

ASSESSING THE IMPACT OF MAGPIE GEESE INTERACTIONS ON THE TOP END'S MANGO INDUSTRY AND EVALUATING NOVEL DAMAGE MITIGATION TECHNIQUES

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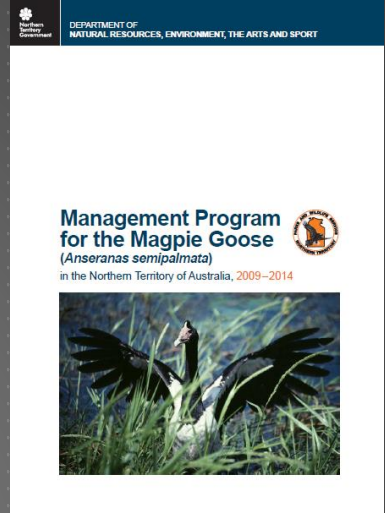
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PROBLEM STATEMENT

- ▶ Geese invade in large numbers
 - ▶ September – October, but may stay to February
 - ▶ ~15000 geese on-site at peak times (orchards with ~50,000 trees)
- ▶ Peck and mark green fruit
- ▶ Destroy early crops and small trees
- ▶ Damage irrigation systems
- ▶ Large-scale businesses – lost 10-15% of crop
- ▶ Darwin region losses ~ \$2mil p.a.





BACKGROUND

- ▶ 1960s - pest of rice industry (Frith and Davies 1961).
- ▶ 1980s - wetland use (Tulloch et al. 1988)
- ▶ 1990s – Whitehead & Tschirner – breeding ecology
- ▶ 2000's – lead poisoning investigation
- ▶ 2009 - PhD thesis – (Lochlan Trill) – general ecology
- ▶ 2009 - magpie goose management plan (Delaney et al. 2009)
- ▶ 2013 – problem cited by mango industry - HAL project MGI2005
- ▶ 2013 - targeted research activity requested by PWC, DLRM, NTFA
- ▶ 2014 – growers concerned – DPIF to address issue
- ▶ 2014 – DPIF approach CDU
- ▶ 2014 – proposal to Horticulture Innovation Australia (HIA) - R&D Strategic Co-Investment Call - ~\$200K
- ▶ 2015 – Assessment deferred by HIA until after March 2015

INCREASING MEDIA ATTENTION

- ▶ <http://www.abc.net.au/news/2015-01-06/magpie-geese-shot-on-mango-farms/6002776>



CONCERN - BECOMING UNMANAGEABLE – URGENT INTERVENTION

- ▶ Is goose behaviour changing?
 - ▶ larger numbers
 - ▶ more early damage
 - ▶ becoming resident in orchards
- ▶ Impacts vary from property to property depending on:
 - ▶ mango variety
 - ▶ size and proximity of orchards to roosting sites
 - ▶ timing of fruit set.
- ▶ Is hunting displacing them from natural feeding grounds?



RESEARCH QUESTIONS

1. Identify geo-spatial distribution, onset, frequency and impact of the magpie geese on the mango industry in the Darwin region (2015-2018).
2. Identify the potential causes of changes to magpie goose behaviour in orchards.
3. Evaluate several novel damage mitigation techniques.

DAMAGE MITIGATION METHODS

- ▶ Promising chemical bird repellents (anthraquinone; methyl-anthranilate)
- ▶ Mechanical – percussion scarers (limited effect)
- ▶ Shooting – ethics of lead poisoning
- ▶ Trapping and translocation
- ▶ UAVs
- ▶ Guard dogs



A-flockalypse Now: Canadians order DRONE strikes on nuisance geese by equipping remote-controlled copters with speakers to scare off the wild birds

- Geese dirty the waters around Ottawa's beaches with their droppings
- That raises E. coli levels in the river, creating a health hazard for bathers
- But since deploying drones number of geese has fallen dramatically
- However, they have not been as effective against 'more stubborn' seagulls

LOGISTICS AND TIMING

- ▶ 2-3 research seasons – ideally July 2015 – December 2017
- ▶ Capture and radio-tracking essential (need cannon net license)
- ▶ Co-operation from several growers (medium to large-scale):
 - ▶ access to do on-site bird counts
 - ▶ field crop-damage assessments
 - ▶ ancillary damage e.g., irrigation infrastructure
 - ▶ in-shed assessments of down-graded fruit
 - ▶ access to long-term yield records
 - ▶ trialling damage mitigation methods

RESEARCH FUNDING

Research essential but will not happen without industry co-investment

Post-doctoral research (experienced and certified to conduct capture and control methods)

- ▶ Minimum \$300K over 2.5 years
- ▶ Salary = \$220K
- ▶ Running costs = \$80K

Ph.D student

- ▶ Minimum \$200K over 2.5 years
- ▶ Scholarship = \$120K
- ▶ Running costs = \$80K

Funding sources include HAL– will need further support from industry - minimum of \$80K.

In-kind support provided by CDU and DPIF

