



Northern  
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DEPARTMENT OF HEALTH AND FAMILIES

# Biting Midge Pest Calendar for the Coastal Top End NT 2010



Peter Whelan and Nina Kurucz  
Medical Entomology  
Centre for Disease Control  
Department of Health and Families  
Northern Territory Government

[www.health.nt.gov.au/Medical\\_Entomology/index.aspx](http://www.health.nt.gov.au/Medical_Entomology/index.aspx)

# Biting Midge Pest Periods in the Coastal Top End of the NT.

## **Biting midges**

The mangrove biting midge, *Culicoides ornatus*, causes widespread pest problems around the coast of northern Australia. Areas mostly affected are extensive coastal and tidal river mangrove areas, and adjacent areas up to 2km inland from these areas.

## **Breeding sites**

Primary breeding sites are the upper neap tide level of the mud banks of the upper reaches of small tidal creeks to the limit where the canopy closes over, and are associated with mud and *Rhizophora* and *Avicennia* mangrove pneumatophores. The more of these small mangrove creeks in an area (eg dendrite patterns of creeks) the more area of prime biting midge breeding, and the greater potential for severe pest problems. Less productive breeding sites include the muddy foreshore areas with wide and extensive areas of the woodland mangrove species *Sonneratia* present.

## **Local problem sites in Darwin**

Biting midges may be a nuisance all around the NT coast within 1.5 kilometres of extensive areas of coastal mangroves containing small feeder creeks. Mangrove creeks and areas in Darwin and Palmerston that will see increased midge activity include:

- Mangrove areas adjacent to Sandgrove Creek including the Winnellie industrial area and Bayview Haven locality, Reichardt Creek, Hudson Creek, Elizabeth River near Palmerston, the mouth of Buffalo Creek and the Lee Point area towards the northern edge of Lyons and Leanyer suburbs (high midge activity).
- Palmerston rural residential areas within 1 km of harbour – fronting mangroves (high midge activity), including the Marlow Lagoon area near the Archer ovals.
- Within 500 m of the lowest reaches of Rapid Creek and Ludmilla Creek (moderate midge activity).
- Suburban border areas of Palmerston suburbs Durack, Driver, Moulden, Archer, and Bellamack (moderate midge activity).

## **Seasonal occurrence**

Biting midge abundance varies greatly during the month, with highest numbers occurring around the time of the full moon and to a lesser extent around the new moon.

Biting midge numbers also vary during the year with relatively low numbers during the wet season, an increase from April to August, and highest

numbers occurring between August and November. The increase in numbers each month coincides with the increase in the highest tide levels each month from the mid to late dry season.

### **Biting midge numbers**

Biting midge numbers exceeding 1,000 *C. ornatus* in one CO<sub>2</sub> baited EVS trap per night is considered a high pest problem, with numbers exceeding 5,000 per trap night indicating a severe pest problem. High primary peaks of biting midges can be expected between August and November around the full moon, with average numbers within 1.5km of extensive areas of mangroves with primary breeding sites of 15,000 to 25,000 per trap night, and high secondary peaks of 5,000 to 15,000 around the new moon. Moderate primary peaks of 1,000 to 5,000 can be expected between December and July around the full moon, and moderate secondary peaks of 300 to 1,000 around the new moon. Areas of mangroves with less prime breeding sites will experience lower pest levels.

### **Biting midge bites**

Biting midges do not transmit diseases to humans but scratching of the bites may lead to secondary bacterial infection. *Culicoides ornatus* bite in the highest numbers in the hour before and after sunrise, and the hour before and after sunset. However, bites can also occur at other times and during the day in or adjacent to their primary breeding sites.

### **Self protection**

Personal protection, such as full-length trousers, long sleeved shirts, socks and shoes, and the use of insect repellents containing DEET or Picaridin will generally be required at their prime pest times to provide protection from biting midges within 1.5 km of their prime breeding sites.

### **Pest calendar**

This calendar shows periods when high numbers of *C. ornatus* are expected in the Darwin area in relation to tides in Darwin Harbour and moon phases. Highest numbers will start 2-3 days before the full/new moon and last until 2-3 days after the full/new moon. Pest periods will occur in other areas around the NT coast at the same periods. The period of least *C. ornatus* biting activity is in the 9 to 4 days preceding full or new moons.

## High pest period (August to November)

### Highest primary peaks of *C. ornatus* (Full moon)

#### (Pest rank 1)

Days highlighted in red indicate expected highest primary peaks of the pest biting midge *Culicoides ornatus* within 1.5km of extensive prime breeding sites. These extremely high biting midge pest levels can occur in the late dry season (August to November) in the days around the full moon and present a very high to severe pest problem.

### High secondary peaks of *C. ornatus* (New moon)

#### (Pest rank 2)

Days highlighted in orange indicate expected high secondary peaks of the pest biting midge *Culicoides ornatus* within 1.5km of extensive areas of prime breeding sites. These high biting midge levels can occur in the late dry season (August to November) in the days around the new moon. *Culicoides ornatus* numbers are slightly lower compared to the numbers during the primary peaks in those months but still present a high to very high pest problem.

## Moderate pest period (December to July)

### Moderate primary peaks of *C. ornatus* (Full moon)

#### (Pest rank 3)

Days highlighted in yellow indicate expected moderate primary peaks of the pest biting midge *Culicoides ornatus* within 1.5km of prime breeding sites. These moderate biting midge pest levels can occur in December to July around the full moon, with highest levels around December.

### Moderate to low secondary peaks of *C. ornatus* (New moon)

#### (Pest rank 4)

Days highlighted in blue indicate expected moderate secondary peaks of the pest biting midge *Culicoides ornatus* within 1.5km of prime breeding sites. These moderate to low biting midge pest levels can occur in December to July around the new moon, with highest levels around December.

**For more information on biting midges or personal protection, please contact:  
Medical Entomology, CDC, DHF Darwin on (08) 89228901**

# Biting Midge Pest Calendar for the Coastal Top End of the NT

## AUSTRALIA, NORTH COAST – DARWIN

LAT 12° 28' S LONG 130° 51' E

TIMES AND HEIGHTS OF HIGH AND LOW WATERS

# 2010

TIME ZONE –0930

JANUARY		FEBRUARY		MARCH		APRIL									
Time	m	Time	m	Time	m	Time	m								
1	0015 3.05 0533 6.36 1233 0.59 1915 7.92	16	0118 2.86 0624 6.15 1305 1.27 1945 7.20	1	0141 1.85 0715 7.22 1348 0.52 2015 8.10	16	0149 2.04 0730 6.80 1341 1.42 2000 7.35	1	0044 1.81 0629 7.20 1255 0.82 1910 7.92	16	0055 1.93 0648 6.85 1258 1.70 1900 7.18	1	0131 0.46 0746 7.80 1339 1.70 1925 7.53	16	0115 1.01 0733 7.32 1319 2.14 1900 6.94
2	0100 2.70 0621 6.66 1315 0.43 1958 7.83	17	0142 2.66 0659 6.34 1332 1.25 2010 7.25	2	0222 1.43 0804 7.36 1424 0.80 2044 8.02	17	0215 1.80 0801 6.88 1402 1.56 2017 7.31	2	0122 1.21 0715 7.59 1330 0.87 1940 8.02	17	0119 1.59 0719 7.08 1319 1.70 1919 7.23	2	0206 0.43 0824 7.66 1411 2.04 1952 7.27	17	0145 0.89 0804 7.35 1346 2.25 1928 6.86
3	0145 2.38 0710 6.85 1357 0.47 2035 7.98	18	0208 2.48 0734 6.45 1358 1.33 2031 7.24	3	0301 1.18 0850 7.28 1458 1.30 2112 7.76	18	0242 1.65 0832 6.86 1423 1.80 2035 7.18	3	0200 0.80 0759 7.73 1403 1.15 2007 7.93	18	0148 1.32 0749 7.20 1341 1.80 1938 7.22	3	0241 0.65 0900 7.33 1442 2.48 2020 6.86	18	0217 0.93 0837 7.24 1417 2.46 1954 6.88
4	0231 2.12 0800 6.88 1437 0.75 2111 7.78	19	0236 2.34 0808 6.45 1422 1.52 2052 7.17	4	0342 1.16 0934 6.97 1529 1.96 2137 7.34	19	0311 1.61 0903 6.74 1445 2.14 2052 6.97	4	0236 0.63 0839 7.62 1434 1.62 2031 7.65	19	0214 1.17 0818 7.21 1404 1.99 1958 7.10	4	0315 1.09 0936 6.86 1511 2.95 2048 6.33	19	0251 1.13 0913 7.00 1453 2.77 2026 6.37
5	0318 1.94 0852 6.74 1516 1.24 2145 7.54	20	0307 2.24 0734 6.37 1444 1.81 2112 7.03	5	0421 1.36 1019 6.50 1558 2.89 2200 6.80	20	0342 1.69 0938 6.52 1508 2.57 2111 6.66	5	0312 0.74 0917 7.28 1503 2.20 2056 7.21	20	0243 1.17 0849 7.10 1430 2.28 2018 6.89	5	0350 1.67 1013 6.33 1539 3.43 2118 5.73	20	0330 1.46 0954 6.65 1534 3.15 2103 5.96
6	0408 1.86 0945 6.45 1556 1.89 2217 7.18	21	0340 2.21 0919 6.20 1505 2.18 2131 6.82	6	0502 1.73 1107 5.93 1619 3.39 2224 6.18	21	0414 1.88 1018 6.20 1535 3.08 2132 6.28	6	0347 1.09 0956 6.77 1528 2.83 2118 6.65	21	0314 1.33 0922 6.87 1458 2.67 2041 6.58	6	0429 2.29 1056 5.79 1624 3.88 2157 5.09	21	0414 1.91 1044 6.24 1632 3.53 2154 5.46
7	0455 1.91 1042 8.05 1633 2.93 2250 6.71	22	0414 2.23 0959 5.96 1529 2.63 2153 6.53	7	0547 2.19 1206 5.39 1704 4.05 2258 5.52	22	0449 2.14 1108 5.79 1615 3.66 2200 5.83	7	0422 1.62 1036 6.17 1547 3.44 2143 6.00	22	0346 1.61 1001 6.51 1530 3.15 2109 6.17	7	0520 2.87 1155 5.33 1842 4.17 2329 4.53	22	0510 2.38 1148 5.87 1806 3.72 2324 5.03
8	0546 2.04 1144 5.84 1718 3.35 2323 6.19	23	0451 2.32 1045 5.69 1600 3.15 2216 6.17	8	0649 2.62 1345 5.07 1926 4.49	23	0538 2.44 1219 5.40 1740 4.22 2245 5.33	8	0501 2.24 1125 5.57 1621 4.02 2211 5.30	23	0425 2.00 1050 6.05 1615 3.68 2140 5.67	8	0638 3.29 1337 5.12 2142 3.86	23	0628 2.76 1313 5.71 2000 3.49
9	0645 2.21 1259 5.32 1829 3.95	24	0534 2.43 1144 5.40 1654 3.71 2249 5.78	9	0808 4.88 0830 2.83 1622 5.41 2254 4.18	24	0659 2.67 1429 5.34 2013 4.40	9	0556 2.82 1240 5.10 1859 4.45 2314 4.62	24	0516 2.43 1159 5.60 1745 4.14 2238 5.11	9	0252 4.63 0827 3.38 1538 5.36 2228 3.39	24	0145 5.06 0807 2.87 1438 5.88 2121 2.88
10	0808 5.67 0756 2.32 1444 5.32 2015 4.25	25	0628 2.52 1303 5.22 1830 4.20 2341 5.38	10	0308 4.76 1016 2.63 1715 5.92 2341 3.68	25	0047 4.90 0907 2.53 1617 5.89 2215 3.94	10	0729 3.19 1556 5.19 2249 4.01	25	0639 2.77 1350 5.46 2015 4.11	10	0357 5.13 0959 3.11 1824 5.72 2257 2.94	25	0316 5.62 0832 2.70 1541 6.21 2218 2.16
11	0128 5.24 0916 2.27 1622 5.72 2214 4.12	26	0750 2.50 1513 5.41 2035 4.33	11	0428 5.13 1115 2.27 1762 6.36	26	0331 5.24 1033 2.01 1712 6.55 2316 3.25	11	0324 4.65 0948 3.08 1647 5.87 2320 3.50	26	0134 4.83 0841 2.74 1535 5.88 2158 3.49	11	0440 5.63 1049 2.79 1856 6.06 2323 2.50	26	0422 6.25 1034 2.45 1629 6.54 2305 1.53
12	0306 5.14 1027 2.07 1721 6.19 2329 3.75	27	0124 5.11 0932 2.21 1638 6.01 2217 4.03	12	0013 3.26 0515 5.57 1154 1.93 1824 6.71	27	0441 5.94 1130 1.45 1757 7.15	12	0427 5.16 1052 2.69 1720 6.09 2345 3.08	27	0332 5.41 1010 2.32 1634 6.43 2253 2.72	12	0518 6.11 1126 2.51 1724 6.36 2349 2.06	27	0517 6.83 1124 2.25 1709 6.81 2346 1.00
13	0415 5.32 1119 1.82 1805 6.59	28	0329 5.32 1045 1.70 1732 6.64 2323 3.52	13	0039 2.92 0553 5.98 1227 1.64 1853 6.88	28	0002 2.51 0537 6.62 1215 1.03 1836 7.63	13	0508 5.66 1131 2.31 1749 6.43	28	0437 6.15 1107 1.88 1718 6.94 2337 1.96	13	0554 6.54 1159 2.29 1749 6.61	28	0608 7.27 1205 2.14 1744 6.96
14	0014 3.39 0505 5.61 1200 1.58 1843 6.89	29	0438 5.84 1141 1.16 1820 7.22	14	0102 2.61 0627 6.34 1254 1.46 1918 7.18	29	0009 2.69 0543 6.12 1202 2.01 1815 6.75	14	0009 2.69 0543 6.12 1202 2.01 1815 6.75	29	0532 6.84 1152 1.57 1758 7.32	14	0017 1.63 0828 6.90 1227 2.16 1813 6.81	29	0026 0.65 0852 7.53 1243 2.13 1816 7.03
15	0047 3.10 0546 5.90 1235 1.39 1915 7.09	30	0014 2.96 0533 6.40 1228 0.73 1902 7.68	15	0126 2.32 0659 6.61 1318 1.38 1941 7.30	30	0031 2.31 0616 6.52 1230 1.80 1839 6.99	15	0031 2.31 0616 6.52 1230 1.80 1839 6.99	30	0017 1.27 0621 7.38 1231 1.43 1829 7.56	15	0045 1.27 0700 7.17 1253 2.11 1837 6.92	30	0102 0.50 0732 7.58 1318 2.22 1849 6.96
		31	0059 2.38 0625 6.88 1310 0.50 1941 7.98			31	0055 0.75 0706 7.71 1308 1.48 1858 7.63								

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 Datum of Predictions is Lowest Astronomical Tide  
 Moon Symbols ● New Moon ◐ First Quarter ◑ Full Moon ◒ Last Quarter

### High Pest Periods

- Highest primary peaks of *C. ornatus* (Full moon) (Pest rank 1)
- High secondary peaks of *C. ornatus* (New moon) (Pest rank 2)

### Moderate Pest Periods

- Moderate primary peaks of *C. ornatus* (Full moon) (Pest rank 3)
- Moderate to low secondary peaks of *C. ornatus* (New moon) (Pest rank 4)

\*This Calendar has been produced by Medical Entomology Northern Territory, using the Tidal Tables template with the authorisation of the Bureau of Meteorology. All highlights pertaining to the biting midge, *Culicoides ornatus*, are additions made by Medical Entomology.

# Biting Midge Pest Calendar for the Coastal Top End of the NT

## AUSTRALIA, NORTH COAST – DARWIN

LAT 12° 28' S LONG 130° 51' E

# 2010

TIMES AND HEIGHTS OF HIGH AND LOW WATERS

TIME ZONE –0930

MAY		JUNE		JULY		AUGUST	
Time m	Time m	Time m	Time m	Time m	Time m	Time m	Time m
<b>1</b> 0139 0.56 0810 7.45 1352 2.40 1922 6.78	<b>16</b> 0121 0.77 0754 7.31 1332 2.44 1904 6.61	<b>1</b> 0229 1.33 0904 6.77 1452 2.74 2020 5.94	<b>16</b> 0230 0.80 0904 7.25 1456 2.24 2029 6.42	<b>1</b> 0242 1.55 0911 6.68 1515 2.36 2051 5.94	<b>16</b> 0300 0.96 0921 7.37 1537 1.40 2125 6.66	<b>1</b> 0304 2.06 0915 6.50 1554 1.47 2150 5.97	<b>16</b> 0348 2.31 0941 6.65 1637 1.24 2247 6.13
<b>2</b> 0215 0.82 0845 7.18 1426 2.64 1956 6.44	<b>17</b> 0158 0.80 0830 7.24 1410 2.52 1942 6.50	<b>2</b> 0303 1.68 0936 6.52 1531 2.89 2102 5.65	<b>17</b> 0313 1.10 0943 7.08 1547 2.21 2124 6.20	<b>2</b> 0311 1.85 0935 6.50 1551 2.41 2133 5.74	<b>17</b> 0340 1.48 0852 7.07 1623 1.41 2217 6.35	<b>2</b> 0330 2.47 0936 6.20 1630 2.01 2233 5.70	<b>17</b> 0425 3.00 1008 6.02 1723 1.75 2344 5.58
<b>3</b> 0249 1.23 0919 6.82 1500 2.94 2050 6.04	<b>18</b> 0237 0.98 0909 7.06 1452 2.66 2024 6.27	<b>3</b> 0339 2.07 1007 6.24 1617 3.02 2150 5.34	<b>18</b> 0358 1.56 1022 6.82 1643 2.20 2227 5.92	<b>3</b> 0340 2.22 0959 6.26 1631 2.46 2219 5.50	<b>18</b> 0419 2.13 1024 6.64 1712 1.56 2314 5.95	<b>3</b> 0404 2.93 0959 5.83 1712 2.19 2325 5.42	<b>18</b> 0517 3.63 1042 5.34 1824 2.25
<b>4</b> 0325 1.72 0954 6.41 1537 3.25 2109 5.57	<b>19</b> 0320 1.31 0951 6.80 1543 2.85 2114 5.92	<b>4</b> 0417 2.49 1040 5.96 1715 3.11 2250 5.06	<b>19</b> 0446 2.12 1102 6.48 1743 2.19 2337 5.67	<b>4</b> 0414 2.63 1025 5.98 1716 2.51 2312 5.28	<b>19</b> 0503 2.81 1057 6.12 1805 1.79	<b>4</b> 0455 3.42 1027 5.43 1803 2.36	<b>19</b> 0102 5.17 0706 4.04 1154 4.68 1955 2.56
<b>5</b> 0403 2.25 1032 6.01 1630 3.54 2159 5.09	<b>20</b> 0403 1.75 1038 6.49 1648 3.01 2218 5.54	<b>5</b> 0503 3.07 1118 5.69 1818 3.09	<b>20</b> 0540 2.70 1146 6.10 1847 2.14	<b>5</b> 0459 3.07 1056 5.66 1807 2.54	<b>20</b> 0017 5.57 0801 3.42 1137 5.57 1910 2.02	<b>5</b> 0031 5.20 0815 3.83 1113 5.01 1915 2.43	<b>20</b> 0315 5.22 1004 3.84 1456 4.55 2140 2.48
<b>6</b> 0450 2.74 1117 5.64 1802 3.70 2318 4.70	<b>21</b> 0503 2.24 1131 6.19 1805 3.00 2346 5.29	<b>6</b> 0002 4.89 0602 3.26 1204 5.44 1923 2.95	<b>21</b> 0053 5.52 0646 3.19 1239 5.75 1955 2.02	<b>6</b> 0013 5.12 0559 3.47 1137 5.32 1906 2.50	<b>21</b> 0140 5.34 0729 3.83 1245 5.06 2029 2.13	<b>6</b> 0212 5.19 0801 3.99 1254 4.71 2051 2.28	<b>21</b> 0437 5.65 1112 3.31 1616 4.98 2247 2.18
<b>7</b> 0552 3.15 1216 5.36 1940 3.59	<b>22</b> 0810 2.70 1232 5.98 1927 2.75	<b>7</b> 0125 4.92 0711 3.50 1303 5.26 2025 2.68	<b>22</b> 0218 5.56 0806 3.49 1345 5.49 2103 1.84	<b>7</b> 0129 5.11 0715 3.74 1238 5.05 2015 2.35	<b>22</b> 0325 5.46 0824 3.82 1438 4.87 2148 2.04	<b>7</b> 0357 5.60 0947 3.74 1512 4.91 2213 1.86	<b>22</b> 0524 6.07 1149 2.85 1704 5.46 2333 1.87
<b>8</b> 0122 4.65 0710 3.39 1333 5.26 2056 3.25	<b>23</b> 0125 5.35 0728 3.00 1339 5.86 2039 2.33	<b>8</b> 0251 5.19 0827 3.57 1412 5.23 2122 2.33	<b>23</b> 0340 5.81 0930 3.51 1458 5.42 2205 1.63	<b>8</b> 0305 5.33 0844 3.78 1405 4.96 2128 2.07	<b>23</b> 0445 5.84 1100 3.47 1600 5.07 2253 1.83	<b>8</b> 0500 1.16 1057 3.25 1620 5.47 2313 1.35	<b>23</b> 0600 6.41 1218 2.49 1742 5.88
<b>9</b> 0300 4.98 0832 3.41 1450 5.38 2147 2.83	<b>24</b> 0249 4.98 0848 3.10 1444 5.89 2140 1.85	<b>9</b> 0400 5.91 0940 3.46 1516 5.37 2213 1.93	<b>24</b> 0449 6.17 1044 3.33 1600 5.52 2259 1.42	<b>9</b> 0421 5.78 1004 3.57 1530 5.17 2230 1.67	<b>24</b> 0539 6.22 1153 3.07 1655 5.40 2342 1.59	<b>9</b> 0549 6.71 1147 2.89 1714 6.07	<b>24</b> 0008 1.62 0631 6.67 1244 2.18 1816 6.23
<b>10</b> 0358 5.43 0945 3.25 1543 5.61 2227 2.37	<b>25</b> 0400 6.13 0959 3.03 1539 6.02 2232 1.41	<b>10</b> 0451 6.07 1038 3.25 1607 5.60 2259 1.53	<b>25</b> 0545 6.51 1140 3.07 1651 5.70 2345 1.26	<b>10</b> 0517 6.26 1104 3.25 1628 5.55 2324 1.25	<b>25</b> 0622 6.54 1231 2.73 1738 5.73	<b>10</b> 0002 0.89 0633 7.19 1231 2.10 1804 6.62	<b>25</b> 0038 1.45 0668 6.85 1307 1.90 1848 6.50
<b>11</b> 0443 5.91 1038 3.03 1622 5.87 2302 1.92	<b>26</b> 0501 6.57 1057 2.89 1626 6.17 2318 1.08	<b>11</b> 0538 6.50 1125 3.02 1650 5.88 2343 1.16	<b>26</b> 0631 6.76 1225 2.82 1735 5.89	<b>11</b> 0607 6.72 1154 2.87 1717 5.98	<b>26</b> 0022 1.39 0659 6.76 1302 2.46 1817 6.02	<b>11</b> 0046 0.60 0714 7.54 1354 1.54 1854 7.04	<b>26</b> 0103 1.88 0720 6.98 1390 1.65 1919 6.62
<b>12</b> 0524 6.37 1119 2.81 1656 6.12 2337 1.49	<b>27</b> 0554 6.92 1145 2.73 1708 6.30	<b>12</b> 0622 6.86 1205 2.79 1731 6.15	<b>27</b> 0027 1.15 0713 6.90 1302 2.62 1815 6.04	<b>12</b> 0013 0.87 0653 7.10 1239 2.49 1804 6.37	<b>27</b> 0055 1.27 0730 6.89 1330 2.24 1854 6.23	<b>12</b> 0126 0.52 0748 7.72 1354 1.08 1943 7.27	<b>27</b> 0128 1.42 0740 6.99 1365 1.44 1950 6.75
<b>13</b> 0802 6.76 1155 2.63 1728 6.34	<b>28</b> 0000 0.87 0640 7.14 1226 2.61 1747 6.38	<b>13</b> 0025 0.88 0705 7.13 1245 2.59 1812 6.38	<b>28</b> 0104 1.12 0747 6.95 1337 2.49 1855 6.14	<b>13</b> 0058 0.81 0735 7.38 1323 2.11 1852 6.67	<b>28</b> 0125 1.23 0756 6.94 1356 2.06 1929 6.36	<b>13</b> 0203 0.68 0818 7.71 1434 0.78 2029 7.28	<b>28</b> 0150 1.55 0759 6.95 1422 1.32 2020 6.72
<b>14</b> 0011 1.14 0641 7.07 1227 2.50 1759 6.51	<b>29</b> 0039 0.80 0721 7.21 1303 2.55 1826 6.40	<b>14</b> 0106 0.70 0746 7.28 1325 2.42 1854 6.52	<b>29</b> 0140 1.16 0819 6.91 1410 2.41 1934 6.15	<b>14</b> 0140 0.51 0814 7.53 1407 1.78 1942 6.82	<b>29</b> 0152 1.30 0818 6.93 1423 1.92 2002 6.39	<b>14</b> 0239 1.07 0847 7.52 1515 0.70 2115 7.07	<b>29</b> 0212 1.78 0816 6.82 1501 1.32 2050 6.60
<b>15</b> 0046 0.89 0717 7.26 1259 2.43 1830 6.61	<b>30</b> 0118 0.86 0759 7.15 1340 2.55 1903 6.33	<b>15</b> 0147 0.67 0828 7.32 1408 2.30 1939 6.53	<b>30</b> 0212 1.32 0846 6.81 1443 2.38 2012 6.09	<b>15</b> 0220 0.83 0848 7.53 1452 1.53 2032 6.82	<b>30</b> 0216 1.46 0838 6.85 1451 1.83 2037 6.33	<b>15</b> 0314 1.64 0914 7.16 1555 0.87 2200 6.66	<b>30</b> 0235 2.08 0834 6.60 1520 1.44 2125 6.39
<b>31</b> 0154 1.05 0832 6.99 1418 2.82 1942 6.17				<b>31</b> 0240 1.72 0857 6.71 1521 1.81 2113 6.18		<b>31</b> 0300 2.47 0853 6.29 1553 1.68 2203 6.09	

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Bureau of Meteorology

National Tidal Centre

Datum of Predictions is Lowest Astronomical Tide

Moon Symbols

● New Moon

◐ First Quarter

○ Full Moon

◑ Last Quarter

### High Pest Periods

Highest primary peaks of *C. ornatus* (Full moon) (Pest rank 1)

High secondary peaks of *C. ornatus* (New moon) (Pest rank 2)

### Moderate Pest Periods

Moderate primary peaks of *C. ornatus* (Full moon) (Pest rank 3)

Moderate to low secondary peaks of *C. ornatus* (New moon) (Pest rank 4)

\*This Calendar has been produced by Medical Entomology Northern Territory, using the Tidal Tables template with the authorisation of the Bureau of Meteorology. All highlights pertaining to the biting midge, *Culicoides ornatus*, are additions made by Medical Entomology.

# Biting Midge Pest Calendar for the Coastal Top End of the NT

## AUSTRALIA, NORTH COAST – DARWIN

# 2010

LAT 12° 28' S LONG 130° 51' E

TIMES AND HEIGHTS OF HIGH AND LOW WATERS

TIME ZONE -0930

SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER	
Time m	Time m	Time m	Time m	Time m	Time m	Time m	Time m
<b>1</b> 0330 2.93 0914 5.91 WE 1630 1.99 2251 5.72	<b>16</b> 0451 3.75 1004 5.10 TH 1744 2.54	<b>1</b> 0407 3.48 0919 5.41 FR 1652 2.35 2335 5.62	<b>16</b> 0645 3.86 1130 4.41 SA 1828 3.19	<b>1</b> 0030 5.80 0719 3.39 MO 1259 4.82 1922 2.97	<b>16</b> 0103 5.40 0839 3.09 TU 1452 4.90 2011 3.60	<b>1</b> 0051 6.02 0800 2.42 WE 1413 5.44 2004 3.40	<b>16</b> 0027 5.44 0806 2.79 TH 1448 5.04 2000 3.98
<b>2</b> 0415 3.43 0940 5.47 TH 1720 2.33 2355 5.36	<b>17</b> 0024 5.20 0703 4.06 FR 1132 4.41 1916 2.96	<b>2</b> 0529 3.87 1014 4.89 SA 1810 2.70	<b>17</b> 0110 5.22 0902 3.55 SU 1441 4.58 2010 3.31	<b>2</b> 0150 5.85 0846 2.83 TU 1447 5.34 2052 2.88	<b>17</b> 0216 5.40 0934 2.69 WE 1554 5.39 2126 3.49	<b>2</b> 0157 5.94 0909 1.95 TH 1534 5.94 2124 3.39	<b>17</b> 0136 5.28 0912 2.48 FR 1603 5.52 2125 3.91
<b>3</b> 0535 3.90 1020 4.98 FR 1834 2.57	<b>18</b> 0236 5.13 1006 3.66 SA 1514 4.54 2115 2.91	<b>3</b> 0102 5.43 0738 3.86 SU 1251 4.56 1959 2.74	<b>18</b> 0252 5.35 1003 3.06 MO 1548 5.09 2135 3.12	<b>3</b> 0258 6.09 0947 2.13 WE 1558 6.04 2200 2.66	<b>18</b> 0316 5.54 1015 2.25 TH 1638 5.90 2223 3.29	<b>3</b> 0300 5.99 1006 1.46 FR 1640 6.49 2229 3.23	<b>18</b> 0251 5.31 1006 2.10 SA 1652 6.09 2230 3.69
<b>4</b> 0132 5.22 0742 4.06 SA 1220 4.56 2025 2.51	<b>19</b> 0408 5.51 1052 3.11 SU 1614 5.10 2225 2.59	<b>4</b> 0245 5.69 0925 3.29 MO 1508 5.12 2130 2.41	<b>19</b> 0351 5.63 1038 2.60 TU 1629 2.62 2228 2.85	<b>4</b> 0351 6.39 1036 1.44 TH 1653 6.71 2253 2.45	<b>19</b> 0400 5.76 1050 1.83 FR 1717 6.37 2306 3.08	<b>4</b> 0355 6.13 1057 1.05 SA 1734 6.97 2323 3.04	<b>19</b> 0350 5.51 1052 1.70 SU 1733 6.50 2317 3.42
<b>5</b> 0330 5.59 0945 3.65 SU 1513 4.91 2157 2.08	<b>20</b> 0450 5.90 1122 2.66 MO 1654 5.62 2308 2.27	<b>5</b> 0352 6.17 1022 2.54 TU 1612 5.90 2232 1.99	<b>20</b> 0429 5.92 1106 2.18 WE 1706 6.11 2306 2.69	<b>5</b> 0435 6.66 1120 0.66 FR 1744 7.24 2339 2.30	<b>20</b> 0437 5.97 1124 1.44 SA 1753 6.77 2342 2.89	<b>5</b> 0443 6.30 1141 0.76 SU 1822 7.30	<b>20</b> 0437 5.79 1134 1.32 MO 1814 6.91 2338 3.16
<b>6</b> 0433 6.17 1046 2.98 MO 1619 5.63 2257 1.55	<b>21</b> 0523 6.23 1148 2.28 TU 1730 6.08 2342 2.01	<b>6</b> 0441 6.65 1107 1.76 WE 1705 6.85 2320 1.67	<b>21</b> 0500 6.19 1132 1.78 TH 1741 6.53 2340 2.41	<b>6</b> 0514 6.66 1200 0.44 SA 1830 7.58	<b>21</b> 0510 6.19 1157 1.11 SU 1829 7.08	<b>6</b> 0009 2.85 0527 6.43 MO 1222 0.62 1905 7.47	<b>21</b> 0518 6.08 1134 1.00 TU 1853 7.24
<b>7</b> 0521 6.75 1132 2.26 TU 1713 6.36 2345 1.12	<b>22</b> 0551 6.50 1212 1.92 WE 1802 6.46	<b>7</b> 0521 7.05 1147 1.05 TH 1755 7.25	<b>22</b> 0526 6.40 1159 1.40 FR 1815 6.87	<b>7</b> 0019 2.24 0550 6.97 SU 1238 0.24 1913 7.71	<b>22</b> 0014 2.75 0542 6.36 MO 1230 0.88 1903 7.28	<b>7</b> 0051 2.72 0608 6.50 TU 1300 0.63 1945 7.49	<b>22</b> 0036 2.91 0558 6.35 WE 1251 0.78 1931 7.46
<b>8</b> 0602 7.22 1214 1.54 WE 1802 6.99	<b>23</b> 0611 1.83 0615 6.70 TH 1235 1.58 1834 6.76	<b>8</b> 0002 1.50 0566 7.31 ● 1841 7.65	<b>23</b> 0009 2.29 0551 6.58 SA 1236 1.09 1846 7.12	<b>8</b> 0058 2.28 0627 6.94 MO 1315 0.27 1852 7.63	<b>23</b> 0045 2.65 0615 6.48 TU 1302 0.76 1939 7.37	<b>8</b> 0130 2.65 0649 6.48 WE 1337 0.80 2021 7.38	<b>23</b> 0114 2.59 0638 6.54 TH 1328 0.70 2009 7.57
<b>9</b> 0027 0.88 0639 7.55 TH 1253 0.92 1850 7.43	<b>24</b> 0037 1.74 0637 6.85 FR 1259 1.29 1904 6.96	<b>9</b> 0041 1.50 0628 7.43 SA 1303 0.16 1923 7.80	<b>24</b> 0036 2.23 0616 6.69 SU 1254 0.67 1917 7.25	<b>9</b> 0136 2.40 0703 6.79 TU 1353 0.52 2030 7.40	<b>24</b> 0118 2.61 0647 6.52 WE 1336 0.78 2014 7.34	<b>9</b> 0211 2.65 0729 6.38 TH 1413 1.09 2054 7.19	<b>24</b> 0154 2.50 0720 6.84 FR 1404 0.77 2044 7.58
<b>10</b> 0105 0.86 0711 7.70 FR 1331 0.46 1935 7.65	<b>25</b> 0101 1.73 0657 6.92 SA 1324 1.07 1934 7.07	<b>10</b> 0116 1.66 0669 7.39 SU 1340 0.09 2003 7.71	<b>25</b> 0103 2.24 0642 6.71 MO 1323 0.79 1948 7.27	<b>10</b> 0215 2.60 0739 6.49 WE 1430 0.95 2107 7.05	<b>25</b> 0155 2.63 0723 6.46 TH 1412 0.94 2050 7.23	<b>10</b> 0251 2.71 0809 6.14 FR 1445 1.49 2125 6.94	<b>25</b> 0238 2.35 0805 6.61 SA 1442 1.02 2118 7.47
<b>11</b> 0140 1.06 0739 7.67 SA 1408 0.25 2017 7.61	<b>26</b> 0125 1.84 0717 6.90 SU 1351 0.96 2003 7.06	<b>11</b> 0152 1.95 0730 7.17 MO 1417 0.30 2043 7.41	<b>26</b> 0130 2.33 0708 6.65 TU 1354 0.65 2020 7.18	<b>11</b> 0255 2.86 0816 6.09 TH 1505 1.50 2144 6.65	<b>26</b> 0235 2.70 0803 6.30 FR 1449 1.23 2128 7.04	<b>11</b> 0332 2.82 0850 5.85 SA 1515 1.95 2155 6.65	<b>26</b> 0324 2.25 0855 6.44 SU 1521 1.45 2153 7.26
<b>12</b> 0215 1.44 0806 7.45 SU 1445 0.32 2059 7.32	<b>27</b> 0149 2.01 0738 6.79 MO 1420 1.01 2033 6.95	<b>12</b> 0228 2.34 0800 6.78 TU 1454 0.76 2121 6.96	<b>27</b> 0201 2.49 0736 6.49 WE 1426 1.06 2055 6.97	<b>12</b> 0340 3.14 0857 5.61 FR 1543 2.09 2223 6.25	<b>27</b> 0323 2.81 0848 6.01 SA 1531 1.66 2211 6.78	<b>12</b> 0415 2.93 0935 5.51 SU 1545 2.44 2224 6.35	<b>27</b> 0414 2.59 0949 6.17 MO 1601 2.02 2229 6.95
<b>13</b> 0248 1.97 0834 7.05 MO 1523 0.67 2140 6.85	<b>28</b> 0215 2.26 0800 6.58 TU 1450 1.20 2106 6.73	<b>13</b> 0303 2.79 0832 6.25 WE 1531 1.38 2201 6.43	<b>28</b> 0237 2.73 0806 6.22 TH 1501 1.40 2133 6.68	<b>13</b> 0440 3.39 0946 5.11 SA 1627 2.67 2306 5.87	<b>28</b> 0420 2.92 0944 5.64 SU 1620 2.18 2258 6.49	<b>13</b> 0504 3.02 1029 5.16 MO 1622 2.84 2257 6.03	<b>28</b> 0507 2.19 1052 5.84 TU 1646 2.68 2307 6.57
<b>14</b> 0321 2.57 0801 6.49 TU 1602 1.23 2223 6.27	<b>29</b> 0245 2.60 0822 6.27 WE 1522 1.51 2144 6.40	<b>14</b> 0345 3.26 0907 5.63 TH 1613 2.07 2247 5.90	<b>29</b> 0319 3.04 0842 5.85 FR 1543 1.83 2220 6.34	<b>14</b> 0558 3.50 1103 4.68 SU 1728 3.18 2358 5.57	<b>29</b> 0528 2.93 1058 5.30 MO 1720 2.72 2350 6.22	<b>14</b> 0600 3.05 1136 4.90 TU 1718 3.43 2335 5.72	<b>29</b> 0605 2.20 1203 5.54 WE 1745 3.32 2350 6.14
<b>15</b> 0357 3.18 0930 5.83 WE 1645 1.90 2314 5.67	<b>30</b> 0319 3.02 0847 5.88 TH 1600 1.92 2230 6.01	<b>15</b> 0447 3.68 0950 4.97 FR 1706 2.72 2346 5.45	<b>30</b> 0414 3.36 0929 5.39 SA 1635 2.32 2317 6.00	<b>15</b> 0722 3.40 1304 4.56 MO 1847 3.51	<b>30</b> 0645 2.78 1235 5.19 TU 1837 3.17	<b>15</b> 0700 2.98 1300 4.81 WE 1835 3.81	<b>30</b> 0712 2.18 1309 5.43 TH 1909 3.82
			<b>31</b> 0534 3.55 1044 4.93 SU 1747 2.75				<b>31</b> 0049 5.76 0828 2.06 FR 1512 5.65 2049 3.98

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Bureau of Meteorology

National Tidal Centre

Datum of Predictions is Lowest Astronomical Tide

Moon Symbols

● New Moon

◐ First Quarter

○ Full Moon

◑ Last Quarter

### High Pest Periods

Highest primary peaks of *C. ornatus* (Full moon) (Pest rank 1)

High secondary peaks of *C. ornatus* (New moon) (Pest rank 2)

### Moderate Pest Periods

Moderate primary peaks of *C. ornatus* (Full moon) (Pest rank 3)

Moderate to low secondary peaks of *C. ornatus* (New moon) (Pest rank 4)

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