The effectiveness of the Northern Pegasus Bay Bylaw at managing recreational dog walkers at the Ashley Rakahuri Estuary

GEOG309 Research Report
University of Canterbury School of Earth & Environment

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Executive Summary

- The Ashley/Rakahuri Estuary, adjacent to Waikuku Beach in North Canterbury, is an ecologically and culturally significant site supporting vulnerable bird species such as the Wrybill and Banded Dotterel.
- The *Northern Pegasus Bay Bylaw 2024* was introduced by the Waimakariri District Council (WDC) to manage beach activities and reduce environmental impacts, including restrictions on dogs within the estuary and leash requirements on the adjacent spit.
- Research aims to assess the effectiveness of the Northern Pegasus Bay Bylaw in managing recreational dog walkers at the Ashley/Rakahuri Estuary.
- To aid in evaluating public awareness, understanding, and compliance with the bylaw and associated signage.
- Data collection involved in-person interviews, online surveys and field observations to record dog-walker behaviour and compliance with restrictions.
- Observed behaviour and sighting of dog tracks within dune and breeding areas showed continued off-leash activity, even in prohibited zones.
- High general support, with 70% of respondents in both surveys and interviews agreeing with current dog restrictions.
- Low bylaw awareness, with 70% of online respondents understanding the bylaw's purpose, compared to just 4.3% of interviewees.
- A clear disconnect between knowledge and behaviour persists, with awareness of signage not guaranteeing compliance.
- Strong opinions and social norms ("my dog doesn't disturb wildlife"). Limited understanding of ecological impacts reduces rule adherence
- Signage placement influences engagement. Clearer positioning at decision points (e.g., entrances, carparks).
- The new viewing platform at the estuary presents opportunities for community education and conservation messaging.
- Future success requires communication strategies that link dog-walking behaviour to wildlife protection outcomes.

- Investigate how social norm interventions (e.g., peer influence or visual cues) can increase compliance.
- Expand study scope to capture seasonal variation and non-local visitor behaviour.
- Enhance collaboration with Ngāi Tūāhuriri and use co-management approaches to integrate cultural values into enforcement and education.
- Develop targeted public education campaigns to clarify the purpose of the bylaw and its ecological importance.

1. Introduction

1.1 Background

The Ashley/Rakahuri Estuary is located north of Christchurch in the Waimakariri District. It provides nesting areas for many different species of native and migratory birds and is a significant area for local iwi Ngāi Tūāhuriri. It is a popular area for recreational activities, including walking, jogging, and dog walking. Seasonal activities such as white baiting also occur annually.

The Northern Pegasus Bay Bylaw 2024 provides the current restrictions for recreational activities in the Northern Pegasus Bay area, including Waikuku Beach and Ashley Rakahuri Estuary. The aims of the bylaw include controlling activities on beaches in order to protect the natural values of the environment, managing recreational uses for the benefit and enjoyment of all users, and managing environmental impacts arising from recreational activity.

One of the key activities that the bylaw regulates is dog walking in the Northern Pegasus Bay area. The bylaw requires that all dogs on the beach shall be kept under continuous and effective control. Dogs are prohibited from the Ashley/Rakahuri Estuary, and are required to be on a lead on the seaward-facing side of the spit adjacent to the estuarine area. This is illustrated in Figures 1 and 2. When the Northern Pegasus Bay Bylaw 2024 was introduced, the Waimakariri District Council received a range of feedback on the dog walking regulations. After initially proposing to prohibit dogs from the spit as well as the estuary, feedback from the public resulted in this being changed to allow dogs on a leash on the spit. The Waimakariri District

Figure 1: Map from the Waimakariri District Northern Pegasus Bay Bylaw. Red: complete dog prohibition. Pink: dogs must be on a leash. (Waimakariri District Council., 2024).

Council seek to gain a better understanding of how effective these new dog walking restrictions are at the Ashley/Rakahuri Estuary.

1.2 Research Objectives

The research objective of this project was to analyse the effectiveness of the Northern Pegasus Bay Bylaw at managing recreational dog walkers at the Ashley/Rakahuri Estuary. In this analysis, it was hoped to gain an understanding of the effectiveness of the restrictions at achieving their aims, which involved determining whether current signs are effective and whether dog restriction zones are clear. It was also hoped to understand public opinion and awareness of the restrictions by determining whether people follow and agree with the restrictions and are aware of their importance.

This is significant for the Waimakariri District Council by providing a general sense of what residents think of the restrictions and whether these restrictions are being followed. It will be useful for the Council to have this information for future reform and changes to the Bylaw to ensure that its objectives are being met.

1.3 Study Area

This project was carried out from the Ashley Rakahuri Estuary to Waikuku Beach, north of the surf lifesaving club. The Ashley Rakahuri Estuary and Waikuku Beach have alternating dog restrictions, dependent on the specific area you are in. Having the study area not expand further south past the surf club would allow us to gather data that was concentrated around recreational dog walkers and their behaviours towards the dog restrictions.

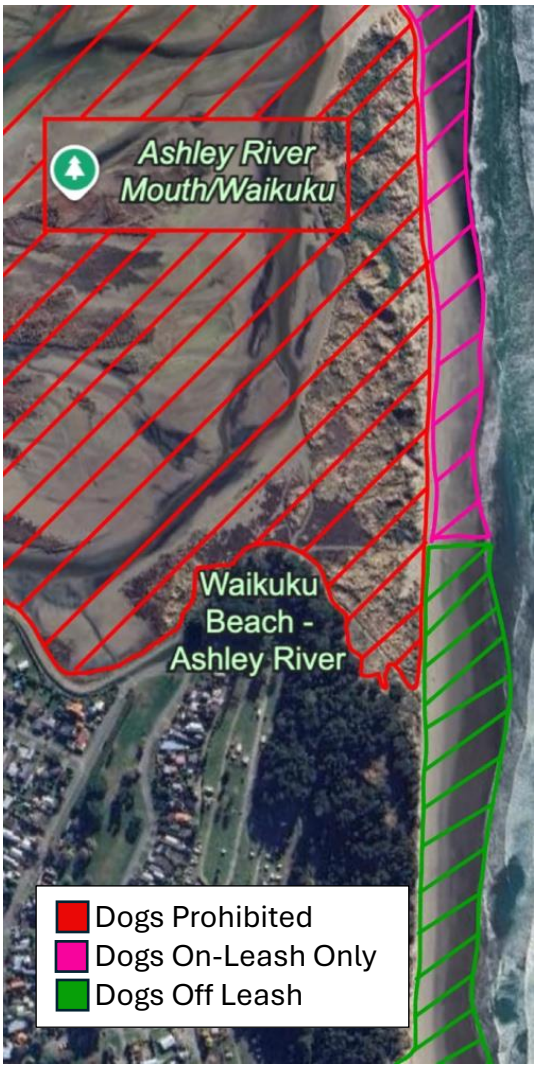

Figure 2: Areas at Ashley Rakahuri Estuaryand the different restrictions (Google Earth, 2025)

2. Literature Review

A review of existing relevant literature was conducted to understand pre-existing ideas on this topic for this project to build off. Four key themes were explored. These were the motivation of people to walk their dogs at the beach, the cultural and ecological significance of the bird species present at the Estuary, the impact of dogs on beach ecosystems and birds, and the effectiveness and inclusivity of signs.

2.1 The motivation of people to walk their dogs at the beach

Some key themes across articles looking at the motivation of people to walk their dogs at the beach and why they let them off leash in these areas included social norms and the perceived freedom being off leash at the beach gives the dogs (Packer et al., 2024; Willeman et al., 2025). In addition to this has been found that even when dog owners were aware of the ecological impact dogs can have on ecosystems, they are likely to think that their own well-behaved dog is not part of this issue (Packer et al., 2024; Dayer et al., 2022). Another finding was that compliance with leash regulations was higher where there were nearby alternative off-leash areas (Dayer et al., 2022; Packer et al., 2024; Schneider et al., 2020). The literature shows that it can be difficult to get the public to comply with different leashing restrictions in places like beaches, where dog walkers may want their dogs to be able to run free. However, Waikuku Beach serves as a nearby alternative where dogs can be walked off-leash, which the literature indicates could help increase compliance rates. These readings were useful to try and gain insight into why people are or are not complying with the bylaw, which can help build understanding of why it is or is not effective.

2.2 The cultural and ecological significance of bird species

Birds are a strong symbol throughout traditional Māori ideology and customs. Manu (birds) are a central part of Māori practices, and represent the bridge between the physical and spiritual worlds in Māori cosmology (Burgman & Tau, 2017). Birds are linked with the value of whakapapa (genealogy). Where biological ancestry links to a broader idea of ancestors, land, and the natural world. Kaitiakitanga establishes Māori as guardians of taonga species (treasured or valuable species), allowing for practices like mahinga kai (customary food

gathering) to be sustainable for future generations (Stewart, 2024). Many native bird species were associated with the Ngāi Tahu. For Ngāi Tūāhuriri, the Ashley Rakahuri Estuary is a site of ecological significance and is seen as wāhi taonga (treasured place). The Wrybill *(Anarhynchus frontalis)* and Banded Dotterel *(Charadrius bicinctus)* are two of the nationally vulnerable species that occupy the Ashley/Rakahuri braided river and estuary. Both species maintain the balance of the estuary's ecosystem with insect control and nutrient cycling (Wright et. al 1995).

2.3 The impact of dogs on beach ecosystems and birds

The impact of dogs on beach and riverbed birdlife relates directly to this project on how recreational activities affect wildlife in the Ashley–Rakahuri Reserve. Dog walking is a major recreational activity in this area and poses a significant threat to native ground-nesting birds. It has been shown that the presence dogs, whether leashed or unleashed, greatly reduce bird diversity and abundance. Bird numbers declined by up to 40% in areas with high dog activity (Bryant, J. V. (2007)). As well as the obvious short-term effects, the long-term impacts from scent and waste also influence how quickly nesting birds will return to the area (Gilson, L. N. (2025)). *Flight-Initiation Distance in Birds* (Blumstein, D. T. (2003)) demonstrated that buffer zones reduce disturbance by increasing the distance between dogs and nesting sites. Dogs also trample vegetation, this in turn can destabilise dunes, causing habitat loss, especially in small reserves with limited nesting options (Connolly, R. M. (2014)). Collectively, these studies show that dog walking has widespread ecological impacts and reinforce the need for management measures such as leash requirements, exclusion zones, and better public awareness within the Ashley–Rakahuri Reserve.

2.4 Inclusivity and effectiveness of signs.

Research on signage and behavioural compliance has shown that strategically placed regulatory statements can significantly affect human behaviour in outdoor and conservation environments. Concise, symbol-based signs at important decision points have been shown in studies to dramatically lower rule-breaking and wildlife disturbance (Allbrook & Quinn, 2020). These findings are supported by broader assessments of outdoor safety communication, which point out that signs with clear, concise designs are more successful

than those with a lot of text or interpretation (Espiner & Apse, 2023). Similarly, the use of novel or emotionally engaging signs has been shown to capture attention and deter unsafe or non-compliant behaviours in recreation areas (Girasek, 2019). In particular, studies on dog control emphasise the need of positive and persuasive messaging that links obedience to wildlife conservation rather than punishment (Jorgensen & Brown, 2017). Together, these conceptual insights helped to inform the design of this project's survey and interview components, focusing on awareness, signage interpretation, and behavioural motivation.

3. Methods

3.1 Direct Observation

Direct observations served as the quantitative baseline. The primary goal of this method was to establish a basic understanding of people's compliance and dog leash behaviour before any public interaction. The majority of the observations were conducted at the main beach access points and surrounding areas. The observation specifically tracked the total number of people walking with dogs, also looking at whether they were on-leash or off-leash in the correct areas. The direction of travel was also noted: movement left toward the dunes and the spit area (the restricted zone) versus movement right toward the surf club (off-leash zone). These observations provided objective quantitative evidence of the overall adherence to the rules, creating a measurable benchmark against which the bylaw's impact could be judged.

3.2 Online Survey

Surveys were implemented to gather data across the local community. The primary benefit of this approach was its wide reach, giving a larger pool of potential responses. The digital surveys also made replying more convenient for responders, enabling them to provide replies and share their views in their own time. However, the online surveys are subject to some limitations. The responses were primarily from locals, introducing a potential sampling bias. Furthermore, the reliance on platforms like Facebook likely excluded individuals who do not

use social media, creating a platform bias and therefore limiting the overall sample size. Despite these limitations, the survey provided important insights into the general sentiment around the rules in the bylaw.

3.3 In-Person Interviews

In-person interviews were designed to secure more contextual data that the other two methods could not provide. The goal was to move beyond 'yes/no' or multiple-choice answers to obtain more personal responses that provided more depth to the findings. A benefit of this method was the ability to observe the participant’s behaviour and non-verbal cues alongside their given answers. This offered a better interpretation of their views. This method also carried its own set of risks. The potential for participants to refuse the interview could bias the resulting sample, and the face-to-face nature risked participants offering a more socially desirable answer instead of their true views.

Combining the objective data from the observations, the larger response pool from the surveys, and the more contextual understanding from the interviews ensured a comprehensive assessment of the Northern Pegasus Bay Bylaw's effectiveness in protecting the estuary's wildlife.

4. Results

4.1 Observation Results

Two days were allocated to field observations to enhance our understanding of the research area. This proved particularly valuable, as none of the group members had previously visited the Ashley/Rakahuri Estuary or Waikuku Beach before commencing the project.

During these observation periods, a greater number of individuals were observed walking their dogs along Waikuku Beach towards the surf club rather than the spit. Along the spit, only 50% of recreational dog walkers were observed adhering to the on-leash restrictions clearly signposted at the entrance of the beach access walkway from the North Terrace car park.

Despite the limited number of recreational dog walkers observed over the two days, evidence of off-leash activity was recorded within the dune areas of the spit (Fig. 5). Dog tracks were notably visible in the absence of corresponding human footprints, indicating that dogs had been released with minimal supervision. This provides clear evidence of dogs entering known habitat and breeding areas for threatened bird species.

Figure 3: Sign present at the beginning of the access pathway. Providing brief information on the bylaw and the need for the restrictions 15/08

Figure 4: Dog restrictions signs. Far left: Positioned at the end of the spit on the beach. Centre: Positioned in the Estuary next to the beach access. Far Right: Sign positioned right in the car park indicating prohibited areas. 15/08

Figure 6: Dog footprints observed with limited owner footprints present in dunes. The restrictions prohibit 15/08.

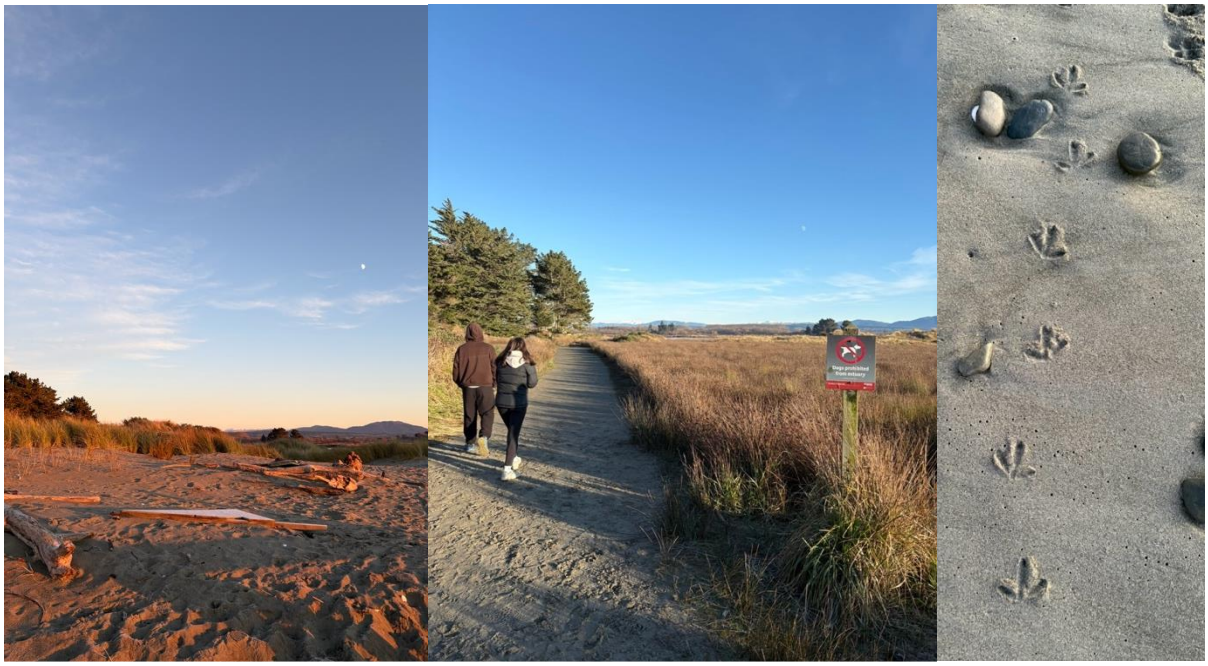

Figure 7: Further observations, photos from 15/08.

4.2 Data Analysis

Our final sample size for our data collection totalled 43, with:

- 20 online survey responses

- 23 in-person interview responses

Bar graphs were chosen to present the collected categorical data. Allowing for easy presentation to display and compare responses between different groups. Overall, we were happy with our final sample size, considering it a success. Given the challenges we faced with limited time, restricted access to local Facebook pages, and the cooler weather during interviews in late winter/early spring.

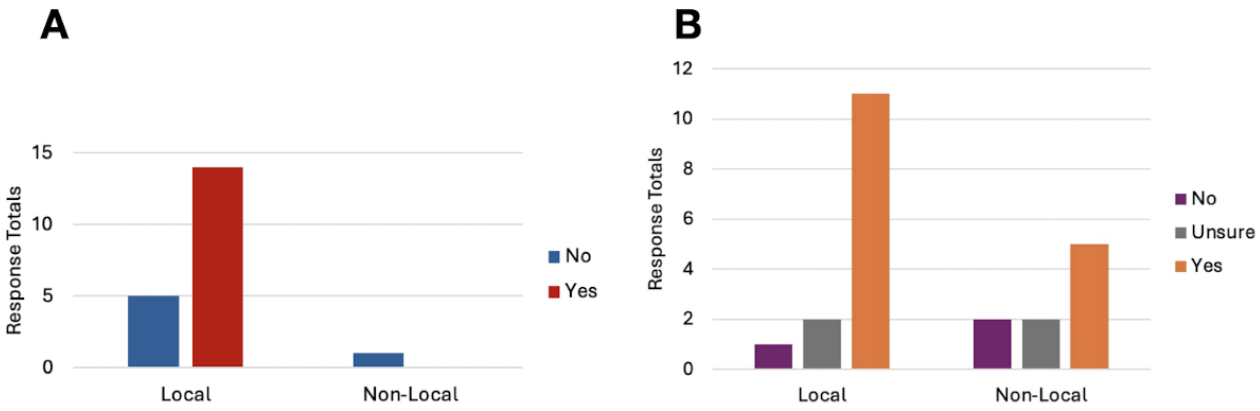

Figure 8: A) Online survey agreement towards the current dog restrictions. B) In-person interview agreement towards the current dog restrictions.

A) 14/20 (70%) respondents agreed, 6/24 (30%) respondents disagreed.
B) 17/23 (69.5%) respondents agreed, 4/23 (17.4%) respondents were unsure, and 3/23 (13.1%) respondents disagreed.

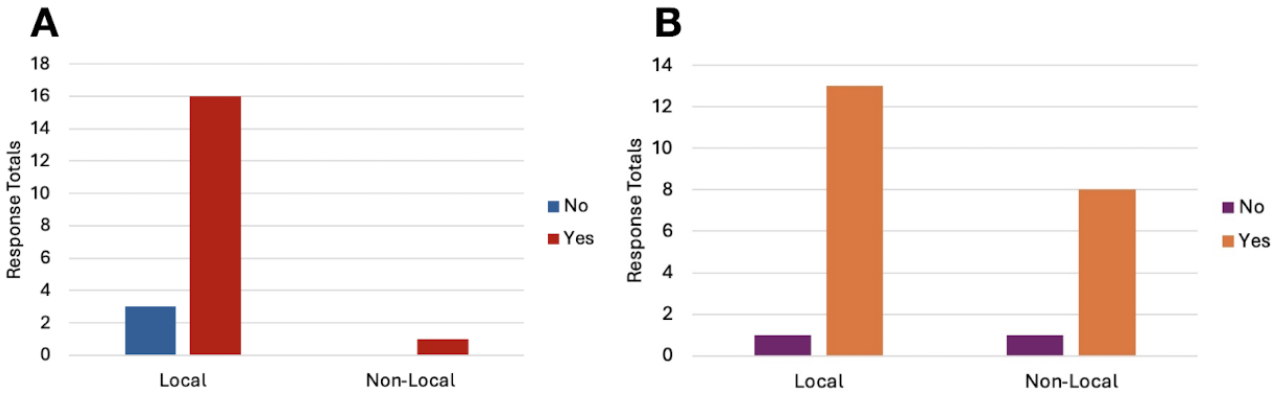

Figure 9: A) Online survey awareness of signs highlighting dog restriction areas. B) In-person interview, awareness of signs highlighting dog restriction areas.

A) 17/20 (85%) respondents were aware of signage restrictions, 3/20 (15%) were unaware.
B) Of the 21/23 (91.3%) respondents were aware of signage restrictions, 2/23 (8.7%) were unaware.

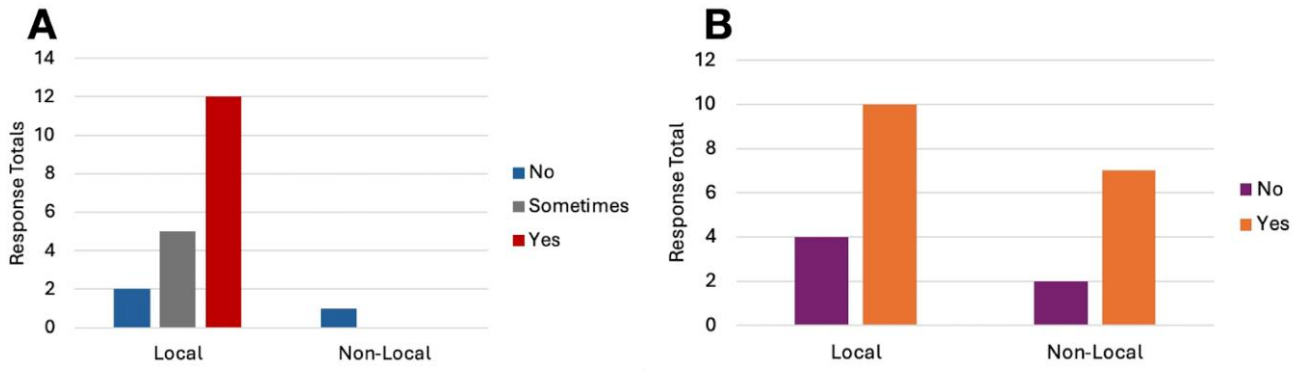

Figure 10: A) Online survey compliance towards restrictions displayed by signs. B) In-person interview compliance towards restrictions displayed by signs

A) 12/20 (60%) respondents consistently abided by the signage restrictions. 5/20 (25%) of respondents sometimes abided by the signage. 3/20 (15%) did not abide by the signage restrictions.
B) 18/23 (73.9%) respondents consistently abided by the signage. 6/23 (26.1%) respondents did not abide by the signage restrictions.

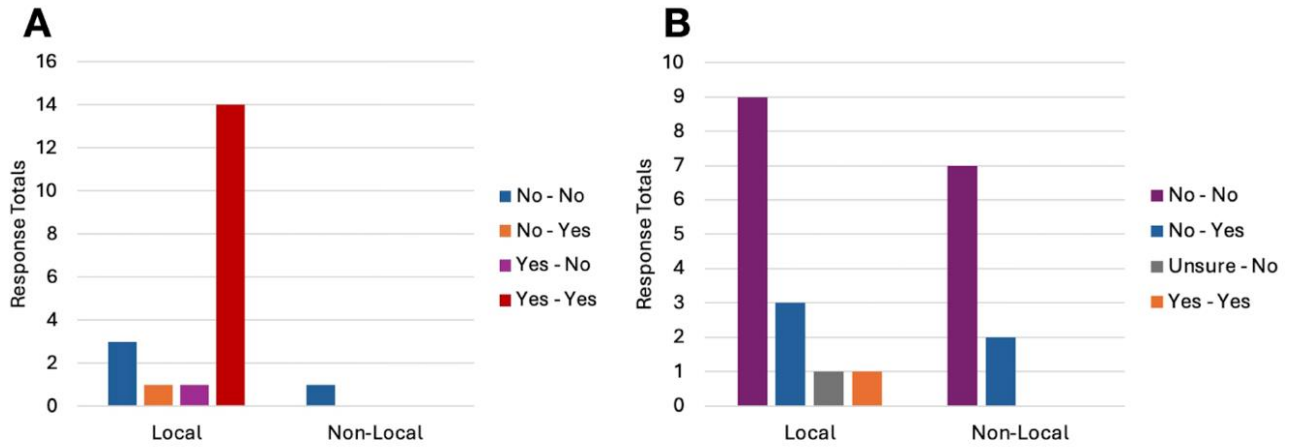

Figure 11: A) Online survey awareness of the Northern Pegasus Bay Bylaw and what it intends to protect. B) In-person interview, awareness of the Northern Pegasus Bay Bylaw and what it intends to protect.

A) 14/20 (70%) respondents knew of the bylaw and understood what it intended to protect. 1/20 (5%) respondents knew of the bylaw but did not understand what it intended to protect. 1/20 (5%) of respondents were unaware of the bylaw but

understood what it intended to protect. 4/20 (5%) respondents were unaware of the bylaw and what it intended to protect.

B) 1/23 (4.3%) respondents knew of the bylaw and understood what it intended to protect. 1/23 (4.3%) respondents had a limited understanding of the bylaw, but did not understand what it intended to protect. 5/23 (21.7%) respondents were unaware of the bylaw but understood what it intended to protect. 16/23 (69.7%) respondents were unaware of the bylaw and what it intended to protect.

4.3 Results Summary

Agreement with recreational dog-walking restrictions (Fig. 8) was consistent across both methods of data collection, with 70% of survey respondents and 69.5% of interviewees expressing support. Awareness of restriction signage (Fig. 9) was slightly higher among interview participants (91.3%) compared to survey respondents (85%). In contrast, knowledge of the Northern Pegasus Bay Bylaw (Fig. 11) showed a marked difference. While 70% of survey respondents were aware and understood its purpose, only 4.3% of interviewees demonstrated the same level of awareness. These findings should, however, be interpreted with caution due to the relatively small sample size.

5. Discussion

5.1 Interpretation of Data

Analysis of our data across both online surveys and in-person interviews revealed consistent public support for the Ashley Rakahuri Estuary's dog control restrictions, although levels of understanding and compliance vary. As shown in Figure 8a, 70% of the online respondents agreed with the current dog restrictions that are in place, while Figure 8b shows 69.5% of in-person participants were also in support. This indicates some shared attitudes between methods that regulation is necessary to protect estuarine wildlife. However, more complex responses surfaced in-person, with Figure 8b showing 17.4% as being unsure and 13.1% disagreeing with restrictions. Overall, local residents tended to have a stronger general understanding and more awareness of the rules and regulations, which is what we would expect.

Awareness of signage was relatively high in both samples, as shown in Figure 9. Among online respondents, 85% reported noticing signage, and among interview participants, this was even higher at 91.3%, indicating that the current signage is largely visible and does play a role in conveying information. However, when it came to actual compliance, these results contrast with Figure 10a, where only 60% of survey participants claimed to consistently abide by the rules. 25% reported partial compliance and 15% reported no compliance at all. In-person interviews had slightly better compliance rates, with Figure 10b illustrating 73.9% always adhered to the rules. This reveals a critical gap between environmental awareness and consistent behavioural adherence, a common issue in environmental regulation (Karvounidi, 2025).

The most notable difference between methods came in response to the bylaw itself. As shown in Figure 11, 70% of online respondents claimed to understand the bylaw and its purpose, compared to only 4.3% of interviewees. This discrepancy could result from sampling differences, as online respondents had greater access to background information when filling out the survey. Alternatively, in-person interviews were conducted spontaneously, which may have limited participants' ability to recall specific examples on the spot. This effect may be linked to recall bias, likely contributing to the higher number of uncertain answered during face to face interactions. Even among those whose behaviour the Bylaw is intended to regulate, this result implies that awareness of local policy remains low in the absence of effective communication strategies.

5.2 Knowledge and Awareness

Despite the high degree of signage awareness, our research indicates a disconnect between surface level recognition and more comprehensive understanding of conservation regulations. Many participants were unable to explain the purpose of having dog-leash restrictions or the wildlife they are intended to protect. This gap between intention and behaviour may further contribute to lower behavioural compliance, as individuals are less likely to internalise rules they view as unclear (Rangone, 2018). This perspective is supported by research on environmental education which shows that people are more likely to act in a pro-conservation manner when they understand the ecological rationale behind restrictions (Kollmuss &

Agyeman, 2002). Another factor that may relate to the inconsistencies experienced between knowledge and awareness is the fact that the bylaw was only introduced in 2024. As a relatively new policy, it is likely public knowledge is still developing, especially among non-locals or casual visitors who may not have encountered the signage or related communications.

5.3 Behaviour vs Belief

One important trend that our findings showed is that in both self-reports and from our own observations, is the discrepancy between peoples stated beliefs and their actual behaviours. We experienced several instances of interviewees claiming to be aware of where the on-leash and off-leash zones were located but were then observed letting their dogs roam freely in a restricted zone, or they gave inaccurate examples of where the zones were during the interview. This highlights how perceived knowledge can differ from accurate understanding, a challenge commonly noted in behaviour change literature (Wallace et al., 2019). Issues like following social norms, ambiguous signage or internal defences such as “my dog has excellent recall” or “my dog doesn’t bother birds” can all lead to these inconsistencies. According to (Cialdini et al., 2006) these results highlight the significance of not just providing information but also promoting social norms, consequences and visual cues that clearly direct behaviour.

5.4 Practical Insights

Through fieldwork and observations, we obtained important insights as to when and how rule engagement takes place. Relative to engagement, our findings suggest a mixed result that signage plays an important but sometimes insufficient role in promoting compliance. While most signs were visible and easy to understand, their placement and positioning especially at entrances and on the beach, appeared to influence effectiveness. Overall, we know through our results that signage was clearly noticed, suggesting that awareness alone is not the limiting factor. This is consistent with past research that emphasise the importance of positioning signage where behavioural decisions are made (Meis & Kashima, 2017). A key development at the site is the construction of a new public viewing platform overlooking the estuary. Its existence presents useful opportunities to raise awareness of the biological significance of the wetland and the effort that goes into protecting it. Positioned at the main carpark next to existing signage, the platform may serve as a focal point for both recreational enjoyment and informal education as ideally this would encourage dog walkers to take note

of the signs when observing. As people pause to observe the landscape, they are more likely to absorb contextual information, such as leash boundaries.

We also noted variation in responses based on the survey methodology and timing. The in person interviews, which were primarily conducted on weekends around midday, may have under-sampled weekday visitors or those who walk their dogs after work. Our online survey was distributed via Facebook community pages only, so responses were limited to users on that platform. This creates a potential sampling bias, as we perhaps did not capture the full diversity of all beachgoers, and our survey likely skewed toward more digitally engaged individuals.

5.6 Significance of Results

Our findings show that although the Northern Pegasus Bay Bylaw has public support in theory, it is undermined by gaps in understanding of specific risks and the occasional opposition to rules. While this is common in many areas of local environmental governance, it is particularly critical in coastal and estuarine ecosystems, where even slight disturbances can have disproportionate effects on vulnerable populations (Plante et al., 2018). From a management perspective, the findings emphasise the value of community engagement and co-management approaches. Rather than just increasing enforcement alone, stronger communication tactics and creating an emotional connection between dog walkers and the species at risk may prove to be more successful in the long run.

5.7 Ecological and Cultural Context

Beyond the behavioural insights, this study needs to be interpreted in the context of its larger ecological and cultural impact. In addition to being a Key Biodiversity Area of international significance and an important site for migratory shorebirds, it also holds important cultural significance to the tribes of Ngāi Tahū and Ngāi Tūāhuriri.

As part of a larger network of coastal wetlands, the Ashley Rakahuri Estuary is considered a wāhi taonga (sacred place) for Ngāi Tahu and is important for mahinga kai (traditional food gathering practices). The estuary and nearby waterways have historically been essential for the survival of the Kaiapoi Pā and continue to hold great cultural significance today. Disruption to breeding habitats undermines both biodiversity and the ability of iwi to uphold traditional relationships with the area and taonga species. According to Te Rūnanga o Ngāi Tahu (1999),

bylaws safeguarding this area contribute to the restoration of mauri (life force) and are in line with the values of kaitiakitanga (guardianship), guaranteeing the preservation of the estuary's ecological and cultural integrity for many years to come.

6. Conclusion

Overall, our research aimed to evaluate the effectiveness of the Northern Pegasus Bay Bylaw 2024 in managing recreational dog walkers at the Ashley/Rakahuri Estuary. Through a combination of surveys, interviews and field observations, we found that while the public generally supported the restrictions, consistent behavioural compliance remained limited. Most participants recognised and approved of the restriction signage, yet noticeable discrepancies emerged between self-reported and observed behaviour. Revealing a persistent gap between belief and practice.

Compliance with these restrictions cannot be achieved solely through signage. Effective management for these restrictions will require the public to have a deeper understanding of why these restrictions exist. Strengthening the public's education and engagement around the ecological and cultural significance of the estuary, particularly its importance to Ngāi Tūāhuriri and its vulnerable bird species, could help align public behaviour with conservation efforts. Social and community-based approaches may aid in the acceptance of restrictions, and signage placed at key access points is also likely to enhance voluntary compliance rather than punishment/enforcement.

The bylaw represents a valuable framework for protecting the Ashley/Rakahuri Estuary, but its success depends on continued communication, collaboration, and adaptive management. Future research should focus on how visitor demographics can influence the understanding of restrictions, monitoring how public awareness evolves into the future.

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