SOUTHERN CELL

Pathway One	Coastal Unit L: Clifton

Short term	Medium term	Long term

RENOURISHMENT[2,3,6,7]

Regular gravel renourishment to offset erosion losses in combination with beach maintenance and planting

MANAGED RETREAT[18]

Property and Assets relocated inland, natural character of coastline reinstated

MANAGED RETREAT[18]

Property and Assets relocated inland, natural character of coastline reinstated

NOTES:

In the short term renourishment used to offset erosion losses and increase the size of the beach

Beach maintenance and planting used where applicable as part of a beach management plan

Renourishment will benefit area to the north

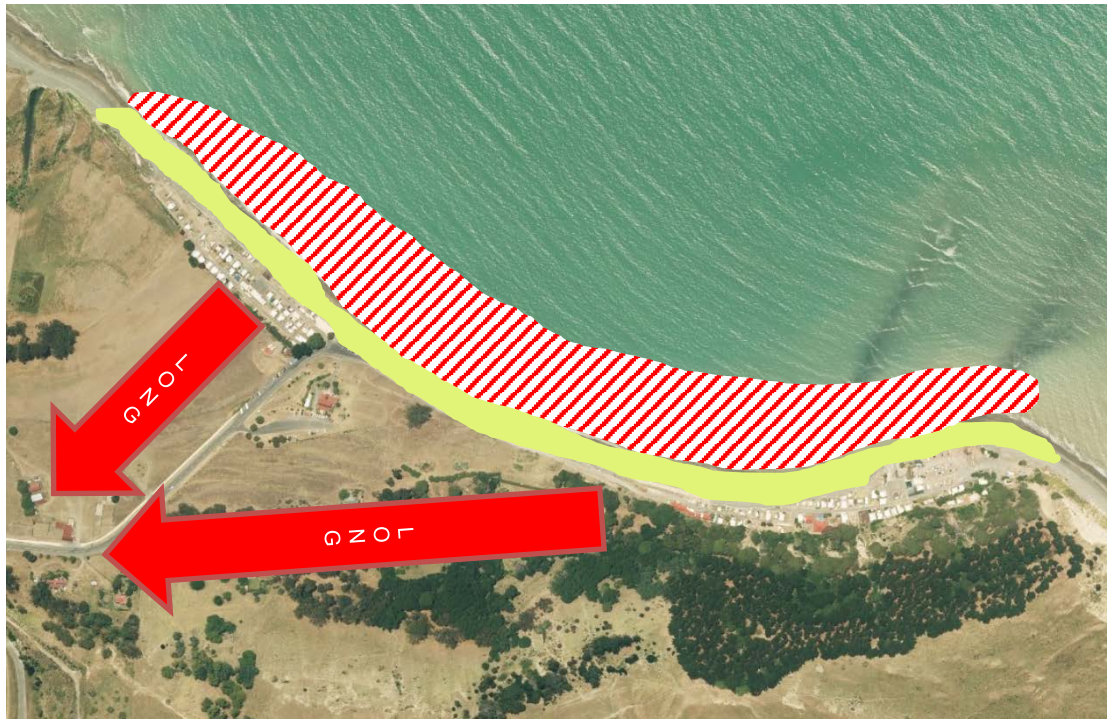
Structure and asset maintenance may still be required

Managed retreat planned for the medium term and actioned on a trigger level that makes the short term option no longer viable

SOUTHERN CELL

Pathway Two | **Coastal Unit L: Clifton**

Short term	Medium term	Long term
RENOURISHMENT + CONTROL STRUCTURES[3,13,14] Structures used to maintain beach with additional gravel renourishment	**RENOURISHMENT + CONTROL STRUCTURES**[3,13,14] Additional beach renourishment and structure maintenance as required	**MANAGED RETREAT**[18] Property and Assets relocated inland, natural character of coastline reinstated



NOTES:

Gravel nourishment with controlling structures (Groynes or Breakwaters)

Additional beach renourishment maybe required in the medium term to compensate for abrasion losses

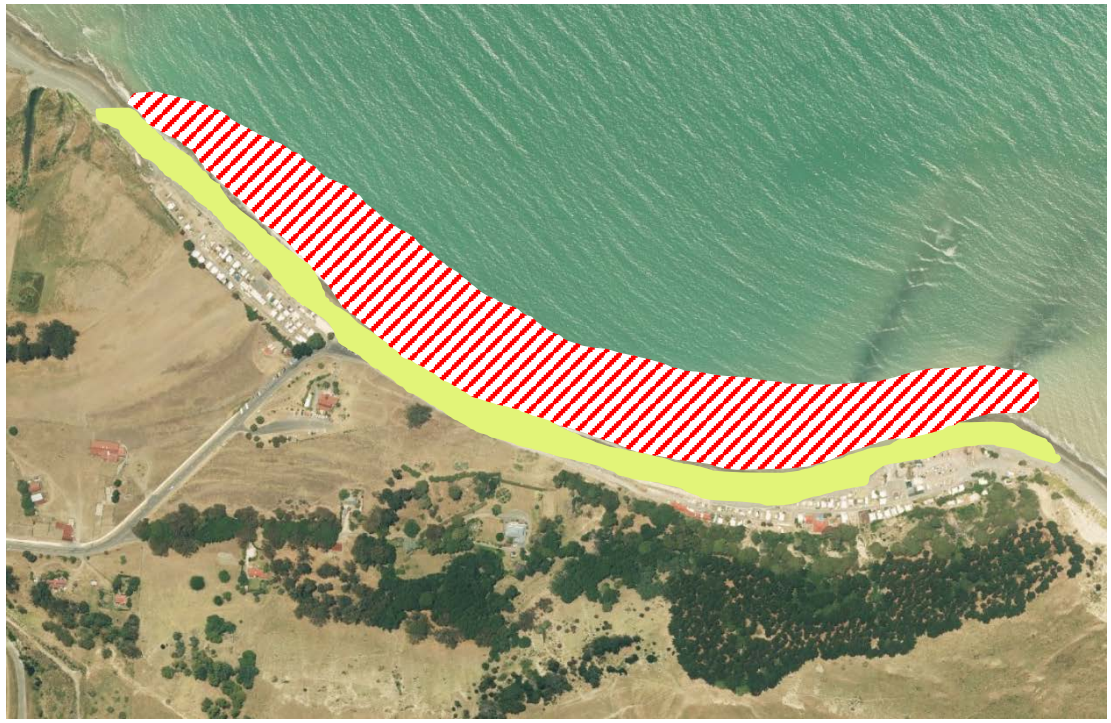
Beach maintenance and planting used as part of beach management plan

Managed retreat planned for the long-term when maintaining option deemed impractical or economically unfeasible

SOUTHERN CELL

Pathway Three: | **Coastal Unit L: Clifton**

Short term	Medium term	Long term
RENOURISHMENT + CONTROL STRUCTURES[3,13,14] Structures used to maintain beach with additional gravel renourishment	**RENOURISHMENT + CONTROL STRUCTURES**[3,13,14] Additional beach renourishment and structure maintenance as required	**RENOURISHMENT + CONTROL STRUCTURES**[3,13,14] Structures raised and/or lengthened and size/crest elevation of beach increased



NOTES:

Gravel nourishment with controlling structures (Groynes or Breakwaters)

Additional beach renourishment maybe required in the medium term to compensate for abrasion losses

In the longer term size of controlling structures and beach increased to compensate for sea level rise and wave climate

Beach maintenance and planting used as part of beach management plan

SOUTHERN CELL

Pathway Four | **Coastal Unit L: Clifton**

Short term	Medium term	Long term
RENOURISHMENT + CONTROL STRUCTURES[3,13,14] Structures used to maintain beach with additional gravel renourishment	**RENOURISHMENT + CONTROL STRUCTURES**[3,13,14] Additional beach renourishment and structure maintenance as required	**SEA WALL**[16] Constructed as primary protection for inundation and erosion. No requirement to nourish beach.

NOTES:

Gravel nourishment with controlling structures (Groynes or Breakwaters)

Additional beach renourishment maybe required in the medium term to compensate for abrasion losses

In the long-term a seawall would be installed as the primary defence. This may also require a stopbank to prevent the wall being outflanked.

The length of the wall is subject to detailed design and an economic analysis, consequently it may only cover part of the unit. The rest would be subject to natural processes.

SOUTHERN CELL

Pathway Five	Coastal Unit L: Clifton

Short term	Medium term	Long term

SEA WALL[16]

Constructed as primary protection for inundation and erosion. No requirement to nourish beach.

SEA WALL[16]

Maintenance as required

MANAGED RETREAT[18]

Property and Assets relocated inland, natural character of coastline reinstated

NOTES:

Sea Wall will be a rock revetment; if there is not a sufficient supply of suitable rock, concrete units may also be used. Stopbanks may also be required to prevent outflanking.

The length of the wall is subject to detailed design and an economic analysis, consequently it may only cover part of the unit. The rest would be subject to natural processes.

SOUTHERN CELL

Pathway Six	Coastal Unit L: Clifton

Short term	Medium term	Long term
SEA WALL[16] Constructed as primary protection for inundation and erosion. No requirement to nourish beach.	**SEA WALL[16]** Maintenance as required	**SEA WALL[16]** Height may need increasing in order to offset the impacts of sea level rise. Maintenance as required

NOTES:

Sea Wall will be a rock revetment; if there is not a sufficient supply of suitable rock, concrete units may also be used. Stopbanks may also be required to prevent outflanking.

The length of the wall is subject to detailed design and an economic analysis, consequently it may only cover part of the unit. The rest would be subject to natural processes.

SOUTHERN CELL

Pathway One | **Coastal Unit K2: Te Awanga**

Short term	Medium term	Long term
RENOURISHMENT[3] Regular gravel renourishment to offset erosion losses in combination with beach maintenance and planting	**RETREAT THE LINE[17]** New defence line to reduce inundation risk constructed along Clifton Road/Wellwood Terrace	**MANAGED RETREAT[18]** Property and assets north of new defence line relocated inland, natural character of coastline reinstated

NOTES:

Medium term option could include some small renourishments if conditions dictate

Lagoon optimisation can be looked at

Clifton Road North of Te Awanga will have to be retreated in the medium to long term with this pathway.

River stopbanks will need to be raised in the medium to long-term in order to reduce inundation risk.

SOUTHERN CELL

Pathway Two	Coastal Unit K2: Te Awanga

Short term	Medium term	Long term

RENOURISHMENT + CONTROL STRUCTURES[3,13,14]

Structures used to maintain beach with additional gravel renourishment

RENOURISHMENT + CONTROL STRUCTURES[3,13,14]

Additional beach renourishment and structure maintenance as required

RETREAT THE LINE[17]

New defence line to reduce inundation risk constructed along Clifton Road/Wellwood Terrace

NOTES:

Control structures could be groynes or offshore breakwaters.

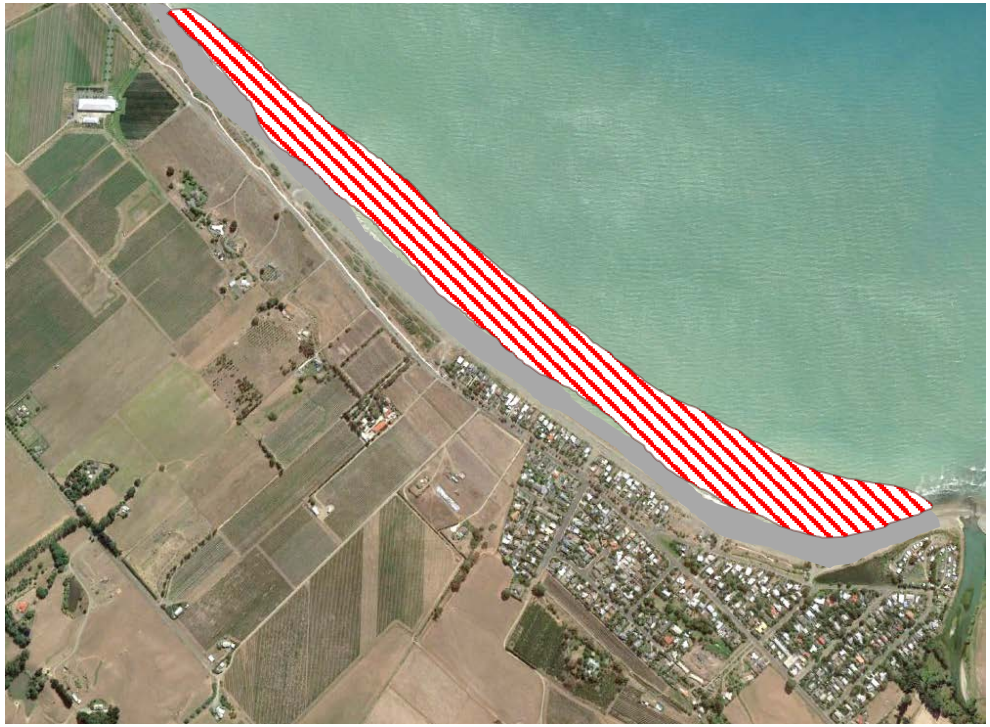
Dune planting and beach maintenance employed as part of the strategy.

Clifton Road north of Te Awanga may be defended with the same approach or relocated inland (medium/long term).

SOUTHERN CELL

Pathway Three | **Coastal Unit K2: Te Awanga**

Short term	Medium term	Long term
RENOURISHMENT + CONTROL STRUCTURES[3,13,14] Structures used to maintain beach with additional gravel renourishment	**RENOURISHMENT + CONTROL STRUCTURES**[3,13,14] Additional beach renourishment and structure maintenance as required	**RENOURISHMENT + CONTROL STRUCTURES**[3,13,14] Structures raised and/or lengthened and size/crest elevation of beach increased



NOTES:

Control structures could be groynes or offshore breakwaters.

Dune planting and beach maintenance employed as part of the strategy.

In order to keep pace with sea level rise and climate change structures will need to be increased in height. This will also require increasing the size of the beach through renourishment to provide an equivalent standard of protection.

Clifton Road north of Te Awanga may be defended with the same approach or relocated inland.

SOUTHERN CELL

Pathway Four	Coastal Unit K2: Te Awanga

Short term	Medium term	Long term

RENOURISHMENT + CONTROL STRUCTURES[3,13,14]

Structures used to maintain beach with additional gravel renourishment

RENOURISHMENT + CONTROL STRUCTURES[3,13,14]

Additional beach renourishment and structure maintenance as required

SEA WALL[16]

Constructed as primary protection for inundation and erosion. No requirement to nourish beach.

NOTES:

Control structures could be groynes or offshore breakwaters.

Sea Wall will be a rock revetment; if there is not a sufficient supply of suitable rock, concrete units may also be used.

Dune planting and beach maintenance employed as part of the strategy.

Clifton Road north of Te Awanga may be defended with the same approach or relocated inland.

SOUTHERN CELL

Pathway Five | **Coastal Unit K2: Te Awanga**

Short term	Medium term	Long term

RENOURISHMENT[3]

Regular gravel renourishment to offset erosion losses in combination with beach maintenance and planting

SEA WALL[16]

Constructed as primary protection for inundation and erosion. No requirement to nourish beach.

RETREAT THE LINE[17]

New defence line to reduce inundation risk constructed along Clifton Road/Wellwood Terrace

NOTES:

Sea Wall will be a rock revetment; if there is not a sufficient supply of suitable rock, concrete units may also be used.

Dune planting and beach maintenance employed as part of the strategy.

Clifton Road north of Te Awanga may be defended with the same approach or relocated inland (medium/long term).

SOUTHERN CELL

Pathway Six	Coastal Unit K2: Te Awanga

Short term	Medium term	Long term
SEA WALL[16] Constructed as primary protection for inundation and erosion. No requirement to nourish beach.	**SEA WALL[16]** Maintenance as required	**SEA WALL[16]** Height may need increasing in order to offset the impacts of sea level rise. Maintenance as required

NOTES:

Sea Wall will be a rock revetment; if there is not a sufficient supply of suitable rock, concrete units may also be used.

Clifton Road north of Te Awanga may be defended with the same approach or relocated inland (medium/long term).

SOUTHERN CELL

Pathway One | **Coastal Unit K1: Haumoana**

Short term	Medium term	Long term
RENOURISHMENT[2,3,6,7] Regular gravel renourishment to offset erosion losses in combination with beach maintenance and planting	**MANAGED RETREAT**[18] Property and Assets relocated inland, natural character of coastline reinstated	**MANAGED RETREAT**[18] Property and Assets relocated inland, natural character of coastline reinstated

NOTES:

Renourishment in the short term would have to be large quantities in order to provide sufficient reduction in risk to seawards properties

A planned managed retreat for all properties seaward of the 2065 hazard risk zones would occur in the medium-term

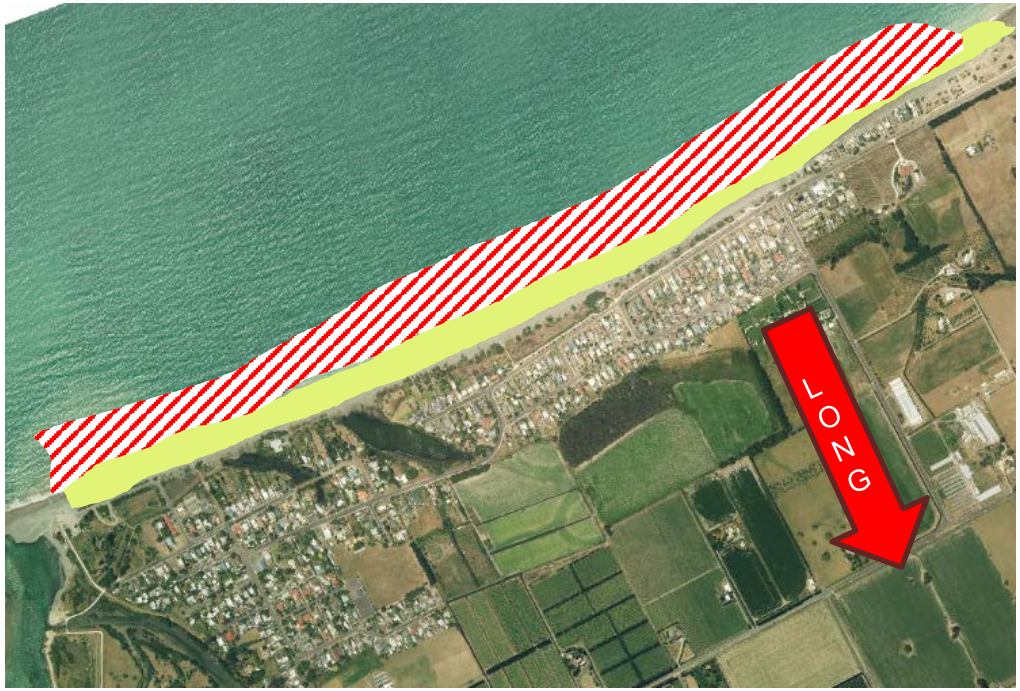
In the long term a more widespread planned managed retreat of all properties at unacceptable risk

Raising of river stopbanks and flood gate required in order to reduce inundation risk to remainder of community in the medium to long-term..

SOUTHERN CELL

Pathway Two | **Coastal Unit K1: Haumoana**

Short term	Medium term	Long term
RENOURISHMENT + CONTROL STRUCTURES[2,3,13,14] Structures used to maintain beach with additional gravel renourishment and planting	**RENOURISHMENT + CONTROL STRUCTURES**[3,13,14] Additional beach renourishment and structure maintenance as required	**MANAGED RETREAT**[18] Property and Assets relocated inland, natural character of coastline reinstated



NOTES:

Gravel nourishment with controlling structures (Groynes or Breakwaters)

Additional beach renourishment maybe required in the medium term to compensate for abrasion losses. Raising of stopbanks may also be necessary, including the installation of flood gate.

In the long term a planned managed retreat of all properties at unacceptable risk.

SOUTHERN CELL

Pathway Three:	Coastal Unit K1: Haumoana

Short term	Medium term	Long term

RENOURISHMENT + CONTROL STRUCTURES[2,3,13,14]

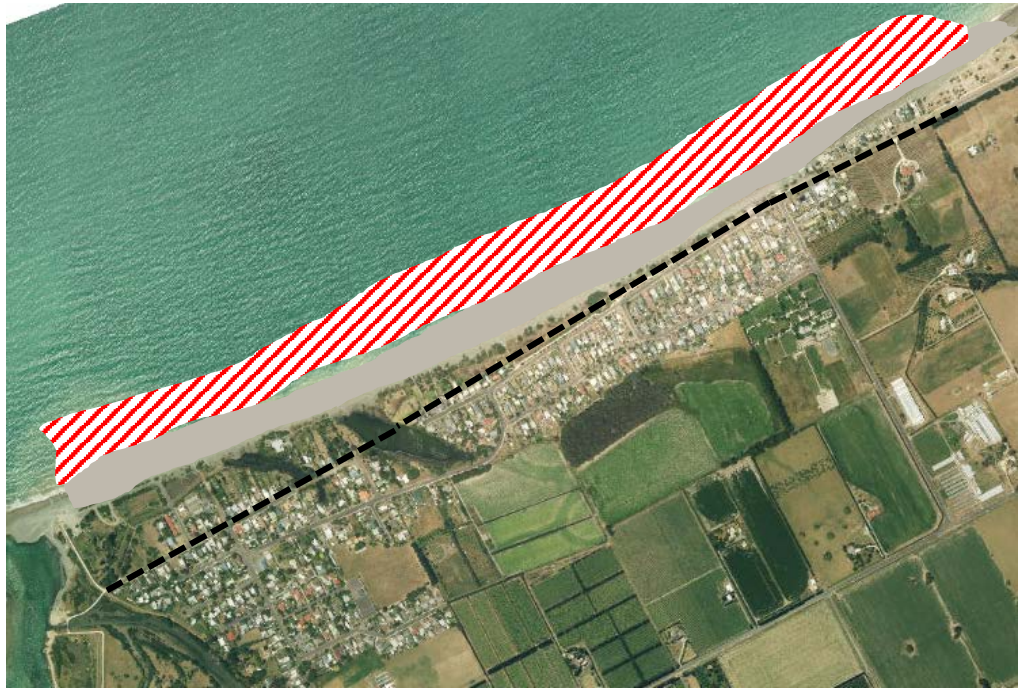
Structures used to maintain beach with additional gravel renourishment and planting

RENOURISHMENT + CONTROL STRUCTURES[3,13,14]

Additional beach renourishment and structure maintenance as required

RETREAT THE LINE[17]

Staged retreat with renourishment and control structures maintained where practical



NOTES:

Gravel nourishment with controlling structures (Groynes or Breakwaters)

Additional beach renourishment maybe required in the medium term to compensate for abrasion losses. Raising of stopbanks may also be necessary, including the installation of flood gates.

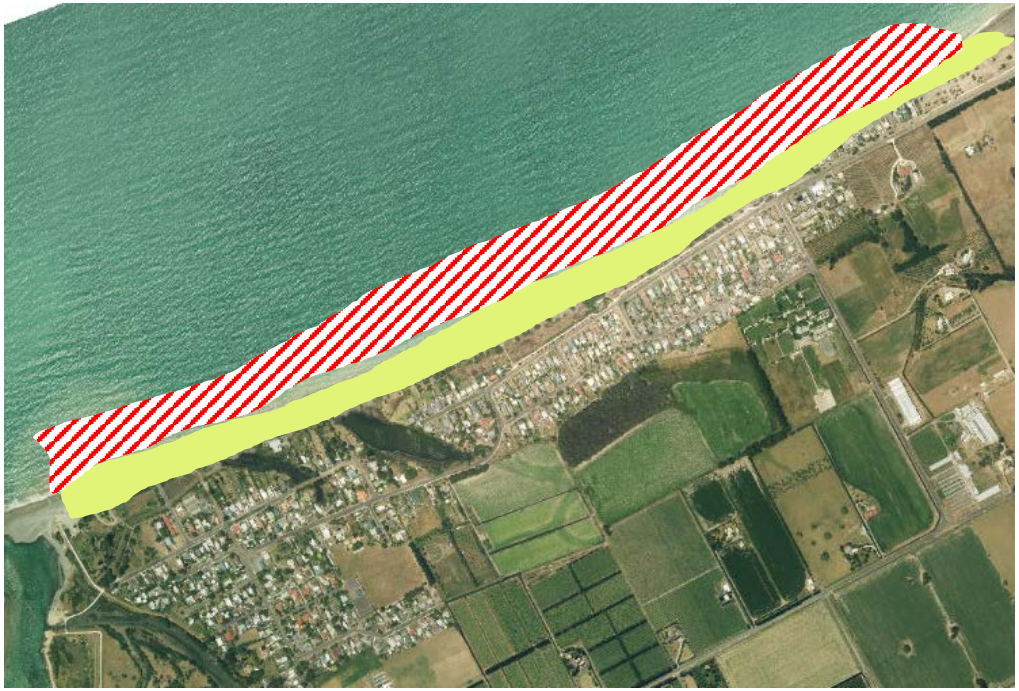
In the long term defence line retreated. Lagoons filled in or banks engineered to reduce inundation risk. River stopbanks raised.

SOUTHERN CELL

Pathway Four

Coastal Unit K1: Haumoana

Short term	Medium term	Long term
RENOURISHMENT + CONTROL STRUCTURES[2,3,13,14] Structures used to maintain beach with additional gravel renourishment and planting	**RENOURISHMENT + CONTROL STRUCTURES[3,13,14]** Additional beach renourishment and structure maintenance as required	**RENOURISHMENT + CONTROL STRUCTURES[3,13,14]** Structures raised and/or lengthened and size/crest elevation of beach increased



NOTES:

Gravel nourishment with controlling structures (Groynes or Breakwaters)

Additional beach renourishment maybe required in the medium term to compensate for abrasion losses

In the longer term size of controlling structures and beach increased to compensate for sea level rise and wave climate. Stopbanks raised, flood gates installed, and lagoons engineered to reduce inundation risk.

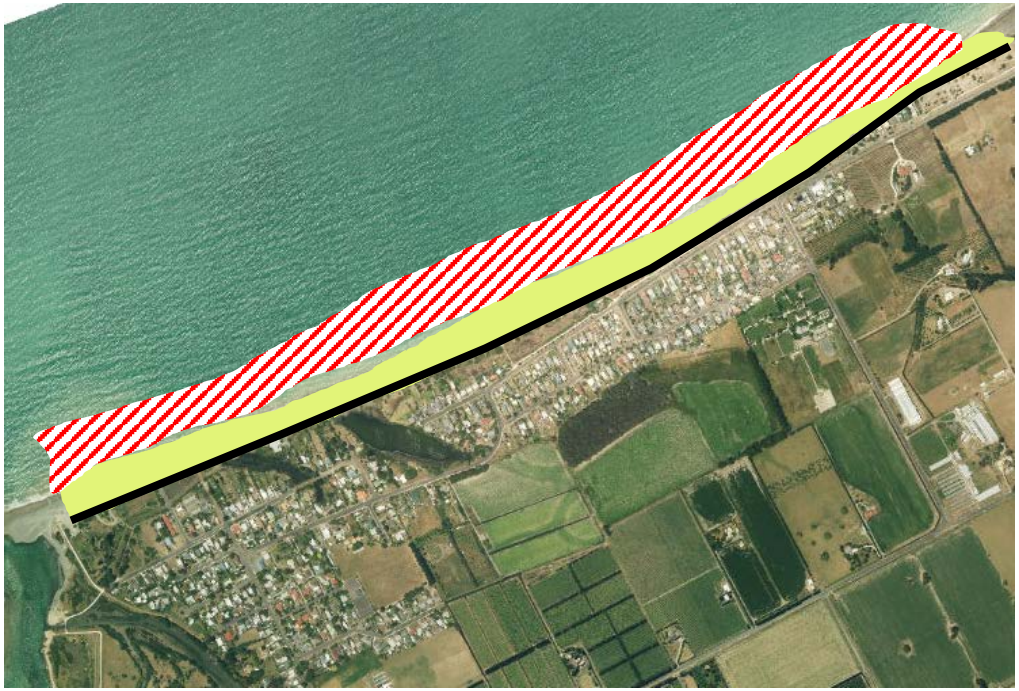
Beach maintenance and planting used as part of beach management plan

SOUTHERN CELL

Pathway Five

Coastal Unit K1: Haumoana

Short term	Medium term	Long term
RENOURISHMENT + CONTROL STRUCTURES[2,3,13,14] Structures used to maintain beach with additional gravel renourishment and planting	**RENOURISHMENT + CONTROL STRUCTURES**[3,13,14] Additional beach renourishment and structure maintenance as required	**SEA WALL**[16] Constructed as primary protection for inundation and erosion. No requirement to nourish beach.



NOTES:

Gravel nourishment with controlling structures (Groynes or Breakwaters)

Additional beach renourishment maybe required in the medium term to compensate for abrasion losses

Beach maintenance and planting used as part of beach management plan

In the longer term sea wall constructed as primary defence. Stopbanks raised, flood gates installed, and lagoons engineered to reduce inundation risk.

SOUTHERN CELL

Pathway Six | **Coastal Unit K1: Haumoana**

Short term	Medium term	Long term
SEA WALL[16] Constructed as primary protection for inundation and erosion. No requirement to nourish beach.	**SEA WALL[16]** Maintenance as required	**SEA WALL[16]** Height may need increasing in order to offset the impacts of sea level rise. Maintenance as required

NOTES:

Sea Wall will be a rock revetment; if there is not a sufficient supply of suitable rock, concrete units may also be used.

Initially built in front of most at risk property, subsequently extended to cover whole unit.

In the long term sea wall and stopbanks will need to be raised and flood gates installed.

SOUTHERN CELL

Pathway One	Coastal Unit J: Clive

Short term	Medium term	Long term

STATUS QUO[1,2]

RENOURISHMENT + CONTROL STRUCTURES[3,13,14]

Structures used to maintain beach with additional gravel renourishment

RETREAT THE LINE/ MANAGED RETREAT[17,18]

NOTES:

No immediate hazard risk in the short-term, planting utilised to reduce erosion rates.

Gravel nourishment with controlling structures (Groynes or Breakwaters) required to protect the whole unit in the medium term.

For this unit adaption of existing groynes and potentially increasing the number most practical option.

Long-term retreating the line and construction of new stopbanks. This may necessitate a planned managed retreat of some infrastructure.

SOUTHERN CELL

Pathway Two	Coastal Unit J: Clive

Short term	Medium term	Long term

STATUS QUO[1,2]

RENOURISHMENT + CONTROL STRUCTURES[3,13,14]

Structures used to maintain beach with additional gravel renourishment

RENOURISHMENT + CONTROL STRUCTURES[3,13,14]

Structures raised and/or lengthened and size/crest elevation of beach increased

NOTES:

No immediate hazard risk in the short-term, planting utilised to reduce erosion rates.

Gravel nourishment with controlling structures (Groynes or Breakwaters) required to protect the southern corner in the medium term.

For this unit adaption of existing groynes and potentially increasing the number most practical option.

In the long term renourishment and controlling structures extended to whole unit. Stopbanks may also need to be raised.

SOUTHERN CELL

Pathway Three	Coastal Unit J: Clive

Short term	Medium term	Long term

STATUS QUO[1,2]

SEA WALL[16]

Constructed as primary protection for inundation and erosion. No requirement to nourish beach.

RETREAT THE LINE/ MANAGED RETREAT[17,18]

NOTES:

No immediate hazard risk in the short-term, planting utilised to reduce erosion rates.

Sea wall constructed in the medium term to protect the whole unit.

Long-term retreating the line and construction of new stopbanks. This may necessitate a planned managed retreat of some infrastructure.

SOUTHERN CELL

Pathway Four	Coastal Unit J: Clive

Short term	Medium term	Long term
STATUS QUO[1,2]	**SEA WALL**[16] Constructed as primary protection for inundation and erosion. No requirement to nourish beach.	**SEA WALL**[16] Height may need increasing in order to offset the impacts of sea level rise. Maintenance as required

NOTES:

No immediate hazard risk in the short-term, planting utilised to reduce erosion rates.

Sea wall constructed in the medium term to protect southern corner.

Sea wall extended, and potentially raised, to cover whole unit. River stopbanks may also have to be raised.