PESTSMART

CASE STUDY: Common myna impacts

Case Study on the impacts of common (Indian) mynas on other bird species and the effectiveness of community trapping in Canberra

Introduction:

Common or Indian mynas are now widespread throughout eastern Australia and are considered to threaten native biodiversity due to their territorial behaviours and nest cavity competition.

The perceived impacts of the common myna are often based on unreliable information, and there is a lack of scientific research that confirms the bird's actual impacts[1,2].

The abundance of native species frequently changes with environmental factors, including habitat clearing and urbanisation. This means that it is hard to separate the effects of common mynas from environmental factors.

Many community trapping programs have been set up in response to the perceived negative impacts of the common myna on native birds. These programs encourage people to trap and humanely euthanise common mynas. However, there is only limited scientific evidence that these trapping attempts reduce the overall abundance of the common myna or benefit native species.

In 2008, the Invasive Animals Cooperative Research Centre (IA CRC) funded a PhD project undertaken by Kate Grarock using Canberra as a case study. Prior to this research there was limited understanding of the impact the common myna had on the abundance of native species.

This project aimed to investigate:

- the invasion history of common mynas in Canberra[3]
- long-term native bird abundance in Canberra before and after common myna establishment[4]
- the impact of the common myna in combination with habitat variation[5]
- the impact of the common myna on cavity nesting species[6]
- the effect of common myna trapping on their abundance[7]

Process:

This project used long-term data and an integrated approach to provide the strongest evidence to date for the impact of the common myna on the population abundance of some cavity-nesting and small bird species[4].

Bird abundance in Canberra between 1981 and 2010 was documented based on long-term survey data, gathered by the Canberra Ornithologists Group (COG), which amounted to a total of 74,492 Garden Bird Surveys (GBS)[3].

Environmental factors, such as urban development (eg dwelling and human population density) and vegetation variables (eg native grassland, modified urban grassland, dry forest, woodland) were taken into account to distinguish between impacts of the common myna

Project partners

- Invasive Animals CRC
- Australian National University
- Canberra Ornithologists Group (COG)
- Canberra Indian Myna Action Group Inc (CIMAG)

THE AUSTRALIAN NATIONAL UNIVERSITY

CENTRE FOR INVASIVE SPECIES SOLUTIONS

Australian Government
Australian Bureau of Agricultural and Resource Economics and Sciences

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Glossary

Species abundance
The number of individuals of a species in an area, landscape or ecosystem

Species richness
The number of different species in an area, landscape or ecosystem

Common myna eggs and chick in a nestbox (above) and Crimson Rosella (below) using a nest box. Images: Kate Grarock

and those of habitat change.

Abundance and nesting success of common mynas and native cavity-nesting species were also investigated at 15 survey sites around Canberra using 225 purpose-built nest boxes[6].

Common mynas, habitat change and species richness:

The research indicated that the common myna primarily takes advantage of habitat change when colonising a new area. High numbers of common mynas in combination with habitat change had a negative impact on some cavity-nesting and small bird species[5].

Tree density strongly influenced the abundance of the common myna and the species was far more abundant in urban areas with fewer trees than in nature reserves[5]. There were no negative associations between common myna abundance and total species abundance and richness, native cavity-nester or large native bird abundance and richness[5].

Common mynas and cavity nesting species:

Project results indicated that habitat has a strong influence on the abundance and nesting success of the common myna, crimson rosella and eastern rosella.

At sites with fewer trees, the common myna occupied a high number of nest boxes (up to 90%) and built 'fake' nests that further reduced cavity availability[6]. Crimson rosella and eastern rosella abundance was lower at these sites. The negative influence of common myna nest box occupancy on crimson rosella abundance was even more dramatic at high tree density sites[6].

Effect of trapping:

High intensity community trapping was found to reduce common myna abundance at a local scale[7]. Over larger scales, however, natural reproduction, survival and/or immigration may limit the effectiveness of trapping[7], which is often found where lethal controls are used[2]. The apparent success of fine scale culling indicates that trapping may be more effective if targeted in areas of greatest impact.

Trap shyness, where birds adapt their behaviour to avoid traps[8], may also reduce effectiveness. Some studies indicate that this is more likely to occur with adults than juveniles[9]. The common myna has also been observed avoiding areas where shooting occurs[7].

Trapping with decoy birds may enhance success of valve traps for common mynas, especially where food is readily available. Additional control methods, such as nest box trapping and roost trapping[7,10] may improve overall effectiveness of trapping to benefit the community and the environment.

How should we manage the common myna?

Community support is already very strong for common myna management in Australia and greater use of science in community-led projects could further enhance management outcomes. The main priority should be to prevent the transport and establishment of new common myna incursions[2].

The research demonstrated that the common myna had both a short lag period before population growth (<3 years) and spreading to new areas (six years)[3]. This suggests it is important to respond to new invasions rapidly before the population can grow in numbers and further spread. Once a species becomes widespread and abundant, total eradication is highly unlikely; population control and impact mitigation are then the best management strategies[3].

Culls of at least 25 birds per km^2 per year are needed or alternative methods for controlling this species will be required[7] (this cull rate relates to the Canberra study and population). The common myna is able to compensate for culling through rapid reproduction so control programs need to be maintained year after year or the species will quickly recover.

The timing of trapping can have a large impact on the effects of a control program. Currently the largest numbers are caught just after the breeding season, when young birds are easily trapped. However, it would be more effective to trap prior to and during the breeding season, when culling is more likely to be additive to natural mortality[7]. Trapping from September to December would also be more likely to reduce the competitive pressure for nest cavities.

Several methods of controlling the common myna will likely be required, due to its adaptable nature[11]. An integrated approach could include reducing food availability (eg dog food), limiting nesting sites (such as roof cavities), habitat manipulation (tree planting and revegetation) and culling in sensitive areas.

Modifying current practices (timing of trapping) or using alternative and/or complementary culling methods may also be required[7] for effective control.

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Implications for control of common mynas:

This study showed that habitat needs to be considered when investigating the impacts of an introduced species on native species[4,5,6]. This will help determine if the impacts of an introduced species are more severe in particular habitats.

Understanding the impacts will enable targeted management and mitigation programs. For example, the impact of the common myna might be more severe in areas that represent 'high quality' habitat for native birds[6]. Effectiveness of trapping may be enhanced by targeting efforts in areas where mynas have greatest impacts to the environment or community. For example, near breeding areas of superb parrots (*Polytelis swainsonii*), or where large roosts occur in high use areas (food courts, churches etc).

The research indicates the common myna may prefer using nest boxes to natural cavities[1,6]. Simply providing nest boxes to alleviate competition for cavities could lead to an increase in common myna nesting and abundance if the nest boxes are not actively managed to remove nesting myna birds[10].

Habitat modification in combination with the introduction of invasive species can have significant negative impacts on native species[7]. The common myna occurs in greater abundance in cities and towns, and in areas with low densities of native trees[5,6]. Human habitat modification can reduce the 'quality' of habitat for native species and lead to an increase in common myna abundance.

Low tree density, or fragmentation of native vegetation, may enhance habitat quality for the common myna enabling the species to spread into new areas and compete for resources with native species[1,5,6]. For example, housing developments that are built adjoining

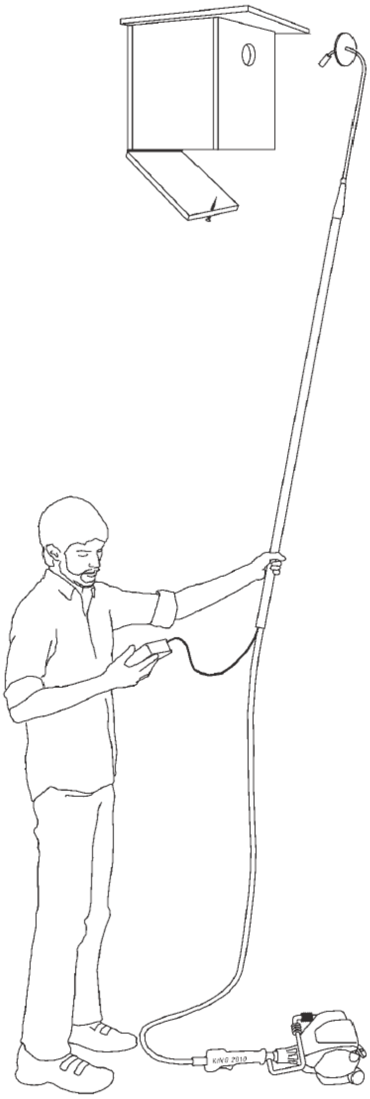

Diagram above:
Drop-floor nestbox and portable micro-euthanaser system used in this research. The 25 cc 4-stroke engine delivers air-cooled exhaust (3% carbon monoxide) via a wand that also includes a closed-circuit television camera and screen. This enables the operator to view the contents of the nestbox, thereby preventing euthanasing non-target species[8,10].

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Common mynas. Image: Luke Pomfret

The main priority should be to prevent the transport and establishment of new common myna incursions.

Rapid response to new incursions before bird numbers grow and spread is also important.

threatened species habitat would be of significant concern. This type of habitat modification would drive an increase in the abundance of the common myna in sensitive areas, greatly increasing the likelihood of negative impacts on threatened species.

Habitat restoration and tree planting may be useful tools to both control common myna abundance and to aid native bird species recovery[4,5,6,7]. This will not only increase habitat quality for native species (including cavity availability in the longer term), but it is also likely to make the habitat less suitable for the common myna. Without restoring habitat and making these areas 'less suitable' for the common myna, attempts to control species numbers are only likely to succeed over the short term, with the species reinvading once control actions are eased.

Further Reading:

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2. Tracey JP, Bomford M, Hart Q, Saunders G and Sinclair R (2007). Managing Bird Damage to Fruit and Other Horticultural Crops. Bureau of Rural Sciences, Canberra.
3. Grarock K, Tidemann CR, Wood J and Lindenmayer DB (2012). Is it benign or is it a pariah? Empirical evidence for the impact of the Common Myna on Australian birds. PLoS ONE 7(7): 1-12. doi:10.1371/journal.pone.0040622
4. Grarock K, Lindenmayer DB, Wood JT, Tidemann CR (2013). Using invasion process theory to enhance the understanding and management of introduced species. A case study reconstructing the invasion sequence of the common myna. J. of Env. Management, 129: 398-409.
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6. Grarock K, Lindenmayer DB, Wood JT, Tidemann CR (2013). Does human- induced habitat modification influence the impact of introduced species? A case study on cavity-nesting by the introduced common myna (*Acridotheres tristis*) and two Australian native parrots. *Environmental Management*, Volume 52, Issue 4, pp 958-970 doi:10.1007/s00267-013-0088-7
7. Grarock K, Tidemann CR, Wood JT, Lindenmayer DB (2013) Understanding basic species population dynamics for effective control: A case study on community-led culling of the common myna (*Acridotheres tristis*). *Biological Invasions*, Nov 2013. doi: 10.1007/s10530-013-0580-2
8. King DH (2010). The effect of trapping pressure on trap avoidance and the role of foraging strategies in anti-predator behaviour of common mynas (*Sturnus tristis*). *Canberra Bird Notes 35(2): 85-108.*
9. Conover MR and Dolbeer RA (2007). Use of decoy traps to protect blueberries from juvenile European starlings. *Human-Wildlife Conflicts, 1, 265-270.*
10. Tidemann CR, Grarock K, and King DH (2010). Euthanasia of pest sturnids in nestboxes. *Corella 35(2): 49-51.*
11. Tidemann C (2005). *Indian Mynas — Can the problems be controlled?* In: M Hayward (Ed), Proc. of the 15th National Urban Animal Management Conference, Australian Veterinary Association, Canberra Pp 55-57.

More information:

PestSmart Toolkit: http://www.pestmart.org.au/pestsmart/

PestSmart Factsheet: Common (Indian) Myna (2013). PestSmart Toolkit publication, Invasive Animals CRC. http://www.pestmart.org.au/pestsmart-indian-myna/

MynaScan: http://www.feralscan.org.au/mynascan

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