVEV |
| 17/1/2023 | 20/1/2023 | Mildura | MVEV |
| 17/1/2023 | 20/1/2023 | Mildura | RRV |
| 17/1/2023 | 20/1/2023 | Loddon | MVEV |
| 17/1/2023 | 20/1/2023 | Loddon | MVEV |
| 17/1/2023 | 20/1/2023 | Greater Bendigo | RRV |
| 17/1/2023 | 20/1/2023 | Wellington | RRV |
| 17/1/2023 | 24/1/2023 | Campaspe | MVEV |
| 17/1/2023 | 24/1/2023 | Greater Shepparton | MVEV |
| 17/1/2023 | 24/1/2023 | Campaspe | RRV |
| 18/1/2023 | 24/1/2023 | Indigo | MVEV |
| 18/1/2023 | 24/1/2023 | Indigo | MVEV |
| 17/01/2023 | 27/01/2023 | Indigo | MVEV |
| 24/01/2023 | 27/01/2023 | Mildura | WNV/Kunjin |
| 24/01/2023 | 27/01/2023 | Mildura | MVEV |
| 24/01/2023 | 27/01/2023 | Mildura | MVEV |
| 24/01/2023 | 27/01/2023 | Mildura | MVEV |
| 24/01/2023 | 27/01/2023 | Campaspe | MVEV |
| 24/01/2023 | 27/01/2023 | Loddon | MVEV |
| 24/01/2023 | 27/01/2023 | Indigo | MVEV |
| 24/01/2023 | 31/01/2023 | Greater Shepparton | MVEV |
| 24/01/2023 | 31/01/2023 | Horsham | MVEV |
| 24/01/2023 | 3/02/2023 | Wodonga | MVEV |
| 31/01/2023 | 3/02/2023 | Campaspe | MVEV |
| 31/01/2023 | 3/02/2023 | Mildura | MVEV |
| 31/01/2023 | 3/02/2023 | Mildura | MVEV |
| 31/01/2023 | 3/02/2023 | Mildura | MVEV |
| 31/01/2023 | 3/02/2023 | Mildura | WNV/Kunjin |
| 31/01/2023 | 3/02/2023 | Mildura | WNV/Kunjin |
| 24/01/2023 | 7/02/2023 | Indigo | MVEV |
| 24/01/2023 | 7/02/2023 | Indigo | MVEV |
| 31/01/2023 | 7/02/2023 | Loddon | MVEV |
| 7/02/2023 | 10/02/2023 | Mildura | MVEV |
| 7/02/2023 | 10/02/2023 | Mildura | MVEV |
| 7/02/2023 | 10/02/2023 | Greater Shepparton | MVEV |
| 7/02/2023 | 10/02/2023 | Loddon | WNV/Kunjin |
| 7/02/2023 | 14/02/2023 | Swan Hill | MVEV |
| 14/02/2023 | 17/02/2023 | Mildura | MVEV |
| 15/02/2023 | 21/02/2023 | Indigo | MVEV |
| 21/02/2023 | 24/02/2023 | Mildura | MVEV |
| 21/02/2023 | 24/02/2023 | Mildura | MVEV |
| 21/02/2023 | 24/02/2023 | Mildura | MVEV |
| 30/12/2022 | 3/03/2023 | Wellington | RRV |
| 30/12/2022 | 3/03/2023 | Wellington | RRV |
| 7/03/2023 | 10/03/2023 | Mildura | MVEV |
| 7/03/2023 | 10/03/2023 | Mildura | MVEV |
| 15/03/2023 | 21/03/2023 | Wangaratta | MVEV |
| 28/03/2023 | 31/03/2023 | Gannawarra | MVEV |

### Murray Valley encephalitis virus (MVEV) detections in mosquitoes

This map highlights all LGAs with MVEV detections in trapped mosquitoes for the 2022/2023 season.

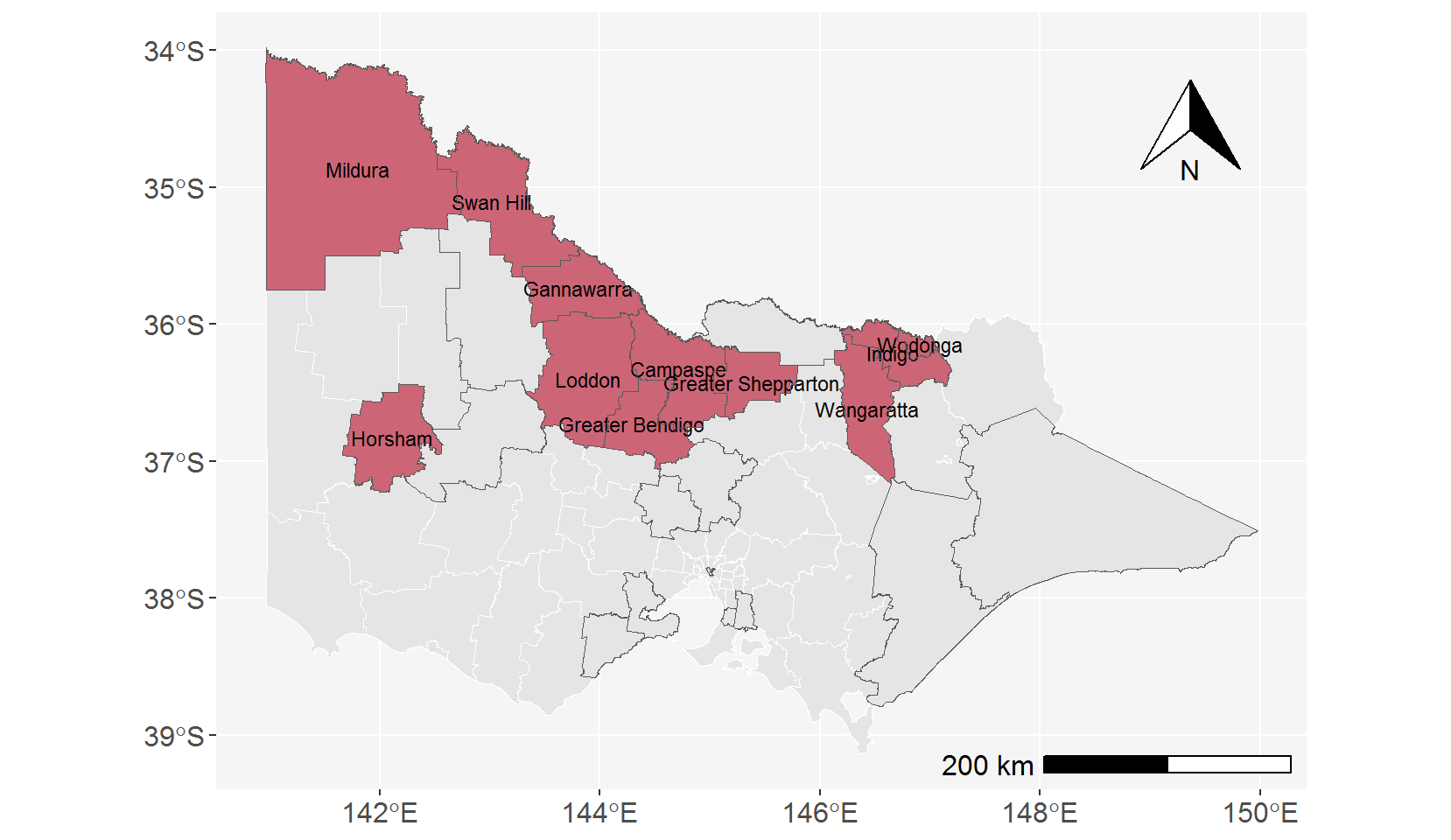


Figure MVEV detections in mosquitoes for the 2022/2023 season are shaded. LGAs with trapping are outlined.

### Ross River virus (RRV) detections in mosquitoes

This map highlights all LGAs with RRV detections in trapped mosquitoes for the 2022/2023 season.

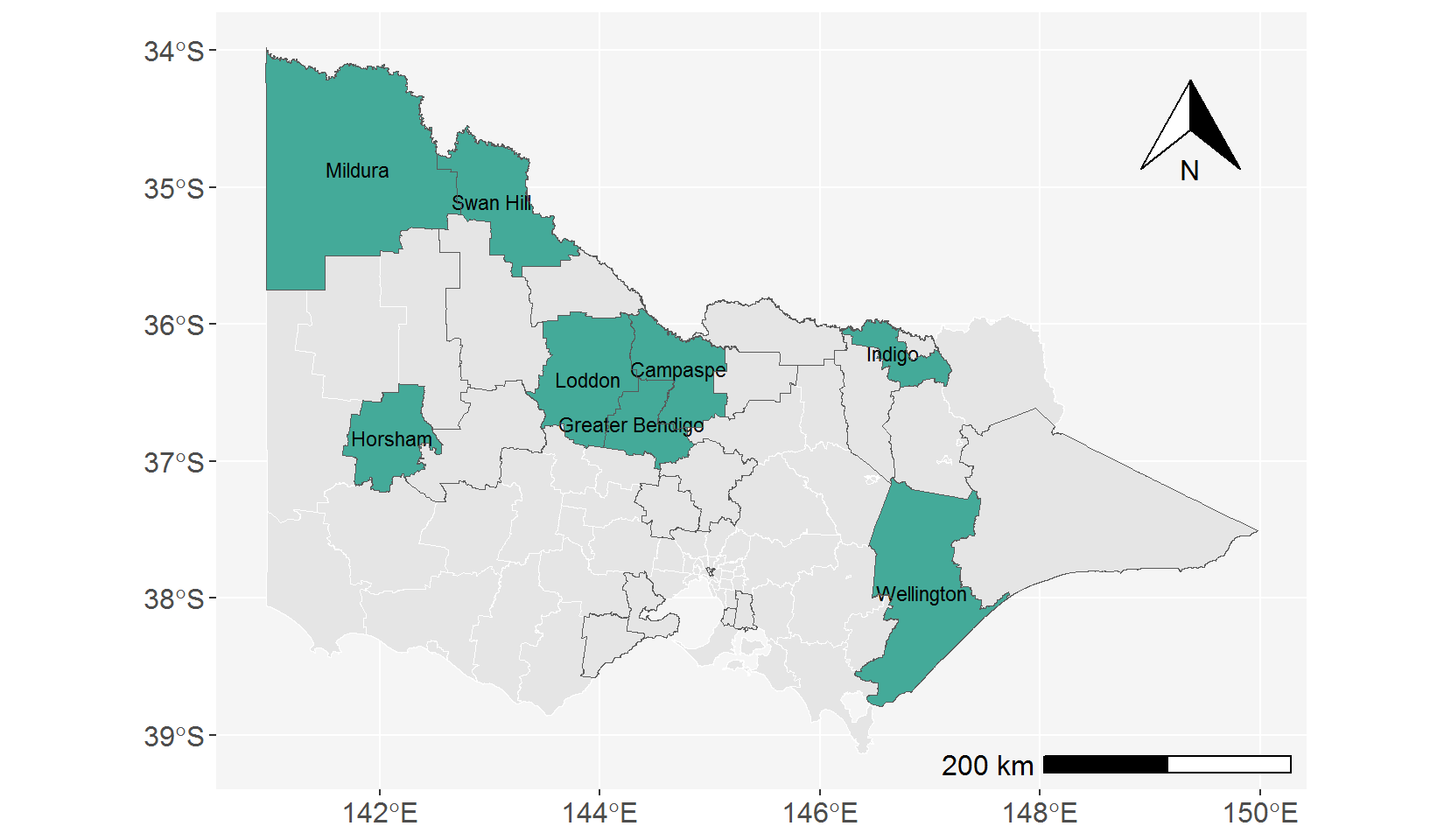


Figure RRV detections in mosquitoes for the 2022/2023 season are shaded. LGAs with trapping are outlined.

### Barmah Forest virus (BFV) detections in mosquitoes

This map highlights all LGAs with BFV detections in trapped mosquitoes for the 2022/2023 season.

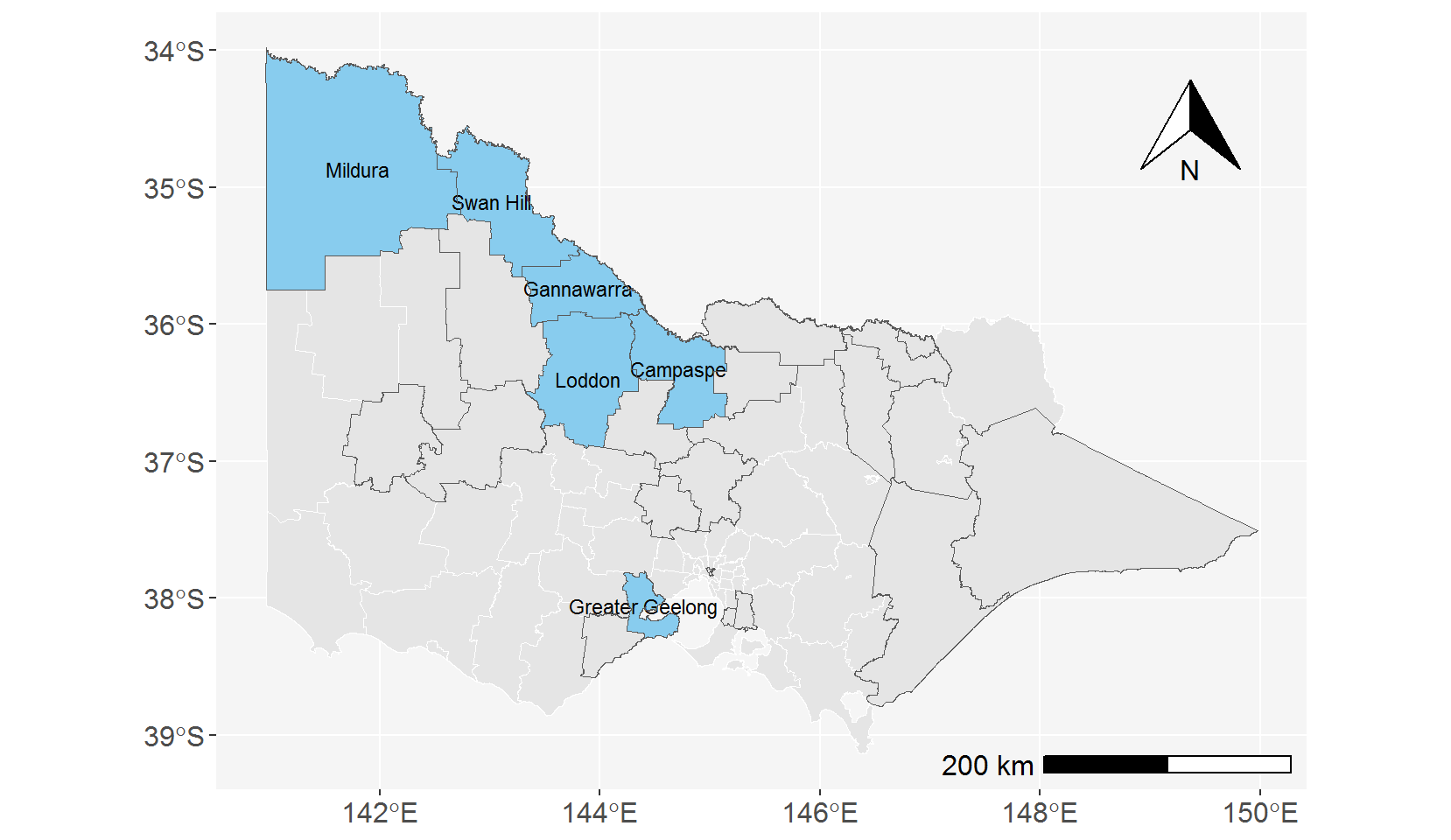


Figure BFV detections in mosquitoes for the 2022/2023 season are shaded. LGAs with trapping are outlined.

### West Nile virus (WNV)/Kunjin detections in mosquitoes

This map highlights all LGAs with WNV/Kunjin detections in trapped mosquitoes for the 2022/2023 season.

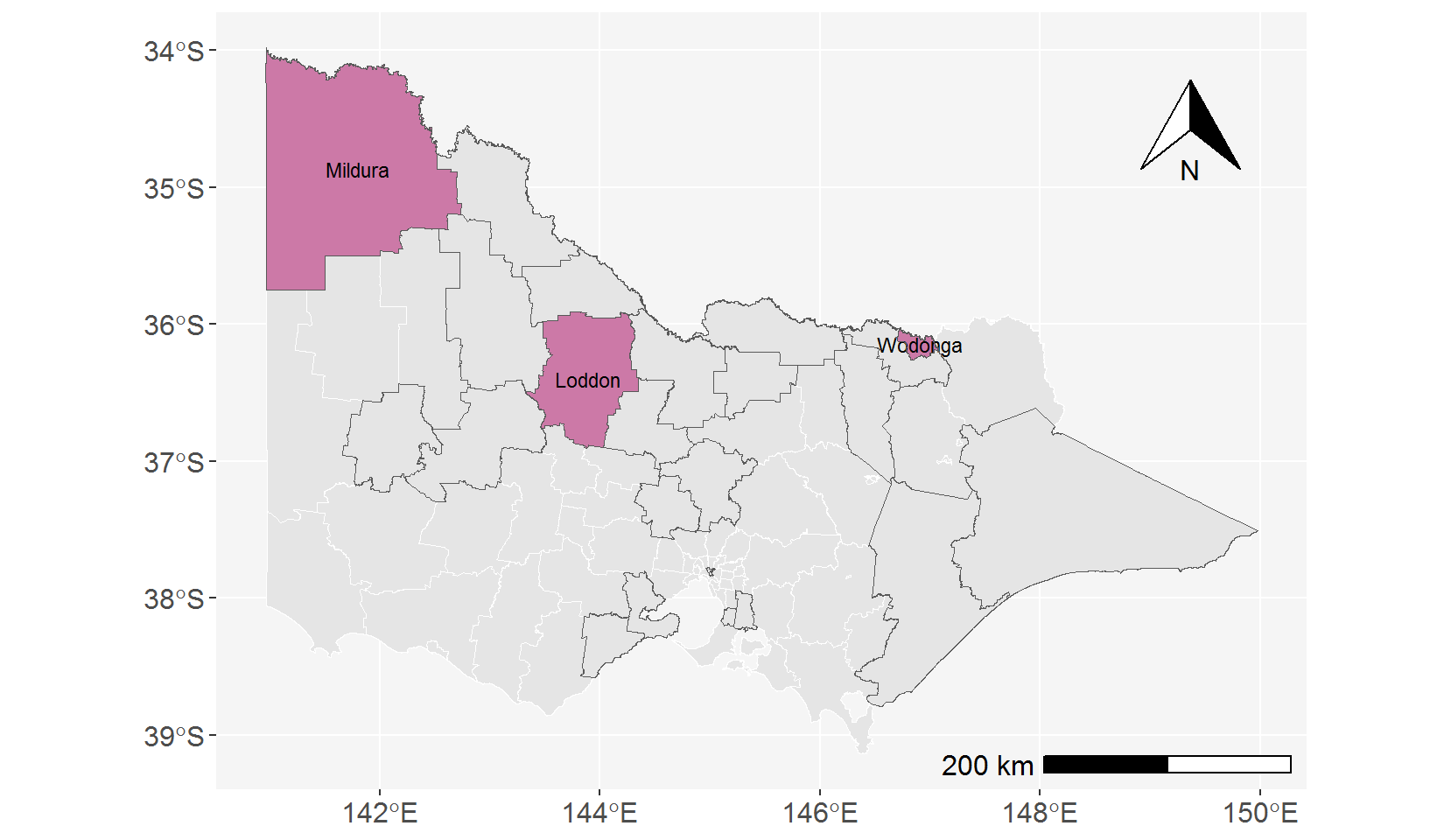


Figure WNV/Kunjin virus detections in mosquitoes for the 2022/2023 season are shaded. LGAs with trapping are outlined.

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