



Manaaki Whenua
Landcare Research

Weka: are they 'good predators'?

Jo Carpenter, John Innes,
Jamie Wood, Phil Lyver



Carpenter, J. K., Innes, J. G., Wood, J. R., & Lyver, P. O. B. (2021). Good predators: the roles of weka (*Gallirallus australis*) in New Zealand's past and present ecosystems. *New Zealand Journal of Ecology*, 45(1), 3425.





**PREDATOR
FREE NZ**





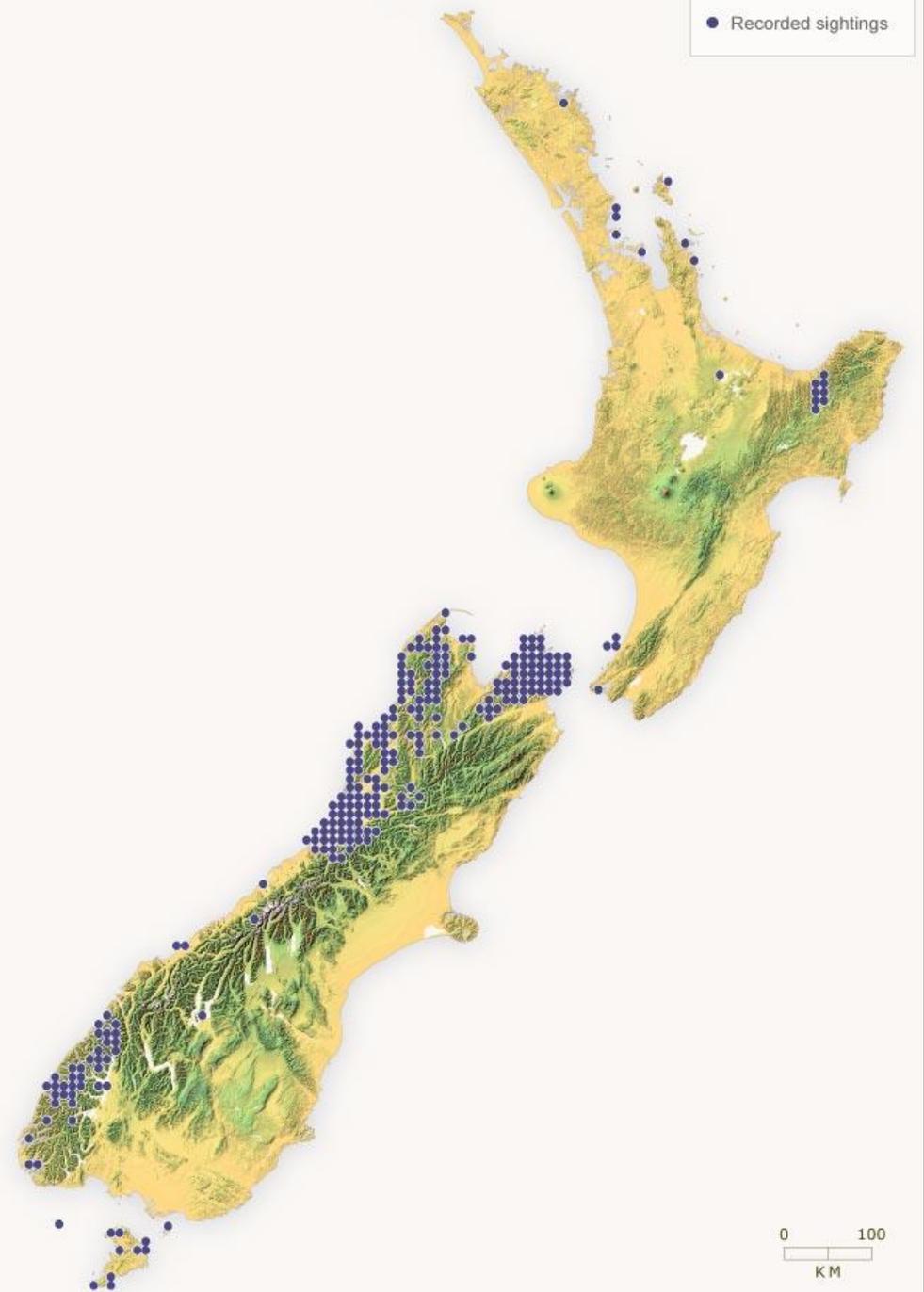
“New Zealand’s avifauna did not evolve in the absence of predators but only in the absence of mammalian predators.” Holdaway 1989





Weka

- Threatened (IUCN)
- Undergone massive range restriction
- Climate change expected to make things worse



Weka can be controversial



“Weka get a bad wrap?! They deserve it !! They may be good seed spreaders but they are also carnivores, they eat meat, they love a feed of the giant snail, powaliphanta, they stab a hole in the shell to kill them then drag them out!! They love picking off chickens, stabbing them to death with their beak and eating them, Ive even observed them chasing, killing and eating quail chicks, and them little blighters are fast. Leave the seed spreading to the kereru!”



Seen them eat blue duck chicks paraphant snails firm bird chicks and pluck birds out of the air in flight and yes they eat rats

Replying to [@PredatorFreeNZ](#) [@ArrestJK](#) and [@FitandAbel](#)

Apparently Weka parents incapacitate rats by pecking out their eyes so their young (mini-raptors) can practice stabbing them to death. I think the Weka and the Cockroach may be the last ones standing the battle royale that is our planet's decline to barren space rock.



They also eat baby quail like they're popcorn.

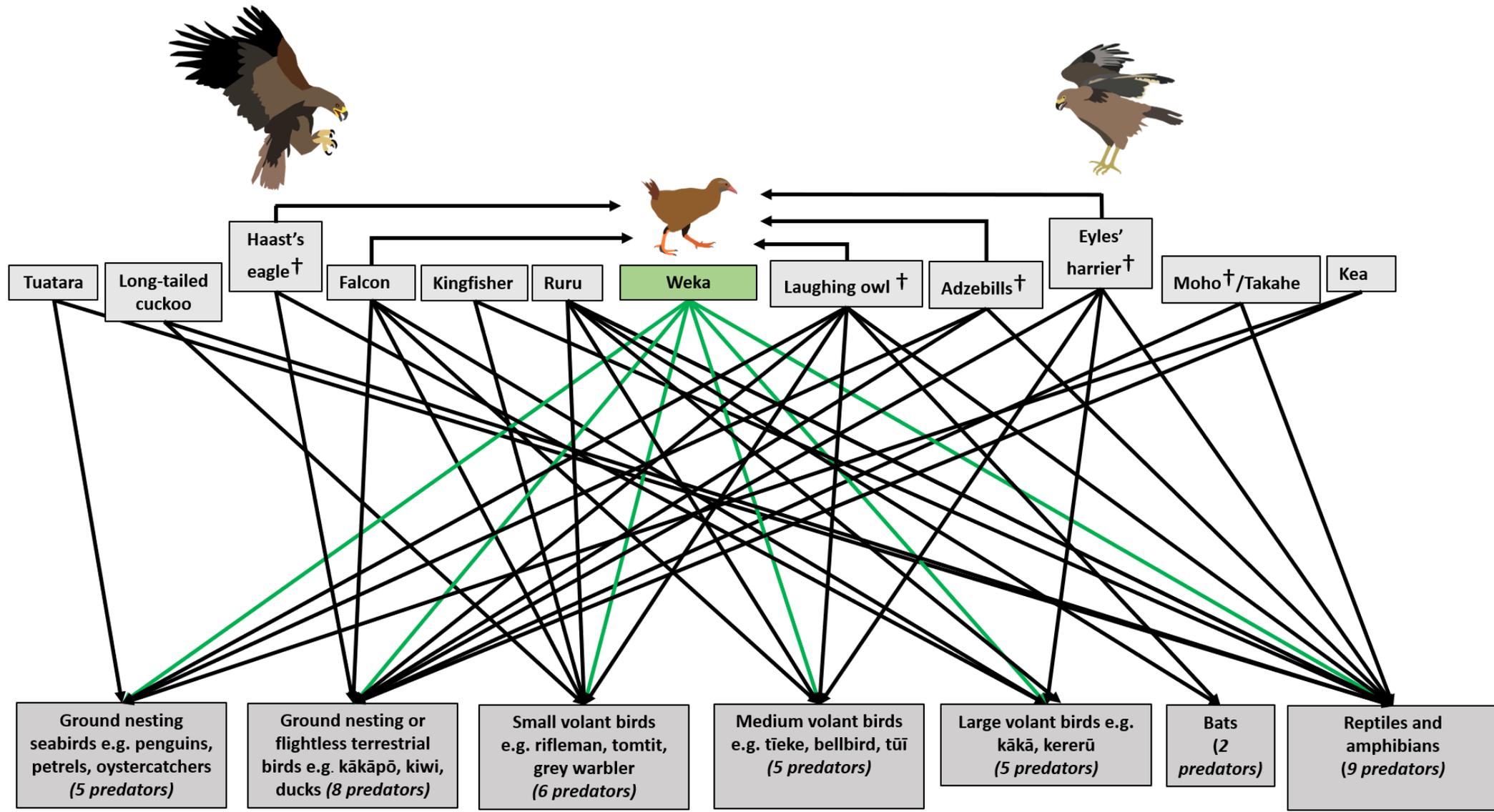


Aims

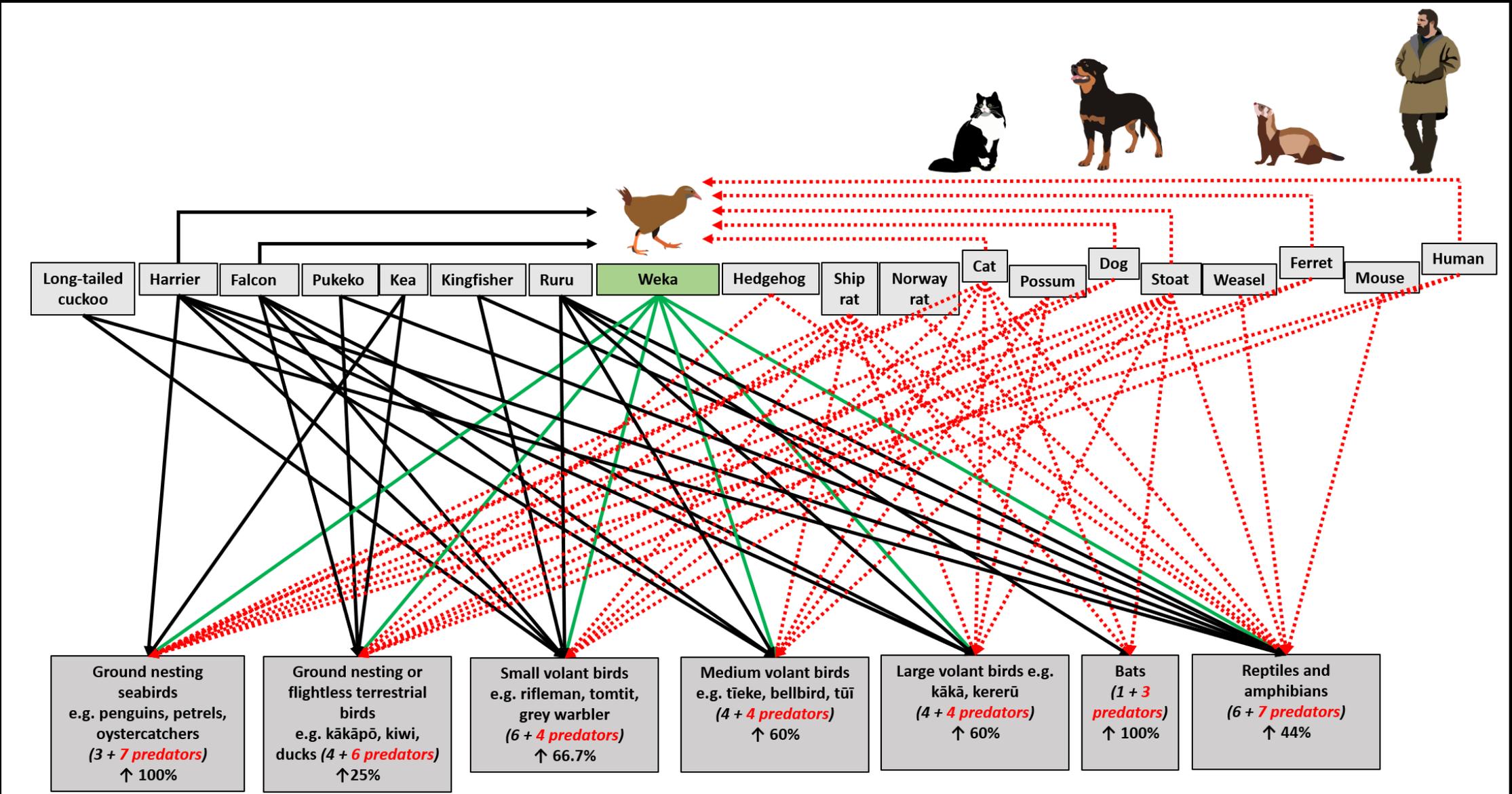
- Contrast prehistoric and contemporary predation webs focused on weka, to highlight NZ's original predator guild and to demonstrate shifts since human arrival
- Review studies on weka diet
- Summarise impacts of weka feeding on native fauna and introduced vertebrates



Prehuman predation web



Contemporary predation web





What do weka eat?

- Mainly fruits, seeds, invertebrates
- Also vegetative matter like flowers, leaves and moss
- Preferred food are flesh and eggs, but rarely recorded in mainland diet studies
- Petrel eggs and chicks common on Whenua Hou and Taukihepa
- Rodents on Macquarie





What impacts have weka had on native vertebrate species?

- Experimental removal of weka on Taukihepa (Big South Cape) increased titi nesting success (Harper 2007)
- Weka exclosures on Kapiti Island showed that weka impacted lizards in forest, but not at coastal sites (Miskelly & Beauchamp 2004)





What impacts have weka had on native vertebrate species?

- When weka were removed from the Chetwodes, detections of two skink spp. increased (Rafaut & Clearwater 1997)
- South Island snipe disappeared from several islands near Rakiura following weka introduction (Miskelly 1987)
- When weka were removed from Kundy Island, the population growth rate of tīeke increased by 5%





What impacts have weka had on native vertebrate species? Circumstantial evidence

- May have caused low abundance of Open Bay Islands skink, gecko, and leech
- Declines in mottled and Cook's petrel populations attributed to weka (kiore and possums also present; Blackburn 1968)
- Irrupting weka population on Jacky Lee Island decimated diving petrel and prion populations (Wilson 1959)
- Weka predation may have caused declines in tītī on Kapiti Island





What impacts have weka had on native vertebrate species? Circumstantial evidence

- Westland petrel population has high adult survivorship and fledging success in presence of weka (Waugh et al. 2006)
- Tīeke populations on Kapiti Island did extremely well with weka
- Weka predation on little spotted kiwi eggs seems to have little impact on the population (Miskelly & Beauchamp 2004)



Summary

- Weka seem more likely to have negative impacts on offshore islands, especially on ground nesting seabirds
 - Because they can reach high densities
 - Because they are a novel predator for some island endemics e.g. Open Bay Islands
 - Small island size may intensify the impact of weka predation
 - Habitat modification may also play a part





What impacts might weka have on introduced mammalian species?

- Several studies have recorded weka eating rodents and rabbits
- “...during an irruption of forest rodents in Fiordland, weka could be seen eagerly snapping up mice and swallowing them head first.” (King 2017)
- But no experimental studies looking at population level effects.



Sid Mosdell



But weka aren't just predators...



Weka scat on D'Urville Island (Photo by Geoff Walls)

They are excellent seed dispersers



- Consume many species of fruits
- Extremely long seed retention times = important long distance dispersal events
- Disperse some species' seeds even further than kereru!



Weka in action on Blumine Island





Where do weka fit into sanctuaries?



- Highly dependent on desired conservation outcomes of project
- Restoring ecosystems with ecological integrity?
- Intensive management of highly threatened species?
- Public engagement and advocacy?

Restoring ecosystems with ecological integrity



- All constituents of an ecosystem are restored where possible, together with the key processes that sustain functional relationships between these components e.g. pollination, predation, seed dispersal

Intensive management of highly threatened species



- Weka may not belong if there is a chance they will impact on the species
- But mitigation strategies may also be possible e.g. exclosures



Public engagement and advocacy



- Weka are charismatic and engaging and often interact with people

Public engagement and advocacy



- Weka are charismatic and engaging and often interact with people...although that's not always a good thing!



Conclusions

- Weka (and other native predators) are an important component of our ecosystems
- More research is needed on when and how weka might impact other threatened fauna, and whether they might be able to control pests
- Sanctuary goals will determine whether weka fit

