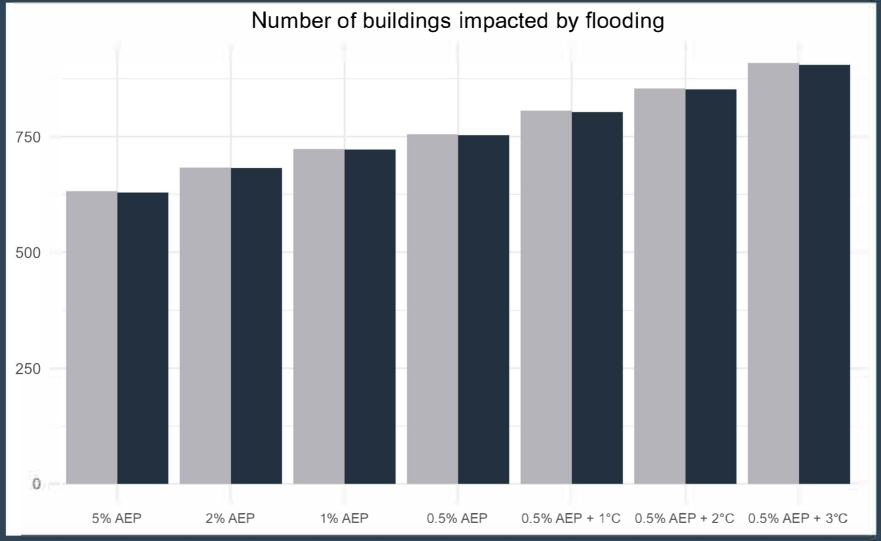
FLOOD VULNERABILITY ASSESSMENT: DANNEVIRKE

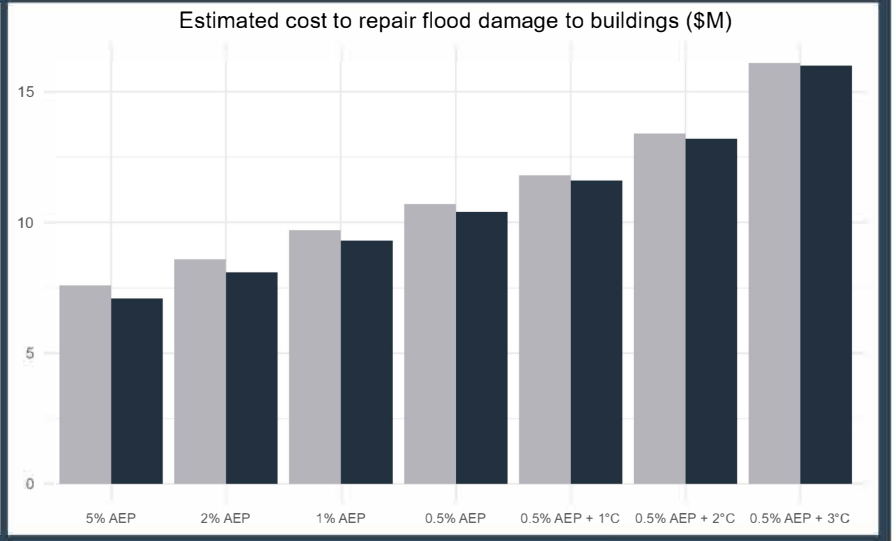
Horizons Regional Council engaged WSP and Earth Sciences NZ to lead the Horizons Flood Vulnerability Assessment, which developed a comprehensive regional flood model to evaluate the flood vulnerability of communities within the Horizons Region. This is a summary of the findings for Dannevirke, which has a population of 6,146 with 8,602 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 Tararua District Council may hold more specific models and outputs that may be more reliable for decision making.

In Dannevirke, 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.

With flood defences structures such as stopbanks in place, approx 629 buildings could be affected in a 5% AEP flood scenario, with an estimated repair cost of around $7 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 905 with repair costs of around $16 Million. **Without the flood defences structures such as stopbanks in place**, the number of buildings impacted by flooding was similar, however the cost to repair those buildings increases. This indicates more damage to buildings without defences in place. In a flood scenario of 0.5% AEP + 3°C of warming due to climate change, the estimated number of affected buildings increases to 909 with repair costs of around $16 Million.

These findings highlight the importance of flood defences structures and how the presence or absence of these can influence the scale and cost of flood events across different scenarios. In a severe flood, these flood defences structures may not be enough to protect your community. 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.





Legend with flood defences structures; without flood defences structures.

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

Summary

In Dannevirke, 629 to 905 buildings could be impacted by flooding.

This is 7% to 11% of buildings in Dannevirke that could be impacted by flooding.

Out of the 52 settlements in the Horizons Region, Dannevirke ranks 11th for the number of buildings affected, and 37th for the percentage of buildings within a town settlement affected.

horizons REGIONAL COUNCIL WSP Earth Sciences New Zealand

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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
Dannevirke,
Tararua District

Scale 1:109,000 at A3

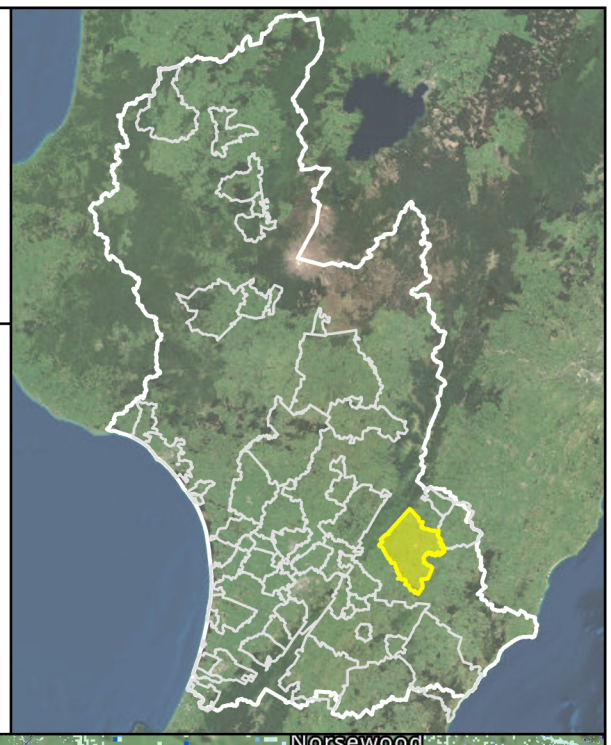
0 3.25 6.5 Km

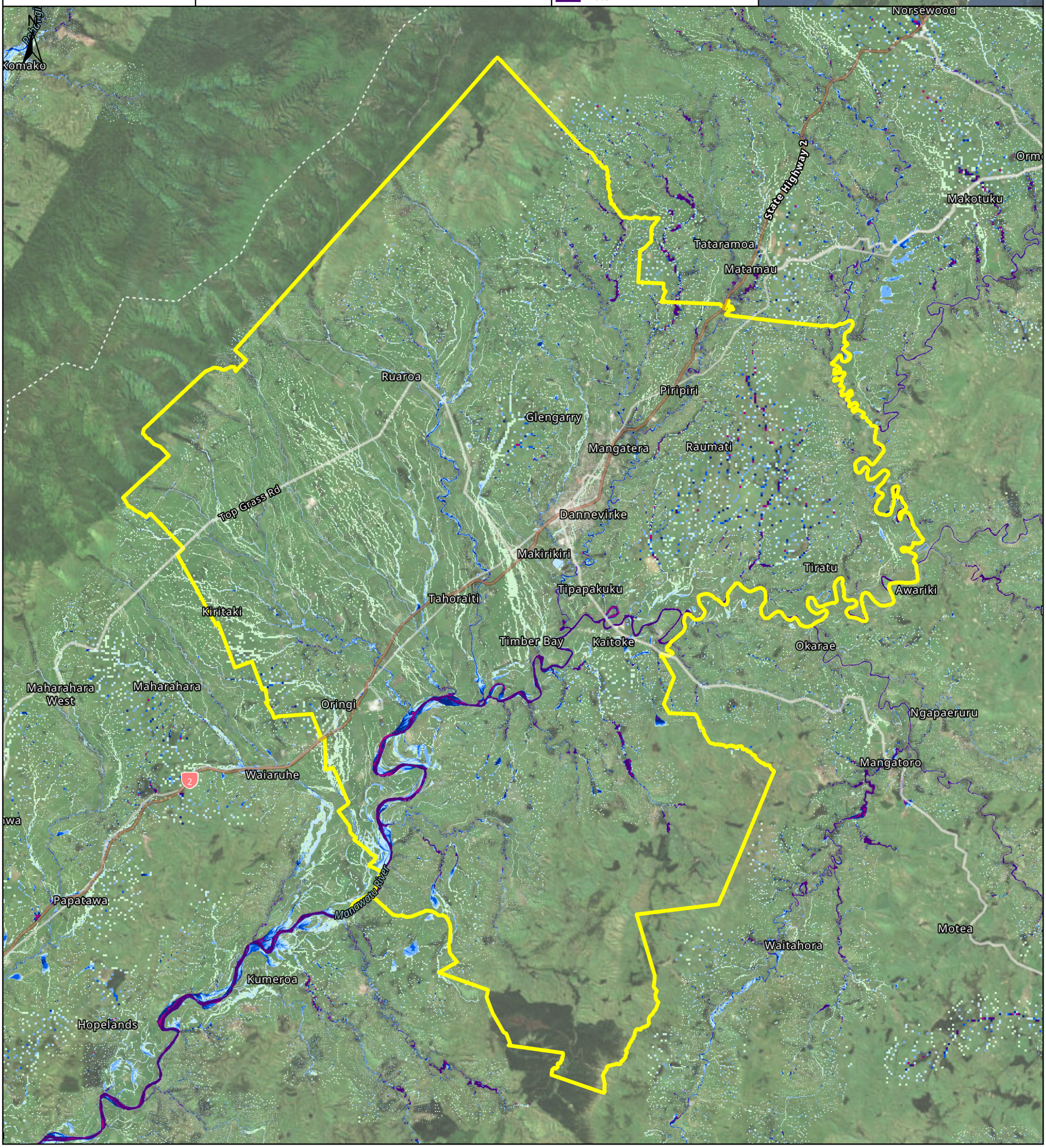
Legend

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

Community
Dannevirke,
Tararua District

Scale 1:109,000 at A3

0 3.25 6.5 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
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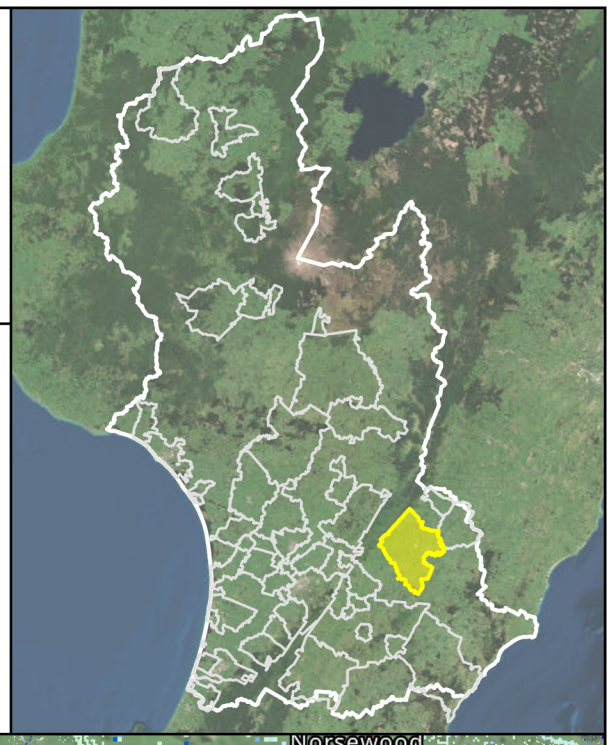

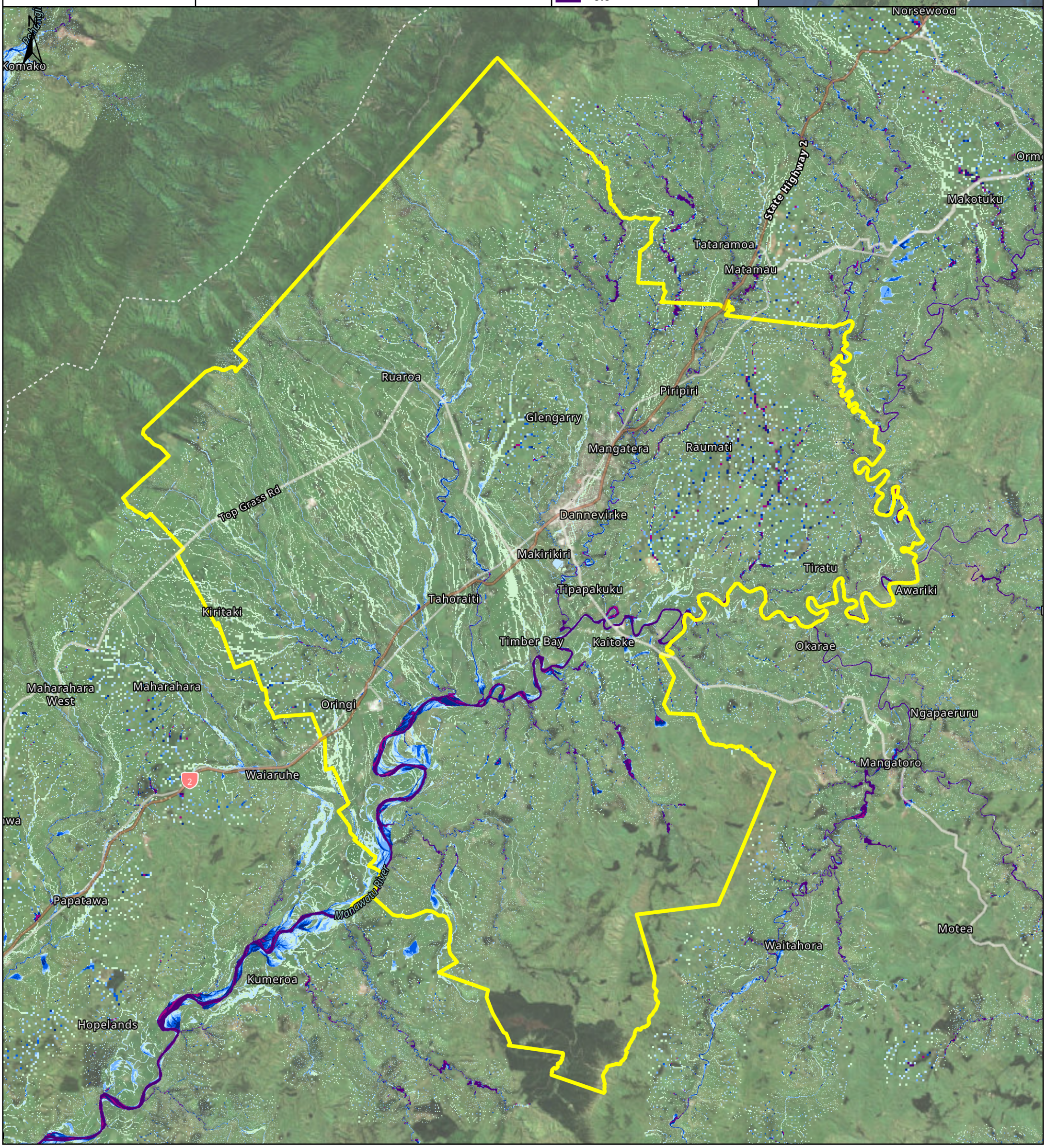

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Horizons Region Flood Vulnerability Assessment

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

Community
Dannevirke,
Tararua District

Scale 1:109,000 at A3

0 3.25 6.5 Km

Legend

- Community Boundary

Flood Depth (m)

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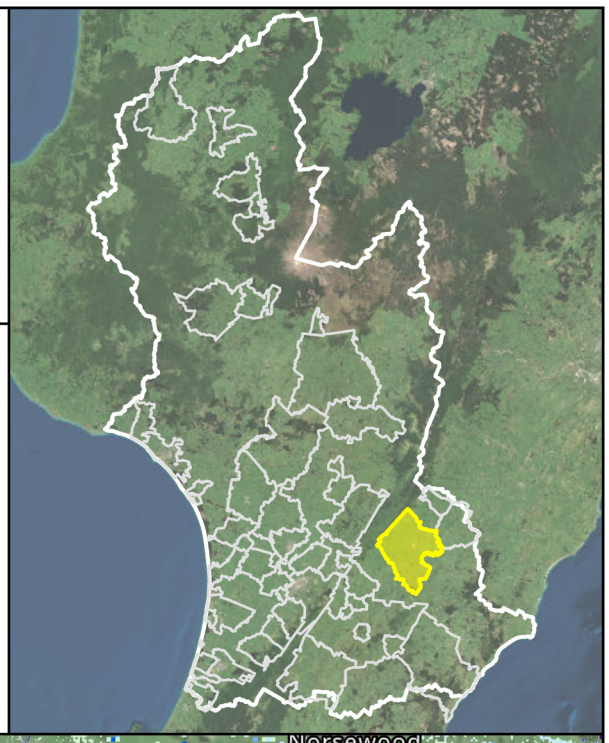

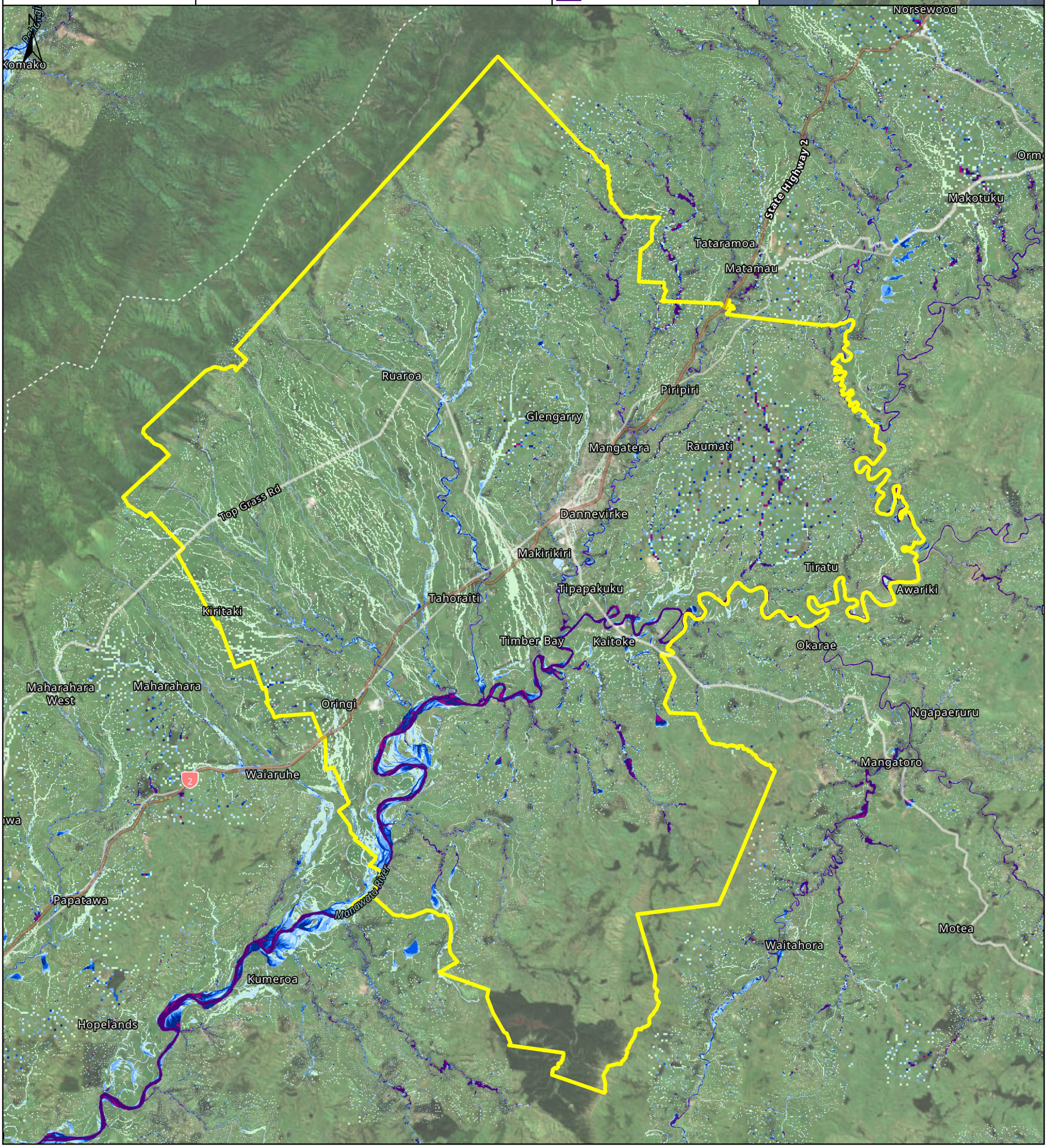

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Horizons Region Flood Vulnerability Assessment

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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Dannevirke,
Tararua District

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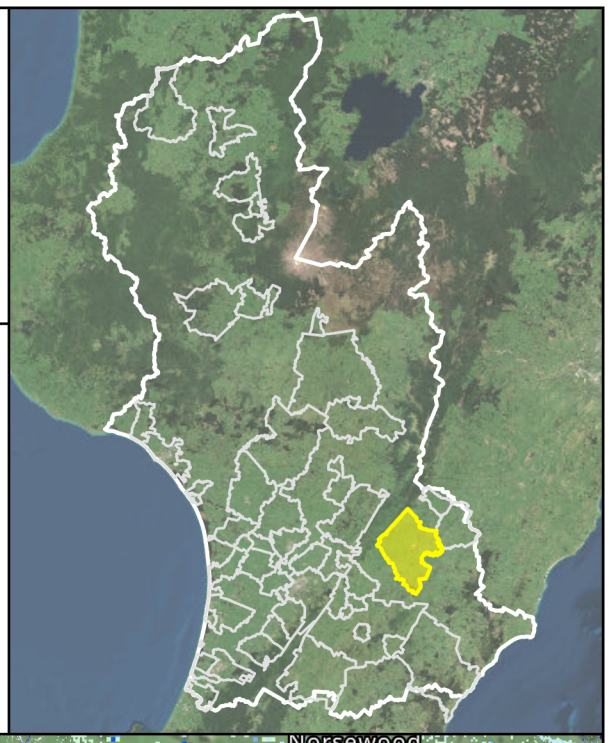

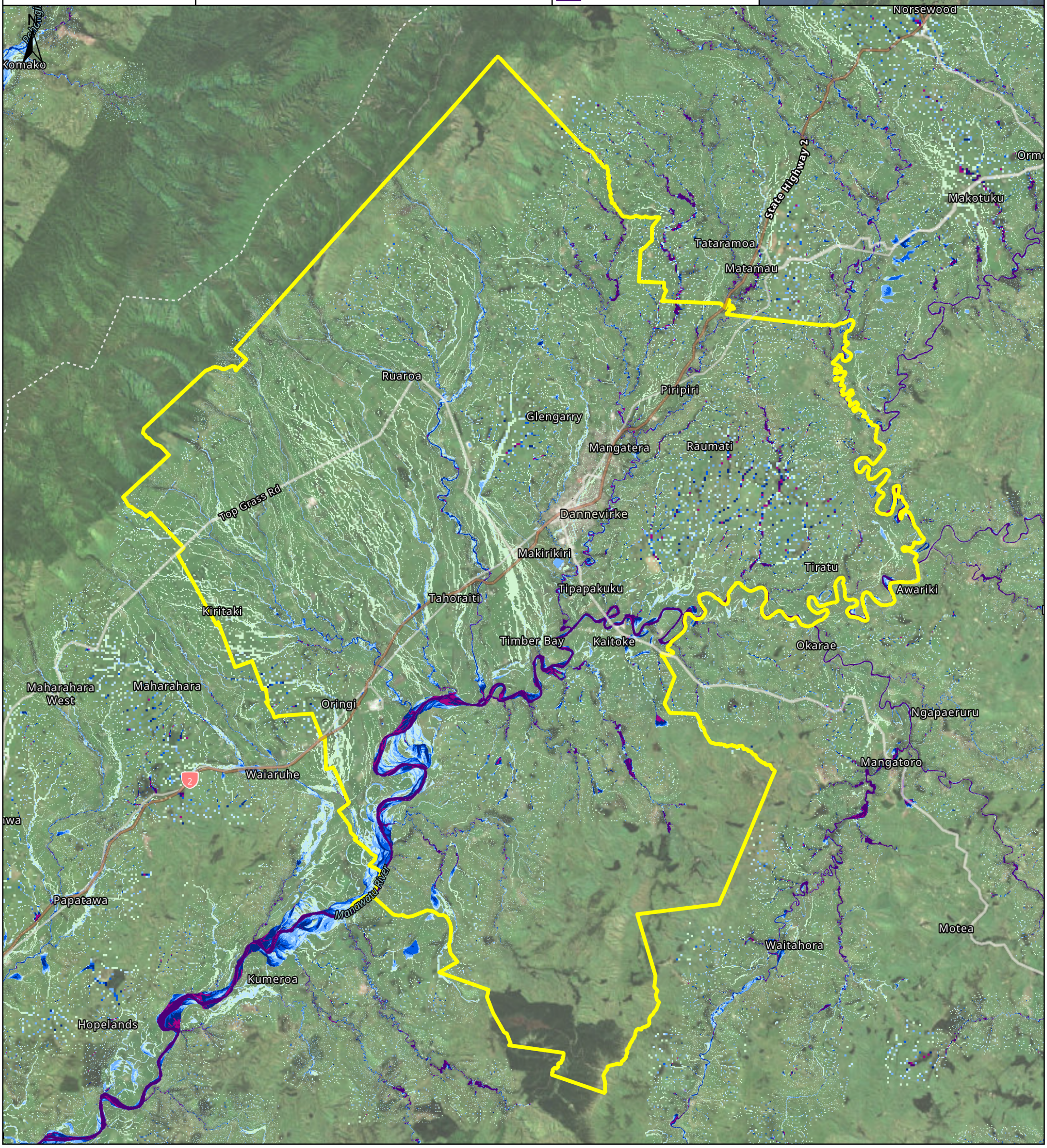

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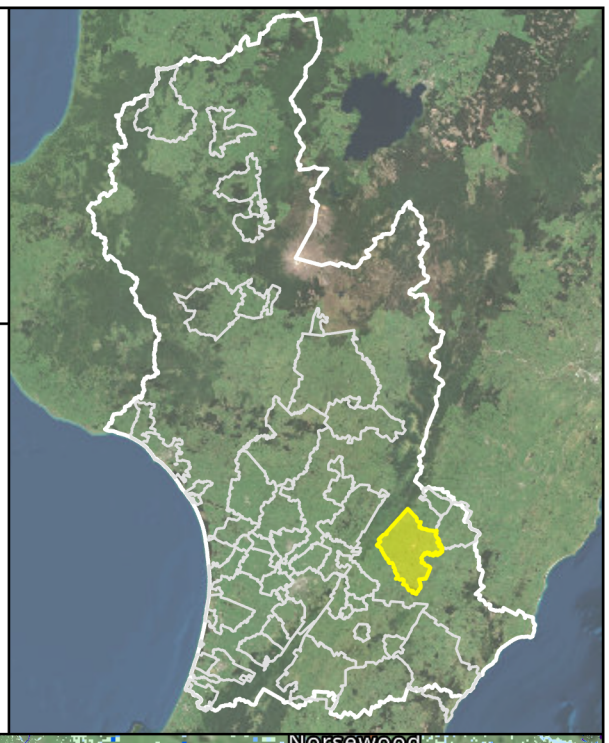

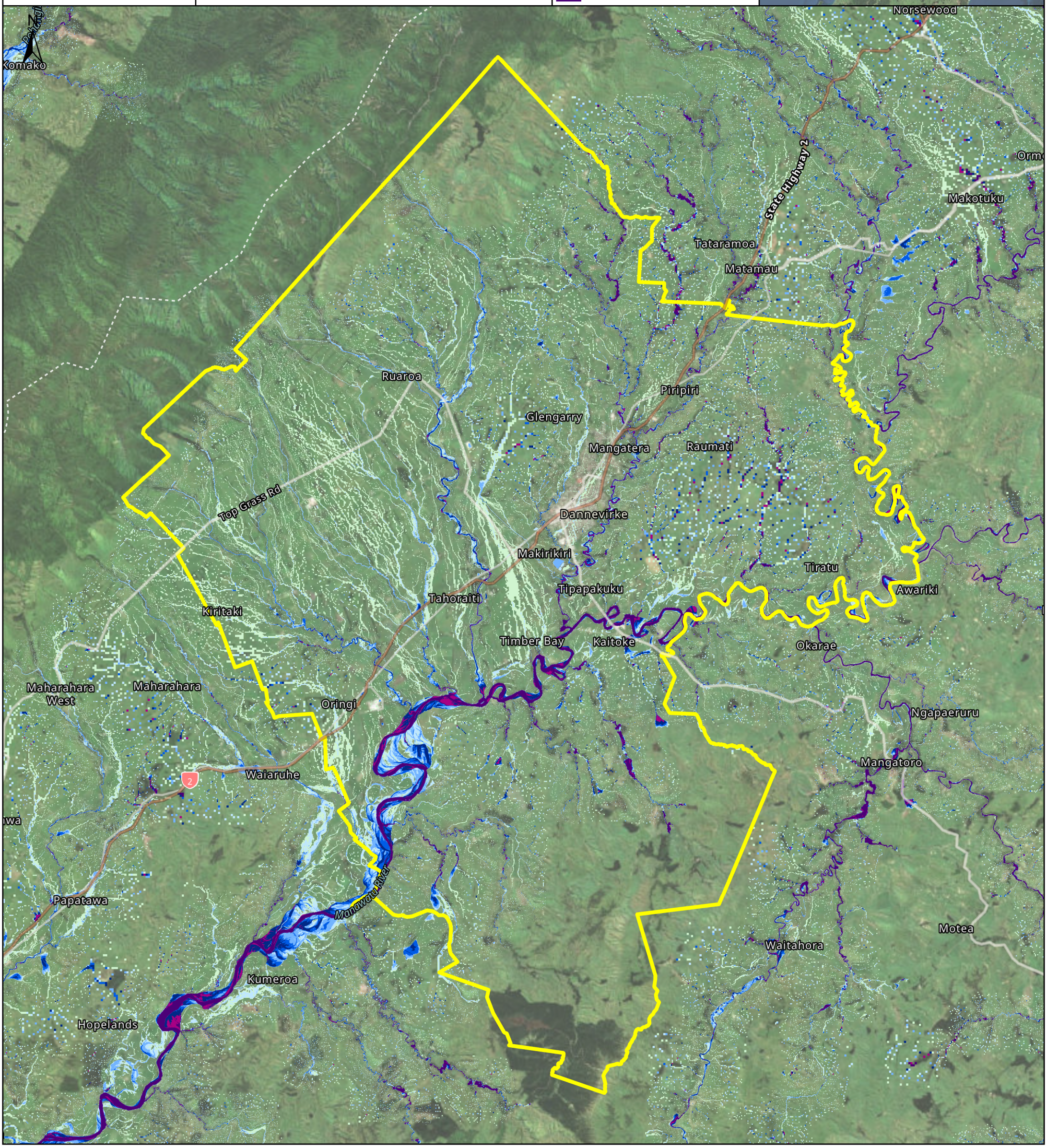

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Flood scenario: 0.5% annual exceedance probability, flood defences up, 2 degrees warming due to climate change, sea level rise excluded

Community
Dannevirke,
Tararua District

Scale 1:109,000 at A3

0 3.25 6.5 Km

Legend
- Community Boundary

Flood Depth (m)
- 0.05 - 0.20
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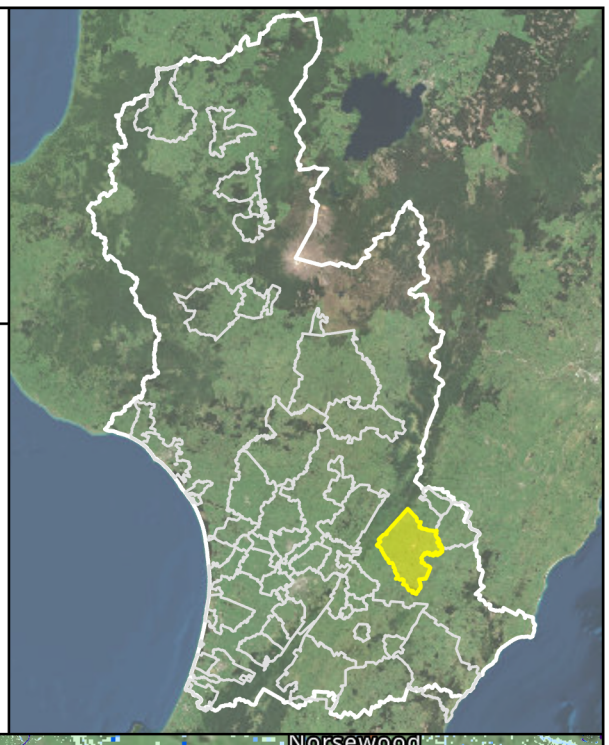

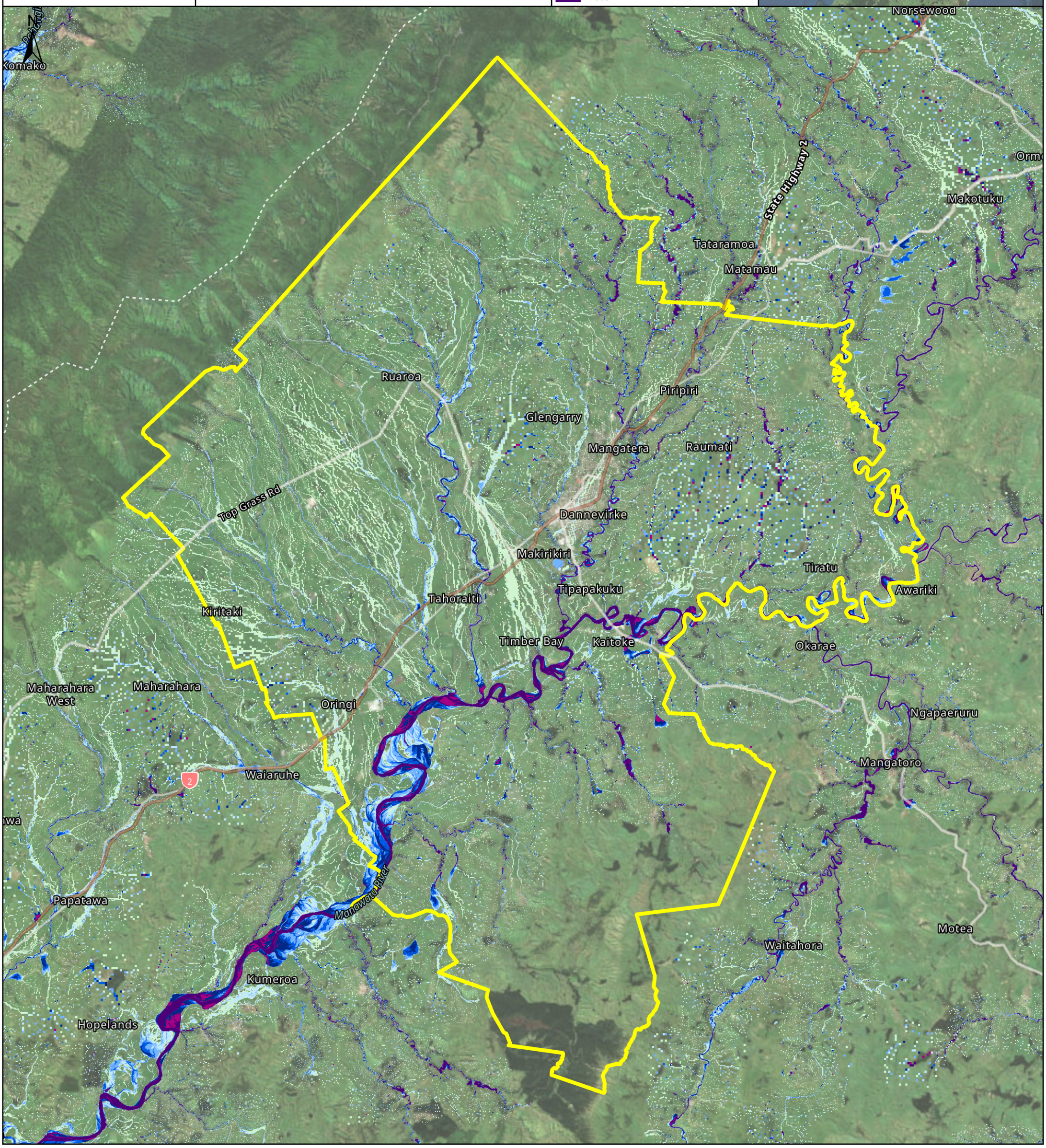

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Horizons Region Flood Vulnerability Assessment

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

Community
Dannevirke,
Tararua District

Scale 1:109,000 at A3

0 3.25 6.5 Km

Legend

- Community Boundary

Flood Depth (m)

- 0.05 - 0.20
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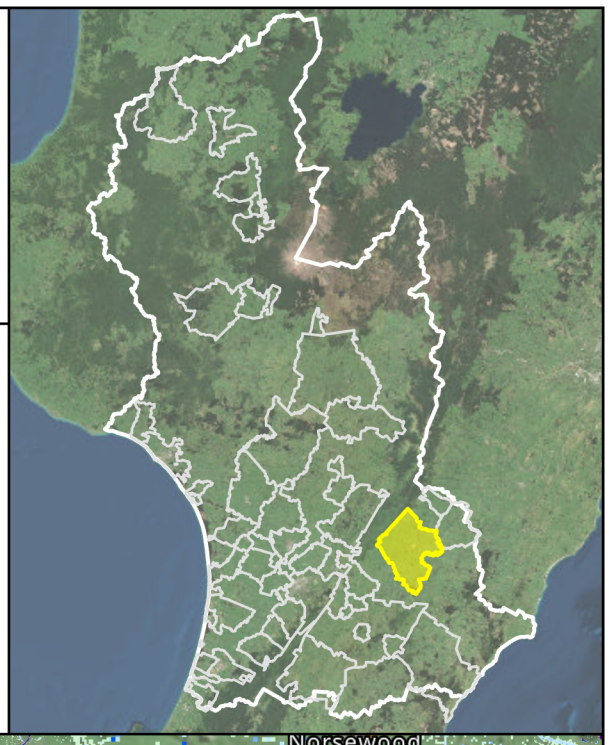

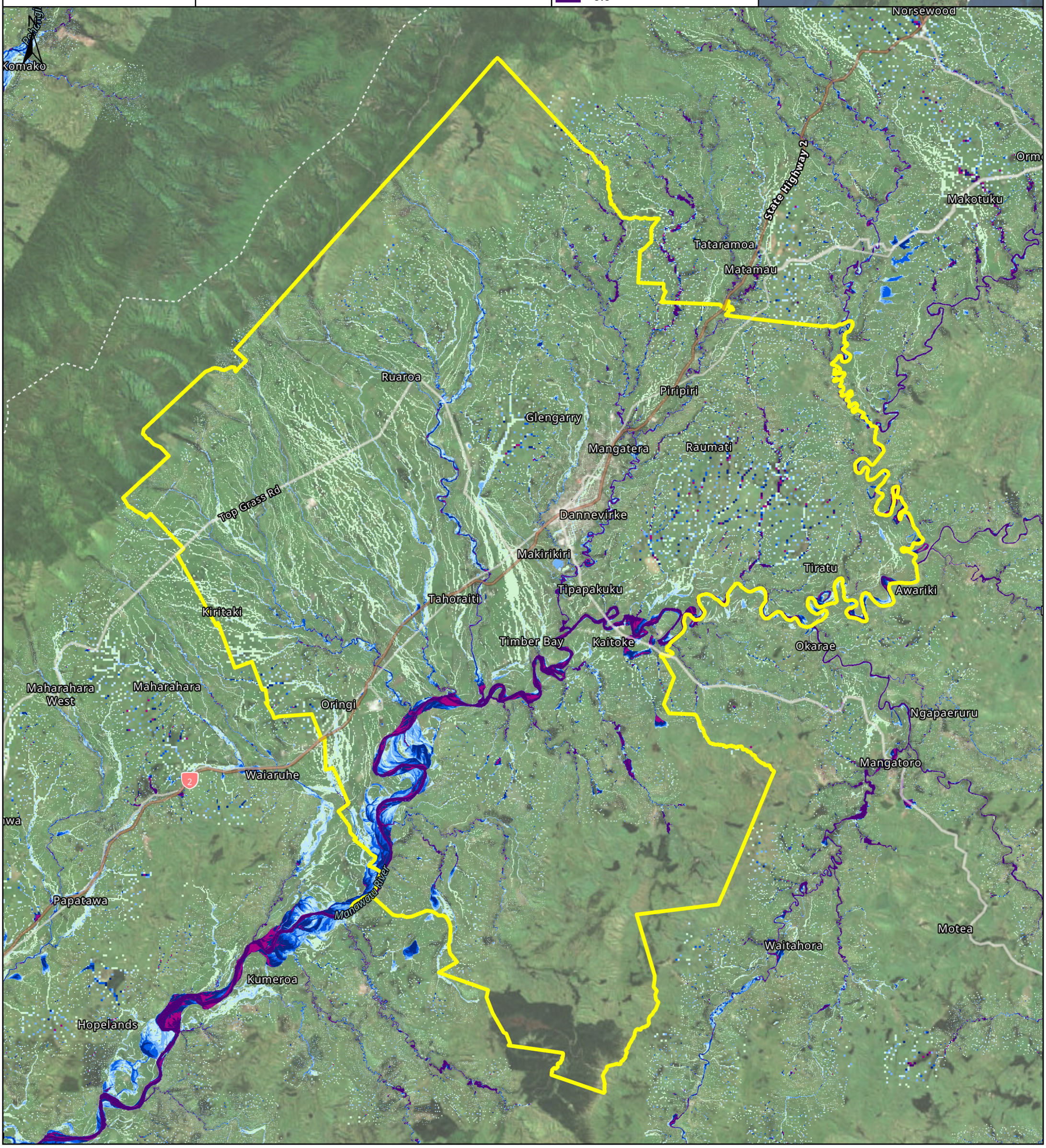

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Horizons Region Flood Vulnerability Assessment

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

Community
Dannevirke,
Tararua District

Scale 1:110,000 at A3

0 3 6 Km

Legend

- Community Boundary

Flood Depth (m)

- 0.05 - 0.20
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- 0.5 - 1.0
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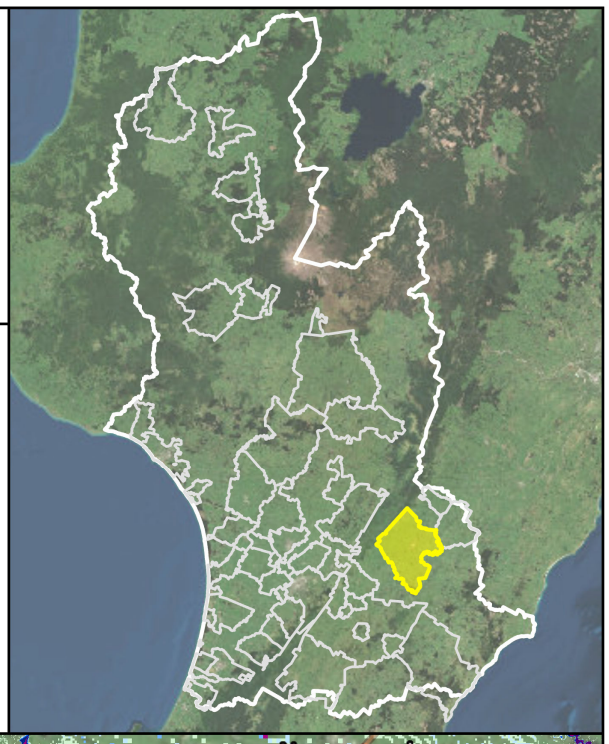

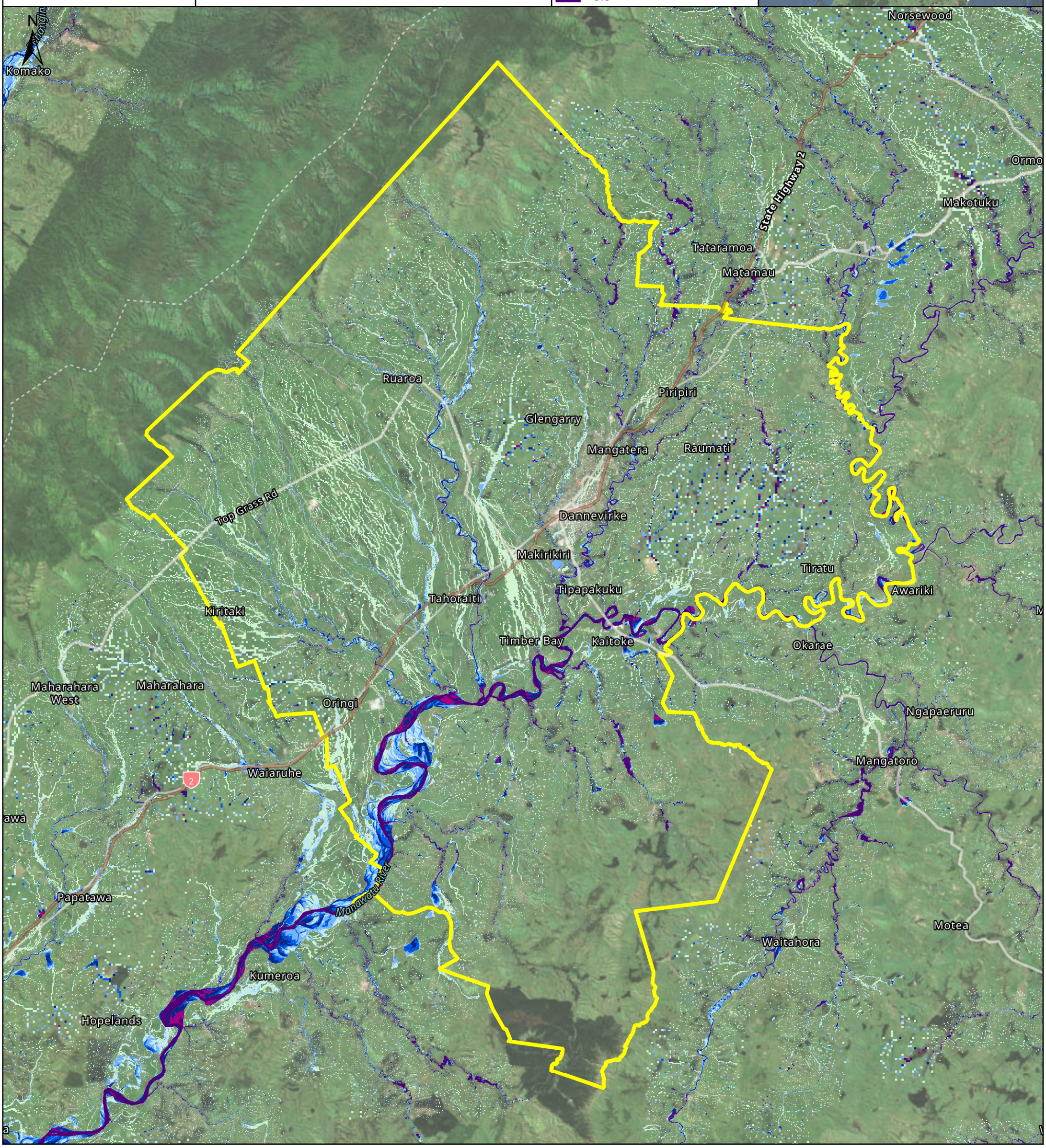

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Horizons Region Flood Vulnerability Assessment

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

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Tararua District

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0 3 6 Km

Legend

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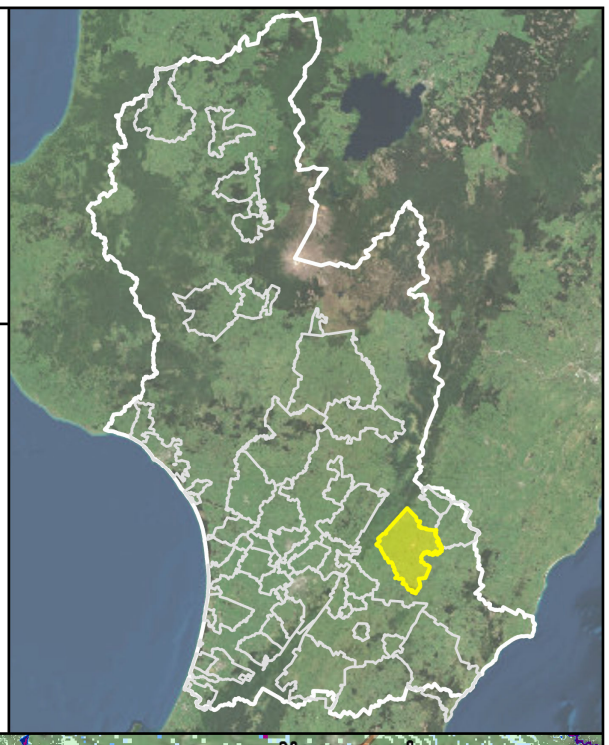

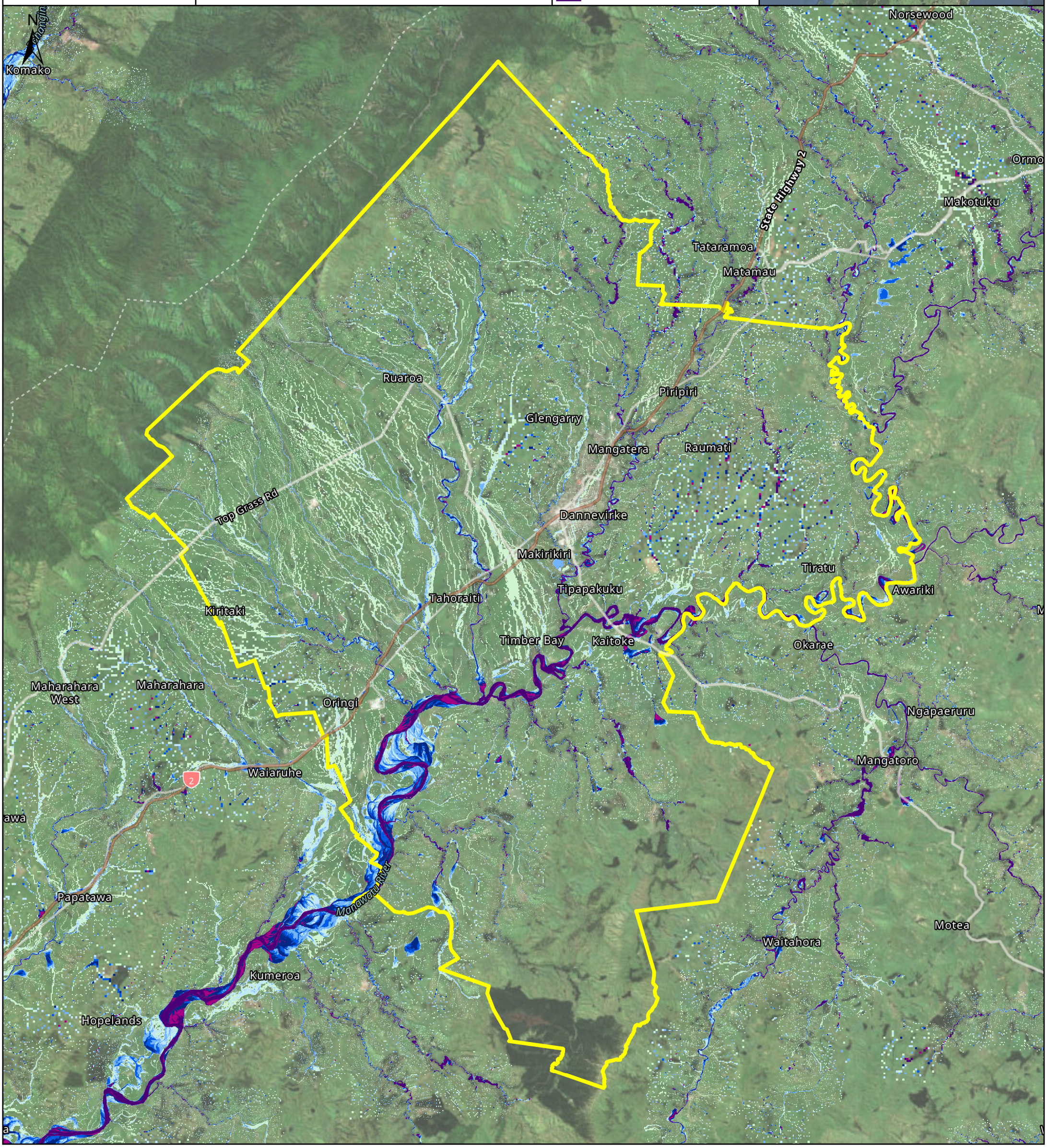

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Horizons Region Flood Vulnerability Assessment

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

Community
Dannevirke,
Tararua District

Scale 1:110,000 at A3

0 3 6 Km

Legend

- Community Boundary

Flood Depth (m)

- 0.05 - 0.20
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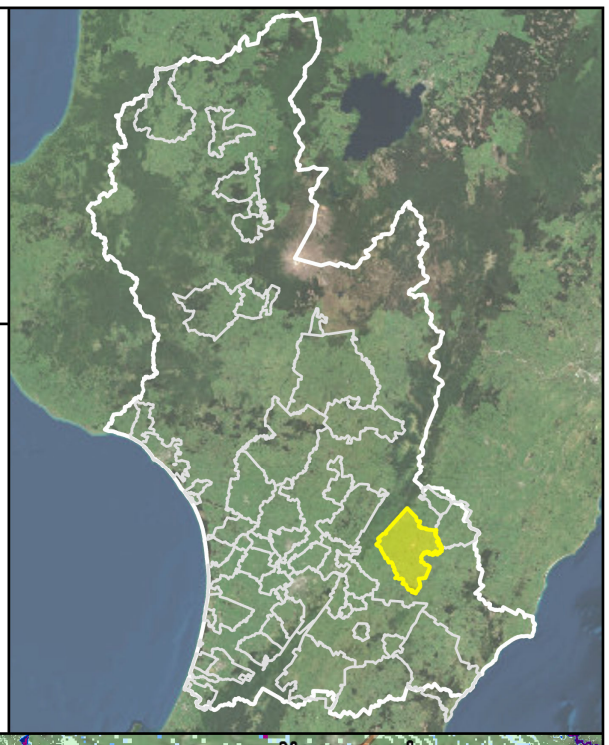

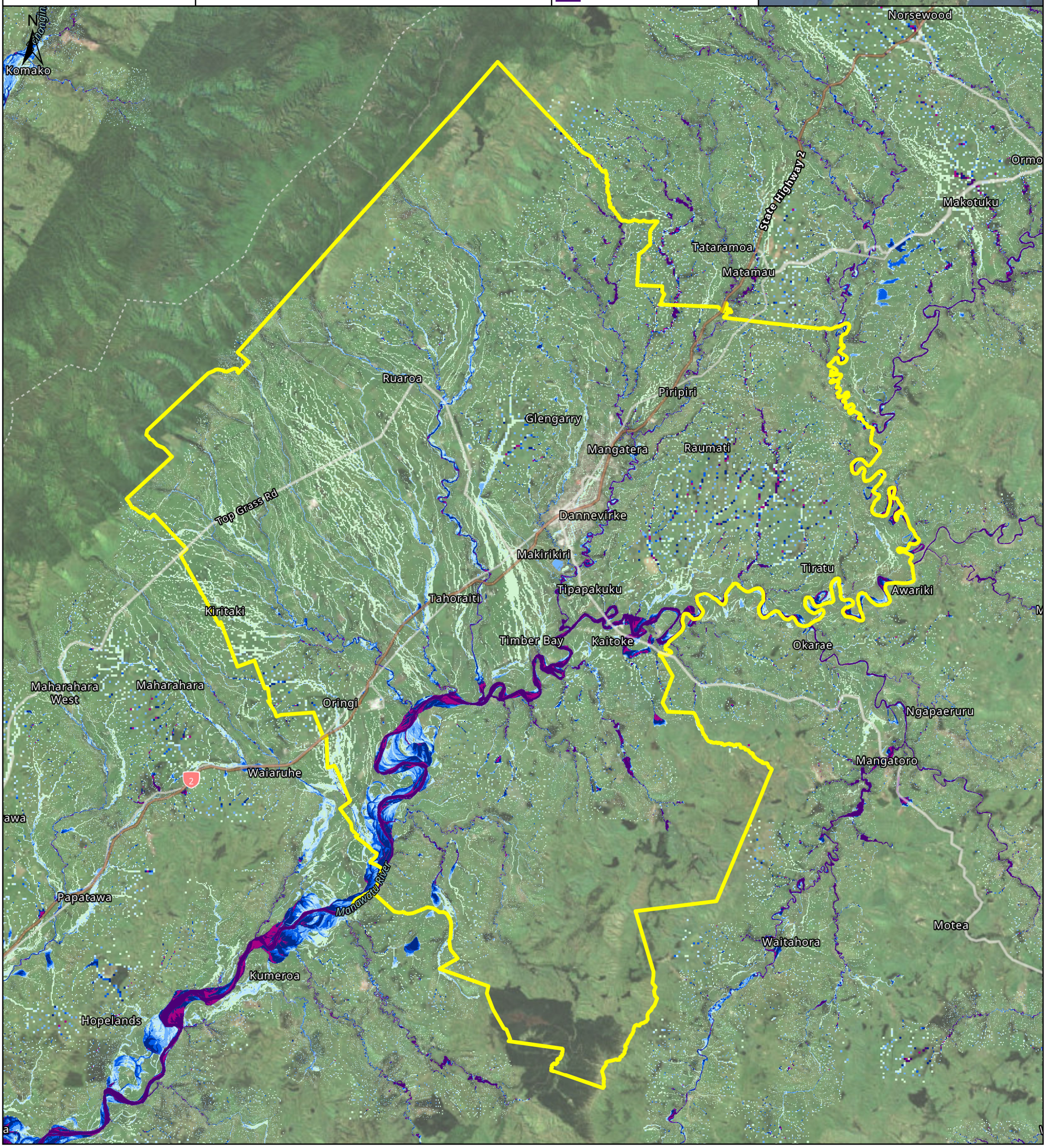

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Horizons Region Flood Vulnerability Assessment

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

Community
Dannevirke,
Tararua District

Scale 1:110,000 at A3

0 3 6 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
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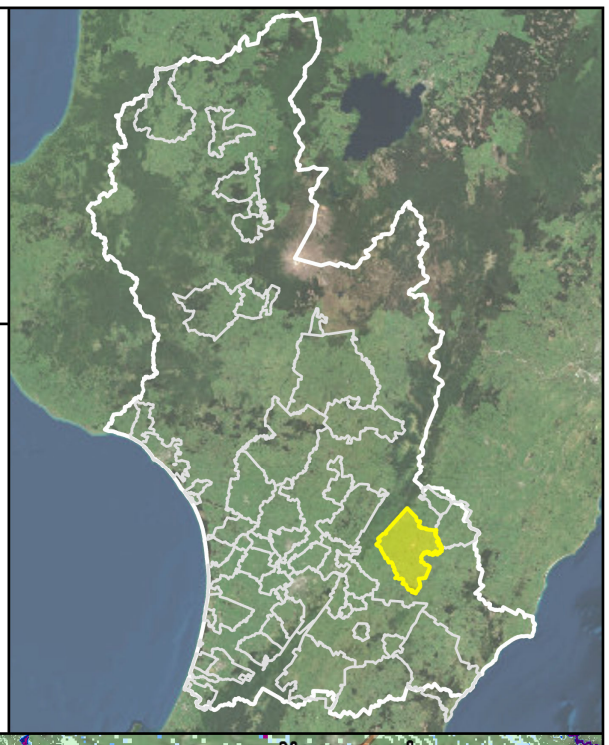

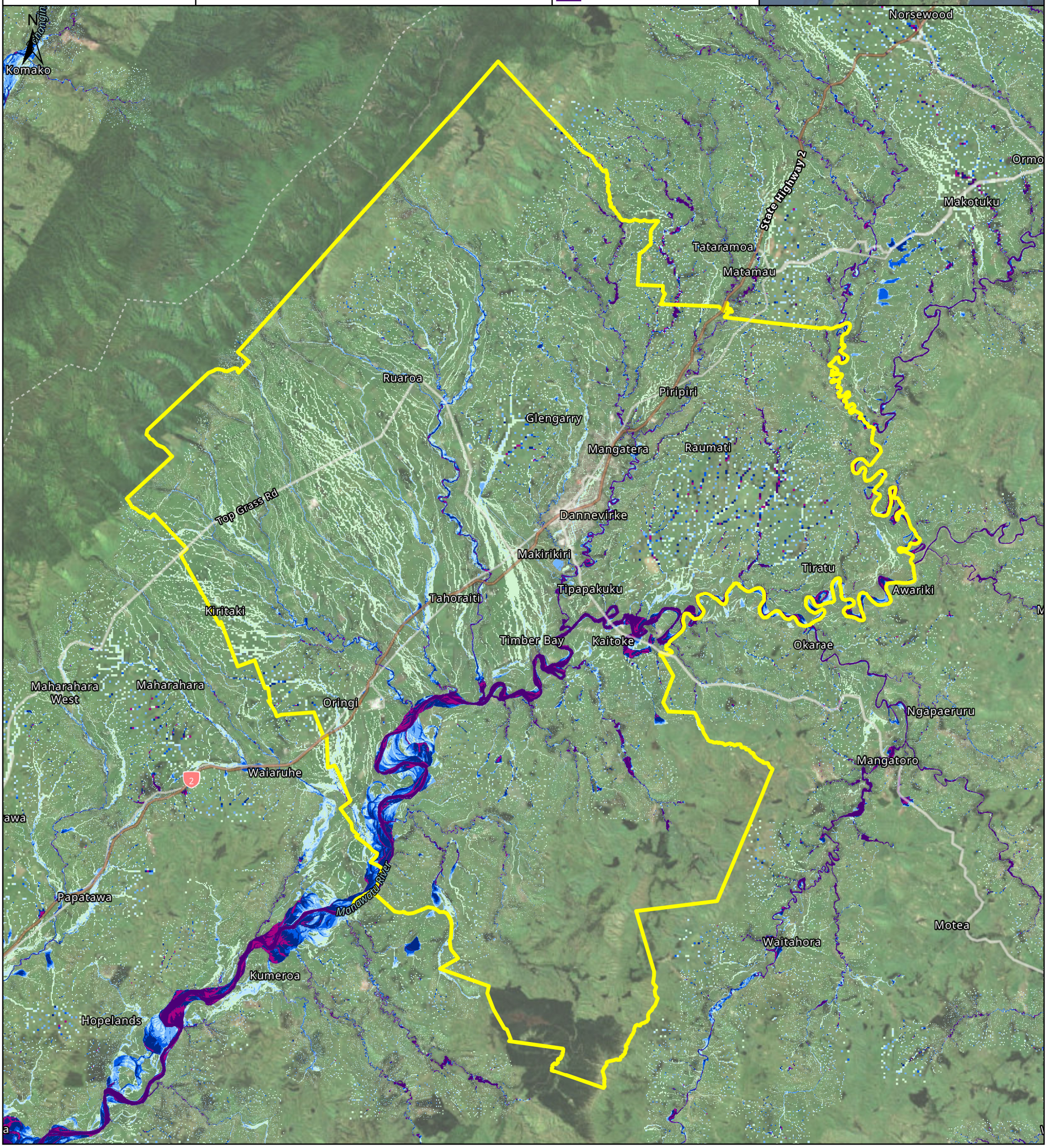

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Horizons Region Flood Vulnerability Assessment

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

Community
Dannevirke,
Tararua District

Scale 1:110,000 at A3

0 3 6 Km

Legend

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Flood Depth (m)

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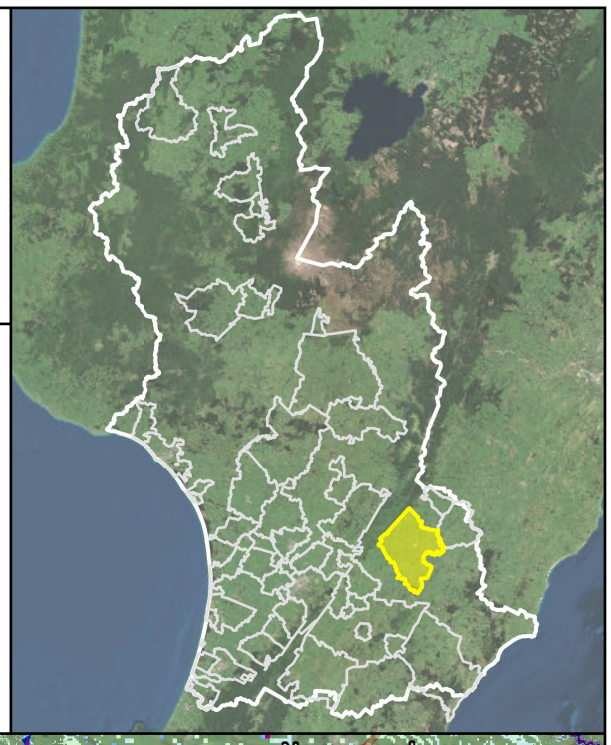

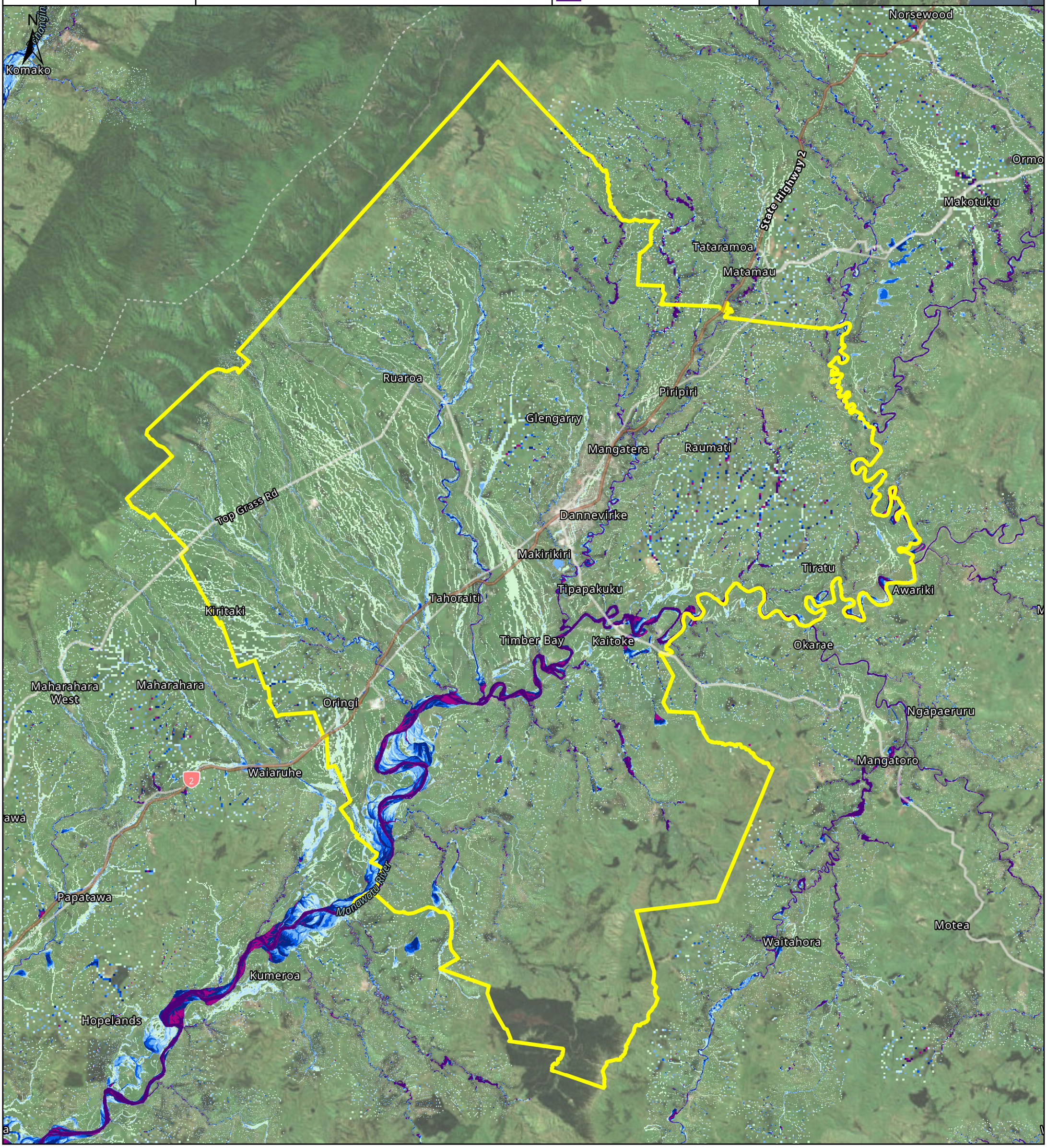

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Community
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Tararua District

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0 3 6 Km

Legend

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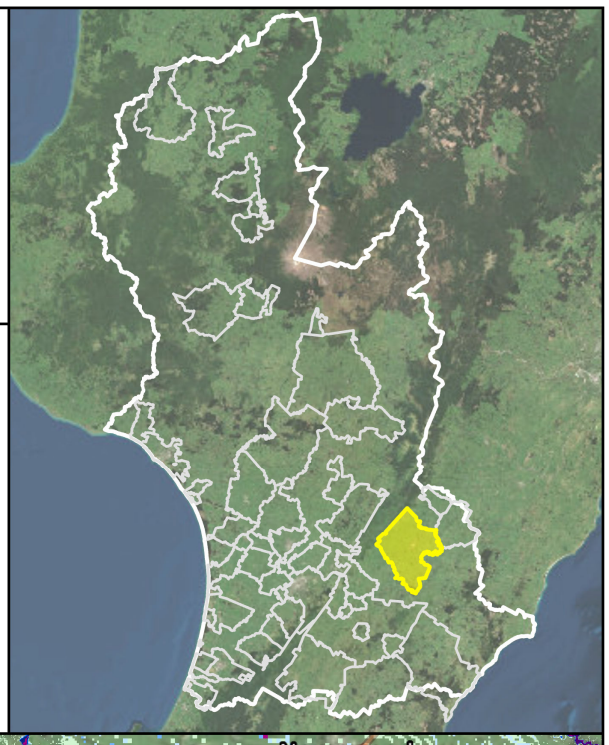

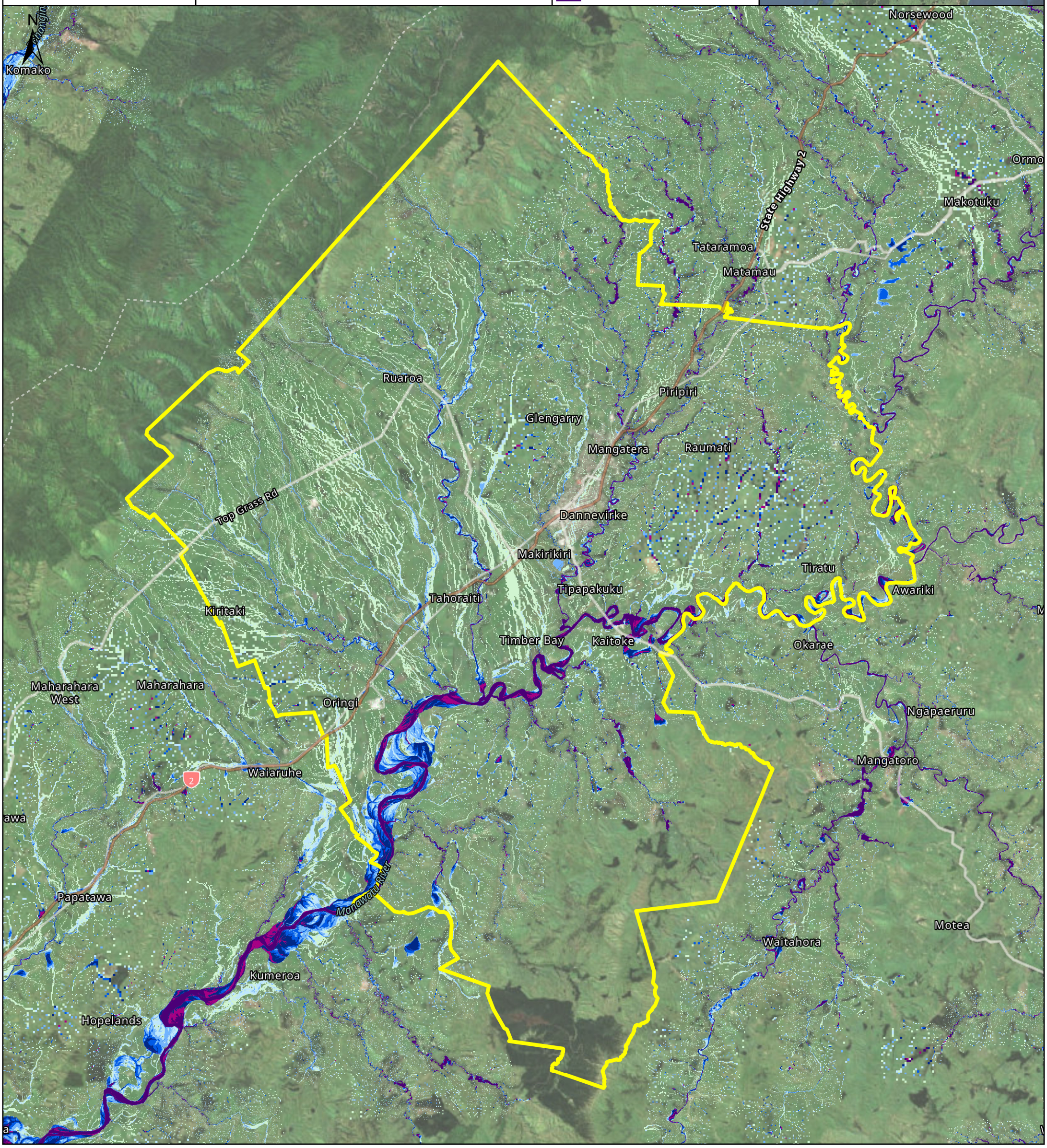

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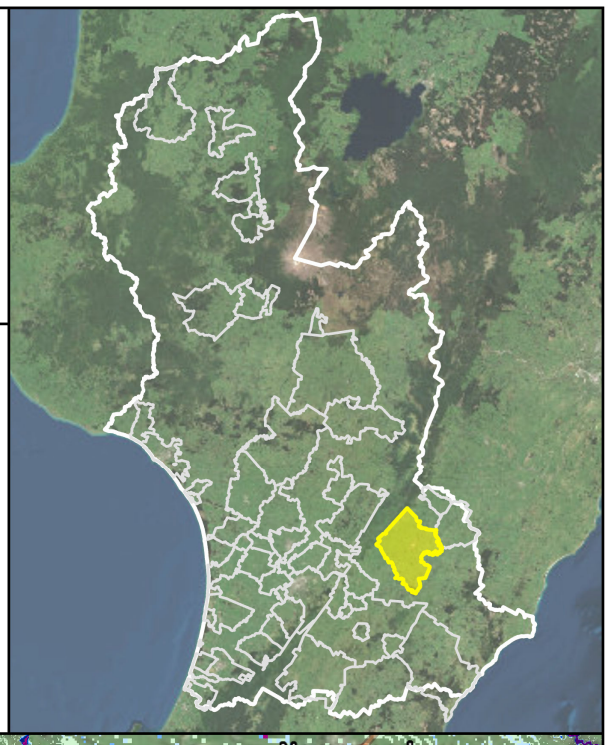

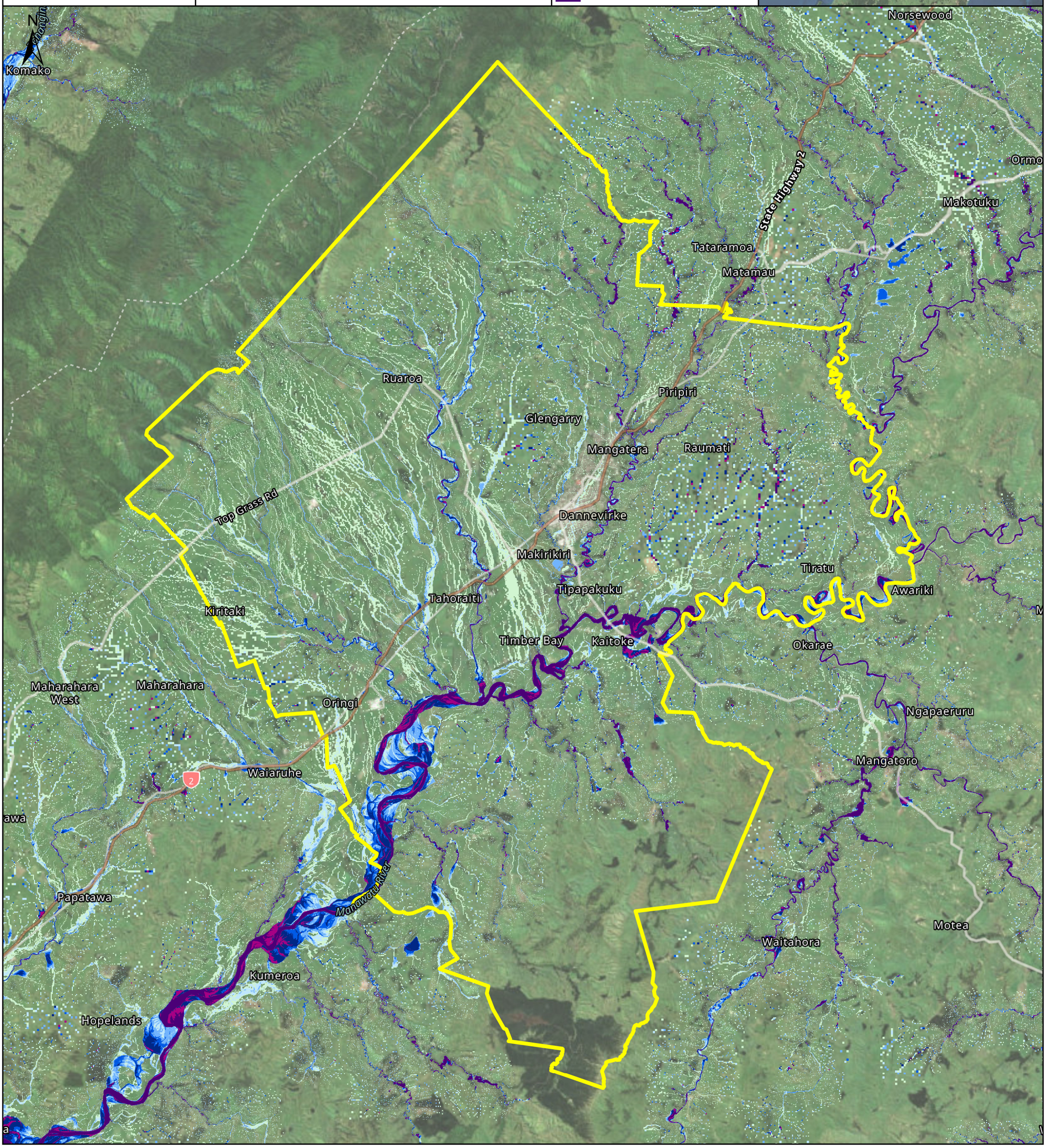

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05/08/2025

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
Dannevirke,
Tararua District

Scale 1:110,000 at A3

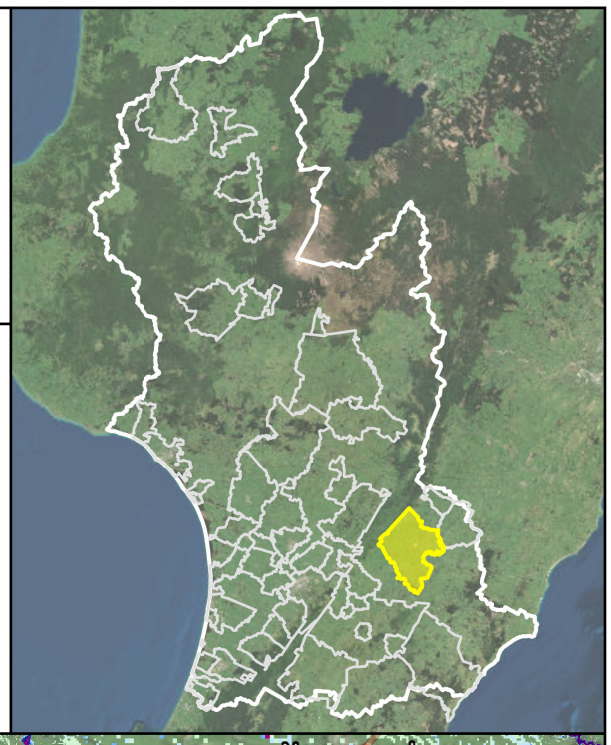
0 3 6 Km

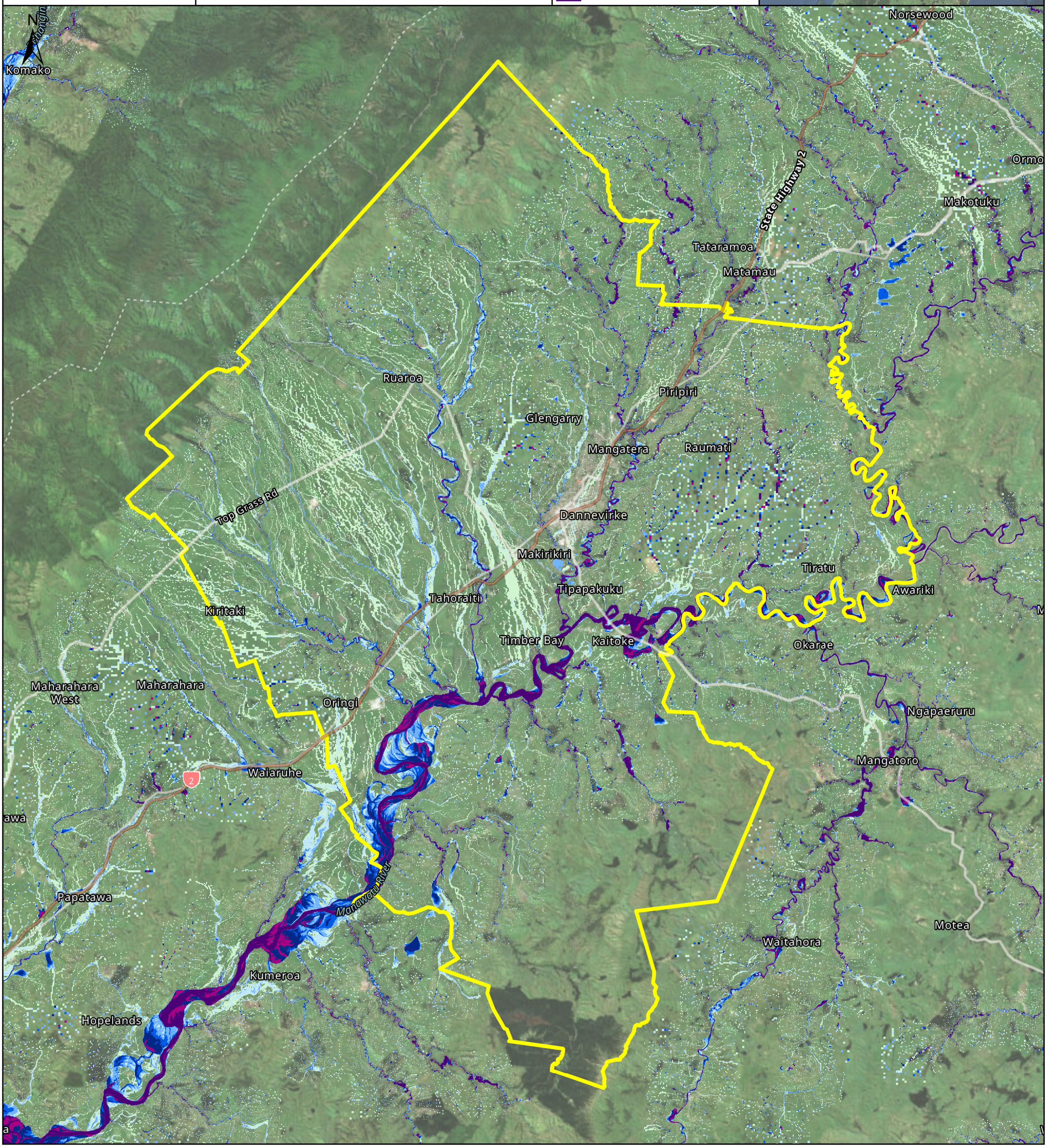
Legend

- 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

horizons REGIONAL COUNCIL

Prepared By

wsp

NIWA Taihoro Nukurangi

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
Dannevirke,
Tararua District

Scale 1:109,000 at A3

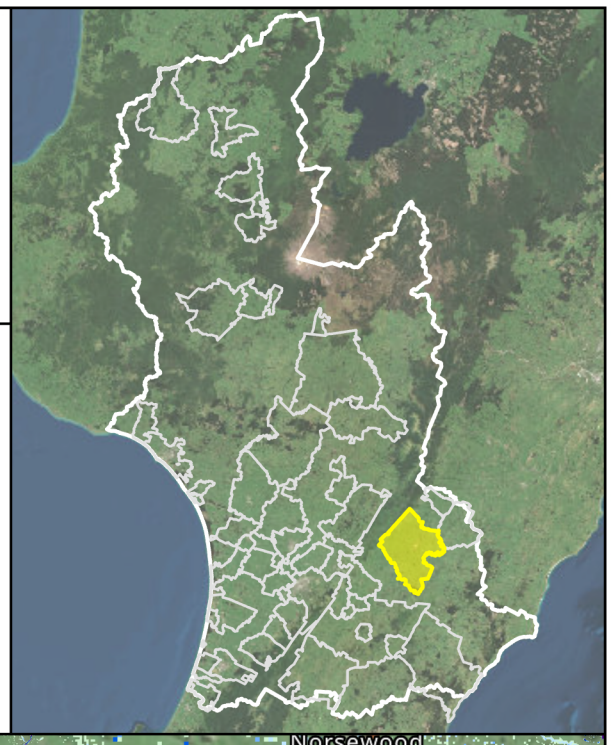
0 3.25 6.5 Km

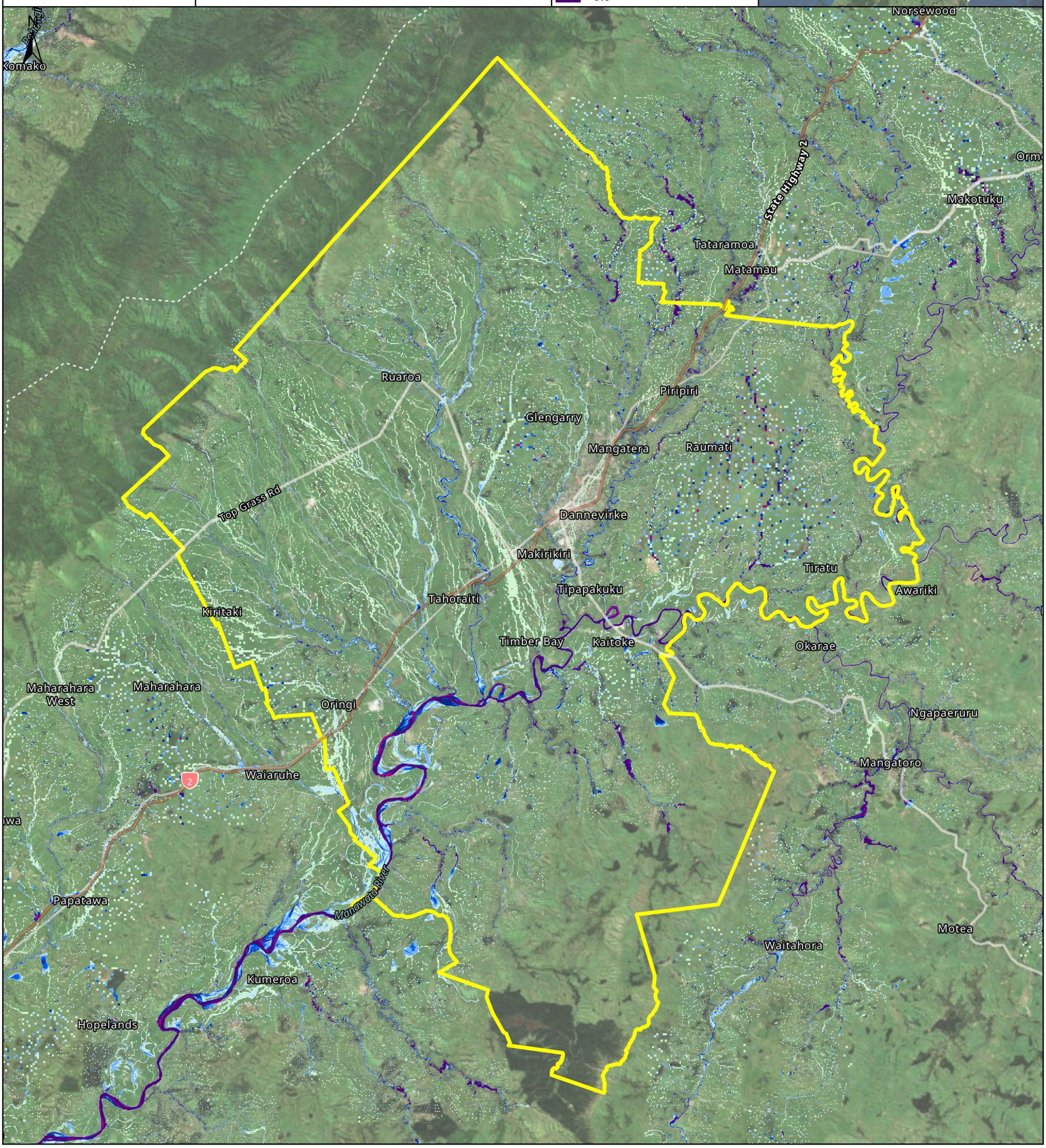
Legend

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

Community
Dannevirke,
Tararua District

Scale 1:109,000 at A3

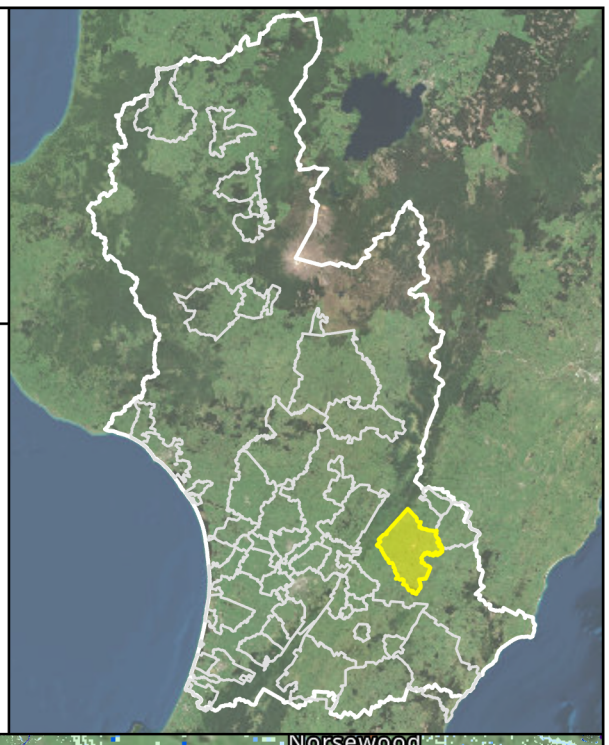
0 3.25 6.5 Km

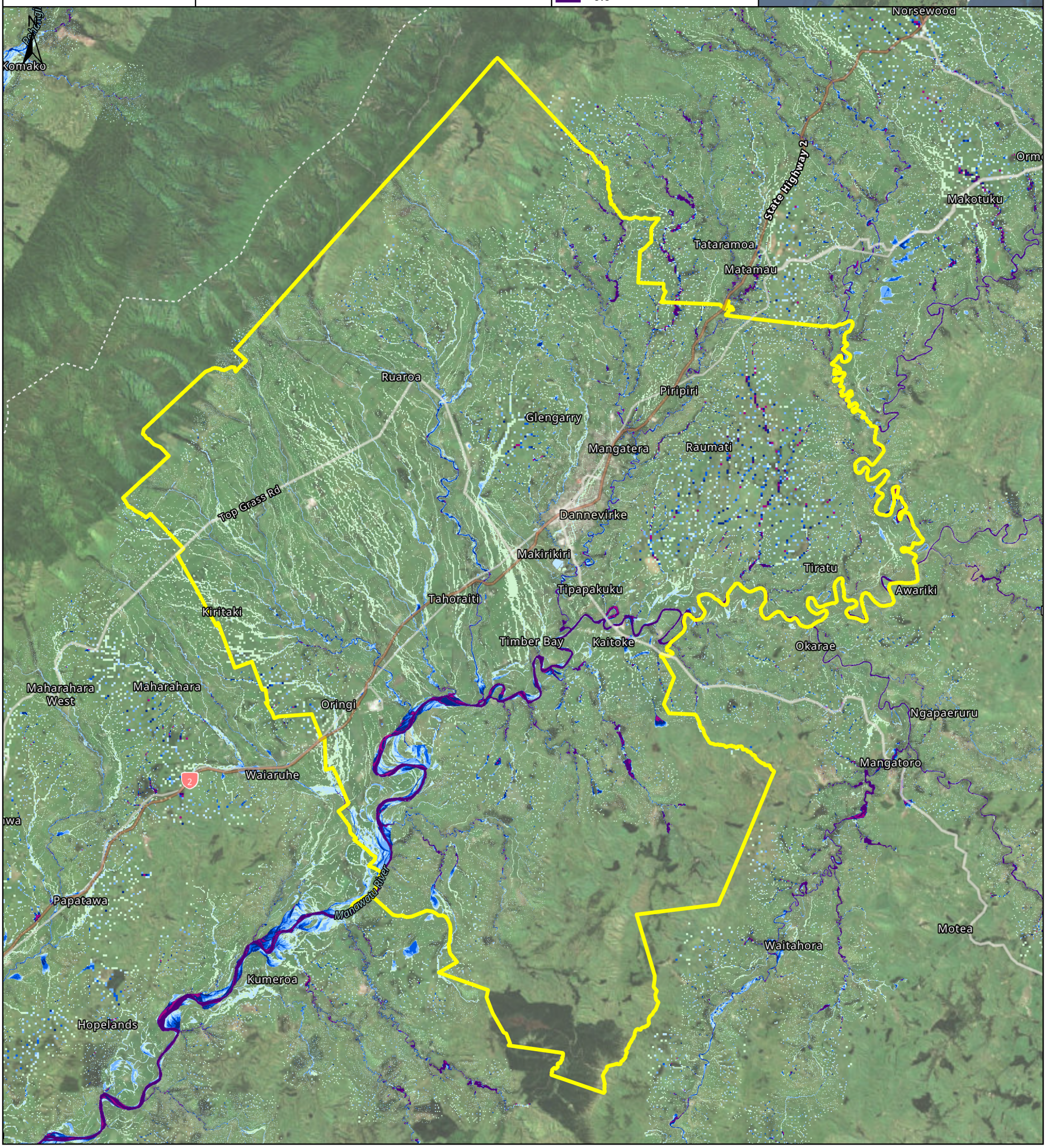
Legend

- 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
Dannevirke,
Tararua District

Scale 1:109,000 at A3

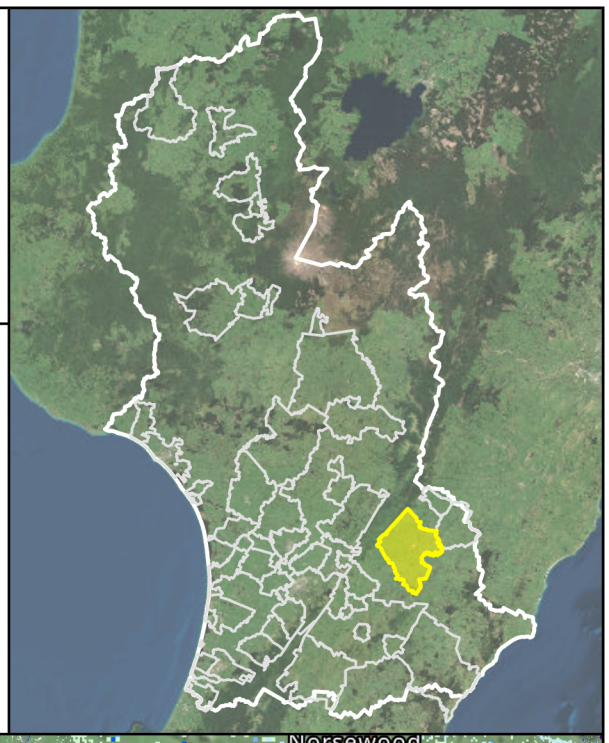
0 3.25 6.5 Km

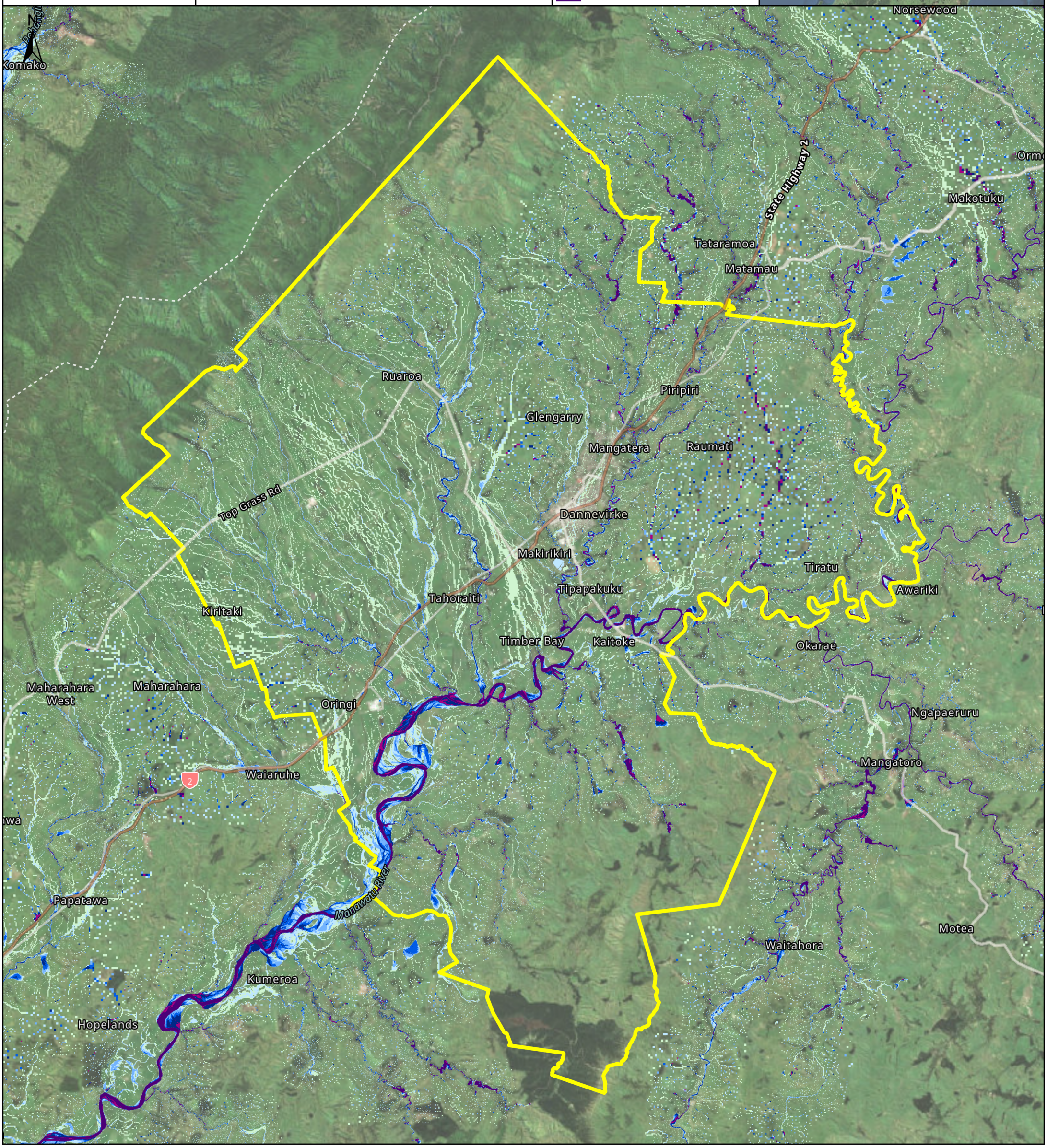
Legend

- 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, 0 degrees warming due to climate change, sea level rise excluded

Community
Dannevirke,
Tararua District

Scale 1:109,000 at A3

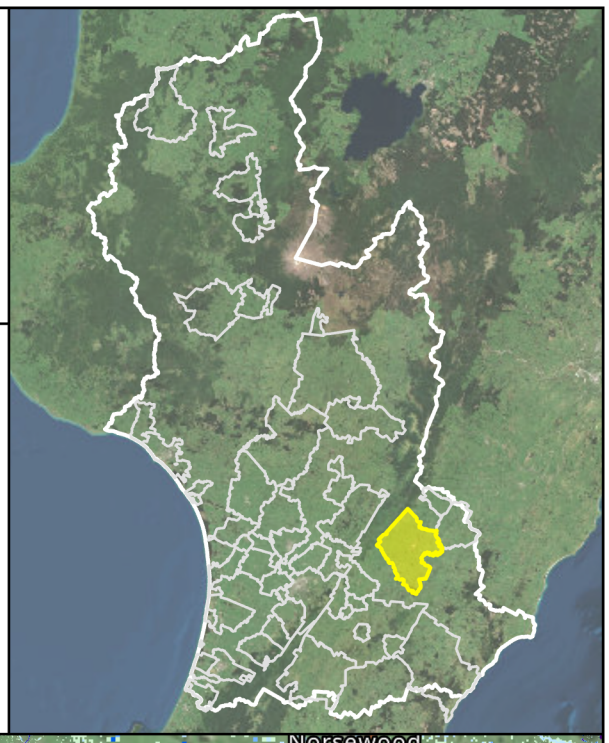
0 3.25 6.5 Km

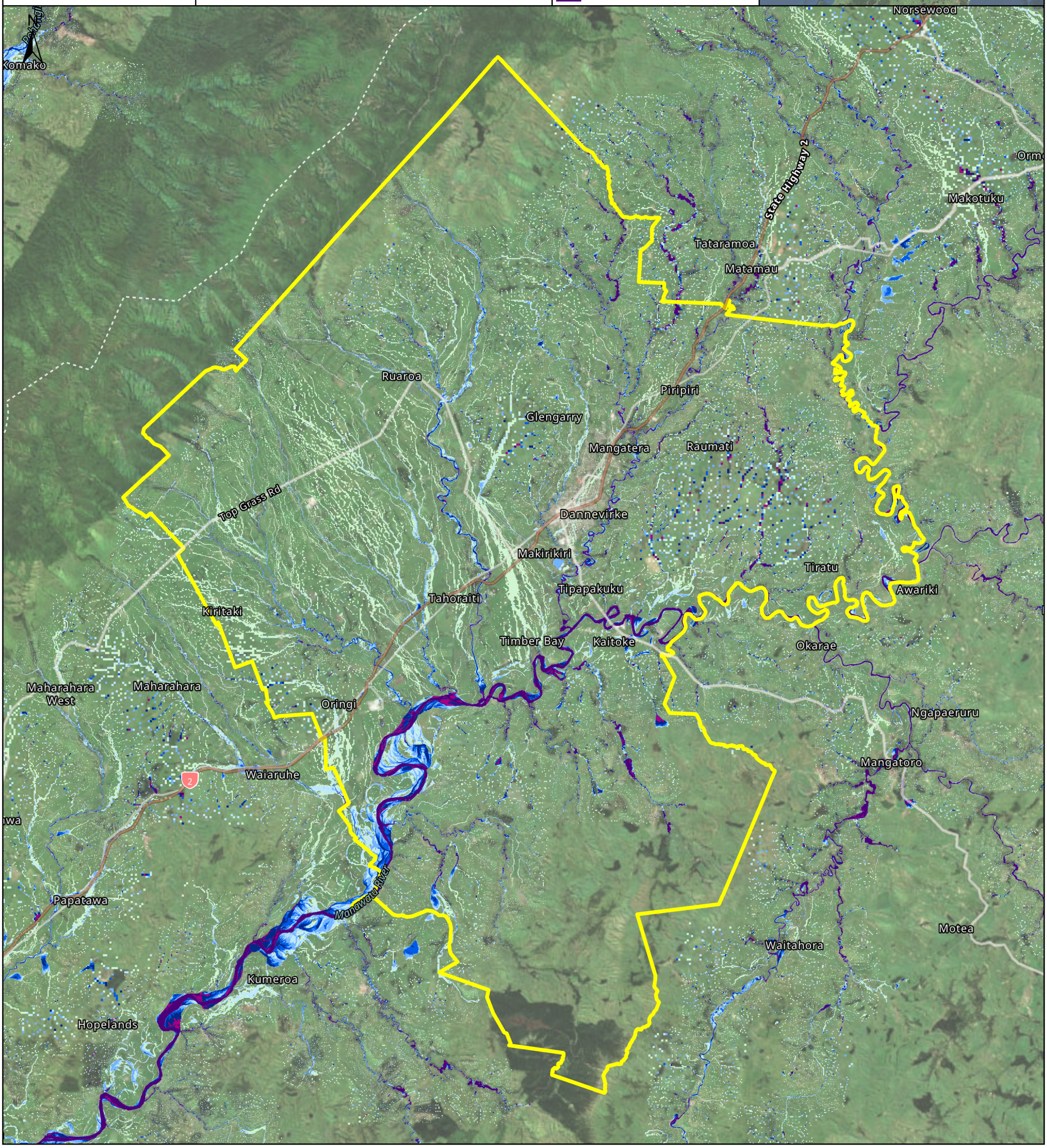
Legend

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

Community
Dannevirke,
Tararua District

Scale 1:109,000 at A3

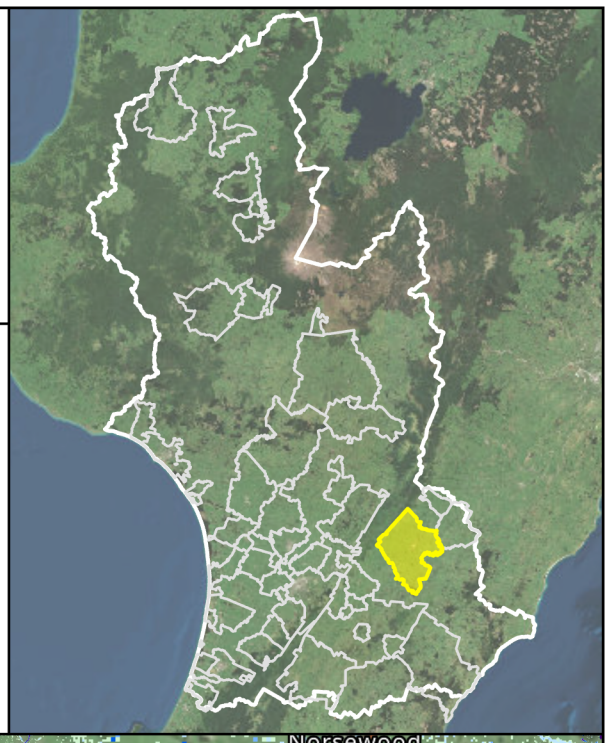
0 3.25 6.5 Km

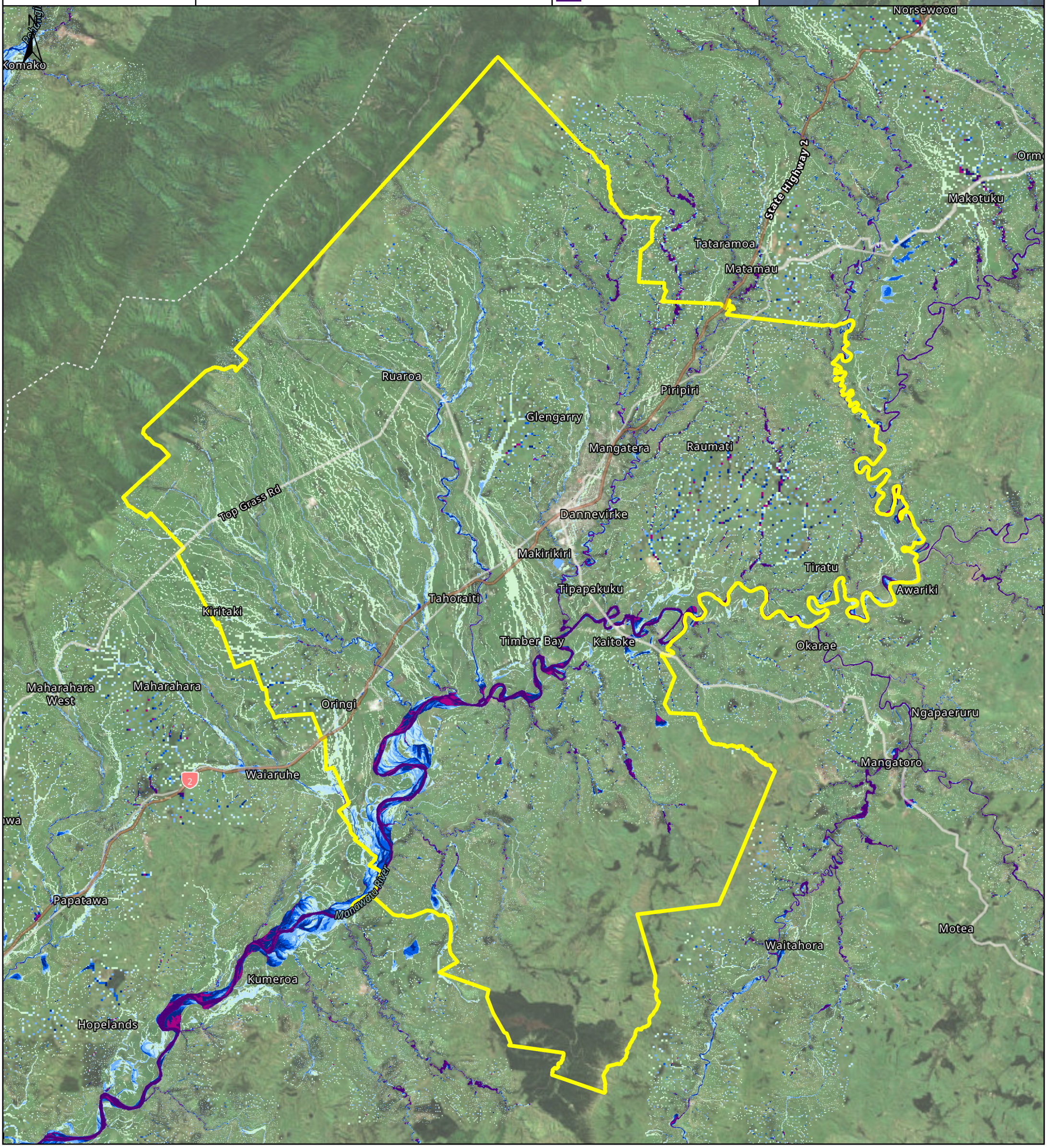
Legend

- 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, 2 degrees warming due to climate change, sea level rise excluded

Community
Dannevirke,
Tararua District

Scale 1:109,000 at A3

0 3.25 6.5 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
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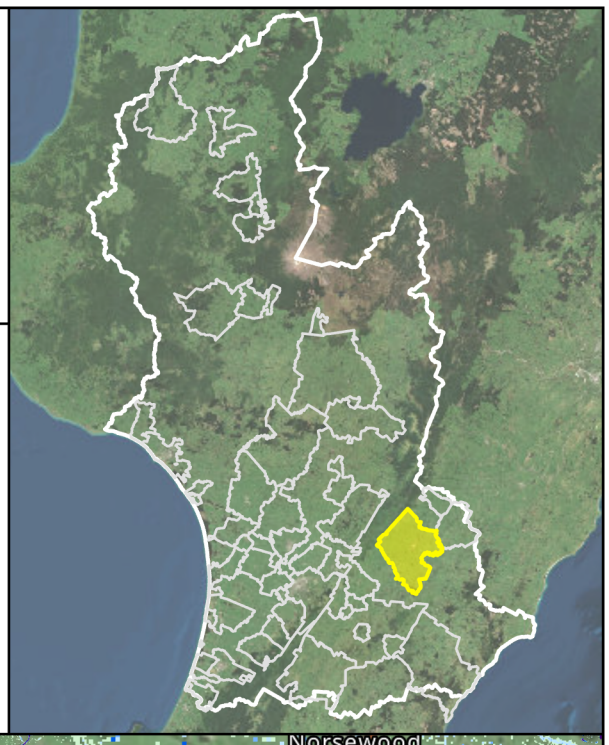

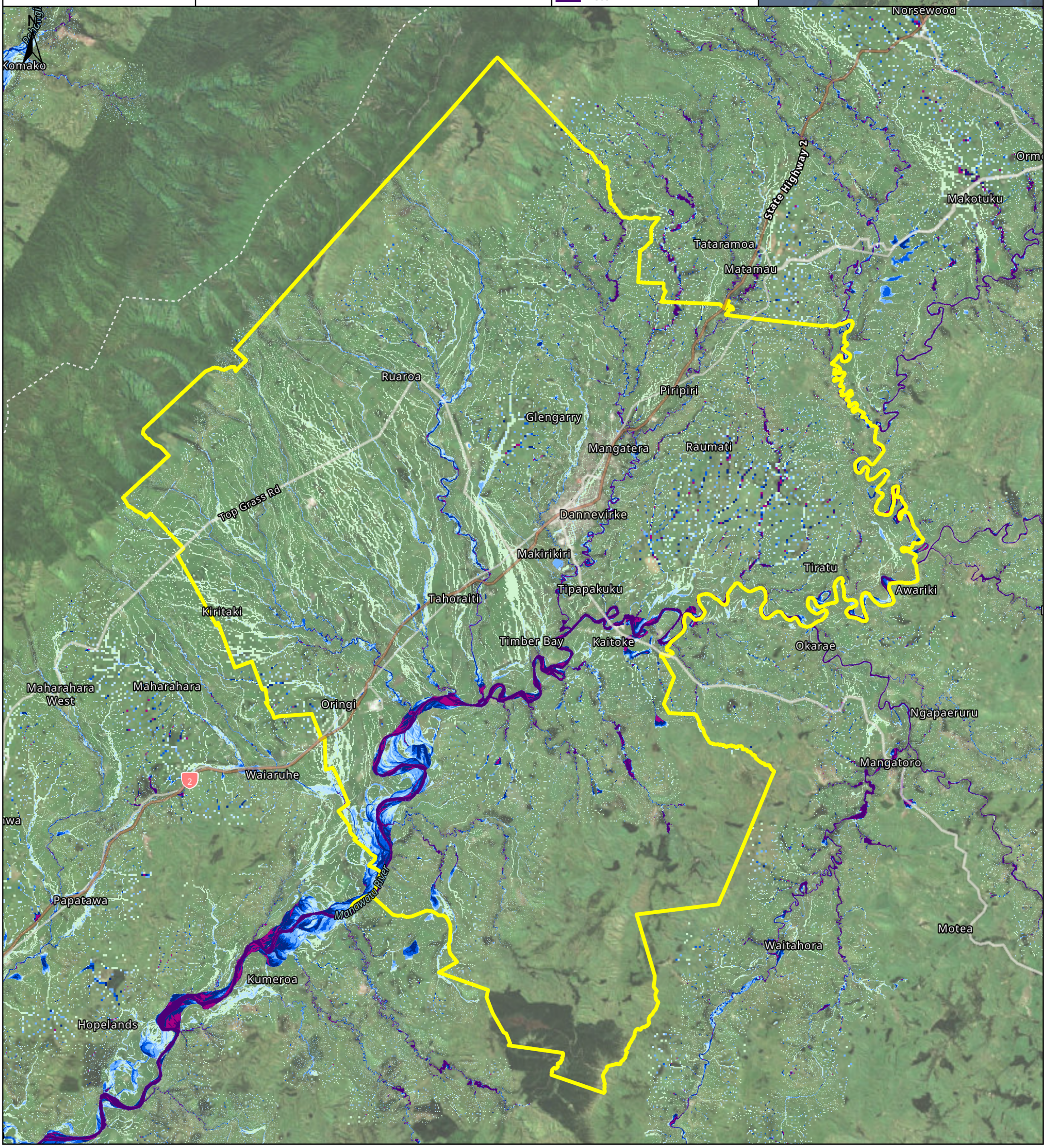

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Horizons Region Flood Vulnerability Assessment

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

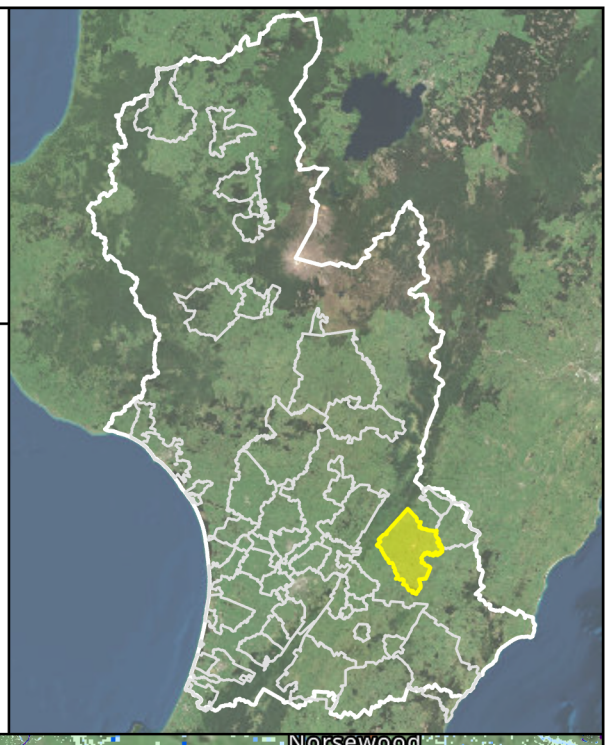
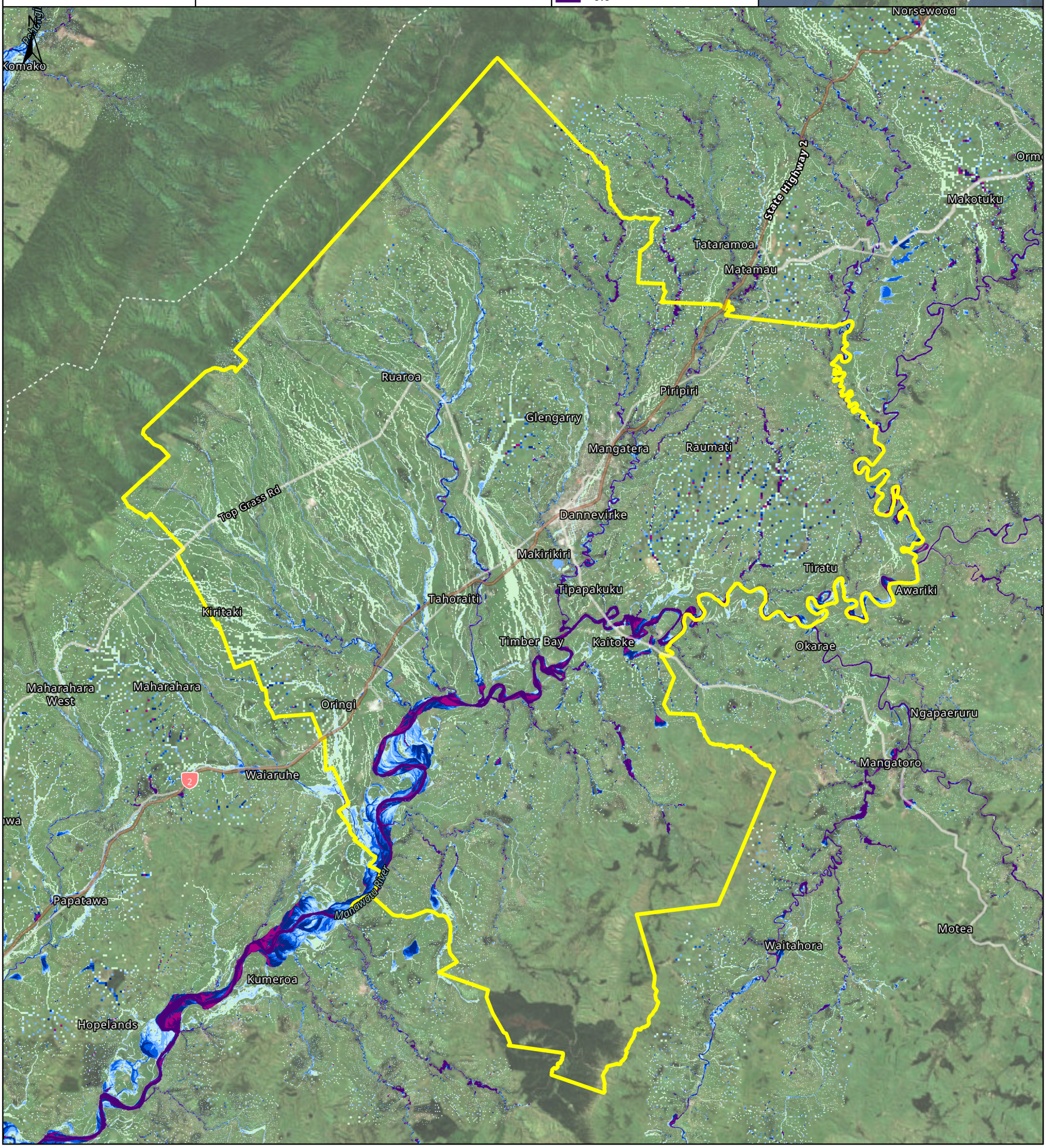
Community
Dannevirke,
Tararua District

Scale 1:109,000 at A3

0 3.25 6.5 Km

Legend

- Community Boundary

Flood Depth (m)

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