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DEPARTMENT OF HEALTH

Katherine and Mataranka mosquito survey report 12 to 14 February 2014

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Background

Medical Entomology (ME) of the Department of Health (DoH) visited Katherine and Mataranka between 12th and 14th February 2014 to carry out mosquito surveillance and control due to high rainfall (417mm) that occurred in Katherine between 1st January and the 2nd February 2014. Operations included larval mosquito surveys at known potential mosquito breeding sites in Katherine based on the Katherine 2006 flood report, setting of adult mosquito CO₂ baited EVS traps and exotic mosquito larval surveys at various locations in Katherine and Mataranka to confirm the absence of the dengue mosquito *Aedes aegypti* and other exotic mosquito species.

Katherine mosquito larval surveys

Mosquito larval surveys (LS) were carried out in Katherine on 12th and 13th February 2014 at the following sites;

- Katherine railway terminal (LS1, LS1A)
- Katherine railway dam (LS2)
- Katherine sewage treatment plant overflow (north east of ponds) (LS3)
- Katherine show & sports grounds (LS4, LS5)
- Katherine Racecourse (LS6, LS6A)
- Katherine Primary School – Riverbank Drive (LS7)
- Vacant Lot 3139 (LS8)
- Grassy depressions close to the Meatworks along the Victoria Highway (LS9)
- Culvert drain between Chambers Drive and Lockhead Road (LS10)
- Culvert drain between Chambers Drive and Lindsay Street (LS11)
- Culvert drain parallel to Bicentennial Road (LS12)
- Katherine waste management facility (LS13)

Larval mosquito survey sites are shown in Figure 1, with larval survey results shown in Table 1.

Despite the high amount of rainfall that occurred in Katherine in January and February 2014, relatively few areas had water ponding.

The vacant Lot 3139 on the Victoria Highway, located adjacent to the Katherine Primary School on Riverbank Drive was the only site breeding relatively high numbers of *Culex annulirostris*, the principal vector for Ross River virus and Murray Valley encephalitis virus. The pest mosquito species, *Cx. quinquefasciatus* was also found in relatively high numbers. Breeding occurred in a number of small grassy depressions and wheel ruts throughout the site, and in a relatively large depression with extensive grass growth at the north-western end of the Lot, bordering the Primary School (Fig. 2).

Water from the large depression located on Lot 3139 accumulated in a swamp located at the north-east corner of the school premise (Fig. 2). Although the swamp area was not breeding mosquitoes at the time the survey was carried out, it was assessed as a potential mosquito breeding site. Mosquito larval control was carried

out by ME on Lot 3139, using s-methoprene pellets, with s-methoprene briquettes placed in the actual swamp.

Both the swamp area and Lot 3139 will be re-assessed by ME in 2015, with rectification measures and mosquito control to be discussed with the relevant land owners.

Katherine adult mosquito trapping

To assess overall adult mosquito numbers present in Katherine following the extensive rainfall, seven CO₂ baited EVS traps were set at the following sites on the 12th and collected on the 13th February;

- The Katherine sports grounds
- The Katherine sewage treatment plant
- The Katherine Primary School – Riverbank Drive
- Katherine Meatworks – along the Victoria Highway (x2)
- O’Keefe House on Riverbank Drive
- Hickeys Lake on Zimin Drive

Trap sites are shown in Figure 1, with trap results shown in Table 2.

Relatively high numbers of *Culex pullus* were collected in the Hickeys Lake trap and the sewage ponds trap, with elevated numbers of this species also collected in the two traps set close to the Meatworks and in the trap set at the Primary School on Riverbank Drive. *Culex pullus* breeds in water high in organic matter, and has previously been found breeding in inundated grassy depressions close to the Meatworks and Katherine sewage ponds. However, this species does not bite humans and is not associated with disease.

Other mosquito species were collected in relatively low numbers (Table 2).

Katherine exotic vector survey

An exotic mosquito larval survey was carried out in Katherine on the 13th February targeting high risk premises, including commercial, recreational, transport and residential premises, as well as caravan parks.

Survey results are shown in Table 3. No exotic mosquitoes were detected during the survey.

Of the eleven sites surveyed, all except for two sites were found breeding mosquitoes. The caravan parks surveyed in Katherine were well managed, with only one receptacle found positive for breeding.

However, premises with high numbers of used tyres had a very high incidence of mosquito breeding. All tyres sampled during the survey were breeding mosquitoes, with an estimated 50% to 86% of all tyres holding water positive for breeding.

The dengue mosquito, *Aedes aegypti* breeds in artificial receptacles including tyres. Thus, high numbers of suitable breeding sites present increase the risk of exotic mosquito establishment during an incursion. To prevent mosquito breeding in used tyres, and to reduce the risk of exotic mosquito establishment, strategies to eliminate

mosquito breeding were discussed with the landowners or managers of relevant premises.

Mataranka exotic vector survey

An exotic mosquito larval survey was carried out in Mataranka on the 14th February, targeting high risk premises, including commercial, transport, caravan and residential premises.

Survey results are shown in Table 3. No exotic mosquitoes were detected during the survey.

All sites surveyed were found breeding mosquitoes. Almost all used tyres sampled were positive for breeding, with an estimated 63% of all used water-holding tyres breeding mosquitoes. To prevent mosquito breeding in used tyres, and to reduce the risk of exotic mosquito establishment, strategies to eliminate mosquito breeding were discussed with the landowners or managers of relevant premises.

FIGURE 1 : KATHERINE SURVEY 12-13 FEBRUARY 2014 - ADULT MOSQUITO CO₂ TRAP SITES AND LARVAL SURVEY SITES

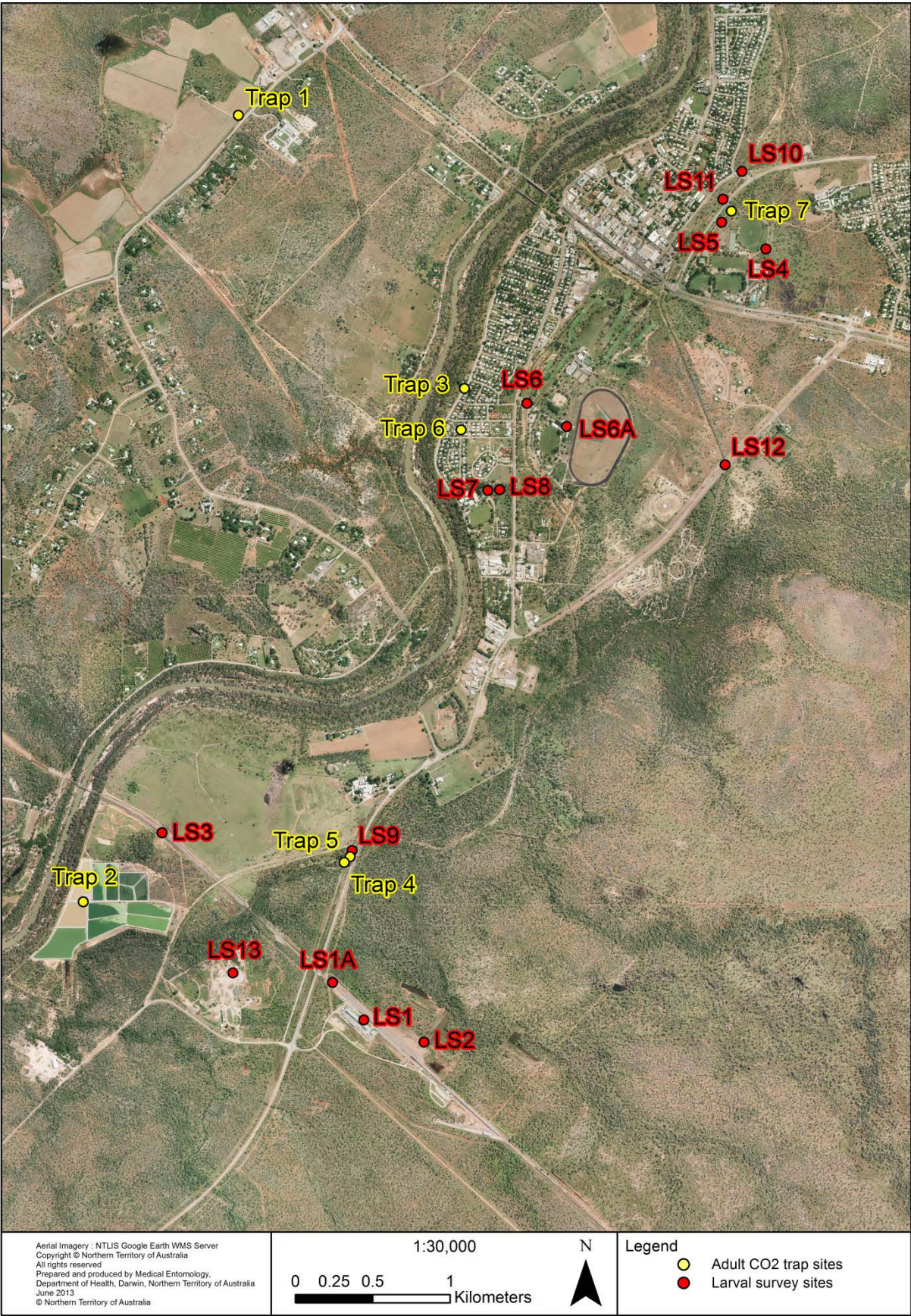


FIGURE 2:



Vacant Lot 3139 – Extensive depression with water ponding.
High number of *Cx. annulirostris* breeding.
Primary school with swamp area visible behind fence.



Vacant Lot 3139 – wheel ruts with water ponding.
High number of *Cx. annulirostris* breeding.



Primary school – fence separating the swamp area on the school premise and vacant Lot 3139.
Deep water ponding at fence line.

TABLE 1: LARVAL MOSQUITO SURVEY SUMMARY - KATHERINE 12 AND 13 FEBRUARY 2014

Site Number	Trap Location	Water presence	Breeding	Water area (m2)	Breeding area (m2)	No. of dips	Average no per dip	Species	Total no in sample	1st instar	2nd instar	3rd instar	4th instar	Pupae
LS1	Rail freight terminal - drain north of shed	Pooling	Yes	20	2	10	N/C	<i>Cx. (Cux) quinquefasciatus</i>	21	0	5	12	4	0
LS1A	Rail freight terminal - depression NW of terminal	Flooded	No	1000	0	15	0	<i>Nil mosquitoes</i>	0	0	0	0	0	0
LS2	Rail Dam - east of rail freight terminal	Pooling	No	1000	0	5	0	<i>Nil mosquitoes</i>	0	0	0	0	0	0
LS3	Sewage ponds overflow area - between railway bridge and sewage ponds	Pooling	No	10	0	10	0	<i>Nil mosquitoes</i>	0	0	0	0	0	0
LS4	Katherine showgrounds - grassy drain SE of cricket pitch	Pooling	No	N/C	0	10	0	<i>Nil mosquitoes</i>	0	0	0	0	0	0
LS5	Katherine showgrounds - grassy drain in north west corner	Pooling	No	30	0	25	0	<i>Nil mosquitoes</i>	0	0	0	0	0	0
LS6	Katherine football oval - north end of drain running along west side of football oval	Pooling	No	N/C	0	8	0	<i>Nil mosquitoes</i>	0	0	0	0	0	0
LS6A	Katherine racecourse - grassy depression on western side of race couse	Pooling	No	10	0	8	0	<i>Nil mosquitoes</i>	0	0	0	0	0	0
LS7	Primary School on Riverbank Drive - swamp area east of school buildings	Pooling	No	N/C	0	7	0	<i>Nil mosquitoes</i>	0	0	0	0	0	0
LS8	Vacant lot 3139 on Victoria Highway, adjacent to Primary School on Riverbank Drive	Pooling	Yes	5000	5000	10	5	<i>Cx. (Cux) quinquefasciatus</i>	7	0	2	5	0	0
		Pooling	Yes	5000	5000	10	5	<i>Cx. (Cux) annulirostris</i>	1	0	0	0	1	0
LS9	Grassy depression along Victoria Hyw - close to Meatworks	Pooling	Yes	5	1	5	5	<i>Cx. (Cux) annulirostris</i>	5	4	0	0	1	0
LS10	Culvert drain between Chambers Drive and Lockhead Road	Pooling	No	N/C	0	5	0	<i>Nil mosquitoes</i>	0	0	0	0	0	0
LS11	Culvert drain between Chambers Drive and Lindsay St - north west of cricket oval	Flooded	No	N/C	0	5	0	<i>Nil mosquitoes</i>	0	0	0	0	0	0
LS12	Culvert on Bicentennial Rd	Pooling	No	5	0	4	0	<i>Nil mosquitoes</i>	0	0	0	0	0	0
LS13	Katherine waste management facility	Pooling	Yes	5	3	7	0.3	<i>Cx. (Cux) annulirostris</i>	2	0	0	2	0	0

TABLE 2:

KATHERINE: ADULT MOSQUITO CO₂ BAITED EVS TRAP RESULTS

				<i>Ae. (Adm) alboscuteallatus</i>		<i>Ae. (Fin) notoscriptus</i>		<i>Ae. (Neo) lineatopennis</i>		<i>Ae. (Och) normanensis</i>		<i>Ae. (Och) phaeasiatus</i>		<i>Ae. (Och) vigilax</i>		<i>An. (Cel) amictus</i>		<i>An. (Cel) annulipes s.l.</i>		<i>Cq. (Coq) xanthogaster</i>		<i>Cx. (Cui) pullus</i>		<i>Cx. (Cux) annulirostris</i>		<i>Cx. (Cux) gelidus</i>		<i>Cx. (Cux) Vishnui group</i>		<i>Tr. (Pol) punctolateralis</i>		TOTALS	
Trap location	Trap type	Date set	Date collected	No. of females	No. of males	No. of females	No. of males	No. of females	No. of males	No. of females	No. of males	No. of females	No. of males	No. of females	No. of males	No. of females	No. of males	No. of females	No. of males	No. of females	No. of males	No. of females	No. of males	No. of females	No. of males	No. of females	No. of males	No. of females	No. of males	Total No. of females	Total No. of males		
Trap 1 - Hickeys Lake	CO2 Trap	12-Feb-14	13-Feb-14	0	0	1	0	4	0	2	0	0	0	0	0	1	0	0	0	5	0	553	0	2	0	7	0	0	0	0	575	0	
Trap 2 - KM Katherine Sewage Ponds	CO2 Trap	12-Feb-14	13-Feb-14	0	0	2	0	0	0	0	0	0	0	1	0	1	0	1	0	1	0	251	0	11	0	0	0	0	0	268	0		
Trap 3 - KM O'Keefe residence, Riverbank Dve	CO2 Trap	12-Feb-14	13-Feb-14	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	88	0	4	0	0	0	1	0	1	0	95	0	
Trap 4 - Near Meatworks on road, Trap A	CO2 Trap	12-Feb-14	13-Feb-14	0	0	0	0	5	0	0	0	0	0	1	0	3	0	0	0	0	167	0	6	0	1	0	2	0	0	0	185	0	
Trap 5 - Near Meatworks on road, Trap B	CO2 Trap	12-Feb-14	13-Feb-14	3	0	0	0	11	0	2	0	1	0	0	0	22	0	1	0	1	128	0	38	0	1	0	1	0	0	0	209	0	
Trap 6 - Primary School, Riverbank Dr.	CO2 Trap	12-Feb-14	13-Feb-14	0	0	6	0	0	0	0	0	0	0	1	0	0	0	0	0	0	107	0	9	0	0	0	0	0	0	0	123	0	
Trap 7 - Showgrounds/sportsground	CO2 Trap	12-Feb-14	13-Feb-14	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	9	0		
TOTALS				3	0	9	0	20	0	13	0	1	0	3	0	27	0	2	0	7	0	1294	0	71	0	9	0	4	0	1	0	1464	0
Note: CO2 trap (EVS CO2 baited) - overnight collection.																																	

TABLE : 3

EXOTIC MOSQUITO RECEPTACLE BREEDING SURVEY - KATHERINE AND MATARANKA
13 AND 14 FEBRUARY 2014
SUMMARY OF RECEPTACLE DESCRIPTION AND MOSQUITO SPECIES COLLECTED.

	PREMISES AND RECEPTACLE SUMMARY						NUMBER OF RECEPTACLES POSITIVE FOR EACH SPECIES														
TOWN	LOCATION TYPE	RECEPTACLE DESCRIPTION	Total No. of potential receptacles	Total No. of receptacle inspected	Total No. of receptacles with water	Total No. of receptacles breeding	% of receptacles with water breeding	<i>Ae. (Fin) notoscriptus</i>	<i>Ae. (Mac) species</i>	<i>Ae. (Mac) tremulus</i>	<i>Ae. (Sig) katherinensis</i>	<i>Ae. (Sig) scutellaris grp</i>	<i>Ae. (Cel) annulipes s.l.</i>	<i>Cx. (Cux) annulirostris</i>	<i>Cx. (Cux) quinquefascians</i>	<i>Cx. (Cux) species</i>	<i>Lu. (Mer) hulfaxii</i>	<i>Tr. (Pol) punctolateralis</i>	<i>Tripteroides species</i>	<i>Nil mosquitoes</i>	
Katherine	Commercial	Tyre (car)	101	11	11	11	100.00	1	0	0	0	0	0	0	1	0	0	0	0	0	
	Caravan Park	Nil containers	0	0	0	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Commercial	Tyre (car)	100	20	20	20	100.00	1	0	1	0	0	0	0	1	1	0	1	0	0	
	Residential	Vase	100	30	30	30	100.00	1	0	1	0	0	0	0	1	0	0	1	0	0	
	Commercial	Bin (unspecified)	1	1	1	1	100.00	0	0	0	0	0	0	0	1	0	0	0	0	0	
		Pot plant base	1	1	1	1	100.00	1	0	0	0	0	0	0	0	0	0	0	0	0	
		Steel beams	2	2	2	2	100.00	1	0	0	0	0	0	0	0	0	0	0	0	0	
		Tarpaulin	2	2	2	2	100.00	1	0	0	1	0	0	0	0	0	0	0	0	0	
	Recreational	Tyre (motor bike)	300	25	25	25	100.00	1	0	1	0	0	0	0	1	0	0	1	1	0	
	Commercial	Tyre (unspecified)	700	40	40	40	100.00	1	0	1	0	0	1	1	0	0	0	0	0	0	
	Commercial	Pot plant base	15	15	15	1	6.67	1	0	0	0	0	0	0	0	0	0	0	0	0	
	Transport	Tyre (unspecified)	2	2	2	2	100.00	0	0	0	0	0	0	1	1	1	0	1	0	0	
Caravan Park	Nil containers	0	0	0	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0		
Caravan Park	Pot (gardening)	1	1	1	1	100.00	1	0	0	0	0	0	0	0	0	0	0	0	0		
Mataranka	Residential	Pot (gardening)	1	1	1	1	100.00	0	0	0	1	0	0	0	0	0	0	0	1	1	0
		Vase	1	1	1	1	100.00	0	0	0	0	1	0	0	0	0	0	1	1	0	
	Commercial	Tyre (unspecified)	100	30	30	30	100.00	1	1	1	0	0	0	0	0	0	0	1	1	1	0
		Bucket (unspecified)	8	8	8	5	62.50	1	0	0	1	0	0	0	0	0	0	0	0	0	0
	Caravan Park	Canoe	1	1	1	1	100.00	1	0	1	0	0	0	0	0	0	0	0	0	0	0
		Pot plant base	5	3	3	1	33.33	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	Transport	Machinery	1	1	1	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		Tyre (unspecified)	1	1	1	1	100.00	1	0	0	0	0	0	0	1	0	0	0	0	0	0
	Caravan Park	Bucket (unspecified)	10	5	5	3	60.00	1	0	0	0	0	0	0	1	1	0	0	0	0	0
		Tyre (unspecified)	7	7	4	4	100.00	1	0	0	0	0	0	0	1	0	0	0	0	0	0
		Unspecified	18	13	13	8	61.54	0	0	0	0	0	0	0	1	0	1	0	0	0	
TOTALS			1478	221	218	191	87.61	17	1	6	3	1	1	2	10	3	2	7	4	1	
% OF TOTALS				14.95	14.75	12.92	87.61	8.90	0.52	3.14	1.57	0.52	0.52	1.05	5.24	1.57	1.05	3.66	2.09	0.52	
% OF CONTAINERS WITH WATER BREEDING							87.61														