Advancing wildlife research – development of a solution to process video footage of waterbirds

Dr Shannon Dundas
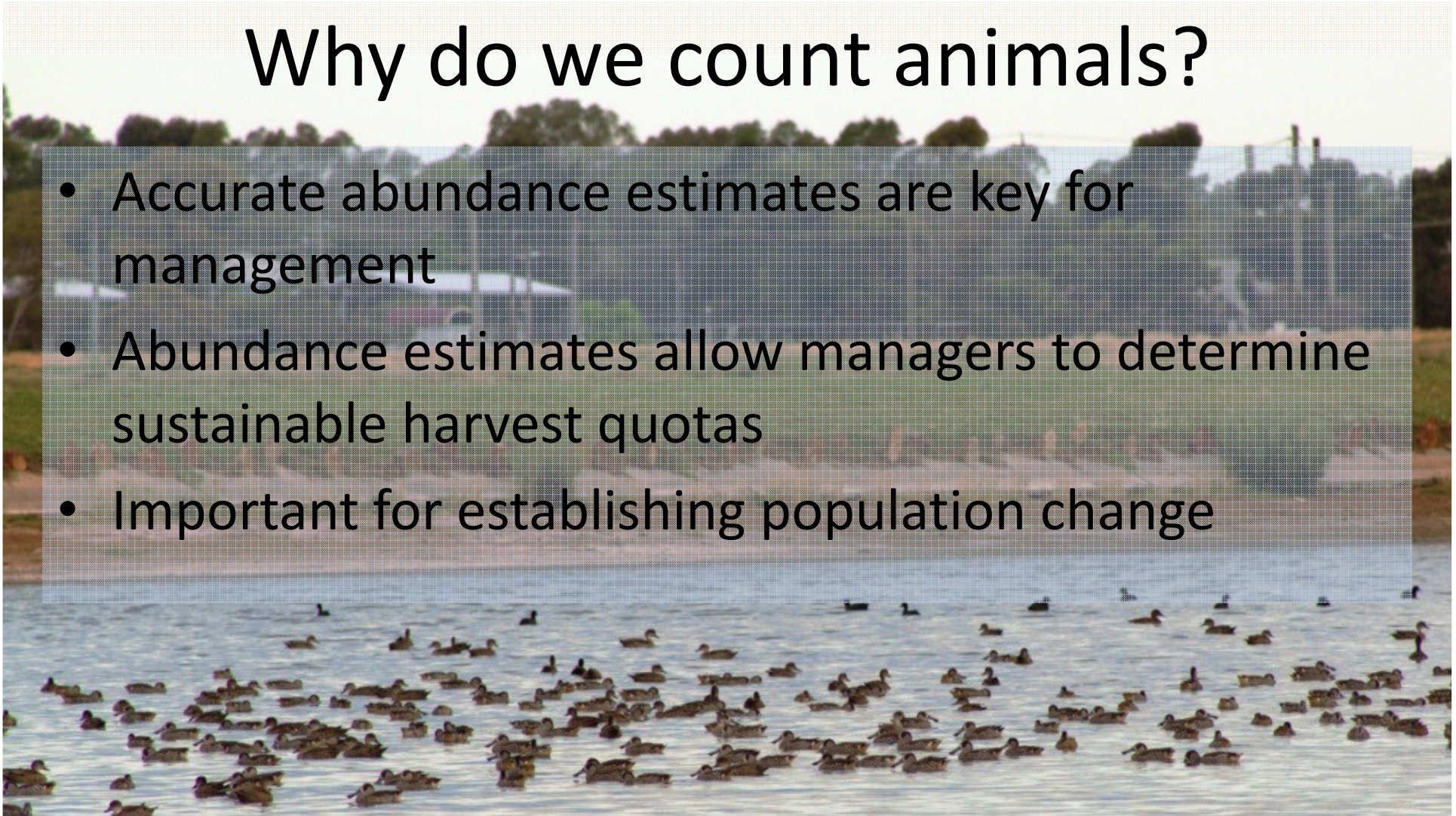Research Officer - NSW Department of Primary Industries

Why do we count animals?

- Accurate abundance estimates are key for management
- Abundance estimates allow managers to determine sustainable harvest quotas
- Important for establishing population change

Traditional survey methods

- Often rely on in-field counts by observers
- Major biases exist with some methods – requires verification
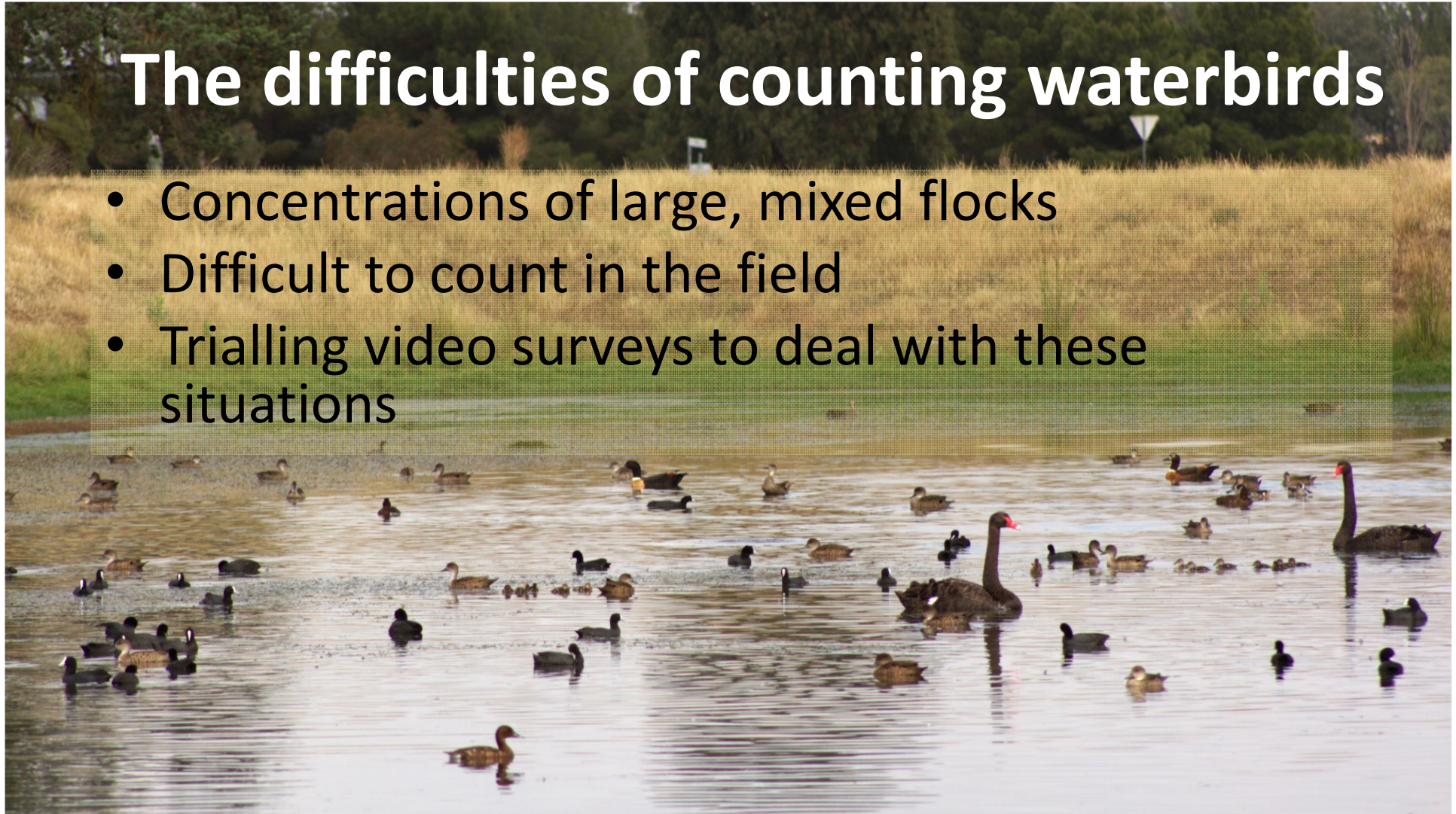- No record for future comparison

Wildlife researchers love new toys!

- Development of UAVs – improved battery life and affordability
- Solution for surveying wildlife, especially large, concentrated groups

The difficulties of counting waterbirds

- Concentrations of large, mixed flocks
- Difficult to count in the field
- Trialling video surveys to deal with these situations

The easy part – in field data collection

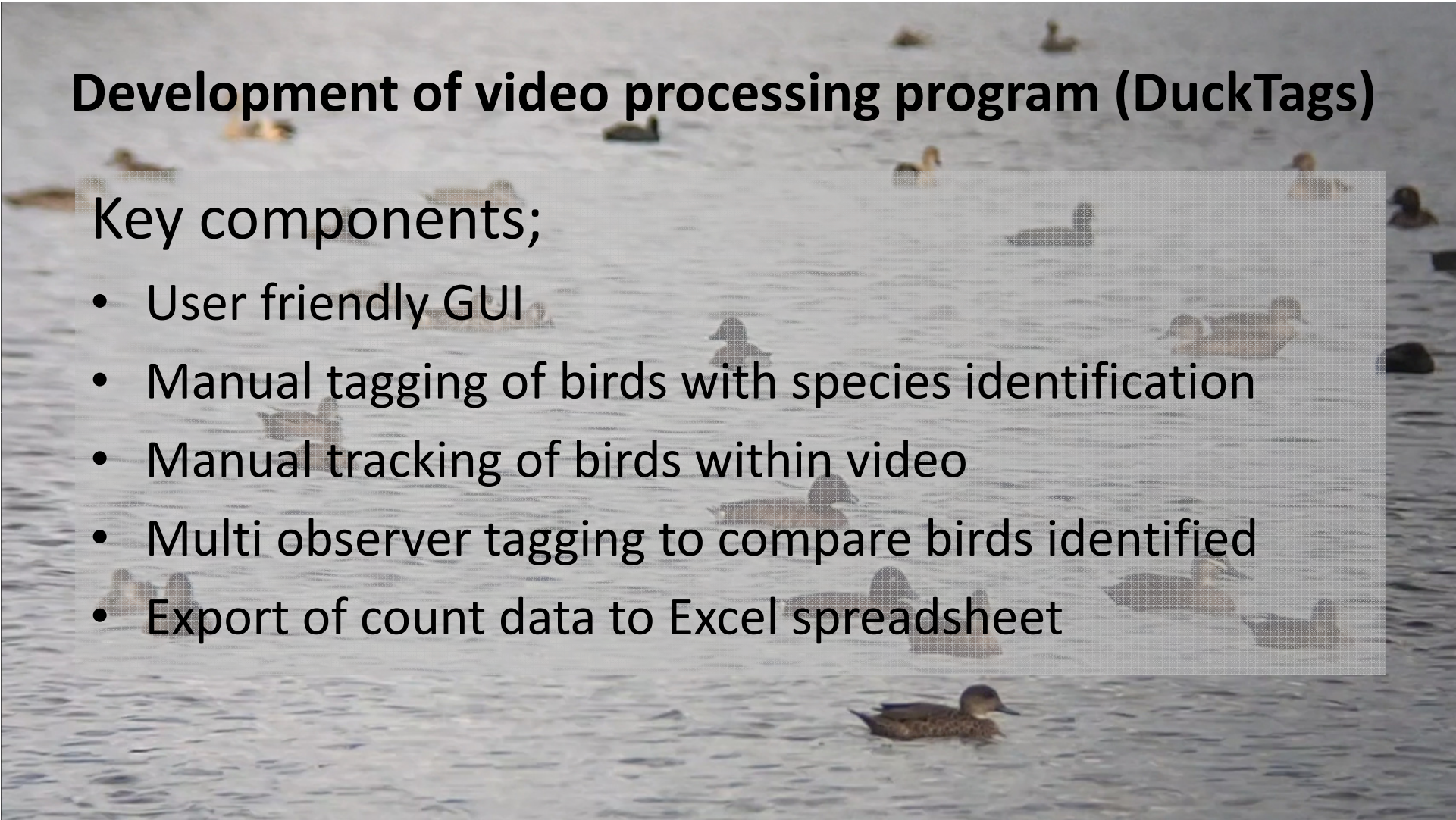# The easy part – in field data collection

So many videos, so little time

- Collection of large quantity of video footage from the field

- Currently no readily available program to process video (freeware available for tagging still images)

Why MATLAB?

- Recommended by Climate research group at DPI

- Extensive consultation during development stages

- Excellent support (even for someone with very limited programming experience!)

Development of video processing program (DuckTags)
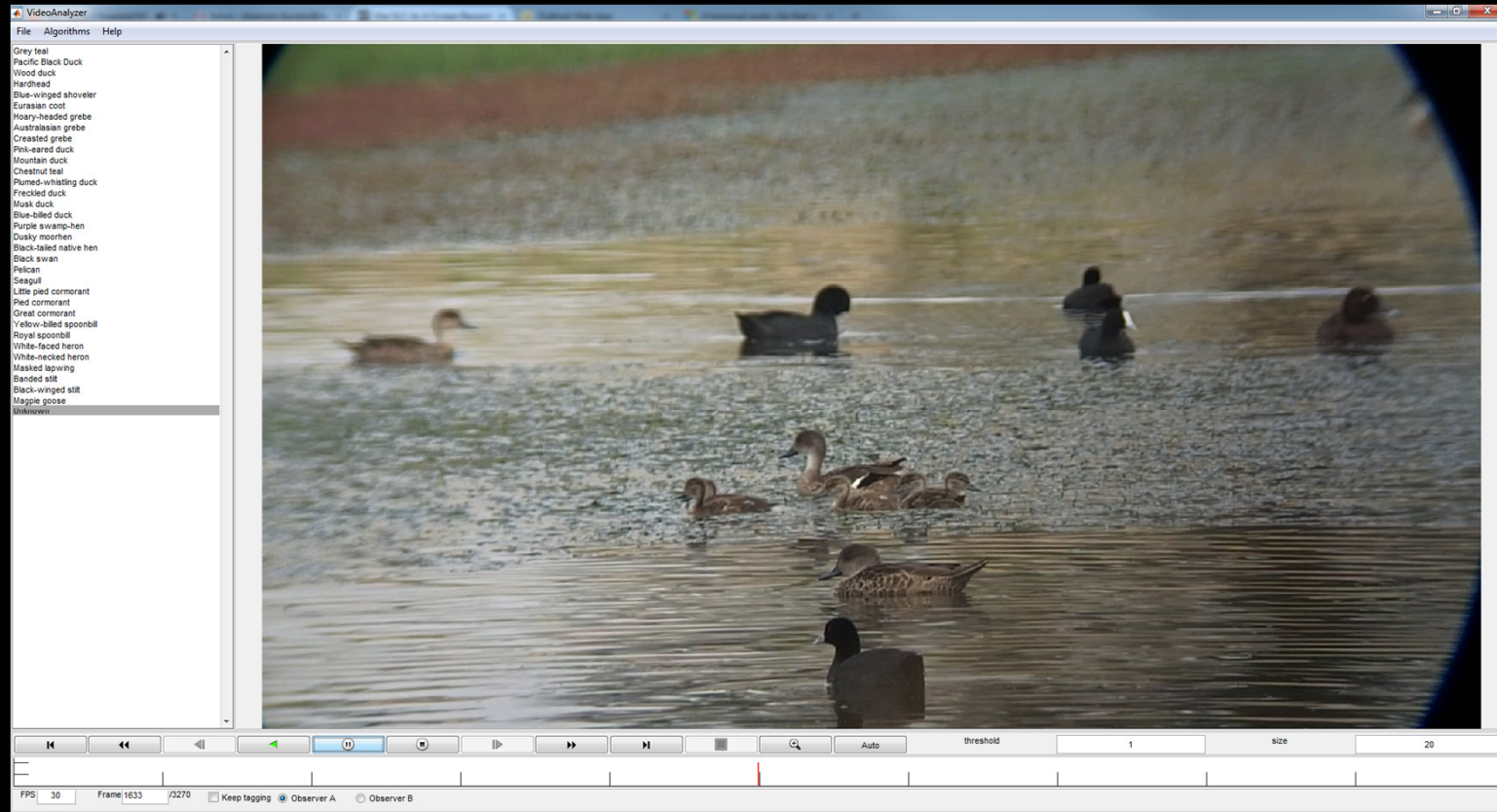
Key components;

- User friendly GUI

- Manual tagging of birds with species identification

- Manual tracking of birds within video

- Multi observer tagging to compare birds identified
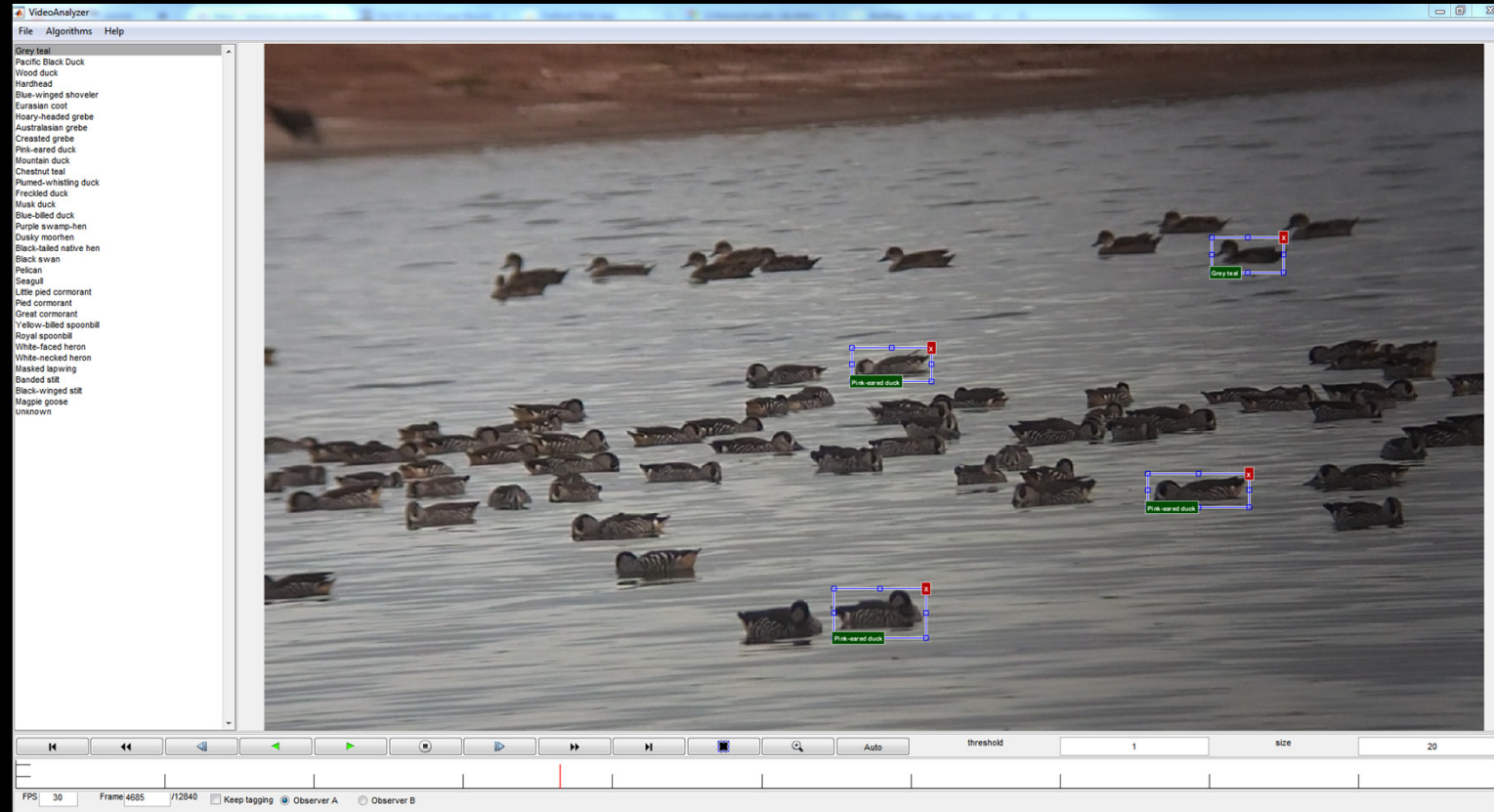
- Export of count data to Excel spreadsheet

MATLAB packages used

- Image Processing Toolbox

- Computer Vision System Toolbox
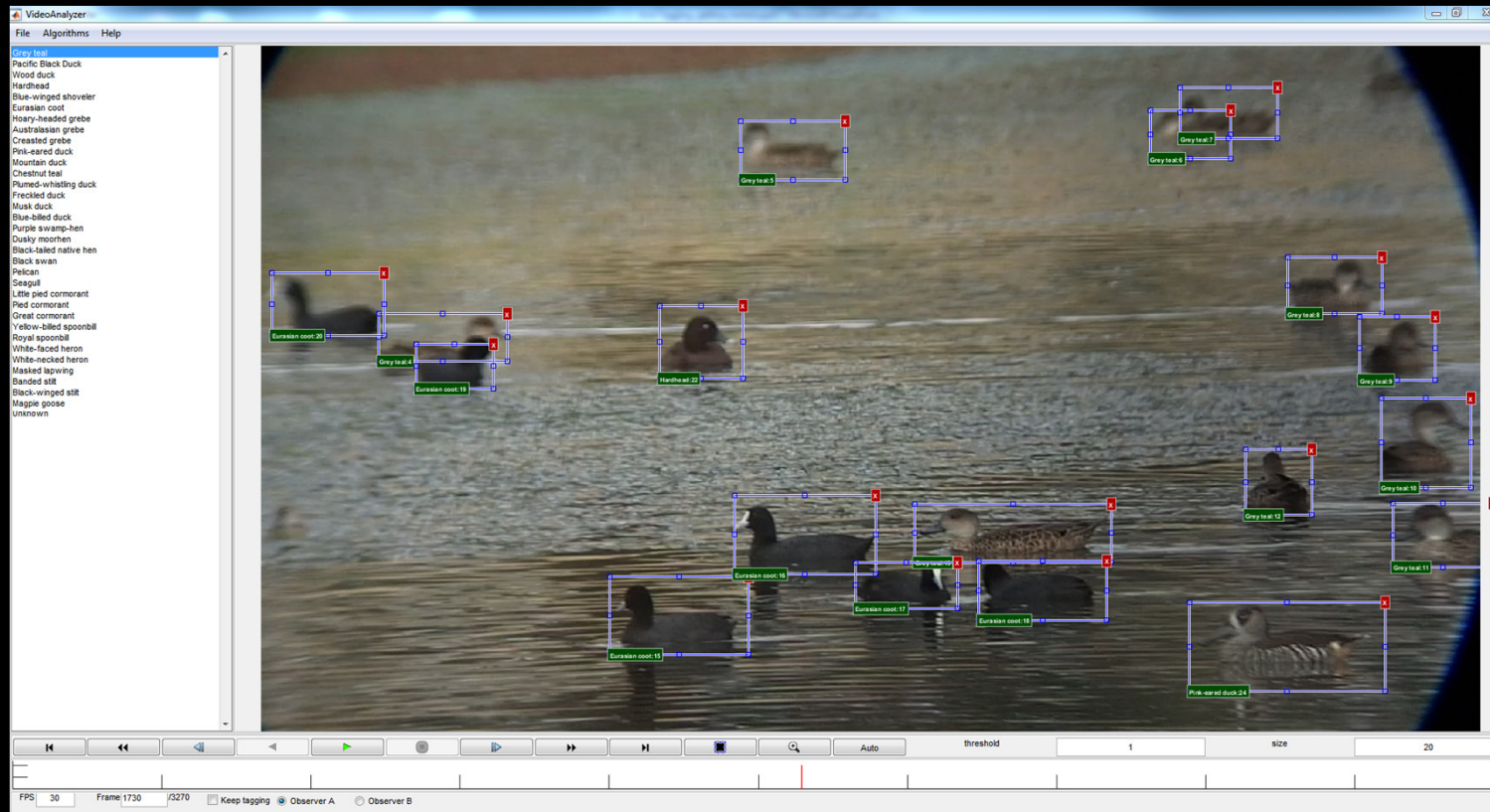
- Customised version of Ground Truth Labelling tool

Multi species tagging

Tracking tagged ducks

Tagging output

Further developments

- Progress towards machine learning to automate tagging and reduce processing time

- Challenges associated with camouflaged animals

- Potential for application to other species

Thanks for listening

shannon.dundas@dpi.nsw.gov.au

@FaunaResearchWA