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RESEARCH REPORT

IMPACT OF THE COMMON (INDIAN) MYNA ON HEALTH AND THE ENVIRONMENT

AND

RECOMMENDATIONS FOR THE IMPLEMENTATION OF A CONTROL PROGRAM

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1 SYNOPSIS

The Central Coast Indian Myna Action Group Inc., as part of their plan to reduce numbers of Common (Indian) Myna (*Acridotheres Tristis)* in the region, have undertaken a research study on the species.

The study documents the detrimental effect that this introduced species is having on our native wildlife and the health risk that it poses to humans.

It then explores control methods that have been developed and used in other areas of Australia and concludes with recommendations for the introduction of a reduction program on the Central Coast.

The Group's Project Plan is comprehensive, combining public education with community, business and government actions to supplement a trapping program. Once proven, this model may be useable in other communities throughout Australia.

2 INTRODUCTION

2.1 WHAT IS THE CENTRAL COAST INDIAN MYNA ACTION GROUP

The Central Coast Indian Myna Action Group is an Incorporated Association whose Central Coast resident members share a common concern at the large increase in population of the Common (Indian) Myna (*Acridotheres Tristis)* in the region.

This concern stems from knowledge that this introduced species is damaging our native fauna and poses a risk to human health.

The Group was formed at a public meeting held at the Central Coast Leagues Club on the 23rd of May 2003. In accordance with the Group's documented Project Plan there are six active teams within the Group. Two of those teams are research teams as detailed in 1.5 below. The other teams and their broad objectives are:

1. The Public Awareness Publicity Team – to educate the public on the detrimental environmental and health impact of the species.
2. The Community Action Publicity Team – to investigate and communicate to the community, business and government actions they can take to help arrest the spread of the species.
3. The Project Fund Raising Team – to raise money to fund the investigative and implementation phases of the project.
4. The Coordination and Communications Team – to facilitate effective internal and external group communications.

2.2 GROUP MISSION

The Group's Mission is:

"To help preserve the Central Coast's native birdlife and protect the health of its residents by targeting a specific threat to their future posed by the large increase in the population of Indian Myna birds".

2.3 OBJECTIVES OF THE GROUP

The Group aims to achieve this Mission by:

1. Researching and documenting the impact of the species on health and the environment,
2. Investigating and documenting control methods being used in other areas of Australia,
3. Communicating the findings of this research to the community, business and government,
4. On the basis of the research report, seeking assistance from the community, business and government for the implementation of a control program suitable for use on the Central Coast.
5. Implementing the program.

2.4 OBJECTIVES OF THIS REPORT

This report aims to achieve items 1 and 2 of the above objectives.

2.5 RESEARCH METHODOLOGY

Two research teams were formed within the Group. They were:

2.5.1 THE INDIAN MYNA RESEARCH TEAM

This team's objectives were to:

1. Research and document the impact of the species on our environment,
2. Research and document the impact of the species on our health,
3. Research and document the subsistence of the species.

The team will do this by:

1. Locating and making contact with ornithologists who could help with the research task;
2. Collecting scientifically supported evidence of the species' detrimental effects on health and the environment;
3. Collecting information on when and where the species breed, their favoured roosting habitats and food sources, where they tend to concentrate and any other information relevant to their habits.

2.5.2 THE ERADICATION PROGRAM RESEARCH TEAM

The objectives of the Eradication Program Research Team were to:

1. Research and document eradication programs being implemented in other areas of Australia.

This study would consider and document at least:

1. Program methods and effectiveness,
2. Program costs including traps, infrastructure and labour,
3. How the Program was justified,
4. How the Program is funded,
5. Resource requirements,
6. Infrastructure requirements,
7. How any legal or moral objections to the program were overcome.

The team would do this by:

1. Obtaining a list of Councils along the eastern seaboard,
2. Searching websites for policy statements and/or eradication programs,
3. Contacting those that have or have had programs for details.

3 THE COMMON (INDIAN) MYNA *(Acridotheres Tristis)*

3.1 EARLY HISTORY

The Common (Indian) Myna is native to India and Southern China. The earliest known release in Australia was in Melbourne in 1862 (1) where they were introduced to control insect pests in market gardens (2). In 1883 birds were taken from Melbourne to north Queensland where it was thought they would control insect pests of sugar cane. (2) They were released in canefields on the Herbert River and the Johnstone River and in Townsville where they quickly established themselves. Some of these birds were taken to Cairns and Toowoomba in 1918. In Sydney, after a few small introductions along the Harbour and Parramatta River last century [1800's], the Myna did not expand its range greatly until the 1940-50 period, by the end of which it had occupied the greater part of the metropolitan area. (1)

3.2 SPREAD

From these origins the bird has spread to many other places in Australia. Free-living populations are now established over much of the eastern seaboard. (2)

Indian Mynas are slow to spread compared to many other invasive species but, like the tortoise, slow and steady wins the race. Colonies establish in urban centres where there is plenty of food, and from there surplus (young) animals invade the surrounding countryside to the detriment of the native fauna. (2) This insidious displacement of our native fauna has led to their being dubbed a "creeping menace" (2)

3.3 SUBSISTENCE

Indian Mynas breed in untidy nests made of grasses and other vegetation, often including paper and plastic, built under roofs, in hollow trees and palms. (3)

It is one of these preferred nesting habitats, hollow trees, that brings them into competition with many of our native birds and mammals. And unfortunately the Indian Myna is winning the competition.

One other of its preferred nesting places, under roofs, brings them into close contact with humans, posing health risks as outlined further in this report.

They are omnivorous, feeding on insects, fruit, grasses and refuse. (3) Their feeding habits again bring them into close contact with humans and, because they feed on easily obtainable refuse (food scraps), have often been referred to as the "garbage bird" or "flying rat". They have been observed feeding on food scraps in school grounds, shopping centres and outdoor (tourist) eating areas, even hopping on to food tables to scavenge leftovers from uncleared plates. This again poses a health risk to humans.

At night they gather in large numbers to roost (sleep). Most often their preferred roosting places are palms and other (non-native) exotic trees because they provide the best, closed protection from potential predators. Often these palms or exotic trees are in public places or residential areas where the attendant concentrated fouling again poses a health risk.

The noise pollution emanating from these roosting sites, particularly pre-sunrise, also presents a health problem with sleep deprivation for residents unfortunate enough to live within a few hundred metres of one of their chosen roost sites.

3.4 IMPACT ON THE ENVIRONMENT

The Indian Myna's most serious "crime" is that they reduce biodiversity. [2]

3.4.1 NATIVE BIRDS

Indian Mynas nest in tree hollows, but tree hollows are in short supply over much of Australia because of clearing for agriculture (and suburban housing). Mynas reduce biodiversity by fighting for hollows with birds like Rosellas, destroying their eggs and chicks and stopping them from breeding. [2]

18% of Australia's birds use tree hollows in some way and 11% are obligate hollow users and can't survive without them. [4] Some of the native birds that are seriously affected by the Indian Myna's dominance of nesting hollows include Sacred Kingfishers, Red-rumped parrots and Eastern and Crimson Rosellas. Sacred kingfishers have almost disappeared from the Avalon area [5] since the arrival of the Indian Myna

The voluminous nests mynas leave behind are greatly disliked by parrots and many will not use a hollow after mynas have finished. Those that do often have their chicks killed when the nest gets wet and starts to "work" like a compost. [4] They (also) build dummy nests in adjacent hollows to help protect a breeding territory. These nests are equally as distasteful to native birds as their naturally abandoned nests.

Mynas are also aggressive birds that will peck other weak or injured birds to death. [3] In groups they will harass and chase out smaller or more timid birds, resulting in the disappearance of small birds such as wrens, Eastern Spinebill, Willie Wagtail from areas they dominate.

3.4.2 OTHER NATIVE ANIMALS

Mynas also evict small mammals like Sugar Gliders from hollows, which commonly means a death sentence for the Gliders because they have nowhere else to go. [2]

42% of Australia's mammals utilise tree hollows. Overall about 400 species of vertebrates use tree hollows in Australia. [4] The dominance of Indian Mynas in the use of tree hollows as a breeding site poses a serious threat to the future of a large percentage of our native animals.

Reports have also been received of groups of Indian Mynas attacking, injuring or even killing blue tongue lizards.

3.5 IMPACT ON HUMANS

Indian Mynas are an economic problem in some places because they damage fruit and grain crops and their noise and smell can be annoying to people in the suburbs. [2]

Mynas also reduce public amenity through noise at communal roosts, and fouling, with attendant risk for human and domestic animal health. [6]

But some of the more potentially serious health risks associated with Indian Mynas stem from the fact that, other than tree hollows, they also commonly nest in roofs in close proximity to humans and food handling areas. This can include houses, warehouses, loading docks (like food distribution centres) and roof spaces above food retail areas. Health risks stem mainly from bird mites in nests and concentrated fouling at roost sites.

3.5.1 BIRD MITES

"Bird mites" or "Tropical fowl mites" are the common names used to describe the mite *Ornithonyssus bursa* from the family of mites Macronyssidae; these mites are often incorrectly called "bird lice", particularly within the pest control industry. [7]

The mites are haematophagous (feed on blood) natural parasites of common birds including pigeons, starlings, sparrows, Indian mynas, poultry, and some wild birds. *Ornithonyssus bursa* mites are small with eight legs, barely visible to the eye, oval in shape with a sparse covering of short hairs, and are extremely mobile. They are semi-transparent in colour, which makes them

difficult to detect on skin until blood is ingested and then digested - when they may appear reddish to blackish. (7)

In the Sydney district, infestations of bird mites generally consist of a mixed population of two species, the Tropical Poultry Mite *Ornithonyssus bursa* and the Poultry Red Mite *Dermanyssus gallinae*. A number of mite species that infest buildings can cause considerable nuisance and some of them spoil foodstuffs. Their bites can cause inflamed itching swellings or severe skin irritation (dermatitis) in people who are allergic to them. Skin contact with dead mites and mite debris causes allergic reactions in some people when they handle infested material. When inhaled with house dust, the cast skins of mites or their faecal pellets can cause respiratory allergies such as asthma and hayfever. (8)

Bird mites normally live on poultry, cage birds, starlings (including Indian mynas), sparrows and pigeons. The nests of these birds are generally infested, especially when young birds are present. The mites shelter by day in cracks and crevices in and around the nest. At night they feed on the blood of their hosts. If disturbed in their haunts during the day, they will crawl quickly over the infested area and may swarm over the person disturbing them. (8)

In summer, when the young birds have left their nests, mites will sometimes migrate from nests in the roof to the interior of a house, looking for an alternative source of food. An invasion can last up to 3 weeks but no longer as the mites must again feed on birds to complete their life cycle. (8)

These mites are a common cause of papular dermatitis in Australia. Attacks are commonest when mites leave the nests of fledgling starlings [and Indian Mynas]. The mites enter houses through ventilators or gaps in walls and ceilings and often attack people in bed. Mites cause small itching papules capped sometimes by a small vesicle or blister. (9)

Contact with humans occurs after the birds gain entry through unprotected eaves, or to roof cavities via broken tiles to construct their nests in homes, factories and other dwellings in early spring or summer. The large amounts of nesting material used by the birds provide the mites with an ideal environment in which to thrive. The unfeathered nestlings plus the adult birds occupying the nest are utilised as a ready blood source for the expanding population of mites. When the young birds are ready to fledge, some mites remain attached to the feathers of their bird hosts and feed intermittently. The mites remaining in the abandoned nest, and left without a suitable host when the birds leave or die, will roam and disperse throughout the dwelling over a 1-2 week period searching for new hosts. Most mites will die within 10 days without a blood meal from a bird host. They will bite but cannot survive on humans and do not infect/infest human skin. (7)

Clinical Presentation

Bites from these mites are difficult to diagnose and can be sometimes mistaken for flea bites although they are typically smaller and less florid. Although the effect of a bird mite invasion is temporary, the mites can cause severe irritation, rashes and intense itching from the saliva they inject while biting, and scratching of the bites may lead to secondary infections. Also, the sensation of crawling mites on the skin will irritate some people. (7)

The mites will bite at random and there are no selected areas of the body that are favoured, but clothed areas of the torso, limbs and the head area are commonly involved. A great deal of discomfort is experienced by the occupants of the building until the infestation is controlled or dies. A bird mite infestation cannot be maintained on humans but will persist while the bird-related source of the mites is maintained. (7)

3.5.2 OTHER HEALTH RISKS

The diseases outlined below have the potential to be carried by <u>any</u> birds, not exclusively the Indian Myna. However, since the Indian Myna's subsistence is so closely linked with humans these health risks cannot be ignored. The Indian Myna nests in homes, factories, food distribution warehouses and other dwellings; most frequently feeds in school grounds, outdoor tourist eating

areas and shopping centres, where food is being consumed by humans, and roosts in public and residential areas where concentrated fouling is evident.

Three groups of potential diseases have been recognised:

3.5.2.1 PSITTACOSIS & ORNITHOSIS

Psittacosis is a systemic infection that frequently causes pneumonia. Its relationship to bird exposure has been known for over 100 years. The causative agent is *Chlamydia psittaci*., which is a systemic infection that frequently causes pneumonia and is common in birds. Anyone in contact with an infected bird is at risk. (10)

When transmitted to man Ornithosis tend to produce illnesses milder than psittacosis. Human infection usually results from inhalation of dust containing dried droppings from infected birds. Human infection may vary from mild influenza like illness to a severe and sometimes fatal pneumonia. (11)

3.5.2.2 SALMONELLOSIS

Salmonellosis is passed on by the faecal-oral route and can cause serious gastroenteritis in humans. Other potential diseases to humans are caused by Arboviruses, which include Japanese Encephalitis, Murray Valley Encephalitis and the Kunjun Virus.

3.5.2.3 NEWCASTLE DISEASE & AVIAN INFLUENZA

This group of diseases also have important commercial consequences as they primarily affect the poultry industry.

Newcastle disease is a globally important disease of chickens. There have been six outbreaks of the virulent Newcastle disease in Australia, the most recent of which occurred in New South Wales in 2002.

Avian influenza is also a globally devastating disease of poultry, which has been passed from poultry to humans on at least one occasion (Hong Kong, 1997). Serological evidence of exposure to Avian Influenza has been found in a wide variety of wild birds around the world. It is suspected that wild birds can cause disease outbreaks in poultry. There have been five outbreaks of Avian Influenza in Australian poultry, the most recent being in 1997 at Tamworth.

4 ERADICATION PROGRAMS

4.1 PROLOGUE

We (The Eradication Program Research Team) started this research assignment with an expectation that, somewhere out there, other organisations or government agencies would have already implemented Indian Myna eradication or reduction programs. They would therefore have addressed and solved all of the potential problems we had recognised in our research objectives including humanely acceptable and effective methods, funding, resource and infrastructure requirements. All we had to do for our research then was to study their methods, select the best of their ideas and practices and design a control program suitable for the Central Coast.

We were disappointed to find this was not the case but at the same time extremely encouraged by the extensive research and development work done by Dr. Christopher R. Tidemann of the Australian National University in Canberra. We did find that some organisations are planning, or have started, to trial his system but, as stated earlier, no one has yet implemented a large-scale eradication program such as we had been envisaging.

The research material presented here is therefore largely based on the work of Dr. Tidemann, in particular his paper entitled “Mitigation of the impact of mynas on biodiversity and public amenity in the ACT”.

4.2 CONTROL METHODS

4.2.1 RESOURCE CONTROL

Several investigators have explored various options for controlling myna numbers. Resource removal and habitat modification have been examined as a potential method. These studies have recommended limiting food supply by restricting access to human waste and domestic animal food but in each case it has been noted that this strategy is very difficult to implement because the species is highly adaptable and is not restricted to any one food supply.

Extreme adaptability in the choice of communal roost sites also suggests that, without removing large numbers of trees, it would be difficult, if not impossible, to reduce myna numbers by restricting the availability of this resource.

4.2.2 CHEMICAL AND BIOLOGICAL

Poisoning, historically probably the most common method of controlling pest birds, is considered to be undesirable, particularly in suburban areas, because of potential effects on non-target species.

No evidence was found of any programs being in place for the development of fertility or biological control methods. Both these appear impractical, at least at the present time.

4.2.3 TRAPPING

Trapping appears to provide the most practical and effective method for control of mynas although there are some “tricks of the trade”. Mynas are highly intelligent and adaptable birds that are capable of learning to avoid dangerous situations by observing the behaviour of others. The species also has a highly sophisticated communication system. Hence it is not difficult to catch small numbers of mynas in many types of traps, eg, rat traps, snares, etc., but once a few birds have been caught, others in the area avoid the trap, particularly if the trapped birds emit distress calls.

Dr. Tidemann has developed a system for trapping mynas at feeding areas. The trap is selective for mynas and minimises avoidance behaviour by maximising the comfort and welfare of the trapped birds.

Others have also done some work on the development of netting traps for use at communal roost sites although there does not appear to be any documentation on effectiveness based on trial results. The Group also has some concerns over the humane aspects of this method as the birds are likely to become distressed when trapped in nets.

A "personal" trapping method has also been developed by the Australian Nestbox Company in Queensland wherein mynas that have occupied a nest box intended for other native species are able to be trapped and removed.

4.3 EFFECTIVENESS

Dr. Tidemann's trapping system appears to be the only myna control method supported by documented evidence of effectiveness. This was based on the results of trials conducted in Canberra from August 2001 to early 2003.

Single traps were operated at two sites in urban Canberra for around 18 months each and at another nine sites for around two weeks each. More than 300 mynas were caught at each of the two long-term sites over about 18 months of trapping, suggesting a low degree of avoidance behaviour. Mynas were trapped at all but one of the short-term sites, the catch varying from 3 to 53 birds over the two-week period. Optimal catches appeared to come from cycles of around 6 days of free feeding followed by one of trapping.

4.4 HUMANE CONSIDERATIONS

The Group has concerns over the humane aspects of control methods such as poisoning or netting for reasons as discussed under control methods.

The objectives of Dr. Tidemann's Minimising Mynas Project Phase I were to determine if myna numbers could be reduced by trapping in a way that was selective, safe for humans and the environment and its humaneness was acceptable to a majority of the community. He has developed a multi-catch trap that is selective for mynas and starlings (another feral species) and a euthanasia system that is considered to be humane by animal welfare authorities.

The trap is made in two sections, a catching section base and a roost section, where undercover perches and food and water are provided, thereby mimicking conditions in natural roosts. The catching section of the trap is designed to permit entry to only mynas and starlings by means of apertures (valves) through which mynas and starlings pass freely but not other species likely to be attracted to the dog-food bait (eg magpies). The roost section is removable from the catching section so that the base can be left on site to continue free-feeding, while trapped birds are taken off site for euthanasia with carbon dioxide.

At the Canberra trials only three magpies and two currawongs were caught over the 18 month period but they were able to be released without harm, proving the selective nature of the trap and, at field demonstrations, the system was considered to be humane by an overwhelming majority of observers (many hundreds).

4.5 COSTS

The objective of the research team had been to determine overall program costs from organisations that had already implemented control programs. Those costs were expected to include costs of traps, training costs for trap operators, logistical costs associated with the deployment and collection of traps, cost of infrastructure associated with euthanasia and disposal of birds, costs of insurance and other administrative costs.

As we were not able to locate any organisation that has implemented a complete program we have not been able to determine these costs based on the experience of others.

Although it is recognised that this is likely to be only a small component of the overall program costs, we have been able to determine the cost of Dr Tidemann's trap as follows:

According to his Feral Facts Newsletter, although not yet commercially available, the trap could be made commercially available if there is sufficient demand, at $1,200.00 + GST.

Limited stocks of traps would be made available to purchasers willing to participate in a supervised 12 month trial, following a half-day training workshop in Canberra.

4.6 INFRASTRUCTURE, RESOURCES AND FUNDING

Again, because we were unable to locate any organisation that had already implemented a control program we have, unfortunately, not been able to determine requirements for infrastructure or resources based on the experience of others. Nor have we been able to determine strategies for funding the project.

The only clue that we have been able to ascertain from Dr. Tidemann's experience with respect to human resource requirements is that one person can service between 10 and 20 traps, dependant on commuting distance.

5 CONCLUSION

5.1 SUMMARY OF RESEARCH

The introduced Indian Myna poses a serious threat to our native wildlife on the Central Coast and indeed throughout the Eastern seaboard of Australia.

There is also substantial evidence that the species poses a significant risk to human health.

Various control methods have been tried, the most successful of which are based on trapping.

One trapping method has been developed in Australia and has undergone extensive and successful testing for effectiveness and humaneness acceptability.

5.2 RECOMMENDATIONS

If we, as a responsible community, are to preserve for future generations the natural heritage we have inherited, we must take positive action to control the invasive introduced species that our forebears have bought to this land.

The impact of the fox, cane toad and European carp on our native wildlife are well documented and publicised. For that reason they are abhorred by all Australians. Lesser-known feral species like the Indian Myna may not do the damage that the fox does but they do warrant our concern. As long as it does not detract from efforts already in place for control of the more damaging species like the fox, it is the ambition of the Central Coast Indian Myna Action Group that we raise the profile of the Indian Myna to the same level of recognition as the cane toad and other similar feral species and attract public sympathy for a concerted effort to eradicate the bird.

The Group also acknowledges that while resource control programs (as discussed under Resource Control 4.2.1) may not have been successful as a control method in their own right, as part of a comprehensive strategy they could ultimately contribute in some degree to the success of a total program as outlined below.

The evidence against the Indian Myna overwhelming suggests that a reduction program is justified. The Central Coast Indian Myna Action Group therefore recommends that they, the community, business and government collaborate to achieve the following objectives:

1) Fund the initial establishment and promotional costs of the Central Coast Indian Myna Action Group.
2) Support and fund the continued activities of the already established CCIMAG Public Awareness Publicity Team whose objective it is to raise public awareness of the Indian Myna problem.
3) Apply to Dr. Chris Tidemann for participation in his trial program.
4) Fund the initial costs of participation in this program for the purchase of a trap plus travel and accommodation for training of a Group member in the operation of the trap. Note that the selected Group member will be carefully chosen for their ability to train other Group members in the use of the trapping system.
5) Fund the operation of the trial trapping program for a period of 12 months.
6) Support and fund the continued activities of the already established CCIMAG Community Action Publicity Team whose objective it is to investigate and communicate to the community, business and government, ways that they can contribute to arresting the spread of the bird. (Note that this is essentially akin to the resource control and habitat modification program, deemed as being unsuccessful in its own right in earlier research. The Group however, believes that, when used in conjunction with a trapping program, resource control and habitat modification could force the bird in to situations that drive them toward selected trapping sites, thereby increasing the effectiveness of the trapping program). This team would also endeavour to encourage such as shopping centre managers, operators of outdoor eating areas, builders and developers and local government to accept more responsibility for their

role in perpetuating the subsistence of the bird by minimising breeding, feeding and roosting opportunities in areas under their jurisdiction.

7) Develop a plan and budget for the expansion of the trial trapping program into a full fledged, large-scale myna trapping program including costs of traps, training costs for trap operators, logistical costs associated with the deployment and collection of traps, cost of infrastructure associated with euthanasia and disposal of birds, costs of insurance and other administrative costs.

8) Implement the program.

Although there is no guarantee, this combination of public education, community, business and government actions, coupled with an extensive trapping program based on proven techniques, should give this project a high probability of success.

Once proven in the region, this model may well be transportable to other communities throughout Australia to help avert what is potentially yet another ecological disaster created by an introduced species.

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