



Australian Government

Department of Agriculture, Fisheries and Forestry

A horizontal collage of small images representing various agricultural and marine products, including oranges, a fish, a wooden crate, wheat stalks, a kiwi, green beans, a bunch of grapes, and a yellow flower.

***Hylesia nigricans* (Lep.: Saturniidae)– a tree & public health pest from South America; intercepted on motor vehicles imported into Australia**

David Rees, John Nielsen, Ross Rickard, Department of Agriculture Fisheries and Forestry, Australia.

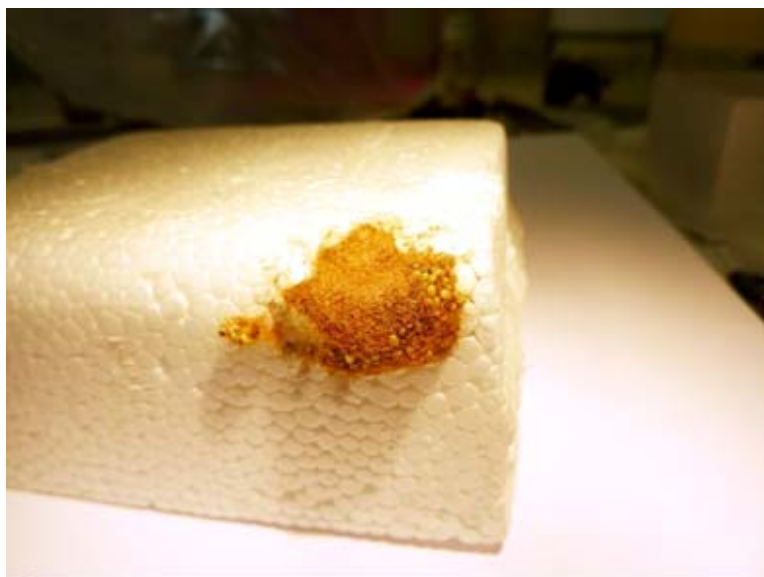
Silvia Passalacqua, Marcelo Sanchez, Servicio Nacional de Sanidad y Calidad Agroalimentaria, Argentina.



The story starts

- Feb–March 2011 – 3 car transporter vessels arrive Port Kembla NSW, cargo included cars loaded in Argentina,
- Total 800 vehicles of which about 60% were infested with egg masses of a moth,
- Dead adult moths were also collected,
- Advice from NZ MAF → AQIS ordered heat treatment of cars (60°C for 10 mins).

Infestation



Photos courtesy AQIS OSP

..and the not so obvious



Photos courtesy AQIS OSP



What is it?

- '*Hylesia spp. probably H. nigricans, initially* based on Brazilian literature
- Subsequently confirmed by -
 - CSIRO / Zoology Museum, Cordoba, Argentina,
 - and later via DNA analysis by AQIS Brisbane,



Genus *Hylesia*

- Silk moths – Saturniidae,
- Sub family – Hemileucinae,
- *Hylesia* - neotropical, 110 spp.- Mexico to Argentina,
 - mostly tropical, many spp. undescribed,
 - polyphagous tree feeders,
 - larvae initially processionary,
 - adult females / egg masses and larvae have irritant hairs.

Hylesia nigricans

Local names in Argentina

'bicho quemador' – **burning bug**

'gata peluda' – **hairy cat** (for caterpillar)

'mariposa negra' – **black butterfly**

male

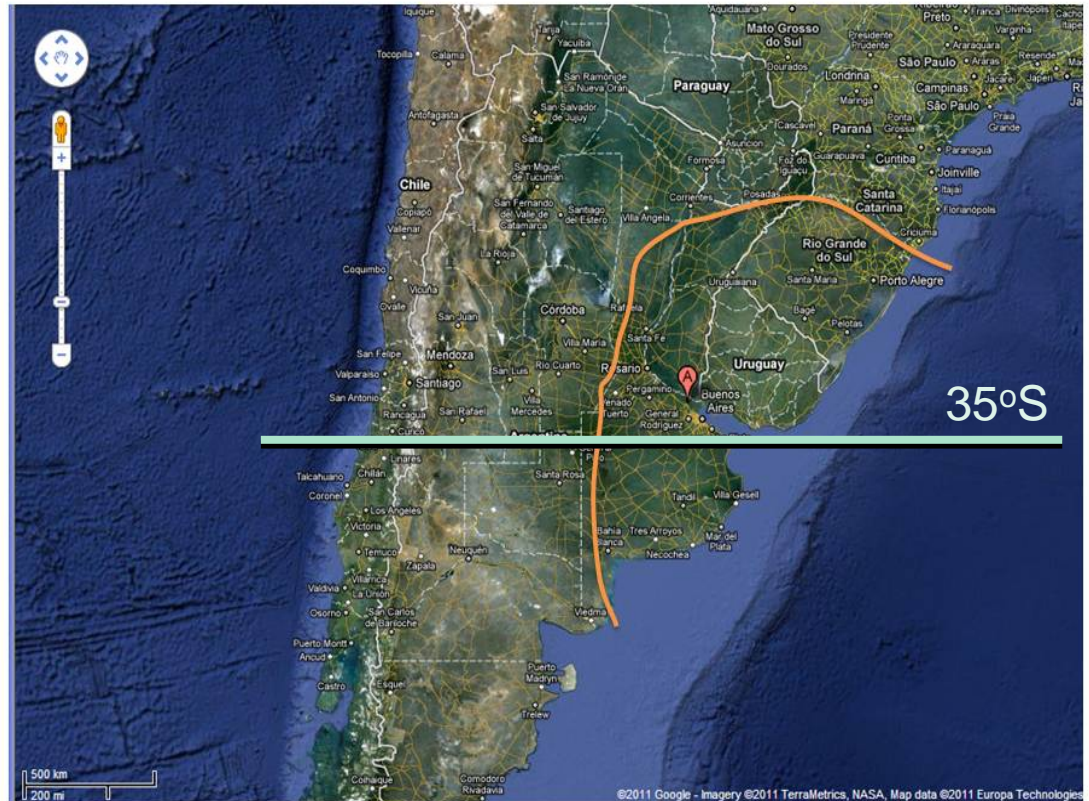


female



Distribution of H.nigricans

- Fairly restricted
- SE Brazil, Uruguay, NE Argentina - a sub-tropical to temperate region,
- The mostly southerly known species of *Hylesia*





Pest risk

- Inhabitant of forests, riversides, woodland, orchards, parks and suburban areas,
- Polyphagous on wide variety of trees -
 - **Aceraceae** – *Acer*, **Aquifoliaceae** – *Ilex*, **Betulaceae** – *Carpinus*, **Boraginaceae** – *Patagonula*, **Cesalpiniaceae** – *Tipuana*, **Fagaceae** – *Quercus*, **Juglandaceae** – *Carya*, **Lauraceae** - *Ocotea*, **Mimosaceae** – *Acacia*, **Myrtaceae** - *Eucalyptus*, *Campomansia*, **Melastomataceae** – *Tibouchina*, **Platanaceae** – *Platanus*, **Salicaceae** – *Populus*, *Salix*, **Rosaceae** – *Cydonia*, *Prunus*, *Pyrus*, *Malus*, *Caphoromoea*, *Nectandra* (Specht et al. 2006).

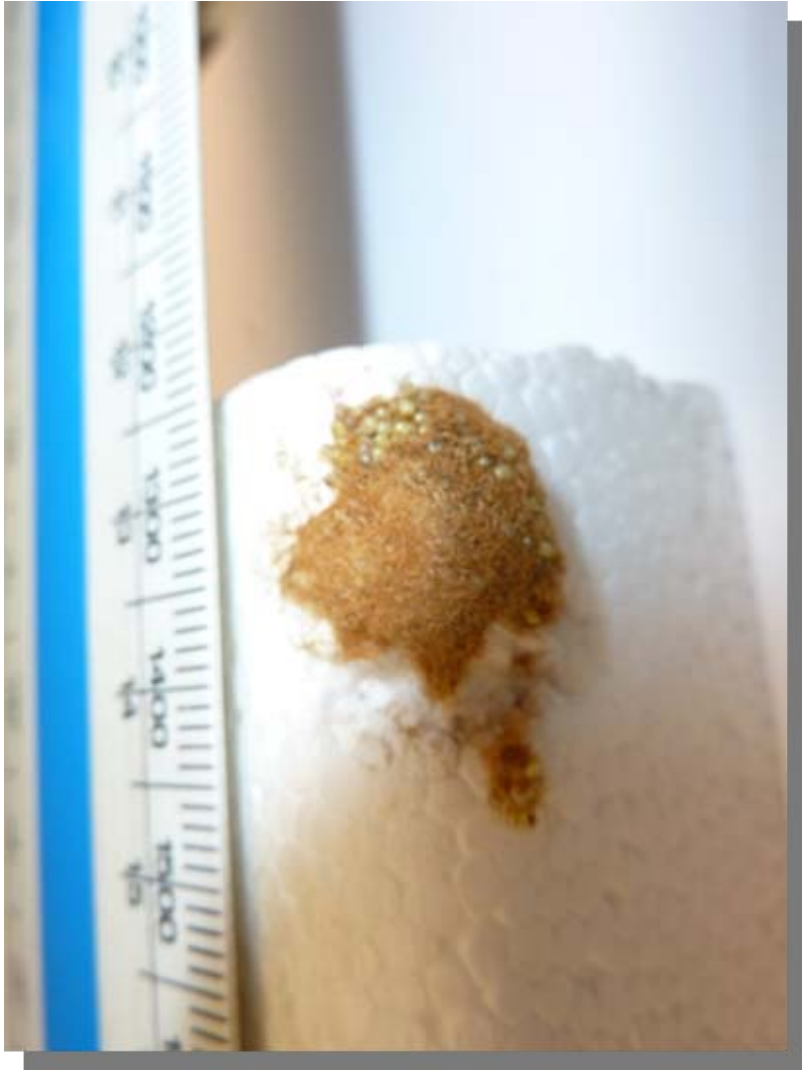


Public Health risk

Risk to human health – irritant hairs

- hairy caterpillars (processionary in early stages)
- hairs on female moths – they detach, blow around in the wind and get inhaled, contaminate surfaces
- hairs on egg masses
- hairs from moths contain histamine
- Moths fluttering round lights can show people nearby with these hairs

Irritant hairs





Ecology of H. nigricans

- Widespread in riverine habitats, delta forests, suburban areas, forest
- Subject to episodic outbreaks, can defoliate trees
- Adults fly on summer nights and are highly attracted to lights,
- Feeds on wide range of trees esp. Acer, plane, willows, poplar, chestnut, apple, peach, pear.



Life cycle of *H. nigricans*

One generation a year

Jan-Feb – adults (short-lived) eggs laid,

Feb-Oct – eggs overwinter,

Oct-Nov – eggs hatch – larvae initially
processionary (instars 1-5),

Nov-Dec - larvae disperse (instars 6-7) to feed
individually then pupate in cocoon made with
leaves in tree.

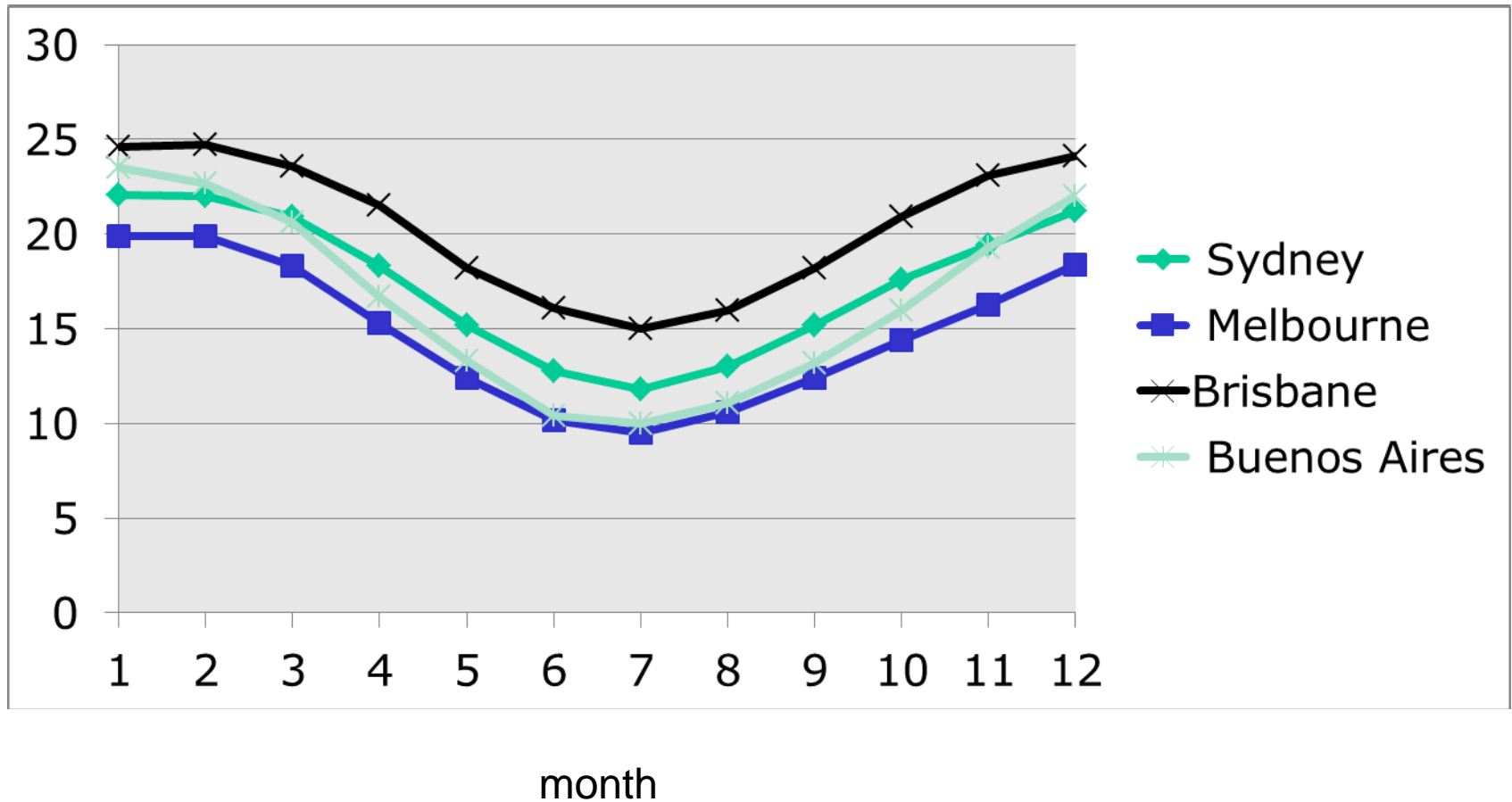


Risk to Australia from *H. nigricans*

- Resistant stage to travel (egg masses) – **yes**
- Ability to arrive alive – **yes (and proven)**
- Seasons synchronised with origin – **yes**
- Climatic conditions similar – **yes**
- Food plants present in Australia - **yes**
- Pest potential in Australia (orchards, street trees, public health) - **yes**
- Pathway to establishment – e.g. infested car parked in driveway near street trees - **possible**

Comparative mean average monthly temp.

Temperature



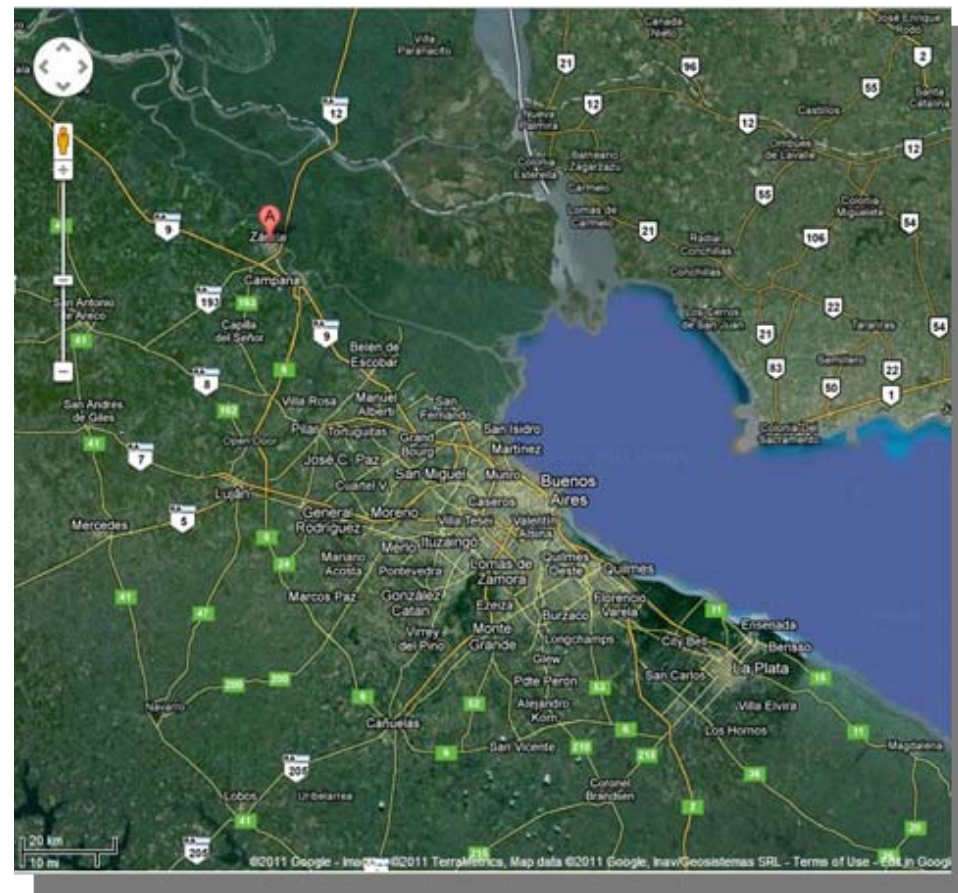
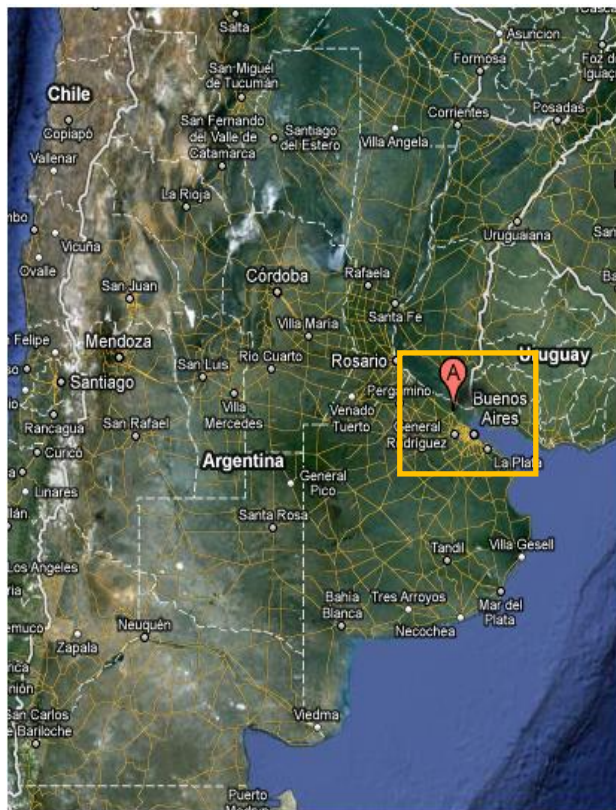
Departure port for vehicles

- Zarate, a specialised facility that handles motor vehicles 90 km NW of Buenos Aires on banks of *Rio Parana*.

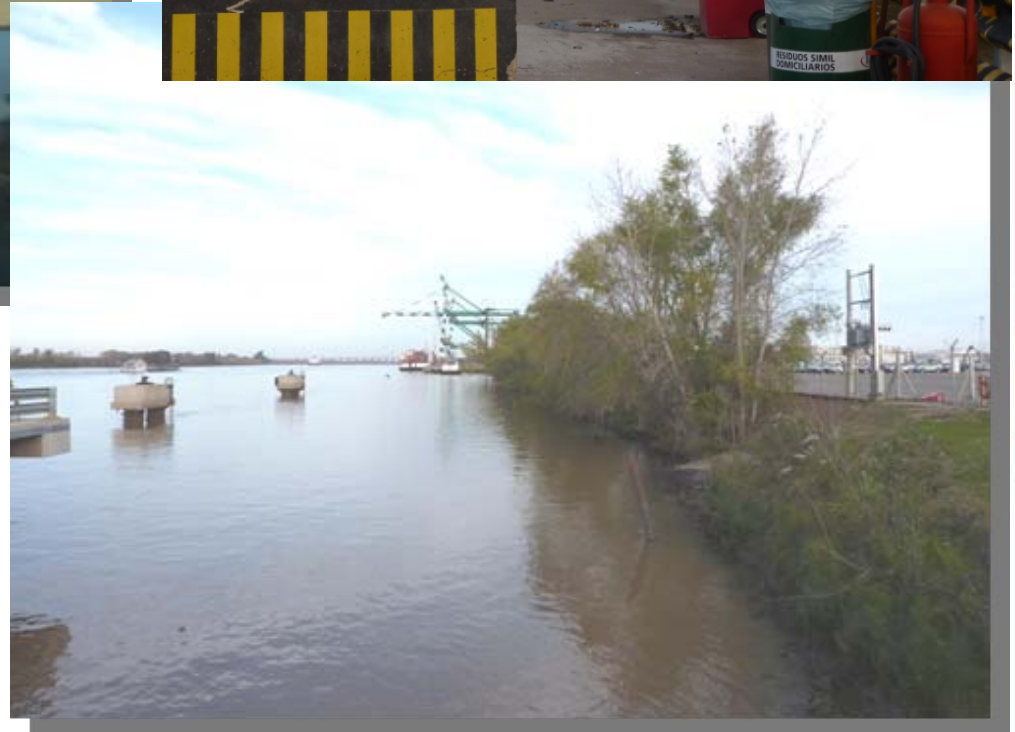


Scale – 1km

Location



Port facilities



Car holding yards



Evidence of infestation



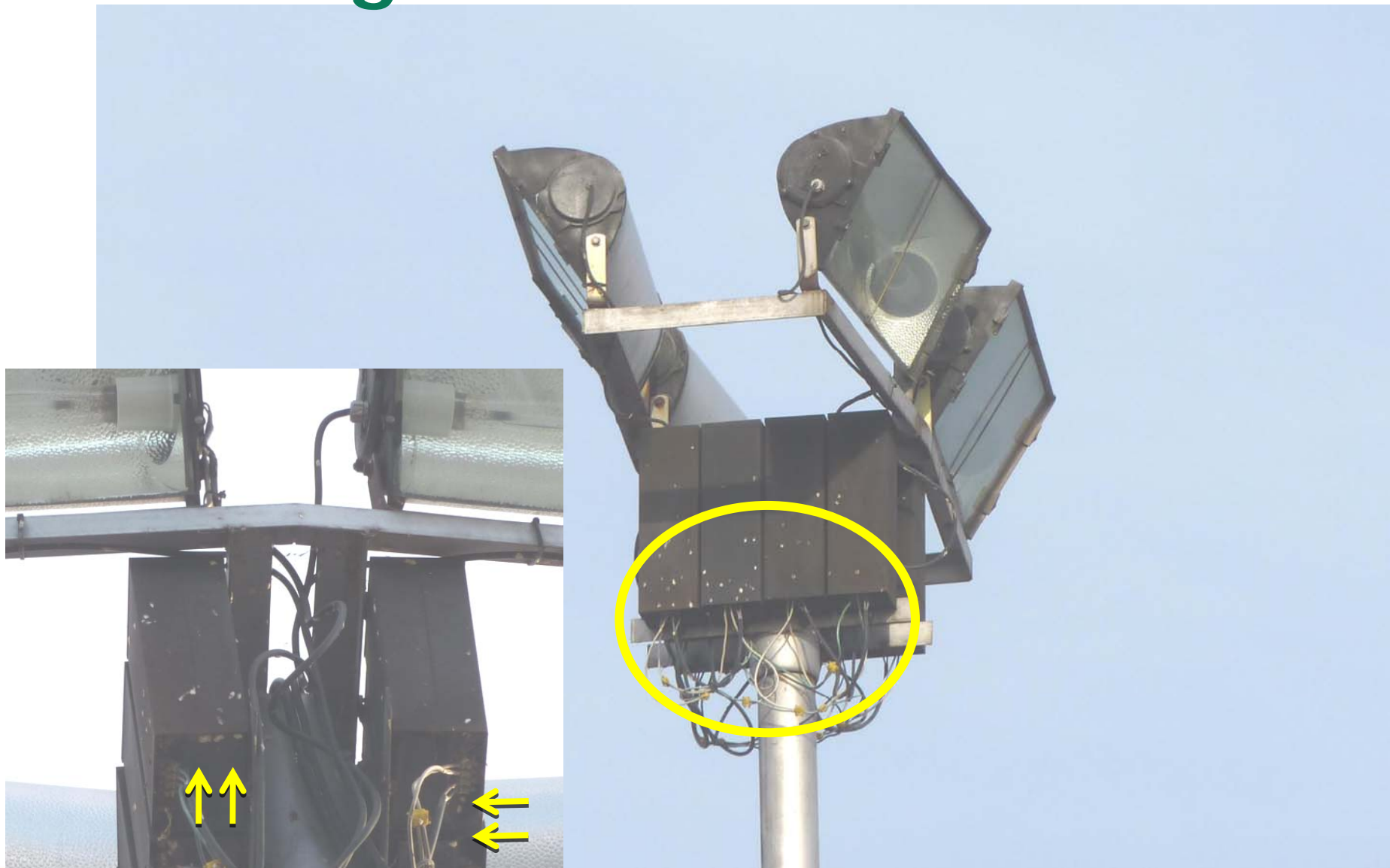
Mobile lighting units



Egg masses on inside of wheel



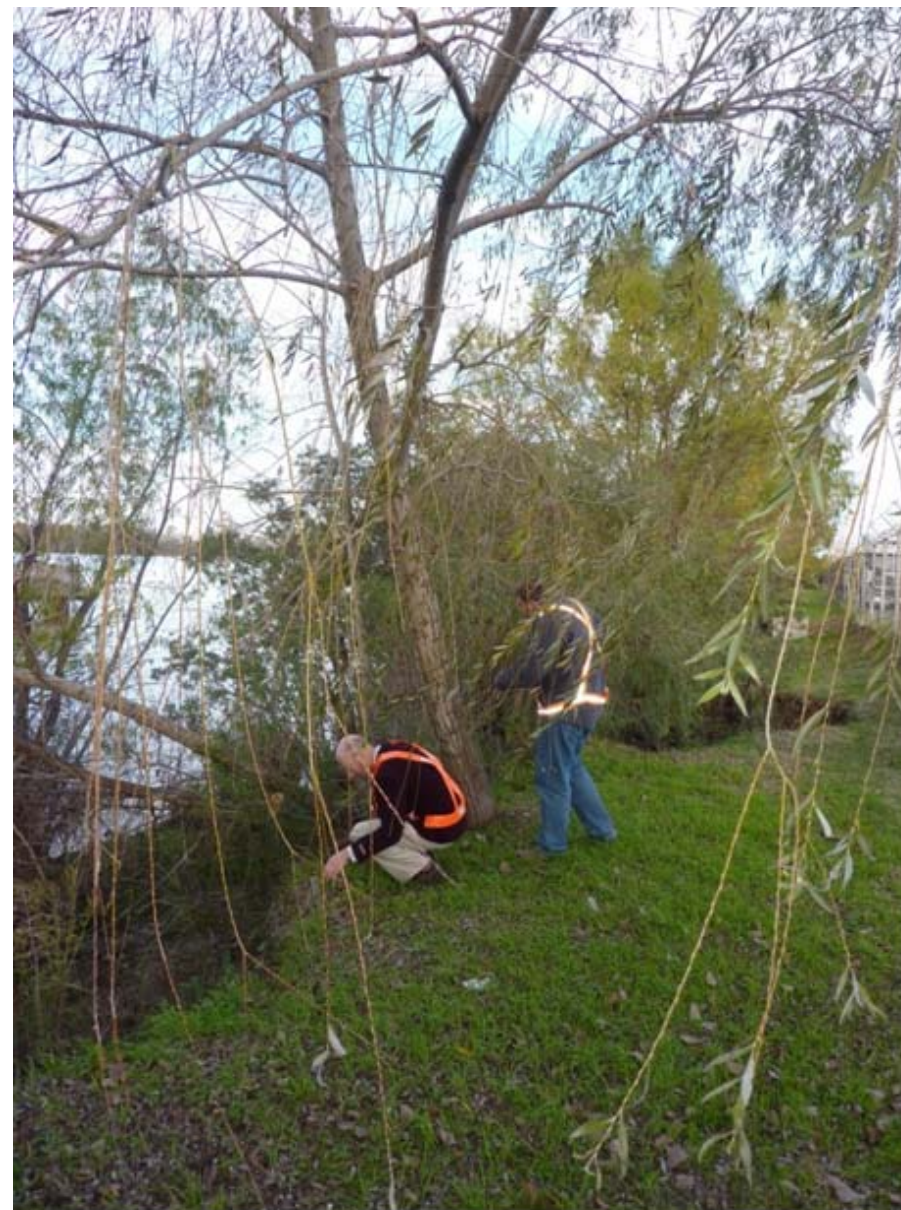
Flood lights



Fence posts



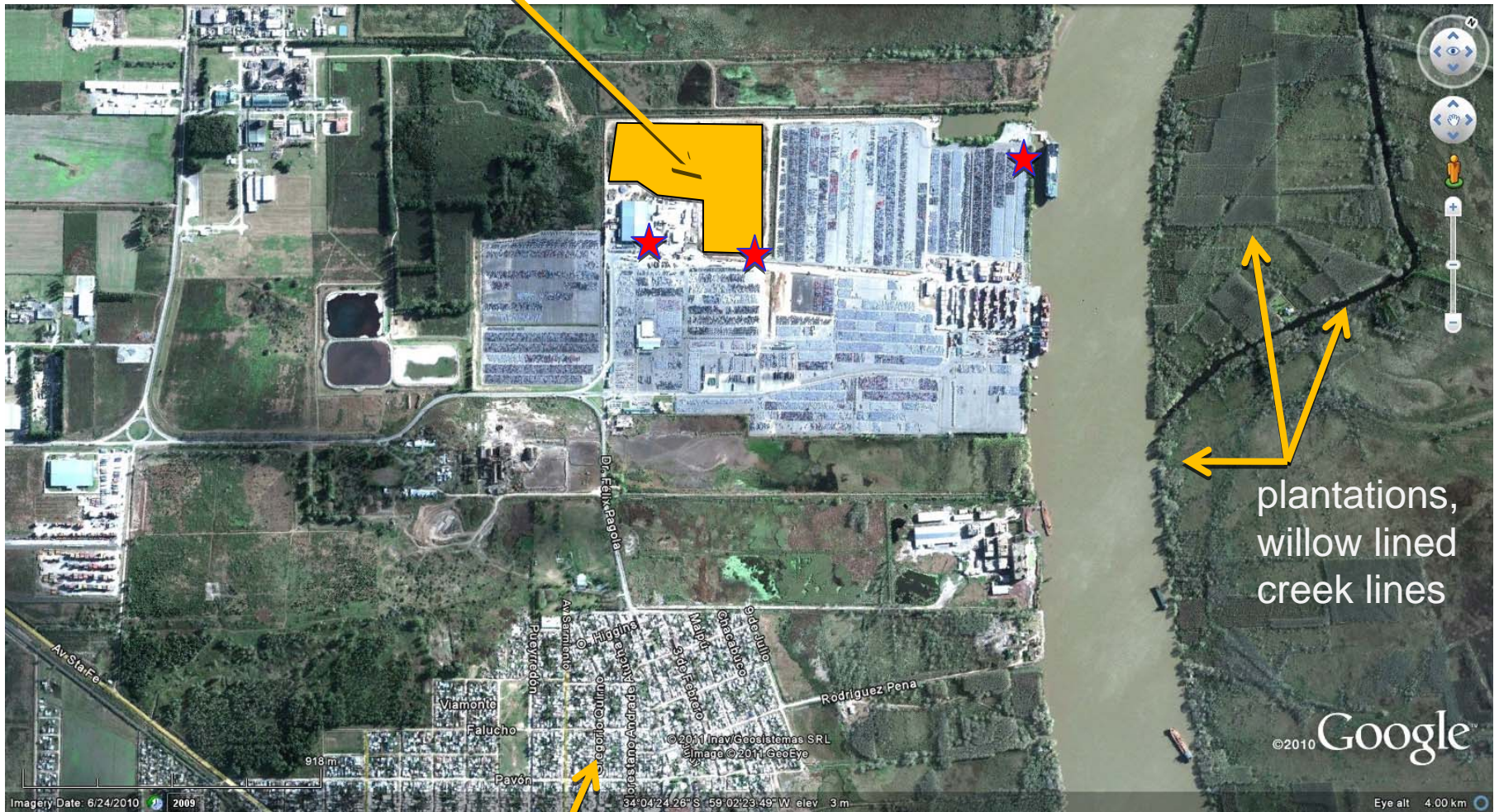
Trees



Egg masses on willows



area now also used
as car yard



plantations,
willow lined
creek lines

★ *Hylesia* egg
masses found

Scale - 1 km

township of Zarate



Conclusions

- Eggs laid on vehicles while stored at port during the short flight season (Jan/Feb),
- Population was very large → large number of egg masses found 6 months later,
- Port in effect a 'huge light trap', placed in suitable habitat,
- Moths fly well > 500m, possibly 1-2 km,
- Plenty of host trees nearby, e.g. willows, in area – e.g. in delta-lands to north of port.



Recommendations

- Define a moth '*flight period*' – (late Dec to early March),
- Port notify vehicle manufacturer / agent when moths present at port site,
- On arrival in Australia, undertake enhanced inspection of vehicles that were in the port during the '*flight period*'.



Recommendations

- Reduce lighting at port to absolute minimum for security and safe work when moths are active,
- In '*flight period*', store vehicles destined for Australia under hail netting,
- Schedule production to minimise number of vehicles exported from Zarate to Australia during '*flight period*',
- Minimise vehicle residence time at Zarate during '*flight period*',
- Train port staff to recognise moth and record periods of moth activity.

Hail netting





Further studies

- Test attraction to different lighting types – e.g. sodium,
- Collect moth flight activity data to better define ‘flight period’,
- Conduct tests to confirm time and conditions needed to kill egg masses using heat,
- Sex pheromones for *Hylesia* spp. need to be identified and produced, to assist monitoring.



Some lessons

- Utility of 'Google Earth' and geo-tagged photo resources for assessing risk,
- The literature may not always be in English,
- New trade routes / port facilities bring new challenges,
- Importance of 'hitch-hikers'
- Trained inspectorate to detect the unexpected,
- Need for permanent facility to heat treat vehicles.