

Effects of Larviciding and Source Reduction on *Culex tarsalis* – Saskatchewan 2003-05



Phil Curry – Saskatchewan Health

Challenges for Mosquito Control in Saskatchewan

- Mosquito habitat is quite variable and spread out over a large area; many of our farms, villages and towns are truly “islands or oases” in a vast landscape
- Mosquito habitat can vary dramatically from year to year
 - Less habitat in 2003/low mosquito numbers; more habitat in 2004 & 2005/higher numbers
 - Some poor habitat changed into good habitat (i.e. creeks that stopped flowing and became stagnant) & vice versa



Larry Easton Photography





Vector Mosquitoes

- *Cx. tarsalis* numbers higher than in 2003
- 3 generations in south; 2 parklands
- Infection rates were lower than in 2003 and didn't rise until later in the season
- *Cx. restuans* less infected than in 2003



Culex tarsalis

- Numbers fluctuate and can increase if more generations occur during extended hot summers; appears to be expanding its range northward
- Prefers birds and mammals
- Takes multiple feeds in hot weather
- Multiple generations under ideal conditions, building up to highest numbers in late summer
- Over-winters as adult females

Larval Habitat

- Larval sites – shallow ponds, irrigation, ditches, artificial containers (e.g. bird baths, used tires), hoof prints filled with water; high organic matter levels
- High association with livestock watering areas, irrigation overflow areas – a rural species that can migrate to urban areas
- *Culex pipiens* in the east (and B.C.) are more urban (breed in storm sewers, catch basins) They also don't fly as far as *Cx. tarsalis*







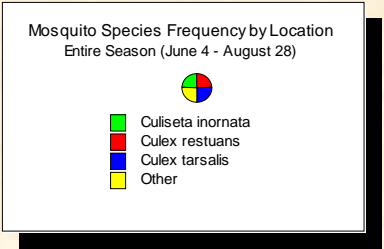
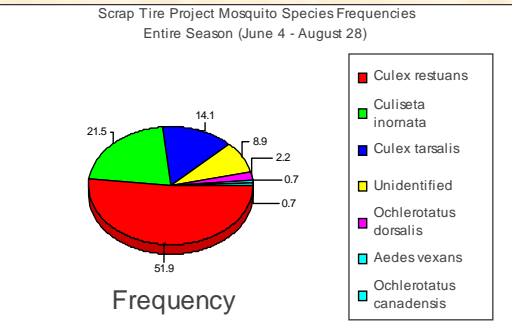
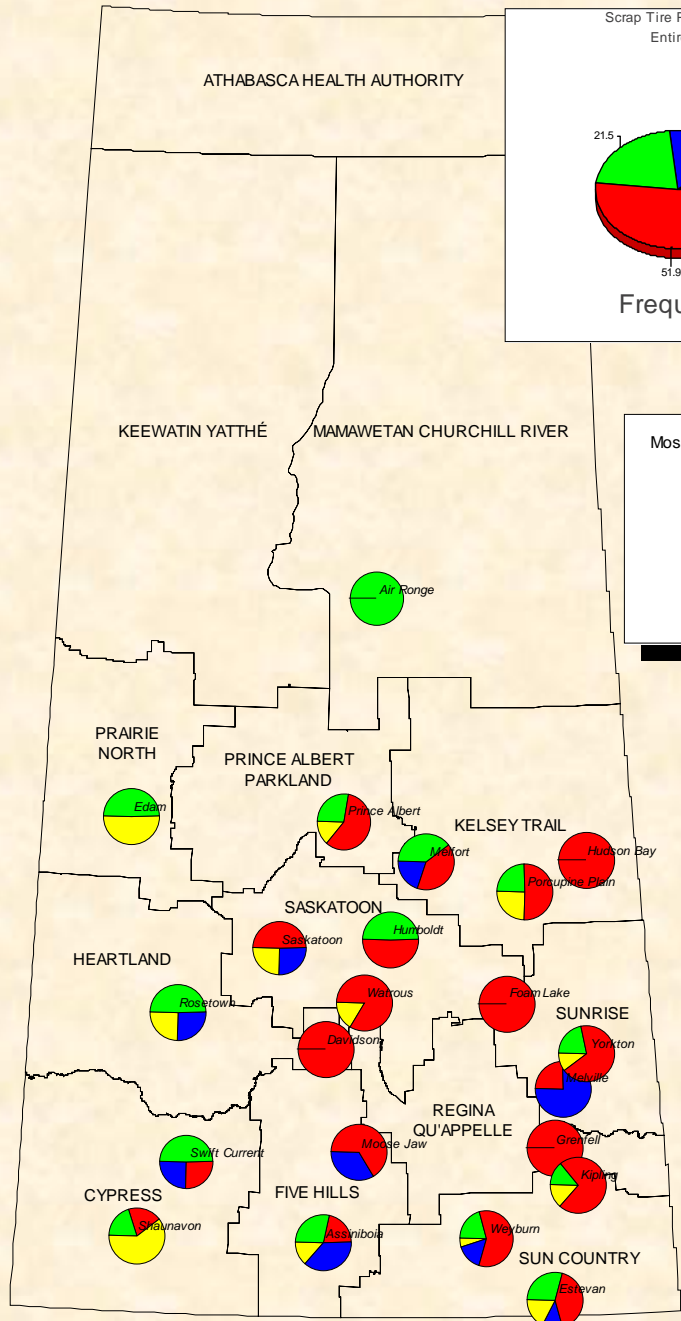






Scrap Tire Research Project

- Funded by SK Scrap Tire Corporation and SK Waste Reduction Council
- Samples taken at 21 locations at tire dealers and recycling plants (July-Aug. 2003)
- Six species found with *Culex restuans* the most numerous, followed by *Culiseta inornata* and *Culex tarsalis*
- Large tractor tires the worst followed by semi-truck tires







Did We Have an Impact?

- Good protection for many towns and cities
- Results more variable in 2005 (higher #s)
- Larger towns and cities with intensive larviciding programs that continued throughout the summer had lower *Culex tarsalis* numbers in all three years
- Fewer organized mosquito control programs in rural areas, irrigation districts, parks, golf courses, or at outdoor rural events

Intensive Larviciding (July-August)

No larvicide or applied sporadically

n = 17	<i>Culex. tarsalis</i>	<i>Culex restuans</i>
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n = 17	<i>Culex tarsalis</i>	<i>Culex restuans</i>
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Mean

11.9

10.5

Mean

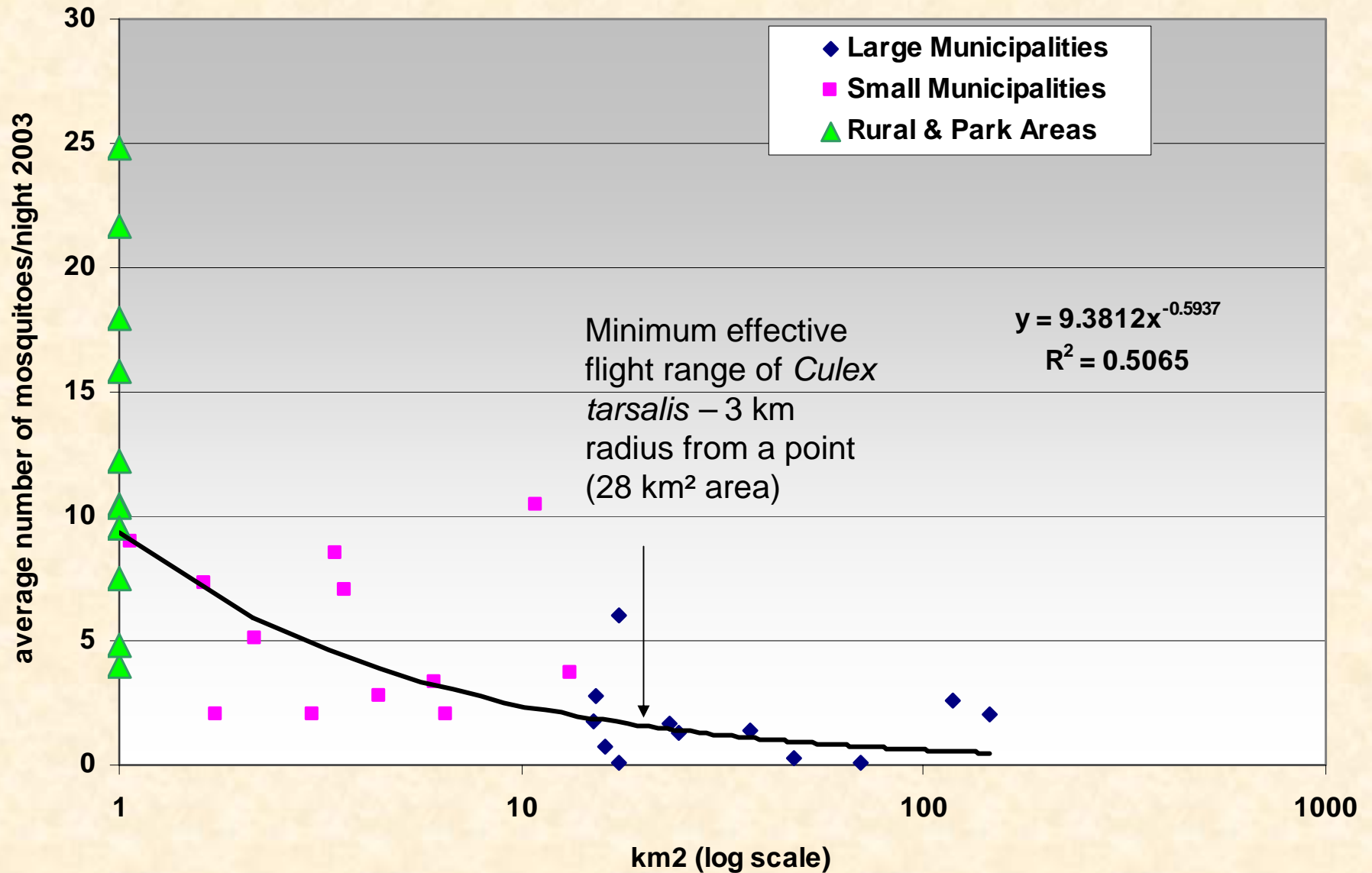
32.5

4.4

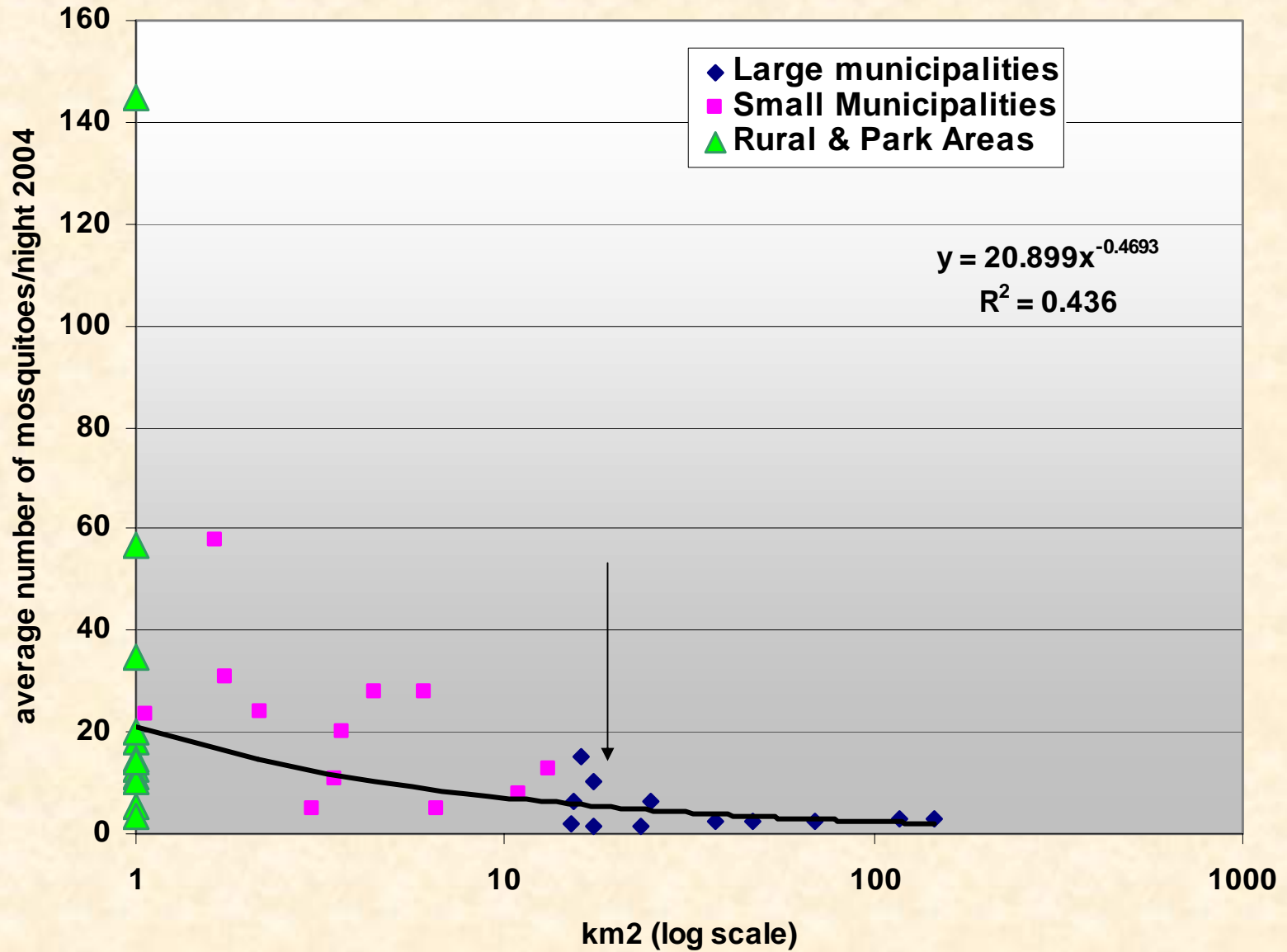
- Communities with New Jersey light traps
- All Eco-regions
- *Culex tarsalis* (P = 0.000129)
- *Culex restuans* (N.S.)

Size Does Matter

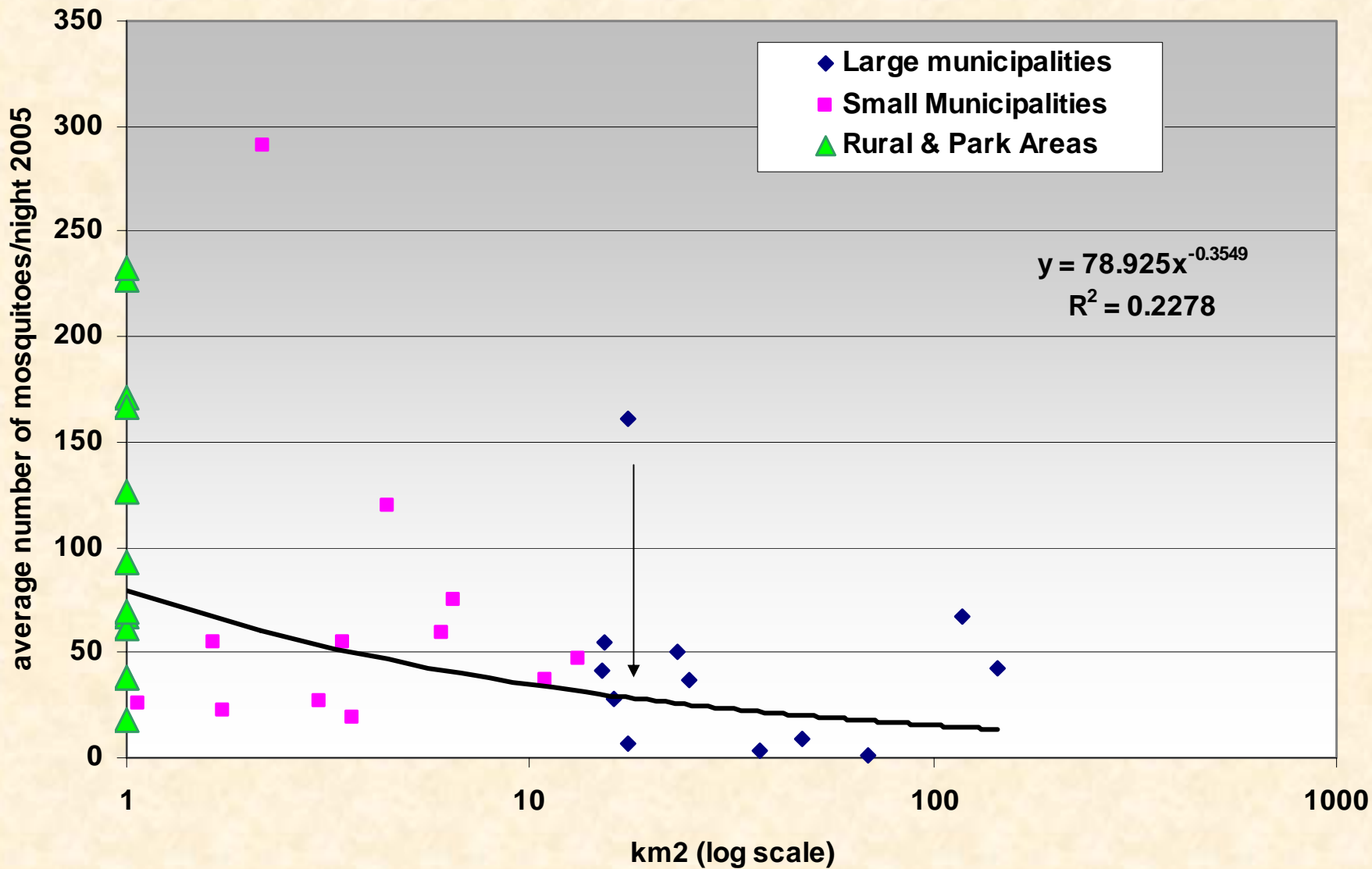
2003 average nightly *Culex tarsalis* mosquito abundance by site size (km²)



2004 average Culex tarsalis per night by site size km2

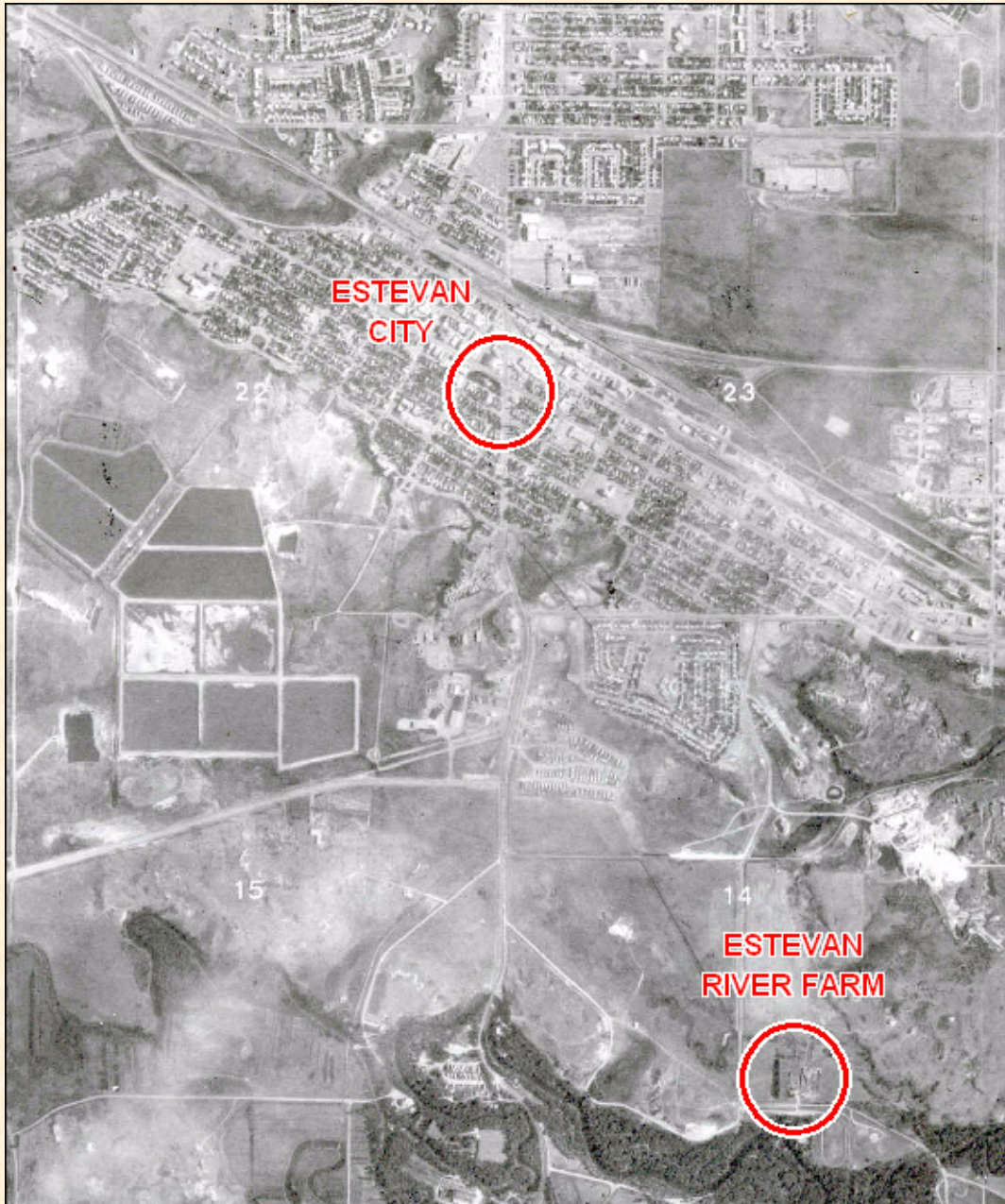


2005 average nightly Culex tarsalis mosquito abundance by site size (km2)



Estevan Case Study

- Mosquito traps set up in Souris River Valley near the regional park and in the city of Estevan
- *Cx.tarsalis* counts consistently higher in the valley than in the city
- Multiple positive pools, high MLE-IRs and risk indices in the valley in all three years
- Positive pools from the city only in 2005
- Positive horses and humans in area



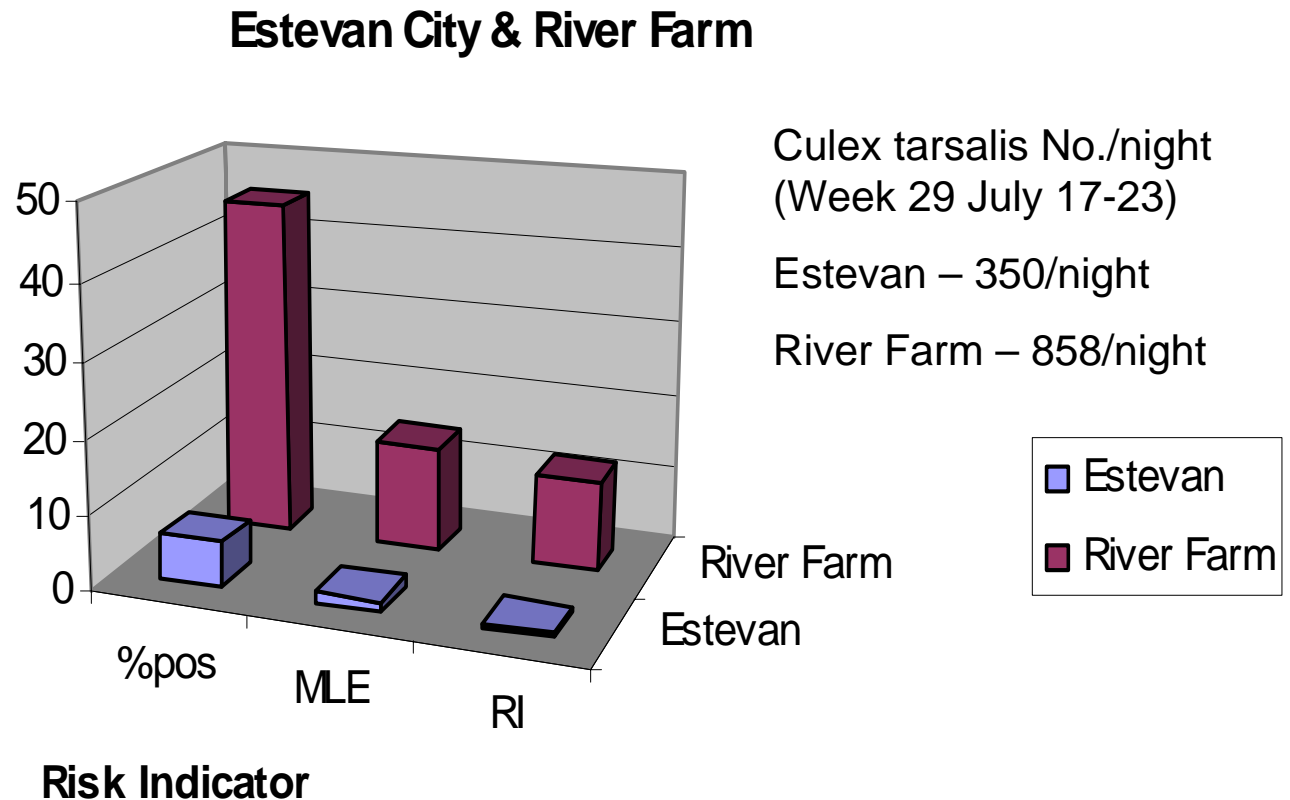
Estevan is located at the edge of the Souris River valley

- 10,000 people
- River farm site near the river and regional park
- City site at the top of the valley near the edge

Estevan Case Study (cont.)

- Estevan city had intensive larviciding program but did not have a 3 km extended treatment area. Higher mosquito numbers in 2005
- Adulticiding was not required in the city
- Larviciding and adulticiding not feasible near the river – mosquitoes were using the valley as a migration corridor
- Health region and city response was to issue and post notices about risks when going to the golf course or regional park in the valley
- Parks staff notified

Estevan Risk Indicators - 2005



Rural Mosquito Management

- Risks are much higher in rural areas – parks, irrigation areas, creek and river valleys, coulees & near shallow sloughs
- 240,968 km² of habitat with small population
- Extensive larviciding and adulticiding is not feasible; different approach is required
- In rural areas programs should focus on identifying & treating *Culex* production areas, source reduction and barrier/ residual treatments near residential areas. **Personal protection must be emphasized**



Memorable Quotes

“Older Females Still Dangerous”

Phil Curry – Provincial WNV Coordinator

SUMA Website Aug. 30, 2004



Questions?