hatched and 59% of these chicks survived to fledge. Both hatching and fledging rates declined through the season. About half the pairs which laid in any year failed to rear a fledgling. Hatching success was greater in cultivated than pasture sites, but fledging success was similar at both sites. Trampling by stock, farming activities, and unknown causes were the main causes of egg loss.

Skylarks on the Canterbury Plain - biological indicators?

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The Skylark (*Alauda arvensis*) is one of fifteen species of farmland bird of which populations have declined markedly in Western Europe over the last 25 years. In the UK seven species have declined by more than 50% including the Skylark (58%). The Skylark was introduced to New Zealand by the Acclimatisation Societies in the 1860s and its populations appear to flourish. Work at Lincoln University, in collaboration with the Royal Society for the Protection of Birds (RSPB), UK, is determining Skylark winter and breeding densities and analysing the ecological factors influencing these. Multivariate and time-lapse video analyses have identified key paddock variables and nest predators, respectively. Winter variables significantly influencing Skylark abundance are field size, vegetation height, and boundary height. Nest predation rates are up to 90%. On typical farmland habitats in the Canterbury Plain there are 0.25 to 1 breeding pairs per hectare. This contrasts with 0.1 to 0.25 breeding pairs per hectare in lowland Britain. Key summer variables determining territory size are being identified currently.

The feeding ecology of Kereru and Bellbird in a modified forest remnant, South Canterbury, New Zealand

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Exotic plant invasion threatens native plant populations, particularly in isolated forest remnants close to sources of exotic plant propagules. Ironically, exotic plants in forest remnants may provide additional food sources that allow the persistence of ecologically important species such as Kereru (*Hemiphaga novaeseelandiae*) and Bellbird (*Anthornis melanura*). This study investigated the use of exotic and native plant food sources by Kereru and Bellbird from February to June 1998 in a modified forest remnant in south Canterbury. The plants used by Kereru and Bellbird varied seasonally and reflected changes in plant phenology. For both species, the amount of fruit taken declined from autumn to winter, paralleling a decline in fruit availability.

Although exotic plants comprised only 4.3% of total basal area in the remnant, they comprised 18.4% and 12.6% of feeding observations for Kereru and Bellbird respectively. Exotic plants were fed on most extensively by Kereru during February

and by Bellbird in March, months when the availability of native fruit was low. Selection analyses revealed Kereru and Bellbird were positively selecting some plant species while avoiding others. This has allowed the identification of important plant resources such as kowhai (*Sophora microphylla*) and pate (*Schefflera digitata*) for Kereru, and kohuhu (*Pittosporum tenuifolium*) and kahikatea (*Dacrycarpus dacrydioides*) for Bellbird. Despite the strong selection for a few plant species, Kereru and Bellbird appear generalist feeders, both feeding on more than 70% of the plant species present. Given the diversity of plant species present in the remnant and low selection for exotic plants, removal of exotic plants is unlikely to limit the foods available for Kereru or Bellbird during autumn and winter. This research has also identified problems with identifying plant selection by native birds that future studies can improve on to enhance research into exotic plant management in forest remnants.

Changes in Birdlife after Wetland Enhancement in Christchurch

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At first impression, Christchurch represents an overwhelmingly modified landscape with apparently very little remaining in the way of indigenous flora and fauna. However, when it comes to birdlife, the combined habitats of Christchurch are surprisingly species rich. Since 1980, 120 bird species have been recorded in Christchurch. Of these, some 82 species (68%) can be classified as wetland/coastal birds, revealing the importance of waterways and wetlands as core habitats within the city.

Since the early 1990s, the Christchurch City Council has embarked on a programme of waterway and wetland enhancement. This programme has included the purchase and development of freshwater and tidal wetlands, creation of wastewater treatment and stormwater retention basins, and riparian enhancement along waterways. Formerly the freshwater birdlife of Christchurch was overwhelmingly dominated by Mallards (*Anas platyrhynchos*) and gulls. In recent years, species richness and native bird abundance have increased markedly. Peak numbers of wintering native ducks (7000-8500 Shoveler *Anas rhynchotis*, 3500-4000 Scaup *Aythya novaeseelandiae*, 2000-2500 Grey Teal *Anas gracilis*, 1200-1800 Paradise Shelduck *Tadorna variegata*, <500 Grey Duck *Anas superciliosa*) now almost balance numbers of introduced waterfowl (15000-20,000 Mallard, 2000-3000 Canada Goose *Branta canadensis*, 300-1100 Black Swan *Cygnus atratus*). Local populations of at least 21 native birds have shown recent expansions and species such as Little Cormorant (*Phalacrocorax melanoleucos*), Scaup, Shoveler, South Island Pied Oystercatcher (*Haematopus ostralegus*), Kingfisher (*Halcyon sancta*) and Bellbird (*Anthornis melanura*) now regularly occur at sites where they were rare or unknown in the 1980s.