## Preferred themes for research projects under Birds NZ Research Fund

After reviewing the analysis of recently funded BNZRF projects presented at the Birds New Zealand conference in 2022, the funding providers of the Birds New Zealand Research Fund (BNZRF) have asked Birds New Zealand to change the emphasis for future funding. They would like to see more research that "**lends itself to immediate conservation use, and research that can be used for evidence-based conservation decisions**". To meet these new expectations the Scientific Committee have provided some new principles for funding applicants to guide their choice of studies:

1. **The New Zealand Threat Classification list (2021) will be used as a scoring criteria for applications (https://www.doc.govt.nz/globalassets/documents/science-and-technical/nztcs36entire.pdf).**

The NZTCL will define the importance of species chosen for research projects. Research that directly benefits threatened and declining species will be scored higher than studies on species that are of lower risk or are not threatened.

2. **Research is preferred on NZ endemic species and threatened native species rather than introduced species.**

3. **Applied research that will benefit threatened species such as development of new and more effective monitoring methods or testing new tools and techniques that protect species will score higher than studies that look at descriptive aspects of bird biology. Research with little relevance to conservation needs is unlikely to be funded.**

New approaches to monitoring threatened species or understanding the pressures that species face through experimental studies will score highly. Understanding the basic biology and ecology of threatened species will score well if it is likely to assist conservation decision making. Research applicable to a group of similar species where little previous research has been conducted will also score well.

4. **Field studies investigating wild bird populations are preferred over laboratory studies looking at minor aspects of bird biology although a combination of field and lab work are acceptable provided the conservation benefit is clearly stated in the objectives.**

### Themes

With these principles in mind, we suggest a range of research themes that are currently needed to help improve the conservation status of New Zealand birds. These 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 protected bird species. Studies of introduced species might be supported where these species are having a direct competitive or predatory impact on our threatened native bird species but the work needs to be targeted at bird species response and demonstrating immediate conservation benefit.

A. **How to monitor the presence and abundance of threatened or rare 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 or tested 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 determining threat status and conservation actions.

**B. Understanding 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 successful establishment? Case studies of various species and projects will help provide answers to inform best practice around species translocations and improve conservation decision making.

**C. 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 seabird species 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, as well as the impacts of climate change.

**D. Defining species boundaries to better target conservation spending on species**

- 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, behaviour and geography.
- Are there cryptic bird taxa amongst the more widespread native species of passerines? Examine species that occur across a wide latitudinal and altitudinal range.

- Using genomic methods to establish the extent of dispersal and mixing between populations of mobile species such as seabirds, shorebirds and rails. Are populations panmictic or have we overlooked discrete breeding populations?

**E. Diets of native species**

- Determining the trophic levels and diets of non-passerine species using DNA sampling of faeces and/or stomach contents 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.
- Understanding the impacts of pesticides and changed land use practices on food availability for native birds that use agricultural landscapes for breeding and foraging.

**F. 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/rainfall patterns alter across a geographical scale. Understanding how these breeding behaviours vary today across the country for passerines 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.

G. **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 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 that aims 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.

**H. Moult and bird behaviour outside of breeding season**

- The biology and behaviour of most species outside of the breeding season is still poorly understood for most species.
- 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 and reduce the risk of predation?
- How important is diet during the moult period to ensure quality feathers are produced?

**I. Impacts of fragmentation and habitat loss on native birds**

- 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 native 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?