

# Attachment B - Pilot Option Profiles

## Contents

Option 1 – Baylys Beach .....	1
Option 2 – West Coast / Ripiro Beach .....	6
Option 3 – Poutō East .....	10
Option 4 – Raupo/Ruawai .....	13
Option 5 – Tinopai and surrounds.....	19
Option 6 – Pahi, Whakapirau and surrounds .....	23
Appendix 1. Exposure count comparisons.....	27
Appendix 2. Project requirements and resource considerations.....	52

# Option 1 - Baylys Beach



Snapshot	Scale	Connectivity	Cultural	Complexity
<p><b>Baylys Beach</b></p>	<ul style="list-style-type: none"> <li>• Coastal settlement</li> <li>• Mixed permanent and baches</li> <li>• Some assets – stormwater, treated water, roads</li> <li>• Potential water reservoir, aquifers</li> <li>• Surf Life Saving Club, Community Centre</li> <li>• Campground</li> <li>• Council reserves, coastal walks</li> <li>• Beach access is regularly maintained by Council</li> <li>• Chases Gorge and private access</li> </ul>	<ul style="list-style-type: none"> <li>• Dependent on Dargaville for water services</li> <li>• Recreational services for wider District (including inland golf course)</li> <li>• Main beach access point, easier access, expectation of access maintenance with roading</li> <li>• Ripiro beach itself is a ‘road’</li> <li>• Wider district expectations and investment in beaches</li> <li>• Ripiro beach is part of a very large geomorphic system, together with Muriwai/South Head and Ninety Mile Beach</li> </ul>	<ul style="list-style-type: none"> <li>• Ripiro Beach cultural significance</li> <li>• Mahinga Kai access</li> <li>• Community investment in coastal lifestyle, Coastal culture / Beach culture</li> </ul>	<ul style="list-style-type: none"> <li>• Existing community concerns and engagement on coastal erosion, stormwater drainage and beach health</li> <li>• There have been community “protect/restore the dunes” efforts in the past</li> <li>• Subdivision and recent development / growth</li> <li>• Stormwater project to control and filter water run-off – managing water run-off</li> <li>• NTA carpark and connectivity project</li> <li>• Playground project – community driven and funded</li> <li>• Deficit in temporary and residential accommodation</li> <li>• DoC land / conservation areas</li> </ul>

## Exposure information

## Periodic inundation

<b>Coastal flooding</b>	CFHZ	Community facilities (no.)	Maori land (m2)	Marae 100m buffer (no.)	Buildings (no.)	Wastewater lines (m)	Stormwater lines (m)	Water lines (m)	Roads (m)
Present day	CFHZ0	0	0	0	0	0	0	16 0.2% of total	14 0.2% of total
2080	CFHZ1	0	0	0	0	0	0	38 0.5% of total	64 0.7% of total
2130	CFHZ3	0	0	0	0	0	0	46 0.7% of total	109 1.2% of total

## Permanent loss of land

<b>Costal erosion</b>	probability	Community facilities (no.)	Maori land (m2)	Marae 100m buffer (no.)	Buildings (no.)	Wastewater lines (m)	Stormwater lines (m)	Water lines (m)	Roads (m)
2080	66%	0	0	0	2 1% of total	0	0	71 1% of total	134 1.5% of total
2130	5%	0	0	0	12 4% of total	0	0	191 3% of total	164 1.9% of total

## Permanent SLR inundation

	sea level rise	Community facilities (no.)	Maori land (m2)	Marae 100m buffer (no.)	Buildings (no.)	Wastewater lines (m)	Stormwater lines (m)	Water lines (m)	Roads (m)
2080	0.6m	0	0	0	0	0	0	0	0
2130	1.2m	0	0	0	0	0	0	5 0.1% of total	0

Criteria assessment	Exposure	Community Readiness	Relationship Building Required
<p><b>Baylys Beach</b></p>	<ul style="list-style-type: none"> <li>• Primary risk is permanent land loss to coastal erosion</li> <li>• Some impacts to private property, growing more intense for 100yr timescale</li> <li>• Impacts to beach access /roading infrastructure, stormwater services more urgent for 50yr timescale</li> <li>• Impacts on reserves for both 50yr and 100yr timescales</li> <li>• Potential for ad-hoc erosion management responses by residents</li> </ul>	<ul style="list-style-type: none"> <li>• In 2017 Council workshopped adaptive pathways process with community, received with mixed interest</li> <li>• Well organised community, well established, active community groups</li> <li>• High awareness of Council’s role</li> <li>• Well-established community organisation that is inclusive of the wider community</li> <li>• Concerns over coastal erosion and community desire for long term decisions</li> </ul>	<ul style="list-style-type: none"> <li>• Requests for high level of communication on council projects and for community involvement.</li> <li>• Desire to be a participant in anything – at design, planning and implementation phases.</li> <li>• Historic issue of installation of sandbags installed by council driven by community at Chases Gorge campground.</li> </ul>

# Option 2 - West Coast / Ripiro Beach



Snapshot	Scale	Connectivity	Cultural	Complexity
<p><b>West Coast / Ripiro Beach</b></p>	<ul style="list-style-type: none"> <li>• Multiple coastal settlements of mixed sizes: Maunganui Bluff, Omamari, Baylys Beach, Mahuta, Glinks Gully</li> <li>• Mixed permanent and baches</li> <li>• Mixed level of assets, medium amount to very limited: stormwater, treated water, roads, closed landfills</li> <li>• Potential water reservoir, aquifers</li> <li>• Surf Life Saving Club (Baylys)</li> <li>• Campgrounds</li> <li>• Council reserves, coastal walks</li> </ul>	<ul style="list-style-type: none"> <li>• Dependent on Dargaville for services</li> <li>• Recreational services for wider District (including inland golf course)</li> <li>• Beach access points</li> <li>• Ripiro beach itself is a 'road'</li> <li>• Wider district expectations and investment in beaches</li> <li>• Ripiro beach is part of a very large geomorphic system, together with Muriwai/South Head and Ninety Mile Beach</li> <li>• Omamari, link between the coast and the Kai Iwi Lakes</li> </ul>	<ul style="list-style-type: none"> <li>• Ripiro Beach cultural significance</li> <li>• Mahinga Kai access</li> <li>• Maunganui Bluff cultural significance</li> <li>• Community investment in coastal lifestyle, Coastal culture / Beach culture</li> </ul>	<ul style="list-style-type: none"> <li>• Previous engagement on adaptive pathways process, mixed interest</li> <li>• Existing community concerns and engagement on coastal erosion, beach health etc</li> <li>• History of landslips on Omamari road, main point of connection for the settlement.</li> <li>• There have been community "protect/restore the dunes" efforts in the past</li> <li>• Limited income, low-income residents</li> <li>• DoC land / conservation areas</li> <li>• Settlements with large population of Tangata Whenua, including Te Roroa whānau</li> </ul>

## Exposure information

## Periodic inundation

<b>Coastal flooding</b>	CFHZ	Community facilities (no.)	Maori land (m2)	Marae 100m buffer (no.)	Buildings (no.)	Wastewater lines (m)	Stormwater lines (m)	Water lines (m)	Roads (m)
Present day	CFHZ0	0	291,861 7% of total	1	0	0	0	16 0.2% of total	14 0.03% of total
2080	CFHZ1	0	364,582 8% of total	1	0	0	2 0.04% of total	38 0.4% of total	64 0.15% of total
2130	CFHZ3	0	506,138 11% of total	1	8 2% of total	0	19 0.43% of total	46 0.5% of total	276 0.65% of total

## Permanent loss of land

<b>Coastal erosion</b>	probability	Community facilities (no.)	Maori land (m2)	Marae 100m buffer (no.)	Buildings (no.)	Wastewater lines (m)	Stormwater lines (m)	Water lines (m)	Roads (m)
2080	1	0	0	0	2 1% of total	0	116 3% of total	71 1% of total	254 0.6% of total
2130	0	0	0	0	18 5% of total	71 3% of total	177 4% of total	317 3% of total	367 0.87% of total

Permanent SLR  
inundation

	sea level rise	Community facilities (no.)	Maori land (m2)	Marae 100m buffer (no.)	Buildings (no.)	Wastewater lines (m)	Stormwater lines (m)	Water lines (m)	Roads (m)
2080	0.6m	0	95,672 2% of total	1	0	0	0	0	0
2130	1.2m	0	199,133 4% of total	1	0	0	0	5 0.05% of total	0



Criteria assessment	Exposure	Community Readiness	Relationship Building Required
<p><b>West Coast / Ripiro Beach</b></p>	<ul style="list-style-type: none"> <li>• Permanent land loss and impacts on buildings, 3W’s pipes and roading is the primary concern for Baylys Beach. Coastal flooding is also an issue for current, 50yr and 100yr timescales.</li> <li>• Omamari will be impacted by coastal flooding, but this for the 100yr timescale and is limited primarily to roading.</li> <li>• Impacts to Māori land significant across 50yr and 100yr timescales for both coastal flooding and permanent inundation.</li> <li>• Given the similarity in coastal geomorphology, coastal erosion may be an issue for Omamari, Mahuta, and Maunganui Bluff, but there is currently no mapping done to formally identify this.</li> </ul>	<ul style="list-style-type: none"> <li>• A diversity of communities of place with a range of needs and skills</li> <li>• No pre-existing collective action across the communities</li> <li>• Opportunity for peer learning across the communities to increase potential and participation</li> <li>• Mixed community needs and availability due to mixed permanent and seasonal residents</li> </ul>	<ul style="list-style-type: none"> <li>• Opportunity for collective action through the beach management project currently underway.</li> <li>• Some specific place-based council projects have been positive but no integrated approach to information sharing across the full area from council.</li> <li>• Representation would be required from each area to ensure inclusion</li> <li>• Degree of division of priorities across this diverse area</li> <li>• Relationship is needs-specific and reactive, rather than continuous.</li> </ul>

# Option 3 - Poutō East



Snapshot	Scale	Connectivity	Cultural	Complexity
<p><b>Poutō East</b></p>	<ul style="list-style-type: none"> <li>• Kellys Bay and Poutō Point main settlements</li> <li>• Kellys Bay predominantly baches, some permanent residents</li> <li>• Limited assets, closed landfills</li> <li>• Multiple drainage catchment systems</li> <li>• Kellys Bay Reserve</li> <li>• New wharf (Kaipara Wharves project), ferry access</li> <li>• Significant forestry area</li> </ul>	<ul style="list-style-type: none"> <li>• Remote access by road, much of which is currently unsealed (Pouto Rd P1 will have approx. 10 km sealed by Christmas, though rest will remain unsealed)</li> <li>• Remote area means takes a long time to drive and access services or for emergency vehicles to respond.</li> <li>• Poutō wharf / Ferry landing</li> <li>• The Beach is an important access for Pouto</li> <li>• Pouto Road and Ripiro Beach are part of the Kaipara Missing Link cycle trail.</li> </ul>	<ul style="list-style-type: none"> <li>• Whenua Māori</li> <li>• Waikāretu Marae</li> <li>• Rīpia marae</li> <li>• Oturei marae</li> <li>• Exposed koiwi sites</li> <li>• Te Uri o Hau sites–               <ul style="list-style-type: none"> <li>○ Te Taa Hinga Nohoanga</li> <li>○ Pouto End Road Cultural Site</li> <li>○ Kanono Stewardship Area</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• DoC land / conservation areas</li> <li>• Residents with low and/or limited incomes</li> <li>• Wharves project underway</li> <li>• Community polarised in interests and relationships with Council</li> <li>• Kellys Bay Society has been supported by Council to develop a sea wall, considered to be working well</li> <li>• Pouto Point impacted by dynamic coastal changes as Kaipara Harbour entrance channel migrates north</li> </ul>

## Exposure information

## Periodic inundation

<b>Coastal flooding</b>		CFHZ	Community facilities (no.)	Maori land (m2)	Marae 100m buffer (no.)	Buildings (no.)	Wastewater lines (m)	Stormwater lines (m)	Water lines (m)	Roads (m)
Present day	CFHZ0	0	783,091 3% of total	0	4 1% of total	0	0	0	0	2,853.0 2% of total
2080	CFHZ1	0	1,311,080 5% of total	0	36 6% of total	0	0	0	0	5,476.0 4% of total
2130	CFHZ3	0	2,038,574 8% of total	0	61 10% of total	0	0	0	0	7,781.6 5% of total

## Permanent loss of land

<b>Coastal erosion</b>		probability	Community facilities (no.)	Maori land (m2)	Marae 100m buffer (no.)	Buildings (no.)	Wastewater lines (m)	Stormwater lines (m)	Water lines (m)	Roads (m)
2080	66%	0	0	0	0	0	0	0	0	0
2130	5%	0	0	0	0	0	0	0	0	0

<b>Permanent SLR inundation</b>		sea level rise	Community facilities (no.)	Maori land (m2)	Marae 100m buffer (no.)	Buildings (no.)	Wastewater lines (m)	Stormwater lines (m)	Water lines (m)	Roads (m)
2080	0.6m	0	961,483 4% of total	0	3 0.5% of total	0	0	0	0	2,482.0 2% of total
2130	1.2m	0	1,585,248 6% of total	0	27 4% of total	0	0	0	0	5,364.3 4% of total

Criteria assessment	Exposure	Community Readiness	Relationship Building Required
<p><b>Poutō East</b></p>	<ul style="list-style-type: none"> <li>• Road connection north and south of Kellys Bay exposed to 50yr and 100yr coastal flooding, risk of cutting off settlement during a storm event.</li> <li>• Kellys Bay roads and residential dwellings exposed to coastal flooding at both 50 and 100 yr timescales.</li> <li>• Significantly less coastal flooding and permanent inundation impacts on Poutō Point settlement due to elevation. Coastal erosion risks are unidentified.</li> <li>• Largest amount of Māori land exposed to coastal flooding and permanent SLR inundation across all timescales.</li> </ul>	<ul style="list-style-type: none"> <li>• Kellys Bay established community organisation</li> <li>• Ageing population may impact level of community-led participation in physical project, but likelihood of increased participation if majority of residents retired or working less.</li> <li>• Poutō Point area of focus for Kaipara Kickstart Wharves project, recent engagement and marae hui.</li> </ul>	<ul style="list-style-type: none"> <li>• Limited examples of council delivering on community aspirations.</li> <li>• Confusion over statutory organisation ownership and responsibility for assets that may require clarification.</li> <li>• Relationship is needs-specific and reactive, rather than continuous.</li> </ul>

# Option 4 - Raupo/Ruawai





Snapshot	Scale	Connectivity	Cultural	Complexity
<p><b>Raupo/Ruawai</b></p>	<ul style="list-style-type: none"> <li>• Mixed public and private infrastructure assets</li> <li>• Raupo drainage catchment and stopbank system, floodgates</li> <li>• Medium employer for the district, Kaipara Produce (Main supplier across NZ), Sleep Systems, Seasonal</li> <li>• Community owned wharf, high use by the wider area</li> <li>• Community cycle track constructed along the stopbank</li> <li>• Education hub, Kindergarten, Primary and High School all located together</li> <li>• Closed landfill Te Kowhai Road</li> <li>• Agricultural soils – a large part of the Northern Wairoa Agricultural Delta. Potential breadbasket.</li> </ul>	<ul style="list-style-type: none"> <li>• Important service town</li> <li>• Major point of connection for two sides of the district.</li> <li>• Access to Kaipara Harbour for the wider area.</li> <li>• Dependent on SH12 for connectivity.</li> <li>• Part of bigger Kaipara Agricultural Delta System</li> <li>• Harbour access</li> <li>• Emergency Services / Rescue chopper landing point at Ruawai College</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• Naumai Marae and Te Kowhai Marae (just outside of the project area).</li> <li>• Multiple places of cultural significance to Te Uri o Hau, including urupa</li> <li>• Anglican Church</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• Agricultural hub with versatile / highly productive soils</li> <li>• Governance overlap with Raupo Drainage Committee</li> <li>• Raupo stopbanks projects – ‘climate resilience’ potential mixed messages from Council</li> <li>• Community and business concerns over restricted development</li> <li>• Concerns over managed retreat and unmanaged retreat</li> <li>• Current impacts from insurance (cost and insurance retreat)</li> <li>• Large Tangata Whenua population, Te Uri o Hau whānau</li> <li>• Waka Kotahi participation required</li> <li>• DoC owned land</li> <li>• Improved modelling underway to better capture</li> </ul>

Snapshot

Scale

Connectivity

Cultural

Complexity



the interaction of flood waters/coastal inundation with the drainage district infrastructure.

- Low land value and low income relative to kilometres of coastline to defend.
- EnviroSchools and high youth engagement in environment and sustainability initiatives.



## Exposure information

## Periodic inundation

<b>Coastal flooding</b>		CFHZ	Community facilities (no.)	Maori land (m2)	Marae 100m buffer (no.)	Buildings (no.)	Wastewater lines (m)	Stormwater lines (m)	Water lines (m)	Roads (m)
Present day	CFHZ0	1 25% of total	147 0.02% of total	0	110 6% of total	106 57% of total	233 4% of total	334 4% of total	1,596 0.7% of total	
	2080	CFHZ1	3 75% of total	172,639 25% of total	1 100% of total	580 32% of total	131 70% of total	568 11% of total	4,529 55% of total	19,335 9% of total
	2130	CFHZ3	3 75% of total	487,701 70% of total	1 100% of total	1,629 91% of total	172 93% of total	5,396 99.8% of total	8,198 99.8% of total	90,999 42% of total

## Permanent loss of land

<b>Coastal erosion</b>		probability	Community facilities (no.)	Maori land (m2)	Marae 100m buffer (no.)	Buildings (no.)	Wastewater lines (m)	Stormwater lines (m)	Water lines (m)	Roads (m)
2080	66%	0	0	0	0	0	0	0	0	0
2130	5%	0	0	0	0	0	0	0	0	0

**Permanent SLR inundation**

		sea level rise	Community facilities (no.)	Maori land (m2)	Marae 100m buffer (no.)	Buildings (no.)	Wastewater lines (m)	Stormwater lines (m)	Water lines (m)	Roads (m)
2080	0.6m	1 25% of total	3,780 0.5% of total	1 100% of total	60 3% of total	99 53% of total	241 4% of total	97 1% of total	1,520 0.7% of total	
2130	1.2m	3 75% of total	348,235 50% of total	1 100% of total	981 55% of total	151 81% of total	4,009 74% of total	4,238 53% of total	33,154 15% of total	

Criteria assessment	Exposure	Community Readiness	Relationship Building Required
Raupo / Ruawai	<ul style="list-style-type: none"> <li>• Significant coastal flooding impact across multiple exposure indicators and all timescales</li> <li>• Permanent tidal inundation poses significant impact in addition to event-specific coastal flooding</li> <li>• High potential for adaptation response ‘lock-in’ due to reliance on stopbank and drainage system and extensive investment, governance and management.</li> </ul>	<ul style="list-style-type: none"> <li>• Well organised via Drainage Board</li> <li>• New members to Ruawai promotions and development group, opportunity to engage new people and work in a collaborative way</li> <li>• Successful past engagement with school</li> <li>• Youth are eager to be involved and seek solutions that are positive for the community</li> </ul>	<ul style="list-style-type: none"> <li>• Ruawai promotions and development group, historic issues e.g., stopbank cycle way licence to occupy agreement unresolved.</li> <li>• Raupo Drainage Board, potential conflicting governance expectations around coastal hazards management precedent</li> <li>• Climate change and sea level rise scepticism</li> <li>• Tension within the community and with Council and concerns over flood risk management and consent requirements</li> </ul>

# Option 5 - Tinopai and surrounds



Snapshot	Scale	Connectivity	Cultural	Complexity
<p><b>Tinopai and surrounds</b></p>	<ul style="list-style-type: none"> <li>• Some public assets.</li> <li>• Closed landfill in the area.</li> <li>• Council roads and reserves along the lower-lying beach front.</li> <li>• Primary school, important meeting place for the community</li> <li>• Small community, mix of baches and permanent residents.</li> <li>• Tinopai campground</li> </ul>	<ul style="list-style-type: none"> <li>• Harbour access, launching point and wharf</li> <li>• Emergency services base</li> <li>• Dependent on single road to reach Matakoho/rest of the District.</li> </ul>	<ul style="list-style-type: none"> <li>• Ngā Tai Whakarongorua Marae, Waiohou Marae and Waiotea Marae</li> <li>• Significant area of Whenua Māori / land owned by Māori</li> <li>• Multiple places of cultural significance to Te Uri o Hau, including pā and urupa</li> </ul>	<ul style="list-style-type: none"> <li>• Large Tangata Whenua population, Te Uri o Hau whānau</li> <li>• Communities with low and/or limited incomes</li> <li>• History of limited social cohesion or capital</li> </ul>

**Exposure information** Note – The exposure counts are specific to Tinopai settlement and do not include the surrounding area.

### Periodic inundation

<b>Coastal flooding</b>		CFHZ	Community facilities (no.)	Maori land (m2)	Marae 100m buffer (no.)	Buildings (no.)	Wastewater lines (m)	Stormwater lines (m)	Water lines (m)	Roads (m)
Present day	CFHZ0	0	158,866 1% of total	0	6 0.5% of total	0	41 2% of total	0	259 0.1% of total	
	2080	CFHZ1	1 25% of total	296,101 3% of total	0	16 1% of total	0	88 4% of total	0 1,020 0.6% of total	
	2130	CFHZ3	1 25% of total	543,919 5% of total	0	39 3% of total	0	129 6% of total	0 3,355 2% of total	

### Permanent loss of land

<b>Coastal erosion</b>		probability	Community facilities (no.)	Maori land (m2)	Marae 100m buffer (no.)	Buildings (no.)	Wastewater lines (m)	Stormwater lines (m)	Water lines (m)	Roads (m)
2080	66%	0	0	0	0	0	0	0	0	
2130	5%	0	0	0	0	0	0	0	0	

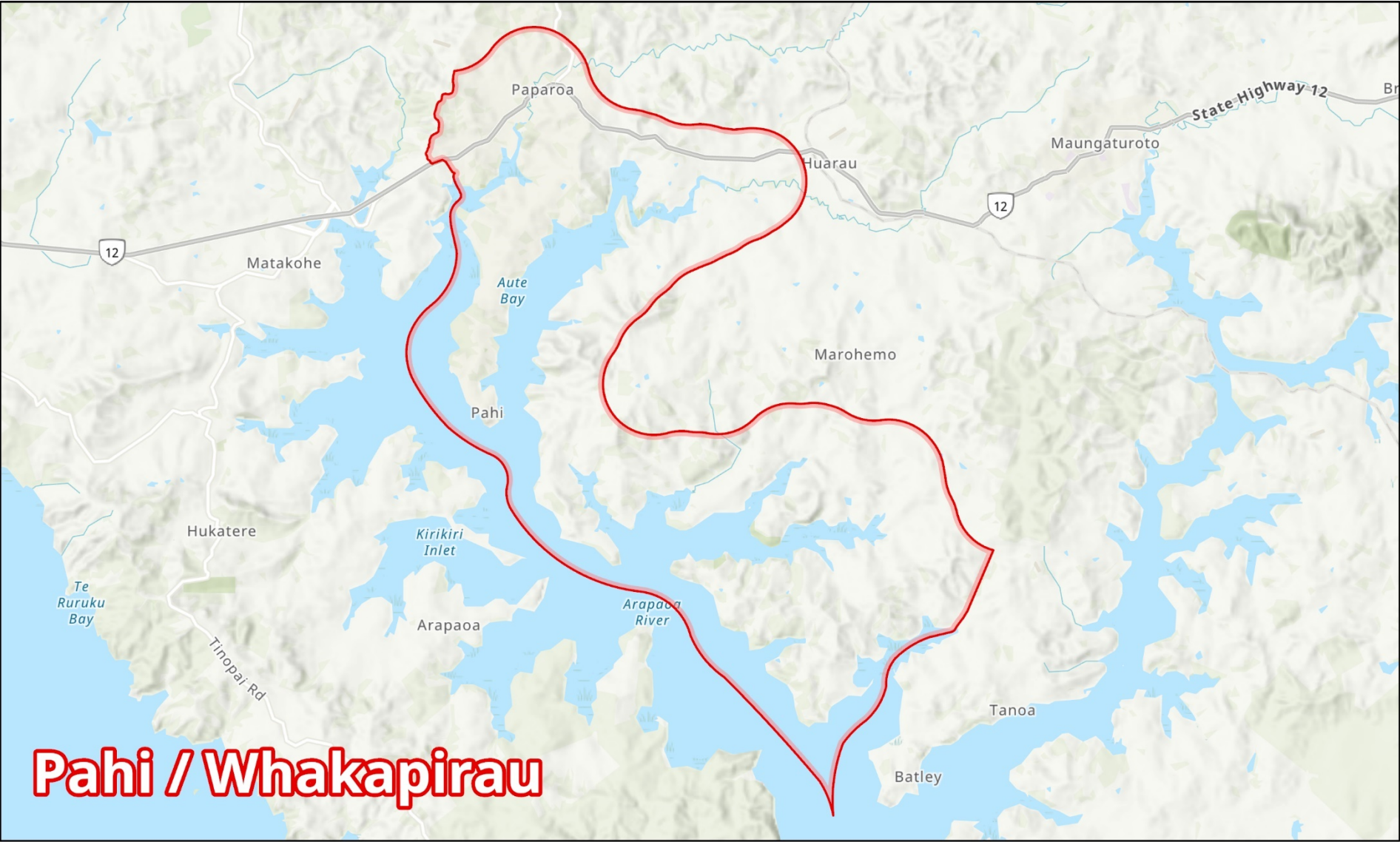
### Permanent SLR inundation

		sea level rise	Community facilities (no.)	Maori land (m2)	Marae 100m buffer (no.)	Buildings (no.)	Wastewater lines (m)	Stormwater lines (m)	Water lines (m)	Roads (m)
2080	0.6m	0	184,590 2% of total	0	3	0	53 3% of total	0	327 0.2% of total	
2130	1.2m	0	347,711 3% of total	0	13	0	115 6% of total	0	1,169 0.7% of total	

Criteria assessment	Exposure	Community Readiness	Relationship Building Required
<p><b>Tinopai and surrounds</b></p>	<ul style="list-style-type: none"> <li>• Coastal flood exposure indicators show buildings, 3W's pipes and roads impacted at multiple timescales. Some urgency given shorter timescales, particularly around impact on buildings and roads.</li> <li>• Coastal flooding will also impact the low-lying parks and reserves, for both 50yr and 100 yr timescales</li> <li>• Permanent tidal inundation is a more minor issue, exposure is limited to low-lying, coast front area.</li> </ul>	<ul style="list-style-type: none"> <li>• Community members ready to transition, younger residents taking the lead in environmental work, emergency services, places for youth</li> <li>• Growing number of community members that are open to new opportunities</li> <li>• Seasonal residents with gradual increase in permanent residents, enough permanent population to stay involved in lifespan of engagement</li> <li>• School is a positive, community centre-point</li> </ul>	<ul style="list-style-type: none"> <li>• History of issues with differing community expectations and lack of cohesion</li> <li>• Adaptive pathways project presents opportunity to galvanise and line up values and outcomes</li> <li>• KDC knowledge of community specific to parks and reserves and some community development work, limited knowledge beyond that</li> <li>• Recent positive working with council on business opportunities and emergency services base</li> <li>• Relationship is needs-specific and reactive, rather than continuous</li> </ul>



# Option 6 - Pahi, Whakapirau and surrounds



Snapshot	Scale	Connectivity	Cultural	Complexity
<p><b>Pahi, Whakapirau and surrounds</b></p>	<ul style="list-style-type: none"> <li>• Coastal settlements</li> <li>• Mixed permanent and baches</li> <li>• Some assets, domains and reserves, wharves</li> <li>• Oyster farms, local business</li> <li>• Pahi wharf upgrade and pontoon (Kaipara Wharves project)</li> </ul>	<ul style="list-style-type: none"> <li>• Limited access by road</li> <li>• Harbour access, launching point</li> <li>• Reliance on Maungaturoto and Paparoa – services</li> <li>• Community connected around harbour recreation, boating, fishing etc - home of Pahi Regatta</li> </ul>	<ul style="list-style-type: none"> <li>• Wahi tapu sites, multiple Significant areas to Te Uri o Hau along the harbour</li> </ul>	<ul style="list-style-type: none"> <li>• Wharves project</li> <li>• DoC &amp; KDC– Karaka Green</li> <li>• Campground</li> <li>• Public toilet near water edge</li> <li>• Fig Tree/Norfolk Pines Protections</li> <li>• Historical efforts to manage coastal erosion</li> <li>• Community concerns over sedimentation and silt build up on beaches</li> <li>• Whakapirau wharf (temporarily closed for investigation and repair, not part of Wharves project)</li> </ul>

Note: The map shows Paparoa village included in the mapped area, but the adaptive pathways engagement would focus on Pahi and Whakapirau.



## Exposure information

### Periodic inundation

<b>Coastal flooding</b>	CFHZ	Community facilities (no.)	Maori land (m2)	Marae 100m buffer (no.)	Buildings (no.)	Wastewater lines (m)	Stormwater lines (m)	Water lines (m)	Roads (m)
Present day	CFHZ0	1 17% of total	0	0	10 0.8% of total	0	149 6% of total	0	473 0.4% of total
	2080	CFHZ1	1 17% of total	0	0	16 1.2% of total	0	279 11% of total	1,113 1% of total
	2130	CFHZ3	1 17% of total	0	0	65 5% of total	0	417 16% of total	1,992 2% of total

### Permanent loss of land

<b>Coastal erosion</b>	probability	Community facilities (no.)	Maori land (m2)	Marae 100m buffer (no.)	Buildings (no.)	Wastewater lines (m)	Stormwater lines (m)	Water lines (m)	Roads (m)
2080	66%	0	0	0	5 0.4% of total	0	100 4% of total	0	177 0.2% of total
2130	5%	0	0	0	10 0.8% of total	0	171 7% of total	0	435 0.4% of total

### Permanent SLR inundation

	sea level rise	Community facilities (no.)	Maori land (m2)	Marae 100m buffer (no.)	Buildings (no.)	Wastewater lines (m)	Stormwater lines (m)	Water lines (m)	Roads (m)
2080	0.6m	0	0	0	4 0.3% of total	0	81 3% of total	0	468 0.4% of total
2130	1.2m	1 17% of total	0	0	12 0.9% of total	0	267 10% of total	0	1,221 1% of total

Criteria assessment	Exposure	Community Readiness	Relationship Building Required
<p><b>Pahi, Whakapirau and surrounds</b></p>	<ul style="list-style-type: none"> <li>• Mixed coastal flooding and coastal erosion hazards for Whakapirau</li> <li>• Coastal erosion is not mapped for Pahi, risk to coastal erosion is unknown</li> <li>• Both Pahi and Whakapirau, Low-lying residential buildings and properties and recreational assets exposed to coastal hazards</li> <li>• Pahi, Fig tree exposed to coastal flooding</li> <li>• Pahi wharf renovations currently underway and unknown impact on this asset</li> </ul>	<ul style="list-style-type: none"> <li>• Whakapirau community – highly motivated and connected.</li> <li>• Good communication through an active residents association.</li> <li>• Range of recreation and community cohesion activities that are self-organised.</li> <li>• Some seasonal residents with smaller numbers during winter season.</li> <li>• Created a civil defence community response plan 3 years ago.</li> </ul>	<p>WHAKAPIRAU</p> <ul style="list-style-type: none"> <li>• Regular and positive contact with the parks and community team to identify and work together on improvement projects.</li> <li>• Long-term issues with old dairy building resolved after several years and additional requirements made of lease holder responded to fears from community of reduced access to boat ramp.</li> </ul> <p>PAHI</p> <ul style="list-style-type: none"> <li>• Positive relationship with campground manager</li> <li>• Licence to occupy for community hall land site underway – Pahi Community Hall Society</li> </ul>

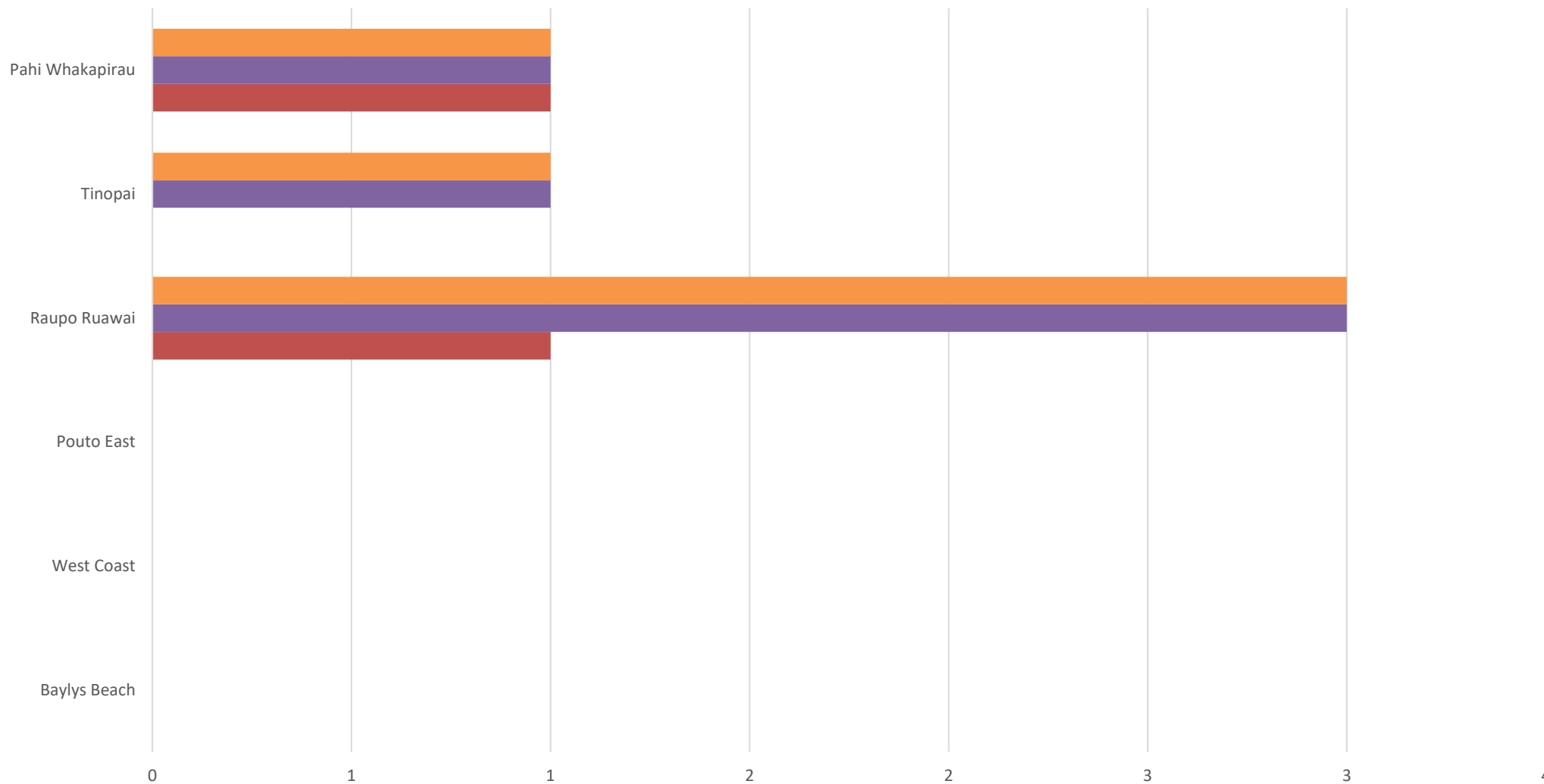
## Appendix 1. Exposure count comparisons

### Exposure indicators

- Buildings (no.)
- Roads (m)
- Stormwater lines (m)
- Water lines (m)
- Wastewater lines (m)
- Marae + 100m buffer (no.)
- Maori land (m<sup>2</sup>)
- Community facilities (no.) (schools, hospitals, Council offices, civil defence centres, libraries, museums, cemeteries)

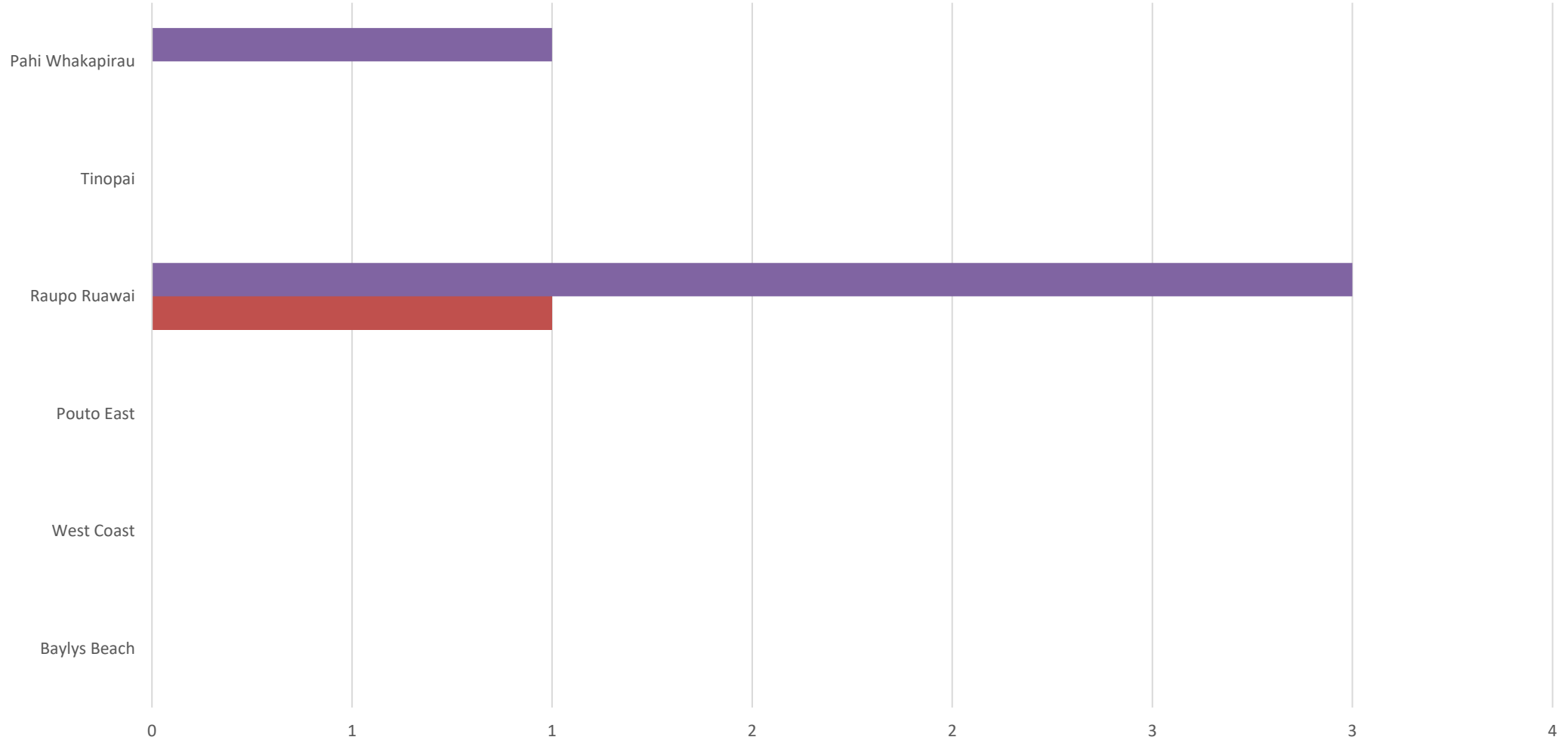
Hazard type	Hazard name	Data layer name	Hazard definition
Periodic inundation events	Coastal flooding present day	CFHZ0	Coastal flooding 1% AEP event, no SLR
	Coastal flooding 2080	CFHZ1	Coastal flooding 2% AEP event, +0.6m SLR
	Coastal flooding 2130	CFHZ2	Coastal flooding 1% AEP event, +1.2m SLR
Permanent loss of land	Coastal erosion 2080	CEHZ1	Coastal erosion 66% probability in 2080, includes 0.6m SLR
	Coastal erosion 2130	CEHZ2	Coastal erosion 5% probability in 2130, includes 1.2m SLR
	Permanent tidal inundation 2080	MHWS2080	Mean high water springs 10, +0.6m SLR
	Permanent tidal inundation 2130	MHWS2130	Mean high water springs 10, +1.2m SLR

### Community facilities exposed to coastal flooding



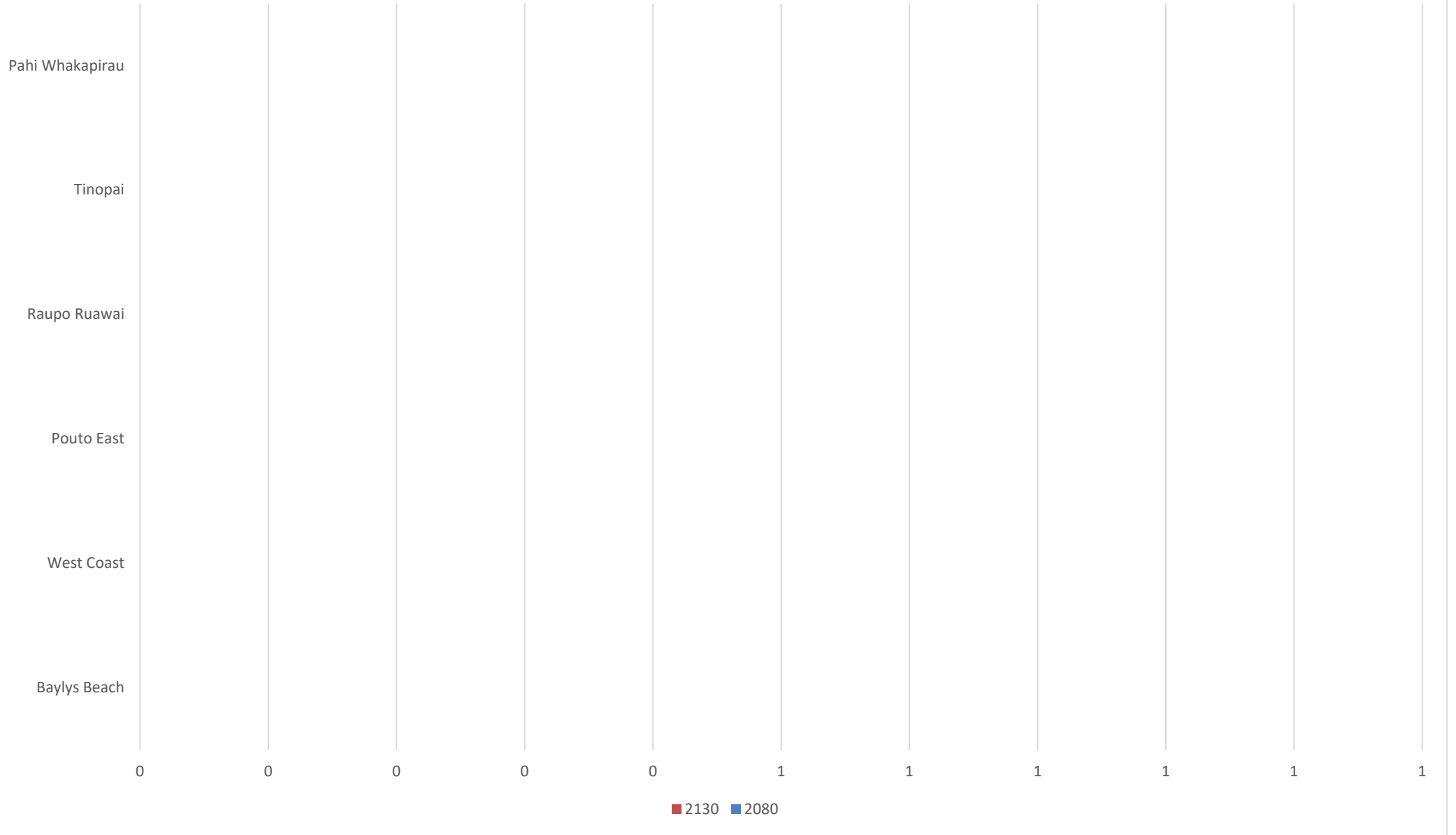
	Baylys Beach	West Coast	Pouto East	Raupo Ruawai	Tinopai	Pahi Whakapirau
2130	0	0	0	3	1	1
2080	0	0	0	3	1	1
Present Day	0	0	0	1	0	1

### Community facilities exposed to permanent SLR inundation

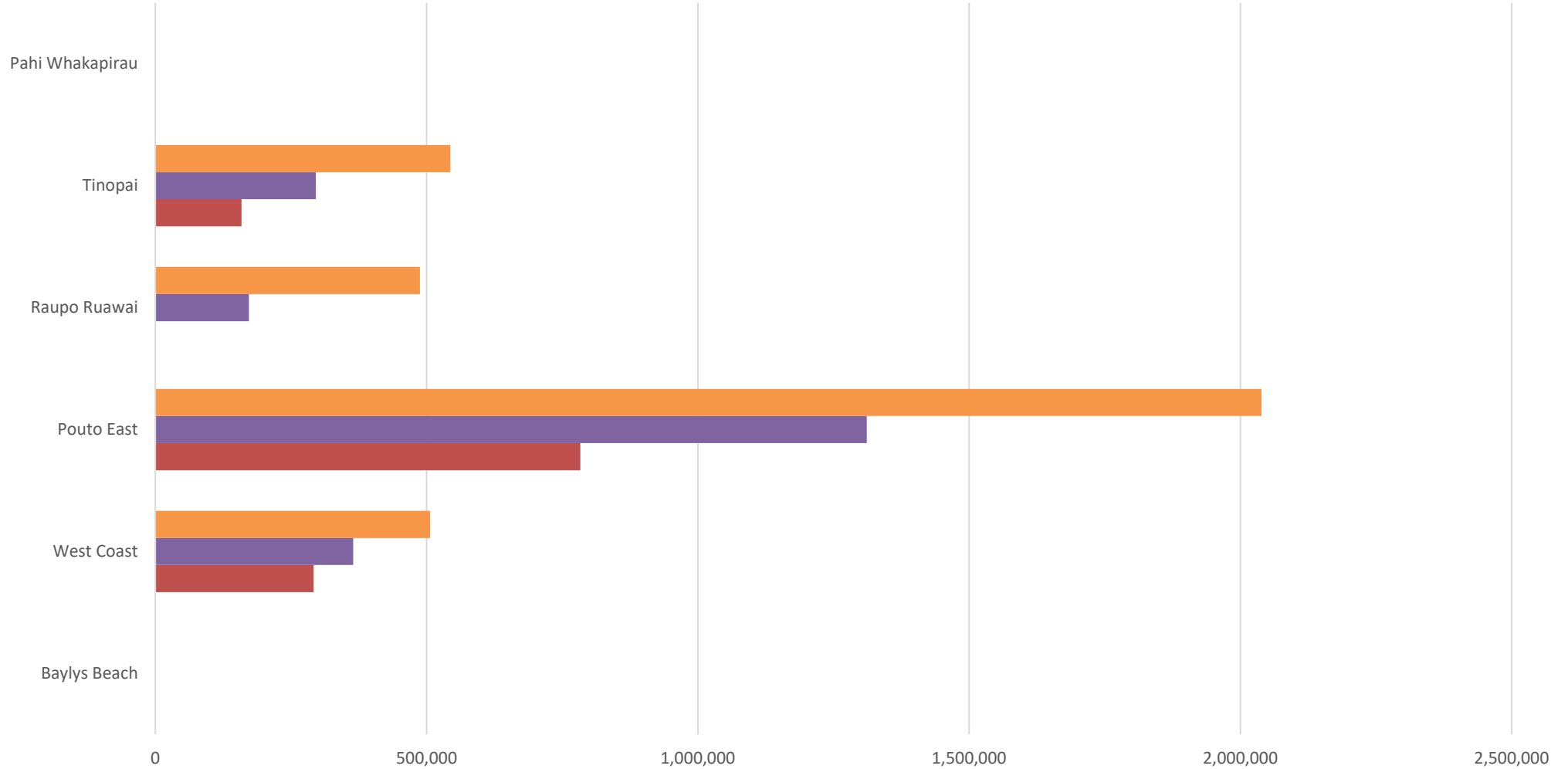


	Baylys Beach	West Coast	Pouto East	Raupo Ruawai	Tinopai	Pahi Whakapirau
■ 2130	0	0	0	3	0	1
■ 2080	0	0	0	1	0	0

### Community facilities exposed to coastal erosion

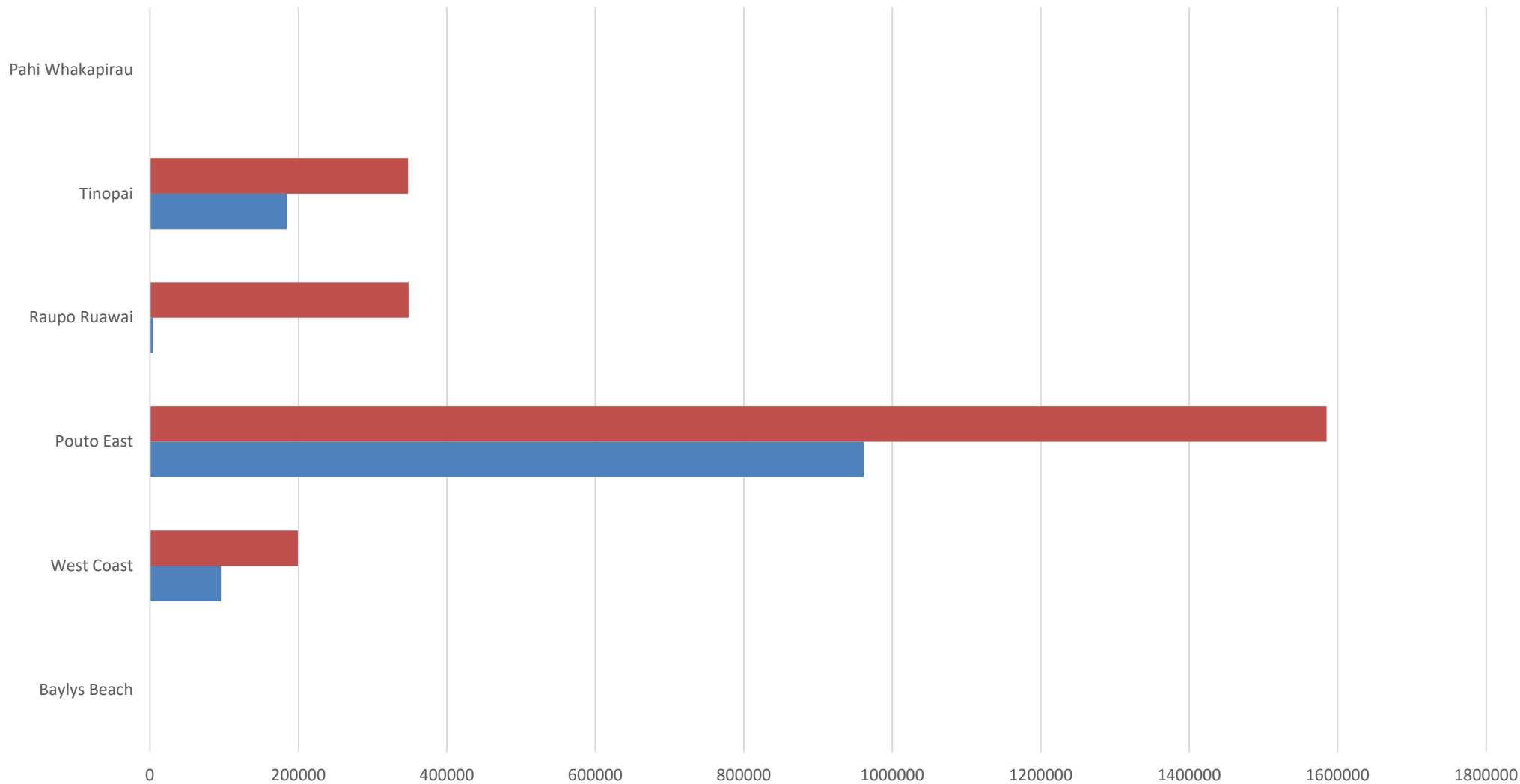


### Māori land (m2) exposed to coastal flooding



	Baylys Beach	West Coast	Pouto East	Raupo Ruawai	Tinopai	Pahi Whakapirau
■ 2130	0	506,138	2,038,574	487,701	543,919	0
■ 2080	0	364,582	1,311,080	172,639	296,101	0
■ Present Day	0	291,861	783,091	147	158,866	0

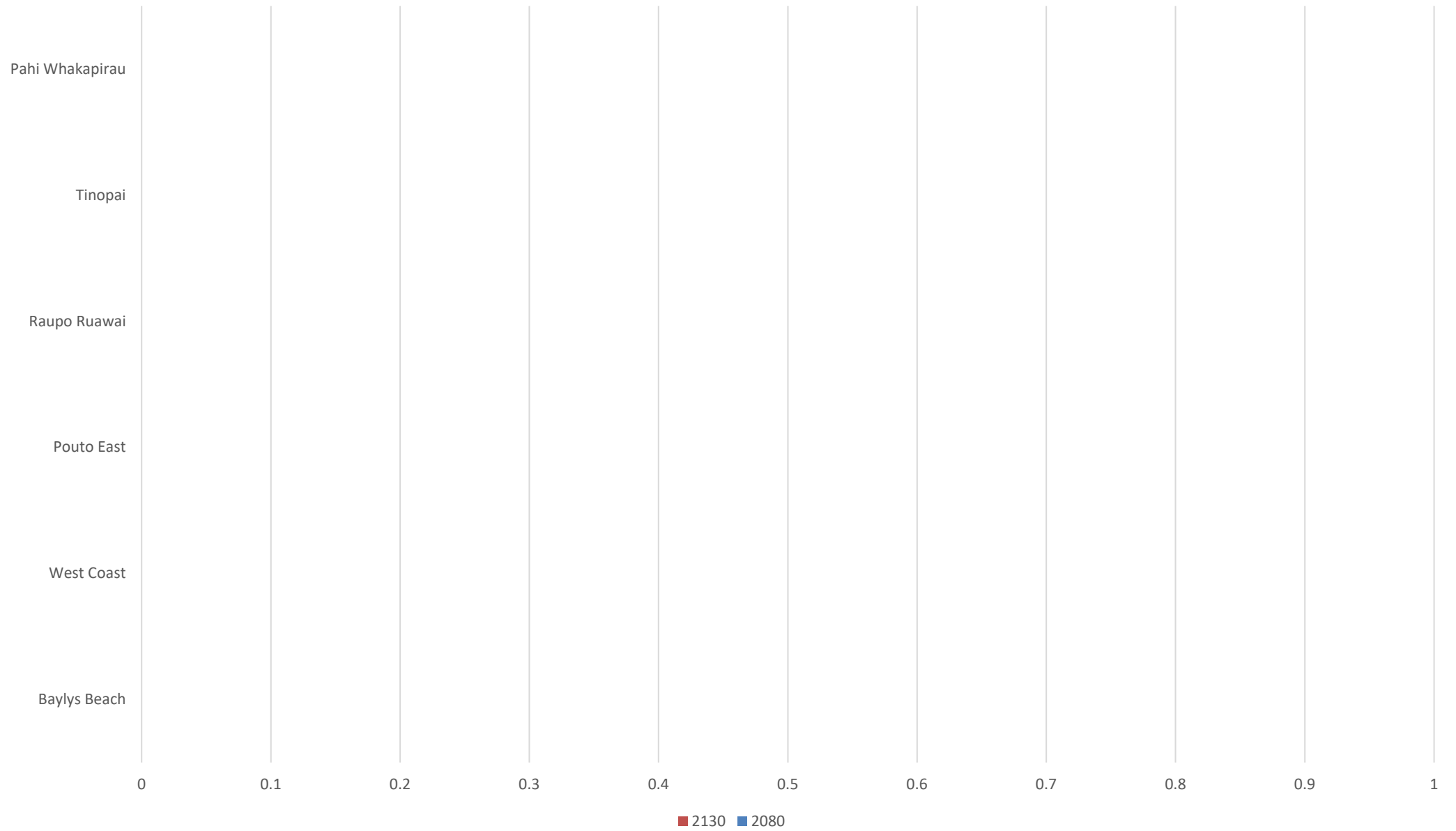
### Māori land (m2) exposed to permanent SLR inundation



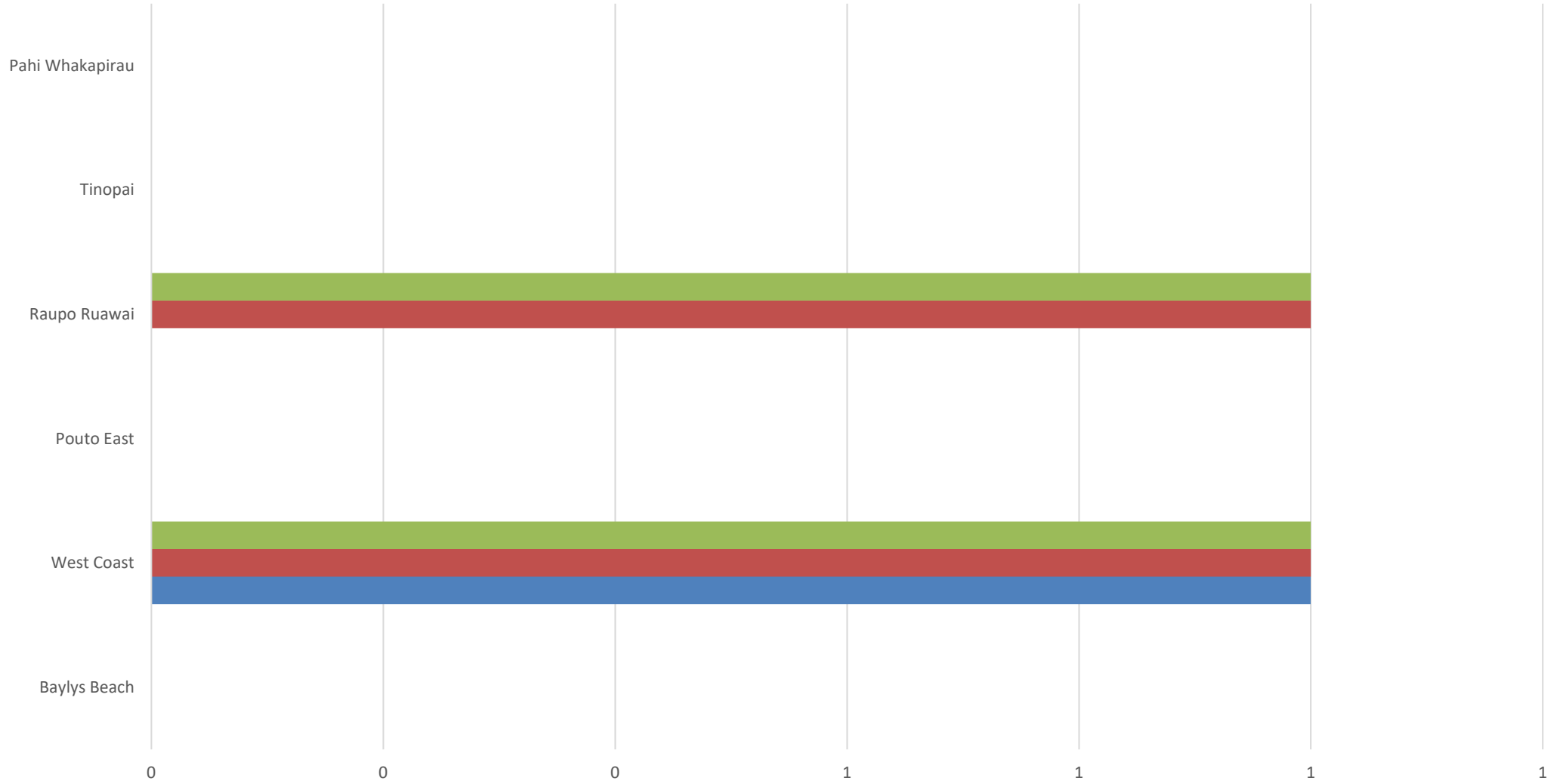
	Baylys Beach	West Coast	Pouto East	Raupo Ruawai	Tinopai	Pahi Whakapirau
■ 2130	0	199,133	1,585,248	348,235	347,711	0
■ 2080	0	95,672	961,483	3,780	184,590	0



### Māori land (m2) exposed to coastal erosion

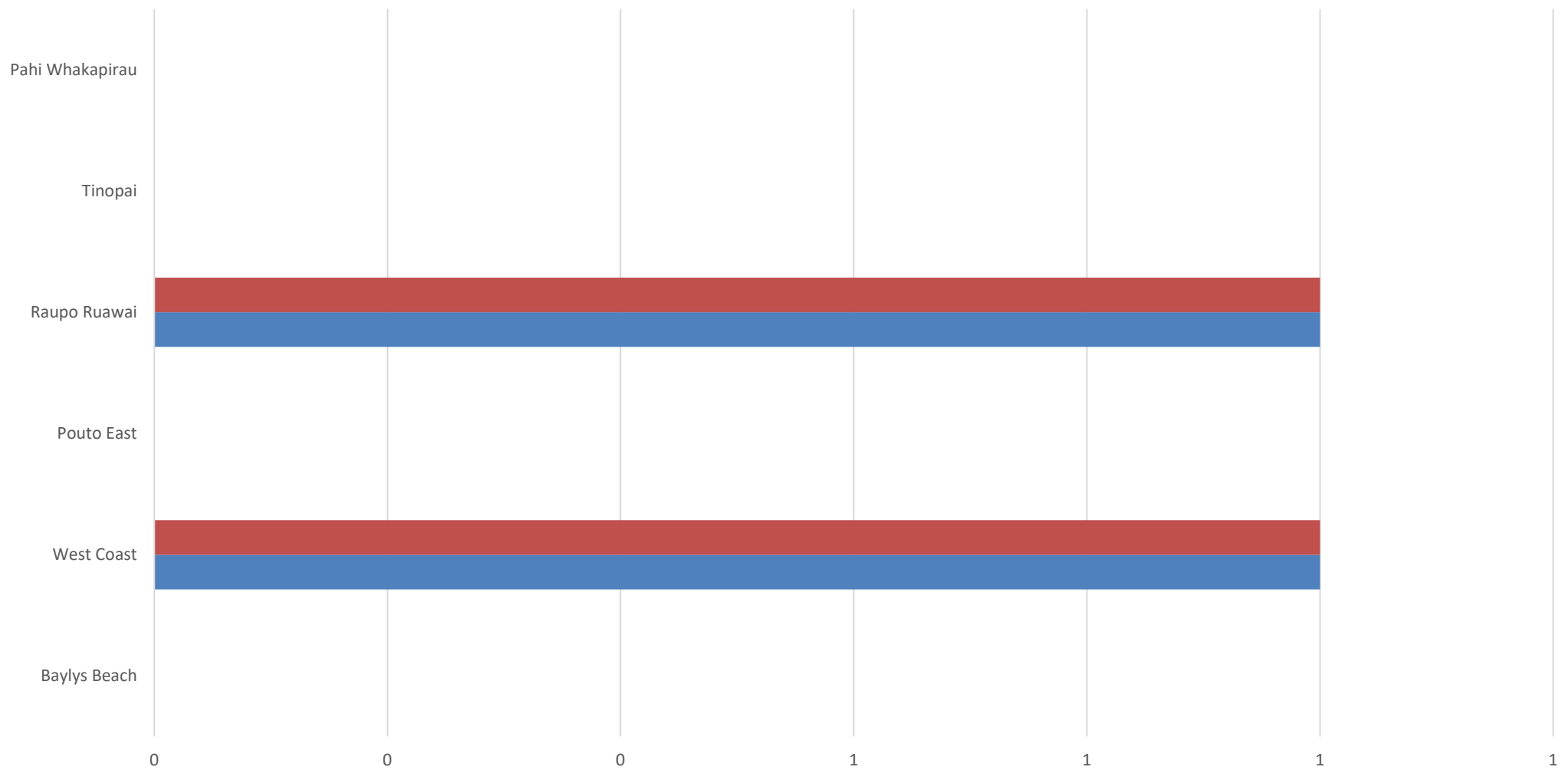


### Marae (100m buffer) exposed to coastal flooding



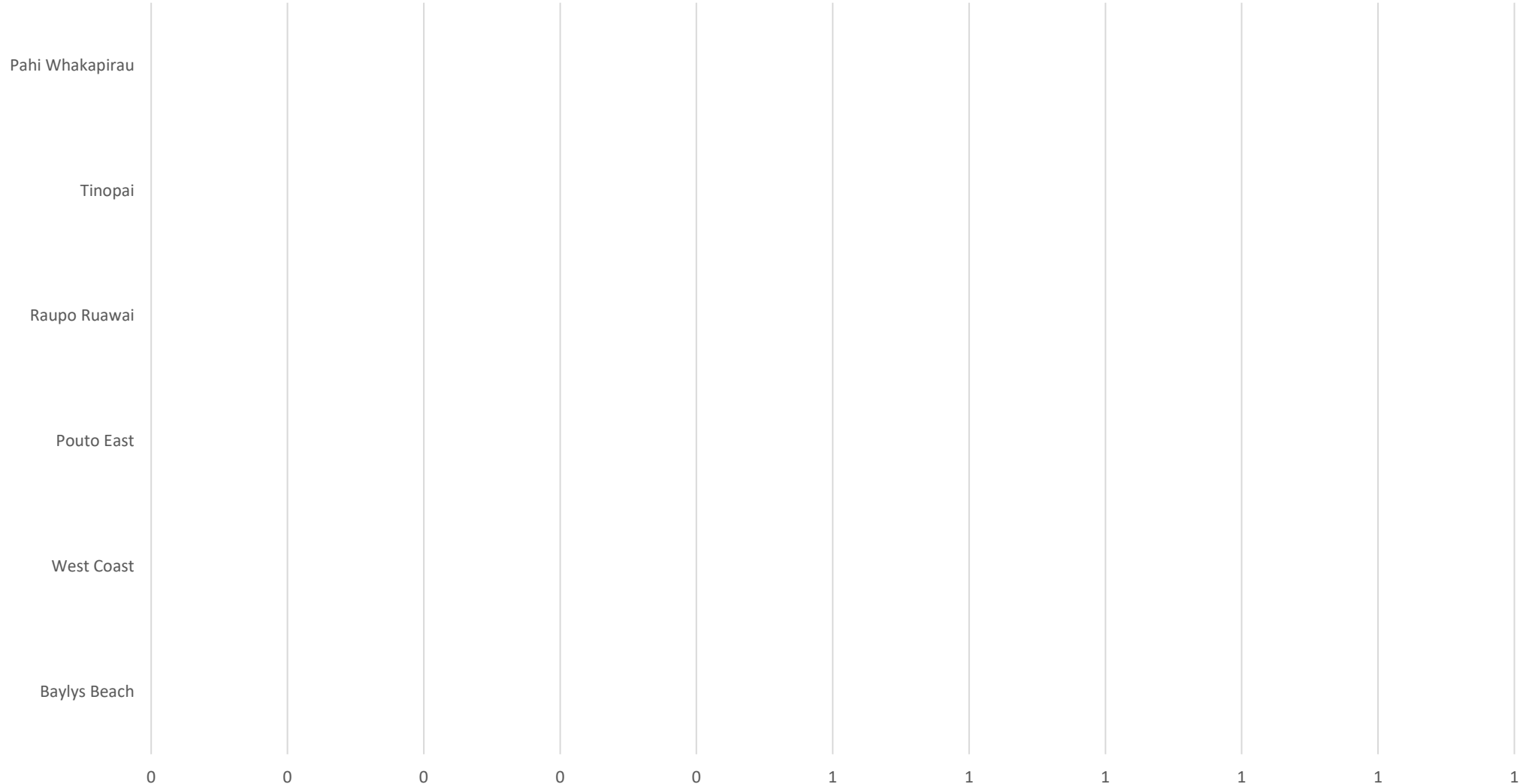
	Baylys Beach	West Coast	Pouto East	Raupo Ruawai	Tinopai	Pahi Whakapirau
■ 2130	0	1	0	1	0	0
■ 2080	0	1	0	1	0	0
■ Present Day	0	1	0	0	0	0

### Marae (100m buffer) exposed to permanent SLR inundation



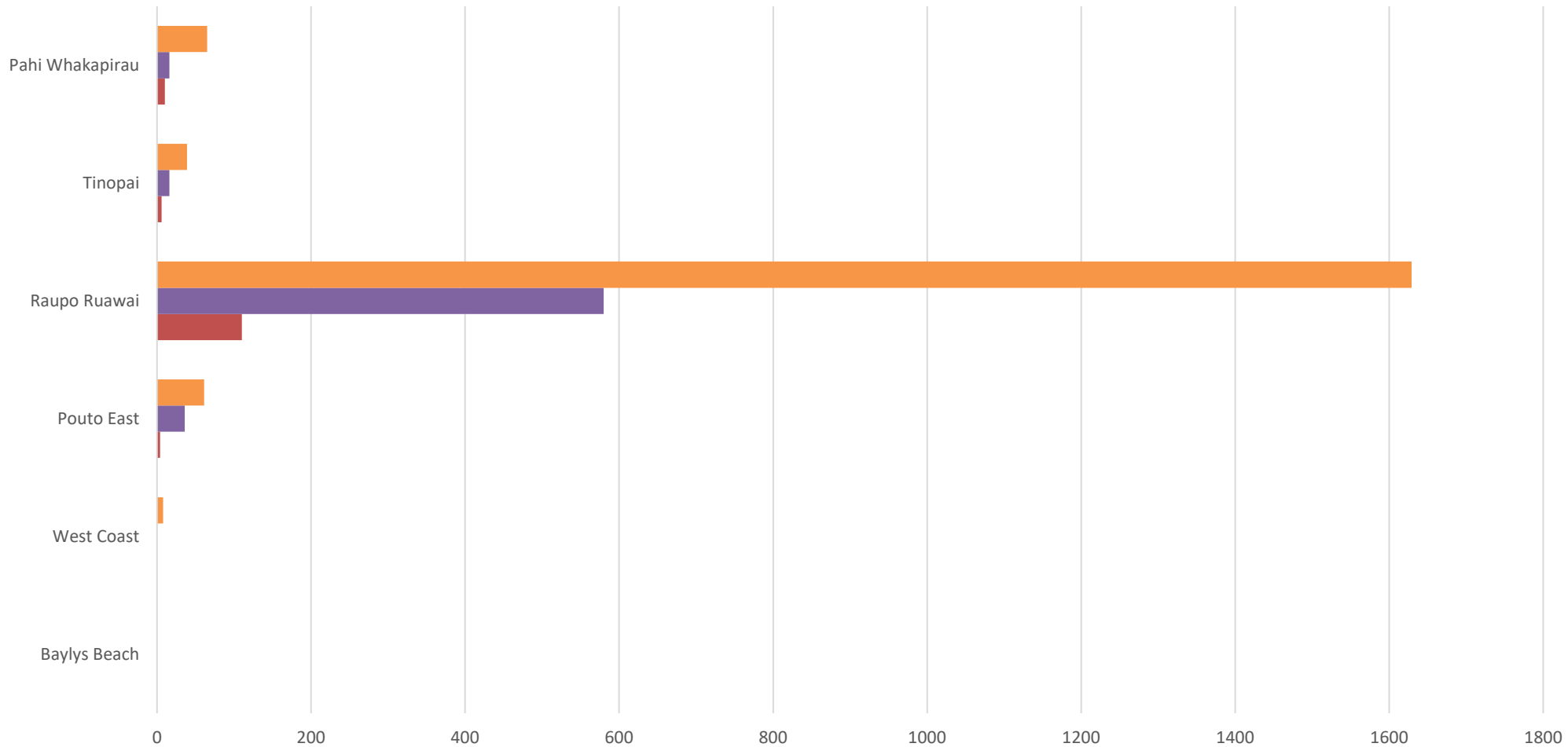
	Baylys Beach	West Coast	Pouto East	Raupo Ruawai	Tinopai	Pahi Whakapirau
■ 2130	0	1	0	1	0	0
■ 2080	0	1	0	1	0	0

### Marae (100m buffer) exposed to coastal erosion



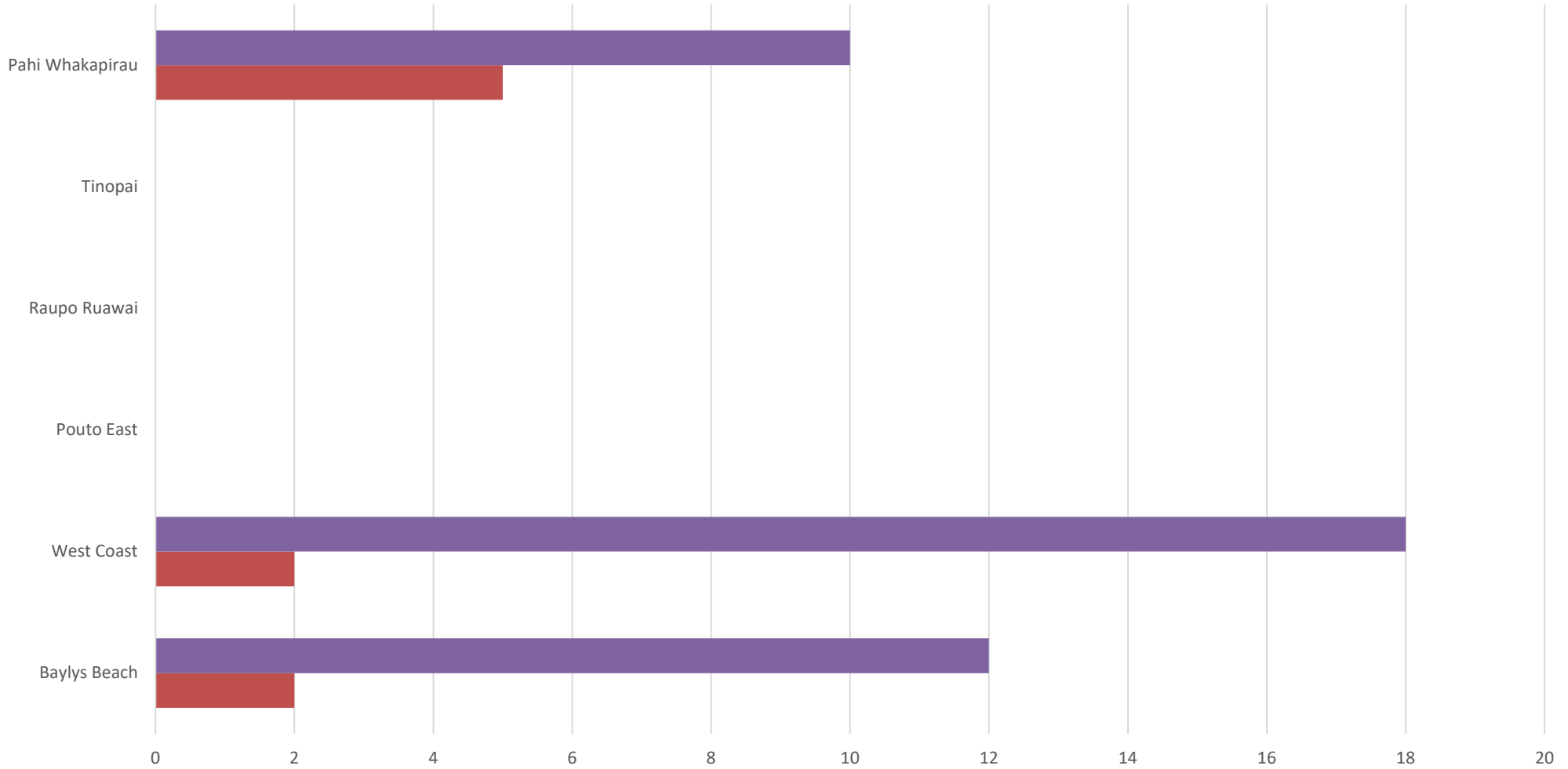
	Baylys Beach	West Coast	Pouto East	Raupo Ruawai	Tinopai	Pahi Whakapirau
■ 2130	0	0	0	0	0	0
■ 2080	0	0	0	0	0	0

### Buildings exposed to coastal flooding



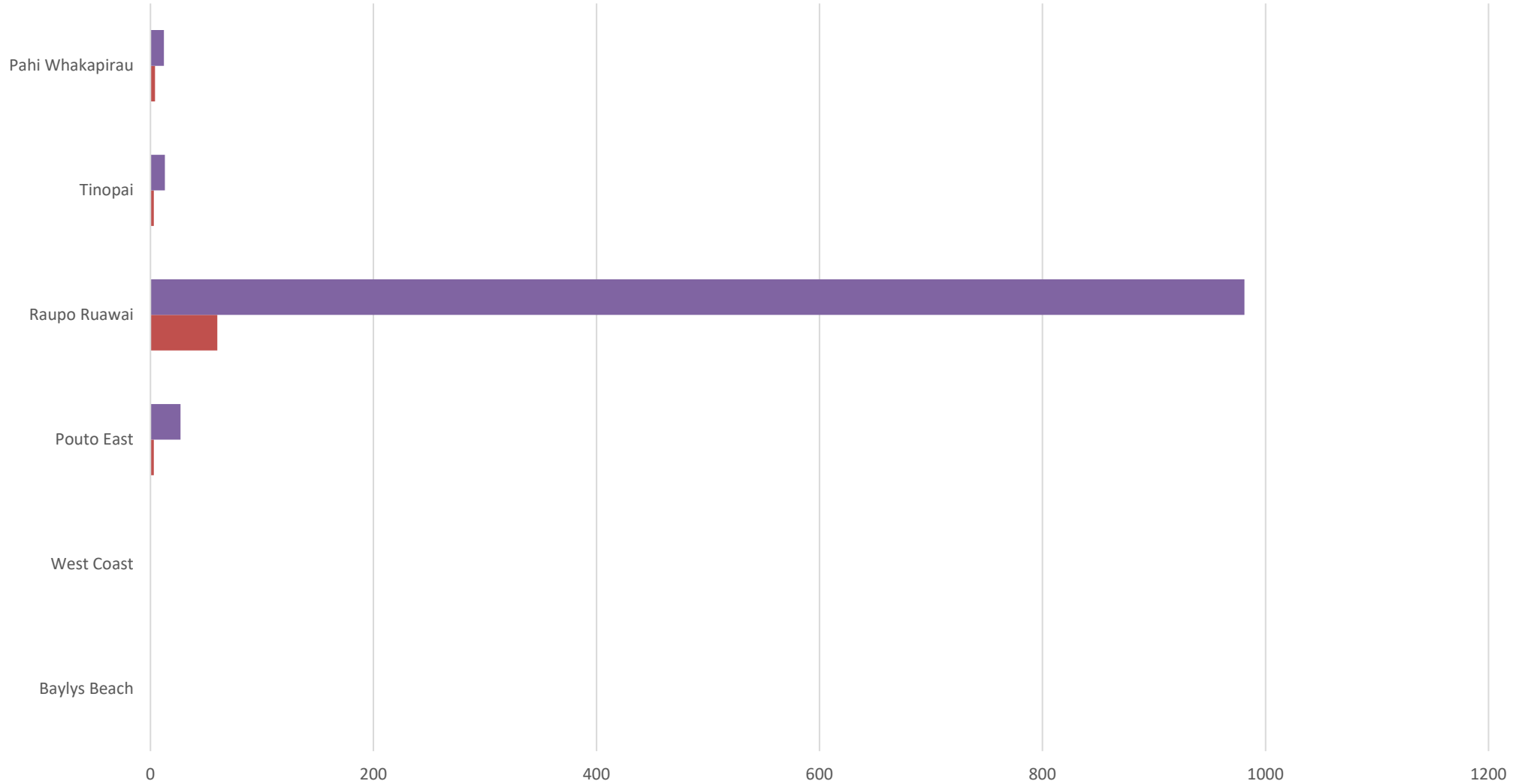
	Baylys Beach	West Coast	Pouto East	Raupo Ruawai	Tinopai	Pahi Whakapirau
2130	0	8	61	1629	39	65
2080	0	0	36	580	16	16
Present Day	0	0	4	110	6	10

### Buildings exposed to coastal erosion



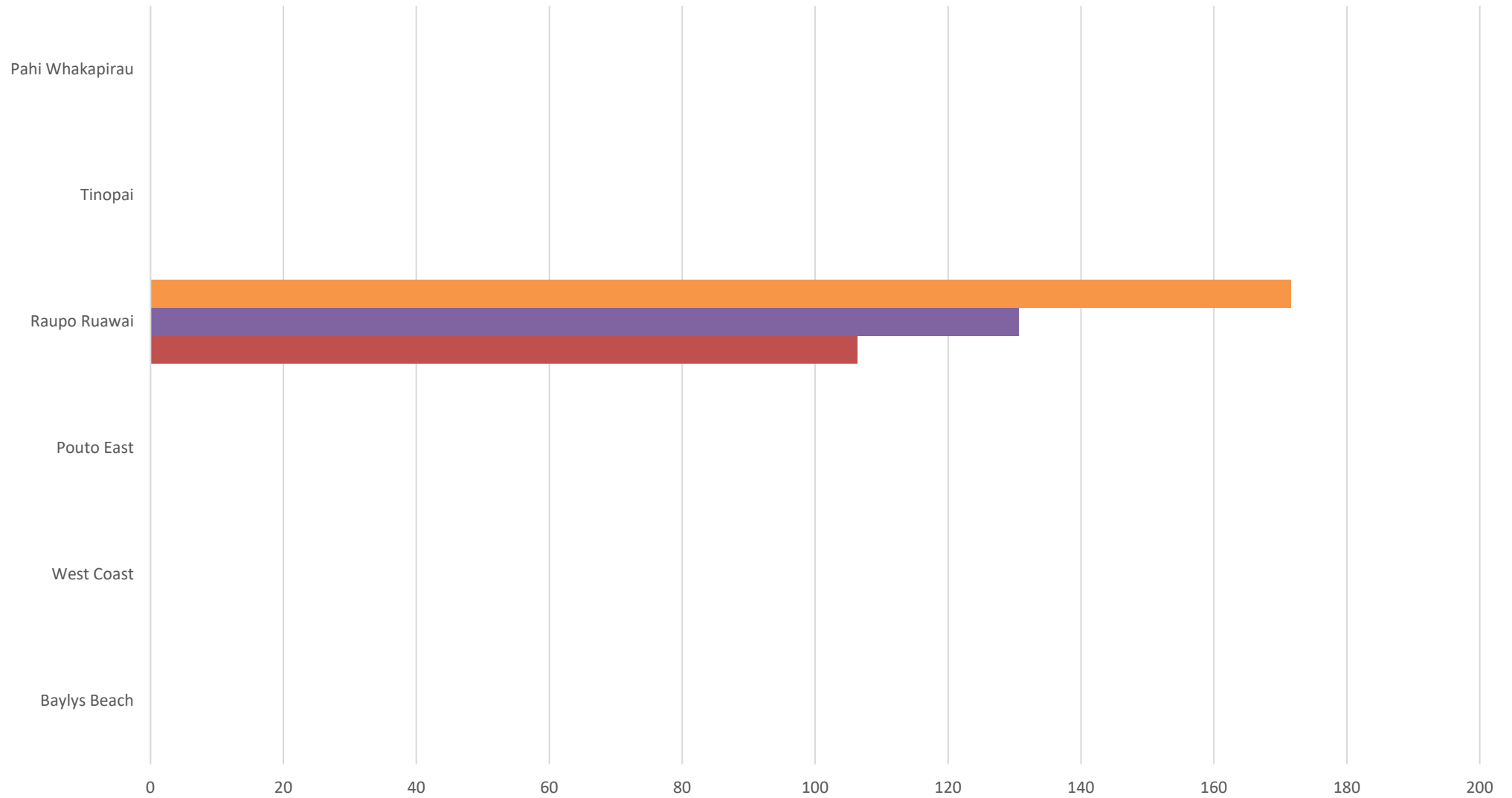
	Baylys Beach	West Coast	Pouto East	Raupo Ruawai	Tinopai	Pahi Whakapirau
■ 2130	12	18	0	0	0	10
■ 2080	2	2	0	0	0	5

### Buildings exposed to permanent SLR inundation



	Baylys Beach	West Coast	Pouto East	Raupo Ruawai	Tinopai	Pahi Whakapirau
■ 2130	0	0	27	981	13	12
■ 2080	0	0	3	60	3	4

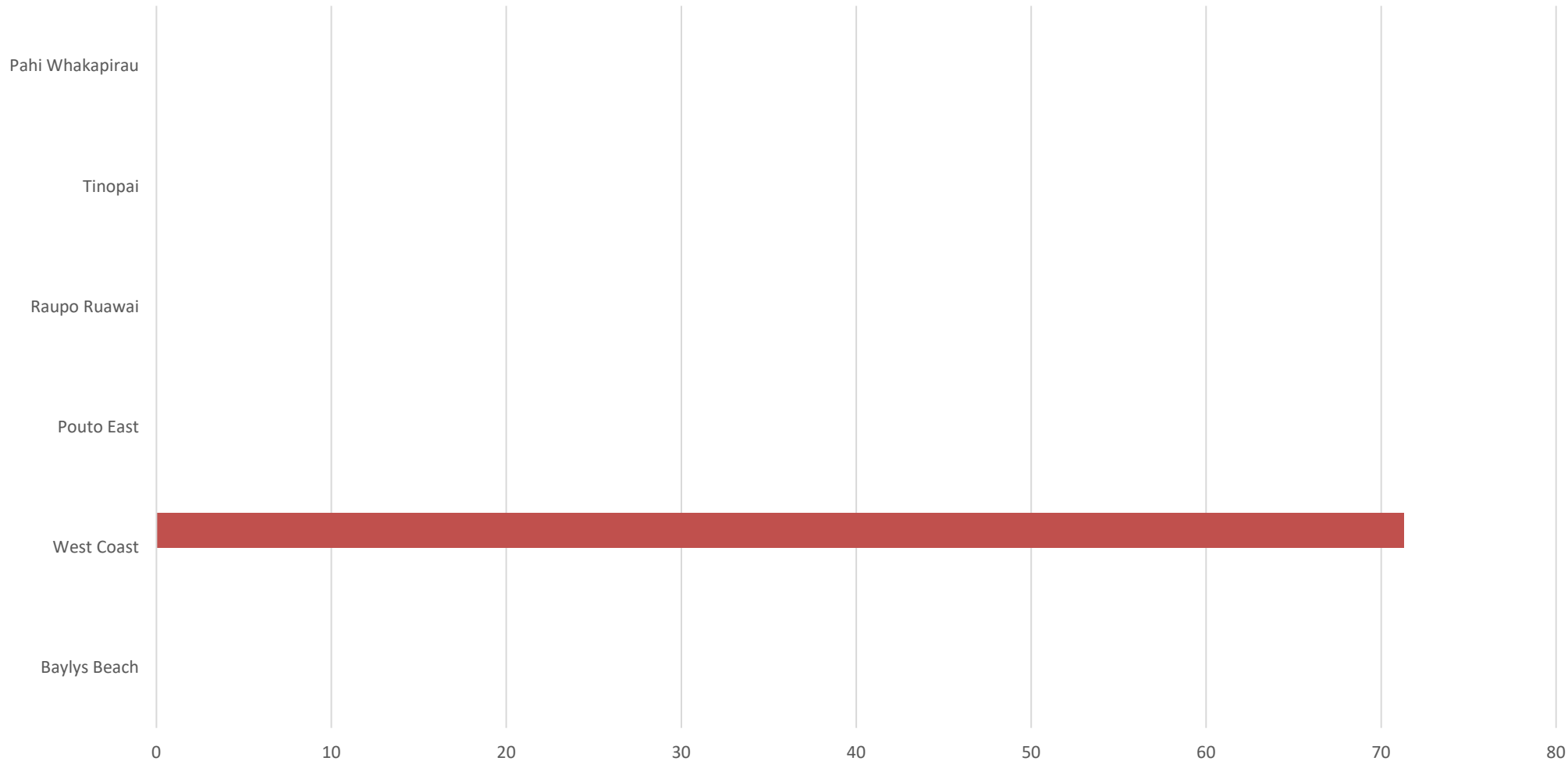
### Wastewater lines (m) exposed to coastal flooding



	Baylys Beach	West Coast	Pouto East	Raupo Ruawai	Tinopai	Pahi Whakapirau
2130	0	0	0	172	0	0
2080	0	0	0	131	0	0
Present Day	0	0	0	106	0	0

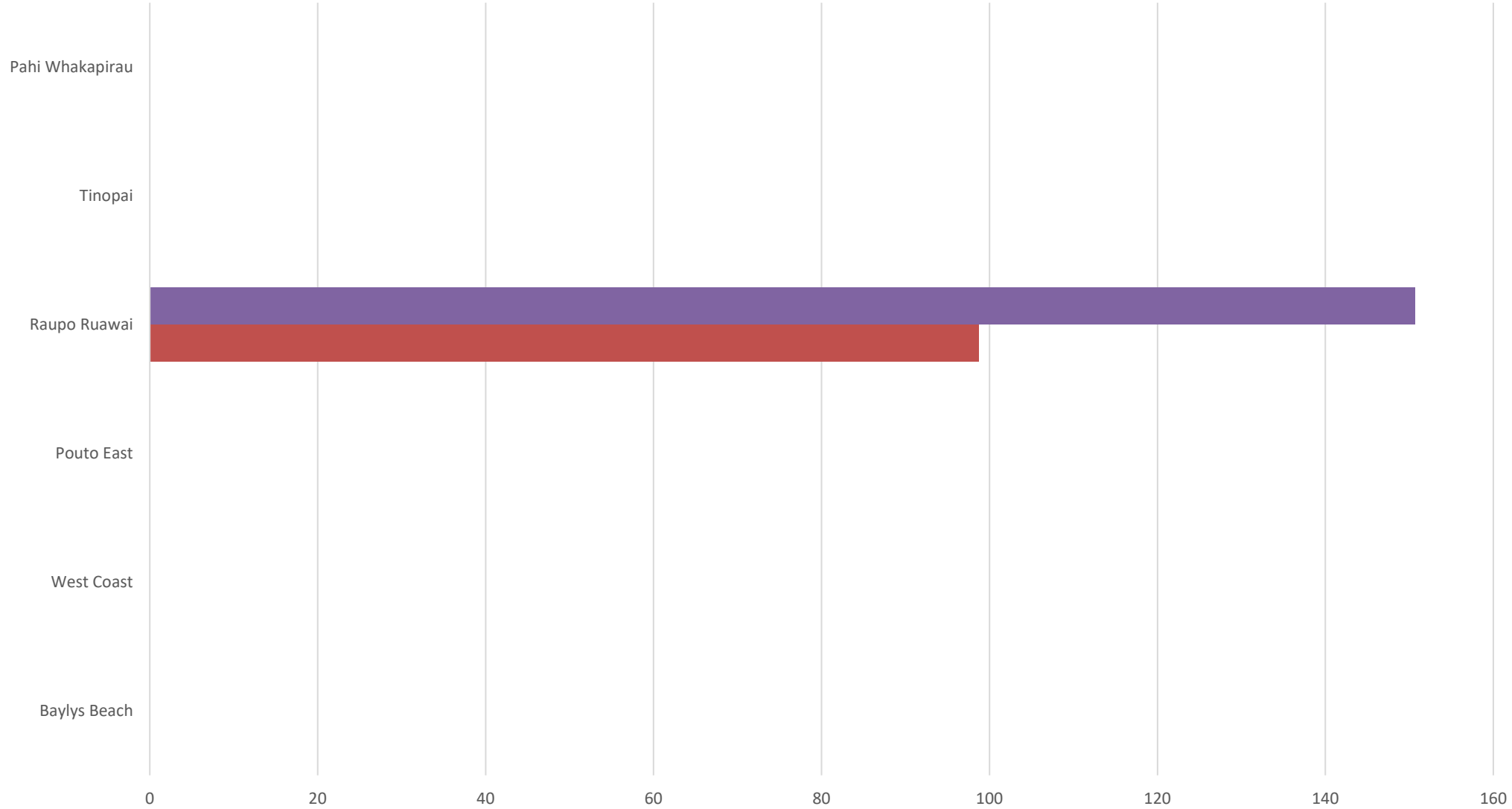


Wastewater lines (m) exposed to coastal erosion



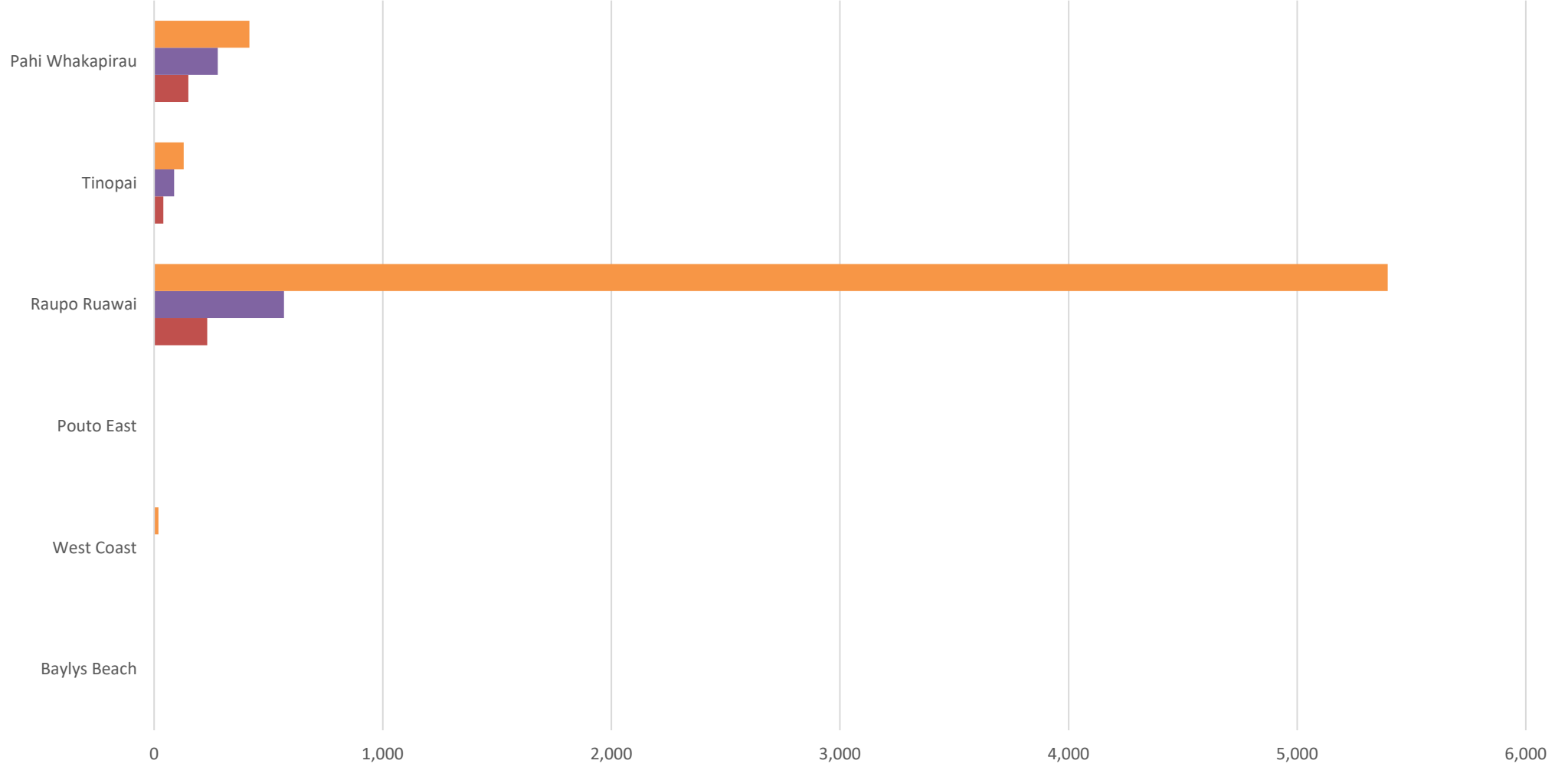
	Baylys Beach	West Coast	Pouto East	Raupo Ruawai	Tinopai	Pahi Whakapirau
■ 2130	0	71	0	0	0	0
■ 2080	0	0	0	0	0	0

### Wastewater lines (m) exposed to permanent SLR inundation



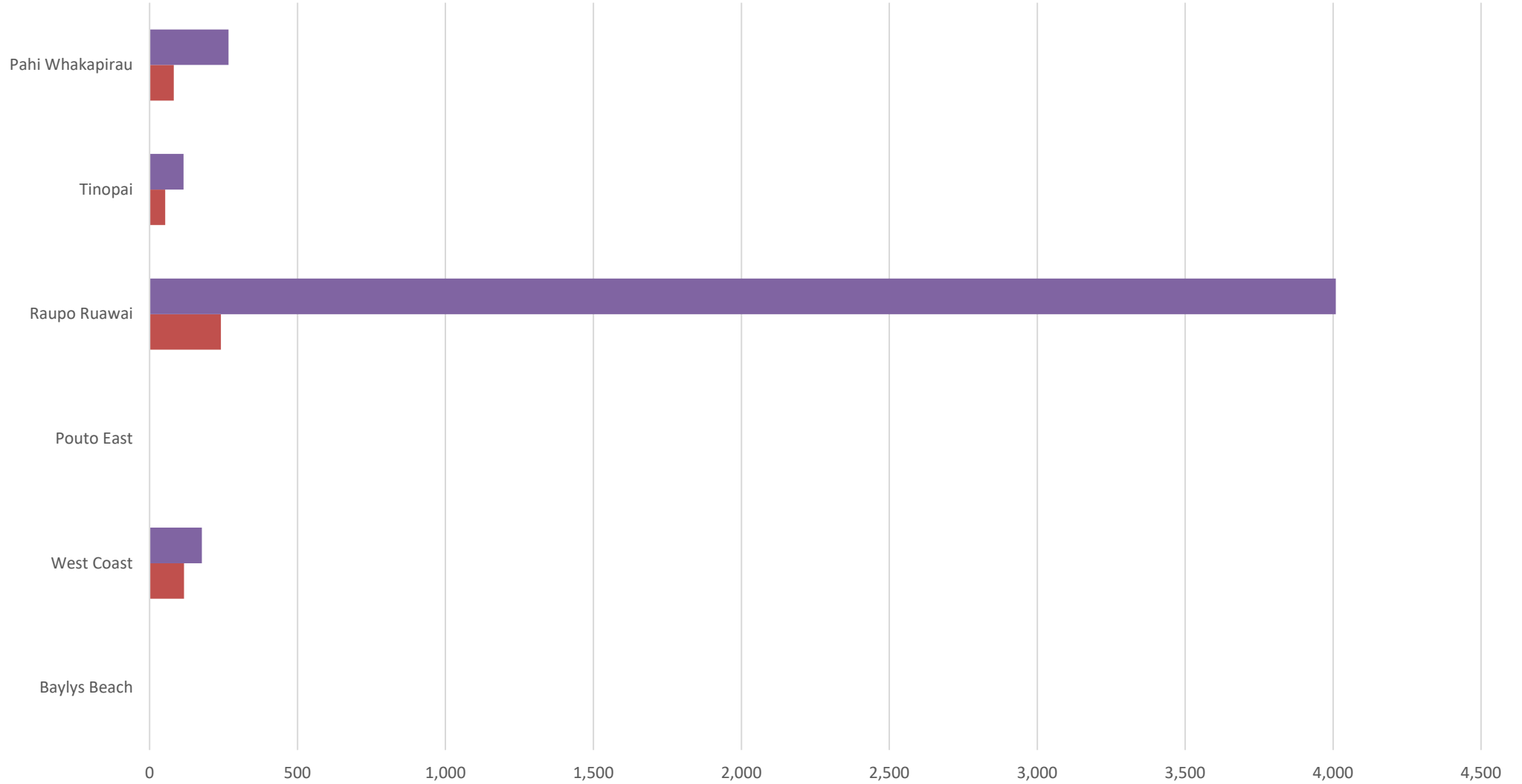
	Baylys Beach	West Coast	Pouto East	Raupo Ruawai	Tinopai	Pahi Whakapirau
■ 2130	0	0	0	151	0	0
■ 2080	0	0	0	99	0	0

### Stormwater lines (m) exposed to coastal flooding



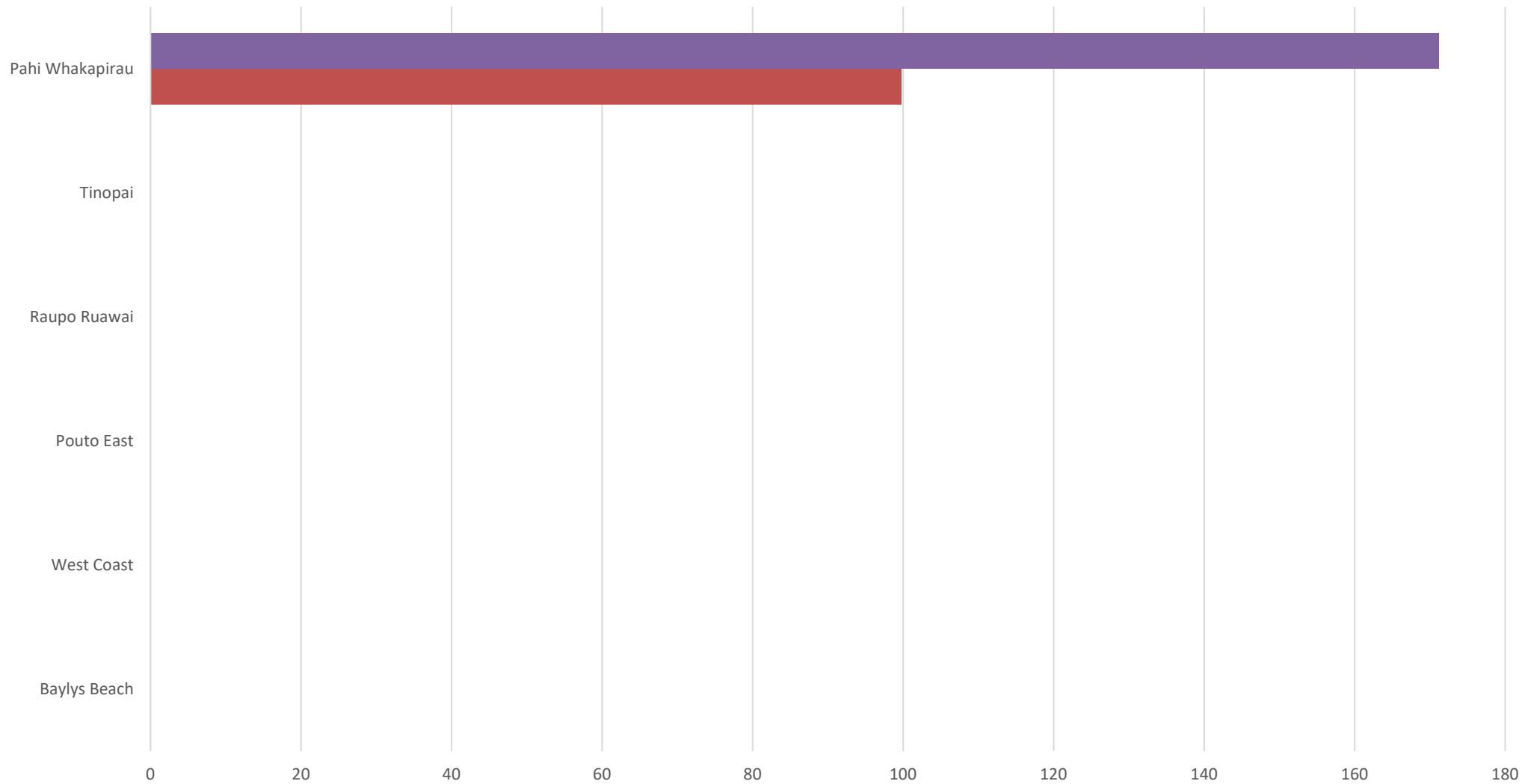
	Baylys Beach	West Coast	Pouto East	Raupo Ruawai	Tinopai	Pahi Whakapirau
2130	0	19	0	5,396	129	417
2080	0	2	0	568	88	279
Present Day	0	0	0	233	41	149

### Stormwater lines (m) exposed to permanent SLR inundation



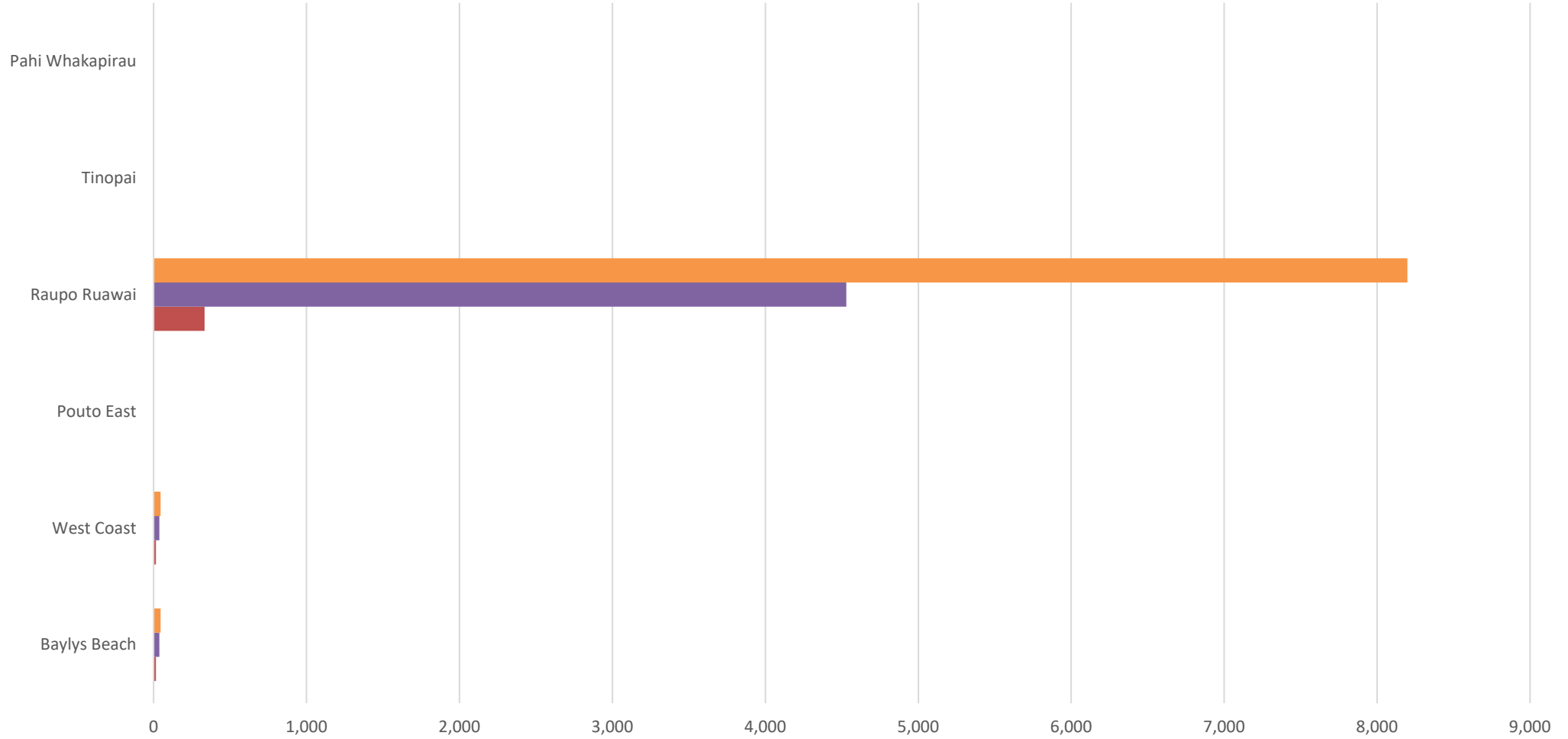
	Baylys Beach	West Coast	Pouto East	Raupo Ruawai	Tinopai	Pahi Whakapirau
2130	0	177	0	4,009	115	267
2080	0	116	0	241	53	81

### Stormwater lines (m) exposed to coastal erosion



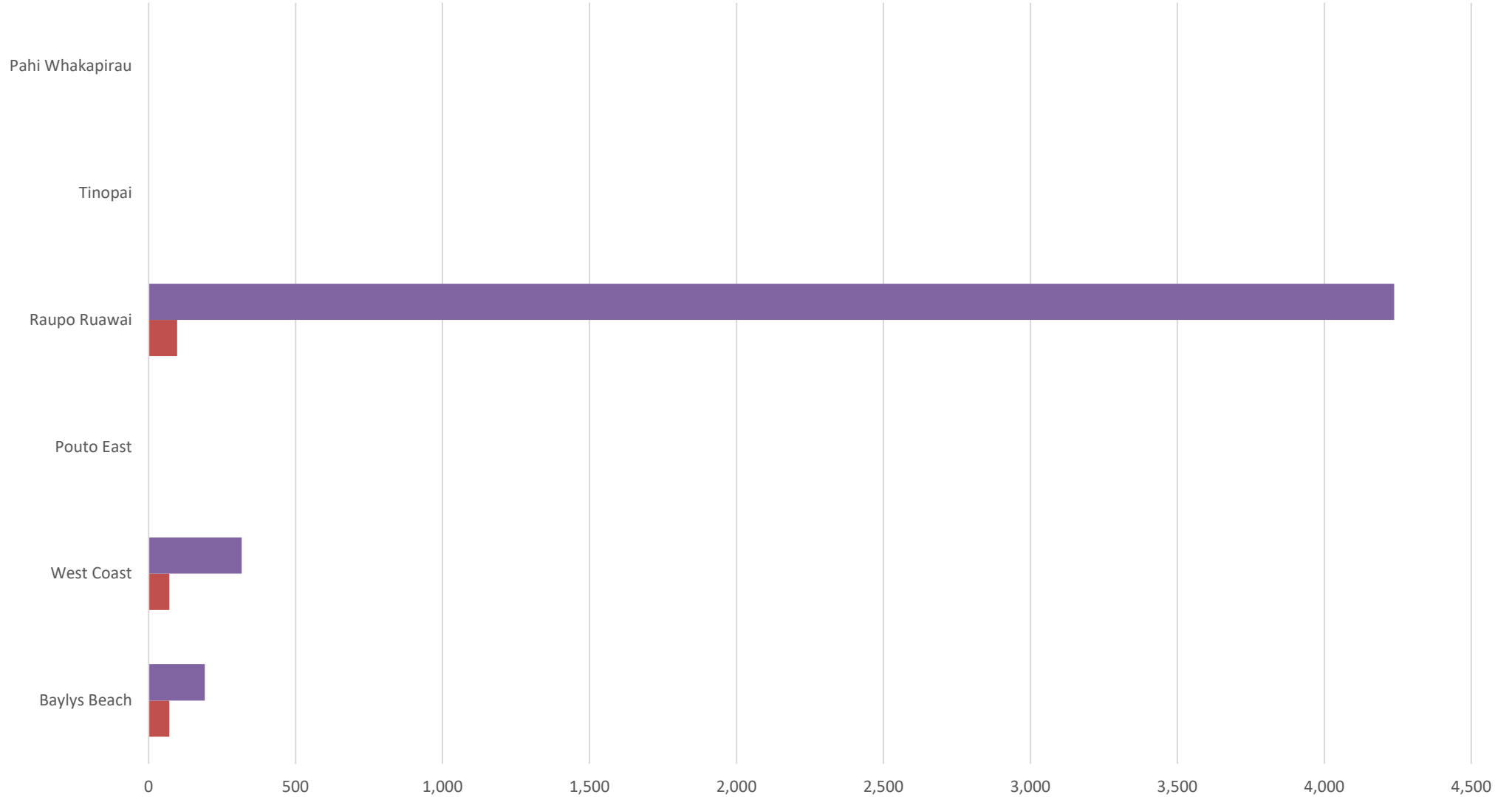
	Baylys Beach	West Coast	Pouto East	Raupo Ruawai	Tinopai	Pahi Whakapirau
■ 2130	0	0	0	0	0	171
■ 2080	0	0	0	0	0	100

### Water lines (m) exposed to coastal flooding



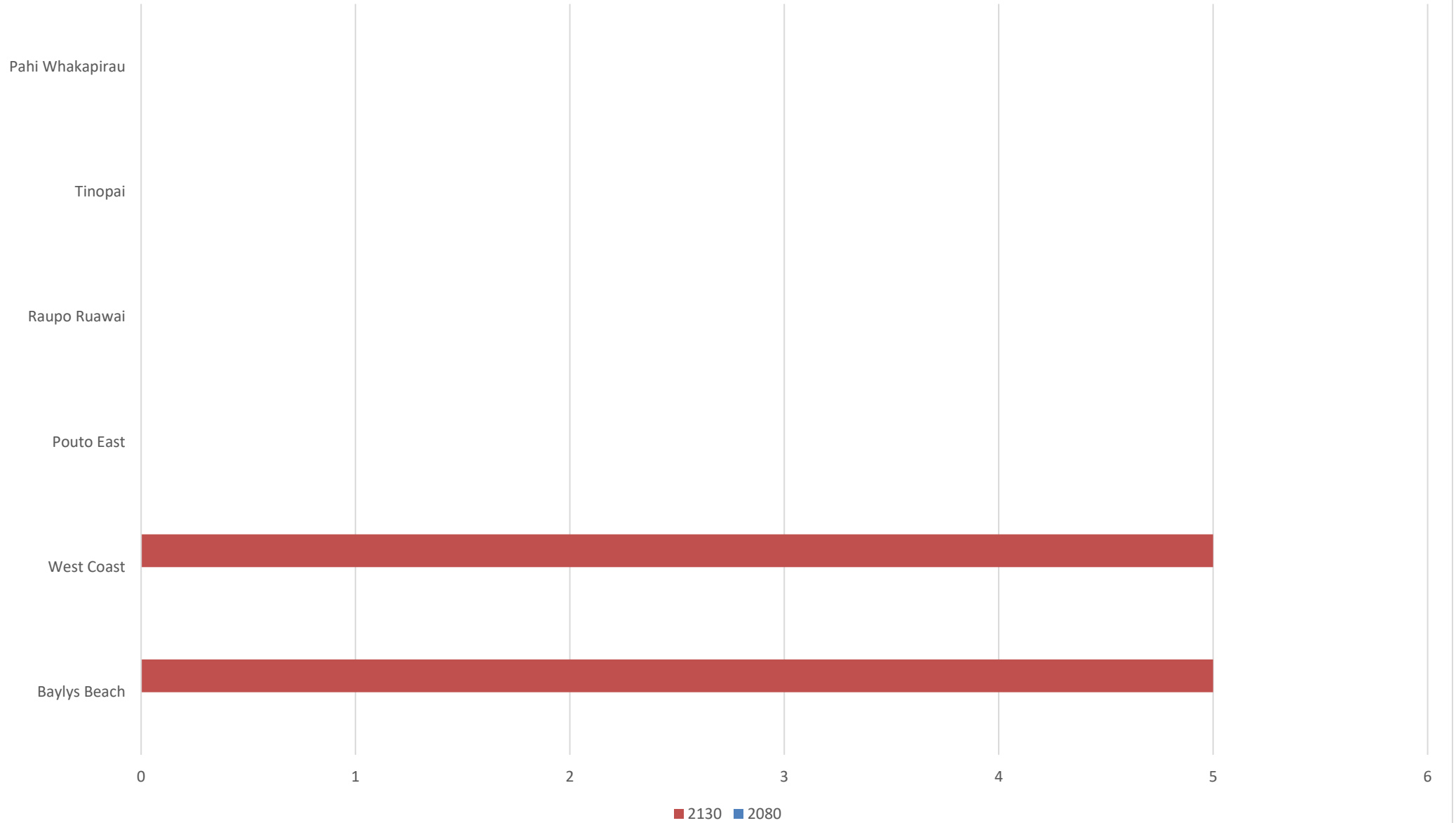
	Baylys Beach	West Coast	Pouto East	Raupo Ruawai	Tinopai	Pahi Whakapirau
2130	46	46	0	8,198	0	0
2080	38	38	0	4,529	0	0
Present Day	16	16	0	334	0	0

### Water lines (m) exposed to permanent SLR inundation



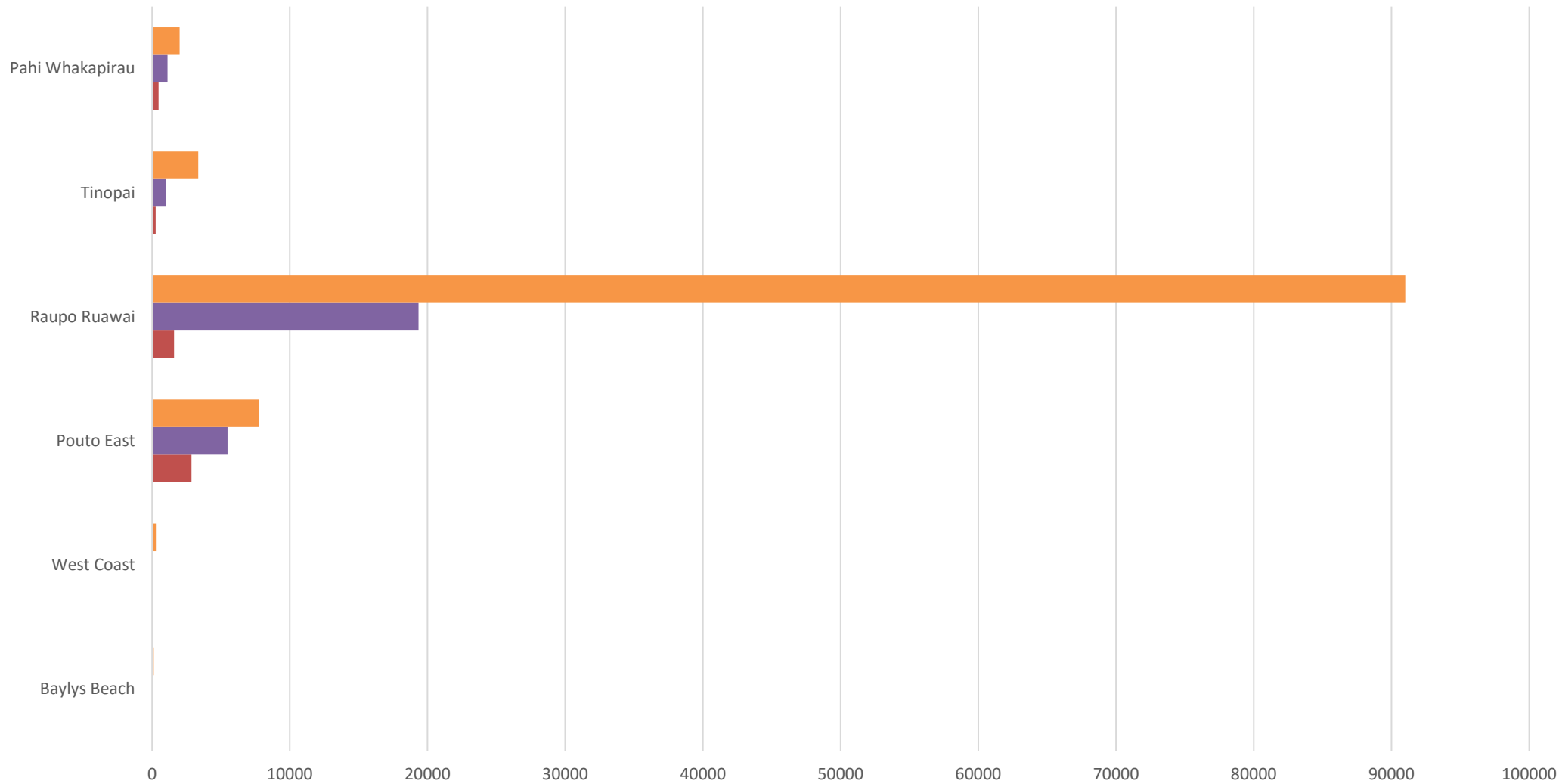
	Baylys Beach	West Coast	Pouto East	Raupo Ruawai	Tinopai	Pahi Whakapirau
■ 2130	191	317	0	4,238	0	0
■ 2080	71	71	0	97	0	0

### Water lines (m) exposed to coastal erosion



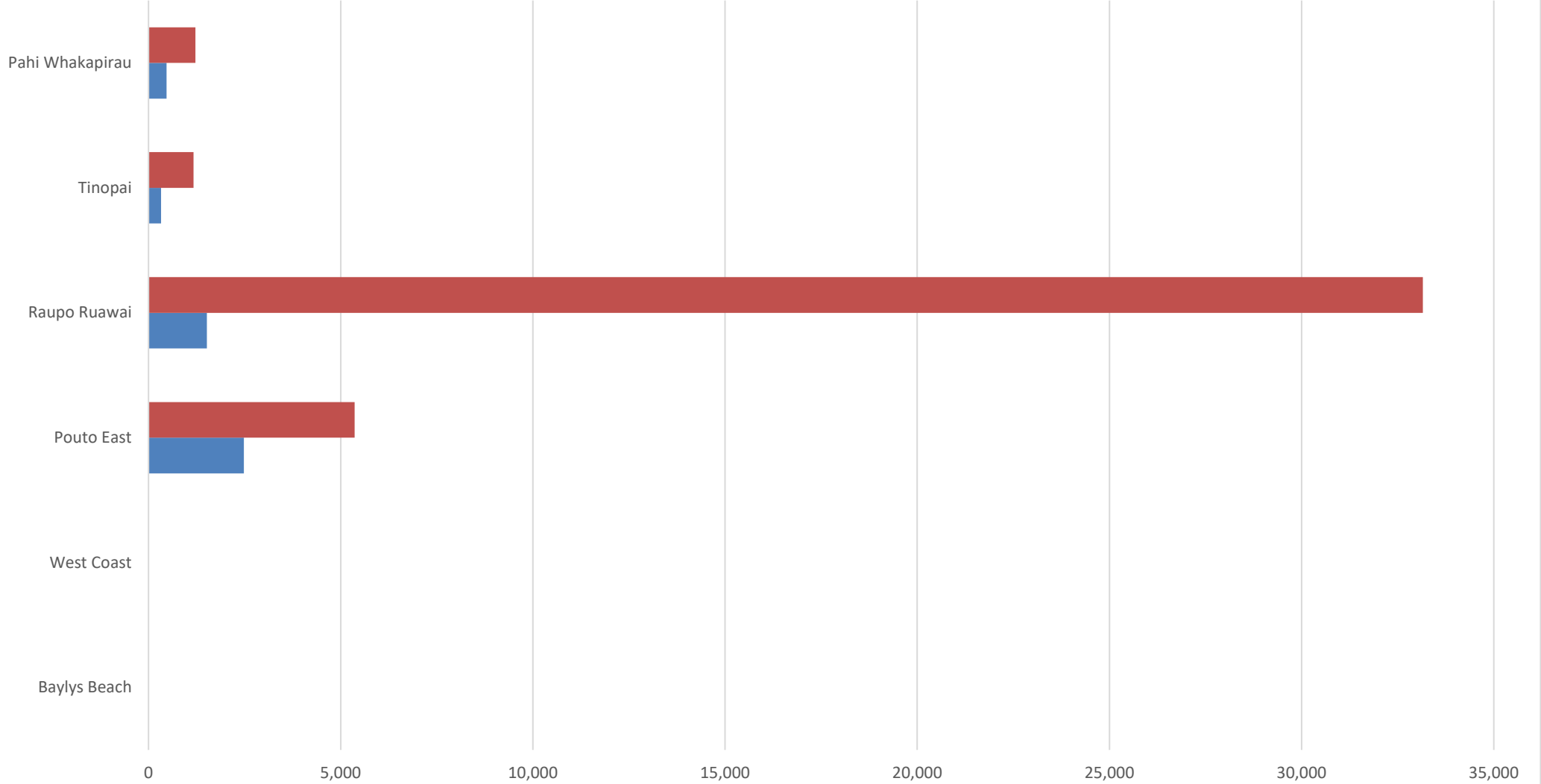


### Roads (m) exposed to coastal flooding



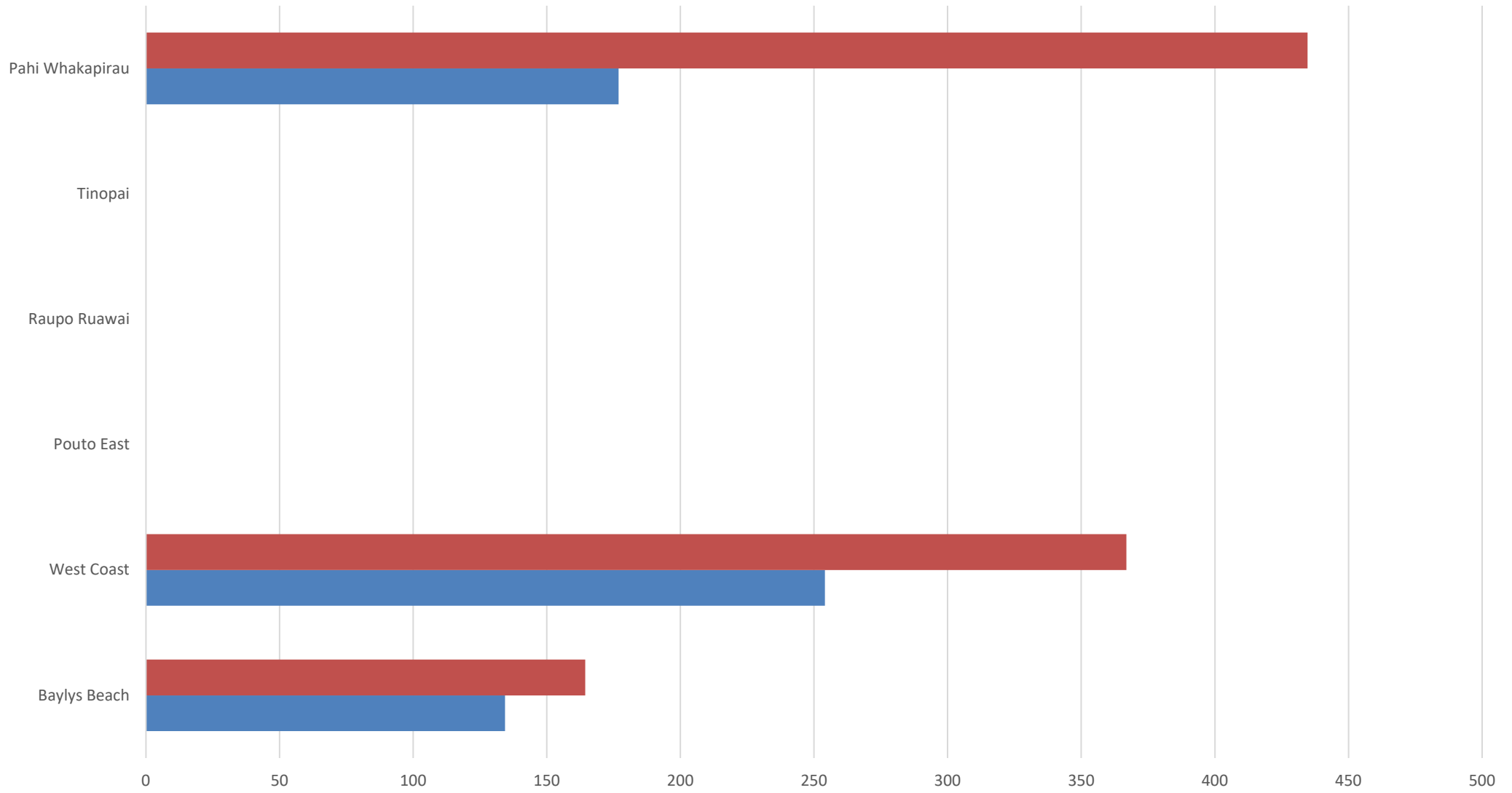
	Baylys Beach	West Coast	Pouto East	Raupo Ruawai	Tinopai	Pahi Whakapirau
2130	109	276	7,782	90,999	3,355	1,992
2080	64	64	5,476	19,335	1,020	1,113
Present Day	14	14	2,853	1,596	259	473

### Roads (m) exposed to permanent SLR inundation



	Baylys Beach	West Coast	Pouto East	Raupo Ruawai	Tinopai	Pahi Whakapirau
■ 2130	0	0	5,364	33,154	1,169	1,221
■ 2080	0	0	2,482	1,520	327	468

### Roads (m) exposed to coastal erosion



	Baylys Beach	West Coast	Pouto East	Raupo Ruawai	Tinopai	Pahi Whakapirau
■ 2130	164	367	0	0	0	435
■ 2080	134	254	0	0	0	177

## Appendix 2. Project requirements and resource considerations

When	Phase	Key milestones	Who is involved	Required services
Year 1 2021-2022	1. What's happening?	<ul style="list-style-type: none"> <li>Climate risk assessments</li> <li>Council decision on pilot location</li> <li>Pre-engagement / introduce project plan to community</li> <li>Agreements with Partners and key stakeholders</li> <li>Establish community panel</li> </ul>	<ul style="list-style-type: none"> <li>KDC Elected Members</li> <li>KDC staff</li> <li>Mana Whenua Partners; Marae and whānau</li> <li>Community residents</li> <li>Business groups</li> <li>Community groups</li> <li>Northland Regional Council</li> <li>Northland Transport Alliance</li> <li>Waka Kotahi</li> <li>CDEM, Lifeline Utilities</li> <li>Crown Research Institutes</li> </ul>	<ul style="list-style-type: none"> <li>Coordination and project support services</li> <li>Community facilitation, engagement and communication services</li> <li>Natural hazards engineering services</li> <li>Cost assessment services</li> <li>Māori cultural services</li> <li>Legal services</li> </ul>
	2. What matters most?	<ul style="list-style-type: none"> <li>Engage on community values</li> <li>Assess cultural and social impacts</li> <li>Decisions on 'what matters most'</li> </ul>		
Year 2 2022-2023	3-5. What can we do about it?	<ul style="list-style-type: none"> <li>Identify adaptation response options</li> <li>Decisions on accepted levels of risks</li> <li>Decisions on affordability and feasibility / consentability</li> </ul>		
Year 3 2023-2024	6-8. How can we implement the strategy? [What are we <i>going</i> to do about it?]	<ul style="list-style-type: none"> <li>Short list options and identify preferred pathway</li> <li>Identify signals, triggers and thresholds</li> <li>Decision on Community Adaptation Plan</li> </ul>		

Current KDC budget for Adaptive Pathways projects under the climate change work programme:

**Year 1**  
\$66,500

**Year 2**  
\$132,000

**Year 3**  
\$105,000

NRC will provide an estimated \$50,000 per year, plus natural hazards and risk assessment technical support and in-kind support.