European Wasp Spring Queen Trapping Program 2023

Jarramlee Grasslands Nature Reserve
ACT Parks & Conservation Services

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eWasp© Research & Monitoring Programs

CoreEnviro Solutions Pty Ltd image
European wasp and Asian paper wasp.

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Directors Summary

CoreEnviro Solutions European Wasp (eWasp™) Spring Queen Trapping Program Report 2023 to ACT Parks & Conservation Services. The information in this report is for the period 30 September - 24 November 2023.

About us

CoreEnviro Solutions is a Canberra-based service provider specialising in the delivery of noxious/environmental, agricultural, horticultural, aquatic pest and weed management, and pest control solutions.

Our main objective is to save our native species. We are committed to educating the public on invasive and beneficial species.

Innovation

CoreEnviro Solutions Pty Ltd is committed to minimising the establishment and spread of eWasps in Australia. We are committed to research and implementing new and improved innovative programs in environmental pest management, this is achieved through improved nest reporting along with insect and arachnid information and identification via both the eWasp mobile app and website.

Notes on Data

Count is the number of European wasp queens trapped and removed from the trap station.
The SQ count is the count day in which the European wasp queen counts were conducted.
European wasp season runs from September through to April.
(eWasp Spring queen survival rate is approx. 30%)

Weather El Niño

El Niño typically means:

- Reduced rainfall
- Warmer temperatures
- Shift in temperature extremes
- Increased frost risk
- Reduced tropical cyclone numbers.
- Later monsoon onset
- Increased fire danger in southeast Australia
- Decreased alpine snow depths[1]

Acronyms

eWasp	European wasp
SQ	Spring Queen
QAPW	Queen Asian paper wasp
JML NR	Jarramlee Nature Reserve

[1] *What is El Niño and what might it mean for Australia? (bom.gov.au)*

Executive Summary Table

- 35 non-chemical lure trap stations were deployed at Jarramlee Grasslands Nature Reserve.
- 115 eWasp queens were trapped and removed from the environment.
- $25,300 in estimated total savings on nest treatments (if all queens produced viable nests).
- Prevented an estimated 460,000 worker wasps impacting the environment (if all eWasp queens produced viable nests).
- Prevented an additional 34,500 next generation eWasp queens from establishing nests (based off 30% survival rate).
- Saved ACT Parks & Conservation Services staff 230 or 29 working days in time spent treating eWasp nests.
- Significantly reduced the use of pesticide required, 23Kg of Permethrin dust, to control established nests in the Jarramlee Grasslands Nature Reserve.
- Vespex is a non-chemical carbohydrate-based lure proved to have low impact on the environment and native species.

2023 saw a total of 115 eWasp spring queen and 37 Asian paper wasp spring queens at Jarramlee Grasslands Nature Reserve.

Directors Comments

Welcome to the European Wasp Spring Queen Trapping Program Report for 2023. The trapping program at Jarramlee Grasslands Nature Reserve was conducted by CoreEnviro Solutions Pty Ltd for ACT Parks & Conservation Services.

Canberra is the bush capital of Australia and has a total of 39 nature reserves in and around Canberra.

Jarramlee Grasslands Nature Reserve, also known as Jarramlee – West MacGregor Grasslands Nature Reserve, sits between the Canberra suburb of McGregor and the New South Wales border. The nature reserve is 145 hectares of protected area and is home to the threatened Golden sun moth. The reserve, with adjacent NSW grasslands, has been reported to contain the second largest population of the Golden Sun Moth in the region.

While CoreEnviro Solutions staff were conducting Alligator weed inspection and control in 2022, on Ginninderra Creek McGregor, there were extremely high numbers of eWasps present on the edge of Jarramlee Grasslands Nature Reserve. The eWasp team from CoreEnviro Solutions Pty Ltd, approached ACT Parks & Conservation Services with a proposal to conduct an eWasp Spring queen trapping program to protect threatened and native species in the reserve, and to reduce the risk of stinging incidents to staff, contractors', and the public who utilise the nature reserve for recreational purposes.

The 2023 spring queen trapping program deployed 35 traps in and around Jarramlee Grassland Nature Reserve. The program used a non-chemical product called Vespex by Sundew, see here for product information.

During the program, another invasive species was caught and removed from the environment, this species was the Asian paper wasp, *Polistes chinensis.* In Tasmania, *t*he Asian paper wasp is a declared pest, and all sightings must be reported to Tasmania Biosecurity.

There were 37 Asian paper wasps, and due to the size of the wasps, we believe they were queens, were trapped and removed from the environment.

The Asian paper wasp is around 1.3 – 2.5 cm in length with a slender body. They are black and yellow in colour and have orange legs and antennae. The Asian paper wasp looks very similar to the European paper wasp, difference is the two distinctive dots on the European paper wasp thorax, behind the head.

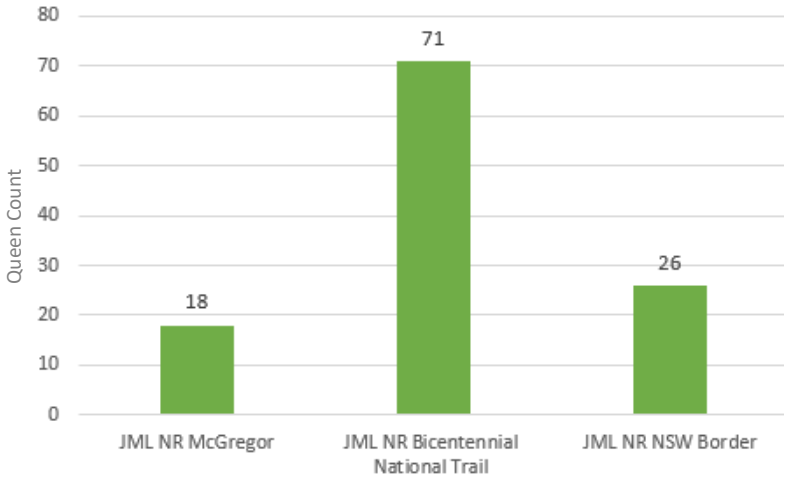
Asian paper wasps can occur at high densities of more than 200 nests per hectare and 6300 wasps per hectare. The potential impact of such high densities of these wasps on native ecosystems is a concern, although the full extent of this impact requires further research. Asian paper wasps prey mainly on invertebrates, especially caterpillars, and are capable of consuming 957g per hectare per season of invertebrate biomass. They also compete with other insects for nectar and honeydew resources[2].

[2] Northland Regional Council New Zealand - Asian paper wasp - Pest control hub - Northland Regional Council (nrc.govt.nz)

Program Results

There were 35 European wasp spring queen traps deployed at Jarramlee Grasslands Nature Reserve. The program ran from 1 October to 24 November 2023.

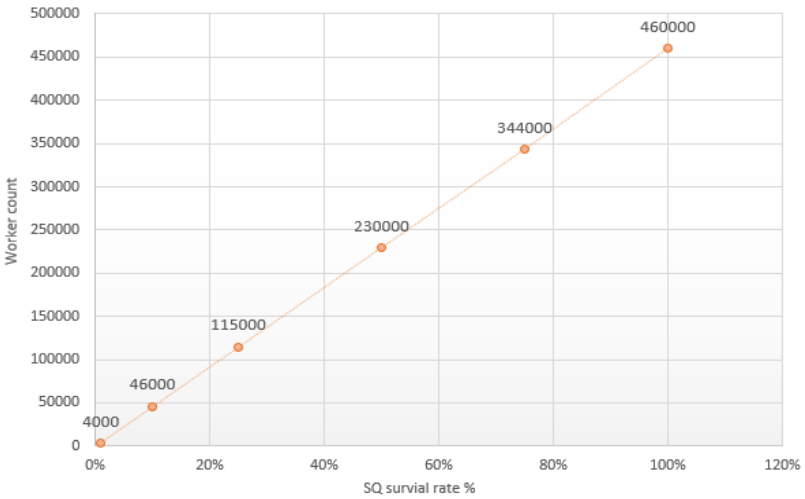
Chart 1 shows the total count by location.



The program was broken up into three (3) areas, Jarramlee Grasslands Nature Reserve McGregor, Jarramlee Grasslands Nature Reserve Bicentennial National Trail, and Jarramlee Grasslands Nature Reserve NSW Border.

The trapping trial was successful in capturing 115 eWasp spring queens with little impact on the environment and native species. By removing the queens from the environment, we have eliminated the potential of 100,000's of invasive wasps impacting the environment at Jarramlee Grasslands Nature Reserve.

Chart 2 shows the worker count by spring queen survival rate.



By removing eWasp spring queens from Jarramlee Grasslands Nature Reserve's environment, it has prevented the possible establishment of 115 nests, that is an estimated 460,000 European worker wasps, and 34,500 next generation queens, (at 30% survival rate), from impacting the environment.

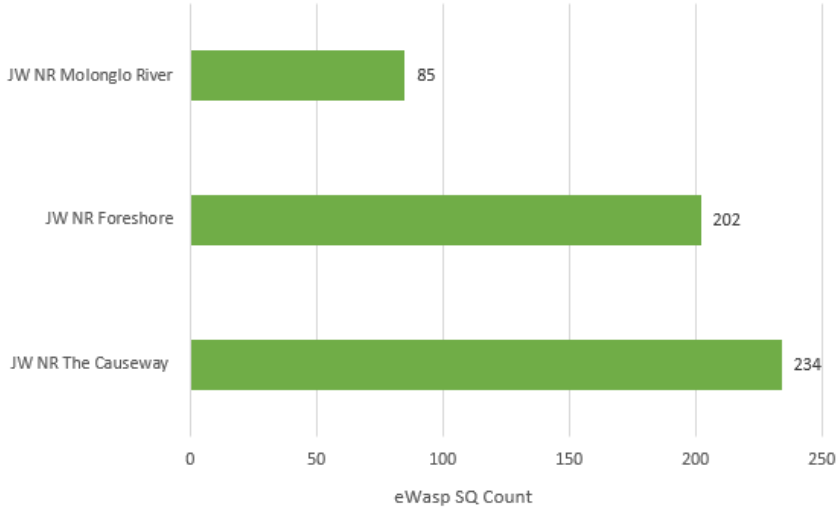
Although the program has been successful in capturing and removing 115 eWasp spring queens from the environment, it is impossible to capture every queen. The queen trapping program by eWasp, CoreEnviro Solutions Pty Ltd, is still in trial phase and further research programs will need to be conducted to improve the trapping program.

Other PCS Program 2023

CoreEnviro Solutions conducted an additional two (2) eWasp spring queen trapping programs for Parks & Conservation Services, Jerrabomberra Wetlands and Tidbinbilla Nature Reserve.

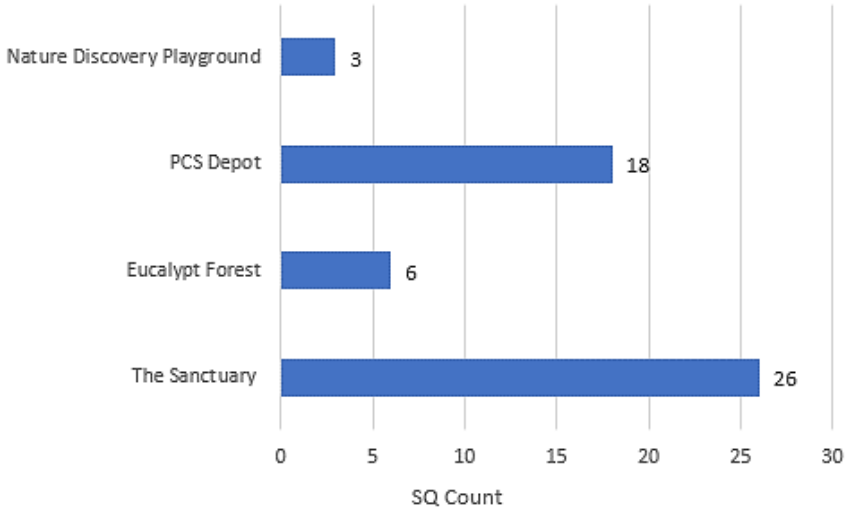
Chart 3 shows the total count by location, Jerrabomberra Wetlands.

The program was broken up into three (3) areas, Jerrabomberra Wetlands, The Causeway had the highest shared of eWasp Spring queens with 45% or 234.



The results for the eWasp spring queen trapping program at Jerrabomberra Wetlands are as follows; there were 22 traps deployed which saw a total of 521 spring queens trapped and removed from the environment, an increase of 353% from 2022.

Chart 4 shows the total count by location, Tidbinbilla Nature Reserve.



The program was broken up into four (4) areas, the Sanctuary had the highest share of eWasp spring queens with 49% or 26.

The results for Tidbinbilla Nature Reserve are as follows; there were 42 traps deployed which saw a total of 53 spring queens trapped and removed from the environment, a decrease of 47% from 2022.

European Wasp Impact

European wasps have a negative impact on our native species and environment. The European wasp has no predators, therefore putting pressure on native species by consuming large amounts of insects which are normally preyed upon by native insects, reptiles, and birds.

The above images are of eWasps foraging on a Kangaroo Carcass at Mulligans Flat Road in Forde, ACT, eWasps foraging on a prey mantis, and eWasps foraging on a Brown snake at Googong Dam, ACT.

Native scavenging animals find it difficult to feed off carcasses due to large numbers of European wasps present on the carcass. Flies have been observed being attacked by European wasps and at times their heads decapitated.

An average European wasp nest can contain an estimated 4,000 wasps during the peak of the season, between February - March, and each nest can produce and additional 1,000 queens at the end of the season; survival rate for spring queens is unknown, Dr Philip Spradbery' s research shows the queen survival rate was around 30%, but further studies would need to be conducted.

Nuisance wasps that forage in large numbers prevent the public from enjoying outdoor areas such as nature reserves, parks, and open spaces, and pose a high risk to public safety.
It is known that European wasp's impact European honey bee hives, they prey on honey bees returning to the hive, rob the hive of honey and attack the brood which weakens the hive. There is no information or evidence that supports they impact native bee hives/species.

A publication in the New Zealand Journal of Zoology, 1991, stated the European wasp's diet consists of Diptera, fly & mosquito species, lepidopteran larvae, caterpillars – moths – butterflies, and arachnids, are also an important food, this was also documented in Europe and North America.

The wasp population at Jarramlee Grasslands Nature Reserve may be impacting the residents of McGregor, including schools and local businesses. Nuisance wasps can prevent the public from enjoying outdoor amenities such as parks and open spaces.

Benefits of a Spring Queen Trapping Program

Treating nests on average for a Ranger can take up to two hours, from set up, to treatment, to waiting for nest activity to settle down. There is also a high risk of a stinging incident occurring.

Tracking European wasps back to a nest is extremely time consuming and does not always pay off; most Rangers don't have the time and capacity for a time-consuming task. Reported European wasp nests on public land are treated by Parkes and Conservation Services, however, there are many nests that go unreported and untreated in the reserves, these nests produce next generation queens which impact the environment.

From the 115 European wasp queens captured and removed from the environment, if all queens captured were to establish nests, 115 nests, the Parks and Conservation Services Ranger would have spent an estimated time of 230 hours or 29 working days treating nests, if a private company were to treat the nests at a cost of $220.00 per nest, the total cost would be $25,300.00.

The European wasp spring queen trapping program has also reduced the quantity of insecticide used at Jarramlee Grasslands Nature Reserve, 23kg of Permethrin dust, which greatly benefits the environment and reduces the cost of purchasing insecticides.

The Vespex lure is a non-chemical carbohydrate that lures and traps European wasp spring queens and has proven very low impact on the environment and native species.

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Data Overview

Weather

Table 1 shows the weather conditions at **Canberra Airport** for the months of October and November 2023.

eWasp Program Weather Conditions		
Statistics	Oct-22	Nov-22
Highest daily	23 °C	26.8°C
Lowest daily	12 °C	12.9 °C
Monthly mean	8.3 °C	20.7 °C
Rainfall	166.2 mm	100.2 mm
Statistics	Oct-23	Nov-23
Highest daily	29.7 °C	33.3 °C
Lowest daily	14 °C	15.8 °C
Monthly mean	21.9 °C	25.5°C
Rainfall	32.6 mm	134.2 mm

Weather data obtained from the Bureau of Meteorology3.

- The weather conditions for October 2023 show an increase for the monthly mean by 164% and a decrease in rainfall by 80%.
- The weather conditions for November 2023 show an increase for the monthly mean by 23% and an increase in rainfall of 34%.

Trap JML 3, McGregor, saw a total of 10% or 11 spring queens removed from the environment.

[3] Australian Capital Territory - Daily Weather Observations (bom.gov.au)

McGregor ACT eWasp Data

Over the last several seasons, the eWasp Team from CoreEnviro Solutions Pty Ltd have identified several hotspot locations in the ACT.

In 2023, one of those hotspot locations/suburbs identified was McGregor, ACT, which may be negatively affecting Jarramlee Grassland Nature Reserve environment or vice versa.

Table 2 shows eWasp data by financial year, for the suburb of McGregor, ACT.

Years	2020/2021	2021/2022	2022/2023
eWasp Nests	23 nests	6 nests	20 nests
eWasp Workers	4 workers	0 workers	0 workers
eWasp Queens	1 queen	3 queens	0 e queens

Table 3 shows the number of eWasp spring queens trapped and removed from the environment by year for the suburb of McGregor, ACT.

Location	2021	2022	Increase/decrease
Macgregor	51	49	4%↓

There were six (6) traps deployed in Macgregor in 2022, the location of the traps were the same GPS locations as the 2021 eWasp queen trapping program; a total of 49 spring queens trapped and removed from the environment during the 2022 trapping program, a decrease of $%.

If the queens survived and established nests, there may have been an estimated 196,000 worker wasps, and an estimated 14,700 next generation queens impacting this area.[4]

[4] Data and information eWasp Spring Queen Trapping Program Report 2022, authored by Christina Bariesheff, CoreEnviro solutions Pty Ltd.

Pre-program Data

There were three (3) pre-program traps deployed and monitored between 30 September - 9 October 2023.

Table 4 shows trap number, trap set up date, GPS coordinates and location/reserve pre-program 2023.

Trap Number	Set-up date	GPS Latitude	GPS Longitude	Location/Reserve
JML 1A	30 September 2023	-35.204547	148.999895	Jarramlee Grasslands NR McGregor
JML 2A	30 September 2023	-35.198803	149.008196	Jarramlee Grasslands NR Bicentennial National Trail
JML 3A	30 September 2023	-35.195506	149.001833	Jarramlee Grasslands NR NSW Border

Table 5 shows the total count of eWasp spring queens by location during the pre-program.

Location & Trap Number	Totals
Jarramlee Grasslands Nature Reserve McGregor 1A	**1**
Jarramlee Grasslands Nature Reserve Bicentennial National Trail 2A	**5**
Jarramlee Grasslands Nature Reserve NSW Border 3A	**2**
Grand Total	**8**

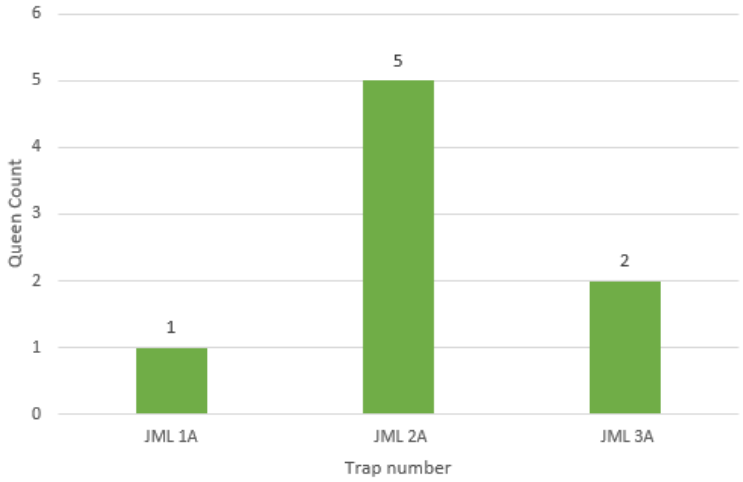


Chart 5 shows Trap JML 2A, Jarramlee Grasslands Nature Reserve Bicentennial National Trail, had the highest count of eWasp spring queens with 62% or 5.

Table 6 shows the count of eWasp spring queens by trap number and count number pre-program, 2023.

Trap Number	SQ Count 1	SQ Count 2	Totals
JML 1A McGregor	0	1	**1**
JML 2A Bicentennial National Trail	4	1	**5**
JML 3A NSW Border	2	0	**2**
Grand Total	**6**	**2**	**8**

Pre-program Results

Previous years data in other locations around the ACT, showed commencing the program in the month of October produced more successful programs. With an El Niño year upon us in 2023, it was difficult to gage the optimum time to deploy traps, therefore, 3 pre-program traps were initially deployed to monitor activity in the area prior to commencing a full program.

There were three (3) traps deployed at Macgregor, Bicentennial National Trail, and the NSW Border. The traps had a total of 8 spring queens trapped and removed from the environment during the pre-program period.

If all queens survived and established nests, there may have been an estimated 32,000 worker wasps, and an estimated 9,600 next generation queens impacting the environment and surrounding areas.

With the combination of dryer and warmer weather conditions forecast, and the data prediction, we believe 2023/2024 may be a peak eWasp season.

Trap JML 3A, NSW Border pre-program, saw a total of 22% or 2 spring queens removed from the environment.

Trap Locations

The trapping program was broken up into three (3) areas, locations below. The program traps were deployed and monitored between 9 October - 24 November 2023.

- Jarramlee Grasslands Nature Reserve McGregor
  Traps JML 1 - 3
- Jarramlee Grasslands Nature Reserve Bicentennial National Trail
  Traps JML 4 - 19
- Jarramlee Grasslands Nature Reserve NSW Border
  Traps JML 20 - 35

eWasp Spring Queen Trap locations at Jarramlee Grasslands Nature Reserve.

Program Data

Table 7 shows trap number, trap set up date, GPS coordinates and location/reserve 2023.

Trap Number	Set-up date	GPS Latitude	GPS Longitude	Location/Reserve
JML 1	9 October 2023	-35.2037655	149.0113013	JML NR McGregor
JML 2	9 October 2023	-35.20164533	149.0092893	JML NR McGregor
JML 3	9 October 2023	-35.19883468	149.0081588	JML NR McGregor
JML 4	9 October 2023	-35.19875715	149.0072076	JML NR Bicentennial National Trail
JML 5	9 October 2023	-35.1990303	149.0062903	JML NR Bicentennial National Trail
JML 6	9 October 2023	-35.19934592	149.0054601	JML NR Bicentennial National Trail
JML 7	9 October 2023	-35.19961057	149.0045975	JML NR Bicentennial National Trail
JML 8	9 October 2023	-35.19989002	149.0037311	JML NR Bicentennial National Trail
JML 9	9 October 2023	-35.20020098	149.0026261	JML NR Bicentennial National Trail
JML 10	9 October 2023	-35.20031659	149.0016266	JML NR Bicentennial National Trail
JML 11	9 October 2023	-35.20046371	149.0007271	JML NR Bicentennial National Trail
JML 12	9 October 2023	-35.20089083	148.9999442	JML NR Bicentennial National Trail
JML 13	9 October 2023	-35.20156807	148.9996284	JML NR Bicentennial National Trail
JML 14	9 October 2023	-35.20232338	148.9997487	JML NR Bicentennial National Trail
JML 15	9 October 2023	-35.20309732	148.9998674	JML NR Bicentennial National Trail
JML 16	9 October 2023	-35.20362715	148.9992606	JML NR Bicentennial National Trail
JML 17	9 October 2023	-35.20427205	148.9987362	JML NR Bicentennial National Trail
JML 18	9 October 2023	-35.20458928	148.9977702	JML NR Bicentennial National Trail
JML 19	9 October 2023	-35.20502076	148.9971067	JML NR Bicentennial National Trail
JML 20	9 October 2023	-35.19547105	149.0018174	JML NR NSW Border
JML 21	9 October 2023	-35.19572613	149.0006104	JML NR NSW Border
JML 22	9 October 2023	-35.19623464	149.0002322	JML NR NSW Border
JML 23	9 October 2023	-35.19830263	149.0011485	JML NR NSW Border

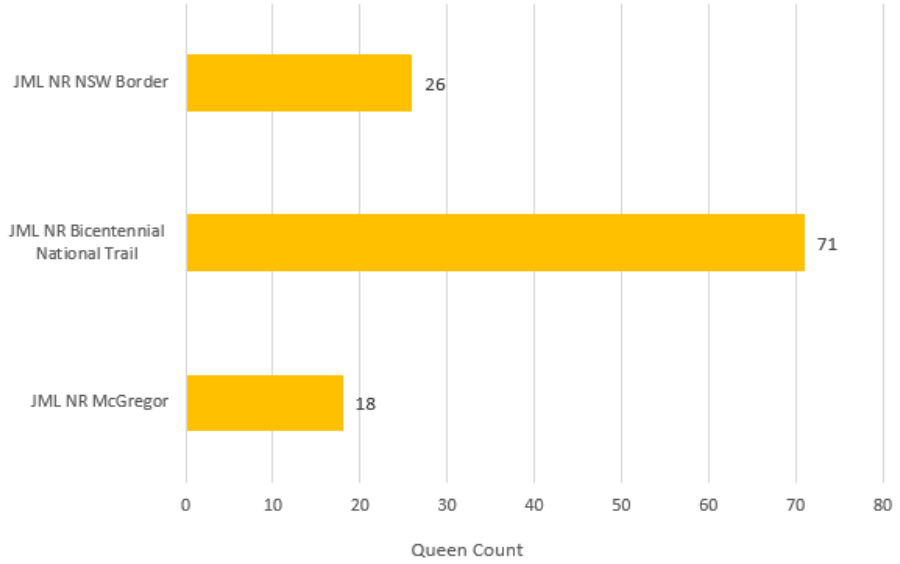
Trap Number	Set-up date	GPS Latitude	GPS Longitude	Location/Reserve
JML 24	9 October 2023	-35.19741439	148.9993598	JML NR NSW Border
JML 25	9 October 2023	-35.19795057	148.9991023	JML NR NSW Border
JML 26	9 October 2023	-35.19870482	148.9986061	JML NR NSW Border
JML 27	9 October 2023	-35.19922948	148.9980264	JML NR NSW Border
JML 28	9 October 2023	-35.19985851	148.9975882	JML NR NSW Border
JML 29	9 October 2023	-35.20042426	148.9969626	JML NR NSW Border
JML 30	9 October 2023	-35.20104836	148.9962498	JML NR NSW Border
JML 31	9 October 2023	-35.20145876	148.9952775	JML NR NSW Border
JML 32	9 October 2023	-35.20153245	148.9944507	JML NR NSW Border
JML 33	9 October 2023	-35.20174258	148.9934609	JML NR NSW Border
JML 34	9 October 2023	-35.20066097	148.9939712	JML NR NSW Border
JML 35	9 October 2023	-35.20017495	148.9943518	JML NR NSW Border

Trap JML 2A, McGregor, pre-program saw a total of 63% or 5 spring queens removed from the environment.

Table 8 shows the total count by location.

Location	Totals
Jarramlee Grasslands Nature Reserve McGregor	**17**
Jarramlee Grasslands Nature Reserve Bicentennial National Trail	**66**
Jarramlee Grasslands Nature Reserve NSW border	**24**
Grand Total	**107**

Jarramlee Nature Reserve Bicentennial National Trail had the highest count of eWasp queens with 62% or 66.



JML Bicentennial National Trail had the highest total count of eWasp spring queen with 61% or 71, followed by JML NR NSW Border with 23% or 26 and JML NR McGregor with 16% or 18.

Table 9 shows the count of eWasp spring queens by location, trap number and location.

Location & eWasp SQ Trap Number	Totals
Jarramlee Grasslands Nature Reserve - McGregor	**17**
JML 1	3
JML 2	3
JML 3	11
Jarramlee Grasslands Nature Reserve - Bicentennial National Trail	**66**
JML 10	2
JML 11	3
JML 12	0
JML 13	2
JML 14	4
JML 15	4
JML 16	5
JML 17	1
JML 18	0
JML 19	1
JML 4	8
JML 5	12
JML 6	7
JML 7	0
JML 8	11
JML 9	6
Jarramlee Grasslands Nature Reserve - NSW border	**24**
JML 20	0
JML 21	0
JML 22	1
JML 23	0
JML 24	16
JML 25	0
JML 26	4
JML 27	0
JML 28	1
JML 29	2
JML 30	0
JML 31	0
JML 32	0
JML 33	0
JML 34	0
JML 35	0
Grand Total	**107**

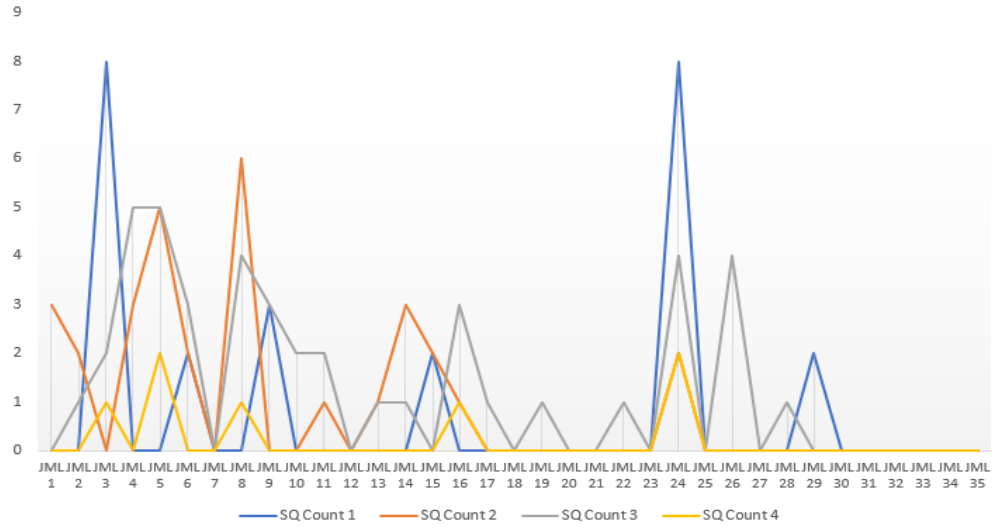
Trap JML 24 had the highest number of eWasp spring queens with 15% or 16.

Table 10 shows the count of eWasp spring queens by trap number and count number, 2023.

Trap Number	SQ Count 1	SQ Count 2	SQ Count 3	SQ Count 4	Totals
JML 1	0	3	0	0	**3**
JML 2	0	2	1	0	**3**
JML 3	8	0	2	1	**11**
JML 4	0	3	5	0	**8**
JML 5	0	5	5	2	**12**
JML 6	2	2	3	0	**7**
JML 7	0	0	0	0	**0**
JML 8	0	6	4	1	**11**
JML 9	3	0	3	0	**6**
JML 10	0	0	2	0	**2**
JML 11	0	1	2	0	**3**
JML 12	0	0	0	0	**0**
JML 13	0	1	1	0	**2**
JML 14	0	3	1	0	**4**
JML 15	2	2	0	0	**4**
JML 16	0	1	3	1	**5**
JML 17	0	0	1	0	**1**
JML 18	0	0	0	0	**0**
JML 19	0	0	1	0	**1**
JML 20	0	0	0	0	**0**
JML 21	0	0	0	0	**0**
JML 22	0	0	1	0	**1**
JML 23	0	0	0	0	**0**
JML 24	8	2	4	2	**16**
JML 25	0	0	0	0	**0**
JML 26	0	0	4	0	**4**
JML 27	0	0	0	0	**0**
JML 28	0	0	1	0	**1**
JML 29	2	0	0	0	**2**
JML 30	0	0	0	0	**0**
JML 31	0	0	0	0	**0**
JML 32	0	0	0	0	**0**
JML 33	0	0	0	0	**0**
JML 34	0	0	0	0	**0**
JML 35	0	0	0	0	**0**
Grand Total	**25**	**31**	**44**	**7**	**107**

SQ Count 3 had the highest count of eWasp spring queens with 41% or 44.

Chart 6 shows the count of eWasp spring queens from the first to fourth count.



SQ Count 3 had the highest number of eWasp spring queens with 41% or 44, followed by SQ Count 2 with 29% or 31.

Trap JML 11, Bicentennial National Trail, pre-program saw a total of 3% or 3 spring queens removed from the environment.

The image shows 2 Asian paper wasps in Trap JML 11.

Asian Paper Wasp Data

During the 2023 eWasp Spring Queen Trapping program, more than half, 60%, of the traps caught Asian paper wasp queens, *Polistes chinensis*.

2023 Asian Paper Wasp Count

Trap Number	Totals
JML 1	**1**
JML 3	**2**
JML 4	**2**
JML 5	**1**
JML 7	**2**
JML 8	**1**
JML 9	**1**
JML 10	**1**
JML 11	**2**
JML 12	**1**
JML 13	**3**
JML 14	**2**
JML 15	**1**
JML 16	**3**
JML 17	**3**
JML 18	**2**
JML 19	**2**
JML 20	**2**
JML 23	**2**
JML 29	**1**
JML 34	**2**
Total	**37**

There was a total of 37 Asian paper wasps, believe to be queens.

Nests can produce several next generation queens, that may be a handful, several dozen, or more, depending on factors environmental conditions, and the health and size of the colony. More research needs to be conducted.

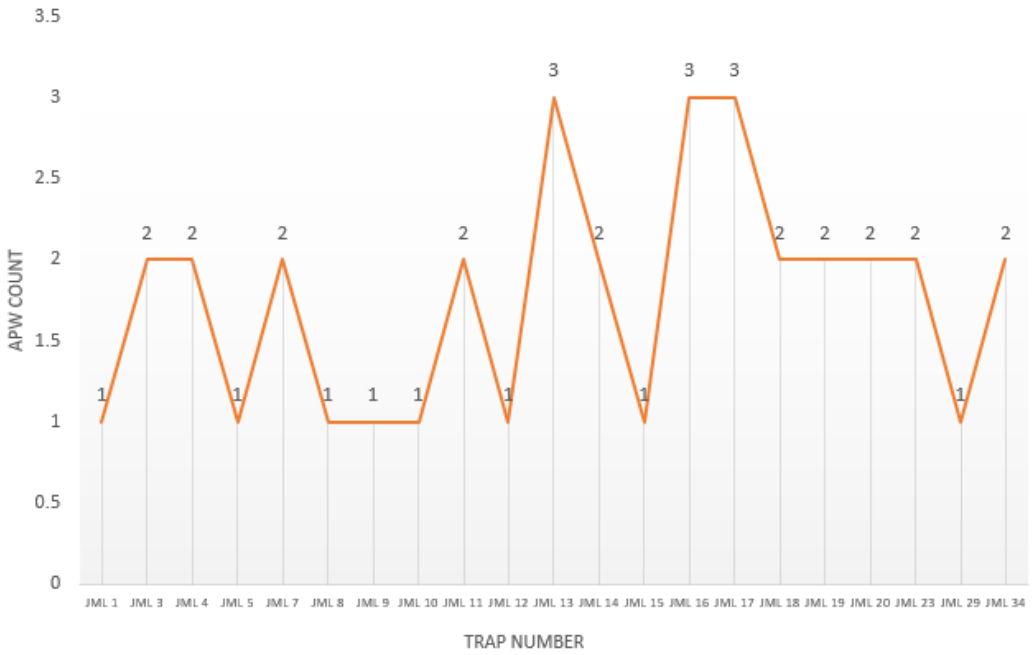
Table 11 shows the count of Asian paper wasps by trap number and count number.

Trap Number	APWQ Count 1	APWQ Count 2	APWQ Count 3	APWQ Count 4	Totals
JML 1	0	1	0	0	**1**
JML 10	0	1	0	0	**1**
JML 11	0	2	0	0	**2**
JML 12	0	0	1	0	**1**
JML 13	0	2	1	0	**3**
JML 14	0	0	2	0	**2**
JML 15	1	0	0	0	**1**
JML 16	0	1	1	1	**3**
JML 17	0	3	0	0	**3**
JML 18	0	2	0	0	**2**
JML 19	1	1	0	0	**2**
JML 20	2	0	0	0	**2**
JML 23	1	1	0	0	**2**
JML 29	1	0	0	0	**1**
JML 3	0	0	0	2	**2**
JML 34	2	0	0	0	**2**
JML 4	1	1	0	0	**2**
JML 5	0	1	0	0	**1**
JML 7	1	1	0	0	**2**
JML 8	0	0	1	0	**1**
JML 9	1	0	0	0	**1**
Grand Total	**11**	**17**	**6**	**3**	**37**

Count 2 shows the highest number of Asian paper wasps with 46% or 17.

Trap JML 20, NSW Border, saw 5% or 2 Asian paper wasps removed from the environment.

Chart 7 shows the total count of Asian paper wasps by trap number.



Results

There were 37 queen Asian paper wasp *Polistes chinensis* caught and removed from the environment.

If the queens were to survive and establish nests, based on 50 wasps per nest, there would be an estimated 1,850 workers impacting the environment and based on 10 spring queens per nest, there would be an additional estimated 370 next generation queens.

There is no research or reports of the Asian paper wasp and the potential impact on native ecosystems in Australia. Further research is required on the Asian paper wasp; what they are praying on in nature reserves and the extent of the impact they are having on native ecosystems.

eWasp Reporting

The eWasp mobile app is available free at both app stores.

The eWasp Research Programs & Information Centre monitors the distribution of invasive species through data collection to create programs with the aim of protecting native and endangered species.

eWasp|CoreEnviro Solutions main objective is to save native and endangered species. We are committed to educating the public on invasive and beneficial species, and through education, we believe we have saved numerous native species.

The eWasp mobile app is an easy-to-use GPS mapping tool that allows the user to report a European wasp (eWasp) nest or sighting, honey bee hive or swarm, and coming soon Fire ant nest or sighting by dropping a location pin on public, commercial & residential land.

eWasp Mobile App - eWasp

Reporting via the eWasp app enables us to monitor the distribution of invasive species and conduct research and monitoring programs where needed.

Results by Location

Jarramlee Grasslands Nature Reserve McGregor

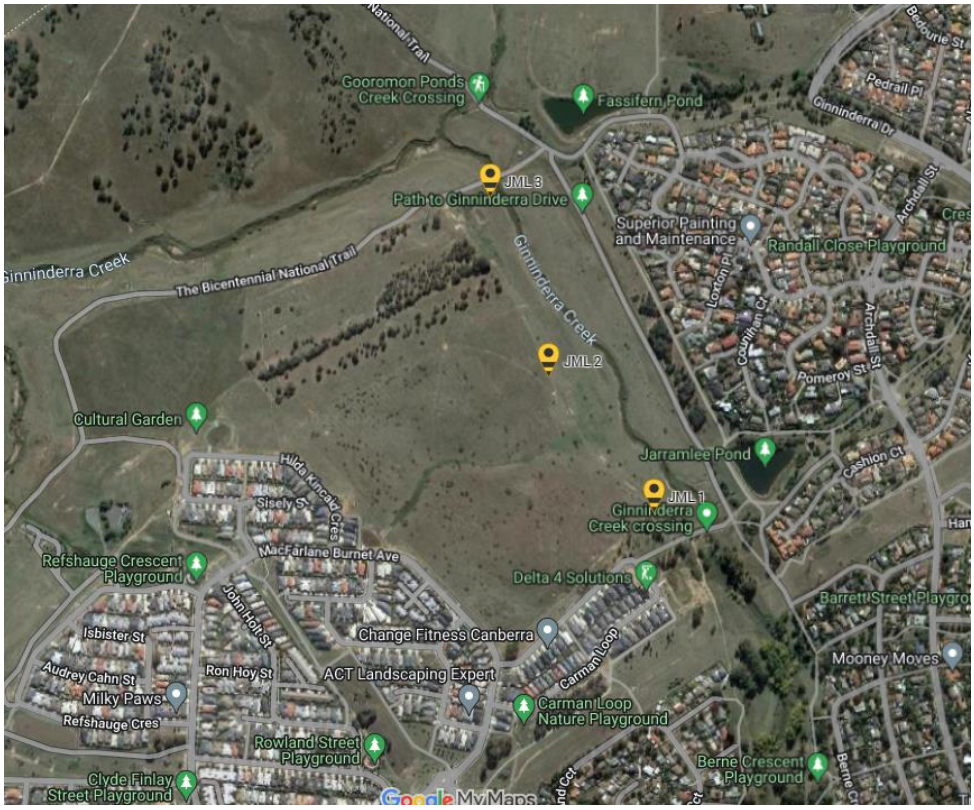
Background

Jarramlee Grasslands Nature Reserve McGregor is near a residential area. The reserve is utilised by the public for recreational Purposes. The suburb McGregor was identified as a hotspot area in 2023. The suburb has open spaces, takeaways, cafes, and a primary school.

2023 eWasp Spring Queen Trap Location

Trap Number	GPS Latitude	GPS Longitude	Location/Reserve
JML 1	-35.2037655	149.0113013	Jarramlee Grasslands Nature Reserve McGregor
JML 2	-35.20164533	149.0092893	Jarramlee Grasslands Nature Reserve McGregor
JML 3	-35.19883468	149.0081588	Jarramlee Grasslands Nature Reserve McGregor

Mapped Traps



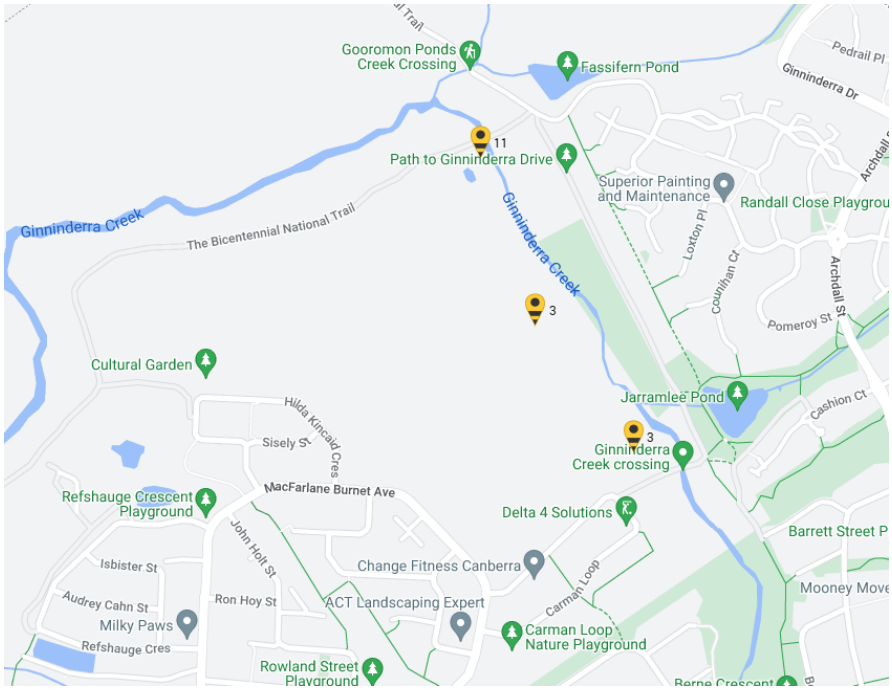
Traps JML 2 – JML 3 were deployed at Jarramlee Grasslands Nature Reserve, McGregor.

2023 eWasp Spring Queen Count

Trap Number	SQ Count 1	SQ Count 2	SQ Count 3	SQ Count 4	Totals
JML 1	0	3	0	0	**3**
JML 2	0	2	1	0	**3**
JML 3	8	0	2	1	**11**
	Total Number of eWasp Spring Queens				**17**

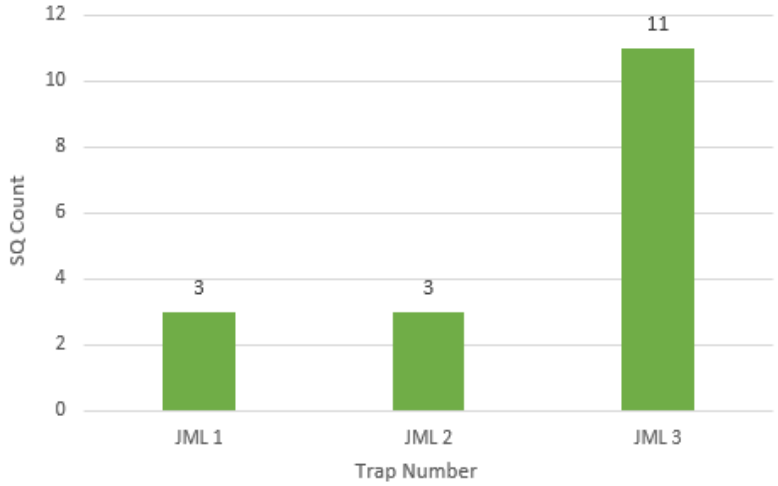
Mapped Counts

Mapped traps with counts.



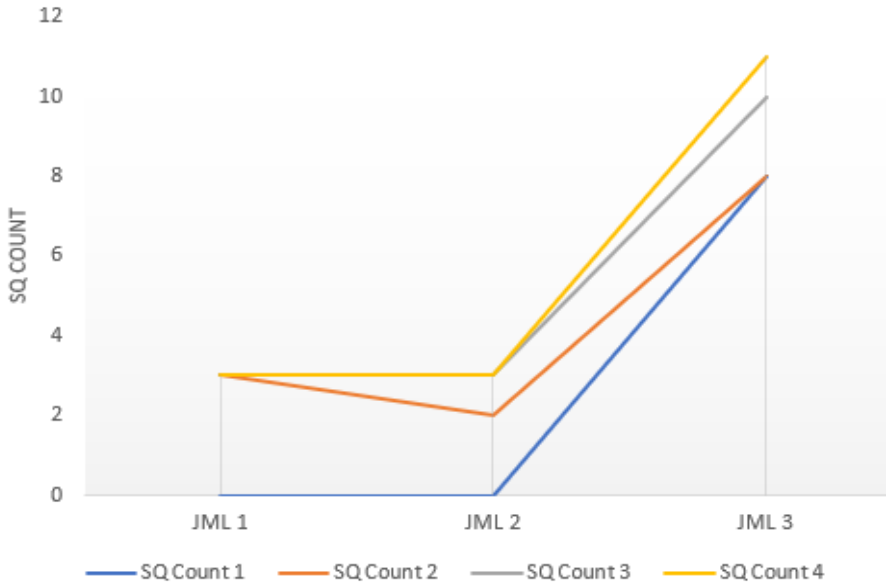
Results

Chart 8 shows the total count by trap number.



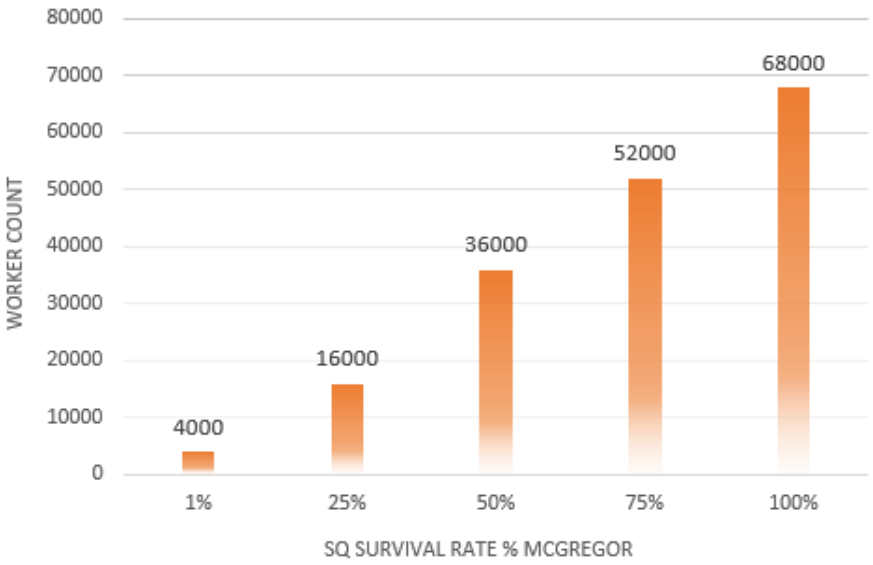
There were three (3) traps deployed at Jarramlee Grasslands Nature Reserve McGregor, which had a total of 17 spring queens trapped and removed from the environment during the program period.

Chart 9 shows the count by trap number and count number.



Of the 17 eWasp spring queens trapped and removed from the environment, JML 3 had the highest count with 65% or 11.

Chart 10 shows the worker count by spring queen survival rate.



If all queens survived and established nests, there may have been an estimated 68,000 worker wasps and an estimated 5,100 next generation queens impacting the environment and surrounding areas.

Jarramlee Grasslands Nature Reserve Bicentennial National Trail

Background

Jarramlee Grasslands Nature Reserve Bicentennial National Trail is a heavily utilised track by the public and their pets for recreational purposes. The area borders a residential area, the suburb of McGregor.

2023 eWasp Spring Queen Location

Trap Number	GPS Latitude	GPS Longitude	Location
JML 4	-35.19875715	149.0072076	Jarramlee Grasslands Nature Reserve Bicentennial National Trail
JML 5	-35.1990303	149.0062903	Jarramlee Grasslands Nature Reserve Bicentennial National Trail
JML 6	-35.19934592	149.0054601	Jarramlee Grasslands Nature Reserve Bicentennial National Trail
JML 7	-35.19961057	149.0045975	Jarramlee Grasslands Nature Reserve Bicentennial National Trail
JML 8	-35.19989002	149.0037311	Jarramlee Grasslands Nature Reserve Bicentennial National Trail
JML 9	-35.20020098	149.0026261	Jarramlee Grasslands Nature Reserve Bicentennial National Trail
JML 10	-35.20031659	149.0016266	Jarramlee Grasslands Nature Reserve Bicentennial National Trail
JML 11	-35.20046371	149.0007271	Jarramlee Grasslands Nature Reserve Bicentennial National Trail
JML 12	-35.20089083	148.9999442	Jarramlee Grasslands Nature Reserve Bicentennial National Trail
JML 13	-35.20156807	148.9996284	Jarramlee Grasslands Nature Reserve Bicentennial National Trail
JML 14	-35.20232338	148.9997487	Jarramlee Grasslands Nature Reserve Bicentennial National Trail
JML 15	-35.20309732	148.9998674	Jarramlee Grasslands Nature Reserve Bicentennial National Trail
JML 16	-35.20362715	148.9992606	Jarramlee Grasslands Nature Reserve Bicentennial National Trail
JML 17	-35.20427205	148.9987362	Jarramlee Grasslands Nature Reserve Bicentennial National Trail
JML 18	-35.20458928	148.9977702	Jarramlee Grasslands Nature Reserve Bicentennial National Trail
JML 19	-35.20502076	148.9971067	Jarramlee Grasslands Nature Reserve Bicentennial National Trail

Mapped Traps

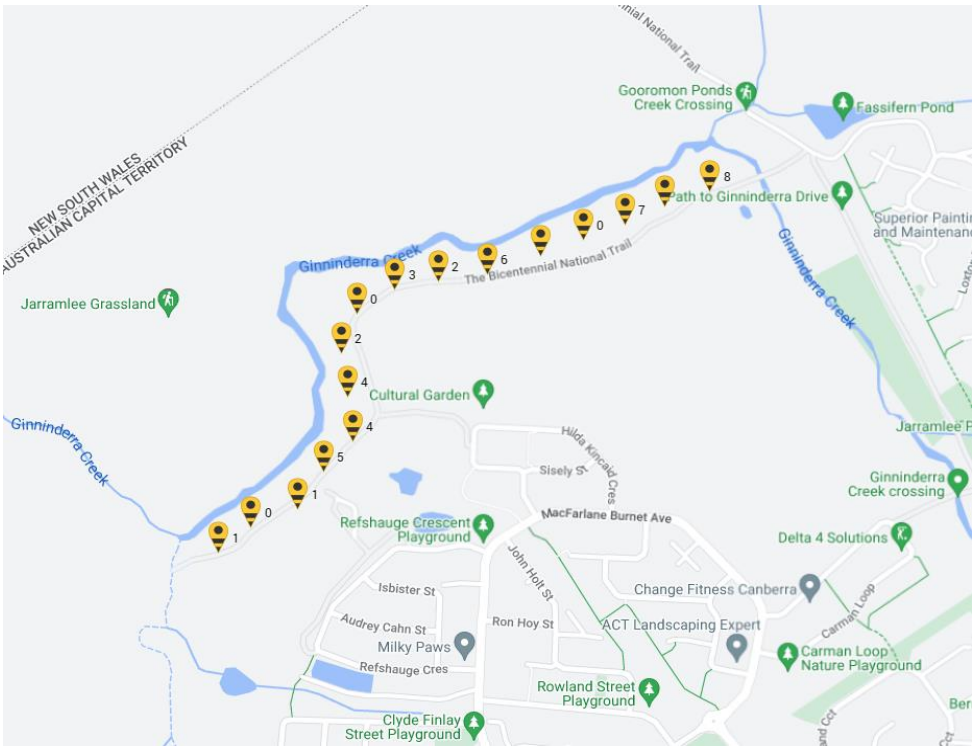
Traps JML 4 – JML 19 were deployed at Jarramlee Grasslands Nature Reserve, Bicentennial National Trail.

2023 eWasp Spring Queen Count

Trap Number	SQ Count 1	SQ Count 2	SQ Count 3	SQ Count 4	Totals
JML 4	0	3	5	0	**8**
JML 5	0	5	5	2	**12**
JML 6	2	2	3	0	**7**
JML 7	0	0	0	0	**0**
JML 8	0	6	4	1	**11**
JML 9	3	0	3	0	**6**
JML 10	0	0	2	0	**2**
JML 11	0	1	2	0	**3**
JML 12	0	0	0	0	**0**
JML 13	0	1	1	0	**2**
JML 14	0	3	1	0	**4**
JML 15	2	2	0	0	**4**
JML 16	0	1	3	1	**5**
JML 17	0	0	1	0	**1**
JML 18	0	0	0	0	**0**
JML 19	0	0	1	0	**1**
	Total Number of eWasp Spring Queens				**66**

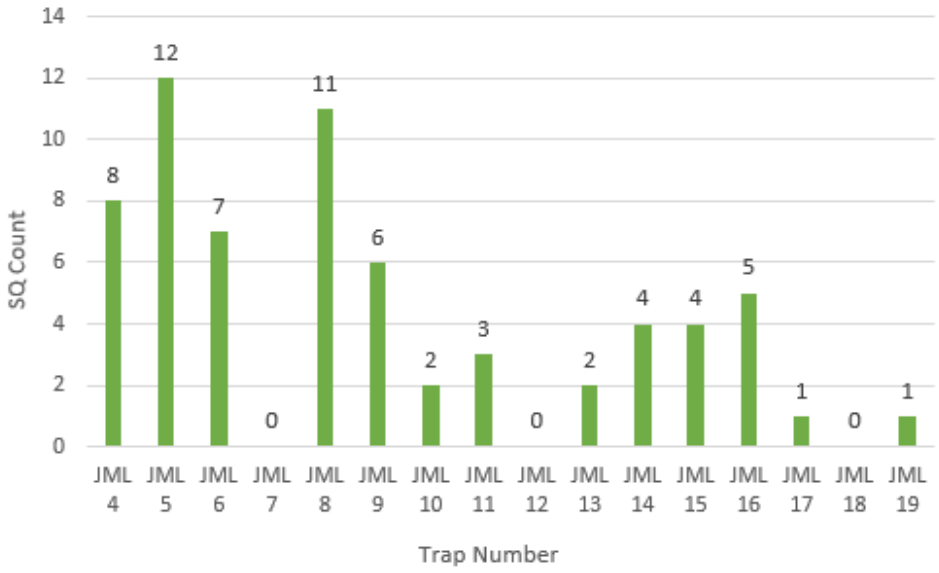
Mapped Counts

Mapped traps with counts.



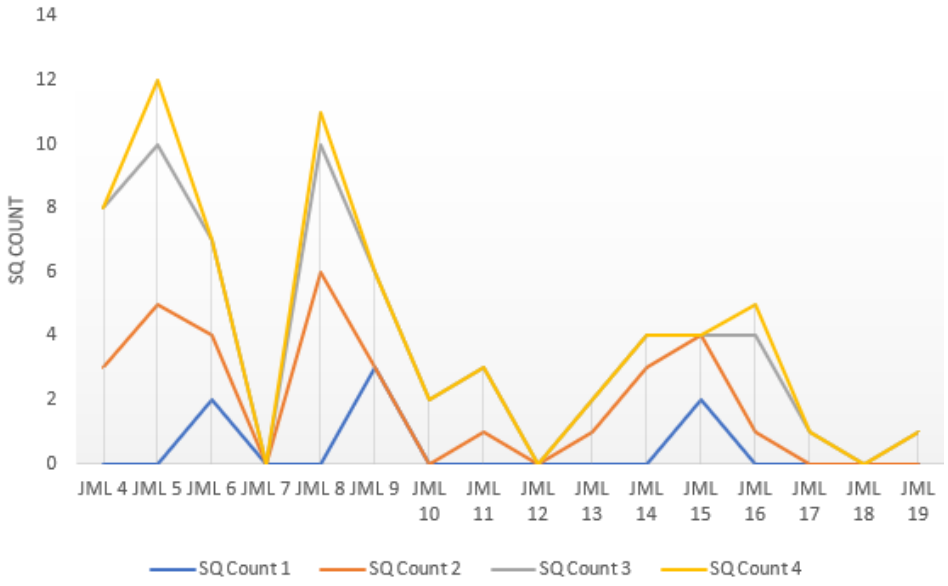
Results

Chart 11 shows the count by trap number.



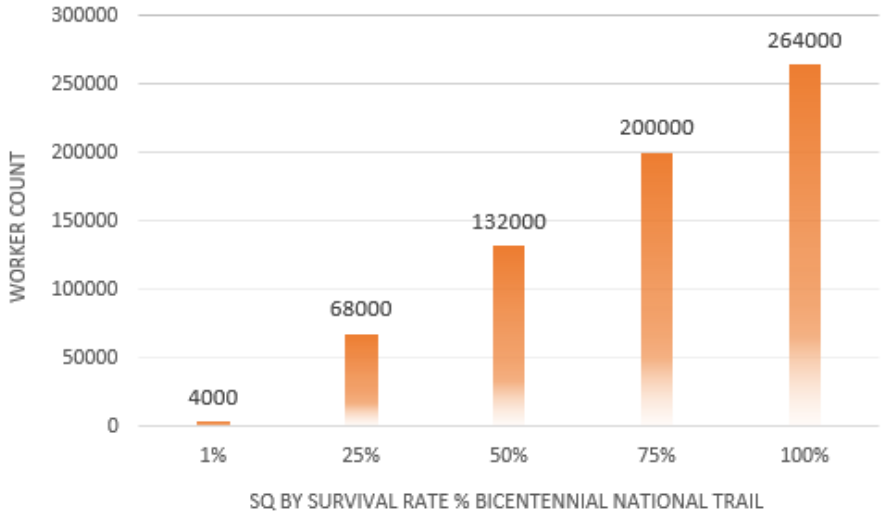
There were sixteen (16) traps deployed at Jarramlee Grasslands Nature Reserve Bicentennial National Trail, which had a total of 66 spring queens trapped and removed from the environment during the program period.

Chart 12 shows the count by trap number and count number.



Of the total of 66 eWasp spring queens trapped and removed from the environment, JML 5 had the highest count with 18% or 12.

Chart 13 shows the worker count by spring queen survival rate.



If all queens survived and established nests, there may have been an estimated 264,000 worker wasps and an estimated 19,800 next generation queens impacting the environment and surrounding areas.

Jarramlee Grasslands Nature Reserve NSW Border

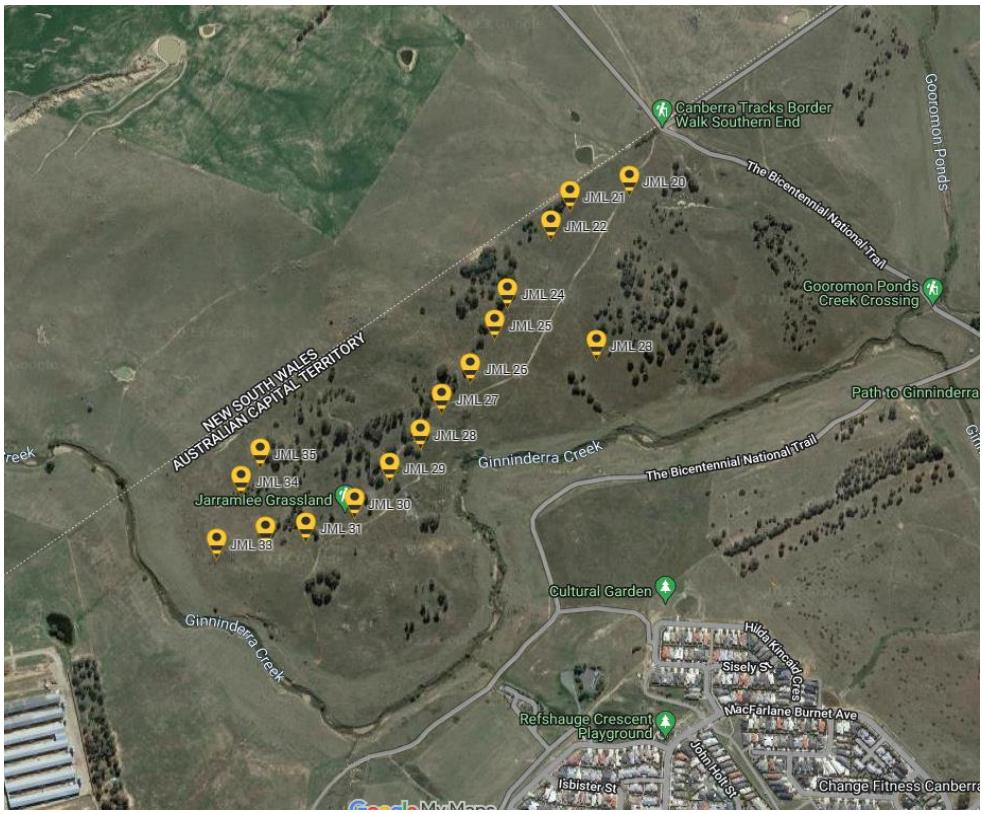
Background

Jarramlee Grasslands Nature Reserve NSW Border is on the boarder of a private property. This part of the reserve is not open to the public due to the significance of the site. It is home to one of the highest recorded numbers of the Golden Sun Moth *Synemon plana* in the region. It is also home to the rare endemic Raspy Cricket, *Cooraboorama Canberrae*.

2023 eWasp Spring Queen Location

Trap Number	GPS Latitude	GPS Longitude	Location
JML 20	-35.19547105	149.0018174	Jarramlee Grasslands Nature Reserve NSW Border
JML 21	-35.19572613	149.0006104	Jarramlee Grasslands Nature Reserve NSW Border
JML 22	-35.19623464	149.0002322	Jarramlee Grasslands Nature Reserve NSW Border
JML 23	-35.19830263	149.0011485	Jarramlee Grasslands Nature Reserve NSW Border
JML 24	-35.19741439	148.9993598	Jarramlee Grasslands Nature Reserve NSW Border
JML 25	-35.19795057	148.9991023	Jarramlee Grasslands Nature Reserve NSW Border
JML 26	-35.19870482	148.9986061	Jarramlee Grasslands Nature Reserve NSW Border
JML 27	-35.19922948	148.9980264	Jarramlee Grasslands Nature Reserve NSW Border
JML 28	-35.19985851	148.9975882	Jarramlee Grasslands Nature Reserve NSW Border
JML 29	-35.20042426	148.9969626	Jarramlee Grasslands Nature Reserve NSW Border
JML 30	-35.20104836	148.9962498	Jarramlee Grasslands Nature Reserve NSW Border
JML 31	-35.20145876	148.9952775	Jarramlee Grasslands Nature Reserve NSW Border
JML 32	-35.20153245	148.9944507	Jarramlee Grasslands Nature Reserve NSW Border
JML 33	-35.20174258	148.9934609	Jarramlee Grasslands Nature Reserve NSW Border
JML 34	-35.20066097	148.9939712	Jarramlee Grasslands Nature Reserve NSW Border
JML 35	-35.20017495	148.9943518	Jarramlee Grasslands Nature Reserve NSW Border

Mapped Traps



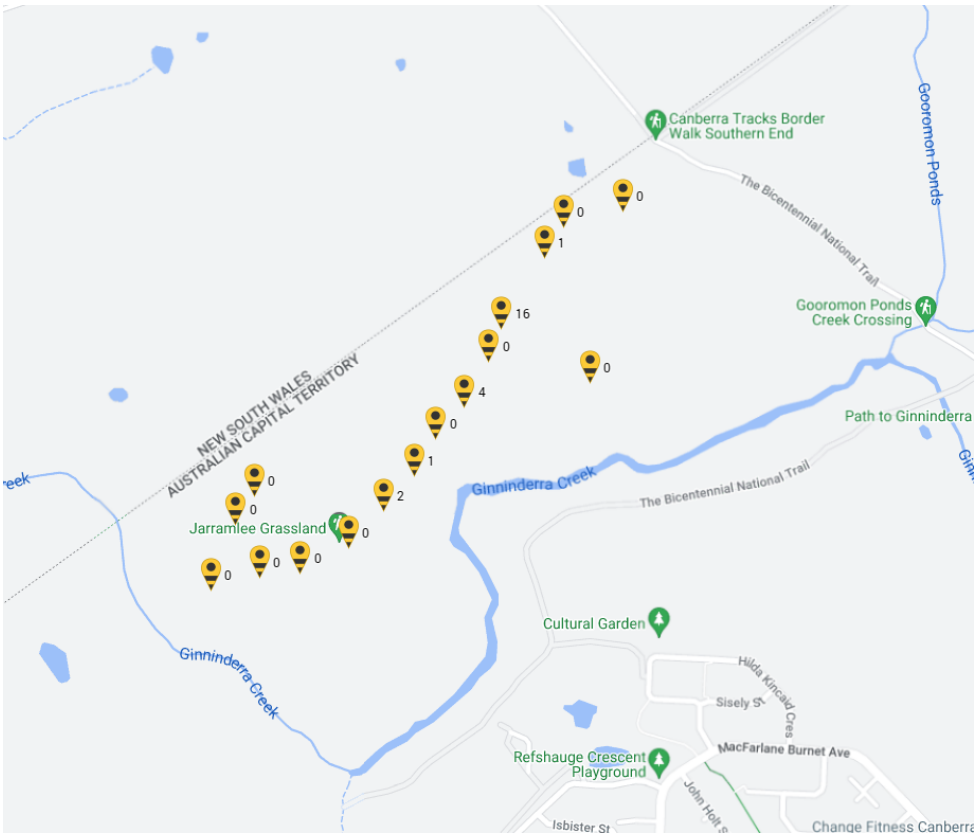
Traps JML 20 – JML 35 were deployed at Jarramlee Grasslands Nature Reserve, NSW Border

2023 eWasp Spring Queen Count

Trap Number	SQ Count 1	SQ Count 2	SQ Count 3	SQ Count 4	Totals
JML 20	0	0	0	0	**0**
JML 21	0	0	0	0	**0**
JML 22	0	0	1	0	**1**
JML 23	0	0	0	0	**0**
JML 24	8	2	4	2	**16**
JML 25	0	0	0	0	**0**
JML 26	0	0	4	0	**4**
JML 27	0	0	0	0	**0**
JML 28	0	0	1	0	**1**
JML 29	2	0	0	0	**2**
JML 30	0	0	0	0	**0**
JML 31	0	0	0	0	**0**
JML 32	0	0	0	0	**0**
JML 33	0	0	0	0	**0**
JML 34	0	0	0	0	**0**
JML 35	0	0	0	0	**0**
	Total Number of eWasp Spring Queens				**24**

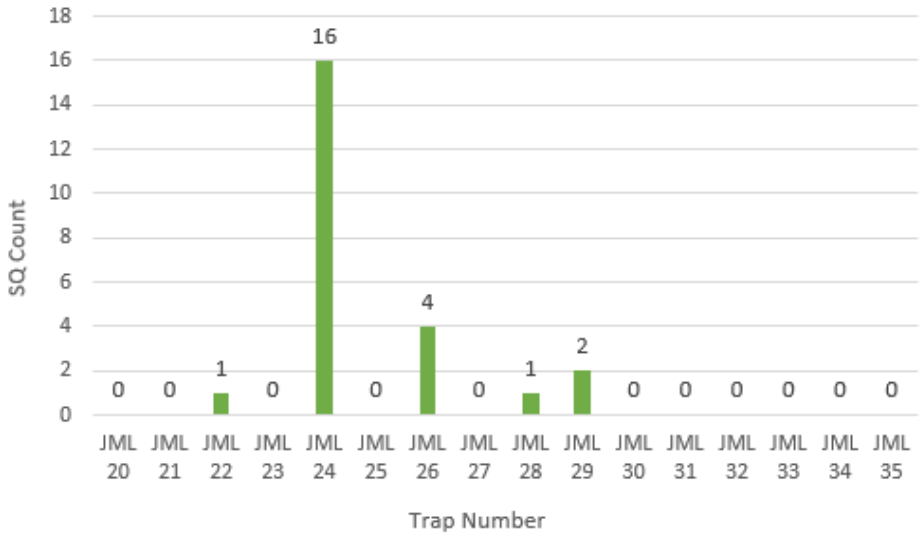
Mapped Counts

Mapped traps with counts.



Results

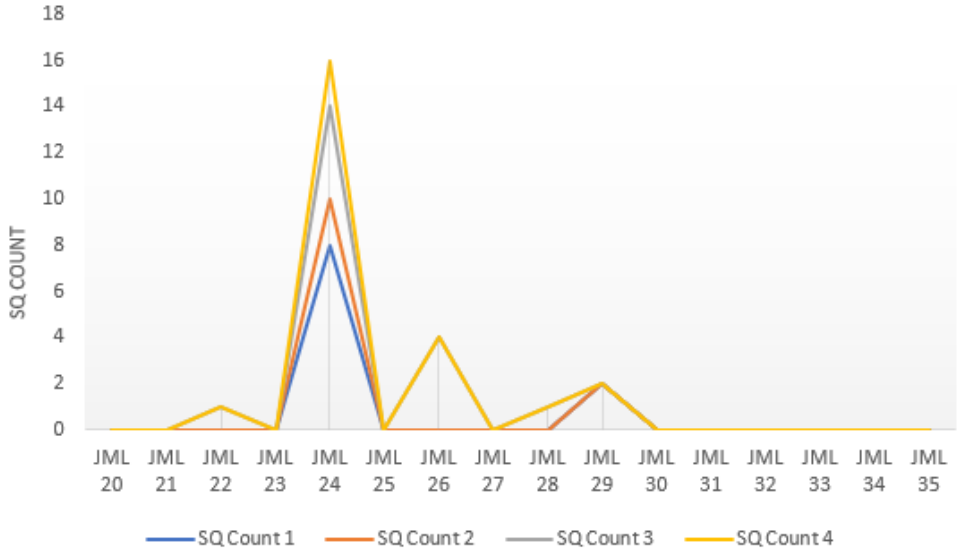
Chart 14 shows the count by trap number.



Note: Traps 30 – 35 had zero counts for counts 1, 2 & 3. This was due to the traps being located on the ground on those count days; this may have been due to an animal trying to get to the lure.

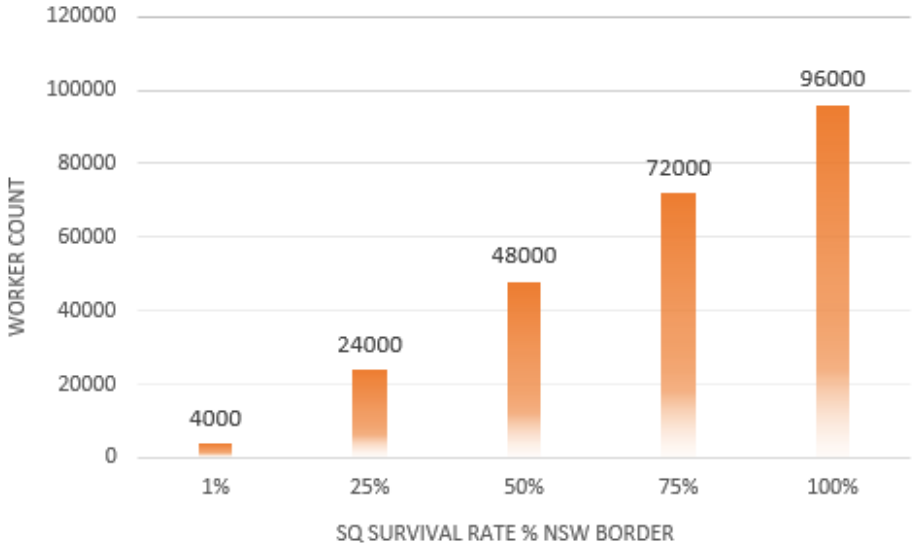
There were sixteen (16) traps deployed at Jarramlee Grasslands Nature Reserve NSW Border, which had a total of 24 spring queens trapped and removed from the environment during the program period.

Chart 15 shows the count by trap number and count number.



Of the total of 24 eWasp spring queens trapped and removed from the environment JML 24 had the highest count of eWasp spring queens with 67% or 16.

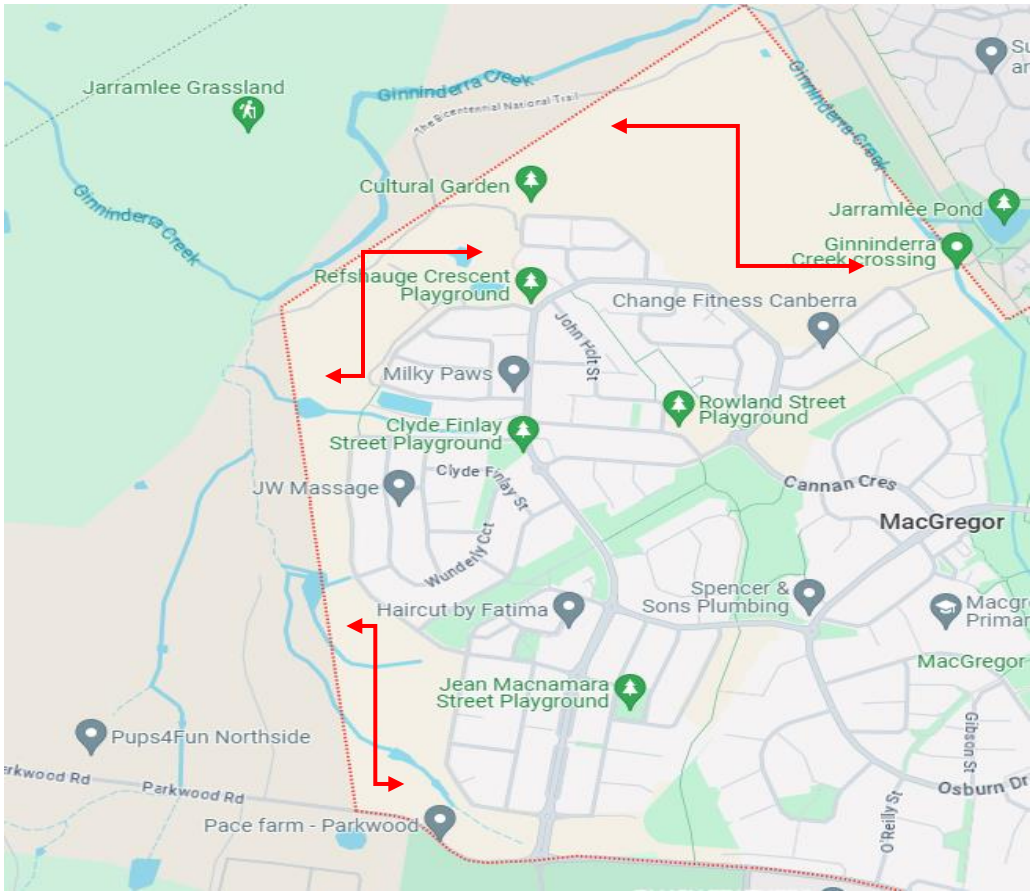
Chart 16 shows the worker count by spring queen survival rate.



If all queens survived and established nests, there may have been an estimated 96,000 worker wasps and an estimated 7,200 next generation queens impacting the environment and surrounding areas.

Recommendation

From late January to March 2024, the eWasp population and activity should be high and noticeable, therefore, an inspection to identify and treat nests in Jarramlee Grasslands Nature Reserve is recommended. This will prevent spring queens from emerging in spring 2024 and establishing nests.



A follow up eWasp spring queen trapping program in 2024 is recommended for Jarramlee Grasslands Nature Reserve, areas to include are the open spaces closest to the suburb of McGregor, ACT, see red arrows above.

It is recommended that 3-4 spring queen traps be deployed to monitor queen activity, prior to deploying all traps.

There were 33 eWasp worker wasps removed from the environment during the program, trap JML 2 McGregor, had 7 workers, this indicates there may be a nest in proximity to the location of the trap.

If eWasp activity is high in January to early February, and nests cannot be located, a baiting program may be required.

Report all nest and significant sightings to the eWasp team, this enables us to monitor the distribution of eWasps at Jarramlee Grasslands Nature Reserve.

Weather Observations BOM

October 2023 Daily Weather Observations, Canberra, ACT

Canberra, Australian Capital Territory
October 2023 Daily Weather Observations
Observations from Canberra Airport.

Australian Government
Bureau of Meteorology

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9am						3pm					
		Min	Max				Dirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	eighths		km/h	hPa	°C	%	eighths		km/h	hPa
1	Su	3.5	29.7	0			W	76	14:21	17.7	48		W	7	1013.6	29.1	15		WNW	44	1009.1
2	Mo	7.0	27.5	0			N	26	13:42	13.9	73	8	ENE	15	1022.4	25.6	42		N	13	1018.3
3	Tu	11.8	26.7	0			N	69	08:34	24.1	37	1	NNW	41	1015.9	25.3	27		NW	35	1014.1
4	We	14.3	19.9	0			N	74	11:42	16.4	71	8	N	4	1011.0	16.4	79	8	N	37	1005.2
5	Th	6.8	14.0	20.4			NW	56	01:29	7.8	86	7	NW	30	1013.7	10.7	59	8	WNW	28	1017.2
6	Fr	5.3	18.7	0.2			ENE	39	17:03	10.5	75	3	NNW	15	1024.9	16.9	47	8	S	7	1024.2
7	Sa	0.1	18.1	0			E	37	18:49	8.4	56		S	17	1031.9	17.0	33		NNW	9	1028.5
8	Su	3.2	19.5	0			N	35	15:11	10.8	69		SW	7	1032.4	18.8	42		NNW	17	1027.9
9	Mo	0.6	23.2	0			NW	48	15:19	9.6	85		NE	2	1026.5	22.1	31		N	20	1022.1
10	Tu	5.0	21.7	0			E	39	18:19	13.6	77	8	NNW	6	1023.5	20.6	36		N	13	1020.3
11	We	5.6	23.5	0			NW	39	15:05	12.6	84	8	SSE	6	1024.6	22.1	35		NNW	24	1021.5
12	Th	1.6	26.7	0			NNW	76	12:31	11.5	71			Calm	1017.9	25.7	31	3	NW	43	1008.9
13	Fr	4.8	17.1	5.0			NW	57	12:17	10.5	65		NW	20	1017.4	16.1	51		WNW	35	1016.4
14	Sa	8.7	19.5	0			W	57	12:53	13.2	72	5	NNW	28	1017.7	19.2	46	6	NW	31	1014.9
15	Su	0.1	18.1	0			NW	41	12:43	10.6	73		WNW	7	1018.3	16.4	55	8	NW	24	1015.1
16	Mo	8.5	15.5	0			NW	52	09:00	12.3	66	8	NW	24	1011.2	11.9	54	6	NW	9	1012.8
17	Tu	-0.3	18.2	7.0			SSW	39	12:47	8.5	75	4	S	20	1027.5	16.9	39	1	SSW	22	1027.5
18	We	4.9	22.0	0			NNE	28	15:11	12.0	59	1	SSE	11	1030.6	20.7	45		NNE	11	1026.9
19	Th	5.6	24.6	0			NW	26	14:08	12.0	69	1	SSW	7	1026.3	23.3	31		NW	11	1019.9
20	Fr	4.3	26.4	0			N	35	17:16	14.2	77		W	6	1019.8	25.6	33		WNW	17	1015.8
21	Sa	6.2	29.1	0			NNW	52	15:16	17.9	61		S	6	1016.8	28.1	28	8	NNW	31	1011.5
22	Su	10.5	19.2	0			NW	54	12:58	13.5	40		NNW	26	1011.2	17.1	41	8	NW	35	1011.2
23	Mo	9.5	22.4	0			NNW	50	14:26	13.3	53		WNW	22	1014.6	21.9	36		NNW	33	1012.1
24	Tu	3.0	25.5	0			NW	50	15:08	14.4	62		NNW	7	1014.9	24.6	19		NW	31	1010.9
25	We	10.7	19.8	0			NNW	54	11:16	16.1	39		NNW	26	1012.6	18.3	20		WNW	28	1012.7
26	Th	-1.1	18.3	0			SSW	48	15:13	8.8	45		S	24	1023.4	17.3	26		S	28	1021.4
27	Fr	0.5	18.3	0			ESE	35	11:24	10.8	47	1	SSE	17	1031.4	15.6	32	4	SE	19	1029.1
28	Sa	2.7	20.6	0			NNW	35	14:48	10.5	67	8	S	9	1029.9	18.4	31		N	13	1024.8
29	Su	0.6	25.5	0			WNW	50	11:58	12.7	55		ENE	6	1021.7	23.6	22		W	19	1016.3
30	Mo	4.9	26.1	0			NW	69	09:59	17.7	33		WSW	9	1011.7	23.2	23	8	NW	35	1008.9
31	Tu	8.2	22.0	0			WNW	48	08:30	14.0	44		W	31	1012.6	20.9	15		WSW	20	1013.6
Statistics for October 2023																					
Mean		5.1	21.9							12.9	62	5		14	1020.3	20.3	36	6		23	1017.4
Lowest		-1.1	14.0							7.8	33	1		Calm	1011.0	10.7	15	1	S	7	1005.2
Highest		14.3	29.7	20.4			#	76		24.1	86	8	NNW	41	1032.4	29.1	79	8	WNW	44	1029.1
Total				32.6																	

Observations were drawn from Canberra Airport {station 070351}
Some cloud observations are from automated equipment; these are somewhat different to those made by a human observer and may not appear every day.

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November 2023 Daily Weather Observations, Canberra, ACT

Canberra, Australian Capital Territory
November 2023 Daily Weather Observations
Observations from Canberra Airport.

Australian Government
Bureau of Meteorology

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9am						3pm					
		Min	Max				Dirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	eighths		km/h	hPa	°C	%	eighths		km/h	hPa
1	We	3.9	22.9	0			ENE	41	17:19	13.3	57	2	SSW	7	1020.7	20.6	26		E	19	1017.5
2	Th	4.0	24.1	0			NE	39	18:05	13.4	61	7	SSW	7	1021.7	22.2	33		ENE	9	1016.8
3	Fr	10.3	25.0	0			E	43	16:07	14.9	64	6	NE	17	1019.1	23.2	33	2	NE	11	1014.6
4	Sa	11.6	15.8	0.6			ESE	41	19:09	14.7	75	8	ESE	15	1021.2	14.6	70	8	E	20	1021.2
5	Su	11.2	19.3	0			ENE	39	13:54	14.2	70	7	ESE	17	1026.5	16.6	59	8	ENE	28	1024.9
6	Mo	9.0	25.4	0			E	41	18:42	14.4	65	7	N	11	1025.4	23.5	32		S	9	1020.0
7	Tu	7.8	27.4	0.2			NNW	43	11:20	16.0	60		NW	6	1021.7	27.0	31	7	WNW	19	1016.7
8	We	9.4	27.1	0			N	46	14:58	18.0	68	7	N	4	1018.5	24.8	36	8	NNW	24	1014.5
9	Th	10.4	21.7	0			W	39	09:19	18.4	65	8	SE	11	1016.5	16.7	86	8	NNW	11	1015.0
10	Fr	8.1	28.9	6.8			NNW	35	15:24	17.5	72		NNW	7	1017.7	26.0	34	2	NW	17	1014.6
11	Sa	9.3	33.3	0			NW	50	11:48	20.1	70		N	7	1018.2	32.8	28	3	NW	30	1013.9
12	Su	14.0	31.7	0.6			NW	54	14:44	22.9	61	2	N	17	1015.5	30.6	10		WNW	31	1012.5
13	Mo	10.2	27.3	0			ENE	37	18:03	15.7	65	8	WSW	11	1018.1	25.0	28		NNW	9	1014.1
14	Tu	6.3	24.1	0			NNW	31	13:53	15.3	73	7	NW	4	1014.4	21.8	31	7	NNW	24	1012.7
15	We	10.6	27.0	0.2			NW	44	13:32	16.9	72	8	ENE	9	1013.1	26.1	36		NW	17	1009.3
16	Th	7.4	26.1	0			NNW	43	14:21	16.3	74	7	NNW	6	1010.1	24.8	28	8	WNW	26	1007.8
17	Fr	10.5	24.0	0			E	44	19:02	13.8	48		S	26	1017.4	21.9	25		WSW	15	1015.8
18	Sa	6.0	27.9	0			NW	35	15:07	15.7	64		W	7	1020.4	26.4	25		NE	11	1016.2
19	Su	8.1	31.4	0			NW	46	12:12	19.6	60		SSE	2	1019.3	29.0	20	1	NW	24	1016.1
20	Mo	16.0	28.5	0			S	59	15:46	21.7	56	8	NNW	17	1019.5	26.3	37	8	NNW	22	1016.1
21	Tu	10.5	26.4	22.6			ESE	39	17:59	17.0	75	7	SSW	6	1020.7	26.4	42	8	WSW	13	1017.0
22	We	11.0	27.7	0.2			ENE	39	16:09	18.0	62	7	SSE	15	1022.2	27.6	39	6	SE	15	1018.6
23	Th	10.9	24.2	0			ESE	50	13:33	19.7	59	5	SSE	19	1023.7	21.6	60	6	ESE	24	1022.7
24	Fr	13.8	22.0	0			E	33	12:28	18.3	70	8	SE	13	1022.3	20.7	64	8	E	17	1018.5
25	Sa	16.6	27.1	32.2			WSW	46	16:26	17.5	99	7	N	9	1014.4	25.1	51	3	N	20	1009.5
26	Su	12.8	26.4	2.0			WNW	54	11:51	19.4	71	1	NNW	19	1010.7	25.0	35	1	W	24	1009.2
27	Mo	12.8	27.6	0			E	48	18:09	19.9	65	3	E	7	1013.1	26.4	31	6	WNW	15	1010.7
28	Tu	16.1	22.1	0			NE	37	12:48	19.1	73	8	E	13	1014.7	17.2	96	8	ENE	13	1012.6
29	We	13.8	19.8	44.8			NW	28	12:08	15.5	99	8	SSW	9	1005.3	16.2	99	4	SSE	9	1003.1
30	Th	13.7	22.7	24.0			S	37	10:03	17.7	66	8	W	17	1002.0	20.8	58	8	SW	13	1001.5
Statistics for November 2023																					
Mean		10.5	25.5							17.2	67	6		11	1017.5	23.6	42	5		17	1014.5
Lowest		3.9	15.8							13.3	48	1	SSE	2	1002.0	14.6	10	1	#	9	1001.5
Highest		16.6	33.3	44.8			S	59		22.9	99	8	S	26	1026.5	32.8	99	8	WNW	31	1024.9
Total				134.2																	

Observations were drawn from Canberra Airport {station 070351}
Some cloud observations are from automated equipment; these are somewhat different to those made by a human observer and may not appear every day.

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December 2023 Daily Weather Observations, Canberra, ACT

Canberra, Australian Capital Territory
December 2023 Daily Weather Observations
Observations from Canberra Airport.

Australian Government
Bureau of Meteorology

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9am						3pm					
		Min	Max				Dirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	eighths		km/h	hPa	°C	%	eighths		km/h	hPa
1	Fr	14.1	24.0	9.2			SSW	33	12:13	17.1	81	8	S	17	1007.0	20.9	59	8	S	13	1004.4
2	Sa	12.4	25.4	11.8			WNW	52	14:30	16.9	84	8	E	9	1008.5	23.7	48	5	NNW	11	1005.9
3	Su	7.6	23.3	0.2			W	48	14:31	16.7	68		WSW	4	1013.5	21.5	48	8	WSW	11	1012.0
4	Mo	8.9	26.8	6.0			NW	30	14:55	14.8	81	8	WNW	4	1018.7	25.4	34		NW	11	1015.0
5	Tu	10.1	32.4	0			WNW	48	14:08	20.6	64		NW	4	1017.0	31.6	25		WNW	33	1013.4
6	We	11.8	32.4	0			W	48	14:39	23.9	48		SSE	7	1016.2	31.9	23		WNW	31	1014.1
7	Th	11.2	31.1	0			SW	52	14:26	17.0	91	8	E	7	1017.3	28.9	27	8	SW	30	1017.0
8	Fr	15.4	33.0	0			NW	83	19:00	22.9	56	8	ENE	2	1018.3	30.5	38	5	SW	11	1013.2
9	Sa	16.2	34.8	3.8			N	59	16:01	21.5	93	7	SSW	7	1012.7	33.9	33		W	13	1010.4
10	Su	17.6	26.7	0.2			ENE	30	09:03	20.2	73	8	ENE	9	1019.5	25.4	60	1	E	11	1016.3
11	Mo	16.8	30.8	0			ESE	41	17:10	22.7	70		SE	2	1017.3	30.4	44		SE	13	1016.3
12	Tu	18.8	30.0	0			E	37	18:30	23.6	66	4	E	15	1019.8	28.9	45	3	NNE	15	1015.7
13	We	16.5	32.5	0			N	59	19:06	21.9	72	8	E	7	1015.2	31.2	33		NNW	24	1010.1
14	Th	17.2	28.4	0			NW	61	13:41	22.6	72	6	NW	33	1006.7	27.7	36	2	WNW	31	1004.5
15	Fr	9.2	28.6	0			W	48	14:34	20.3	63		NW	7	1009.9	27.0	34	3	WNW	30	1006.5
16	Sa	7.1	25.7	0			W	67	09:19	21.3	32		W	30	1005.5	24.4	27	2	WNW	28	1005.7
17	Su	10.9	27.7	0			ENE	39	17:46	18.4	69	1	SW	9	1014.1	26.5	28		N	13	1011.0
18	Mo	13.4	29.6	0			NNW	39	12:43	20.2	68	4	WNW	9	1014.5	28.8	33		NNW	20	1010.9
19	Tu	16.3	34.0	0			N	87	14:12	23.8	67		S	7	1010.7	27.2	41	8	NNE	35	1006.2
20	We	12.9		14.8						12.9	97	8	SSE	13	1014.9						
Statistics for the first 20 days of December 2023																					
	Mean	13.2	29.3							20.0	70	6		10	1013.9	27.7	37	4		20	1011.0
	Lowest	7.1	23.3							12.9	32	1	#	2	1005.5	20.9	23	1	#	11	1004.4
	Highest	18.8	34.8	14.8			N	87		23.9	97	8	NW	33	1019.8	33.9	60	8	NNE	35	1017.0
	Total			46.0																	

Observations were drawn from Canberra Airport {station 070351}
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VESPEX EUROPEAN WASP LURE

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Asian paper wasp

Polistes chinensis

Paper wasps are distinguished by their body shape, which is slender and 13-25mm long. They have reddish-brown to black bodies with yellow rings and...

General Enquiries
0800 002 004
Stay connected: Call us toll-free between 8am and 4:30pm, Monday to Friday (closed public holidays)

Incident Hotline
0800 504 639
The 24/7 NRC Incident Hotline: Report pollution or marine incidents toll free

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