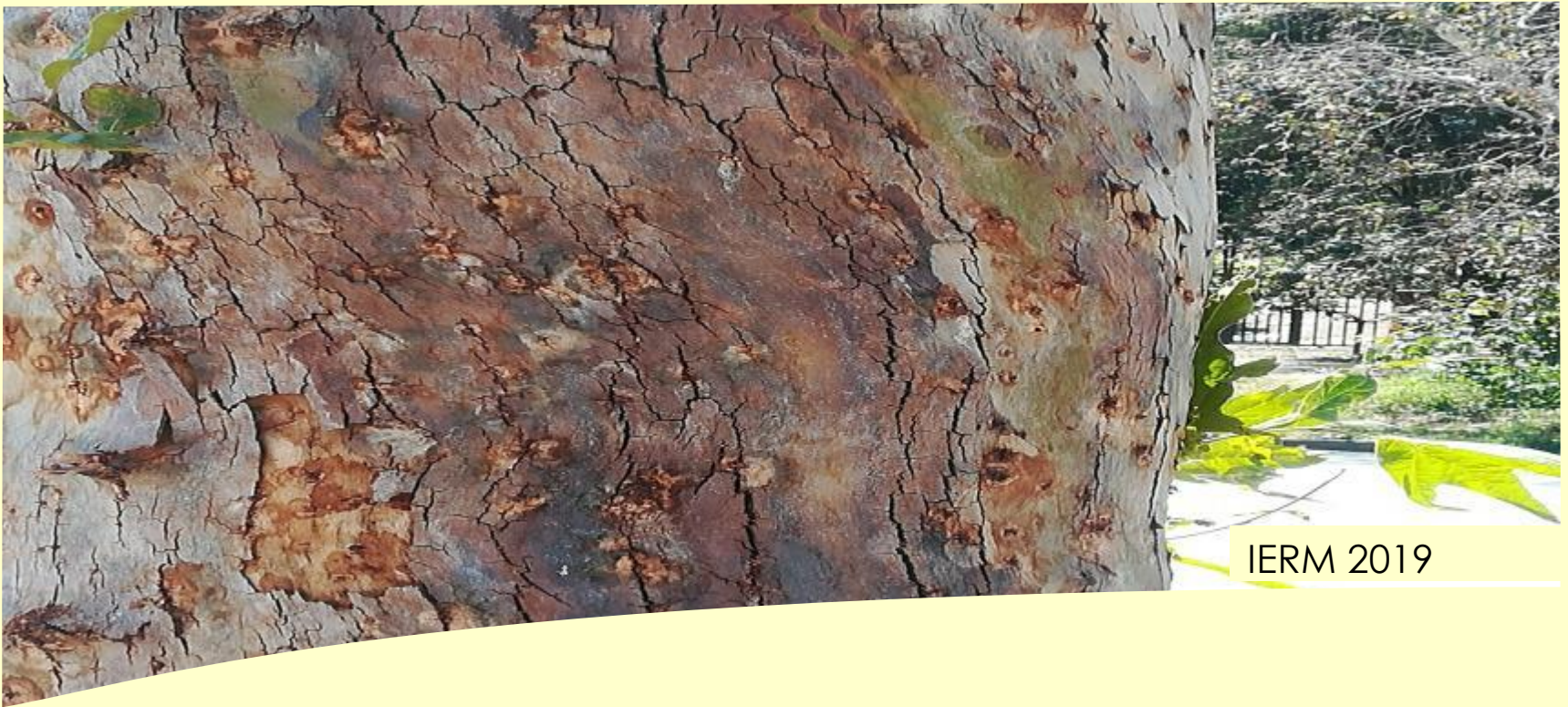


# POLYPHAGUS SHOT HOLE BORER: CITY OF JOHANNESBURG PERSPECTIVE

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Vuyo Yani



IERM 2019



# INTRODUCTION



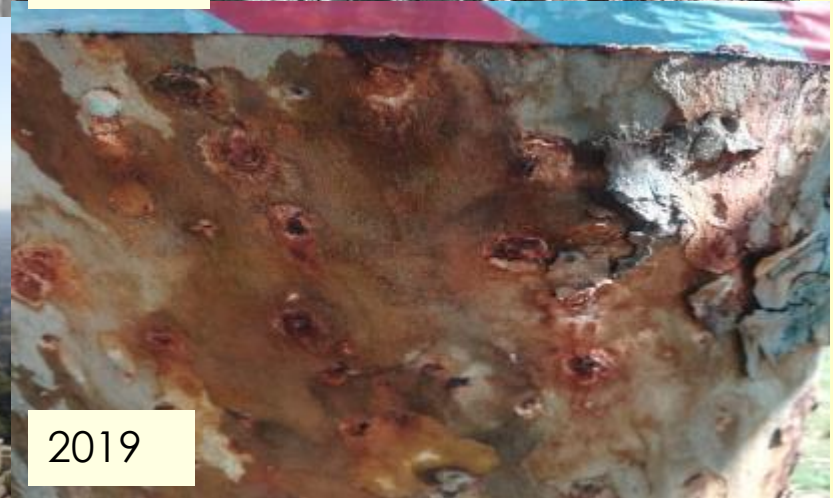
1820



1950



2012



2019

■ Tree as a **living organism**



■ International global trade of live plants linked to increased invasive pest and diseases

■ Climate on increasing invasive forest pest

■ Invasive forest pest are becoming difficult to control

■ Invasive pests and diseases are causing major losses



# WHAT IS SHOT HOLE BORER?



*Euwallacea* complex are:

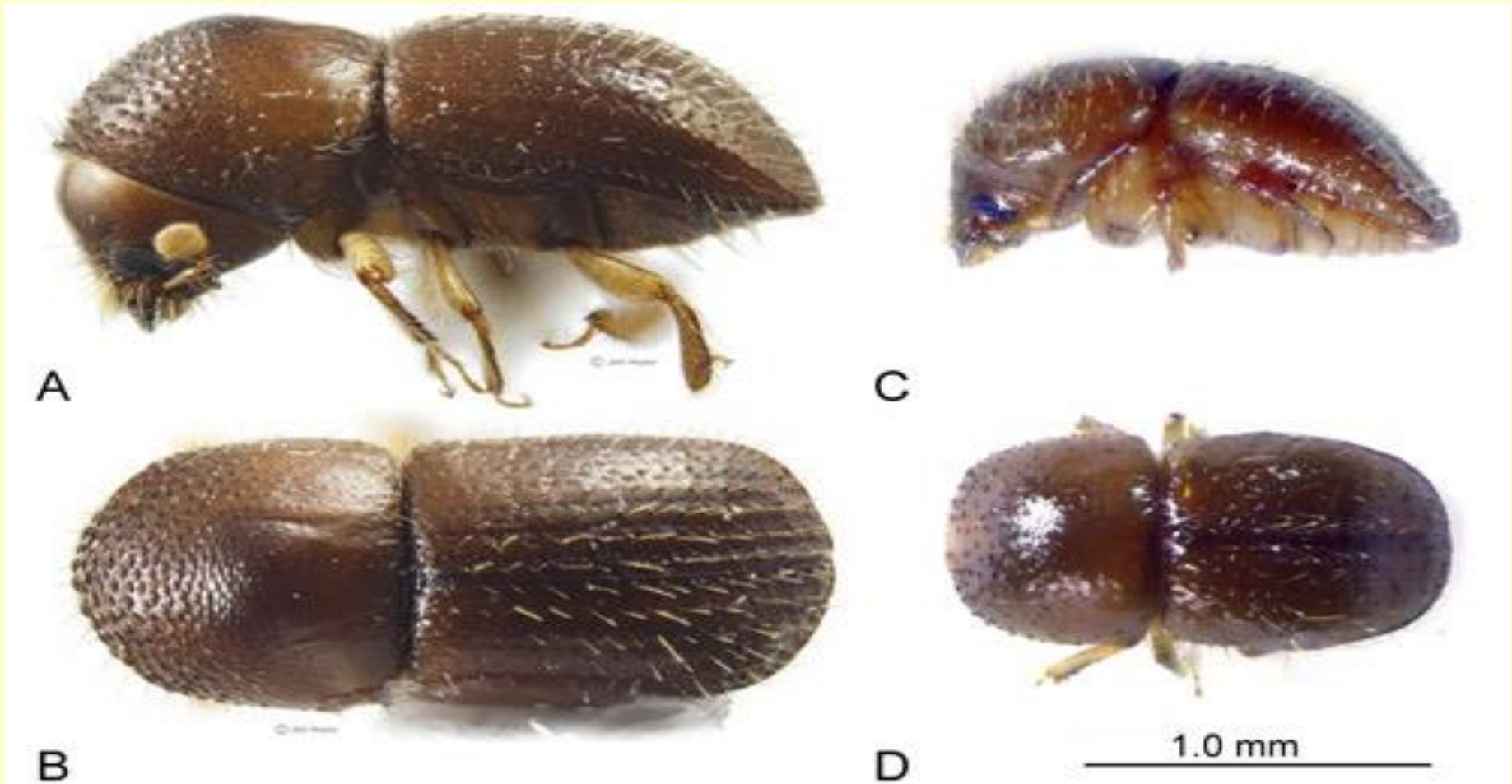
- Tea Shot Hole Borer A = *Euwallacea perbrevis*
- Tea Shot Hole Borer B - *Euwallacea fornicator*
- Polyphagous Shot Hole Borer = *Euwallacea fornicatus*
- Kuroshio Shot Hole Borer = *Euwallacea kuroshio*

# WHAT IS PSHB?



- *Euwallacea fornicatus* (1.8 – 2.5) mm
- Ambrosia beetle native to Southeast Asia
- Attack wide range of plants (over 200)
- Symbiotic relationship with *Fusarium* fungus
- *Fusarium* fungus damages the vascular bundles which results in die-back
- The beetle does not feed on the plant tissue, thus it makes it difficult to control with both systemic and contact pesticides.
- No registered chemical for domestic use (RSA)

# HOW DOES THE BEETLE LOOK LIKE?



**Figure 1: *Ewallacea fornicatus* A-B female and C-D male. (Photo by Jiri Hulcr You Li)**





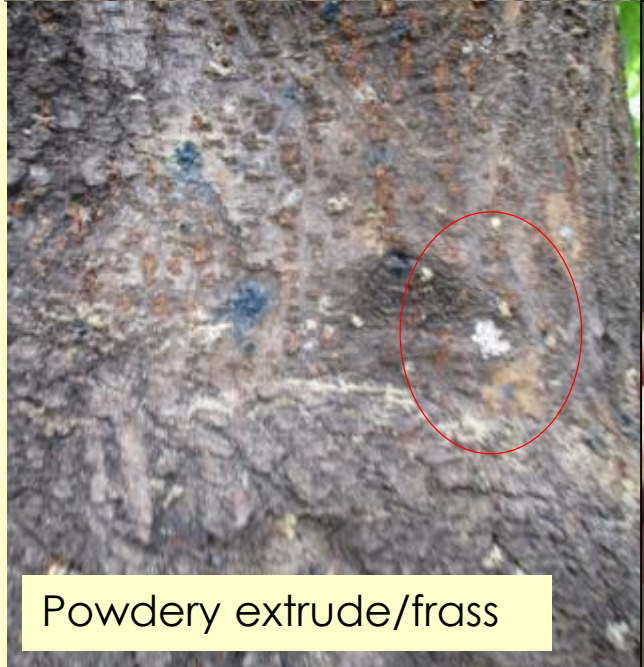
staining



Gun shot-like wounds & staining



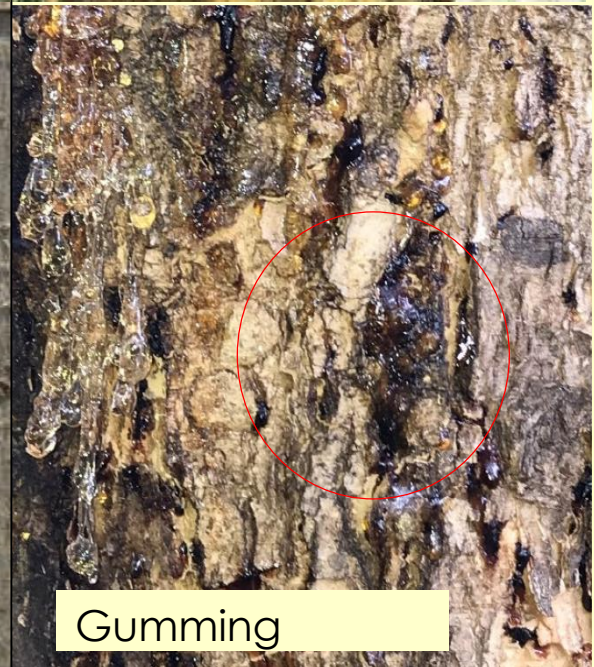
Entry holes



Powdery extrude/frass



Fungus discolouration



Gumming

# POSSIBLE IMPACT OF PSHB



- Highly infested trees may fall over.
- Loss of life and properties, which results in liabilities.
- Loss of urban forest/benefits associated with it.
- Loss of CoJ landscape
- Reputational damage
- Requires money



# PILOT RESEARCH



## ■ Aim of the study

To understand the spread of PSHB in CoJ Context

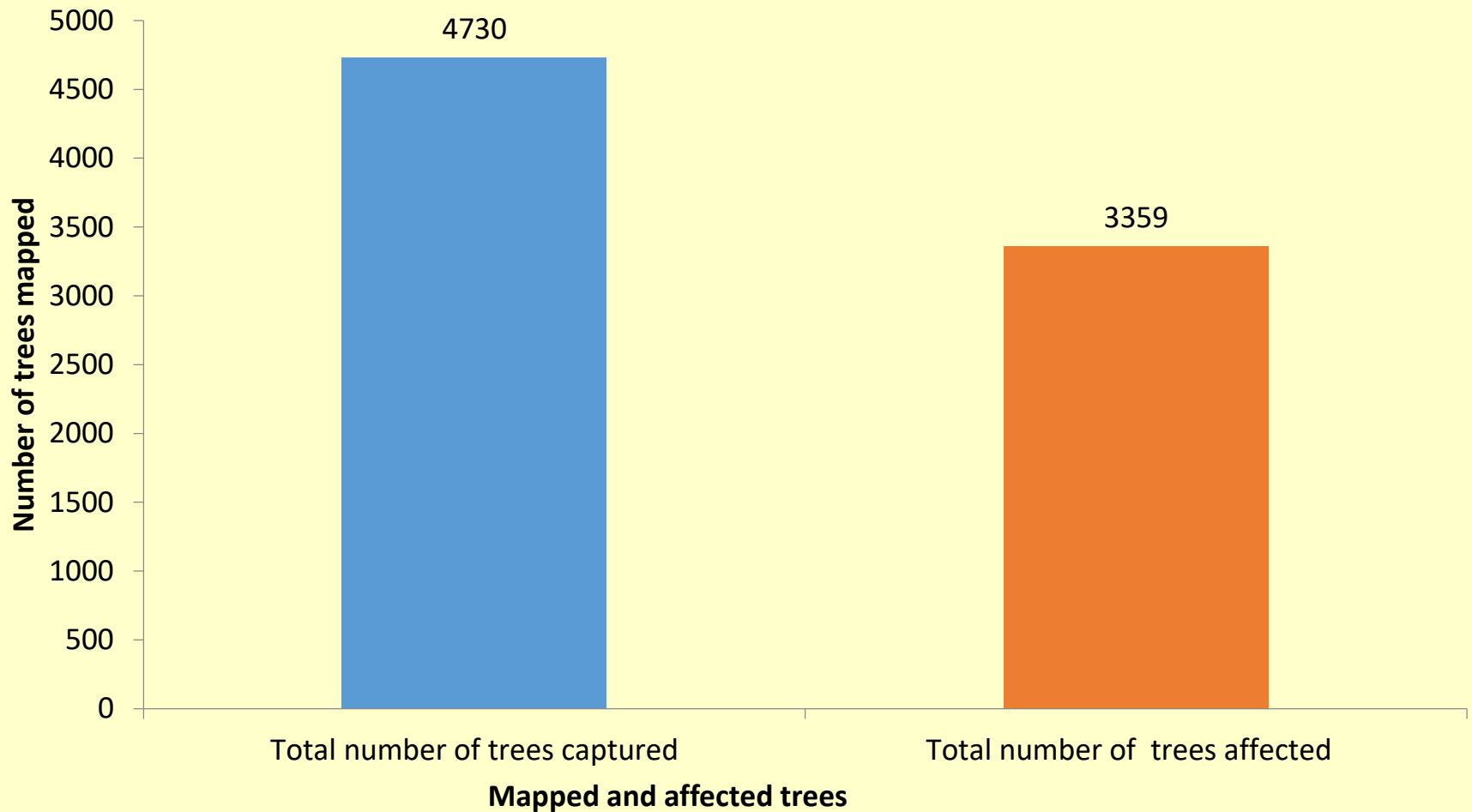
## ■ Objectives

- To map, identify and quantify infestation in CoJ zoned open space (Region B, E and F)
- To determine level of infestation in CoJ zoned open space (Region B, E and F)

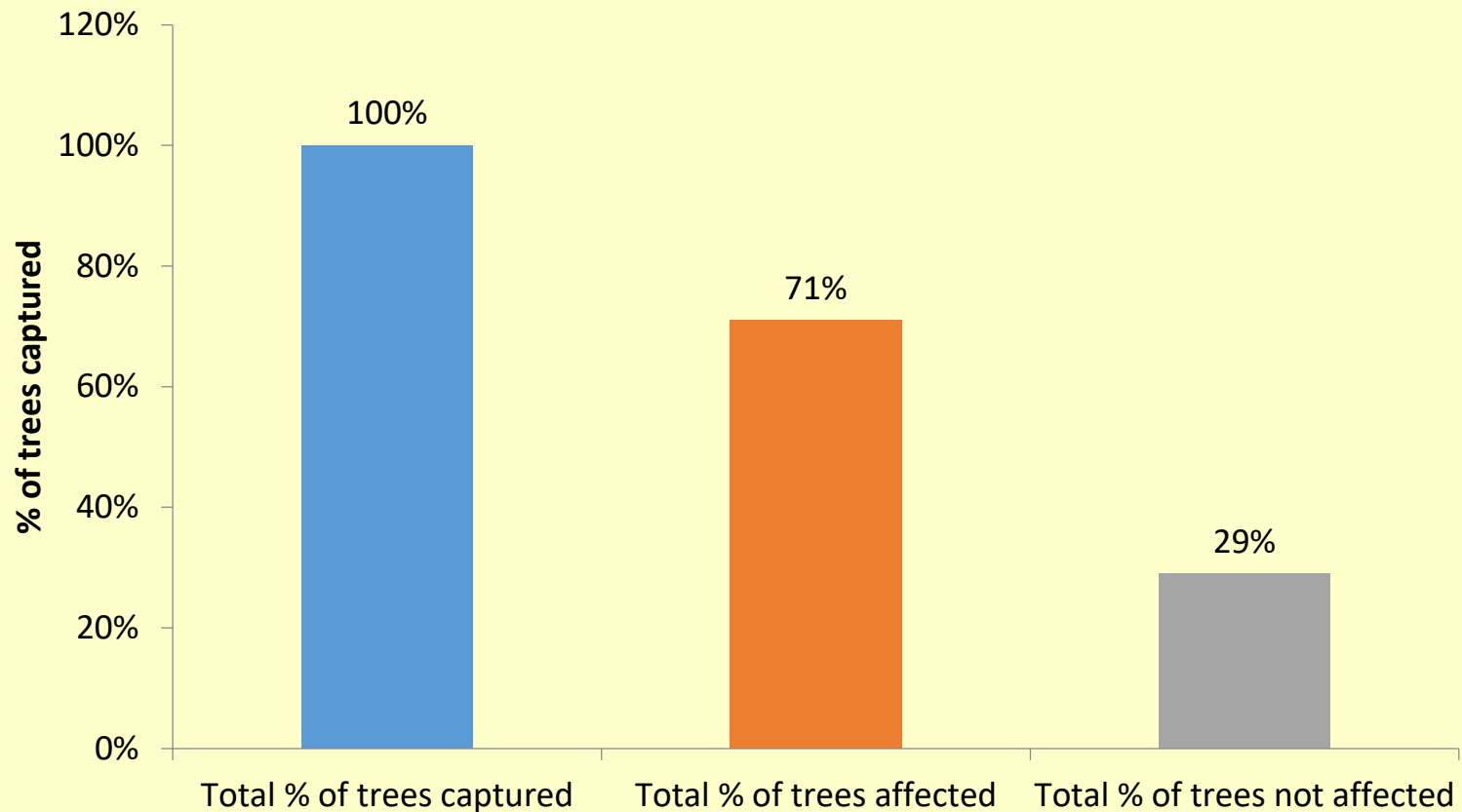
# Preliminary findings / results in Region B +E + F



## MAPPED VS AFFECTED



## TOTAL % OF AFFECTED AND NOT AFFECTED TREES

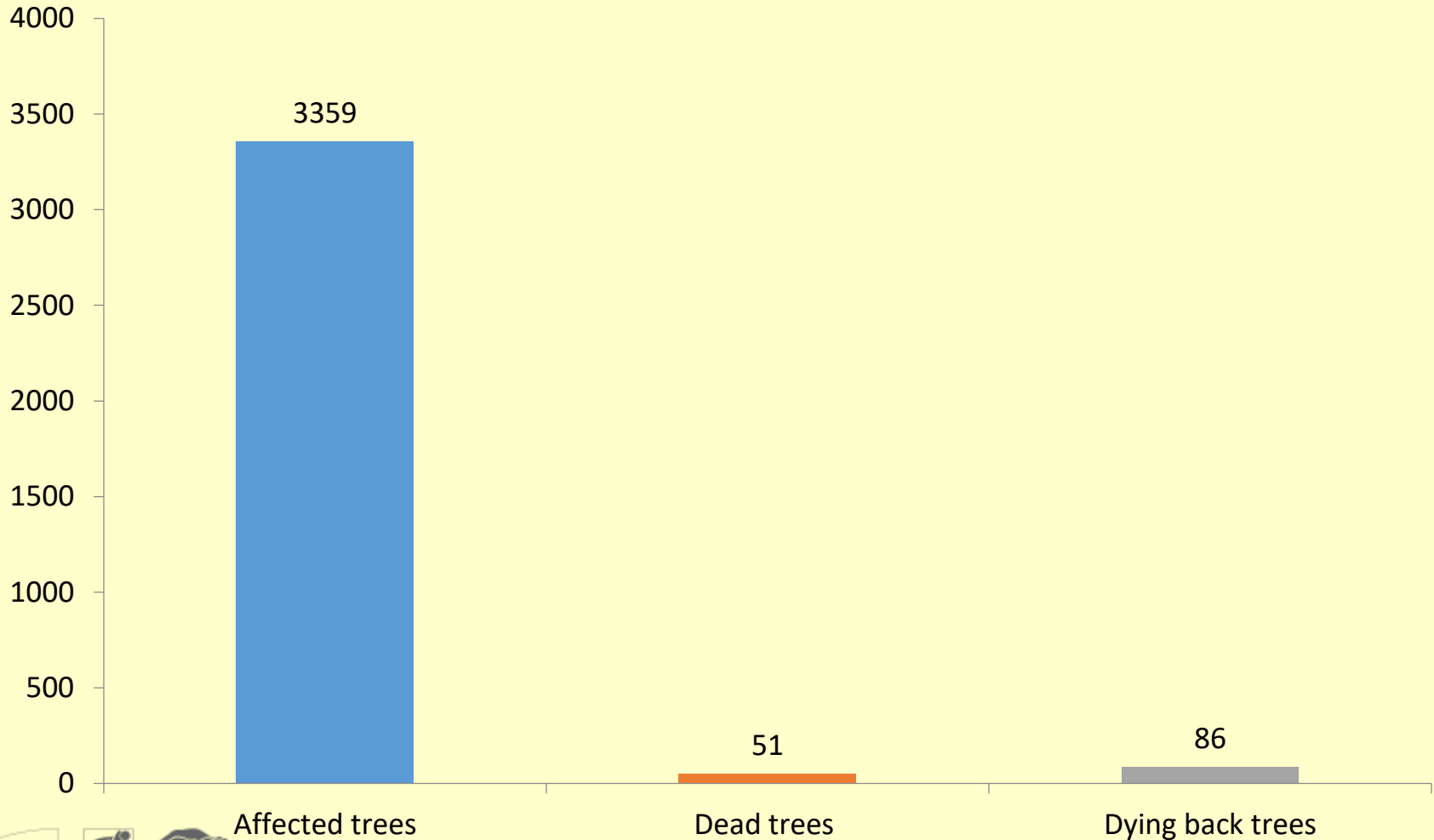


% of captured, affected and not affect trees

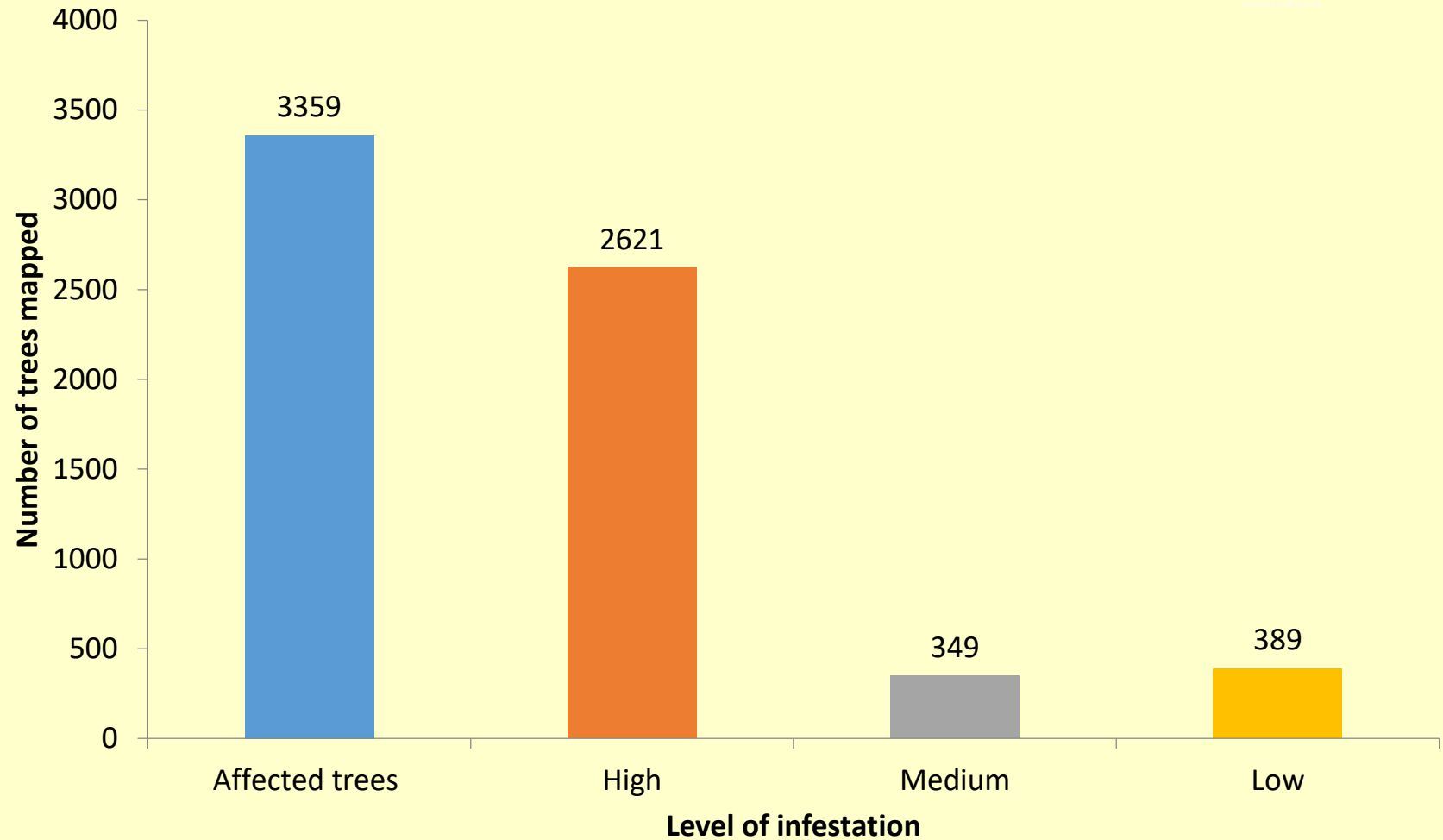




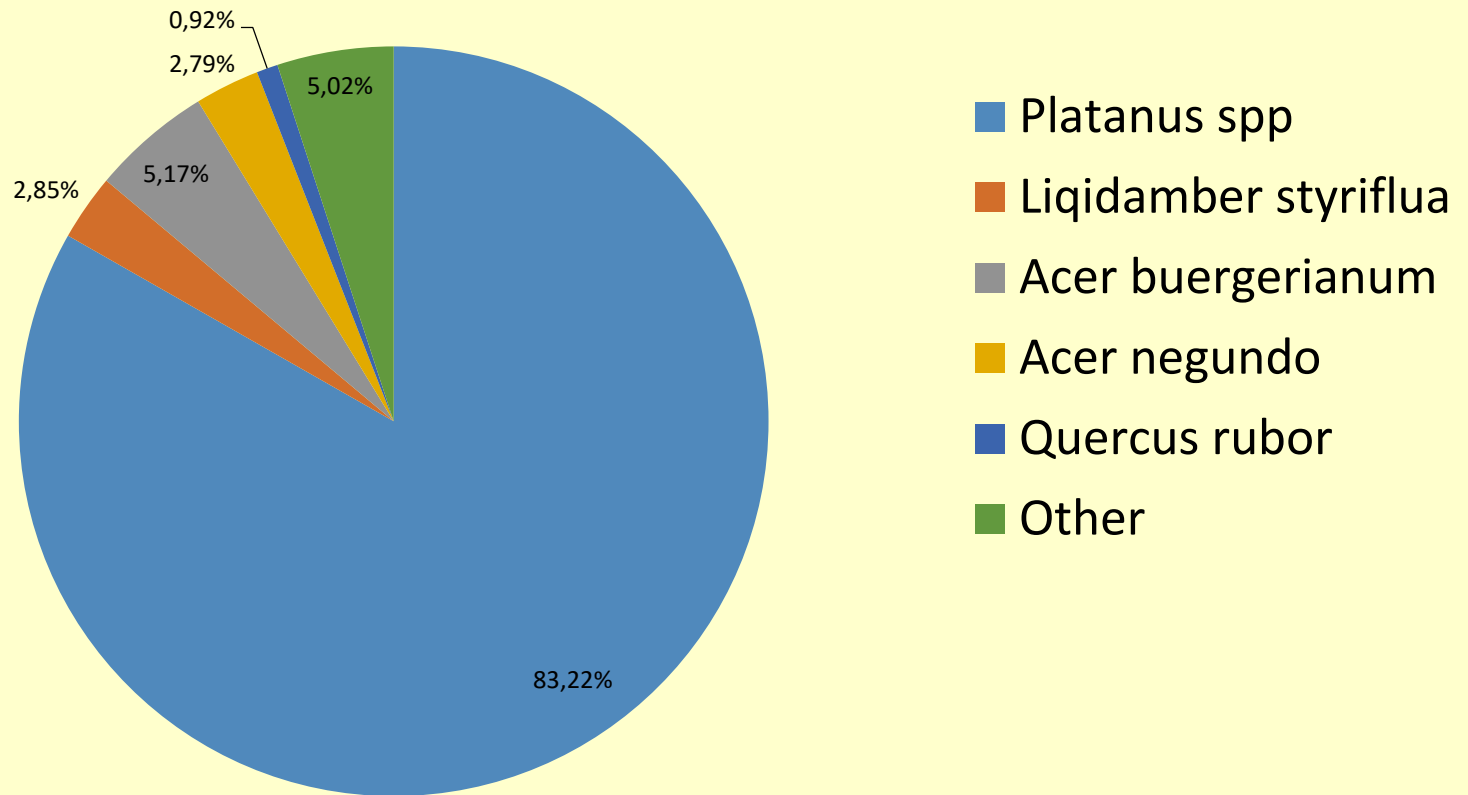
## DEAD AND DYING BACK TREES



## LEVEL OF INFESTATION



## % OF AFFECTED SPECIES











Out of 143 species mapped, 56 were affected



Some of affected species in CoJ

- *Platanus acerecifolia*
- *Platanus wrightii*
- *Liquidambar styraciflua*
- *Acer negundo*
- *Combretum krausii*
- *Acer buergerianum*
- *Quercus robur*
- *Caesalpinia ferrea*
- *Vhachelia sieberiana var woodi*



# JAN SMUTS AVENUE

**Dying  
back**



Some tree species not affected on mapped areas  
(no PSHB observed during mapping yet)



- *Fraxinus spp*
- *Celtis sinensis*
- *Syzygium paniculatum*
- *Magnolia grandiflora*
- *Celtis africana*
- *Trema orientalis*
- *Searsia lancea*
- *Ceratonia siliqua*
- ***NB. Non reproductive host should be considered for tree planting.***

Observations	Responses
When was Craighall Park established?	<ul style="list-style-type: none"> <li>• In 1945</li> </ul>
Are Acer negundos at Craighall Park found killed by PSHB?	<ul style="list-style-type: none"> <li>• Opportunist attacks</li> </ul>
What is the life expectancy of an Acer negundo?	<ul style="list-style-type: none"> <li>• 75 years and less.</li> </ul>
Natural attrition of the tree maybe?	<ul style="list-style-type: none"> <li>• Yes, the trees have reached their life span.</li> </ul>
Could have anyone saved these trees?	<ul style="list-style-type: none"> <li>• No. Acer negundo highly susceptible to various pest and diseases</li> </ul>
Is PSHB the main cause for dead trees in the study area(s)?	<ul style="list-style-type: none"> <li>• No. Acacia melanoxylon, Grevellia robusta, Dias cotonifolia were not found killed by the PSHB infestation.</li> </ul>



# TACKLING THE PSHB

Oversight tour



Mapping of infested trees



Stakeholder engagement



Removal of dead trees





# RESPONSE ON TREE REMOVAL







# CHALLENGES ON TACKLING PSHB



- Advocating for removal of affected trees
- Advocating for use of chemicals
- Charlatans siphoning money from the residents
- Shortage of chippers
- Limited human resources
- Limited financial resources
- Media backlash/fake news



## Shothole Borer

Friday at 10:11



Fantastic news - the first #PSHB product has been approved by The Registrar.

**Pan African Farms - PanAf** are determined to contribute to the fight against the Shot Hole Borer, and PSHB Fungicidal is a weapon that can now be added to the fight against this scourge that is killing our South African trees. We hope that more products and solutions will soon be made available within South Africa to bolster our efforts against the Shot Hole Borer and it's fungal symbiont.



Write a comment...





# CONCLUSIONS



- JCPZ removes only dead and dying back trees
- Region B and E highly affected
- All the plane trees in Parkhurst, Parktown north and Dunkeld and surrounds are affected
- Trees in Sandton drive (M75) highly affected
- Health of affected trees is deteriorating
- Trees in Jan Smuts avenue are showing signs of dying back
- Further research city wide

# ACKNOWLEDGEMENTS



- PSHB Steering committee team (JCPZ)
- Vuyo Yani, Ben Masalesa and Theo Bernhardt

# Thank you &

