Climates changing, gravels shifting.

The potential of innovation to aid pest animal control in braided landscapes Brent Barret

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Points to ponder

- Potential impacts of Climate Change on river dynamics
- Changes in pest animal populations resulting from CC
- Increased complexity of trapping braided systems
- Habitat changes leading to difficulty in pest detection
- Changes in native species that impact bird survivorship
- Innovation pathways in New Zealand
- Commercialisation potential of novel devices
- Gaps in suitable techniques to address these dynamic changes.





Climate change impacts on braided systems

- Increased frequency and intensity of extreme weather events
- Melting of glaciers and reduced snowfall will decrease sedimentation and therefore deposition in the braided systems
- Increased temperatures and precipitation changes will alter water flow timing and magnitude. Reducing flow in dry periods.
- Sea level rise will increase tidal influence and saltwater intrusion in estuarine sections impacting avian feeding strategies and food availability.
- Changes in water temperature will affect aquatic ecosystems particularly fish populations and invertebrate life cycles.
- Increase in erosion and sedimentation in steep banks and gorge sections will impact the riverbed matrix impacting river morphology and habitat suitability.
- Climate change will impact pest population by aiding some weeds to colonize more effectively, some pest animals will become more successful during breeding events and the habitat will be more suitable for novel after border pest species



The importance of people, science and policy

•Implement adaptive management strategies that account for the dynamic nature of braided river systems and their response to climate change. This includes regular monitoring, data collection, and assessment of the impacts on river morphology, hydrology, and ecology.

•Foster collaboration between scientists, policymakers, and local communities to develop and implement effective management plans for braided river systems. This collaboration should consider the needs and perspectives of all stakeholders and incorporate indigenous knowledge and traditional ecological practices.

•Protect and restore riparian vegetation along braided rivers to stabilize banks, provide shade, and enhance habitat diversity. Planting native species can also help reduce erosion and sedimentation and provide valuable carbon sequestration benefits.

•Encourage sustainable land use practices in the catchment areas that contribute to braided river systems. This includes minimizing soil erosion, promoting sustainable farming practices, and managing vegetation to reduce sedimentation and runoff into the rivers.

•Develop and enforce regulations that control and limit water abstraction from braided river systems to ensure ecological flows and maintain the integrity of the ecosystem.

•Enhance public awareness and education about the importance of braided river systems, their vulnerability to climate change, and the need for their protection and restoration. This can include community engagement, educational programs, and interpretive signage at key river sites.

•Implement targeted conservation measures for threatened species that rely on braided river habitats, such as fish spawning grounds and bird nesting sites. This may involve habitat restoration, predator control, and captive breeding programs.

Incorporate climate change considerations into long-term planning and decision-making processes related to infrastructure development, flood management, and land use in the vicinity of braided river systems. This can help minimize adverse impacts and increase resilience to climate change.
Promote research and innovation to better understand the complex interactions between climate change and braided river systems. This can inform more effective management strategies and facilitate adaptive responses to future changes.



What is driving landscape-scale pest work?



FUNDING DELIVERED SPECIFICALLY FOR PEST CONTROL RESEARCH AND ACTION





Growth across all sectors

- Funds to purchase trapping hardware
- Support for riparian trapping groups
- Landscape-scale pest control delivery
- Rural sector intensive control operations
- Resources for collecting, storing and tracking data
- Trap communication tools for safer and efficient delivery





Networking and landscape approaches





To SOP or not to SOP? That is the question.









Addressing field trap materials







From innovation to commercialisation



Technology change is **rapid** Commercialization is **slow** Innovation should piggyback Effective non-target exclusion Wildlife safe endorsement Private land use regulation







Horizon expanding innovations

• UAV (Drones), thermal sensors, multispectral analysis, long life lures, Auto-lures, trap automation and improved cameras





Mind expanding innovations



Live capture



Kill trap



Toxin delivery





Improved monitoring and reporting







Improved lure longevity and attraction







Sustainability and carbon footprint





Broadening the net











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In appreciation of the dedication that so many individuals, hapu/iwi, organisations, and community/private groups demonstrate in conservation within Aotearoa.

