

## Possible research projects for support from the Birds NZ Research Fund

### *Approved for use for the 2022 funding round*

The Birds NZ Research Fund is open to any project that will demonstrably improve our knowledge of New Zealand birds. The topics presented below include a range of themes for project ideas that will enhance our knowledge of New Zealand's endemic and native species. There is still much to learn about most of our bird species. These topics will provide important information that will enhance the long-term protection and conservation of our native species. Studies of introduced species are also supported where these species are having a direct competitive or predatory impact on our native bird species but in general research is preferred on endemic and native species.

#### 1. Breeding Biology

- The basic breeding biology (breeding cycle, egg laying and chick rearing periods) of many bird species are likely to change over time as the climate warms and the moisture patterns alter across a geographical scale. Understanding how these breeding behaviours vary today will inform likely changes and pressures on bird populations in the future.
- For many groups such as seabirds and wetland birds, the basic breeding biology information has not yet been collected. In particular, we have very little information about the annual breeding cycles of most shag species and how these vary between different types of habitats they use (marine and freshwater) as well as latitudinally for the widespread species.

#### 2. Movement ecology

- Understanding the patterns of movements of native species that migrate or disperse between breeding and non-breeding habitats.
- Identifying where colonial birds roost at night and the pressures and threats these species might be under from habitat change, human disturbance, lighting regimes and predators.
- Determining home range size and habitat use patterns of native species using modern tools such as GPS trackers, trail cameras and automated tag detecting devices.
- The foraging ecology, diving behaviour and daily activity patterns of many common seabirds are still poorly known. Especially shags, gulls, and terns. There are also few detailed studies of foraging behaviour by shorebirds and wetland species. Studies using modern tracking equipment could provide insights into how these species utilise their habitats and what pressures they are under from various primary industries and other human activities.

#### 3. Defining species boundaries

- Examining taxonomic structuring and species/subspecies boundaries is still required in many native species. In particular, there is a need to look for supporting evidence that allopatric island species are genetically distinctive as well as separable by plumage and geography.
- Are there cryptic bird taxa amongst the more widespread native species of passerine species that occur across a wide latitudinal and altitudinal range?
- Using genomic methods to establish the extent of dispersal and mixing between populations. Species such as seabirds, shorebirds and rails are obvious candidates but is there also undetected dispersal of other species (e.g. small passerines) and if so how far do they go? Are populations panmictic or have we overlooked discrete breeding populations?

#### 4. Diets of native species

- Determining the trophic levels and diets of bird species using DNA sampling of faeces and/or regurgitations will help determine the importance of various food groups for our species.
- Use feather collections from birds and samples stored in museum collections to determine if there is evidence of diet shifts over time.
- Use modelling to assess how predicted climate change patterns might influence the diets and foraging behaviour of bird species, especially those with narrow or limited foraging niches.

#### 5. Techniques for monitoring presence and abundance of cryptic bird species

- There are many species in New Zealand that live in habitats that are hard to access and monitor such as wetlands and remote offshore islands. Detecting the presence of these species can be difficult but new tools and methods could be developed to provide reliable monitoring techniques (such as acoustic recording, trail cameras, detecting DNA from feathers, footprint sampling, etc). Single species or community studies that enhance our ability to know where these species live and monitor their status, abundance or frequency of occurrence will be useful for conservation

#### 6. Translocation success and failure

- Translocations of species have been widely attempted in New Zealand. These include various passerines, seabirds, rails, waterfowl and kiwi. What factors lead to successful translocations? What do the failures have in common? How often and for how long do we need to monitor translocation populations to measure success? Case studies of various species and projects will help provide answers to inform best practice around species translocations.

#### 7. Population demography

- Studies of bird populations across multiple years and generations are mostly done on threatened species and at very limited study sites. Detailed studies of the more common species looking at rates of dispersal and recruitment, adult survival and generation times are still lacking for the vast majority of bird species. These are not projects that can be done within a 1-3 year university Masters or PhD research period but could become part of a longer term study adopted by a university with students tackling different aspects of the species biology and ecology to build up a longer term mark-recapture programme. Research programmes that aim to work in core study sites over a longer time period to build up demographic data will get preference over short term one-off projects

#### 8. Moult and bird behaviour outside of the breeding season

- The biology and behaviour of most species outside of the breeding season is still poorly understood.
- What are the feather moult patterns for different species and what times of the year does moult occur?
- What physiological stress occurs during moult and how does this vary amongst successful and failed breeders plus non-breeders?
- How do birds alter their behaviour to cope with reduced flight feathers?
- How important is diet during moult to ensure quality feathers are produced?

- A study looking at moult and pre-breeding behaviour of birds is needed across all the taxonomic groups.

#### 9. Changes in abundance and distribution of introduced and recently arrived native bird species

- Is the range and distribution of introduced species stable, increasing, or declining? For example, spotted doves seem to be increasing their range and Indian mynas have shown dramatic local increases at some sites, especially where predator control is in place.
- Do these changes matter?
- Are there any species we should be worried about, especially given climate change predictions (e.g. Indian myna, laughing kookaburra, sulphur-crested cockatoo)

#### 10. Impacts of fragmentation and loss of habitat on our native bird species

- Habitat loss is still an ongoing concern as urban populations expand and new coastal settlements are developed. Changing land use such as forestry conversions to farmland and horticulture, and agricultural intensification can affect the distributions and viability of our native bird species. Studies are needed to examine how habitat loss and changes to wetlands, shrublands, plantation forests, mangroves and farmlands might affect the viability of bird communities.
- How capable are birds of dispersing between patchy habitats in human modified environments?
- How useful are habitat corridors for different bird species and which species are adaptable at colonising newly created islands of suitable habitat in otherwise modified landscapes?
- How vulnerable are birds to edge effects and exposure to different predator guilds when humans alter the scale and diversity of landscapes and wetlands?

*Updated: 27 March 2022*