

The effect of anthropogenic disturbance on braided river birds in New Zealand

Sanaz Safavian

Abstract

New Zealand's braided rivers are critical habitats for a variety of endemic birds but most of these species are declining or endangered as a direct result of human activities or indirectly through introduced predators and invasive weeds. In this project, I examined the effects of human-caused disturbance on a variety of birds and their habitats that occur in the braided rivers of Canterbury as well as testing the effectiveness of weed removal to maintain their nesting habitat. My aims were to: (1) measure the impact of people walking through braided river habitat on the flight response of birds, (2) the effect of jet boats on stress hormone levels in braided river birds, (3) the effectiveness of 'ripping' as a method to remove invasive standing vegetation from nesting areas on the riverbed, and (4) whether the composition of seed banks from ripped sites could predict species composition of post ripping vegetation and how it would compare with the diversity of the standing vegetation. First, I measured flight initiation distances (FID) caused by single hikers on a range of braided river bird species and used this to estimate 'set-back' distance and buffer zones to protect birds from human disturbance. Although bird species differed in FID, all perceived a single walker as a potential threat and responded to it by fleeing away, but species endemic to New Zealand showed lower FID than more widespread native species. FID was also affected by variation in body size. I proposed that safe buffer zones should be implemented using the highest mean FID to protect the less tolerant species. Next, I collected faeces from black-backed gulls in two rivers in north Canterbury, New Zealand to extract and measure glucocorticoid (GC) metabolite concentrations, a measure of stress response, to test the

effect of jet boating on stress levels. GC levels indicated that jet boating has the potential to increase stress levels in black-backed gulls, even though this species did not show a strong behavioural response to the passing jet boats. Lastly, from August 2019 to February 2021, I collected data on the percentage cover and height of invasive weed species after mechanical removal through ripping on the riverbed of the Ashley River, Canterbury. I found this method of mechanical control resulted in the mortality of major weed species in the two years that followed ripping, suggesting it could be an efficient way to restore nesting habitat in key areas of braided river habitat. However, my examination of soil seed banks at the weed-cleared sites showed that regrowth is likely to be comprised exclusively of exotic weed species, though the composition may differ from that previously present. In conclusion, my study has highlighted the range of human-caused disturbances affecting braided river birds, but also presented some practical management methods to minimise their negative impacts. Overall, the results from my thesis contribute to a growing body of knowledge on braided river habitats that will assist in developing management practices to ensure the conservation of this unique ecosystem.