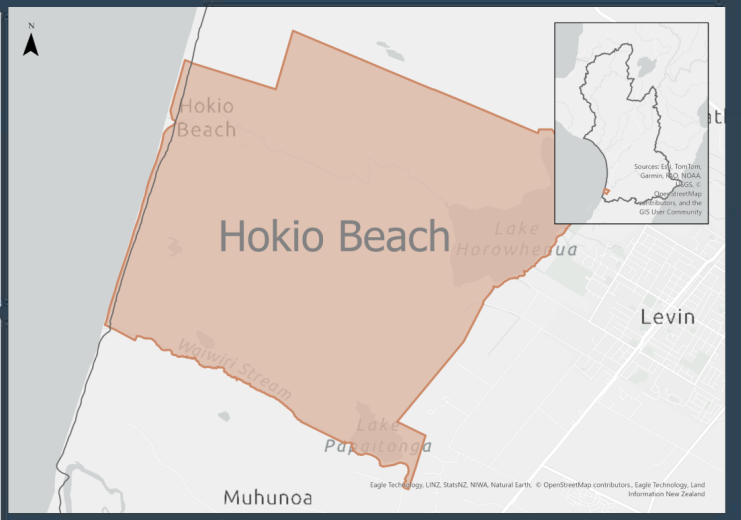
# FLOOD VULNERABILITY ASSESSMENT: HOKIO BEACH

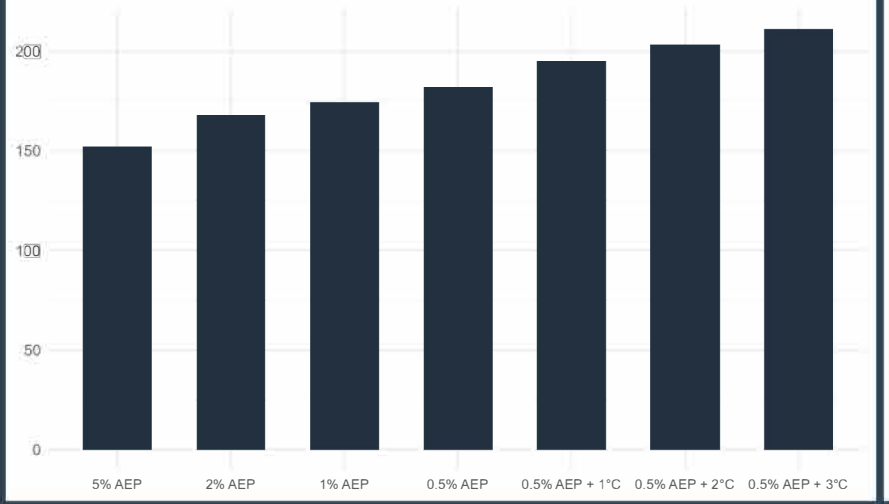
Horizons Regional Council engaged WSP and Earth Sciences NZ to lead the Horizons Flood Vulnerability Assessment, which developed a comprehensive regional flood model to evaluate the flood vulnerability of communities within the Horizons Region. This is a summary of the findings for Hokio Beach, which has a population of 405 with 907 buildings. The model results show the number of buildings impacted and the estimate costs to repair those buildings in floods of different severity. For more detailed information on the flood vulnerability assessment, please refer to the Horizons Regional Council Flood Vulnerability Assessment Report (WSP 2026). The information provided in this document has been developed for a regional view of flood risk. Horizons Regional Council or Horowhenua District Council may hold more specific models and outputs that may be more reliable for decision making.



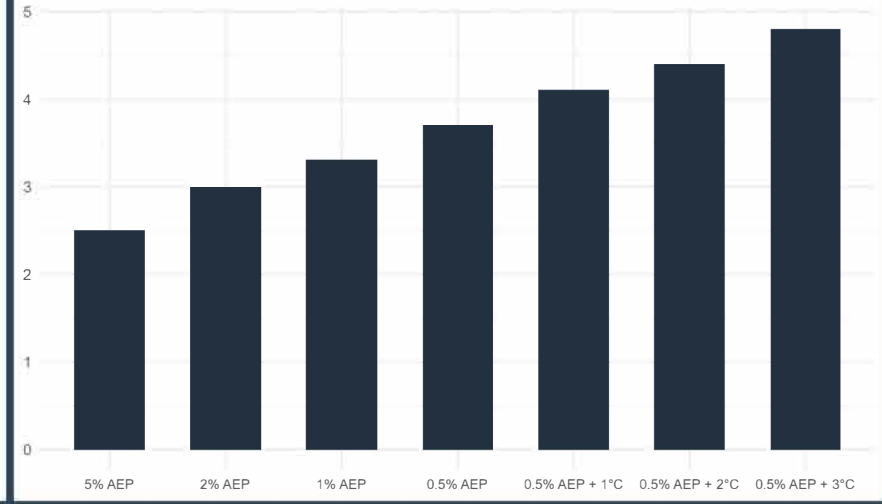

In Hokio Beach, as flood events become more severe, both the extent of flooding and the depth of water increase. Annual Exceedance Probabilities (AEP) indicates the likelihood of a flood event occurring in any given year. For example, a 5% AEP means there is a 5% chance of a flood event exceeding this occurring in any given year; whilst a 0.5% AEP means there is a 0.5% chance in any given year.

The modelling found that approximately 152 buildings could be affected in a 5% AEP flood scenario, with an estimated repair cost $2 Million. However, in a flood scenario of 0.5% AEP + 3°C of warming due to climate change, the estimated number of effected buildings increases to 211 with repair costs of around $5 Million. The extent of flooding in this community may be influenced by coastal sea levels. This is based on regional flood modelling, stormwater networks and their benefits for managing surface water have not been included in this model, leading to conservative impact estimates.

Number of buildings impacted by flooding




Estimated cost to repair flood damage to buildings ($M)




## Summary

In Hokio Beach, 152 to 211 buildings could be impacted by flooding.

This is 17% to 23% of buildings in Hokio Beach that could be impacted by flooding.

Out of the 52 settlements in the Horizons Region, Hokio Beach ranks 27th for the number of buildings affected, and 16th for the percentage of buildings within a town settlement affected.

The information presented on this page is a representation of the findings of the Flood Vulnerability Assessment; features shown may not be in their true extent and location. Models have a level of uncertainty, this was derived from a "Level A" Regional Scale model, which is not intended for property level use. Horizons has other flood models which may be a better fit to describe modelled flooding in your particular location; for further information, and terms and conditions of use, see: https://experience.arcgis.com/experience/3f7b4ec2f6f14503af1146ce412de39e

For more information contact us at https://www.horizons.govt.nz/contact-us

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Earth Sciences New Zealand

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Prepared On

01/07/2025

# Horizons Region Flood Vulnerability Assessment

## Flood scenario: 5% annual exceedance probability, flood defences up, 0 degrees warming due to climate change, sea level rise excluded

**Community**
Hokio Beach,
Horowhenua District

**Scale** 1:36,000 at A3

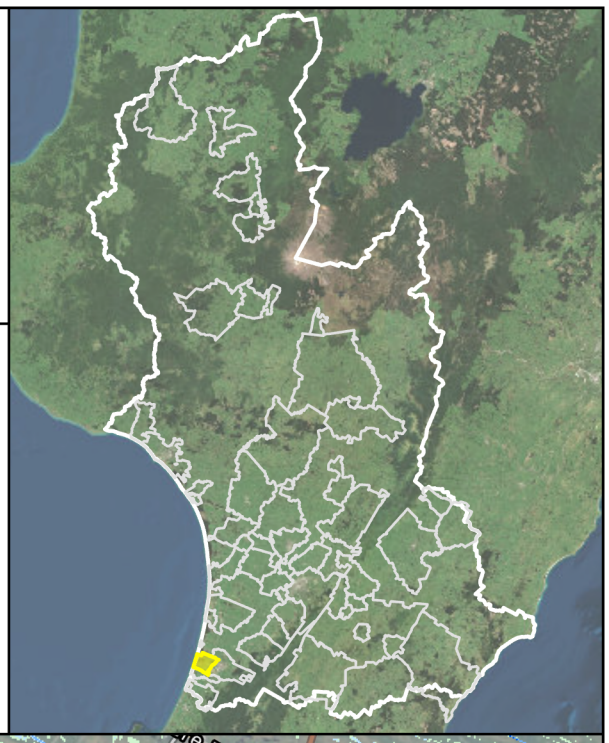
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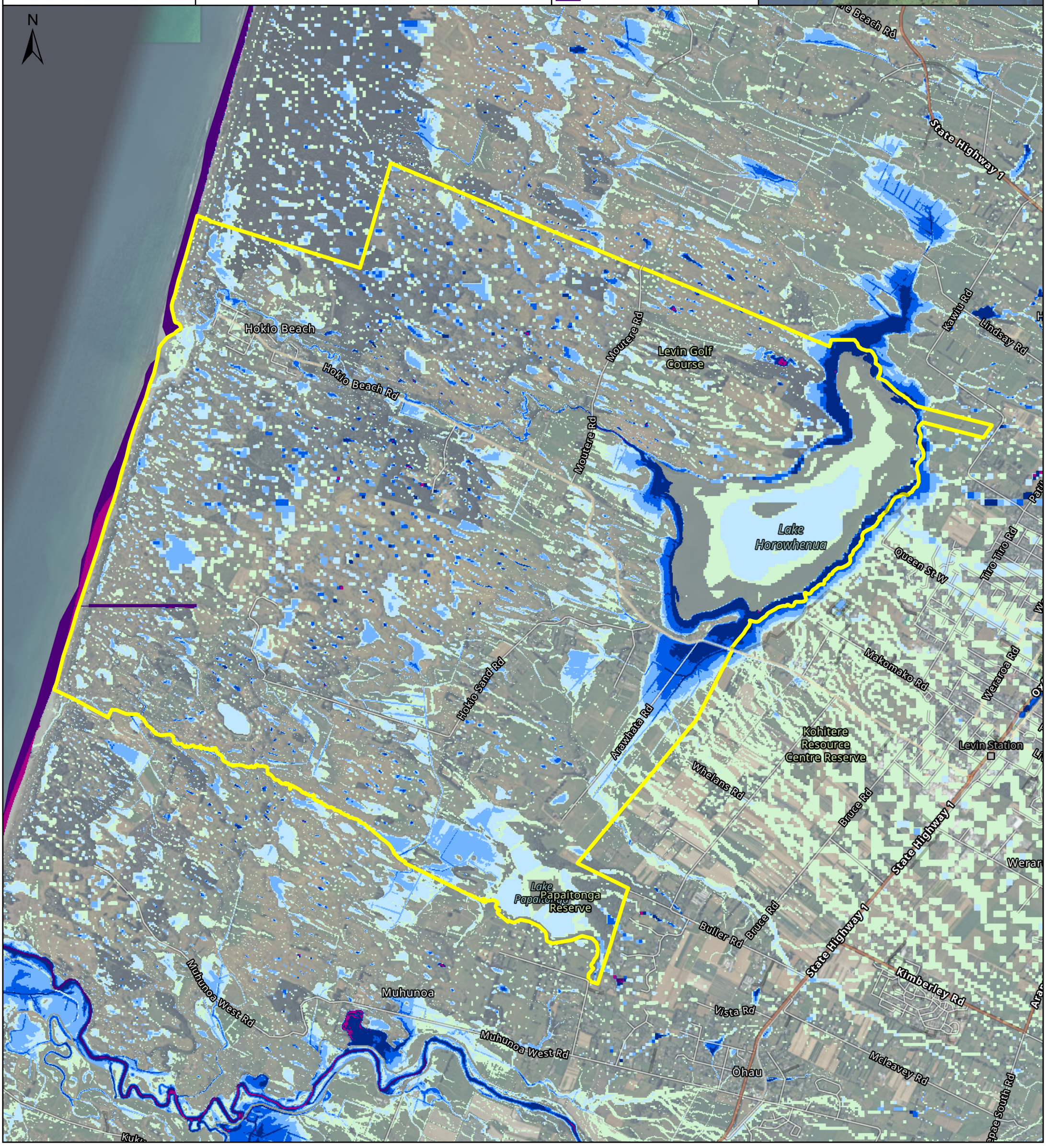
**Legend**

- Community Boundary

Flood Depth (m)

- 0.05 - 0.20
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- 2.5 - 3.5
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# Horizons Region Flood Vulnerability Assessment

## Flood scenario: 2% annual exceedance probability, flood defences up, 0 degrees warming due to climate change, sea level rise excluded

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**Scale** 1:36,000 at A3

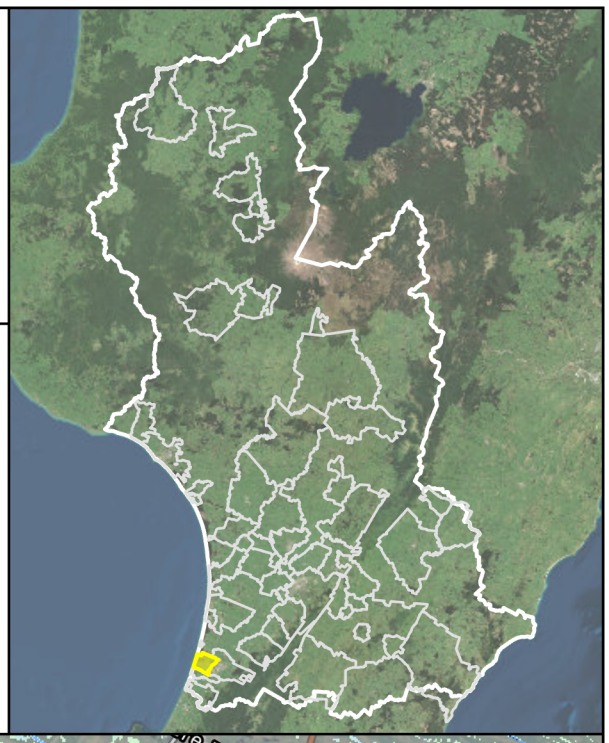
0 1 2 Km

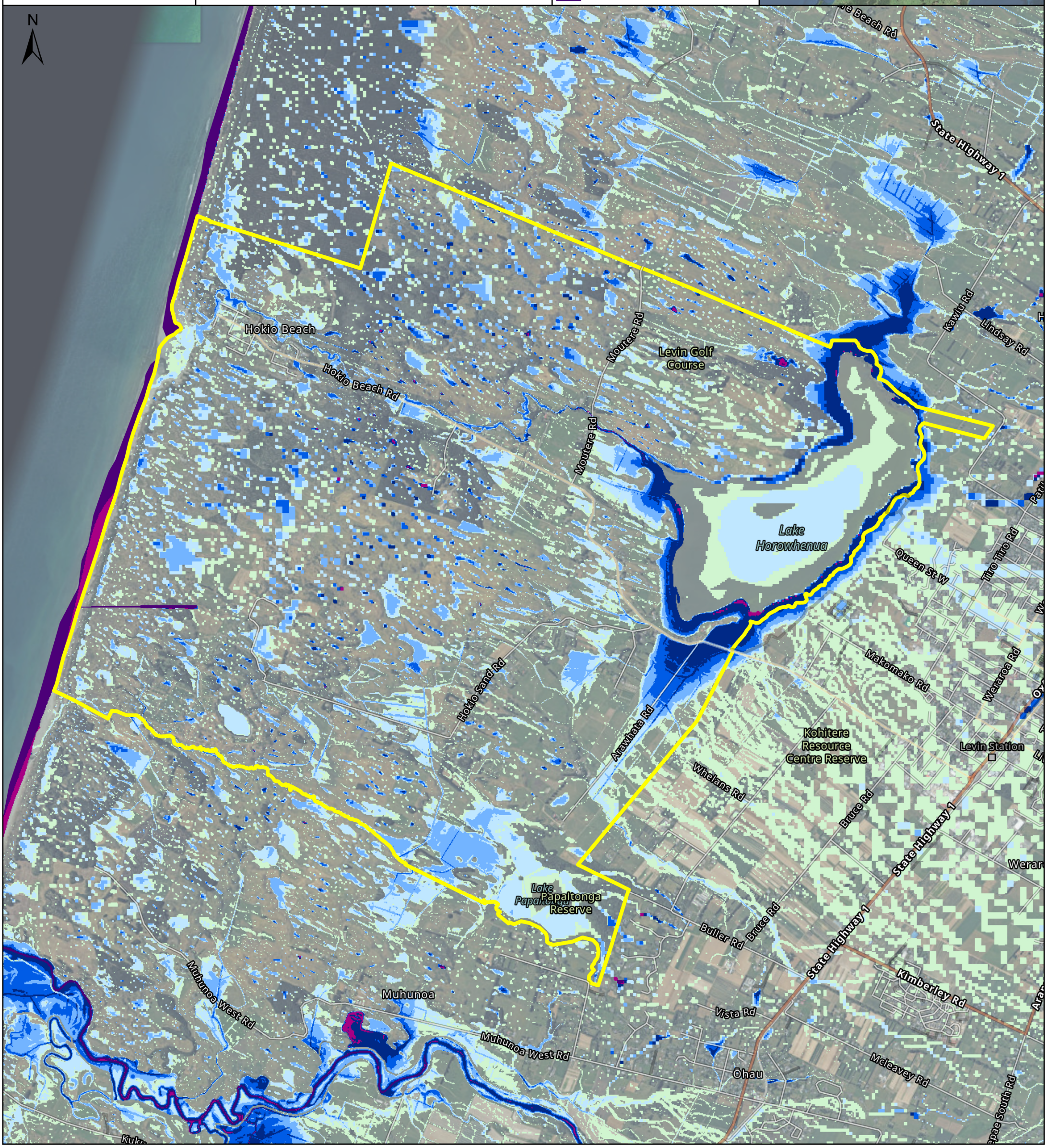
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## Flood scenario: 1% annual exceedance probability, flood defences up, 0 degrees warming due to climate change, sea level rise excluded

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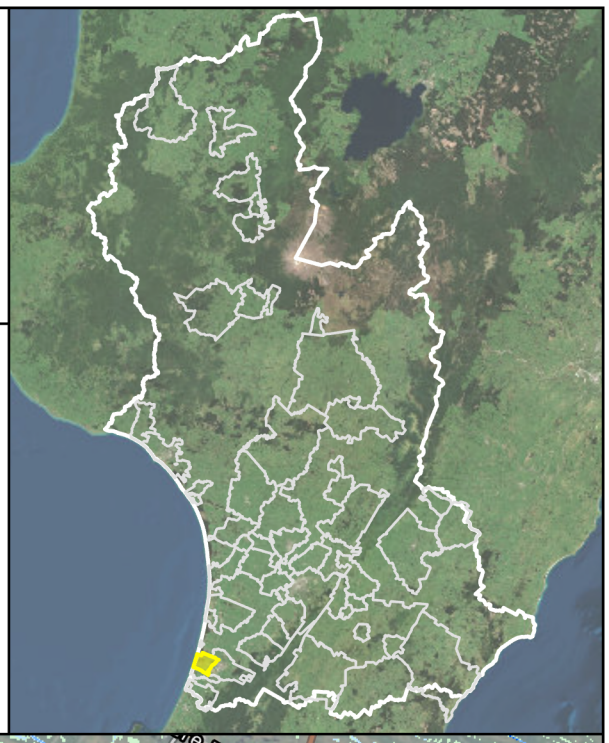
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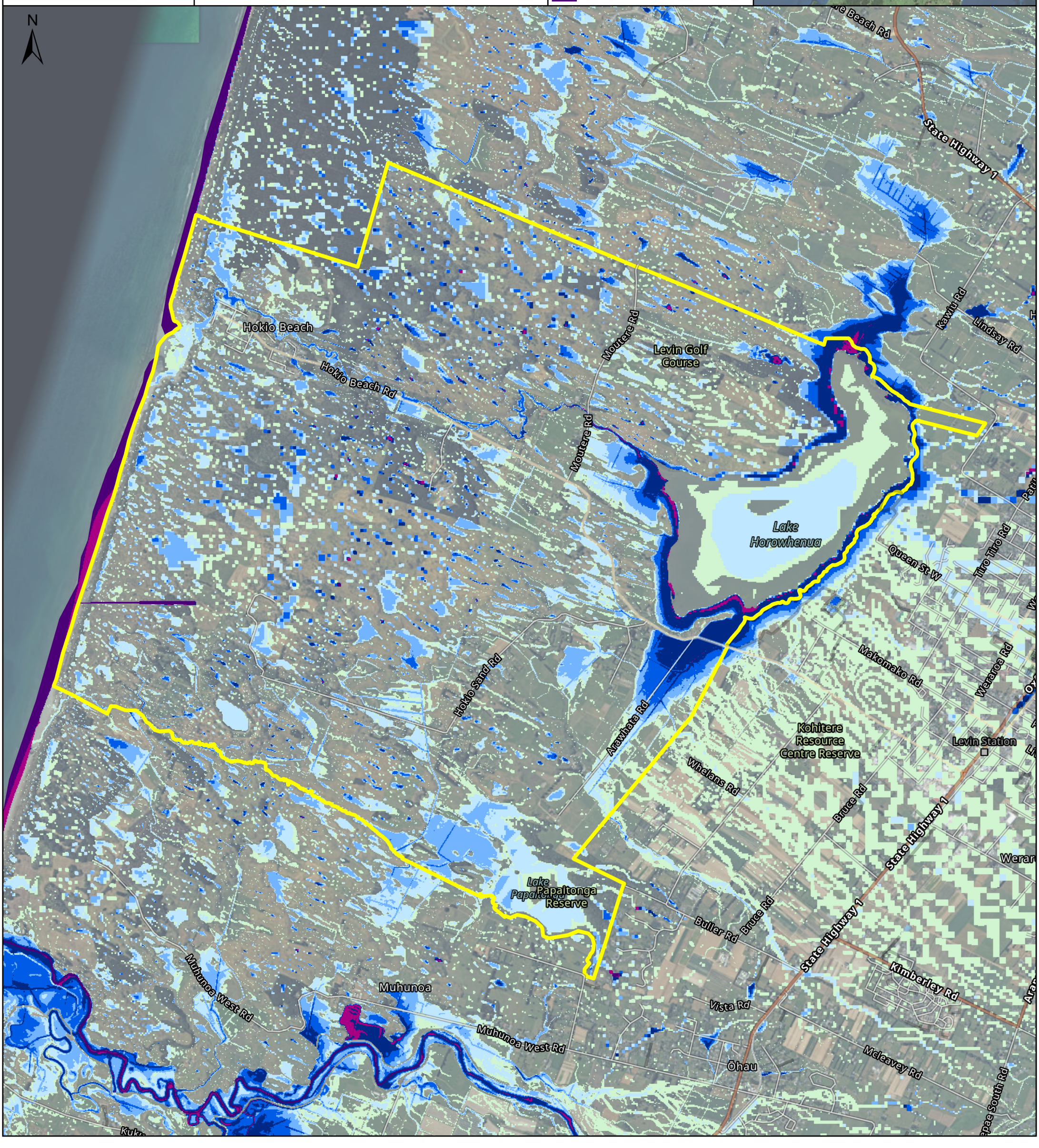
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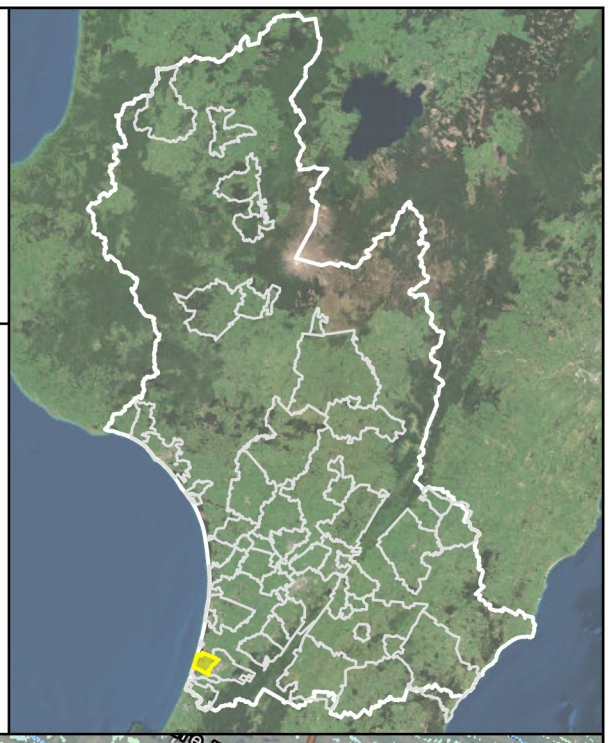
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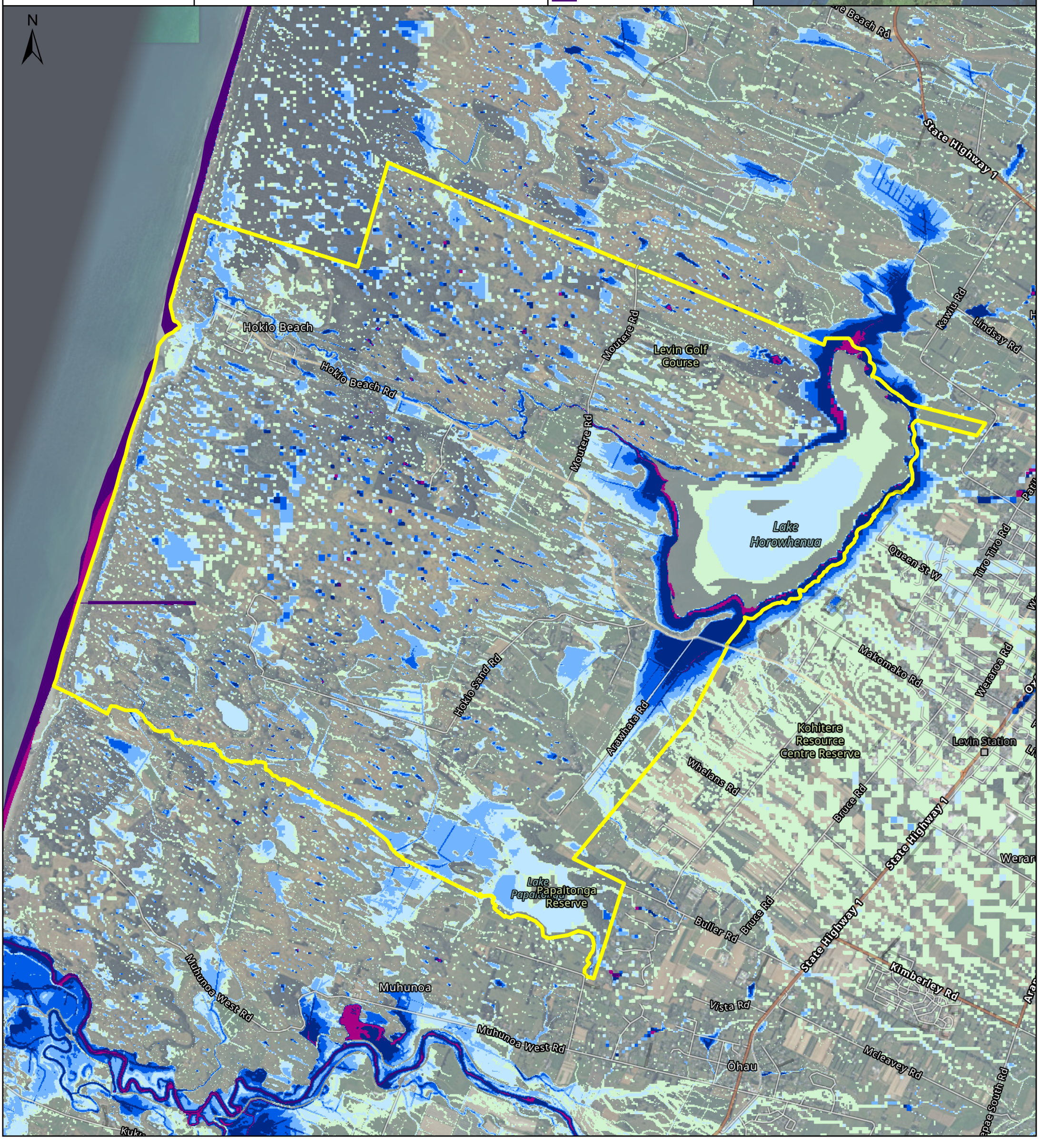
**Legend**

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Flood Depth (m)

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# Horizons Region Flood Vulnerability Assessment

## Flood scenario: 0.5% annual exceedance probability, flood defences up, 1 degree warming due to climate change, sea level rise excluded

**Community**
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Horowhenua District

**Scale** 1:36,000 at A3

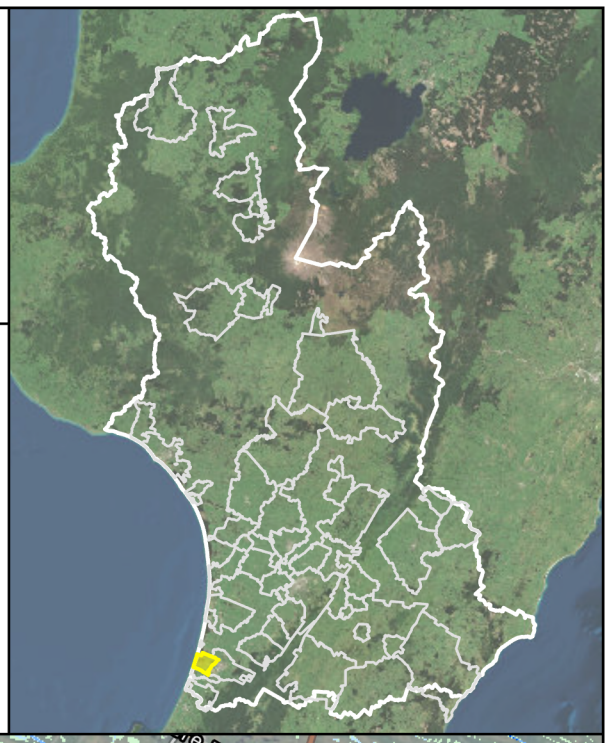
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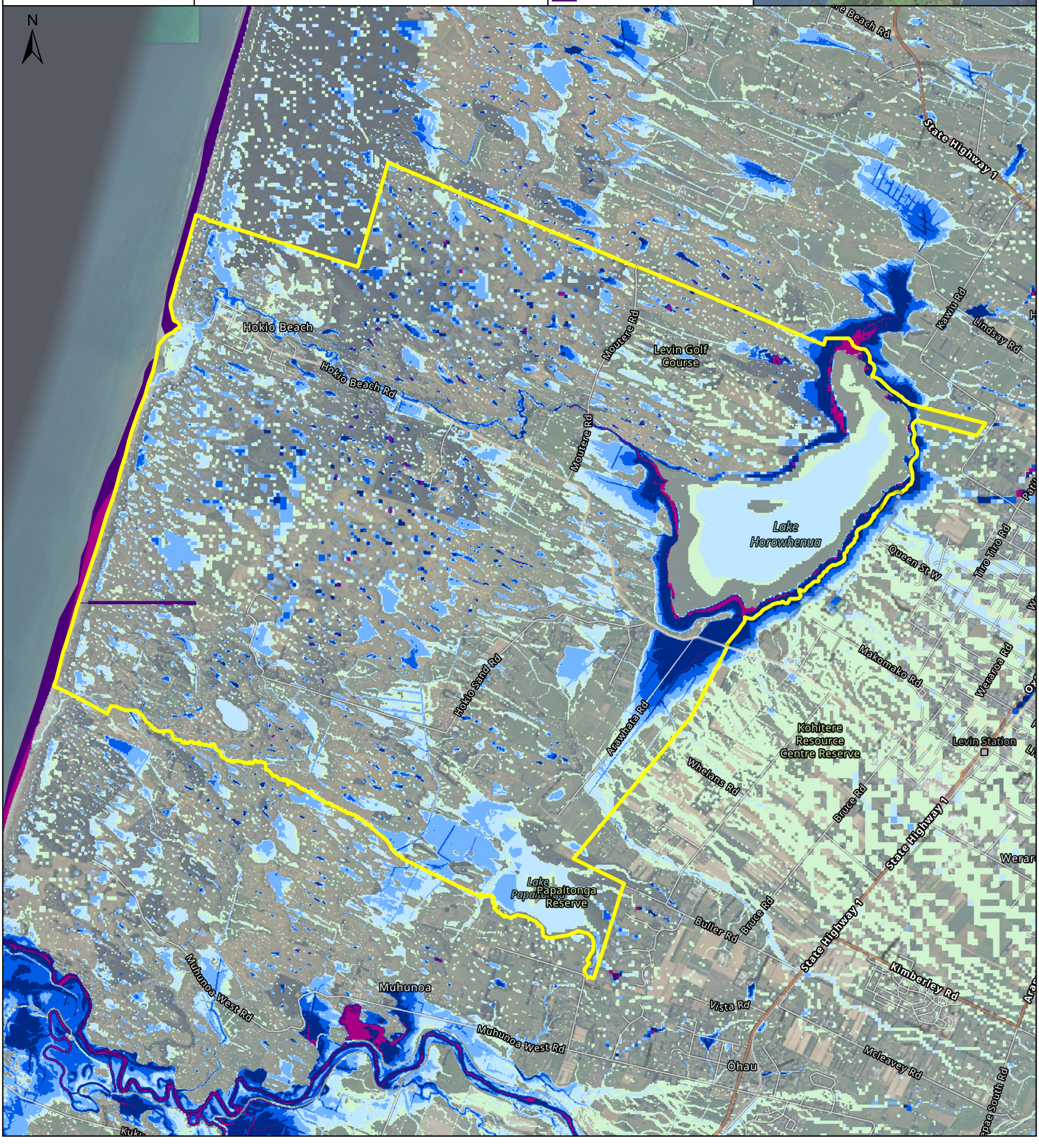
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# Horizons Region Flood Vulnerability Assessment

## Flood scenario: 0.5% annual exceedance probability, flood defences up, 2 degrees warming due to climate change, sea level rise excluded

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Horowhenua District

**Scale** 1:36,000 at A3

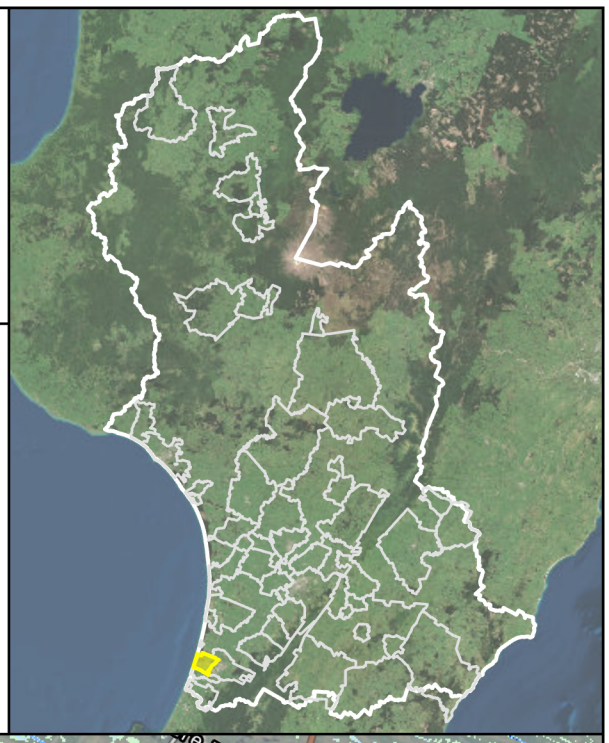
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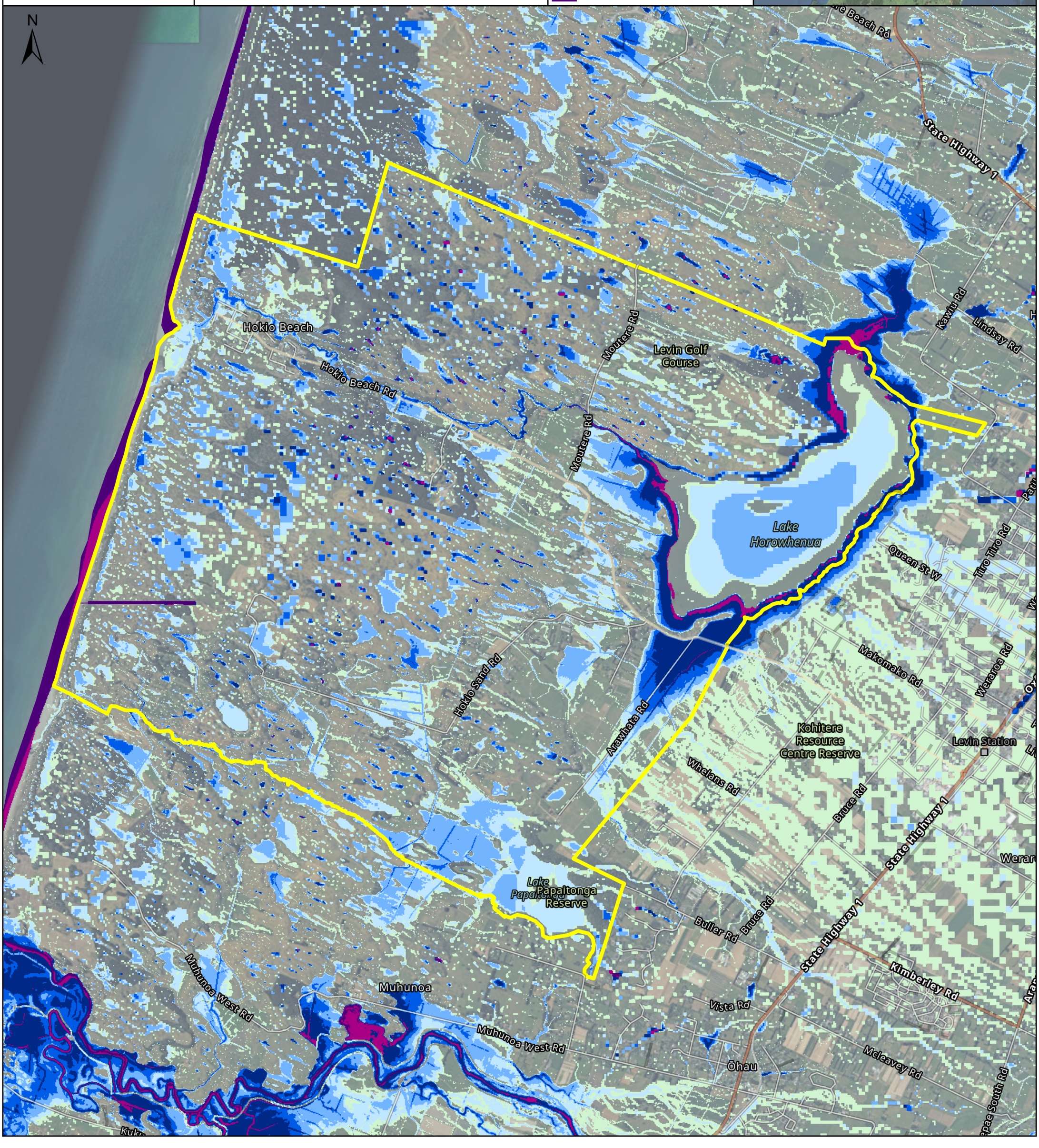
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# Horizons Region Flood Vulnerability Assessment

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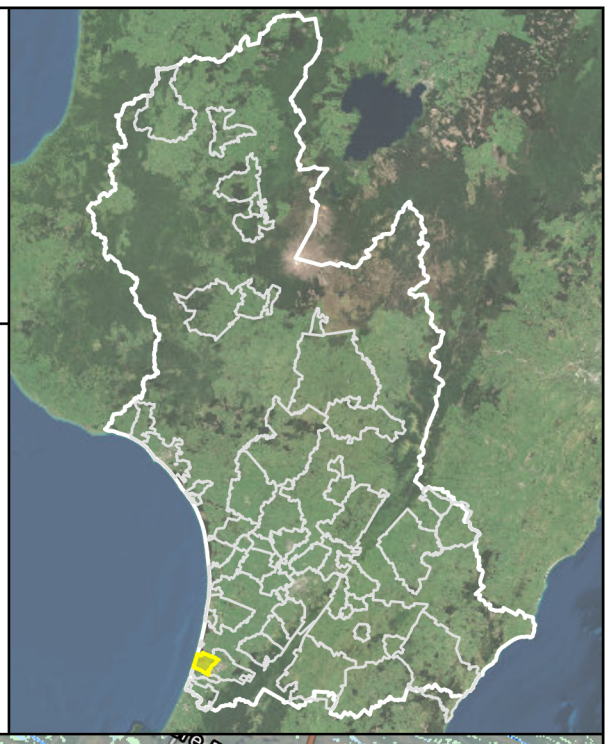
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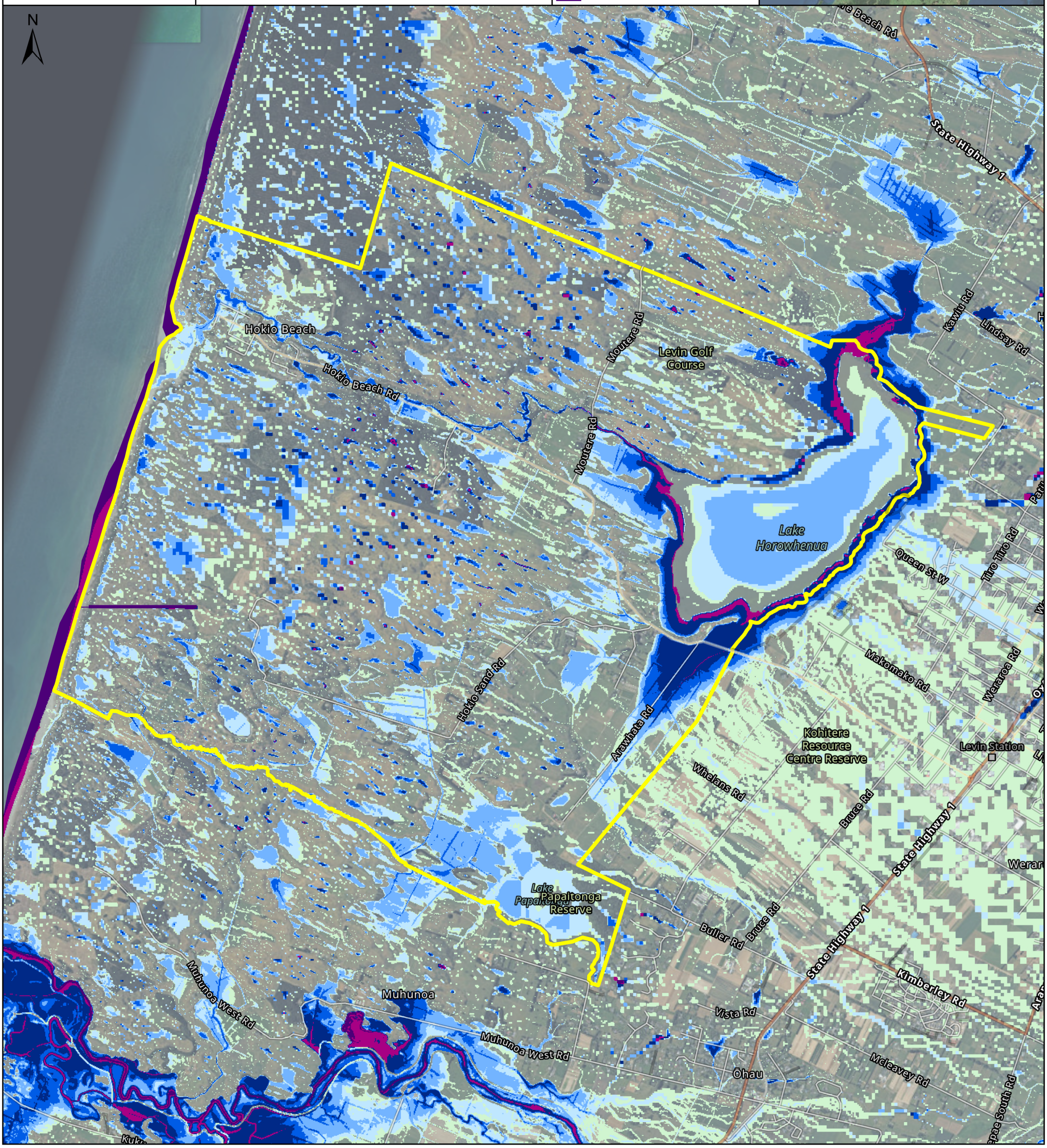
**Legend**

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# Horizons Region Flood Vulnerability Assessment

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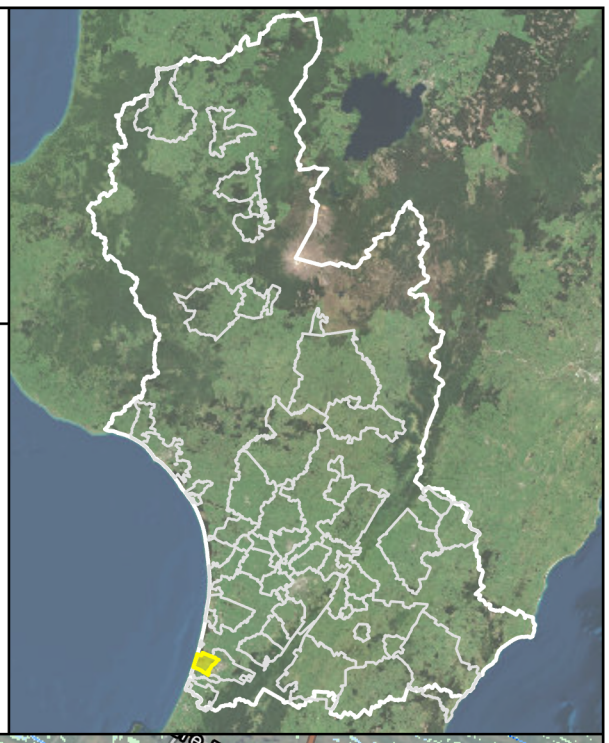
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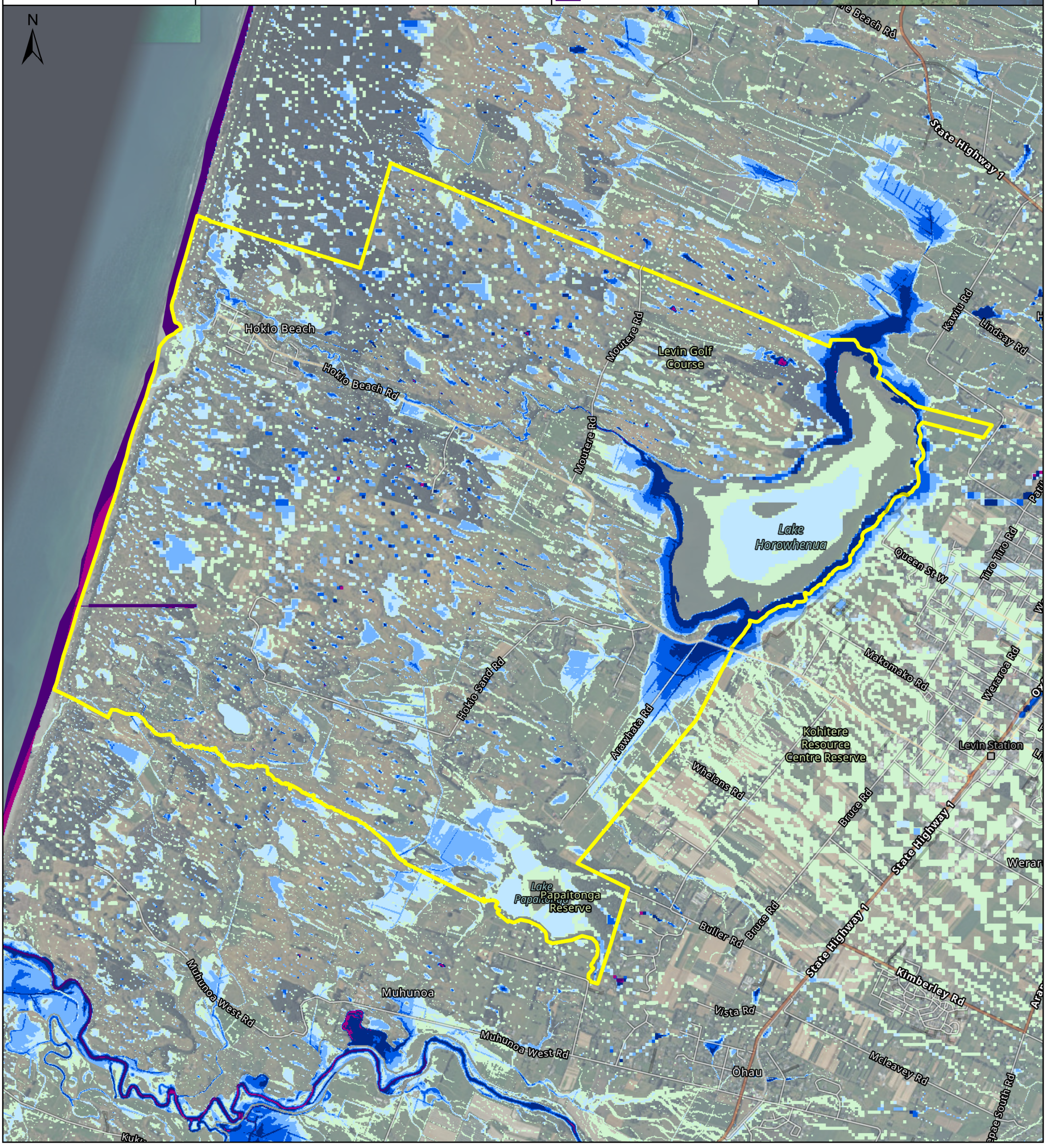
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# Horizons Region Flood Vulnerability Assessment

## Flood scenario: 2% annual exceedance probability, flood defences up, 0 degrees warming due to climate change, sea level rise excluded

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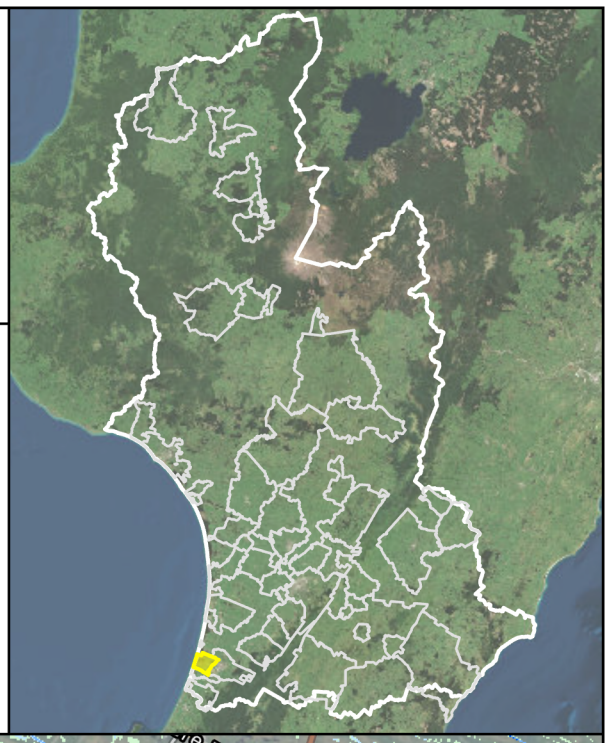
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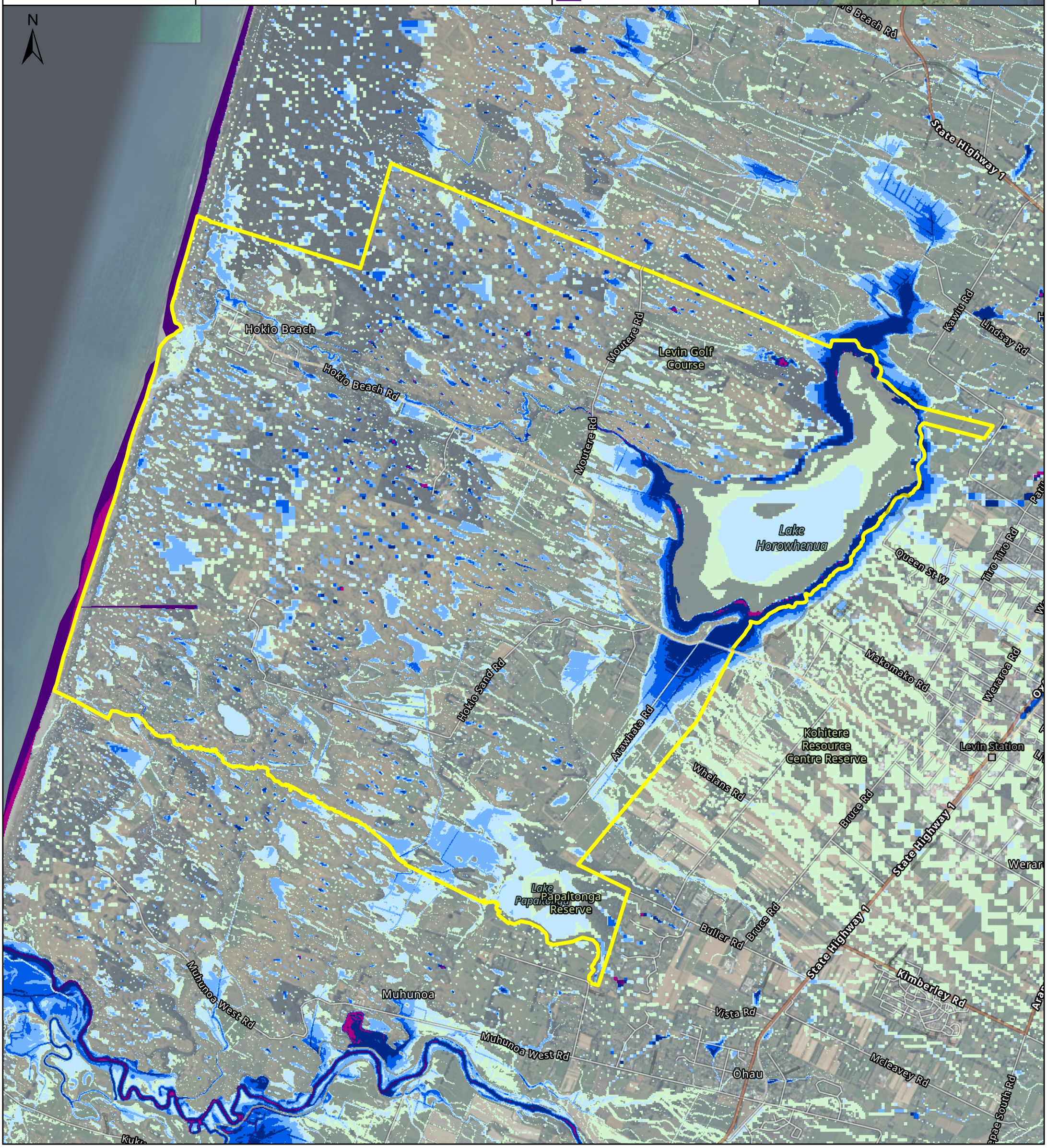
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## Flood scenario: 1% annual exceedance probability, flood defences up, 0 degrees warming due to climate change, sea level rise excluded

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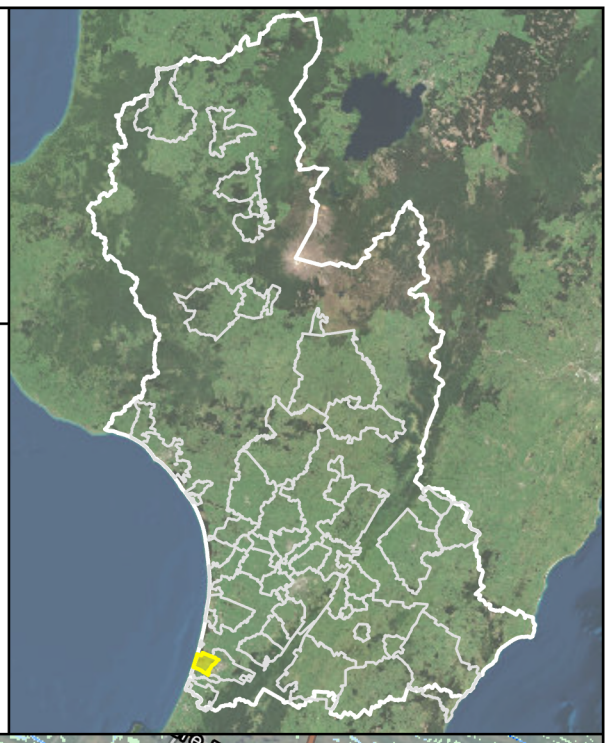
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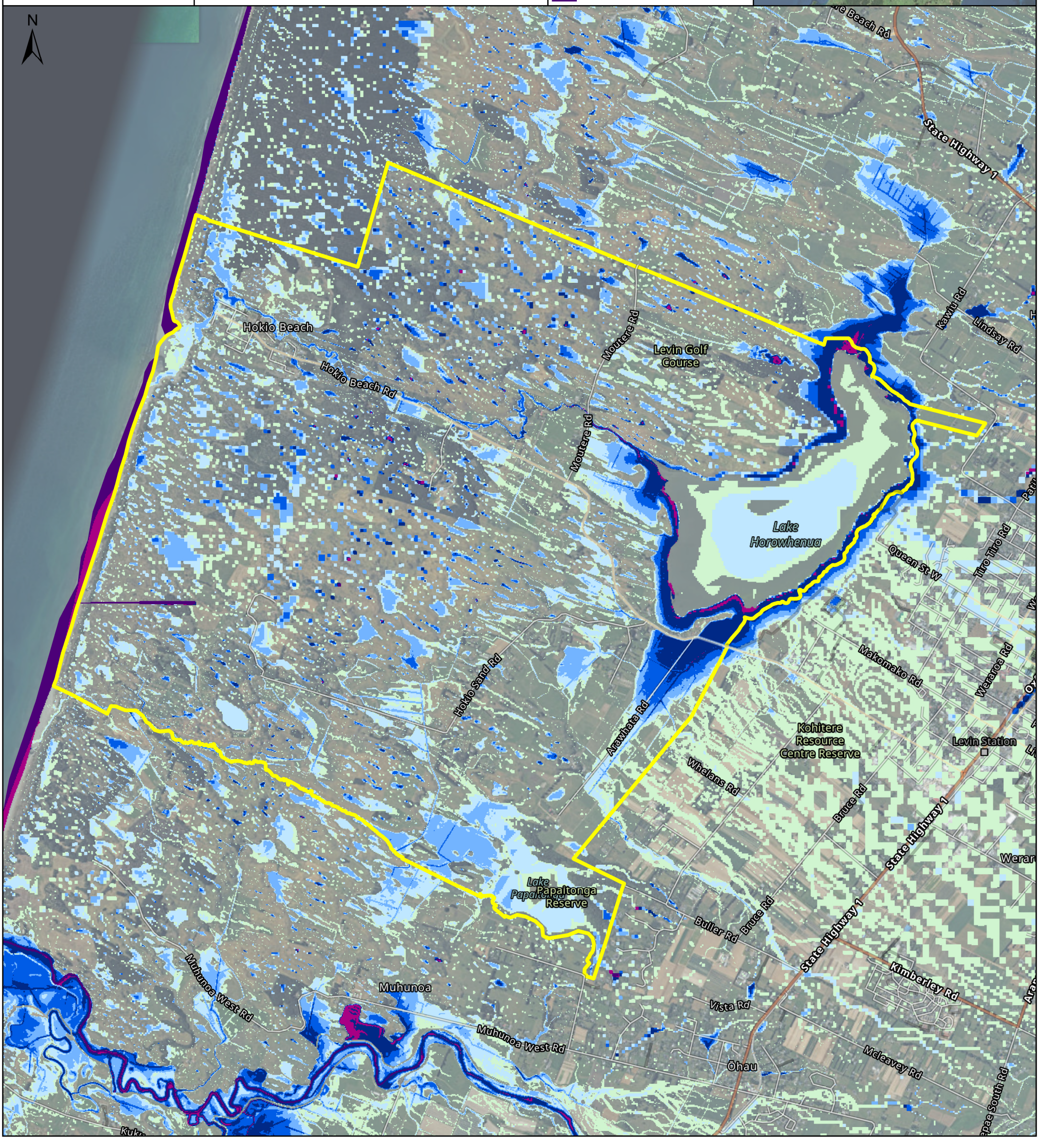
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# Horizons Region Flood Vulnerability Assessment

## Flood scenario: 0.5% annual exceedance probability, flood defences up, 0 degrees warming due to climate change, sea level rise excluded

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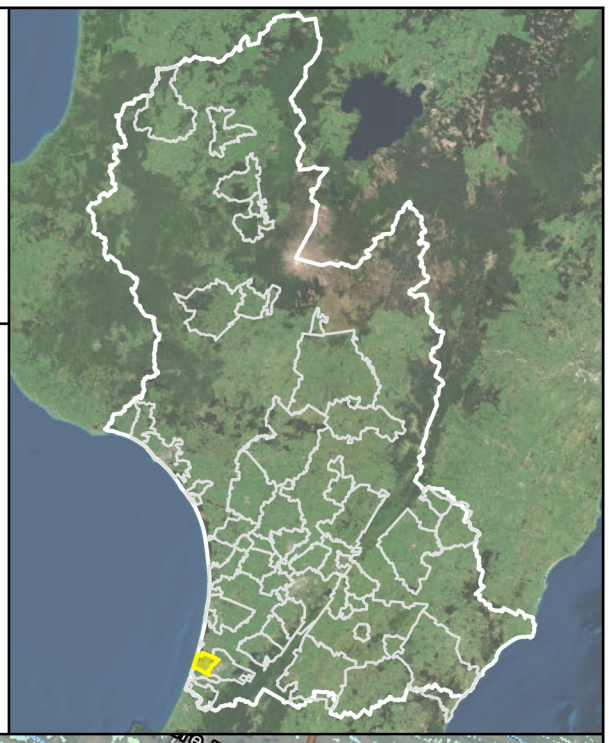
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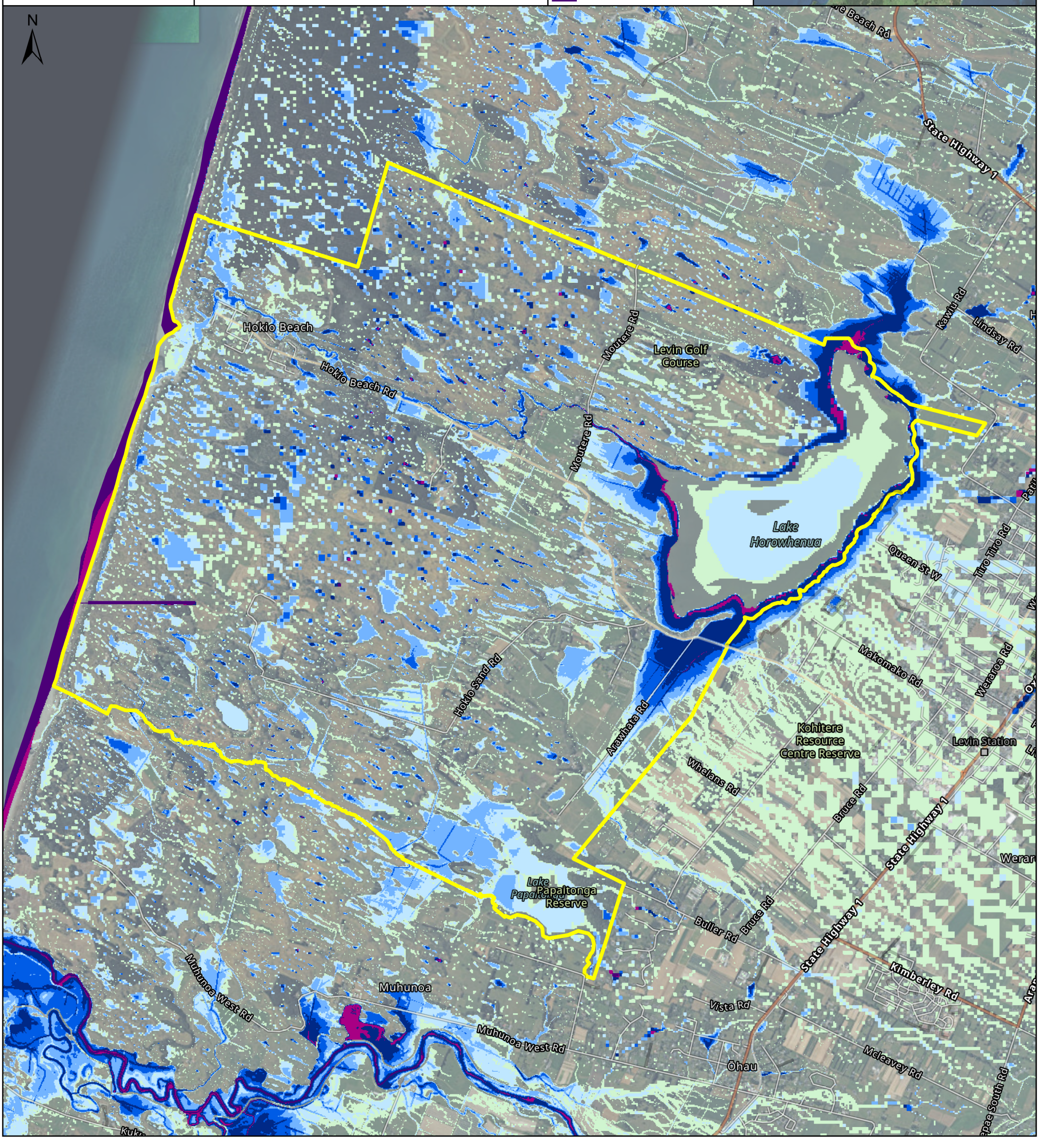
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# Horizons Region Flood Vulnerability Assessment

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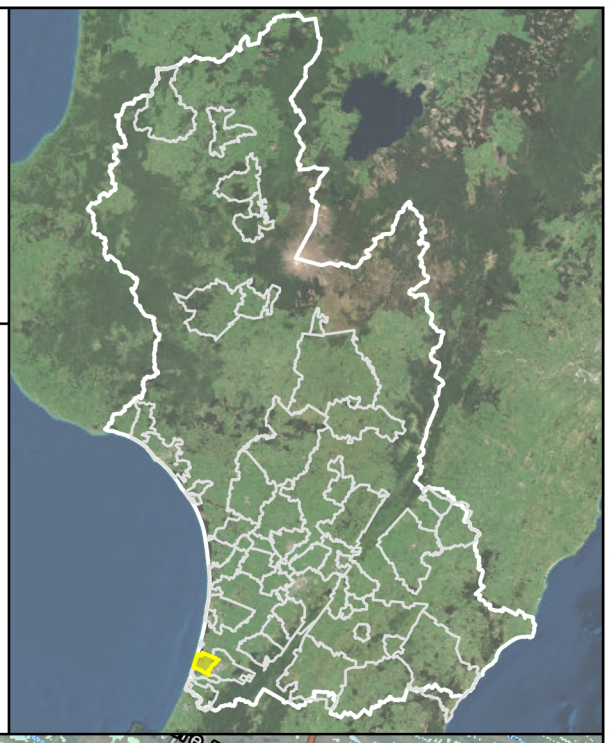
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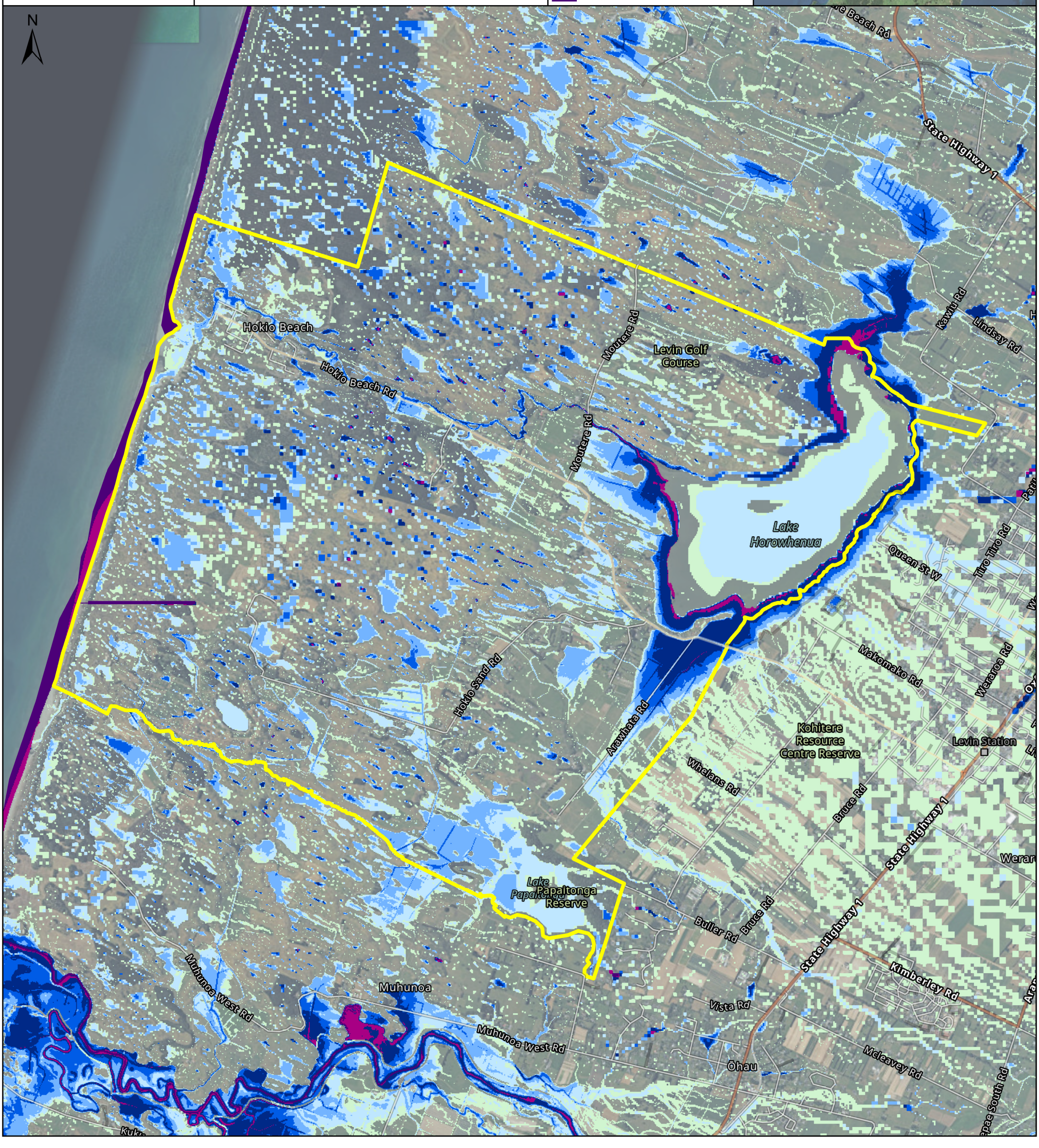
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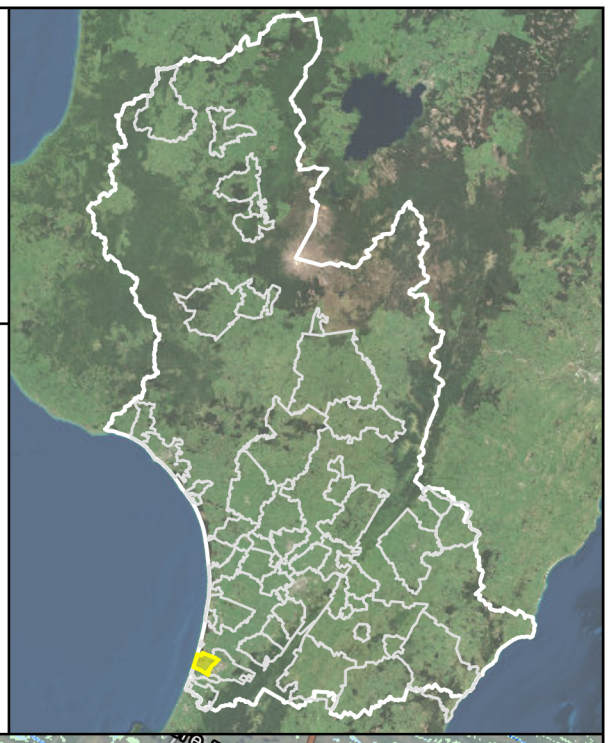
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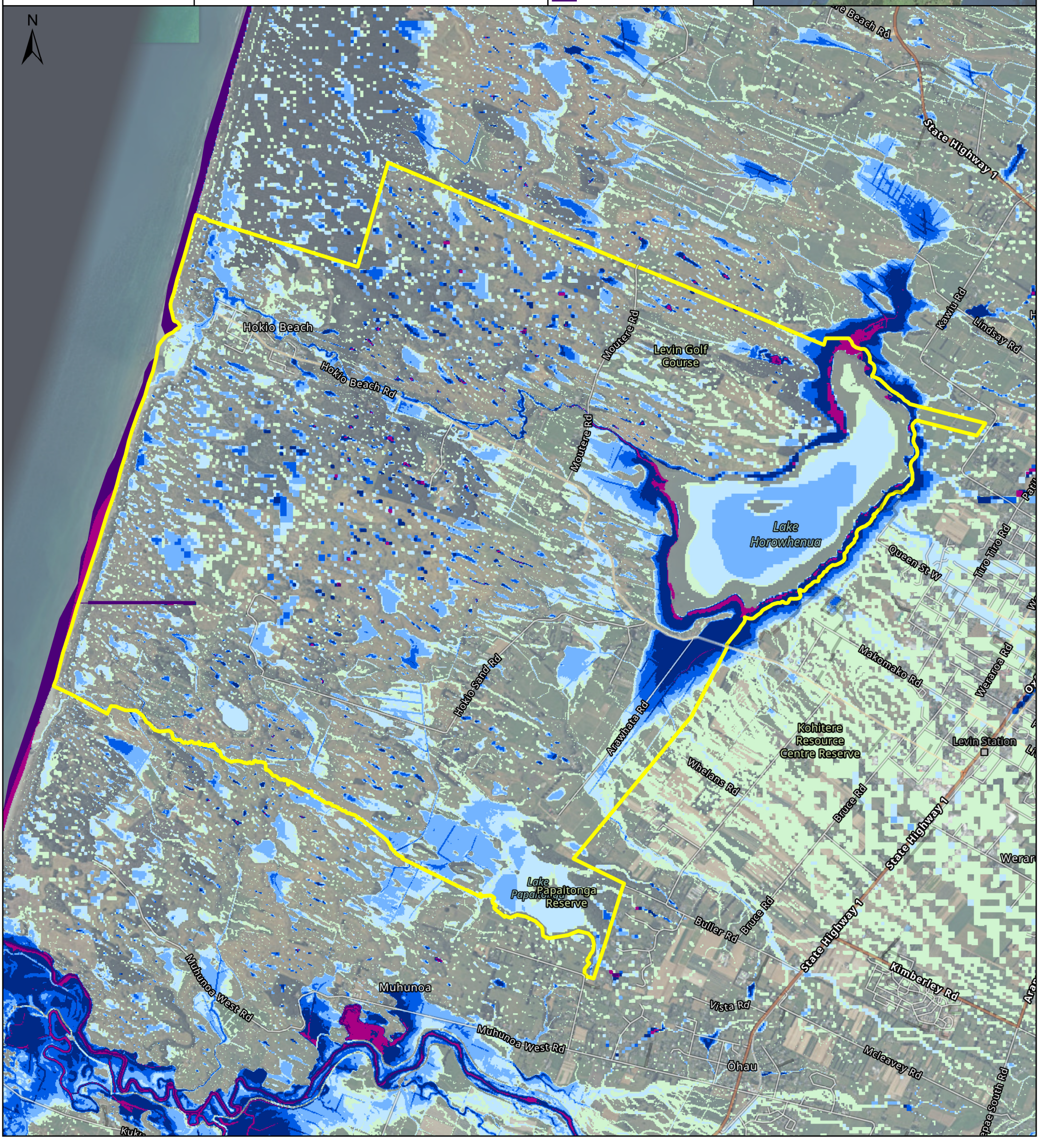
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# Horizons Region Flood Vulnerability Assessment

## Flood scenario: 0.5% annual exceedance probability, flood defences up, 3 degrees warming due to climate change, sea level rise excluded

**Community**
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**Scale** 1:36,000 at A3

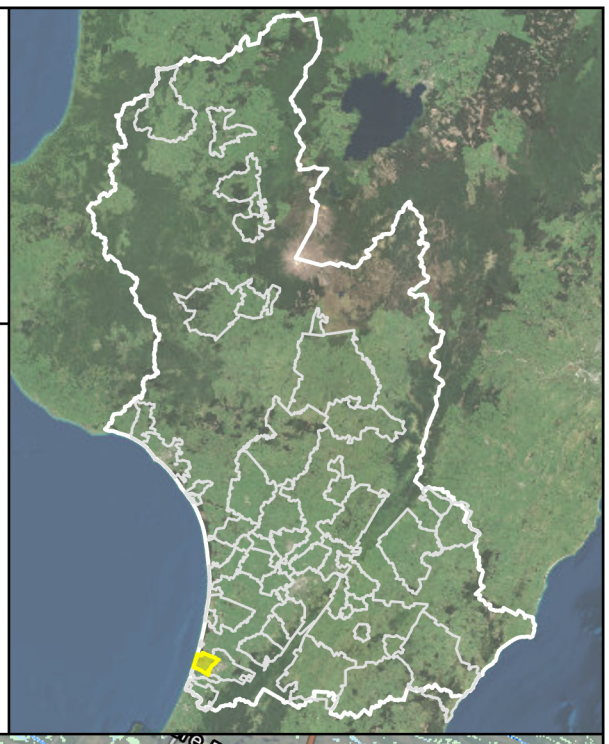
0 1 2 Km

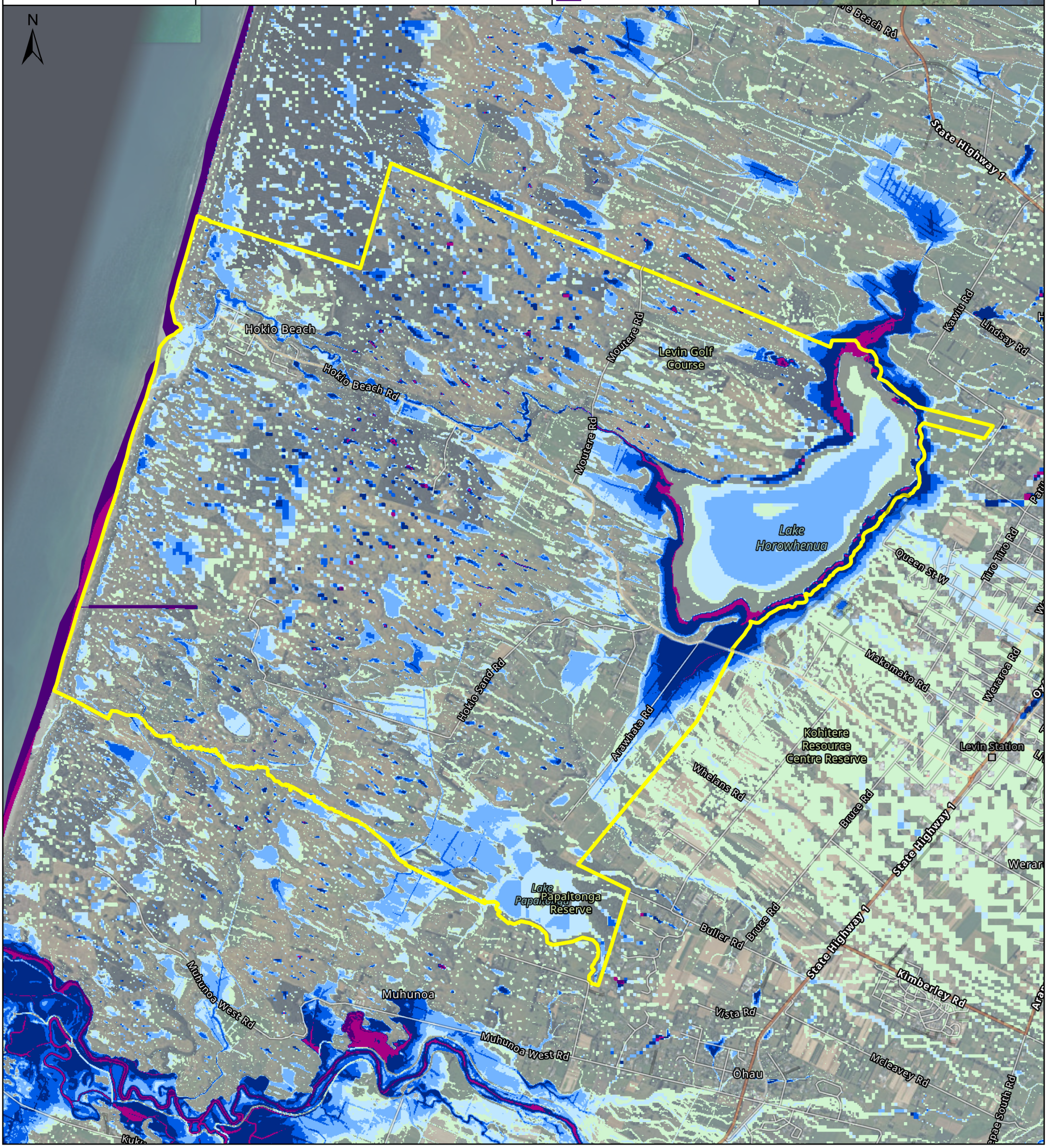
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# Horizons Region Flood Vulnerability Assessment

## Flood scenario: 0.5% annual exceedance probability, flood defences up, 3 degrees warming due to climate change, sea level rise included

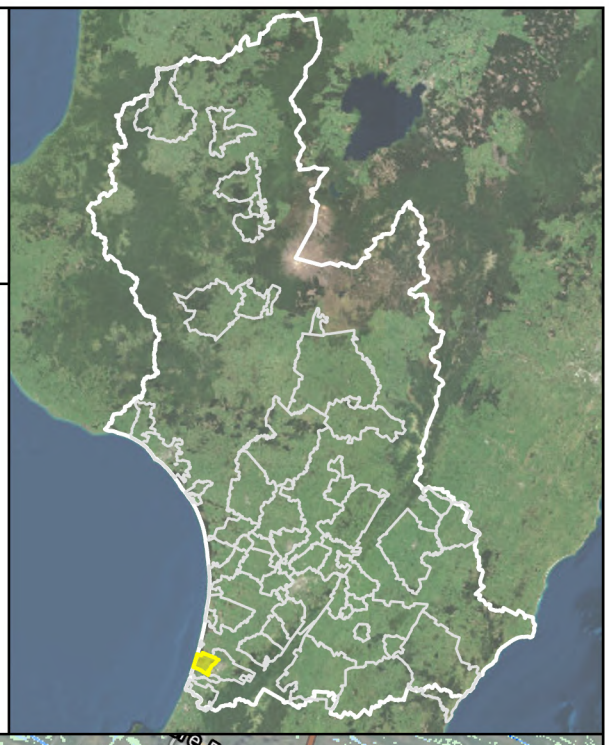
**Community**
Hokio Beach,
Horowhenua District

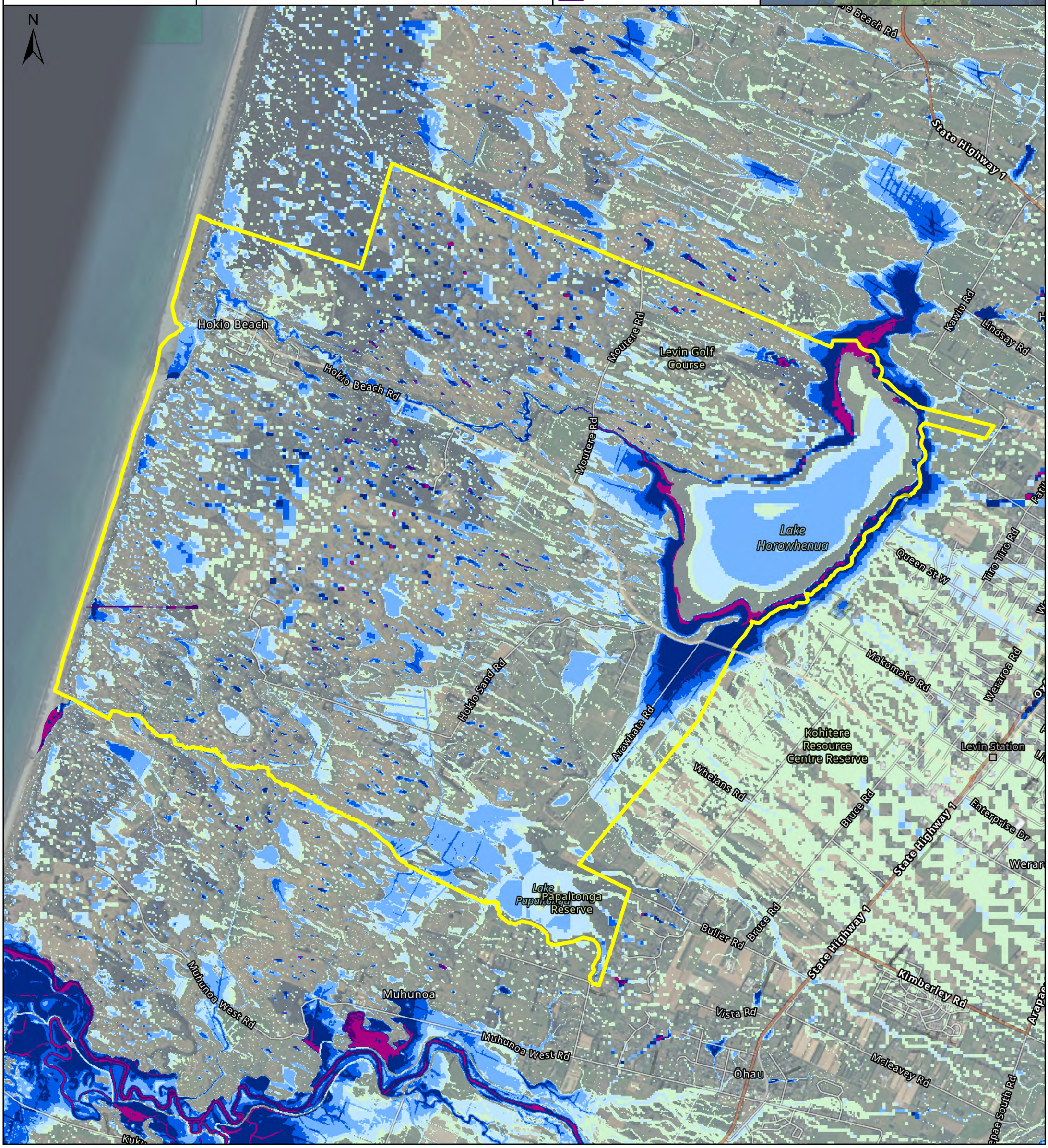
**Scale** 1:36,000 at A3

0 1 2 Km

**Legend**
- Community Boundary

Flood Depth (m)
- 0.05 - 0.20
- 0.2 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.5
- 2.5 - 3.5
- >3.5





Prepared For

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Prepared By

wsp

NIWA Taihoro Nukurangi

**Prepared On**
05/08/2025

# Horizons Region Flood Vulnerability Assessment

## Flood scenario: 0.2% annual exceedance probability, flood defences up, 0 degrees warming due to climate change, sea level rise excluded

**Community**
Hokio Beach,
Horowhenua District

**Scale** 1:36,000 at A3

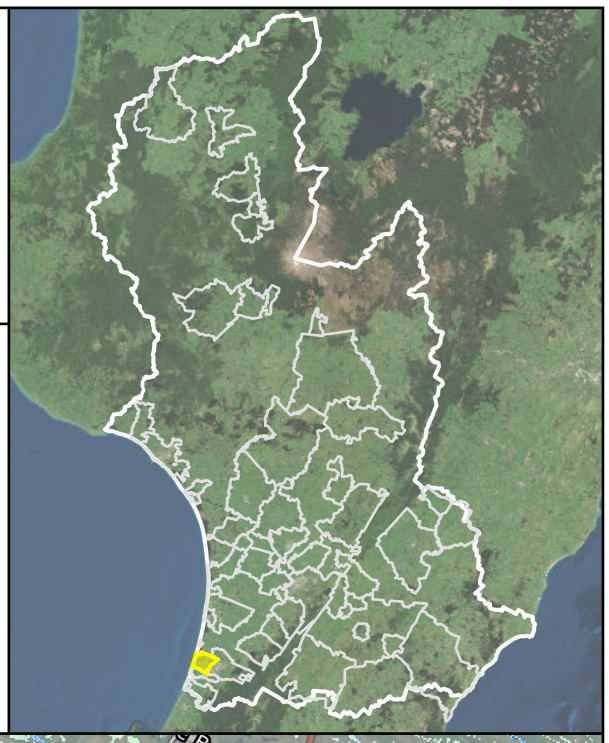
0 1 2 Km

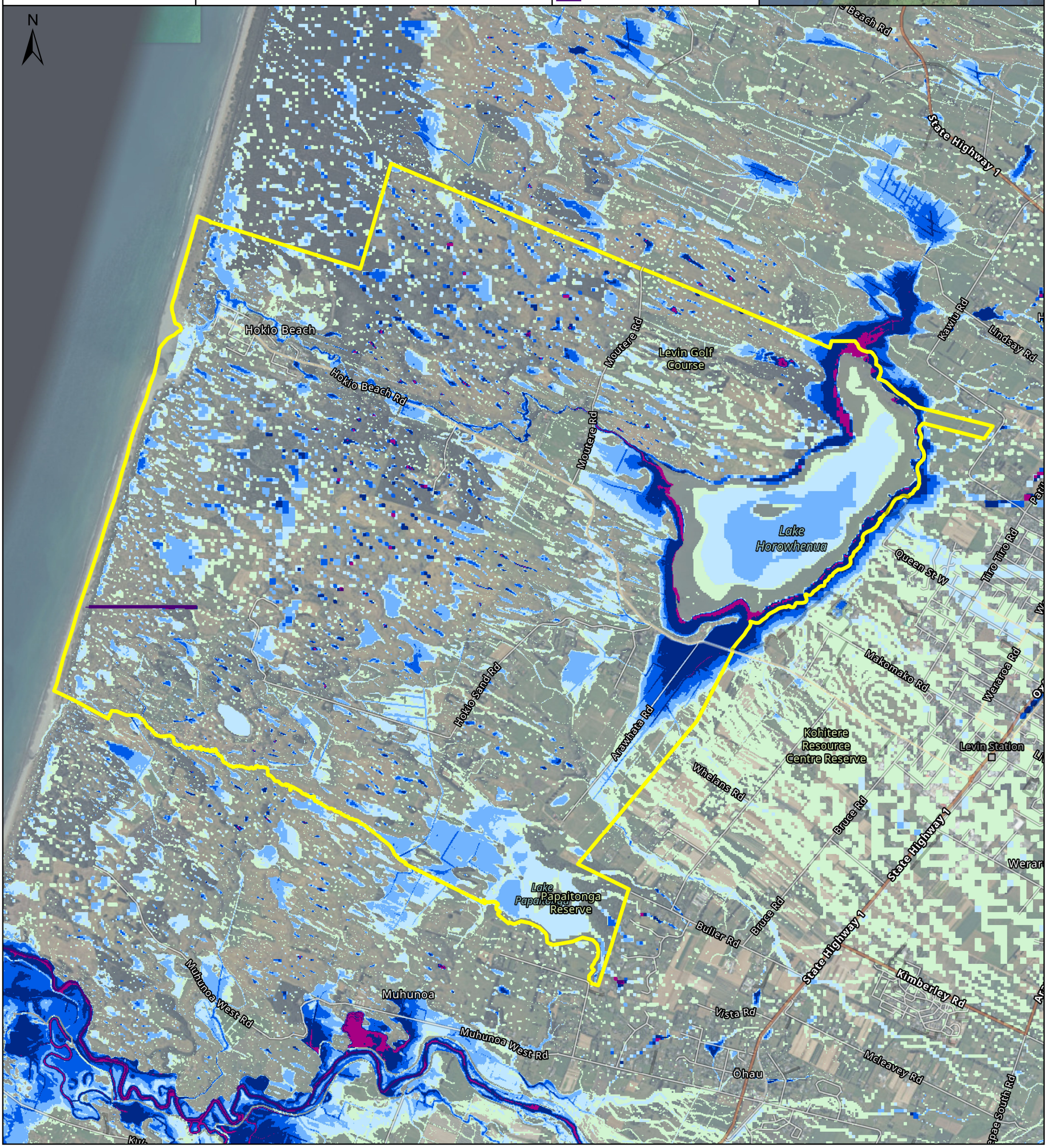
**Legend**

- Community Boundary

Flood Depth (m)

- 0.05 - 0.20
- 0.2 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.5
- 2.5 - 3.5
- >3.5





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# Horizons Region Flood Vulnerability Assessment

## Flood scenario: 0.2% annual exceedance probability, flood defences up, 1 degree warming due to climate change, sea level rise excluded

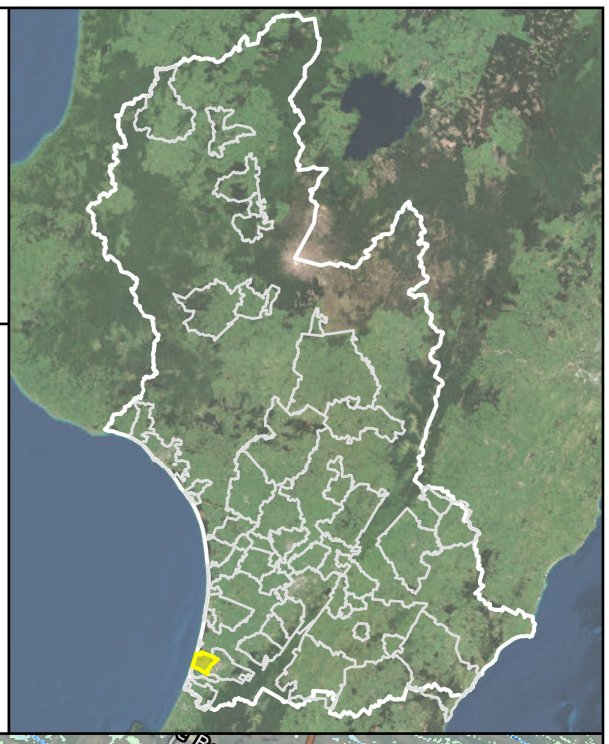
**Community**
Hokio Beach,
Horowhenua District

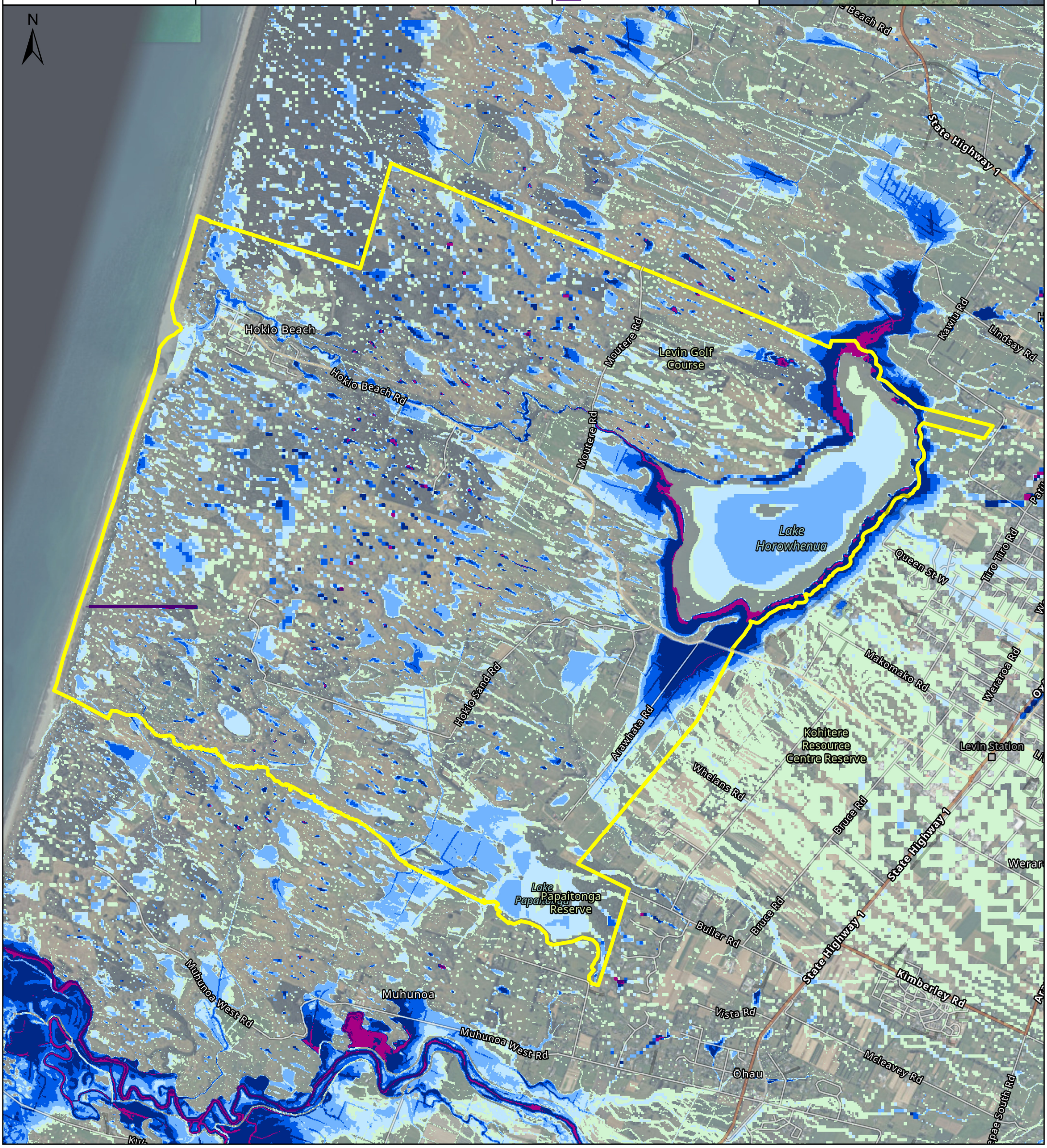
**Scale** 1:36,000 at A3

0 1 2 Km

**Legend**
- Community Boundary

Flood Depth (m)
- 0.05 - 0.20
- 0.2 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.5
- 2.5 - 3.5
- >3.5





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# Horizons Region Flood Vulnerability Assessment

## Flood scenario: 0.2% annual exceedance probability, flood defences up, 2 degrees warming due to climate change, sea level rise excluded

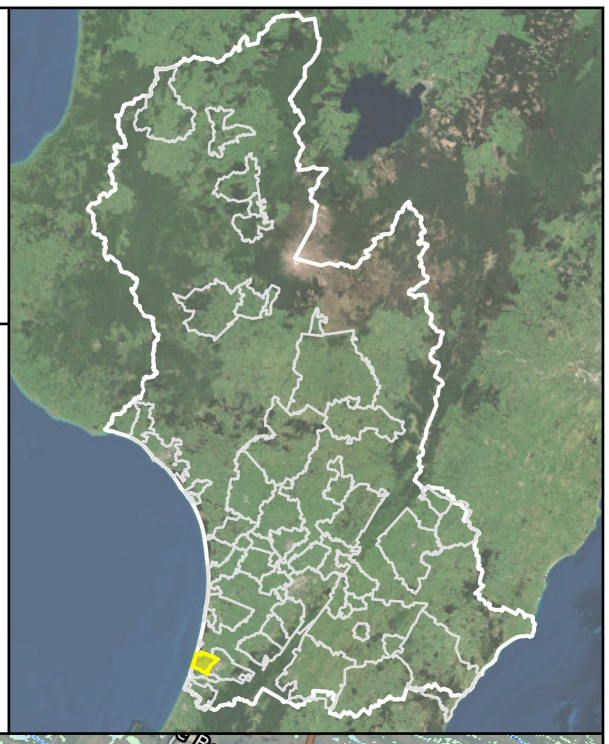
**Community**
Hokio Beach,
Horowhenua District

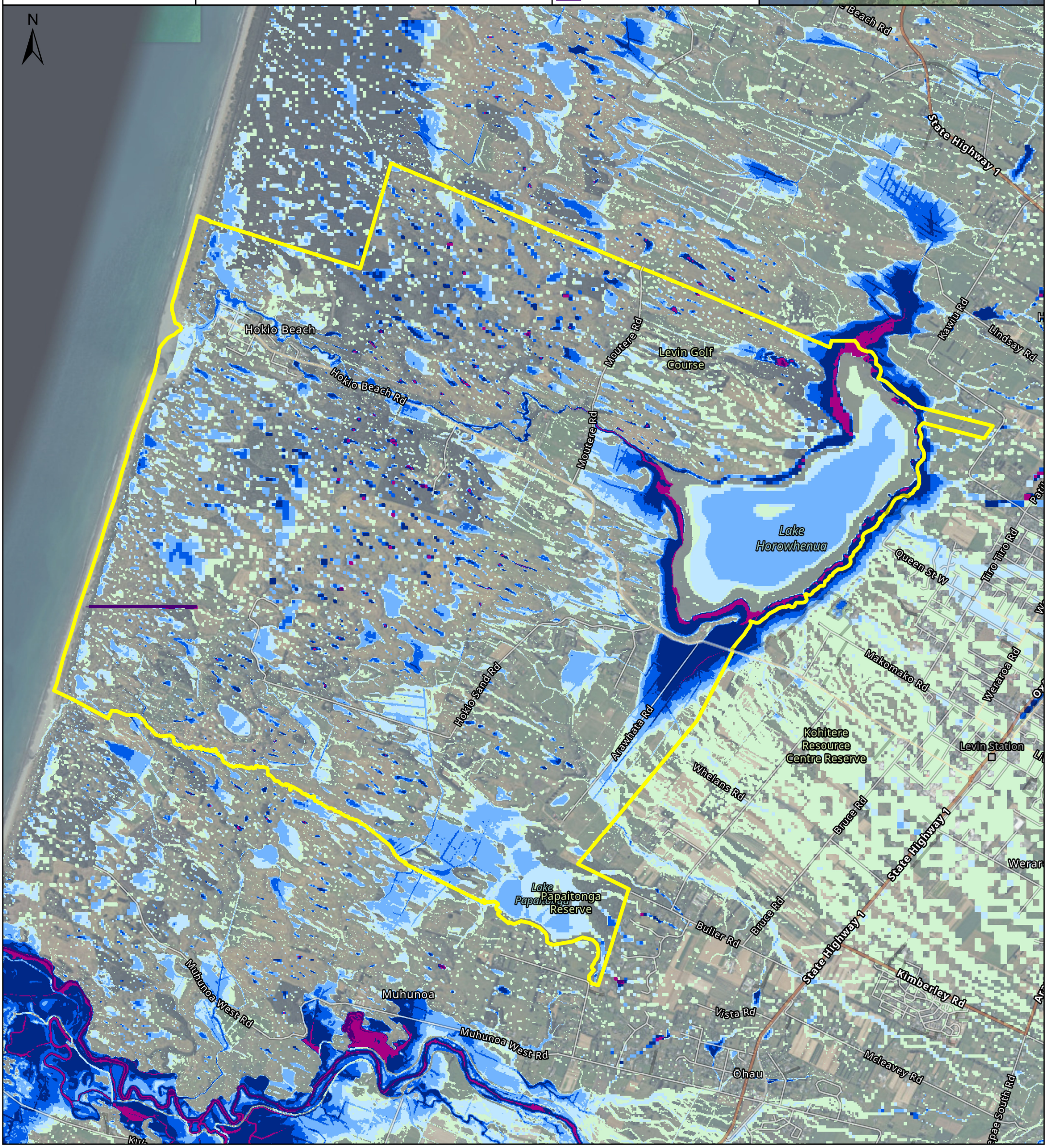
**Scale** 1:36,000 at A3

0 1 2 Km

**Legend**
- Community Boundary

Flood Depth (m)
- 0.05 - 0.20
- 0.2 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.5
- 2.5 - 3.5
- >3.5





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# Horizons Region Flood Vulnerability Assessment

## Flood scenario: 0.2% annual exceedance probability, flood defences up, 3 degrees warming due to climate change, sea level rise excluded

**Community**
Hokio Beach,
Horowhenua District

**Scale** 1:36,000 at A3

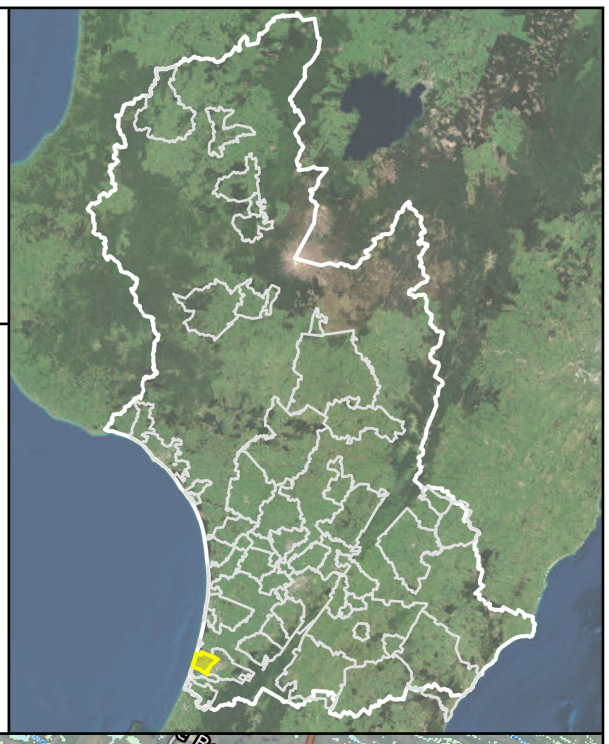
0 1 2 Km

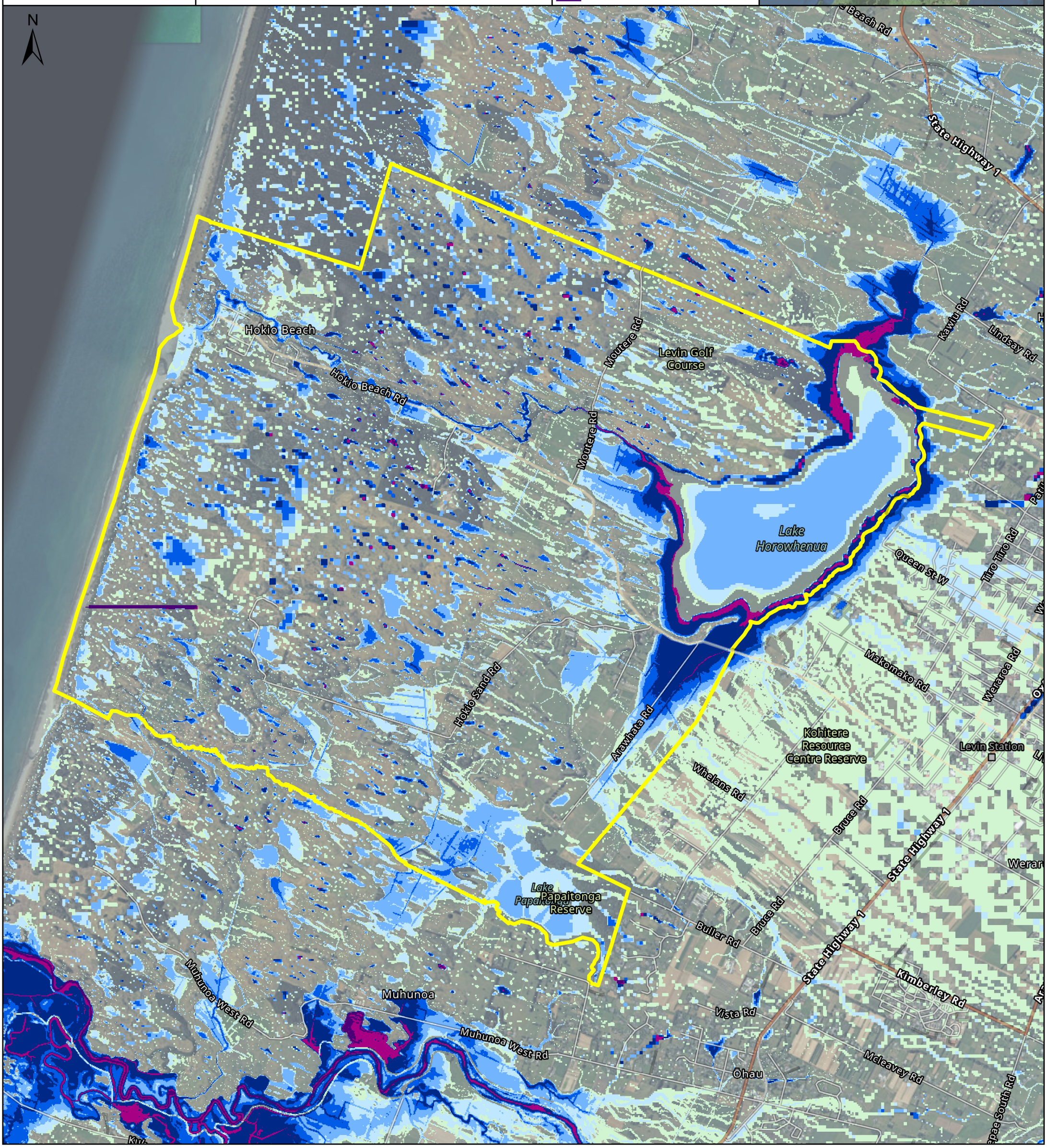
**Legend**

- Community Boundary

Flood Depth (m)

- 0.05 - 0.20
- 0.2 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.5
- 2.5 - 3.5
- >3.5





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**Prepared On**
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# Horizons Region Flood Vulnerability Assessment

## Flood scenario: 0.1% annual exceedance probability, flood defences up, 0 degrees warming due to climate change, sea level rise excluded

**Community**
Hokio Beach,
Horowhenua District

**Scale** 1:36,000 at A3

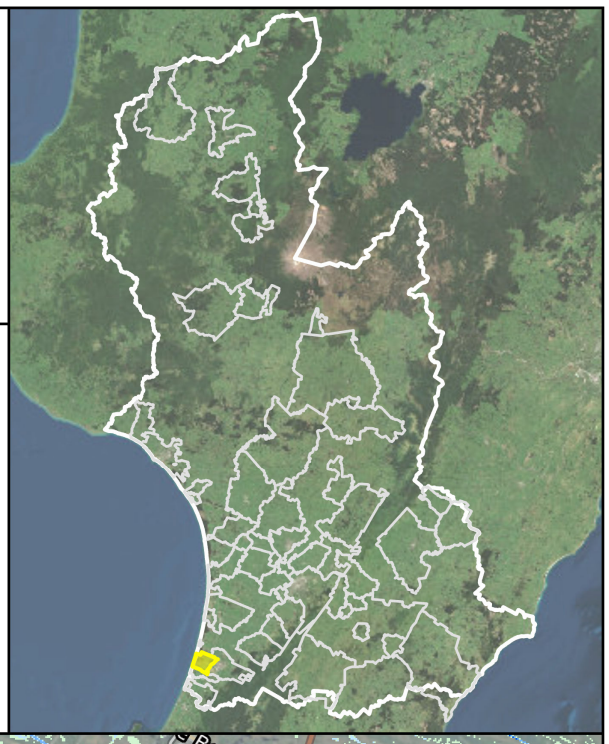
0 1 2 Km

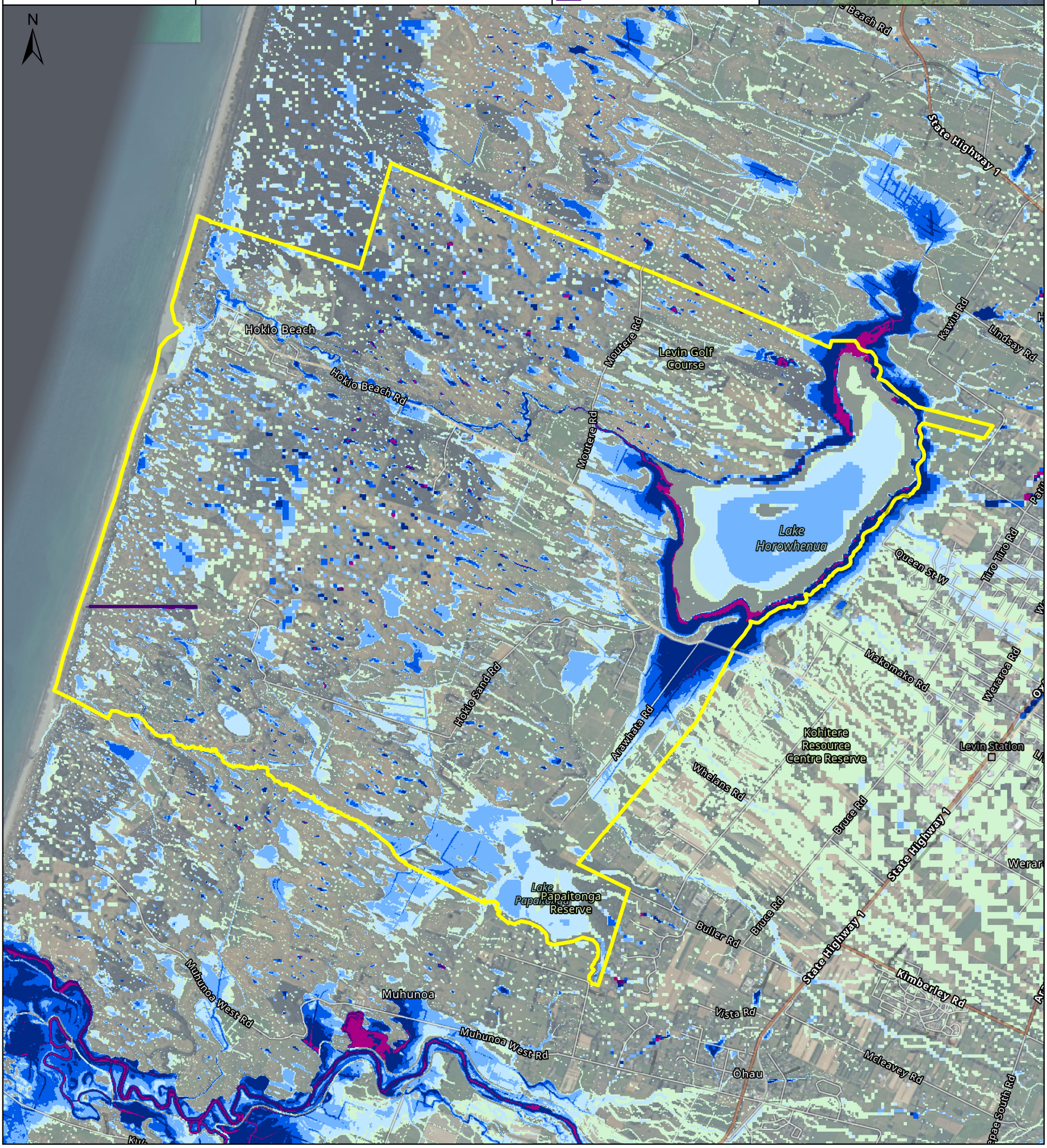
**Legend**

- Community Boundary

Flood Depth (m)

- 0.05 - 0.20
- 0.2 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.5
- 2.5 - 3.5
- >3.5





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**Prepared On**
05/08/2025

# Horizons Region Flood Vulnerability Assessment

## Flood scenario: 0.1% annual exceedance probability, flood defences up, 1 degree warming due to climate change, sea level rise excluded

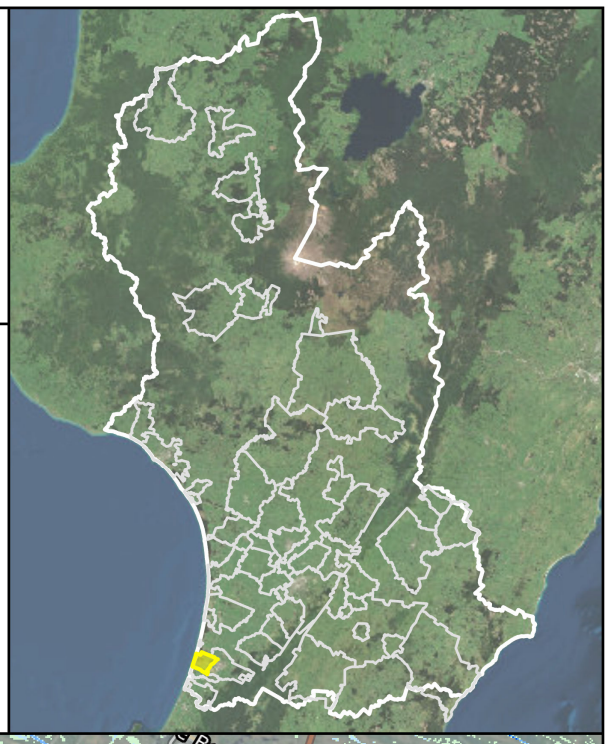
**Community**
Hokio Beach,
Horowhenua District

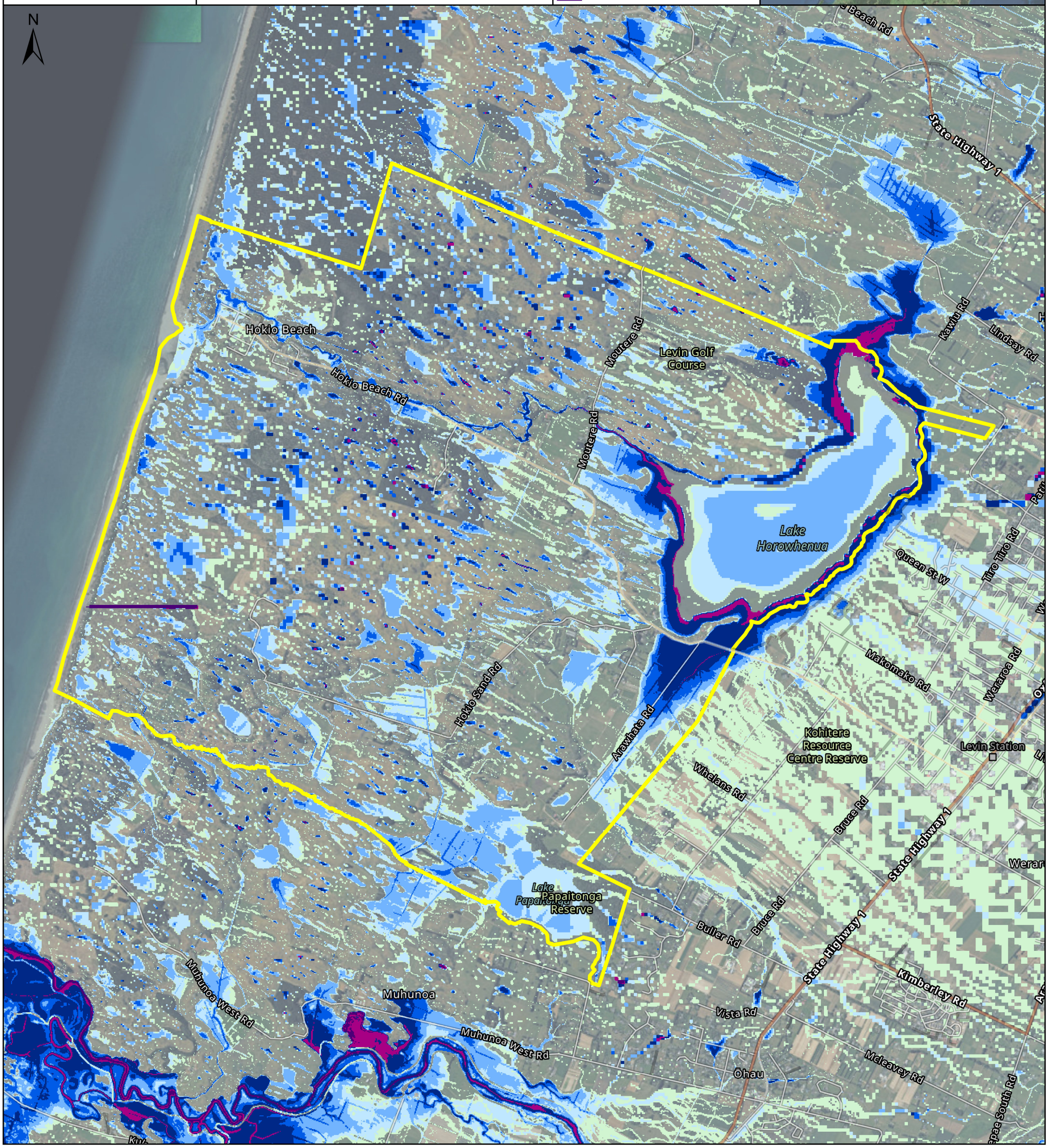
**Scale** 1:36,000 at A3

0 1 2 Km

**Legend**
- Community Boundary

Flood Depth (m)
- 0.05 - 0.20
- 0.2 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.5
- 2.5 - 3.5
- >3.5





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# Horizons Region Flood Vulnerability Assessment

## Flood scenario: 0.1% annual exceedance probability, flood defences up, 2 degrees warming due to climate change, sea level rise excluded

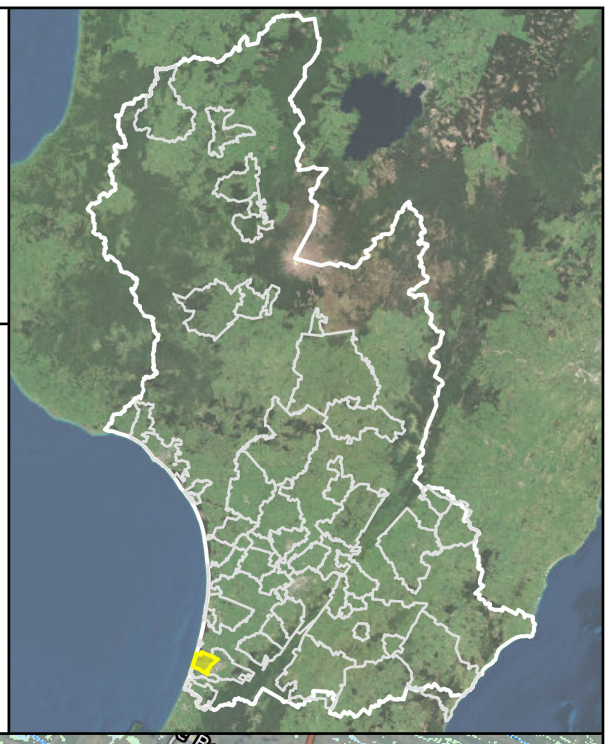
**Community**
Hokio Beach,
Horowhenua District

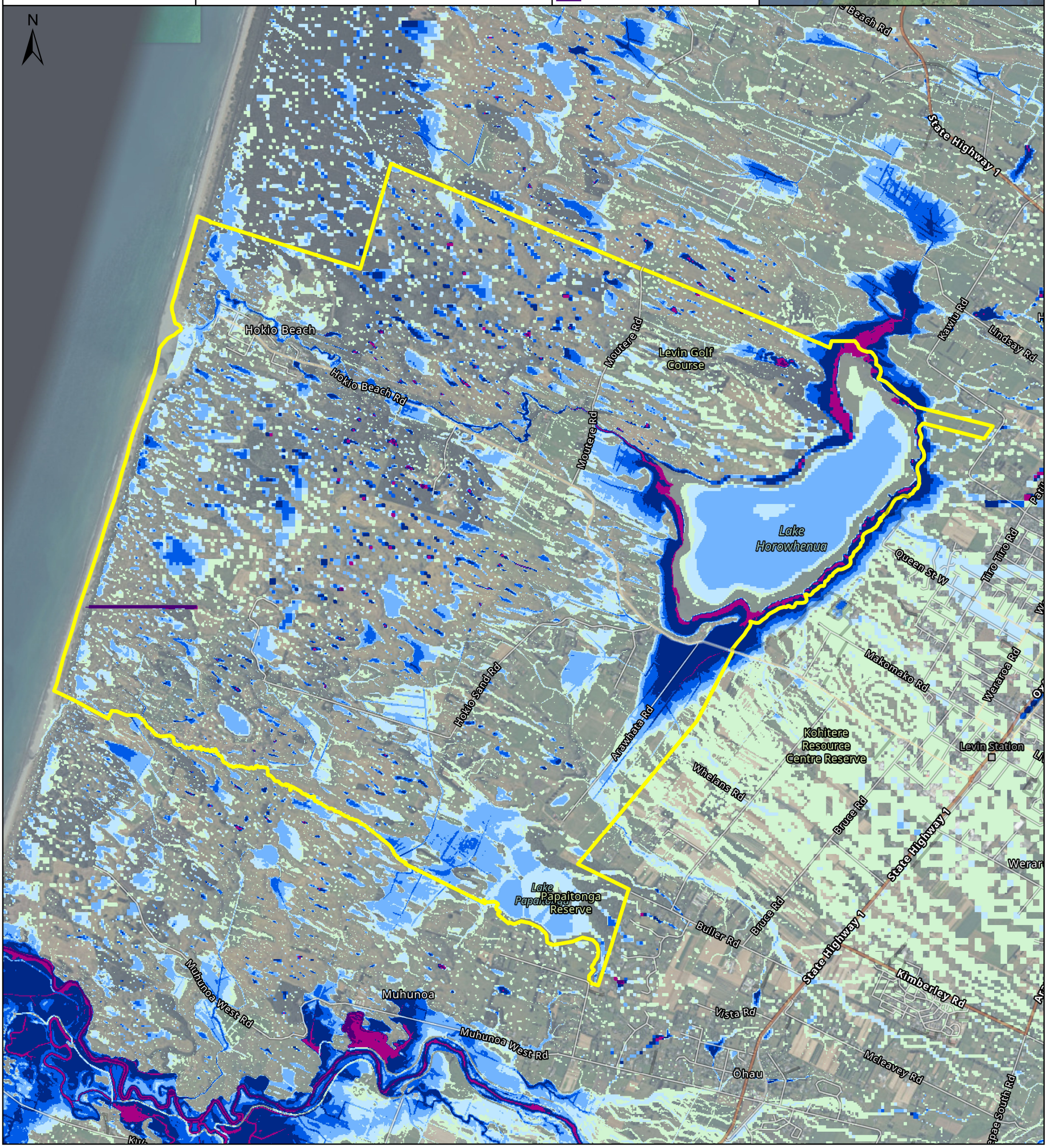
**Scale** 1:36,000 at A3

0 1 2 Km

**Legend**
- Community Boundary

Flood Depth (m)
- 0.05 - 0.20
- 0.2 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.5
- 2.5 - 3.5
- >3.5





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**Prepared On**
05/08/2025

# Horizons Region Flood Vulnerability Assessment

## Flood scenario: 0.1% annual exceedance probability, flood defences up, 3 degrees warming due to climate change, sea level rise excluded

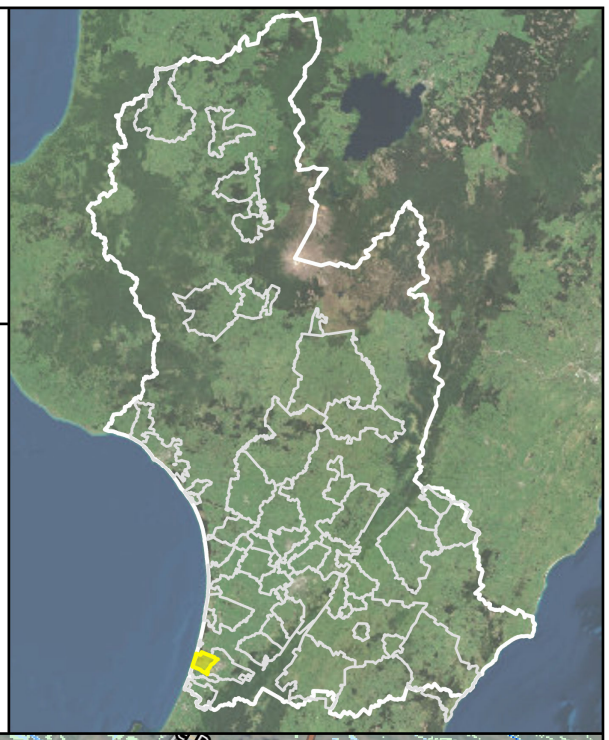
**Community**
Hokio Beach,
Horowhenua District

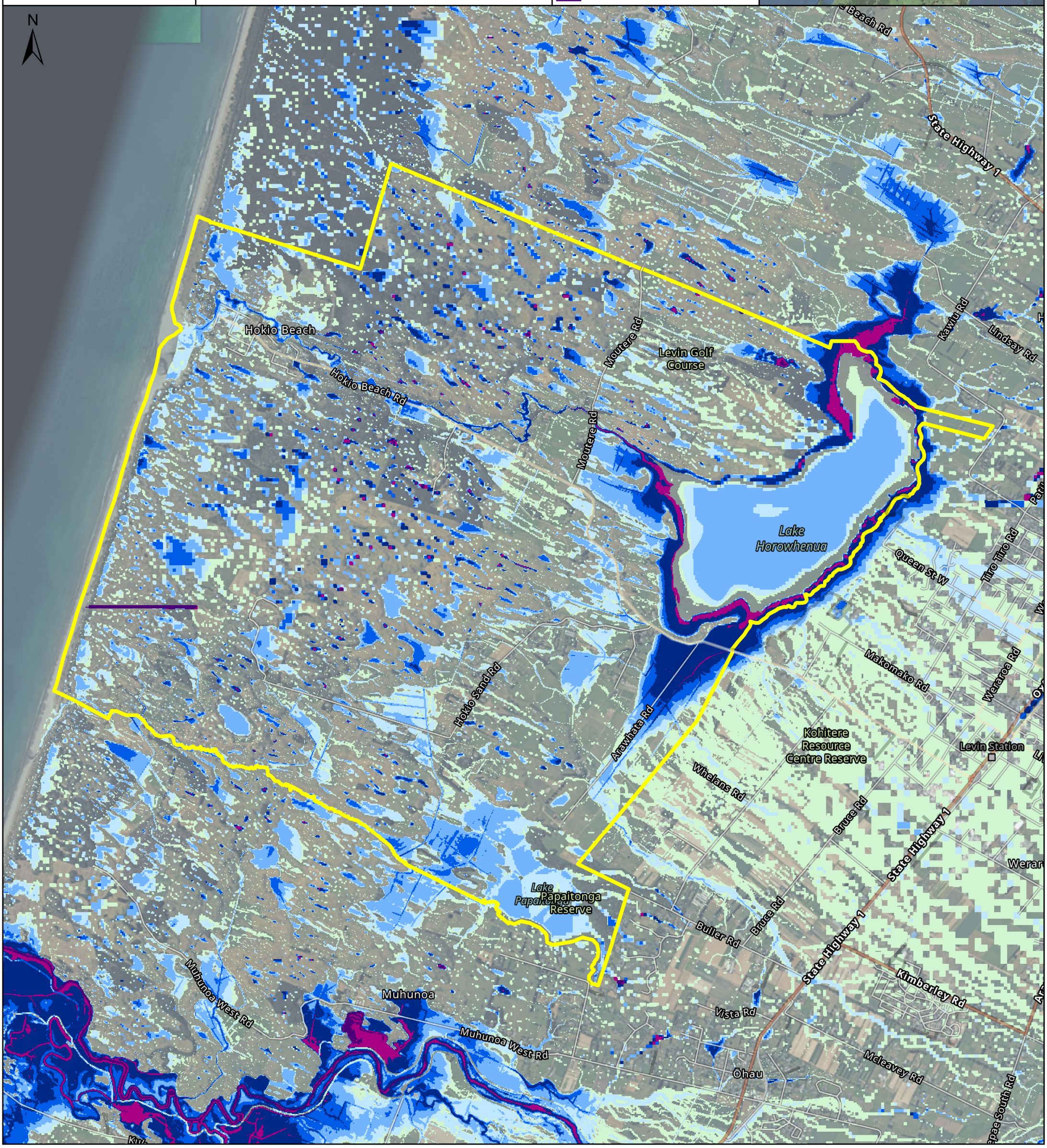
**Scale** 1:36,000 at A3

0 1 2 Km

**Legend**
- Community Boundary

Flood Depth (m)
- 0.05 - 0.20
- 0.2 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.5
- 2.5 - 3.5
- >3.5





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Prepared On

01/07/2025

# Horizons Region Flood Vulnerability Assessment

## Flood scenario: 5% annual exceedance probability, flood defences down, 0 degrees warming due to climate change, sea level rise excluded

**Community**
Hokio Beach,
Horowhenua District

**Scale** 1:36,000 at A3

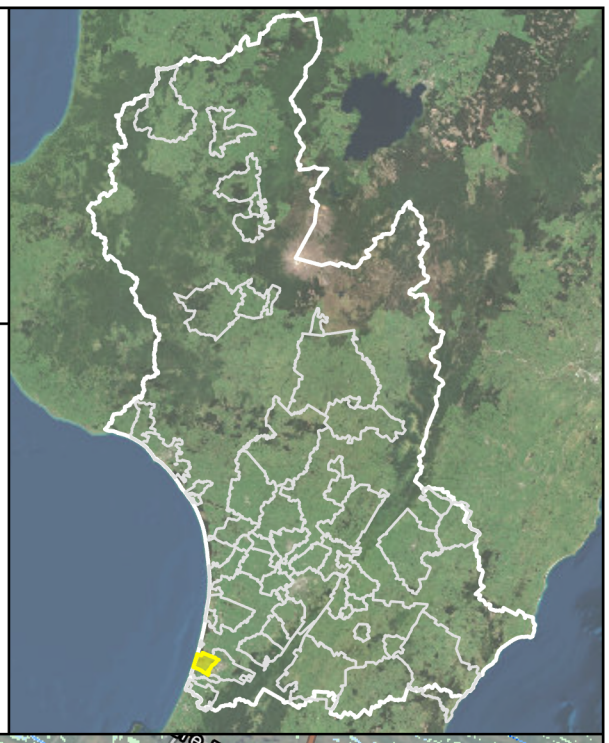
0 1 2 Km

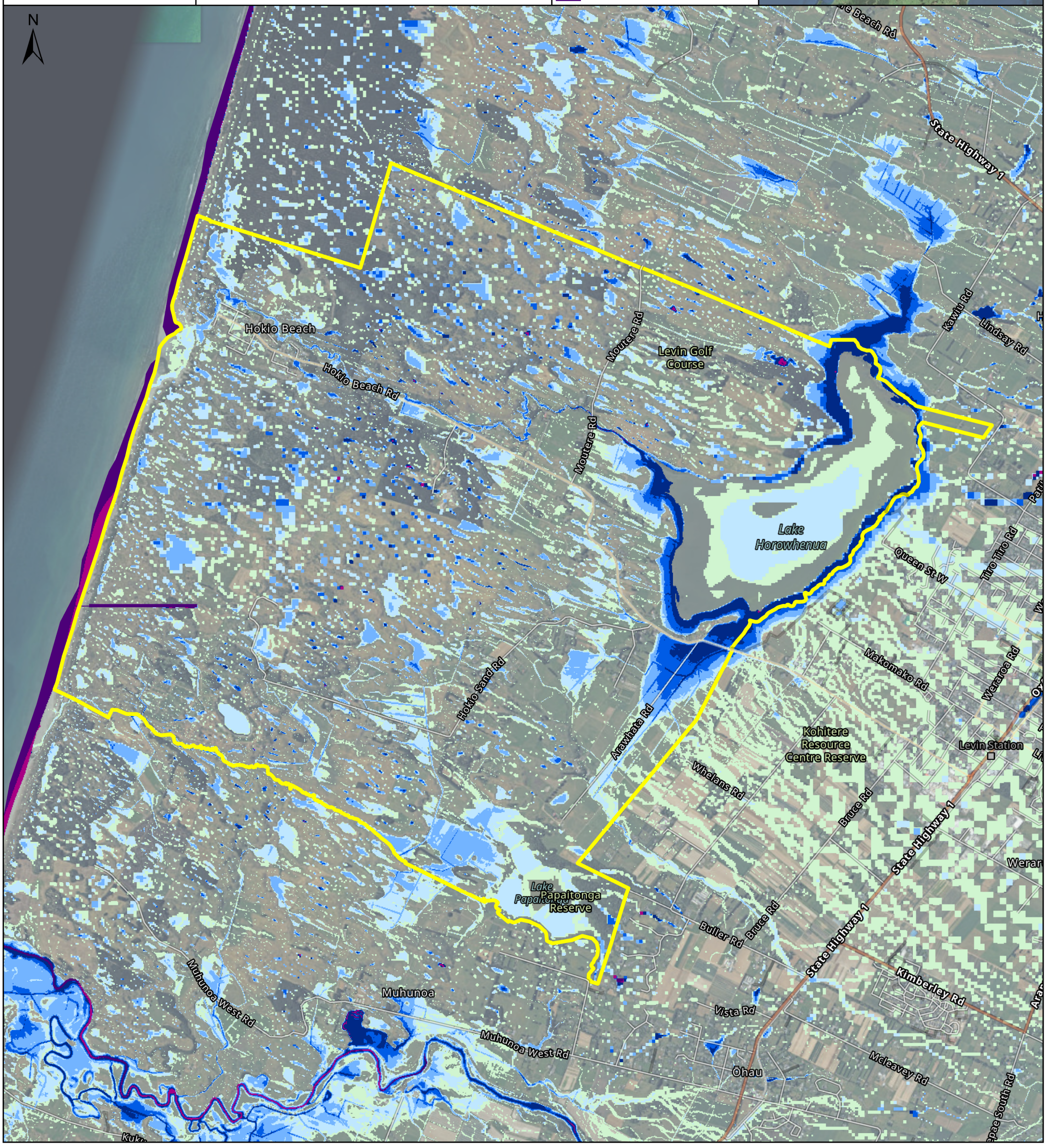
**Legend**

- Community Boundary

Flood Depth (m)

- 0.05 - 0.20
- 0.2 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.5
- 2.5 - 3.5
- >3.5





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Prepared On

01/07/2025

# Horizons Region Flood Vulnerability Assessment

## Flood scenario: 2% annual exceedance probability, flood defences down, 0 degrees warming due to climate change, sea level rise excluded

**Community**
Hokio Beach,
Horowhenua District

**Scale** 1:36,000 at A3

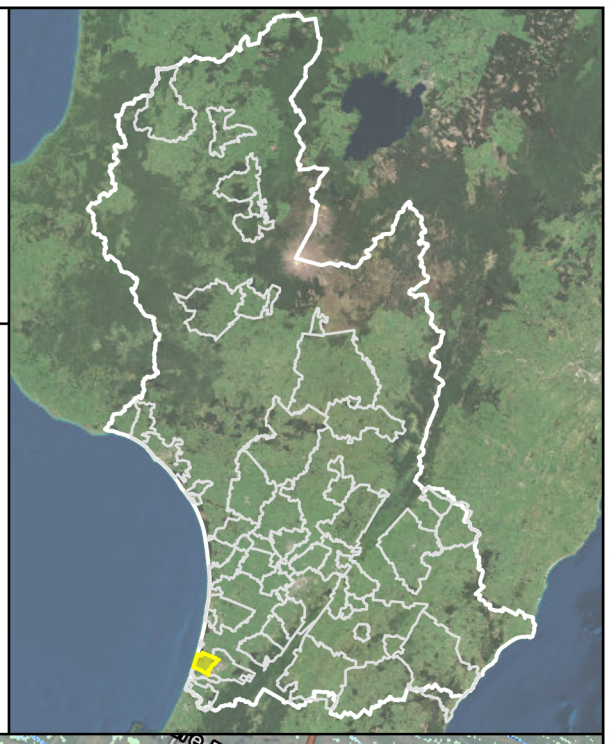
0 1 2 Km

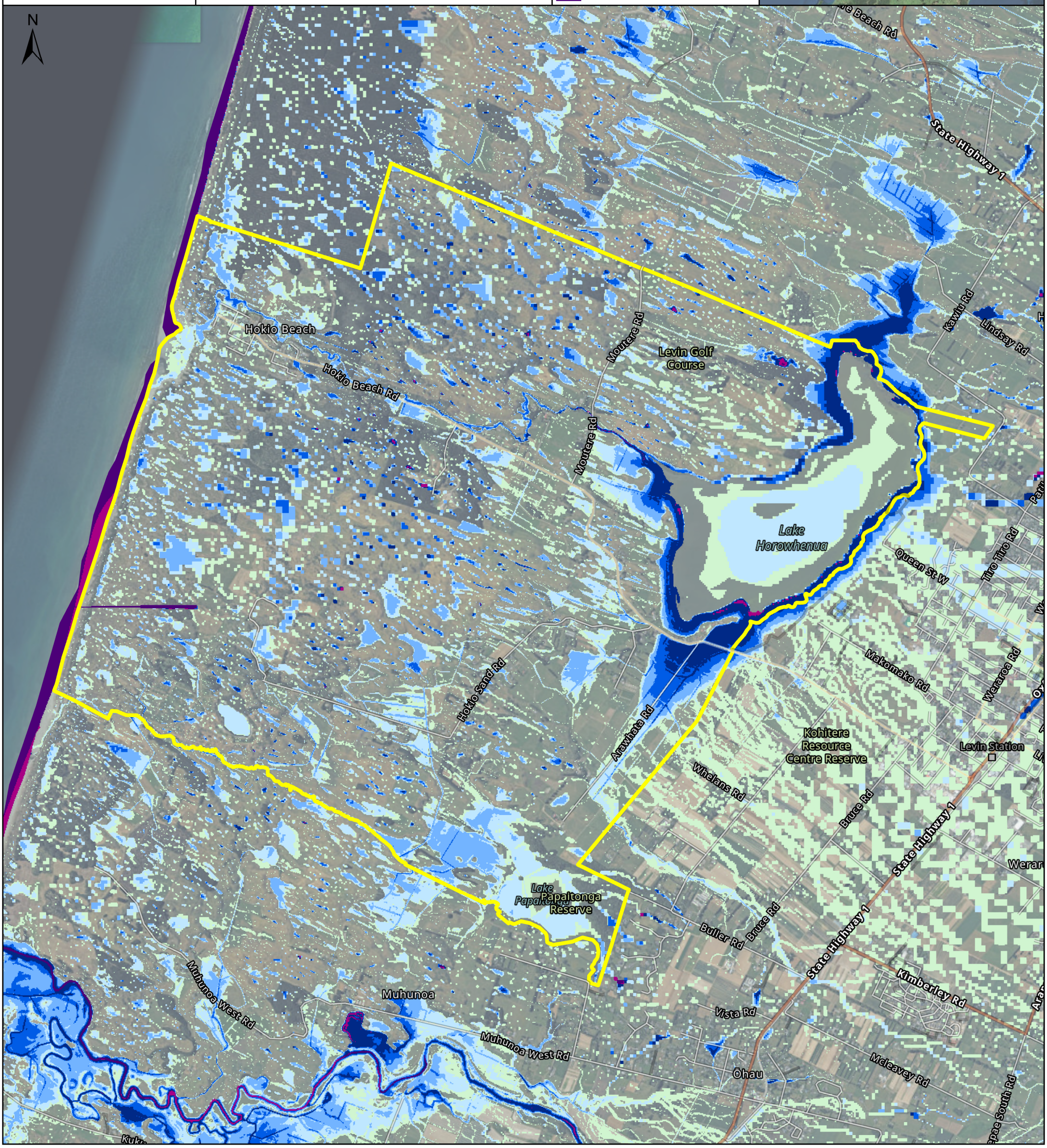
**Legend**

- Community Boundary

Flood Depth (m)

- 0.05 - 0.20
- 0.2 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.5
- 2.5 - 3.5
- >3.5





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Prepared On

01/07/2025

# Horizons Region Flood Vulnerability Assessment

## Flood scenario: 1% annual exceedance probability, flood defences down, 0 degrees warming due to climate change, sea level rise excluded

**Community**
Hokio Beach,
Horowhenua District

**Scale** 1:36,000 at A3

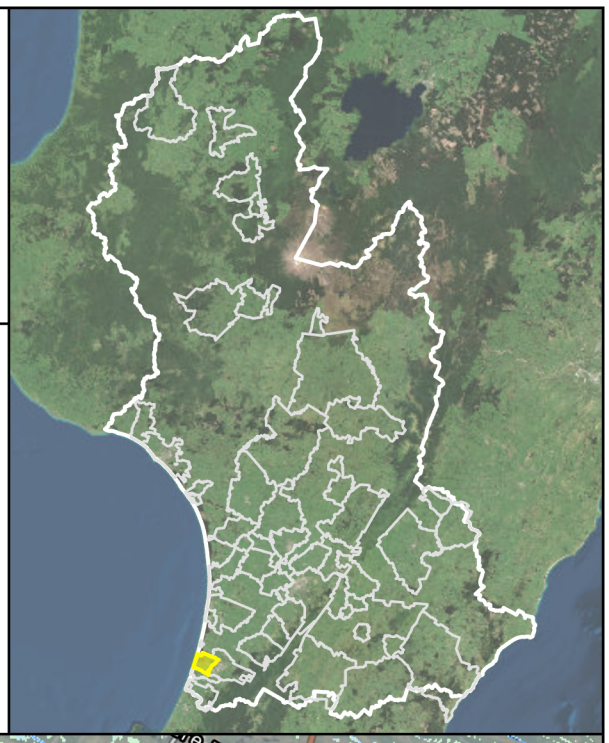
0 1 2 Km

**Legend**

- Community Boundary

Flood Depth (m)

- 0.05 - 0.20
- 0.2 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.5
- 2.5 - 3.5
- >3.5





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01/07/2025

# Horizons Region Flood Vulnerability Assessment

## Flood scenario: 0.5% annual exceedance probability, flood defences down, 0 degrees warming due to climate change, sea level rise excluded

**Community**
Hokio Beach,
Horowhenua District

**Scale** 1:36,000 at A3

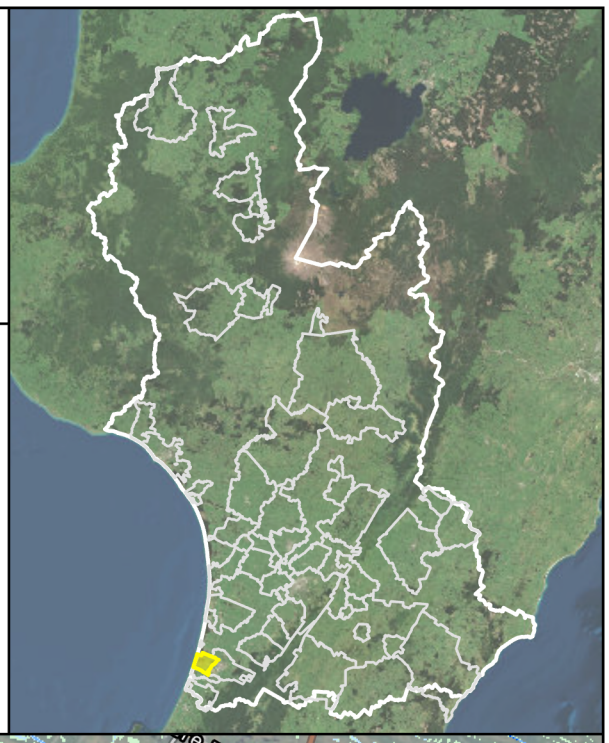
0 1 2 Km

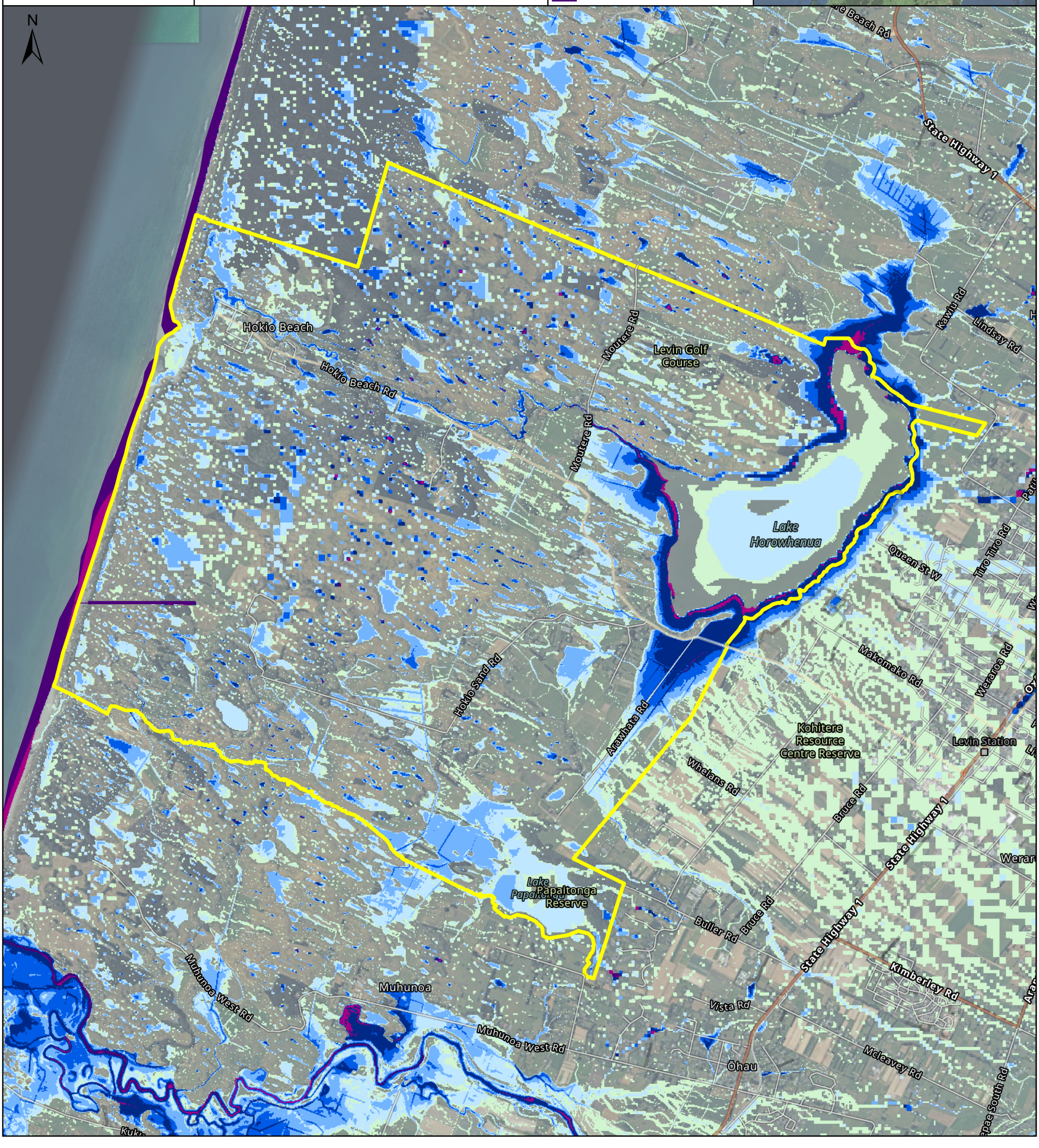
**Legend**

- Community Boundary

Flood Depth (m)

- 0.05 - 0.20
- 0.2 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.5
- 2.5 - 3.5
- >3.5





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# Horizons Region Flood Vulnerability Assessment

## Flood scenario: 0.5% annual exceedance probability, flood defences down, 1 degree warming due to climate change, sea level rise excluded

**Community**
Hokio Beach,
Horowhenua District

**Scale** 1:36,000 at A3

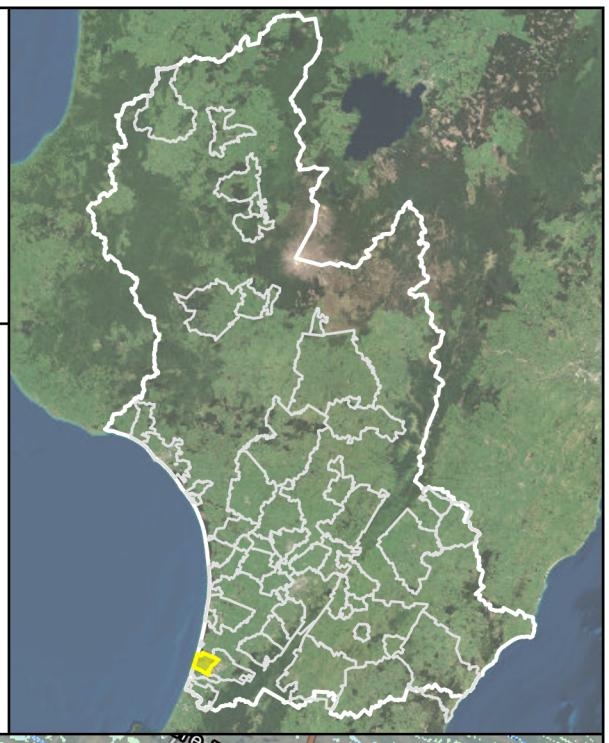
0 1 2 Km

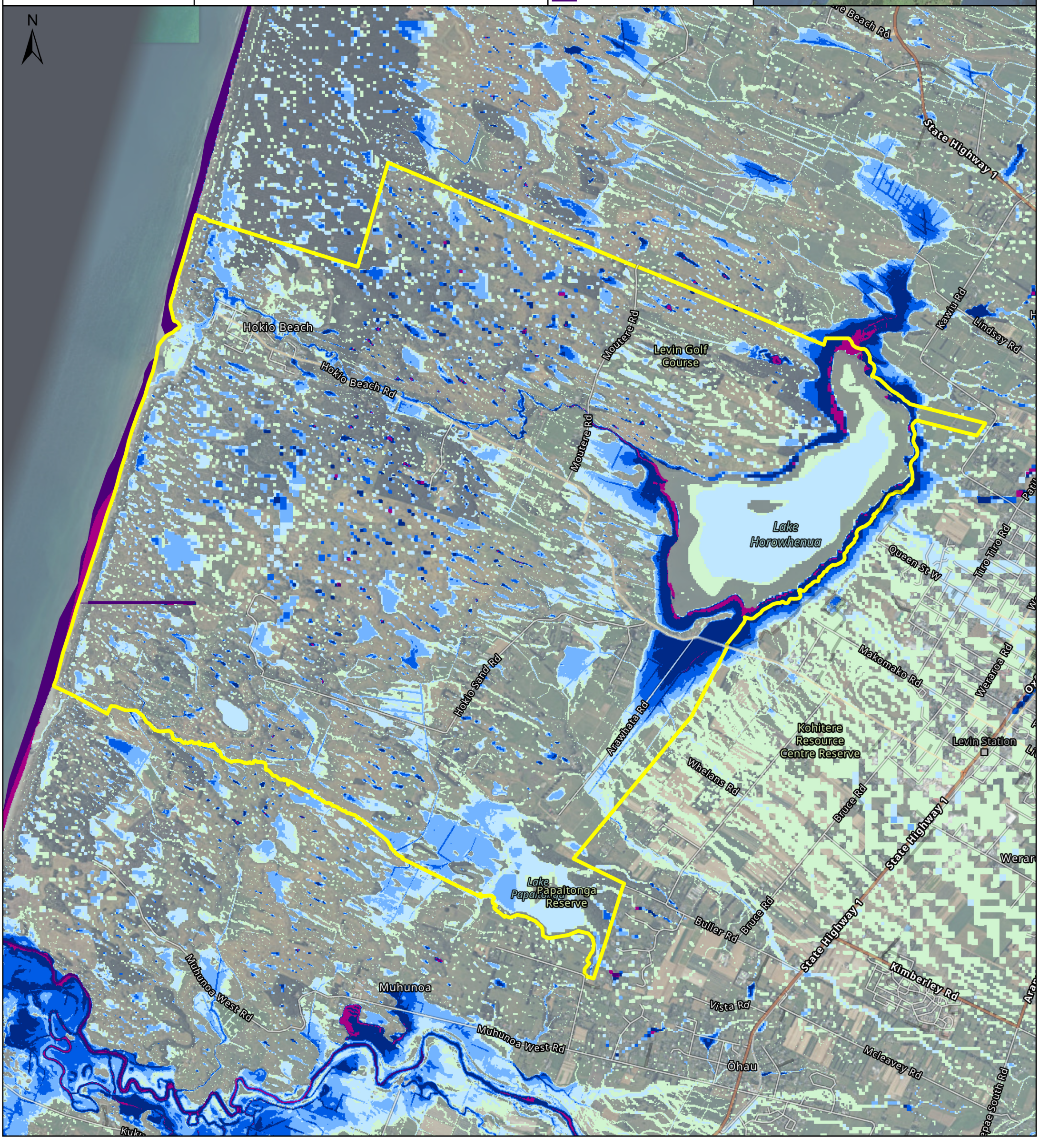
**Legend**

- Community Boundary

Flood Depth (m)

- 0.05 - 0.20
- 0.2 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.5
- 2.5 - 3.5
- >3.5





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# Horizons Region Flood Vulnerability Assessment

## Flood scenario: 0.5% annual exceedance probability, flood defences down, 2 degrees warming due to climate change, sea level rise excluded

**Community**
Hokio Beach,
Horowhenua District

**Scale** 1:36,000 at A3

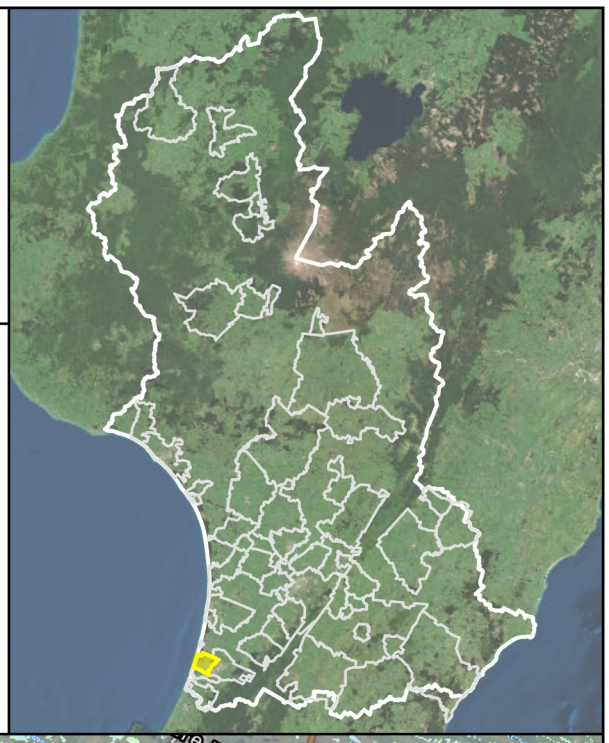
0 1 2 Km

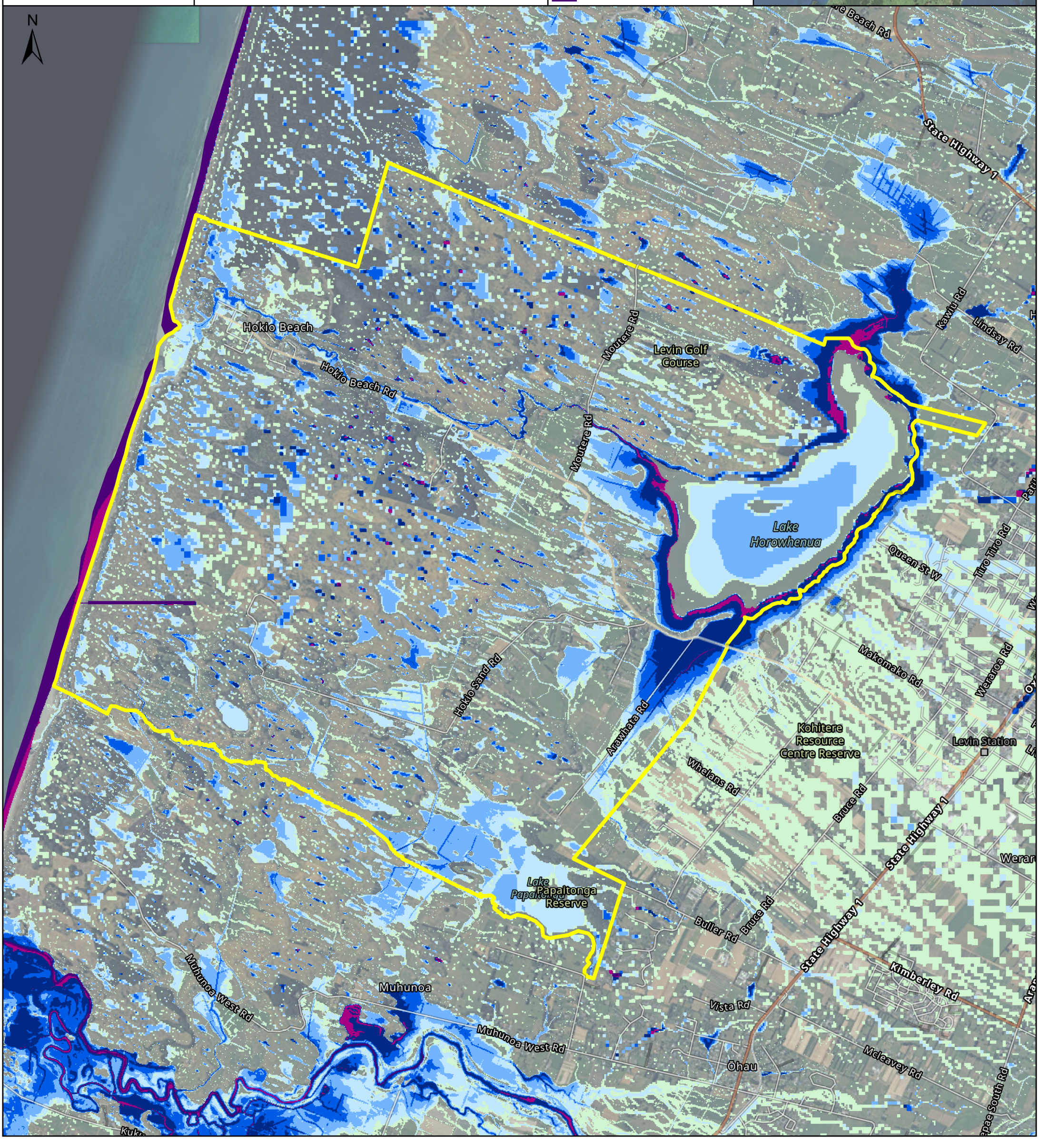
**Legend**

- Community Boundary

Flood Depth (m)

- 0.05 - 0.20
- 0.2 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.5
- 2.5 - 3.5
- >3.5





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# Horizons Region Flood Vulnerability Assessment

## Flood scenario: 0.5% annual exceedance probability, flood defences down, 3 degrees warming due to climate change, sea level rise excluded

**Community**
Hokio Beach,
Horowhenua District

**Scale** 1:36,000 at A3

0 1 2 Km

**Legend**

- Community Boundary

Flood Depth (m)

- 0.05 - 0.20
- 0.2 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.5
- 2.5 - 3.5
- >3.5

