Appendix 7: Wetland advice

Science Advice: Assessment of Environmental Effects of the Seadown Drain Project – Stage One - Wetlands

Date	13/04/2026
To	Jolene Irvine, Team Leader - Rivers Planning, Rivers. jolene.irvine@ecan.govt.nz
Cc	Anna Ivanova, Regional Lead - Rivers Delivery, Rivers Anna.Ivanova@ecan.govt.nz Greg Burrell, Instream Ecology, gburrell@instream.co.nz.
From	Jean Jack, Team Leader, Land Ecology, Science Group, Environment Canterbury.

Summary

This report provides an assessment of effects (AEE) on wetland values of the proposed Waitarakao/Seadown Drain alignment. The report provides Environment Canterbury staff managing the project with an understanding of the actual and potential effects on wetland habitats to inform the on-the-ground works and consent process.

The consent process is split into two project phases, with Phase 1 covering a southern extent of drain and stop bank construction from the rifle range downstream to where the current Seadown Drain enters the Waitarakao / Washdyke Lagoon. Phase 2 will cover construction activities north of the rifle range to Beach Road.

The proposed alignment footprint for Phase 1 was provided to Land Ecology staff and the assessment of effects reported here is based on this footprint and associated works for Phase 1. An assessment for potential effects on wetland values for Phase 2 is expected to follow.

Initial work undertaken by Land Ecology staff in Autumn 2025 provided a delineation of the wetland extent and condition and was used to inform this AEE.

The assessment found that prior to impact management the proposed works would result in adverse ecological effects on wetland values. The level of these effects ranges from very low to low and include the reduction of 0.6ha of wetland extent, the temporary loss of wetland function and the loss of some indigenous vegetation.

Given existing wetland values, the most important actions to manage these adverse effects include the maintenance of the Seadown Drain's function to connect and support the ecological health of the downstream Waitarakao / Washdyke Lagoon and the avoidance or remediation of areas of existing significant indigenous vegetation affected by the proposed realignment.

Provided the proposed effects management measures are effectively implemented, the adverse effects on wetland values from Phase 1 works are expected to be negligible. Overall, the project is anticipated to deliver a net gain in wetland habitat values.

Contents

Introduction

The Waitarakao/Seadown drain and stop bank project seeks to realign existing flood protection and drainage infrastructure to safeguard it against ongoing coastal erosion. These assets stretch 7 km north from the Waitarakao/Washdyke Lagoon. While the stop bank currently protects land and the Seadown Drainage Scheme from seawater flooding, its effectiveness is being undermined by long-term coastal erosion.

The project's guiding principle - and the council's commitment to its partners - is to ensure that the redesigned drain and surrounding environments deliver a significant improvement in ecological values, including wetlands.

Background

The proposed works of the project require resource consent under the Resource Management Act 1991 (RMA) and relevant local government plans. Environment Canterbury staff managing the project have sought advice from Science Group staff to inform the consenting process, requesting an assessment of effects (AEE) for the project regarding wetland habitat values.

The consent process is split into two project phases, with Phase 1 covering the construction of the drain and stop bank from the rifle range downstream approximately 1.8km prior to where the current Seadown Drain enters the Waitarakao/Washdyke Lagoon. Phase 2 will cover construction activities north of the rifle range for approximately 5.5km up to Beach Road.

The proposed alignment design for Phase 1 was provided to Land Ecology, Science staff. The assessment of effects provided here is based on this design and description of works for Phase 1 (**Figure 1**). An assessment for potential effects on wetland values for Phase 2 is expected to follow.

Initial work undertaken by Land Ecology staff in Autumn 2025 provided a delineation of the wetland extent near the current and 'future' Waitarakao/Seadown Drain alignment (**Appendix 1**) and is used here to inform the AEE. The location of delineated wetland habitats within the project area referred to by this report are shown within **Figure 2**.

Assessment scope

This report provides an assessment of effects on the terrestrial ecology values of wetland habitats within the project footprint. Aquatic values (fish etc) are covered by the report of Burrell (2025).

Figure 1 The proposed realignment design and construction footprint for Phase 1 of the project. See Appendix 2 for further map detail.

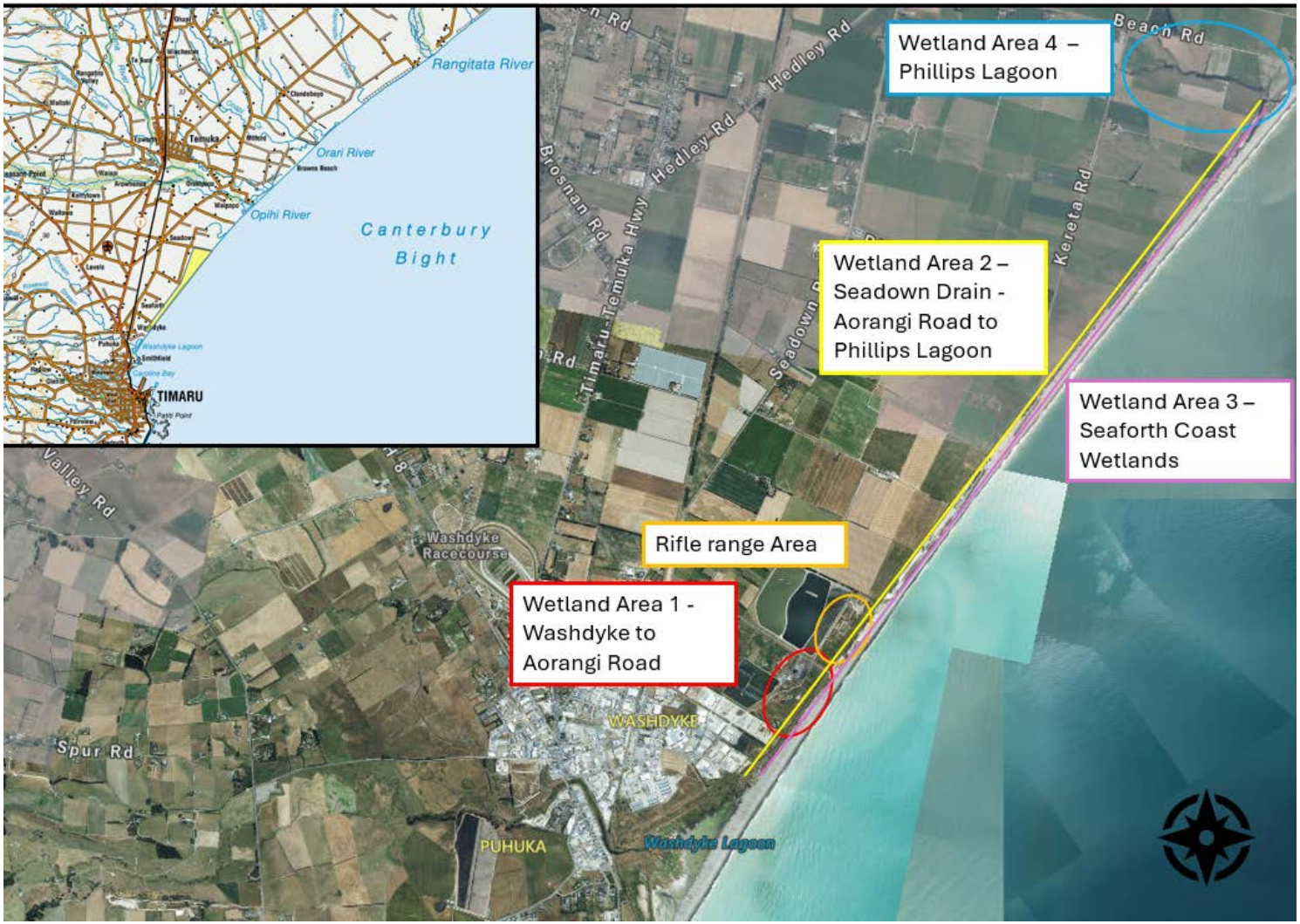


Figure 2 The location of wetland areas referred to in this report within the proposed realignment area. Phase 1 wetland areas considered within this report include Wetland Area 1 – Washdyke to Aorangi Road and the Rifle range Area.

Proposal and project description

The proposed realignment of drain and stop bank structures are shown in **Figure 1**. Phase 1 works impact four areas of delineated wetland habitat including the lower extent of the Seadown Drain and areas referred to as the 'pit-derived wetlands', 'retention pond' and a small extent of wetland within the rifle range (**Figure 2**; Wetland Area 1 & Rifle range Area).

The intention is to realign the Seadown Drain through both the 'retention pond' and 'pit-derived wetlands'. This will connect the currently isolated 'pit-derived wetlands' to these other habitats. The small area of wetland within the rifle range will be lost.

To achieve effective flood management and connectivity of habitats water levels of the 'pit-derived wetlands' and 'retention pond' will need to be lowered. The water levels in the 'pit-derived wetlands' are approximately 1m above the water levels in the current Seadown Drain, and the same as water levels in Philips Lagoon.

To ensure hydraulic flow from Philips Lagoon through to Waitarakao/Washdyke Lagoon, the water levels in the 'pit-derived wetlands' and 'retention pond' wetland will need to drop (potentially by 1m). To achieve this, excavation is proposed, resulting in some reduction of existing wetland extent. The 'pit-derived wetlands' will shift from a system reliant on groundwater and rainwater to one additionally fed by slow-flowing surface water channel, with periodic inundation of a surrounding marsh during high-flow events.

When hydraulic connection is made into the new alignment channel most of the flow will enter the new channel. The currently existing Seadown Drain will lose surface inflow; it may still have a wet base from intercepted groundwater however the extent of the existing wetland footprint will be significantly reduced.

Further key points relevant to the potential effects on wetland values include:

- Water levels and wetland extent of Philips Lagoon will be unchanged.
- Water levels in Seadown Drain upstream of the Phase 1 project area will remain the same during Phase 1 works.
- Works in the new alignment will primarily occur while 'disconnected' to the Seadown Drain.
- Once the new alignment is created and sediment has settled, the final hydraulic connection will be made. First by connecting the bottom end to allow for natural fish migration, then the top end.
- Phase 1 does not include any reclamation/in-filling of the dewatered extent of the Seadown Drain.

- Restoration planting at selected sites including the inland side of the new Seadown Drain as well as within/the surrounds of the identified wetland areas including the 'pit-derived wetlands'.
- Extensive areas of future ecological enhancement have been identified.

Assessment approach

My assessment of the level of potential effects which may occur considers the value of the ecological feature potentially impacted (i.e., wetland values) and the potential magnitude of that impact. I have referred to the Canterbury Regional Policy Statement (CRPS) and its associated ecological significance criteria to inform my assessment of wetland value and significance (relevant for consideration under section 6 of the RMA).

For both magnitude of effect and consequent level of effect I have adopted the Environmental Institute of Australia and New Zealand (EIANZ) guideline descriptions including negligible, low, moderate, high and very high (Roper-Lindsay et al., 2018).

I consider effects management appropriate for all identified potential effects that are more than negligible.

Description of the existing environment - Wetlands

Four areas of wetland habitat totalling approximately 3ha occur within the Phase 1 project area. These include the extent of the Seadown Drain (0.77ha), a small extent of wetland habitat within the rifle range (0.01ha) (**Figure 3**) and two areas south of Aorangi Road referred to as the 'pit-derived wetlands' (2.14ha) and 'retention pond' (0.13ha) (**Figure 4 & 5**). All areas are set within extensive areas of ungrazed exotic grassland, typically dominated by couch (*Elytrigia repens*) and or cocksfoot (*Dactylis glomerata*).

A full description of these wetland areas including further maps and photographs can be found within the wetland delineation report and associated files[1] (**Appendix 1**).

[1] Wetland significance and condition assessments for sites are filed at LAND/INVM/ECOL/4 and available at request. These provide repeat or baseline measures to enable long-term monitoring of a sites ecological state of health.

Figure 3 The small 0.01ha extent of wetland habitat delineated adjacent to the Seadown Drain (blue highlight) within the rifle range lease land. Aorangi Road occurs at the lower left corner of the image.

Figure 4 The existing extent of the 'pit-derived wetlands' south of Aorangi Road. These wetland areas, considered 'natural inland wetlands', were induced following earthworks associated with the adjacent water treatment ponds.

Figure 5 The existing extent of the 'retention pond' wetland south of Aorangi Road. This waterbody, considered an 'RMA wetland' rather than a 'natural inland wetland', was created for stormwater retention (not treatment) purposes.

Assessment of ecological significance

The four wetland areas within the Phase 1 project area were assessed against the ten criteria of the Canterbury Regional Policy Statement following the guidelines of Wildland Consultants (2013). Only the Seadown Drain and 'pit-derived wetlands' are considered ecologically significant.

The Seadown Drain contributes significant freshwater inputs into the ecologically significant Waitarakao/Washdyke Lagoon. While the habitat is highly modified to function as a drain this important function means it is considered ecologically significant under criteria 9 (ecological context) of the CRPS.

The ‘pit-derived wetlands’ appear to have been induced sometime prior to 2015 by excavation works associated with nearby water treatment pond construction (**Figure 6**). The isolated wetland extents present areas of open water, *Juncus* rushland and small areas of raupō reedland (*Typha orientalis*) totalling less than 0.1ha (**Figure 7**). While small, given the reduced extent of indigenous vegetation within the Low Plains context, the areas of raupō vegetation are considered ecologically significant under criteria 3 (rarity / distinctiveness) of the CRPS.

The small wetland area within the rifle range and the ‘retention pond’ are not considered ecologically significant. While additional survey effort may better inform significance assessments of these areas, they are highly modified and appear to provide habitat of very limited quality and extent.

Notably, all areas present opportunities for restoration and enhancement.

Figure 6 Aerial imagery of project area south of Aorangi Road prior to 2015 when construction of adjacent treatment ponds was underway. Current habitat mapping has been over laid illustrating its extent was after this construction activity.

Figure 7 Habitat types of the 'pit-derived wetlands' (and surrounds) viewed by drone (upper image) and earlier mapped during field survey in April 2025 (lower image). Areas of raupō reedland are highlighted. These total less than 0.1ha.

Assessment of effects

Proposed works will include earthworks to reshape the land, temporary discharges of sediment to water, and clearance of some vegetation (**Figure 1**). Consequent potential effects on wetland habitats include loss of extent or changes to wetland composition and function.

Effects on the Seadown Drain wetland

The realignment of the Seadown Drain (the extent within Phase 1) will restore a similar extent and maintain the key value of this habitat – its function to support via water flows and connectivity the ecologically significant habitat of the Waitarakao/Washdyke Lagoon. However, during realignment, it is likely that water quality and water levels will be temporarily affected and impair this function.

When the Seadown Drain is hydraulically connected to wetlands south of Aorangi Road most of the flow will be via this new channel. The affected extent of the existing Seadown Drain (0.77ha) will lose surface inflow. It may retain a wet base from intercepted groundwater; however, the extent of the existing drain will be significantly reduced.

Unlike the current channel the new system will have no significant aquatic macrophyte growth for the first ~2years. However, it is predicted that overtime macrophytes will establish and the new channel will attain a more naturalised state.

These effects are considered of low magnitude on the values of the Seadown Drain wetland and would result in a temporary and **low level of effect**.

Effects on wetlands south of Aorangi Road

Earthworks occurring at the 'pit-derived wetland' and 'retention pond' will primarily be undertaken where the new alignment connects into and exits these existing areas. Additional excavation will also occur where necessary to maintain and manage the wetland extent as designed (**Figure 1; Appendix 2 Map Detail**).

Pit-derived wetlands

The proposed works has the potential to substantially alter the hydrology and consequently both the extent and composition of this wetland habitat. The proposed design footprint indicates approximately 0.5ha of the existing wetland extent (2.14ha) will be lost. Included in this will be some of the current area of raupō reedland.

Given this moderate to high magnitude of effect and the pit-derived wetlands low ecological value, I would consider the potential level of effect on this wetland prior to effects management to be **low**.

Retention pond wetland

The proposal might similarly alter the hydrology of this constructed wetland habitat. The proposed design footprint indicates approximately 0.05ha of the existing wetland extent (0.13ha) will be lost.

Given this moderate to high magnitude of effect and the retention pond's negligible ecological value, I would consider the potential level of effect on this wetland to be **very low**.

Effects on other wetland areas

The small extent of wetland within the rifle range will be lost. Considering the ecological value of this area is negligible and that it will be permanently lost, I consider this a **low-very low level of effect**.

Effects on overall wetland extent

In terms of effects on wetland extent. Of the approximate 3ha of existing wetland extent within the Phase 1 project area 0.6ha of the existing wetland area will be lost.

Management of effects

Due to engineering design some loss of the existing wetland extent footprint is inevitable. Remediation of this loss is anticipated through the establishment of restoration and remediation plantings. While the area of shallow water may be reduced, an equal or greater extent of restoration/remediation plantings (approximately 2ha) will be undertaken, and this will remediate some of the lost wetland habitat.

The project design has sought to minimise the loss of existing wetland extent. Areas of higher ecological value, including raupō reedland will be avoided where possible or otherwise provided for. Raupō is a species which will ready recolonise areas of shallow water, and areas of the proposed realignment will provide such habitat into which the displaced vegetation type can reestablish.

Construction practices will be used to minimise the mobilisation of sediment (a Sediment and Erosion Plan is to be implemented) and habitat connectivity will be maintained or only temporarily affected.

Following earthworks and construction, implementation of remediation planting directly adjacent to waterbodies (i.e. surrounding the 'pit-derived wetlands') and

between the old and new stopbanks will wait for site hydrology to stabilise to ensure plantings align to water levels. Naturally occurring vegetation will also be encouraged to establish at this time and would inform remediation planting efforts. Remediation plantings of the new Seadown Drain berms however will be actively planted as soon as earthworks are completed.

Table 1 provides a summary of effects and management for each of the affected wetland features.

Table 1 Summary of effects on wetland features and effects management.

Ecological Feature	Level of Effect Prior to Effects Management	Effects Management	Level of Effect Post Effects Management
Seadown Drain wetland	Low (temporary)	Mitigation measures as per Burrell (2025); Remediation. Drain habitat & connectivity reinstated with realigned channel.	Negligible
Rifle range wetland	Very Low	Remediation. The 2-ha planting addresses the 0.01ha loss of existing extent.	Negligible
Retention pond wetland	Very Low	Remediation. The 2-ha planting addresses the 0.05ha loss of existing extent.	Negligible
Pit-derived wetland	Low	Mitigation measures as per Burrell (2025); Remediation. Restoration planting - allowing for remaining wetland space as open water address the 0.5ha loss of existing extent.	Negligible

Conclusions

All wetlands within the project area will be affected to some degree by the proposed works. The level of effect on any wetland area prior to management of effects ranges from very low to low.

Of the 3ha or wetland occurring within the Phase 1 project area a total of 0.6ha would be directly impacted.

The proposed effects management, if effectively implemented, is expected to remedy the loss of wetland extent and potential adverse effects on wetland habitats through a combination of remediation plantings, facilitation of natural wetland regeneration, and sustained maintenance of ecological values across the site.

To ensure effect management is successful it is recommended long-term monitoring of both the condition and extent of the wetland areas is undertaken.

Assessments of condition and extent for wetland areas are held by Land Ecology staff and would provide baseline measures of the existing pit-derived wetlands and the Seadown Drain sites.

References

Clarkson BR, Bartlam S. (2017). State of the Environment monitoring of Hawke's Bay wetlands: Tukituki Catchment. Landcare Research Contract Report LC2713. HBRC Report No. RM 17-06 HBRC Publication No. 4928.

Clarkson BR, Sorrell BK, Reeves PN, Champion PD, Partridge TR, Clarkson BD (2004) Handbook for monitoring wetland condition. Coordinated Monitoring of New Zealand Wetlands. A Ministry for the Environment Sustainable Management Fund Project (5105).

Roper-Lindsay, J., Fuller, S.A., Hooson, S., Sanders, M.D., Ussher, G.T. (2018). Ecological impact assessment. EIANZ guidelines for use in New Zealand: terrestrial and freshwater ecosystems. 2nd edition.

Wildland Consultants (2013). Guidelines for the application of ecological significance criteria for indigenous vegetation and habitats of indigenous fauna and wetlands in Canterbury. Wildland Consultants Contract Report No. 2289i. Prepared for Environment Canterbury.

Appendix 1: Wetland Delineation Report

Science Advice; Wetland Delineation Report

Date	23/05/2025
To	Jolene Irvine, Team Leader - Rivers Planning, Rivers. jolene.irvine@ecan.govt.nz
Cc	Anna Ivanova, Regional Lead - Rivers Delivery, Rivers Anna.Ivanova@ecan.govt.nz Greg Burrell, Instream Ecology, gburrell@instream.co.nz.
From	Jean Jack, Team Leader, Land Ecology, Science Group, Environment Canterbury.

RE Wetland delineation for the Seadown Drain realignment proposal

Assessment Date:	16/04/2025
Assessment Locations*: *General points for orientation purposes.	Area 1: NZTM 1461518, 5087576 Area 2: NZTM 1463142, 5089670 Area 3: NZTM 1465084, 5092600 Area 4: NZTM 1464812, 5091681
Assessed by:	Jean Jack, Land Ecologist, Environment Canterbury.
File reference:	LAND/INVM/ECOL/31
File attachments:	Shapefiles of delineated natural inland wetland extents and associated files attached*.

**Ground-surveyed areas should be viewed in conjunction with associated mapping of indicatively mapped (potential) wetland areas which have yet to be ground-truthed to confirm boundaries.*

Background

This report provides 'natural inland wetland[2]' delineation assessment for the area of interest shown in **Figure 1** and an assessment of the ecological significance of these habitats. Aquatic habitat values of the waterbodies are provided by a separate report being prepared by Instream Ecology consultant Greg Burrell.

The area of interest were wetland habitats within a proposed realignment area of the Seadown Drain from Waitarakao / Washdyke lagoon to Beach Road. This area was broken down into four broad areas as indicated in **Figure 8**.

[2] Natural inland wetlands as defined by the National Policy Statement Freshwater Management 2020.

Mapping of wetland habitats which existed prior to the 2025 survey results presented here is shown by **Figure 9**. This included ground-surveyed extents of Washdyke Lagoon and coastal habitats east of the Seadown Drain stopbank. Habitats west (landwards) of the Seadown Drain stopbank had been indicatively mapped by desktop using aerial imagery and contained limited information on vegetation values.

Survey of the area was conducted on 27th and 28th of March 2025. Wetland boundaries were determined following the methodologies for wetland delineation appended to the National Policy Statement for Freshwater Management 2020 and associated guidance documents[3]. Information including plot data was gathered to determine the approximate extent of wetland habitats.

Weather during survey of Washdyke to Aorangi Road and the shooting range was wet and ponding of water within assessed areas was considered during the site visit when determining wetland boundaries. While the survey was conducted late in the growing season, temperatures were mild. Dominant wetland plant species still held some seed heads which assisted identification, however survey during Spring or Summer may identify further plant species.

Results

Approximately eighteen hectares of natural inland wetland was delineated during the survey (**Table 2**). A small extent of wetland (0.3ha) was also mapped, which, while considered a wetland under the Resource Management Act (1991), is excluded from natural inland wetland status when considered against the definition for such habitats provided by the National Policy Statement for Freshwater 2020. This was due to these extents being considered constructed wetlands. The total area and regulatory status of areas mapped

Table 2 Mapped wetland habitats; their area and regulatory status.

Area Name*	Area (ha)	Regulatory Status
Phillips Lagoon	5.09	NPS FM
Seadown Drain_2025_Constructed Area	0.16	RMA
Seadown Drain_2025_Rifle range	0.01	NPS FM
Seadown Drain_Aorangi to Beach Road_2025	6.24	NPS FM
Seadown Drain_Aorangi to Beach Road_2025_Constructed Pond	0.13	RMA
Seaforth Coast Wetlands_2025	5.08	NPS FM
Washdyke to Aorangi Road Wetlands	2.14	NPS FM
Total Area	**18.56**	**NPS FM**
Total Area	**0.29**	**RMA**

*Attached shapefile field name.

[3] Ministry for the Environment. 2020. Wetland delineation protocols. Wellington: Ministry for the Environment.

Figure 3 presents an overview of all wetland areas, while subsequent figures provide greater resolution of each area. Plot data at one location (the rifle range) was used to inform wetland delineation and is provided in **Attachment 1**. Beyond this area wetland extent was able to be determined through 'rapid' assessment due to the dominance of wetland species, and well-defined transitional boundaries between wetland and dryland habitats. This is further explained below.

As per national guidance documents, areas were considered natural inland wetland where hydrophytic species were dominant (dominance index; >50%) & prevalent (prevalence index; score < 3). If all dominant species were obligate / facultative-wetland species, a rapid assessment confirming wetland status was made. Hydric soils & the hydrology of the area also provided supporting evidence. Delineated areas exclude areas where dominant plant species are exotic pasture species (as listed in MfE 2022) and/or are otherwise considered not to be RMA wetland habitats. These were excluded because the dominant vegetation met the NPS-FM pasture exclusion test (area was RMA wetland but not natural inland wetland).

Wetland extent is described as four distinct areas which are either contiguous or of homogeneous habitat types. These are described below and include Wetland Area 1 – Washdyke to Aorangi Road, Wetland Area 2 – Seadown Drain – Aorangi Road to Phillips Lagoon, Wetland Area 3 – Seaforth Coast Wetlands and Wetland Area 4 – Phillips Lagoon. A small area of wetland occurring with the rifle range is described as part of the Wetland Area 2 – Seadown Drain - Aorangi Road to Phillips Lagoon area.

Attachment 2 presents photographs of each area, and a spatial file of the delineated wetland areas accompanies this memo.

Ecological significance of the wetlands

The four wetland areas, considered as seven discrete sites, were assessed against the ten criteria of the Canterbury Regional Policy Statement (**Table 3**Table *2*) following the guidelines of Wildland Consultants (2013). While modified the four areas of Phillips Lagoon, Seaforth Coast, Washdyke to Aorangi Road, and the Seadown Drain are ecologically significance under one or more criteria. Further commentary of the values of each area are found with the area descriptions below.

Other areas did not meet any criteria thresholds. Additional survey effort may better inform significance assessments of these areas; however, they are highly modified and appear to provide habitat of limited quality and extent.

All areas present opportunities for restoration and enhancement.

Table 3 Ecological significance assessment summary

	Representative		Rarity / Distinctiveness				Diversity & Pattern		Ecological Context	
Wetland Area Name	Criteria 1	Criteria 2	Criteria 3	Criteria 4	Criteria 5	Criteria 6	Criteria 7	Criteria 8	Criteria 9	Criteria 10
Phillips Lagoon	✓		✓						✓	✓
Seadown Drain_2025_Constructed Area										
Seadown Drain_2025_Rifle range										
Seadown Drain_Aorangi to Beach Road_2025									✓	
Seadown Drain_Aorangi to Beach Road_2025_Constructed Pond										
Seaforth Coast Wetlands_2025	✓	✓	✓	✓				✓		✓
Washdyke to Aorangi Road Wetlands			✓							

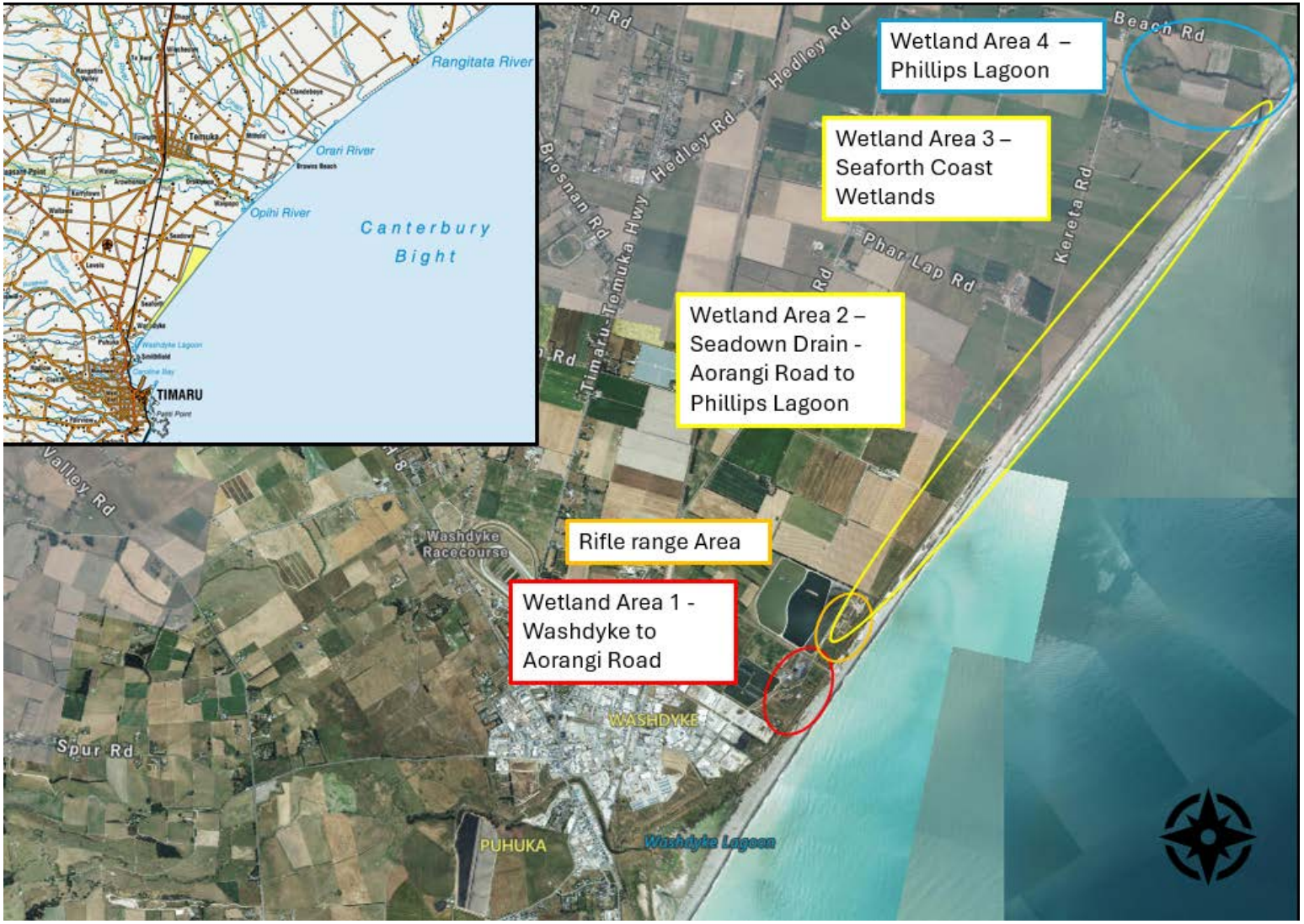


Figure 8 Survey extent and areas referred to within this report.

Figure 9 Wetland mapping prior to 2025 ground survey. Ground-survey extents are shown in blue; indicative mapping from aerial imagery is shown in purple. Ground-survey extents included the Seaforth Coastal wetlands, while indicative desktop mapping included areas of Phillips Lagoon & Seadown Drain. Apart from a small wastewater treatment pond, areas inland of the Seadown Drain referred to as Washdyke to Aorangi Road had not been mapped prior to 2025.

Figure 10 Overview of wetland habitats mapped during the survey. Phillips Lagoon and Seaforth Coast areas are shown at top left, Seadown Drain top right and lower left, and areas surrounding the rifle range and south of Aorangi Road are shown at lower right.

Wetland Area 1 – Washdyke to Aorangi Road Wetlands

Habitats occurring south of Aorangi Road and inland from the Seadown Drain had not been mapped by Council prior to 2025. Wetland habitat is not apparent in aerial imagery prior to 2015 and appear to have been induced by some form of excavation works.

Two discrete areas were delineated as natural inland wetland. While induced by excavation activities the areas have not been deliberately constructed as wetlands, and they have not developed directly around any constructed waterbody such as the treatment ponds being separated by some distance[4].

Set within a series of cut drains and exotic grassland dominated by couch (*Elytrigia repens*) and cocksfoot (*Dactylis glomerata*), the isolated wetland extents present areas of open water and *Juncus* rushland. Areas of raupō (*Typha orientalis*) and crack willow (*Salix fragilis*) also occur. Other native wetland species occurring include bachelor's button (*Cotula coronopifolia*), giant rush (*Juncus pallidus*), sharp spike sedge (*Eleocharis acuta*), and swamp sedge (*Carex virgata*).

Given the reduced extent of indigenous vegetation within the Low Plains context, the areas of raupō vegetation are considered ecologically significant.

[4] The NPS-FM 2020 definition of a natural inland wetland excludes deliberately constructed wetlands or those which have developed in or around a deliberately constructed water body, since the construction of the water body.

An area of wetland habitat mapped south of Aorangi Road and adjoining the Seadown Drain is not considered a natural inland wetland due to it being a purposefully constructed wetland, in this case for the purpose of wastewater treatment, and historic imagery shows no pre-existing wetland at the site prior to construction. This circular 0.1ha area presents shallow water with floating *Azolla rubra* (**Figure 11**) and is not considered ecologically significant.

Figure 11 An area of constructed wetland adjoining the Seadown Drain located approximately 100m south of Aorangi Road (NZTM 1461640, 5087771). The floating *Azolla rubra* carpets the surface of the shallow water treatment pond.

Wetland Area 2 – Seadown Drain – Aorangi Road to Phillips Lagoon Wetland

The mapped Seadown Drain wetland habitat starts just south of Beach Road and runs parallel to the coast until it discharges into Waitarakao / Washdyke Lagoon to which it contributes significant freshwater inputs (**Figure 12**). While the habitat is highly modified to function as a drain it may be considered a modified natural watercourse rather than an artificial waterbody based on the likely occurrence of natural wetlands and waterways prior to its construction. Evidence for this however is limited as construction of the drain (c.1930s) pre-dates available aerial imagery. Supporting the view that it is modified rather than artificial is the understanding that prior to construction of the Seadown Drain the area inland of the coastal beach barrier would not have had a permanent outlet and would have experienced long periods inundation as impounded freshwater backed up behind the coastal beach barrier. Additionally, aerial imagery shows historic channels leading into the Seadown Drain, supporting the assumption that at least parts of the existing drain were constructed through pre-existing wetland areas.

The 7km extent of the Seadown Drain wetland is fed by numerous lateral drains that intercepts emergent groundwater from the adjacent lowland plains and surface run-off from rainfall. The drain presents a highly homogenous habitat consisting of a 2-4m width of shallow water with associated floating and emergent vegetation such as *azolla*, duck and oxygen weed (*Lemna disperma*; *Elodea spp.*). Riparian margins are dominated by exotic grasses including cocksfoot (*Dactylis glomerata*), couch (*Elytrigia repens*) and at the water's edge floating sweetgrass (*Glyceria* spp.).

The waterbody offers some habitat to waterfowl; however, its primary value is its significant contribution of water to the ecologically important habitat of Waitarakao / Washdyke Lagoon. For this reason, it is considered ecologically significant.

Figure 12 The mapped extent of the Seadown Drain wetland. This shallow water habitat begins just south of Beach Road and extents to Washdyke lagoon south of Aorangi Road.

An area of wetland habitat mapped north of Seaforth Settlement Road and adjoining the Seadown Drain is not considered a natural inland wetland due to it being constructed. This 0.2ha area presents shallow water with a small area of raupō alongside jointed rush (*Juncus articulatus*) and various emergent and floating vegetation including duck and oxygen weed (*Lemna disperma*; *Elodea canadensis*) (**Figure 13**). The habitat occurs within a broad area mapped as wetland within the digitised 'black maps' however historic aerial imagery from the 1950s indicate no wetland habitat occurred at the site prior to construction. Imagery suggests the current waterbody formed following redirection of drainage channels in the 1950s, and subsequently further modified for recreational use. Given the reduced extent of indigenous vegetation within the Low Plains context, the area of raupō vegetation may be considered significant, however given its very limited extent I have not considered the area ecologically significant.

Figure 13 An area of constructed wetland adjoining the Seadown Drain located approximately 600m north of Seaforth Settlement Road (NZTM 1463124, 5089738).

A small area of wetland habitat was mapped south of Aorangi Road within the rifle range lease area. Comprising a narrow 1-3m band of exotic wetland grasses (creeping bent; *Agrostis stolonifera*) the 40m length of wetland is isolated from the near-by Seadown Drain. The area is not considered ecologically significant.

Figure 14 The small extent of wetland delineated adjacent to the Seadown Drain (blue highlight) within the rifle range lease land. Aorangi Road occurs at the lower left corner of the image.

Wetland Area 3 – Seaforth Coast Wetlands

The Seaforth Coast Wetland is a coastal lagoon with saline influences resulting in extensive areas of saltmarsh herbfield bordering a reach of shallow water which stretches south to the Waitarakao / Washdyke Lagoon. The full extent of these coastal wetlands was previously mapped in 2011. The extent remapped in 2025 is shown in **Figure 15** and comparison of this with 2011 mapping shows a reduced extent of saltmarsh herbfield which has been replaced by couch, marram grass (*Calamagrostis arenaria*) and beach gravels.

The area receives inflows from waterways exiting a tide gate at Beach Road and subsurface flows from the adjacent Phillips Lagoon. A channel has recently been dug to connect the northern most surface flows from the tide gate to the habitats flowing south. Wetland habitats are bounded by terrestrial marram grass, couch and beach cobbles to the east and the exotic grassland of the stop bank to west. Avifauna observed utilising the habitat during the site visit included black shag/māpunga (*Phalacrocorax carbo*), pied stilt/poaka (*Himantopus himantopus*), pied shag/ kāruhiruhi (*Phalacrocorax varius*) and southern black-backed gull/karoro (*Larus dominicanus*).

The area is considered ecologically significant due to it being representative of coastal habitats in the Low Plains, and the extent of indigenous vegetation and its relatively large size within that

context. The use of the area by a diverse assemblage of avifauna and at-risk species, and the wetland's role within wider habitat networks and their connectivity also contributes to the areas significance.

Figure 15 The mapped extent of the Seaforth Coastal wetland habitats (black outline) adjacent to Phillips Lagoon and Seadown Drain extents (red outline).

Wetland Area 4 – Phillips Lagoon Wetland

Phillips Lagoon was unable to be ground-surveyed due to landowners being away during the site visit timeframe. Assessment is therefore based on available desktop information and observations of the area from Beach Road and the Seadown Drain stopbanks.

Phillips Lagoon is a 5ha freshwater wetland which has been isolated from direct coastal influences by a stop bank. Channelised inflows from a series of farm drains support the wetland; outflows feed into the Seadown Drain and appear to flow through gravels under the stop bank into the Seaforth Coast wetlands.

Small areas of swamp and marsh occur within narrow channels leading to the more extensive area of open shallow water. In places this shallow water is fringed by raupō reedland (*Typha orientalis*).

During the site visit waterfowl including mallard/rakiraki (*Anas platyrhynchos*) and scaup/pāpango (*Aythya novaeseelandiae*) were observed on the lagoon, while swamp harrier/kāhu (*Circus approximans*), which may also utilise the habitat, were seen circling overhead.

Freshwater fish records provided by NIWA for this habitat include longfin and shortfin eel (*Anguilla dieffenbachia*, *Anguilla australis*) and inanga (*Galaxias maculatus*). Banded kokopu (*Galaxias fasciatus*) may also occur at the site (Dr Sriyan Jayasuriya, Council Surface Water Ecologist, *pers. comm*.). Further detail on the aquatic habitat values of the lagoon are provided by a separate report being prepared by Instream Ecology consultant Greg Burrell.

The area is considered ecologically significant due to it being representative of coastal habitats and the extent of indigenous vegetation within the Low Plains context. The wetland's role within wider habitat networks and their connectivity also contributes to the area's significance.

Figure 16 The mapped extent of Phillips Lagoon wetland (blue highlight) occurring just south of Beach Road. Additional wetland habitats including a channel to the north and the Seadown Drain wetland is shown in red.

Discussion

Assessment of effects

The survey work delineated several wetland areas for consideration by the Seadown Drain realignment project team.

If provided with a detailed proposal of works indicating areas for disturbance, an assessment of effects on the wetland habitats described in this report could be undertaken.

The level of effects of a realignment proposal will depend on which wetland features the realignment impacts, their value, the magnitude of those impacts and any mitigations or remedies proposed.

Wetland value

While all wetland sites are important in the context of the regional loss of wetlands and the Councils objectives to protect and restore these habitats, four wetland areas hold values of ecological significance. These values relate to areas being representative of historic habitats, supporting indigenous vegetation within an environment that has little remaining (the Low Plains), providing habitat to At-Risk fauna and or providing important linkages and hydrological functions which support other important habitats such as the Waitarakao / Washdyke Lagoon.

The Seaforth Coast Wetlands and Phillips Lagoon present the areas of highest ecological value and therefore activities which might disturb these areas should be given consideration to ensure effects are managed appropriately.

The value of the Seadown Drain Wetland relates primarily to its function in supporting other more important habitats, therefore activities which might alter this function also warrants careful consideration.

The value of the induced Washdyke to Aorangi Road wetlands revolve around the areas of raupō vegetation. Should disturbance of these habitats occur consideration of appropriate remediation actions should be considered.

Please note that this delineation report does not constitute an assessment of effects of any proposed activity on delineated wetland habitat.

Acknowledgements

Thanks to Chris Fauth for providing some drone images and facilitating access to properties, and respective landowners for their time to show me areas of their properties.

References

Burrell, G. 2025. Seadown Drain Relocation: Ecology Assessment. Prepared for Environment Canterbury, July 2025.

MfE 2022. National Policy Statement for Freshwater Management 2020.

MfE 2022. Wetland delineation protocols.

MfE 2022. Pasture exclusion assessment methodology

Wildland Consultants (2013). *Guidelines for the application of ecological significance criteria for indigenous vegetation and habitats of indigenous fauna and wetlands in Canterbury*. Wildland Consultants Contract Report No. 2289i. Prepared for Environment Canterbury.

Delineation protocols for natural inland wetlands* are available online:

Protocol for use in areas grazed:

- Pasture exclusion assessment methodology | Ministry for the Environment
- https://environment.govt.nz/publications/pasture-exclusion-assessment-methodology/

Protocol for use in areas ungrazed:

- Wetland delineation protocols | Ministry for the Environment
- https://environment.govt.nz/publications/wetland-delineation-protocols/

***natural inland wetland** means a wetland (as defined in the Act) that is not:
(a) in the coastal marine area; or

(b) a deliberately constructed wetland, other than a wetland constructed to offset impacts on, or to restore, an existing or former natural inland wetland; or

(c) a wetland that has developed in or around a deliberately constructed water body, since the construction of the water body; or

(d) a geothermal wetland; or
(e) a wetland that: (i) is within an area of pasture used for grazing; and (ii) has vegetation cover comprising more than 50% exotic pasture species (as identified in the *National List of Exotic Pasture Species* using the *Pasture Exclusion Assessment Methodology* (*see* clause 1.8)); unless (iii) the wetland is a location of a habitat of a threatened species identified under clause 3.8 of this National Policy Statement, in which case the exclusion in (e) does not apply.

Attachments

Attachment 1: Plot delineation – only undertaken at the rifle range.

	Seadown Drain_Rifle range_Plot_1

Date	27/03/2025
GPS	1461960, 5088132
Altitude (m)	2m
Field Team	Jean Jack
Notes:	

Dominance Index	0%
Hydrophytic Vegetation?	No
Prevalence Index	3.95
Pasture Cover %	0.0%

Stratum	NVSCode	Species Name	Cover %	Status
Herb	ELYREP	*Elytrigia repens*	50	FACU
Herb	DACGLO	*Dactylis glomerata*	25	FACU
Herb	TRIREP	*Trifolium repens*	10	FACU
Herb	PLALAN	*Plantago lanceolata*	5	FACU
Herb	TRIFRA	*Trifolium fragiferum*	5	FAC
Herb	HYPRAD	*Hypochaeris radicata*	1	FACU

Attachment 2: Site photographs

Wetland Area 1 – Washdyke to Aorangi Road

Photographs are presented in a south to north direction.

Below: Extensive exotic terrestrial grasslands surrounding induced wetland habitats (indicated by white mark-up). Seadown Drain indicated with blue mark-up.

Below: Exotic grassland occurring north of wetland areas (indicated by white mark-up).

Below: Water discharge pond occurring just south of Aorangi Road which is mapped contiguously with the Seadown Drain to which it flows into.

Below: Looking west down Aorangi road. Seadown Drain in foreground at a lateral drain confluence alongside Aorangi Road.

Wetland Area 2 – Seadown Drain – Aorangi Road to Phillips Lagoon

Photographs are presented in a south to north direction.

Below: Looking south from rifle range towards Aorangi Road. Seadown Drain indicated with blue dashed mark-up.

Below: Seadown Drain looking south near Aorangi Road.

Below: Looking south from the rifle range

Below: Seadown Drain adjacent to the rifle range

Wetland Area 2a – Rifle range wetland

Below: Small area of creeping bent wetland (white mark-up) adjacent to the Seadown Drain (indicated with blue dashed mark-up). Looking south.

Below: Soil at rifle range wetland (above); grey coloration and orange (oxidised) mottles indicating saturated hydric soils – supporting wetland delineation.

Below: Looking north from the rifle range. Seadown Drain indicated with blue mark-up.

Wetland Area 3 – Seaforth Coast Wetlands

Below: Water arising adjacent to stopbank – looking south towards Washdyke from near Beach Road.

Below: Open water habitats adjacent to the stop bank provide habitats to a number of indigenous avifauna, including the pied shags observed during the site survey (at centre image).

Below: Saline influenced native turf vegetation found alongside the open water habitats of the Seaforth Coast wetlands.

Below: A channel cut between the shallow water flowing from the tide gate at the northern end. The channel facilitates movement of water southwards into the remaining Seaforth Coast wetland extent.

Below: Looking south with the coastal shingle bar (left) transitioning to saline turfs of the Seaforth Coastal Wetland (indicated by white mark-up). The dashed blue line indicates the stopbank and Seadown Drain watercourse beyond. Exotic grasses including marram and couch in foreground.

Below: Looking south along the Seaforth Coastal Wetland which continues to Aorangi Road and Washdyke Lagoon.

Below: An old redundant floodgate occurring within the wetland.

Wetland Area 4 – Phillips Lagoon

Below: An arm of the lagoon with willow canopy and purei occurring along riparian margins - as seen from Beach Road.

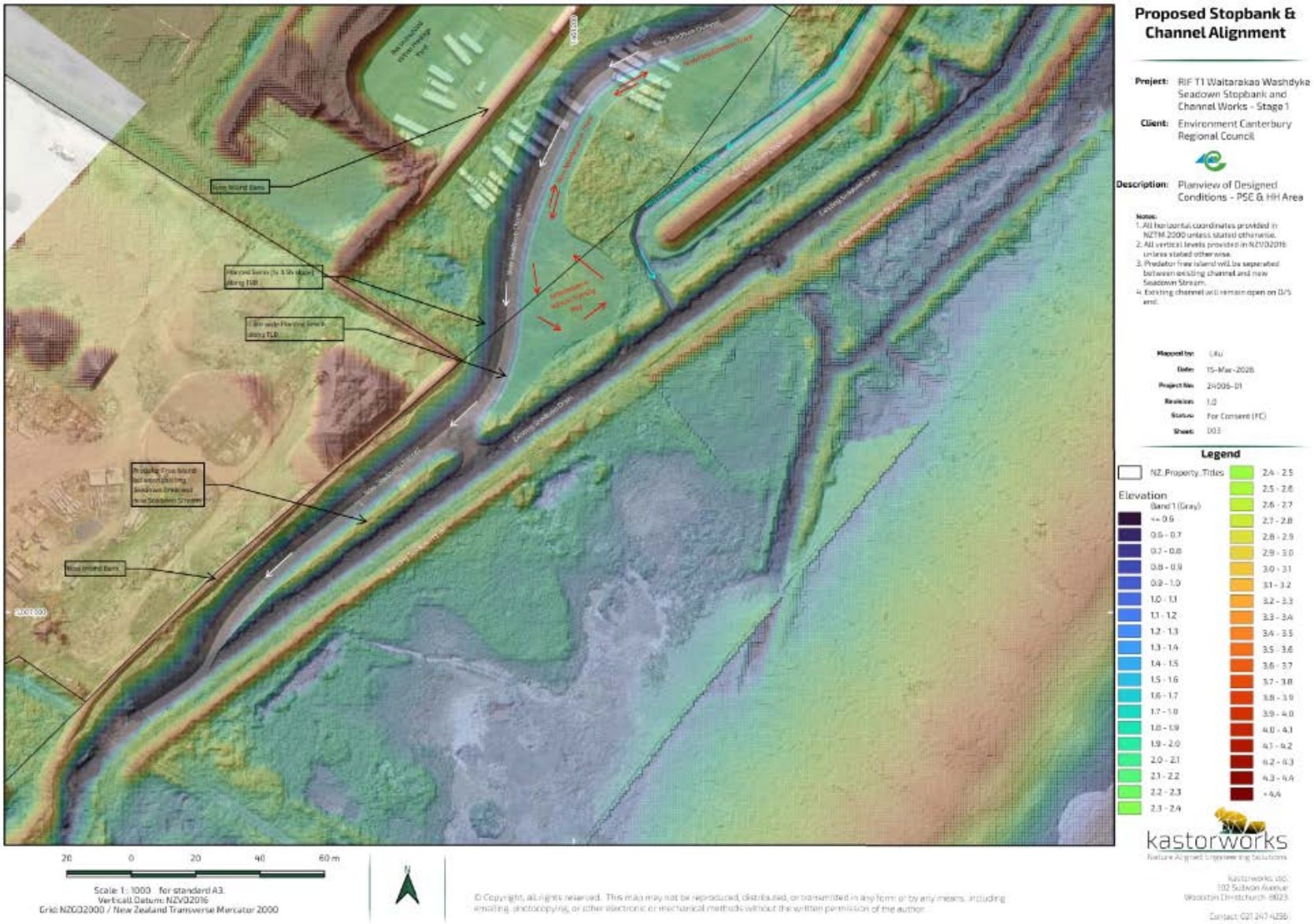
Below: Adjoining drains leading into the lagoon – as seen from Beach Road.

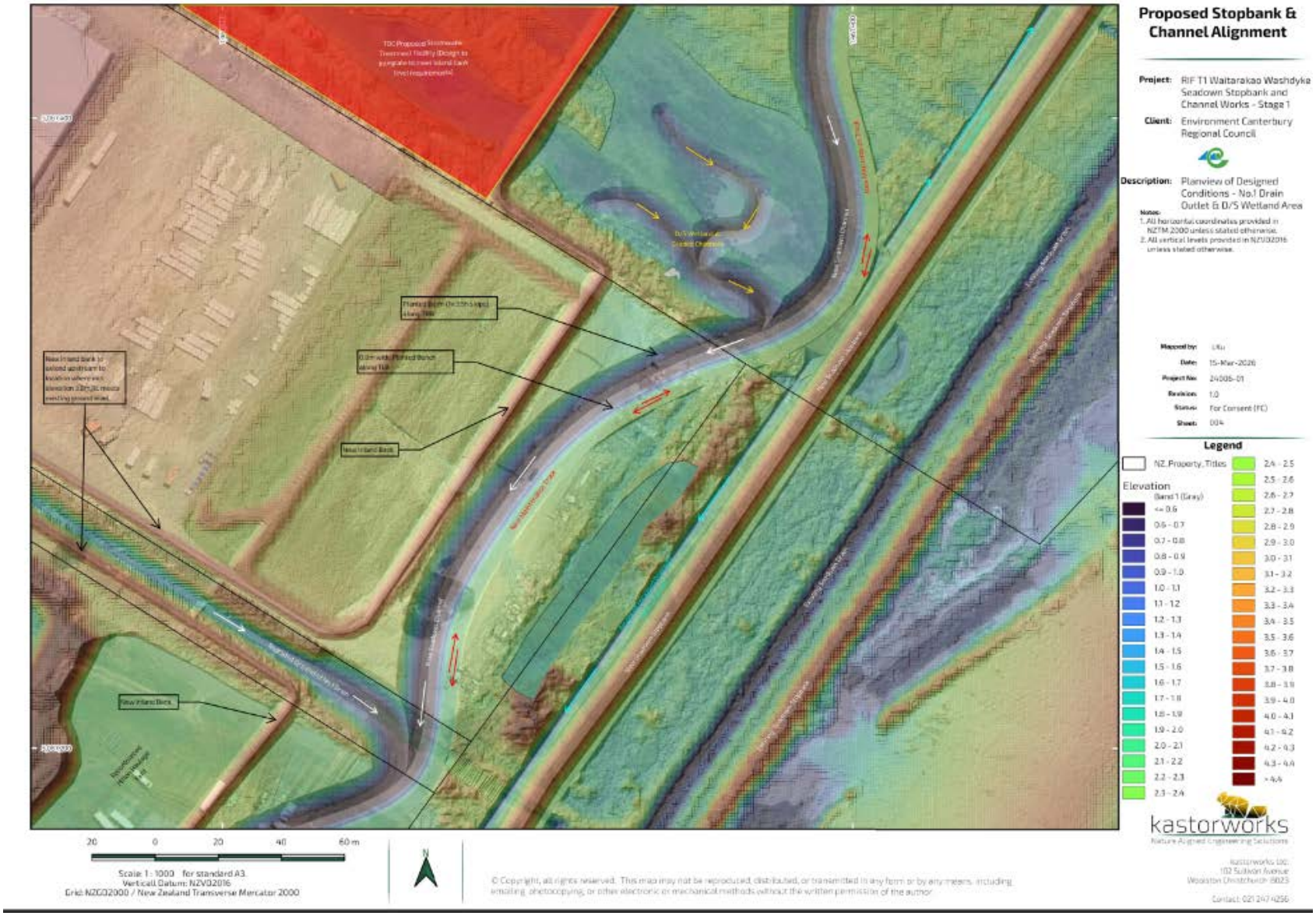
Below: Phillips Lagoon from the stopbank near Beach Road.

Below: Connection of water from Phillips Lagoon (left) entering the Seadown Drain (right).

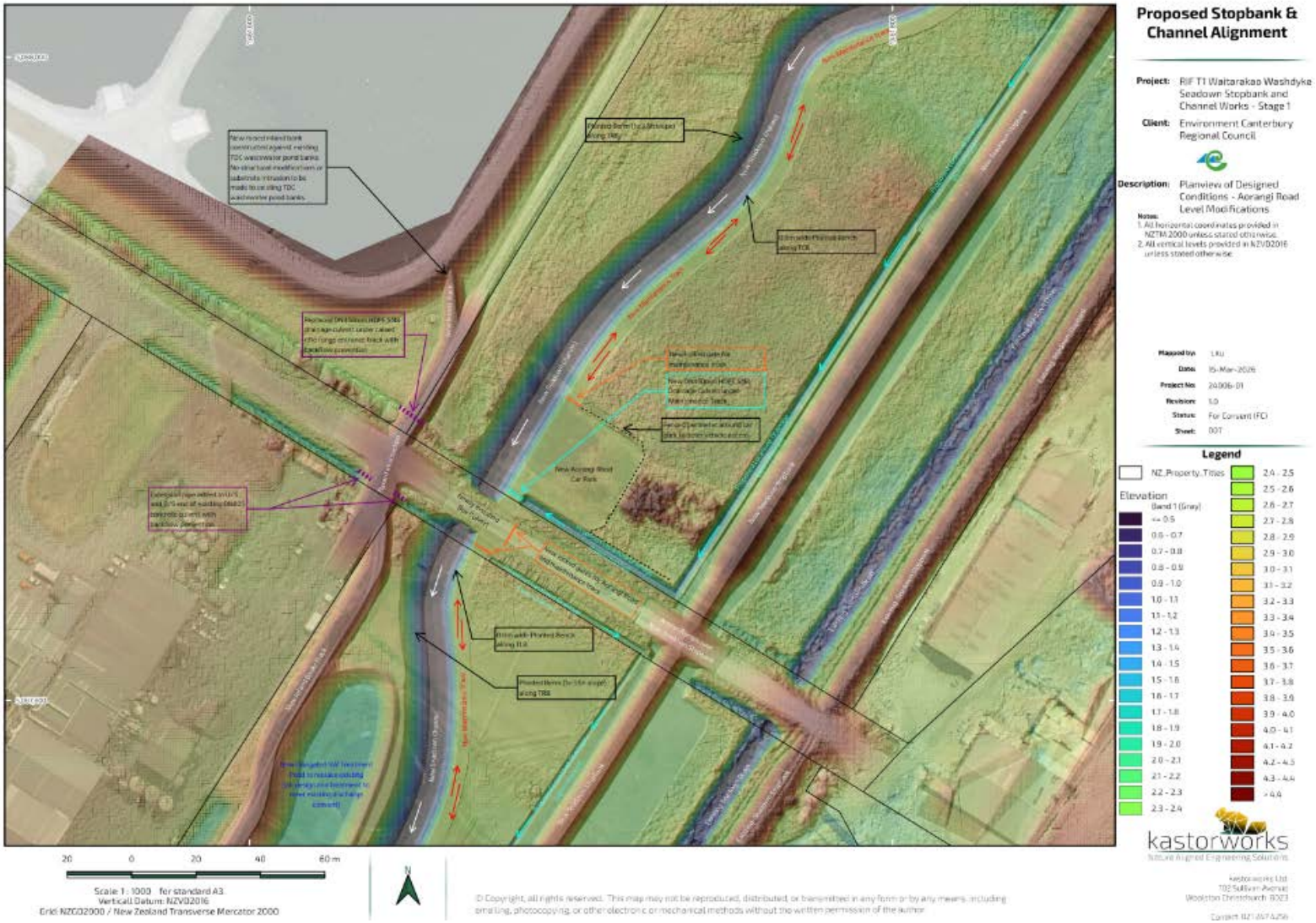
Below: A channel separated from Phillips lagoon which cuts across Beach Road before flowing through a tide gate to the coast. From there a channel has recently been cut (see following photo) connecting this water to that of coastal Seaforth Coast wetland habitats.

Appendix 2: Proposed Design Alignment – Map Detail

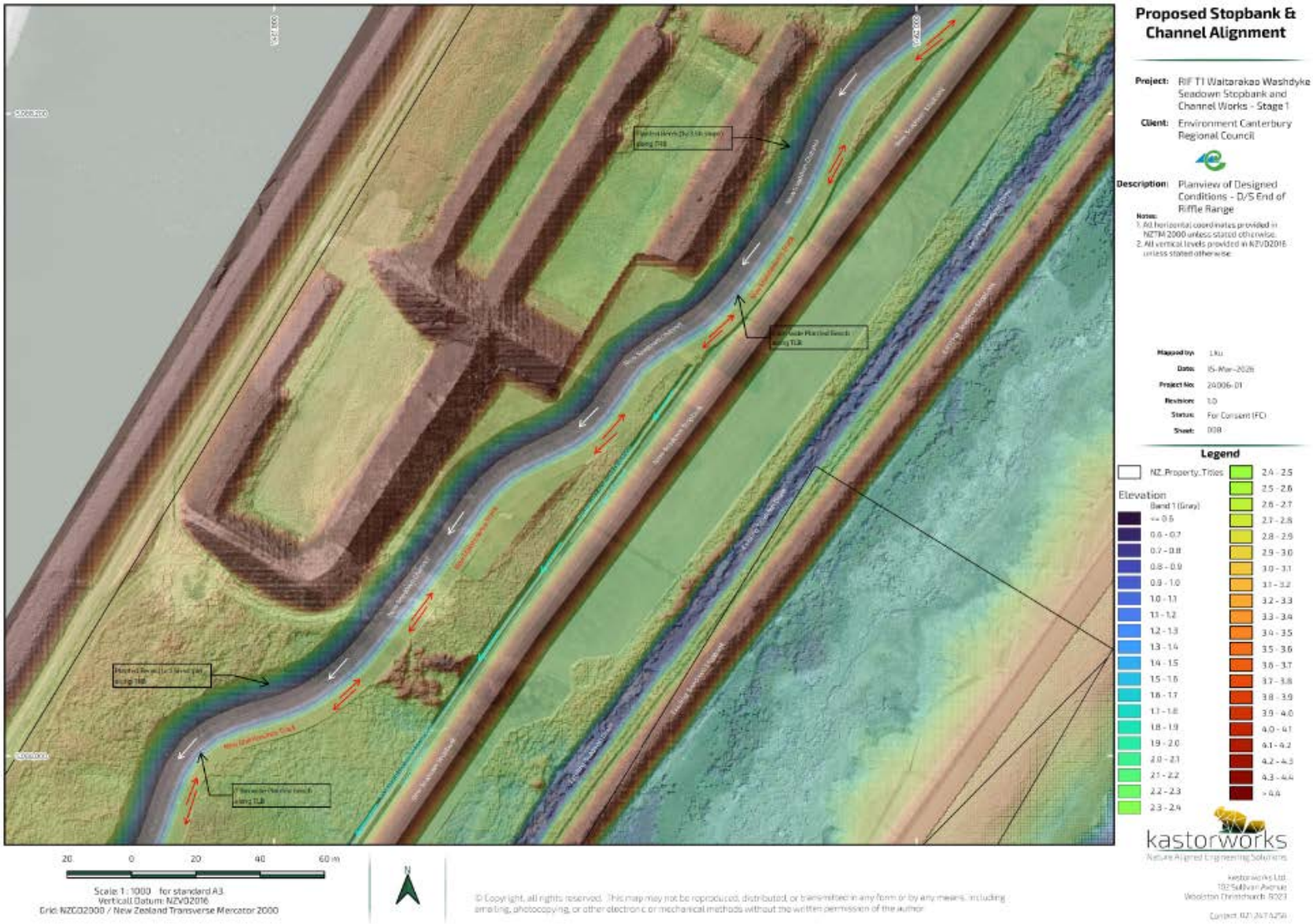


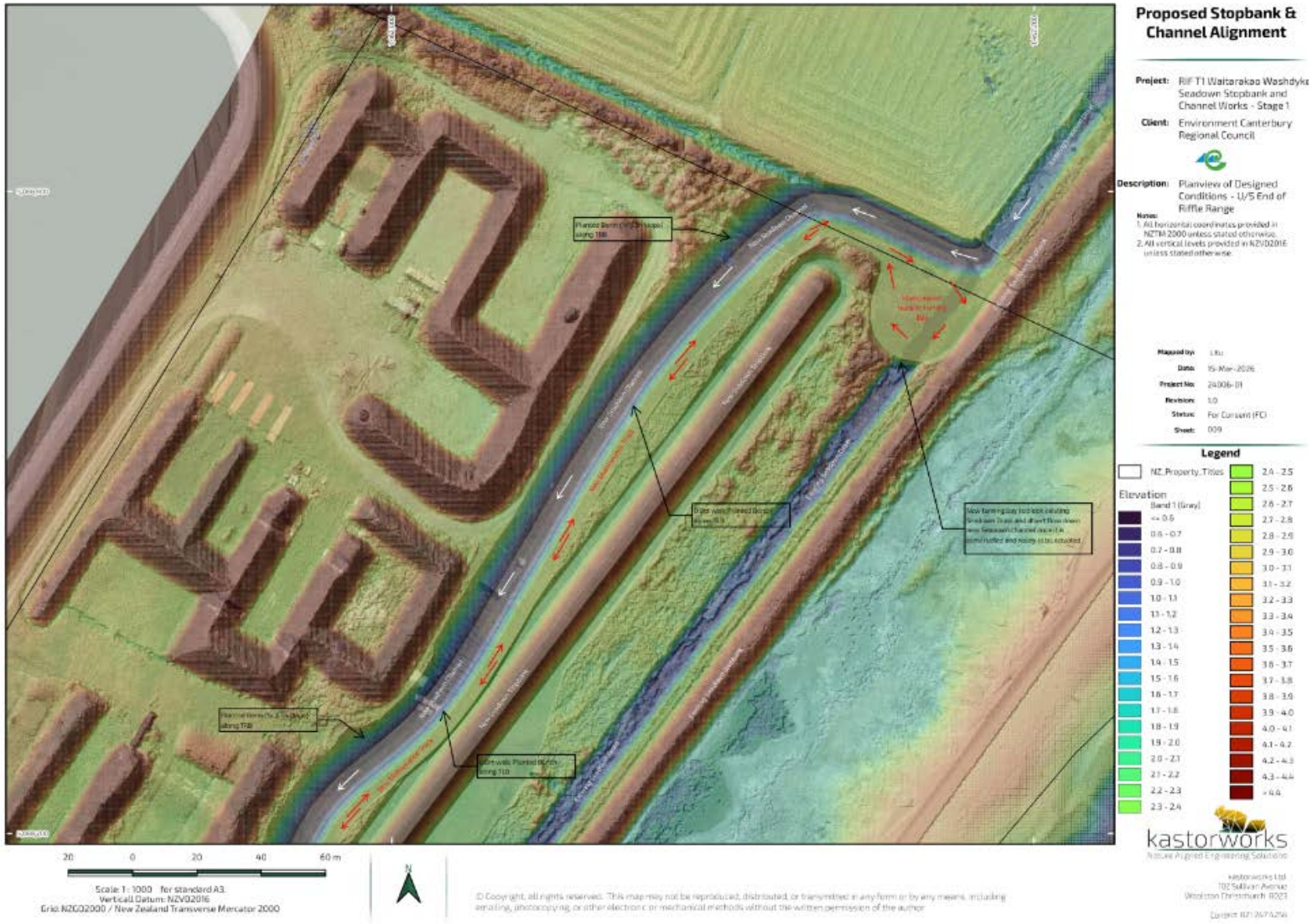


Detail of design; wetland areas south of Aorangi Road including the Seadown Drain, ‘retention pond’ and ‘pit-derived wetlands’.



Detail of design of wetland areas north of Aorangi Road including the Seadown Drain and the small area of rifle range wetland.





Proposed stopbank and channel alignment – updated design drawings 31/03/2026.