Date	Site																													
	#1-Dec	#2-Dec	#3-Dec	#4-Dec	#5-Dec	#6-Dec	#7-Dec	#8-Dec	#9-Dec	#10A - Dec	#10B - Dec	#11-Dec	#12A - Dec	#12B - Dec	#13-Dec	#14-Dec	#15-Dec	#16-Dec	#17-Dec	#18-Dec	#19-Dec	#20-Dec	#21-Dec	#22-Dec	#23-Dec	#24-Dec	#25-Dec	#26-Dec	#27-Dec	#28-Dec	#29-Dec	#30-Dec
13-Dec-21	0	0	0	0	0	0	0	0	0	N/A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	E	0	0	0	0	0	0
14-Dec-21	Weather conditions unsuitable.																															
15-Dec-21	0	0	0	0	0	0	0	0	0	N/A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	E	0	0	0	0	0	0
16-Dec-21	0	0	0	0	0	0	0	0	0	N/A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	E	0	0	0	0	0	0
17-Dec-21	0	0	0	0	0	0	0	0	0	N/A	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	E	1	0	0	0	0	0
18-Dec-21	0	0	0	0	0	0	0	0	0	N/A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	E	0	0	0	0	0	0
19-Dec-21	0	0	0	0	0	0	0	0	0	N/A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	E	0	0	0	0	0	0
20-Dec-21	0	0	0	0	0	0	0	E	0	N/A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	E	0	0	0	0	0	0
21-Dec-21	0	0	0	0	0	0	0	E	0	N/A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	E	0	0	0	0	N/A	0
22-Dec-21	0	0	0	N/A	N/A	N/A	N/A	E	N/A	N/A	0	N/A	0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	E	N/A	N/A	0	N/A	N/A	N/A
Total Count of Bat Passes	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**3**	**0**	**42**	**0**	**0**	**0**
# Suitable Nights Recorded	**29**	**28**	**29**	**34**	**34**	**34**	**34**	**27**	**29**	**18**	**15**	**34**	**35**	**35**	**30**	**32**	**32**	**34**	**32**	**32**	**34**	**34**	**32**	**32**	**33**	**12**	**33**	**34**	**35**	**18**	**33**	**34**
Mean # Nightly Bat Passes	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**

Notes: N/A = ABM not deployed. E = Instrument error. Highlighted blue cells = Number of bat calls.

2.2 April 2022

Date	Site																		
	#1-Apr	#2-Apr	#3-Apr	#4-Apr	#5-Apr	#6-Apr	#7-Apr	#8-Apr	#9-Apr	#10-Apr	#11-Apr	#12-Apr	#13-Apr	#14-Apr	#15-Apr	#16-Apr	#17-Apr	#18-Apr	#19-Apr	#20-Apr	#21-Apr
6-Apr-22	N/A	0	0	N/A	0	N/A	N/A	1	0	1	N/A	Error	2	0	9	1	N/A	0	0	0	Error
7-Apr-22	1	1	0	0	0	27	15	1	0	21	0	Error	2	0	0	0	44	0	0	0	Error
8-Apr-22	0	0	0	3	1	46	58	1	0	4	4	Error	7	1	0	0	56	0	0	0	Error
9-Apr-22	0	0	0	3	3	62	3	3	0	7	1	Error	1	0	0	0	44	0	0	0	Error
10-Apr-22	0	0	0	8	0	17	3	4	2	5	7	Error	0	0	0	0	41	0	0	0	Error
11-Apr-22	0	0	0	0	0	14	0	0	0	23	26	Error	1	7	3	0	190	0	0	0	Error

Date	Site																			
	#1-Apr	#2-Apr	#3-Apr	#4-Apr	#5-Apr	#6-Apr	#7-Apr	#8-Apr	#9-Apr	#10-Apr	#11-Apr	#12-Apr	#13-Apr	#14-Apr	#15-Apr	#16-Apr	#17-Apr	#18-Apr	#19-Apr	#20-Apr	#21-Apr
12-Apr-22	0	0	0	0	0	9	0	1	0	17	4	Error	3	4	3	1	113	0	0	0	Error
13-Apr-22	0	0	0	5	0	2	0	2	0	2	7	Error	2	0	0	1	16	0	0	0	Error
14-Apr-22	0	0	0	0	0	14	0	3	0	11	3	Error	0	0	0	0	68	0	0	0	Error
15-Apr-22	0	0	0	1	0	7	0	0	0	2	3	Error	2	0	0	0	45	0	0	0	Error
16-Apr-22	0	0	0	1	5	22	0	0	0	22	43	Error	2	0	0	0	71	0	0	0	Error
17-Apr-22	0	0	0	0	0	1	0	3	0	2	0	Error	0	0	0	0	181	0	0	0	Error
18-Apr-22	0	0	0	0	0	0	0	0	0	0	0	Error	0	0	0	0	7	0	0	0	Error
19-Apr-22	0	0	0	0	0	0	0	0	0	0	0	Error	0	0	0	0	66	0	0	0	Error
20-Apr-22	0	0	0	0	0	3	0	0	0	7	2	Error	0	3	0	0	17	0	0	0	Error
21-Apr-22	0	0	0	0	0	0	0	0	0	0	0	Error	0	1	0	0	72	0	0	0	Error
22-Apr-22	0	0	0	0	0	1	0	1	0	0	0	Error	1	0	0	0	1	0	0	0	Error
23-Apr-22	0	0	0	0	3	9	0	1	0	1	1	Error	4	0	2	0	35	0	0	0	Error
24-Apr-22	0	0	0	1	0	4	0	0	0	0	1	Error	0	0	1	0	21	0	0	0	Error
25-Apr-22	0	0	0	0	0	10	3	1	0	8	3	Error	0	0	0	0	29	0	0	0	Error
26-Apr-22	0	0	0	0	2	2	0	2	0	4	5	Error	0	1	0	0	113	0	0	0	Error
27-Apr-22	0	0	0	5	7	3	0	2	0	14	15	Error	0	1	0	1	37	0	0	0	Error
28-Apr-22	0	1	0	1	0	12	0	0	0	12	18	Error	3	0	0	0	19	0	0	0	Error
29-Apr-22	0	0	0	0	0	9	0	0	0	6	0	Error	0	1	0	1	29	0	0	1	Error
30-Apr-22	0	0	0	1	0	27	10	0	0	18	10	Error	1	1	0	0	15	0	0	0	Error
1-May-22	0	0	0	0	0	25	11	2	0	34	6	Error	1	1	0	0	8	0	0	0	Error
2-May-22	0	0	0	0	0	20	0	7	0	10	3	0	5	0	0	0	32	0	0	0	Error
Total Count of Bat Passes	**1**	**2**	**0**	**29**	**21**	**346**	**103**	**35**	**2**	**231**	**162**	**0**	**37**	**21**	**18**	**5**	**1370**	**0**	**0**	**1**	**N/A**
# Suitable Nights Recorded	**26**	**27**	**27**	**26**	**27**	**26**	**26**	**27**	**27**	**27**	**26**	**1**	**27**	**27**	**27**	**27**	**26**	**27**	**27**	**27**	**N/A**
Mean # Nightly Bat Passes	**0**	**0**	**0**	**1**	**1**	**13**	**4**	**1**	**0**	**9**	**6**	**0**	**1**	**1**	**1**	**0**	**53**	**0**	**0**	**0**	**N/A**

Notes: N/A = ABM not deployed. E = Instrument error. Highlighted blue cells = Number of bat calls.

3 Appendix 3 - First and Last Bat Pass Results

Table 3 Times in which the first and last bat call was recorded each night, in relation to sunset and sunrise times (December 2021 survey)

Site	Sunset			Sunrise		
	First bat pass recorded during the survey period (hh:mm)	Minimum time difference between sunset and first bat pass (h:mm)	Percentage of nights where first bat pass is within 30 minutes of sunset (%)	Last bat pass recorded during the survey period (hh:mm)	Minimum time difference between last bat pass and sunrise (h:mm)	Percentage of nights where last bat pass is within 30 minutes of sunrise (%)
#2-Dec	02:14	5:50	0.00	02:14	3:40	0.00
#11-Dec	01:07	4:44	0.00	02:00	3:53	0.00
#17-Dec	01:42	1:37	0.00	01:42	4:13	0.00
#21-Dec	02:01	5:38	0.00	02:01	3:53	0.00
#23-Dec	22:26	2:13	0.00	22:26	7:32	0.00
#25-Dec	01:19	4:42	0.00	02:51	3:09	0.00
#27-Dec	23:55	3:33	0.00	02:10	3:44	0.00

Table 4 Times in which the first and last bat call was recorded each night, in relation to sunset and sunrise times (April 2022 survey)

Site	Sunset			Sunrise		
	First bat pass recorded during the survey period (hh:mm)	Minimum time difference between sunset and first bat pass (h:mm)	Percentage of nights where first bat pass is within 30 minutes of sunset (%)	Last bat pass recorded during the survey period (hh:mm)	Minimum time difference between last bat pass and sunrise (h:mm)	Percentage of nights where last bat pass is within 30 minutes of sunrise (%)
#1-April	19:26	1:20	0.00	19:26	11:11	0.00
#2-April	19:27	1:21	0.00	00:39	6:18	0.00
#4-April	18:55	1:15	0.00	23:27	7:15	0.00
#5-April	19:06	1:16	0.00	00:46	5:53	0.00
#6-April	18:35	0:53	0.00	03:43	3:00	0.00
#7-April	19:02	1:01	0.00	21:24	9:17	0.00

Site	Sunset			Sunrise		
	First bat pass recorded during the survey period (hh:mm)	Minimum time difference between sunset and first bat pass (h:mm)	Percentage of nights where first bat pass is within 30 minutes of sunset (%)	Last bat pass recorded during the survey period (hh:mm)	Minimum time difference between last bat pass and sunrise (h:mm)	Percentage of nights where last bat pass is within 30 minutes of sunrise (%)
#8-April	19:01	0:58	0.00	02:07	4:32	0.00
#9-April	19:46	1:44	0.00	19:52	10:50	0.00
#10-April	19:06	1:10	0.00	03:43	2:56	0.00
#11-April	18:26	0:46	0.00	01:38	5:03	0.00
#13-April	18:53	1:17	0.00	03:27	3:11	0.00
#14-April	19:52	2:16	0.00	02:34	4:16	0.00
#15-April	18:42	0:57	0.00	01:33	5:05	0.00
#16-April	20:18	2:19	0.00	02:51	3:53	0.00
#17-April	18:31	0:52	0.00	05:44	1:02	0.00
#20-April	19:16	1:38	0.00	19:16	11:42	0.00

12 Appendix 12 – Incidental Bird Observations

Common Name	Māori Name	Scientific Name	Conservation Status (Robertson et al., 2021)	Relevant NoR
Barbary dove	-	*Streptopelia risoria*	Introduced and Naturalised	S1, S3
Blackbird	Manu pango	*Turdus merula*	Introduced and Naturalised	S1, S3
Canada goose	-	*Branta canadensis*	Introduced and Naturalised	S1, S3
Chaffinch	Pahirini	*Fringilla coelebs*	Introduced and Naturalised	S1, S3
Common pheasant	Peihana	*Phasianus colchicus*	Introduced and Naturalised	S1, S3
Eastern rosella	-	*Platycercus eximius*	Introduced and Naturalised	S1, S3
Fantail	Pīwakawaka	*Rhipidura fuliginosa placabilis*	Not Threatened	S1, S3
Goldfinch	-	*Carduelis carduelis*	Introduced and Naturalised	S1
Greenfinch	-	*Carduelis chloris*	Introduced and Naturalised	S1, S3
Grey duck x mallard hybrid	-	*Anas platyrhynchos x superciliosa*	Not Threatened	S1, S2, S3
Grey warbler	Riroriro	*Gerygone igata*	Not Threatened	S1, S3
House sparrow	Tiu	*Fringilla coelebs*	Introduced and Naturalised	S1, S3
Kingfisher	Kōtare	*Todiramphus sanctus vagans*	Not Threatened	S1, S3
Magpie	Makipae	*Gymnorhina tibicen*	Introduced and Naturalised	S1, S3
Mallard	-	*Anas platyrhynchos*	Introduced and Naturalised	S1, S2, S3
Myna	-	*Acridotheres tristis*	Introduced and Naturalised	S1, S2, S3
Paradise shelduck	Pūtangitangi	*Tadorna variegata*	Not Threatened	S1, S3

Common Name	Māori Name	Scientific Name	Conservation Status (Robertson et al., 2021)	Relevant NoR
Pied shag	Kāruhiruhi	*Phalacrocorax varius*	At Risk - Recovering	S1, S3
Pūkeko	Pūkeko	*Porphyrio melanotus*	Not Threatened	S1, S3
Shining cuckoo	Pīpīwharauroa	*Chrysococcyx lucidus*	Not Threatened	S1, S3
Silvereye	Tauhou	*Zosterops lateralis*	Not Threatened	S1, S2, S3
Skylark	Kaireka	*Alauda arvensis*	Introduced and Naturalised	S1, S3
Song thrush	-	*Turdus philomelos*	Introduced and Naturalised	S1, S2, S3
Spotted dove	-	*Streptopelia chinensis tigrina*	Introduced and Naturalised	S1
Spur winged plover	-	*Vanellus miles novaehollandiae*	Not Threatened	S1, S3
Swamp Harrier	Kāhu	*Circus approximans*	Not Threatened	S1, S3
Tūī	Tūī	*Prosthemadera novaeseelandiae*	Not Threatened	S1
Welcome swallow	Warou	*Hirundo neoxena*	Not Threatened	S1, S2, S3
White-faced heron	Matuku moana	*Egretta novaehollandiae*	Not Threatened	S1, S3
Yellowhammer	-	*Emberiza citrinella*	Introduced and Naturalised	S1, S3

13 Appendix 13 - External Review of Proposed Long-Tailed Bat Mitigation

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MEMORANDUM

To: Michiel Jonker (AECOM)

From: Dr Ian Davidson-Watts (DWEP)

17 August 2022

The North West Future Project - review of effects and proposed mitigation for long-tailed bats

As part of the Supporting Growth Programme, Te Tupu Ngātahi Supporting Growth (SG) is preparing Notices of Requirement (NoRs), on behalf of Waka Kotahi NZ Transport Agency (Waka Kotahi) and Auckland Transport (AT), to designate land, under the Resource Management Act 1991 (RMA), for the purpose of constructing, operating and maintaining a proposed strategic and local arterial transport network in the North West (NW) of Auckland, hereinafter referred to as the 'Project'.

Long-tailed bats (pekapeka) (*Chalinolobus tuberculatus*) are considered 'Threatened – Nationally Critical' (O'Donnell et al., 2018) and are known to be present within the Northwest of Auckland, and surveys undertaken by AECOM in December 2021 and April 2022 have confirmed their presence at various locations within and adjacent to the proposed designation (AECOM 2022).

This memo outlines at a high level, the likely effects of the project on long-tailed bats, and reviews strategic level mitigation to address those effects.

Interpretation of long-tailed bat data in relation to the project

The bat report (AECOM 2022) identified that bats are active in the North West Project area with the highest bat activity recorded in the Alternative State Highway (ASH) NoR.

Wider ABM deployment to the south and north of the project's area also provides useful context in where bats are likely to be originating. These ABMs show a distribution of bat detections generally south of the Kumeu area and the project and no bat detections recorded on ABMs north of Kumeu suggesting bats are originating from the south and west of the project.

Breeding populations of long-tailed bats occur in the northern Waitakere ranges which is less than 10km from the ASH. Commuting ranges, especially after the core breeding period, of over 20km have been recorded for long-tailed bats, and it is possible that the long-tailed bat detections associated with the project could originate from these bats or be associated with a meta-population of the Waitakere long-tailed bat. It is also possible that long-tailed bat populations occur outside of the Waitakere Ranges and roosts could occur in other bush blocks or similar to long-tailed bat populations in Hamilton. These bats could make use of modified landscapes nearer the project.

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The mitigation proposed has been based on the presence and absence of bats and their likely direction of travel based on the presence of suitable habitat, as well as their likely source.

However, the surveys do have a number of limitations, and may not address the information needs to assess the effects at a more detailed level and stakeholders/interested parties may request further information. Although two surveys were undertaken to account for the variance of bat behaviour through the active bat season, the key maternity (post parturition) periods in January/February were not surveyed. Furthermore, ABM's are limited in their ability to determine the presence of roosts and the breeding status of bats if detected.

Notwithstanding these limitations it is possible at this stage of the programme to develop mitigation. This memo focuses on the ASH areas where the potential effects are the greatest.

Potential effects on long-tailed bats from the Project

1. The primary impact of the project is from the fragmentation of habitats being used by long-tailed bats for commuting and foraging. The ASH presents the greatest impact in this respect and the highest levels of long-tailed bat activity were recorded along the proposed ASH alignment, southwest of Kumeu.
2. At the eastern end of the scheme the fragmentation effects of the project would potentially inhibit bats from commuting from the south towards the estuarine and rural habitats south east of Riverhead.
3. Although not strictly related to the project designation, the longer term proposals for residential and commercial development in the area south west of Kumeu would have a cumulative impact on long-tailed bats.
4. In addition, collision risk for bats crossing roads would form part of the same effect, which is considered without mitigation to a be a high-level negative effect on long-tailed bats.
5. Although a Regional consenting matter Direct and indirect foraging habitat loss during the construction phase is an additional negative effect on long-tailed bats.
6. Although significant levels of roosting have not been considered likely given the spread/timings of the ABM data, the limitations of the ABM survey method do not rule out roosting possibilities for these bats locally. Subsequently there could be potential effects on roosting long-tailed bats from the project.

Proposed mitigation

General - The proposed habitat mitigation developed by AECOM is fundamentally sound and is applied appropriately in areas where bats have been detected and suitable commuting and foraging habitat exists. This includes the use of bat hop over in existing vegetated areas and importantly the retention of existing vegetation. Where bridges are present, it will be important to ensure there is

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sufficient height for long-tailed bats to pass under to reduce collision risk, and 4-5m would be the minimum with vegetation guiding the bats to these passing points.

Habitat structure is important to long-tailed bats and retaining as much of the mature vegetation, including exotic trees/tree lines etc, will be crucial to reduce fragmentation effects during construction. Early-stage planting of natives etc is essential to address impacts of fragmentation in the medium and long term phases of the project.

Four additional areas are proposed that would extend the mitigation to address the strategic requirements of bats using the area (see attached KML).

AM1 Additional Mitigation 1 (AM1) is in the centre of the strategic route. The proposed mitigation already encompasses a high level of existing and proposed vegetation to the south of the highway including the main water course. The additional mitigation is proposed north of the project to ensure that long-tailed bats have a larger area of positively managed habitats to ensure they can disperse appropriately to foraging areas to the north.

AM2 The aim of AM2 is to ensure bats have a substantial corridor to enable commuting bats to reach the estuarine habitats to the north. This area is already fragmented due to the existing highway 16 and security of the corridor through this area would seek to apply improved connectively for the project and existing infrastructure.

AM3 The part of the project likely receives bats originating from the west and there are wider vegetative linkages that bats could be exploiting. The aim of the additional mitigation is to increase connectively to the near road mitigation. The other advantage this area has is that it will also improve foraging habitat west of the scheme. This takes into account the proposed residential development south west of Kumeu in the future, and effectively this mitigation seeks to provide alternative foraging habitat in the long term as part of addressing the fragmentation effects.

AM4 Has a similar approach to AM3 in that the area identified appears to be best connected from a long-tailed bat commuting perspective also provide opportunities for foraging enhancements in the long-term.

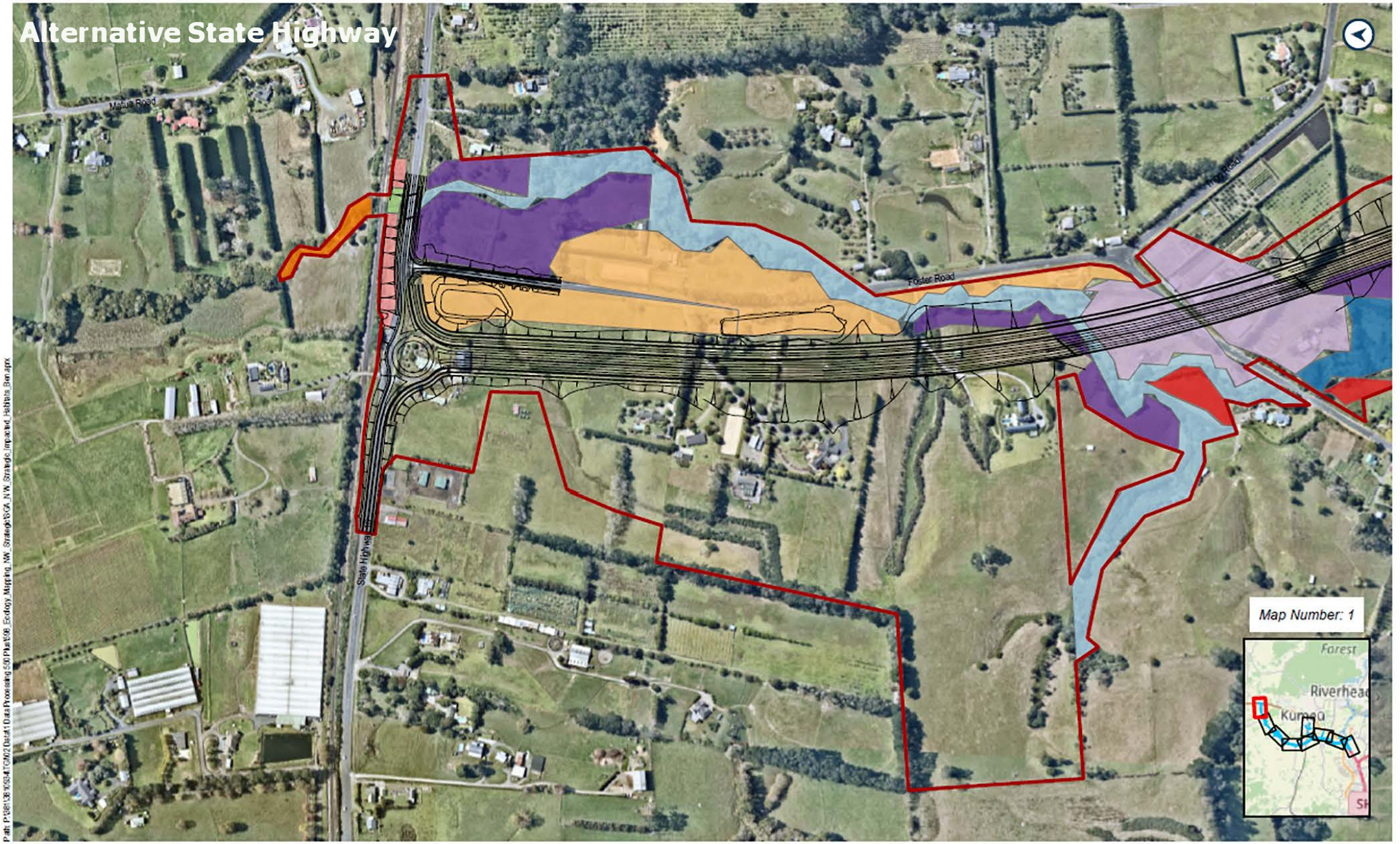
Conclusion

The ABM data has provided a useful baseline from which reasonable assumptions can be made on the likely effects of the project on long-tailed bats at the strategic level. This combined with a widescale approach to mitigation should address the key effects of fragmentation.

However, it will be necessary to obtain further data to refine mitigation and address other potential effects at more local level.

The additional mitigation proposed takes a precautionary approach to ensure that effects of fragmentation of the scheme are addressed at the strategic level.

14 Appendix 14 - Long-Tailed Bat Mitigation

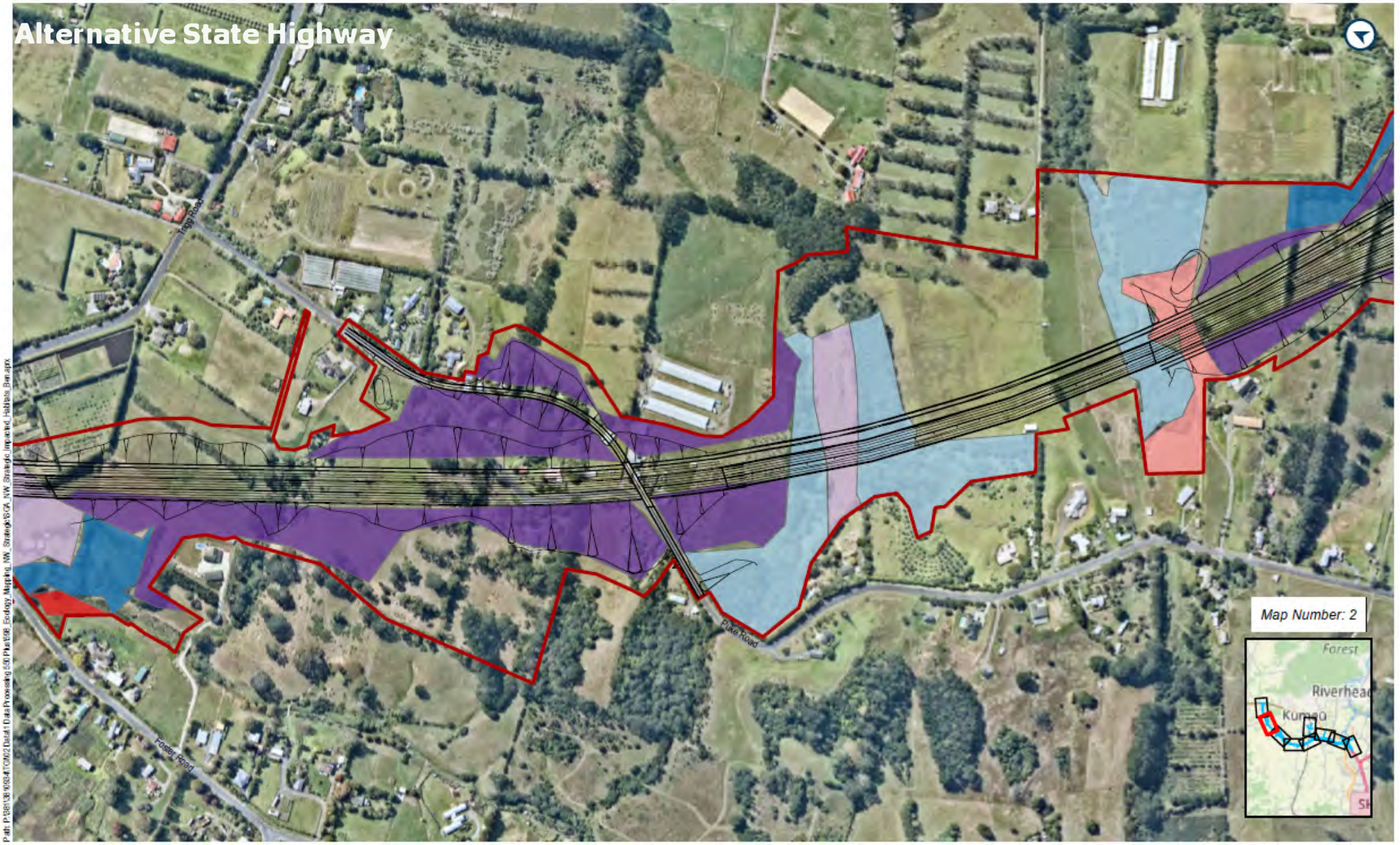


LEGEND

- Route Options
- Designation
- Buffer habitat & hop-over/ under - A
- Buffer habitat - A
- Buffer planting & hop-over/ under - A
- Buffer planting & hop-over/ under - B
- Buffer planting & hop-over/ under - C
- Buffer planting - B
- Buffer planting - C
- Hop-over/under - A
- Hop-over/under - B
- Hop-over/under - C

- *A = Retain vegetation*
- *B = Early-stage planting /mature tree planting*
- *C = Late-stage planting*

Alternative State Highway



Path: P:\8613\90647\GIS\Data\Data Processing\SIP\Plot\98_Ecology_Mapping_NW_Strategic\SGA_NW_Strategic_Impacted_Habitats_Ben.apx

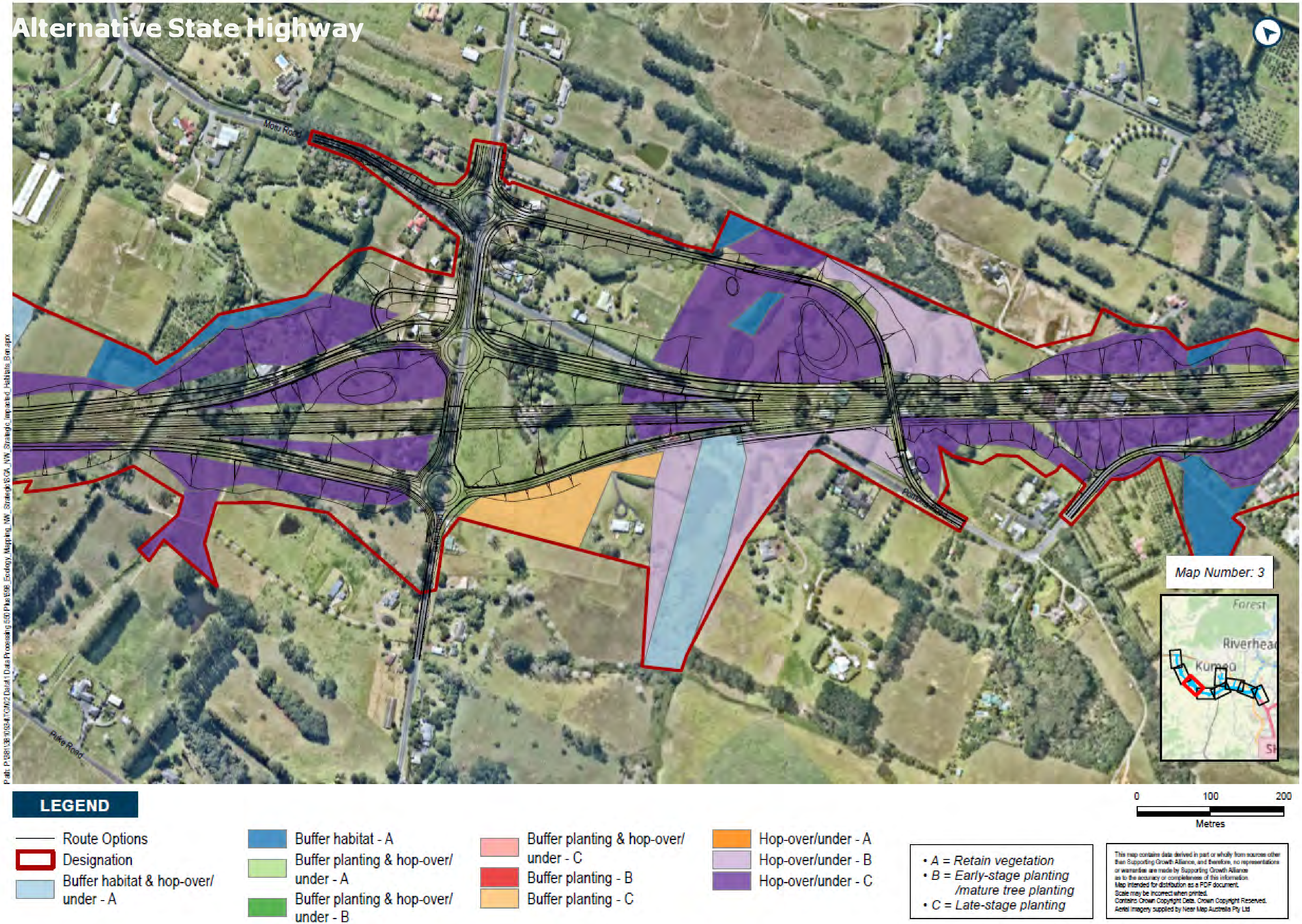
LEGEND

- Route Options
- Designation
- Buffer habitat & hop-over/ under - A
- Buffer habitat - A
- Buffer planting & hop-over/ under - A
- Buffer planting & hop-over/ under - B
- Buffer planting & hop-over/ under - C
- Buffer planting - B
- Buffer planting - C
- Hop-over/under - A
- Hop-over/under - B
- Hop-over/under - C

0 100 200

Metres

- *A = Retain vegetation*
- *B = Early-stage planting /mature tree planting*
- *C = Late-stage planting*


Alternative State Highway
Moto Road
Puke Road
Map Number: 3
Forest
Riverhea
Kumeu
LEGEND
Route Options
Designation
Buffer habitat & hop-over/ under - A
Buffer habitat - A
Buffer planting & hop-over/ under - A
Buffer planting & hop-over/ under - B
Buffer planting & hop-over/ under - C
Buffer planting - B
Buffer planting - C
Hop-over/under - A
Hop-over/under - B
Hop-over/under - C
0
100
200
Metres
• A = Retain vegetation
• B = Early-stage planting /mature tree planting
• C = Late-stage planting
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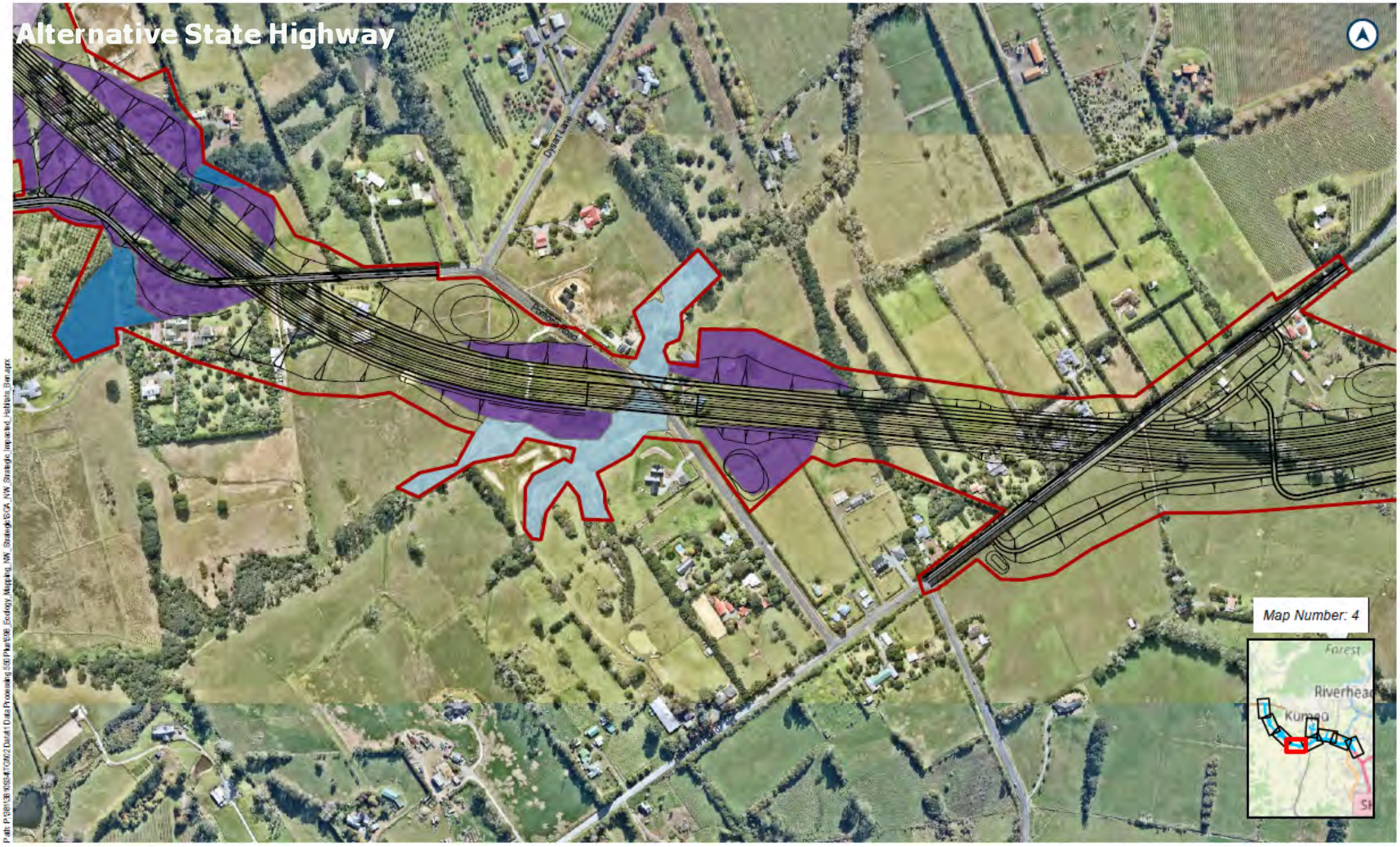

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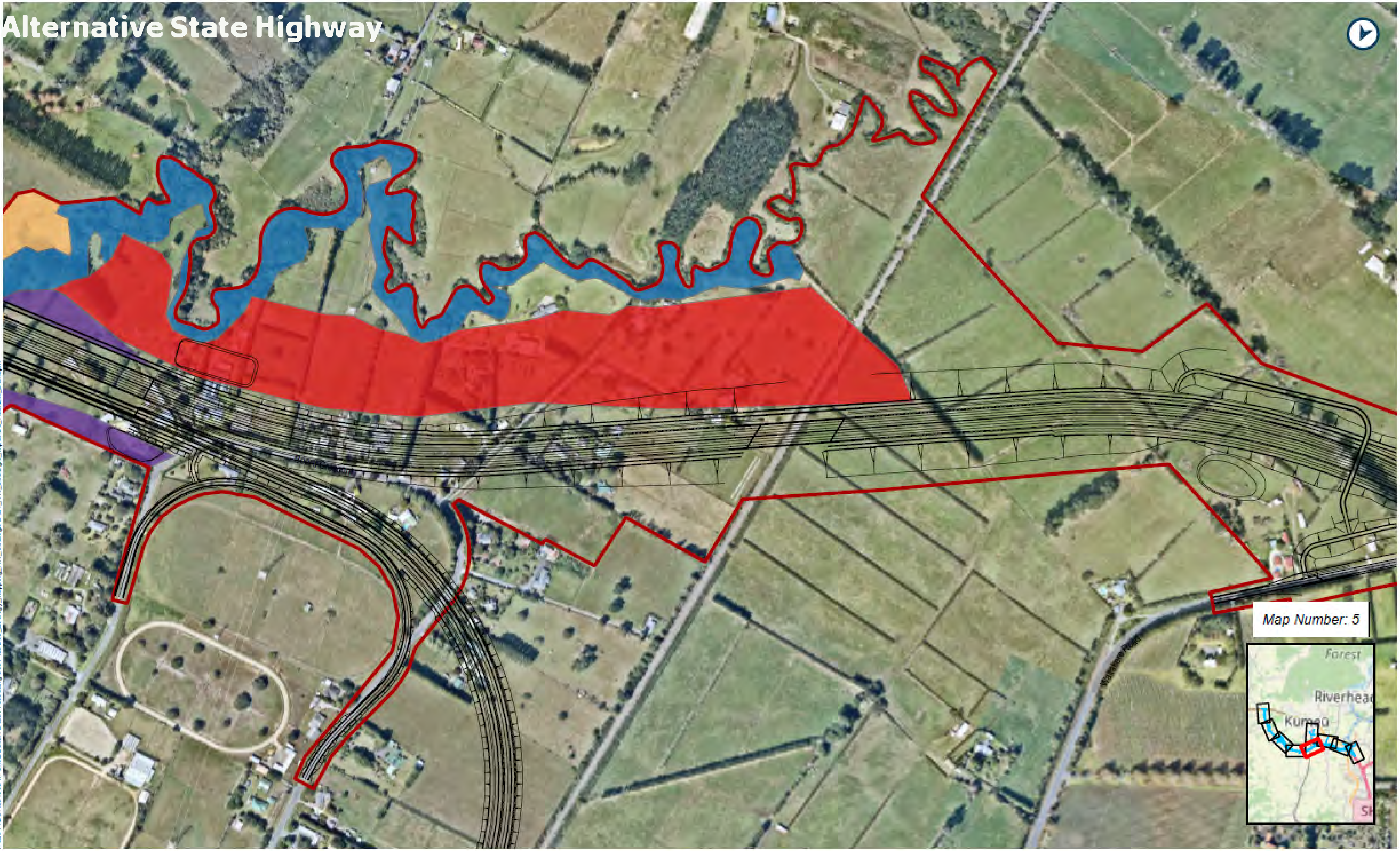
LEGEND

- Route Options
- Designation
- Buffer habitat & hop-over/ under - A
- Buffer habitat - A
- Buffer planting & hop-over/ under - A
- Buffer planting & hop-over/ under - B
- Buffer planting & hop-over/ under - C
- Buffer planting - B
- Buffer planting - C
- Hop-over/under - A
- Hop-over/under - B
- Hop-over/under - C

0 100 200

Metres

- *A = Retain vegetation*
- *B = Early-stage planting /mature tree planting*
- *C = Late-stage planting*



LEGEND

- Route Options
- Designation
- Buffer habitat & hop-over/ under - A
- Buffer habitat - A
- Buffer planting & hop-over/ under - A
- Buffer planting & hop-over/ under - B
- Buffer planting & hop-over/ under - C
- Buffer planting - B
- Buffer planting - C
- Hop-over/under - A
- Hop-over/under - B
- Hop-over/under - C

0 100 200
Metres

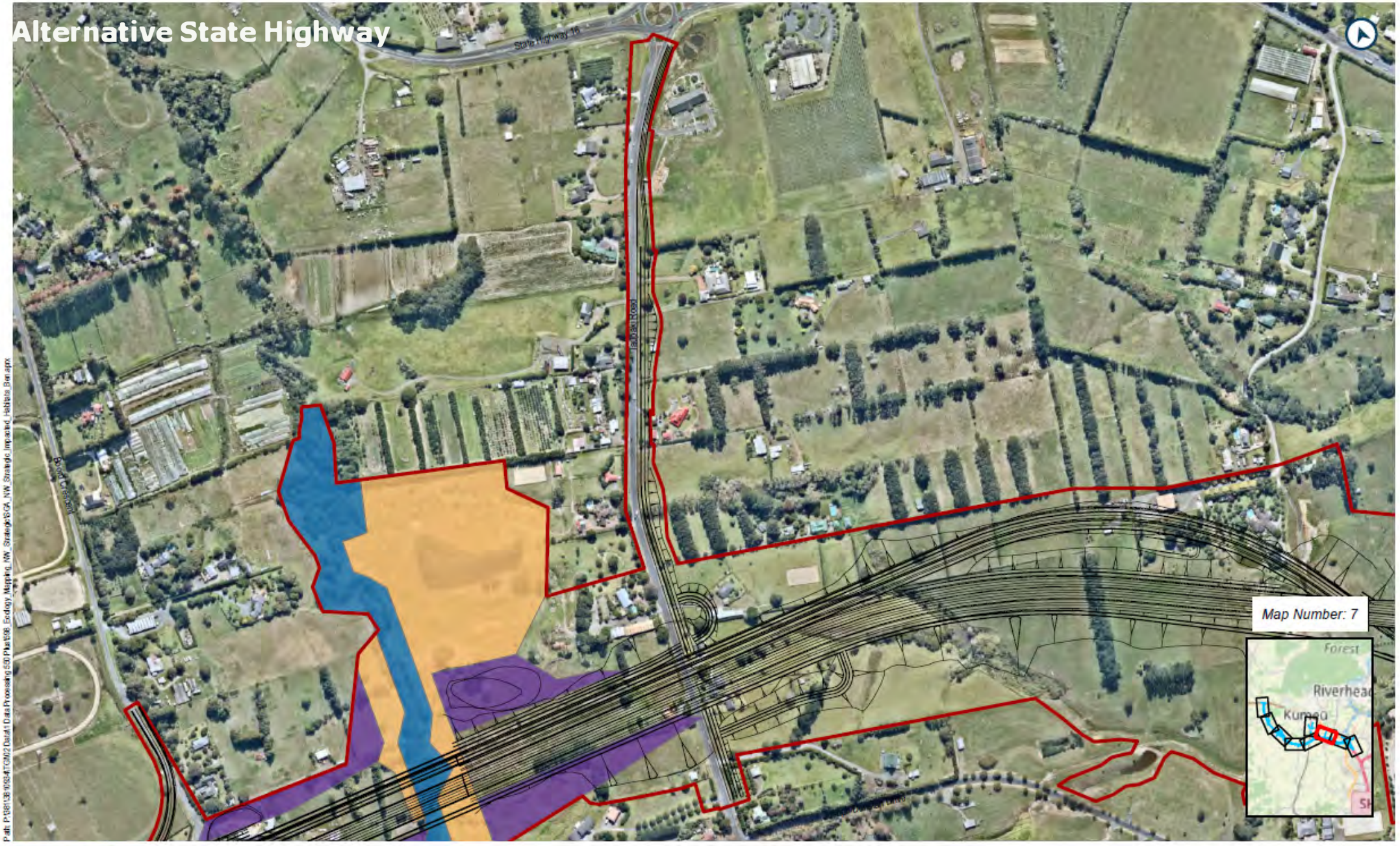
- *A = Retain vegetation*
- *B = Early-stage planting /mature tree planting*
- *C = Late-stage planting*

LEGEND

- Route Options
- Designation
- Buffer habitat & hop-over/ under - A
- Buffer habitat - A
- Buffer planting & hop-over/ under - A
- Buffer planting & hop-over/ under - B
- Buffer planting & hop-over/ under - C
- Buffer planting - B
- Buffer planting - C
- Hop-over/under - A
- Hop-over/under - B
- Hop-over/under - C

0 100 200
Metres

- *A = Retain vegetation*
- *B = Early-stage planting /mature tree planting*
- *C = Late-stage planting*



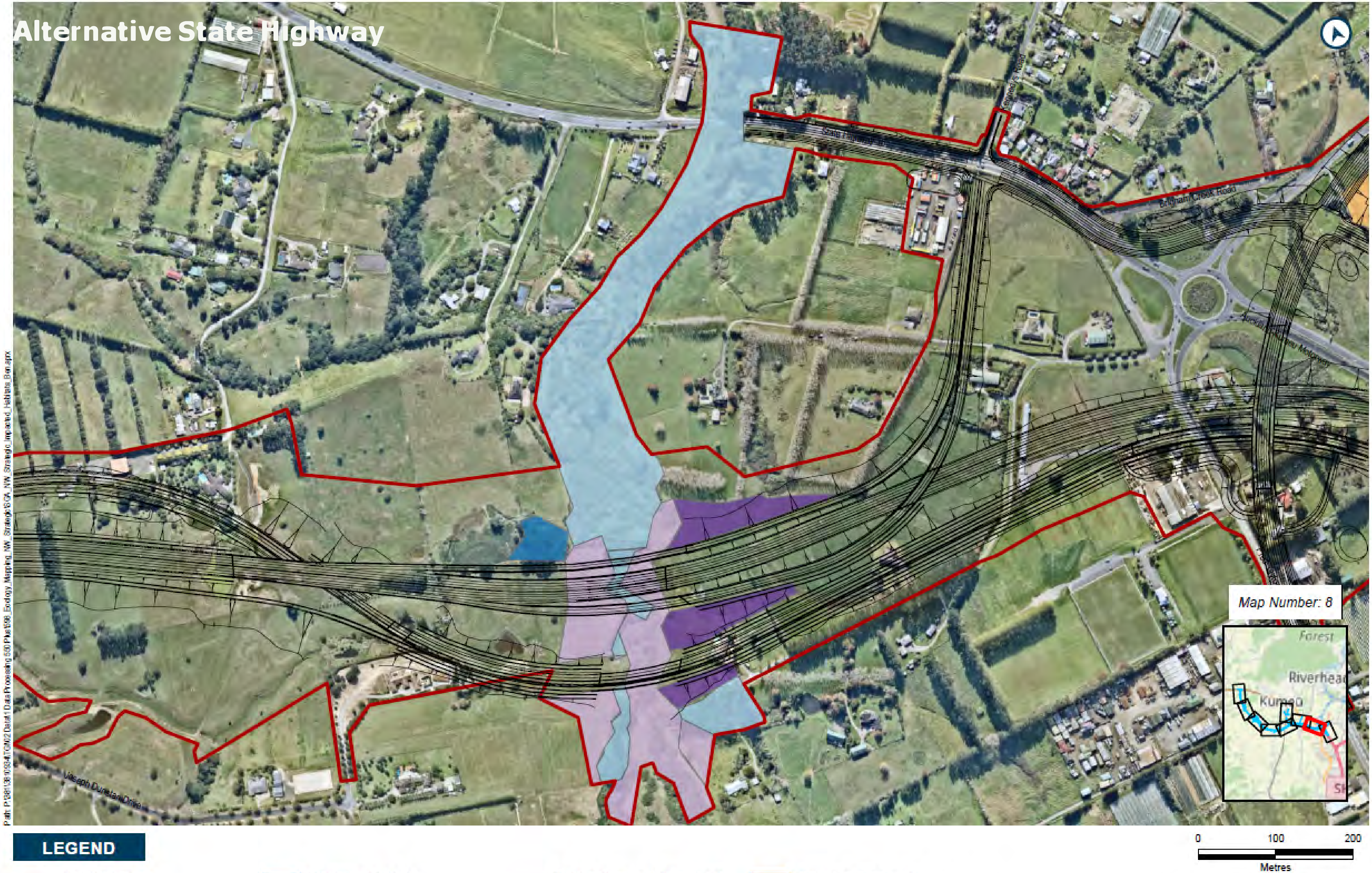
LEGEND

- Route Options
- Designation
- Buffer habitat & hop-over/ under - A
- Buffer habitat - A
- Buffer planting & hop-over/ under - A
- Buffer planting & hop-over/ under - B
- Buffer planting & hop-over/ under - C
- Buffer planting - B
- Buffer planting - C
- Hop-over/under - A
- Hop-over/under - B
- Hop-over/under - C

0 100 200

Metres

- *A = Retain vegetation*
- *B = Early-stage planting /mature tree planting*
- *C = Late-stage planting*



LEGEND

- Route Options
- Designation
- Buffer habitat & hop-over/under - A
- Buffer habitat - A
- Buffer planting & hop-over/under - A
- Buffer planting & hop-over/under - B
- Buffer planting & hop-over/under - C
- Buffer planting - B
- Buffer planting - C
- Hop-over/under - A
- Hop-over/under - B
- Hop-over/under - C

- A = Retain vegetation
- B = Early-stage planting /mature tree planting
- C = Late-stage planting


Alternative State Highway
Spedding Road
Ballance Road
State Highway 16
Auckland-Kumeu Motorway
Fred Taylor Drive
Kauri View Place
Map Number: 9
Forest
Riverhead
Kumeu
SH
LEGEND
Route Options
Designation
Buffer habitat & hop-over/ under - A
Buffer habitat - A
Buffer planting & hop-over/ under - A
Buffer planting & hop-over/ under - B
Buffer planting & hop-over/ under - C
Buffer planting - B
Buffer planting - C
Hop-over/under - A
Hop-over/under - B
Hop-over/under - C
• A = Retain vegetation
• B = Early-stage planting /mature tree planting
• C = Late-stage planting
0
100
200
Metres
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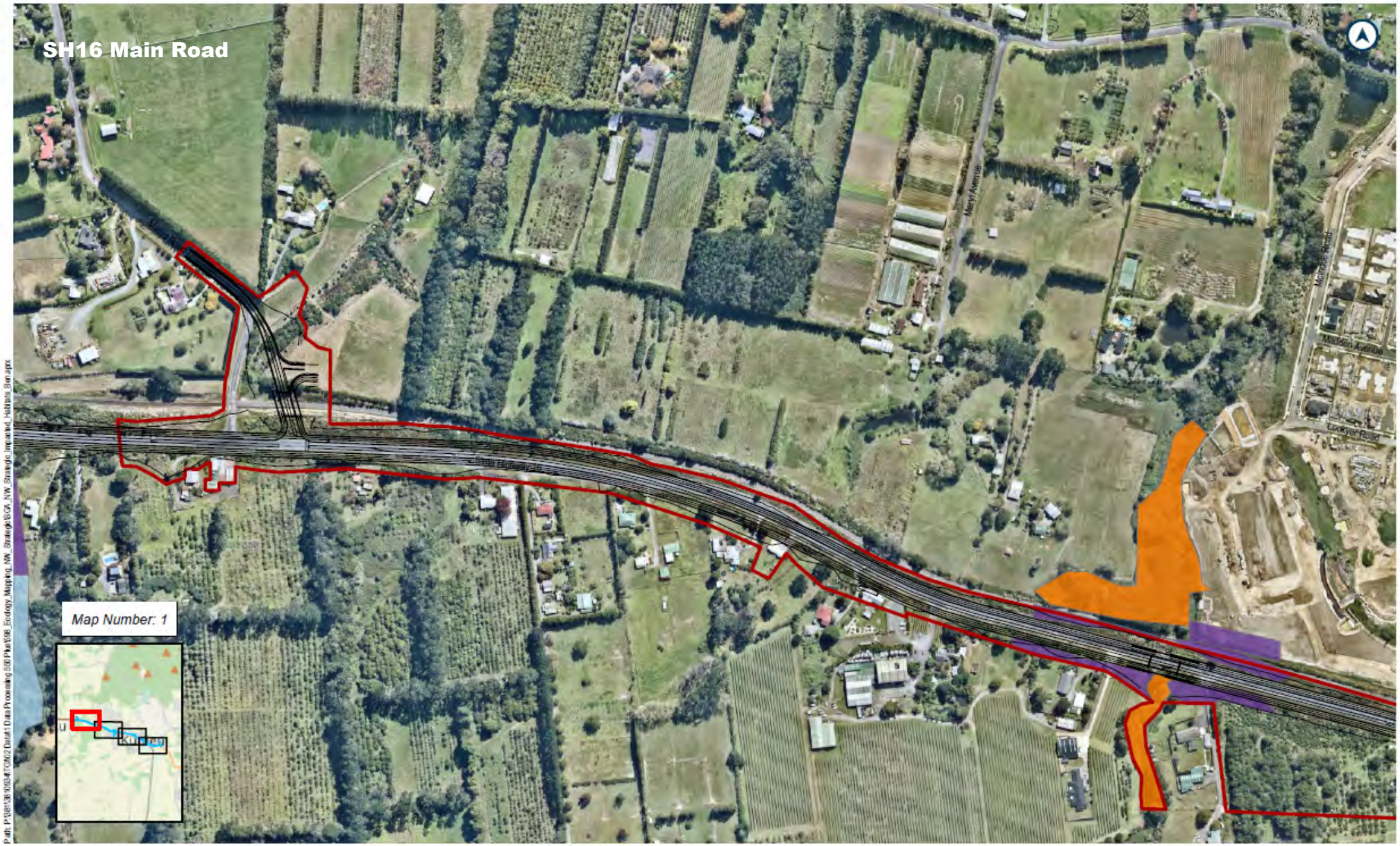

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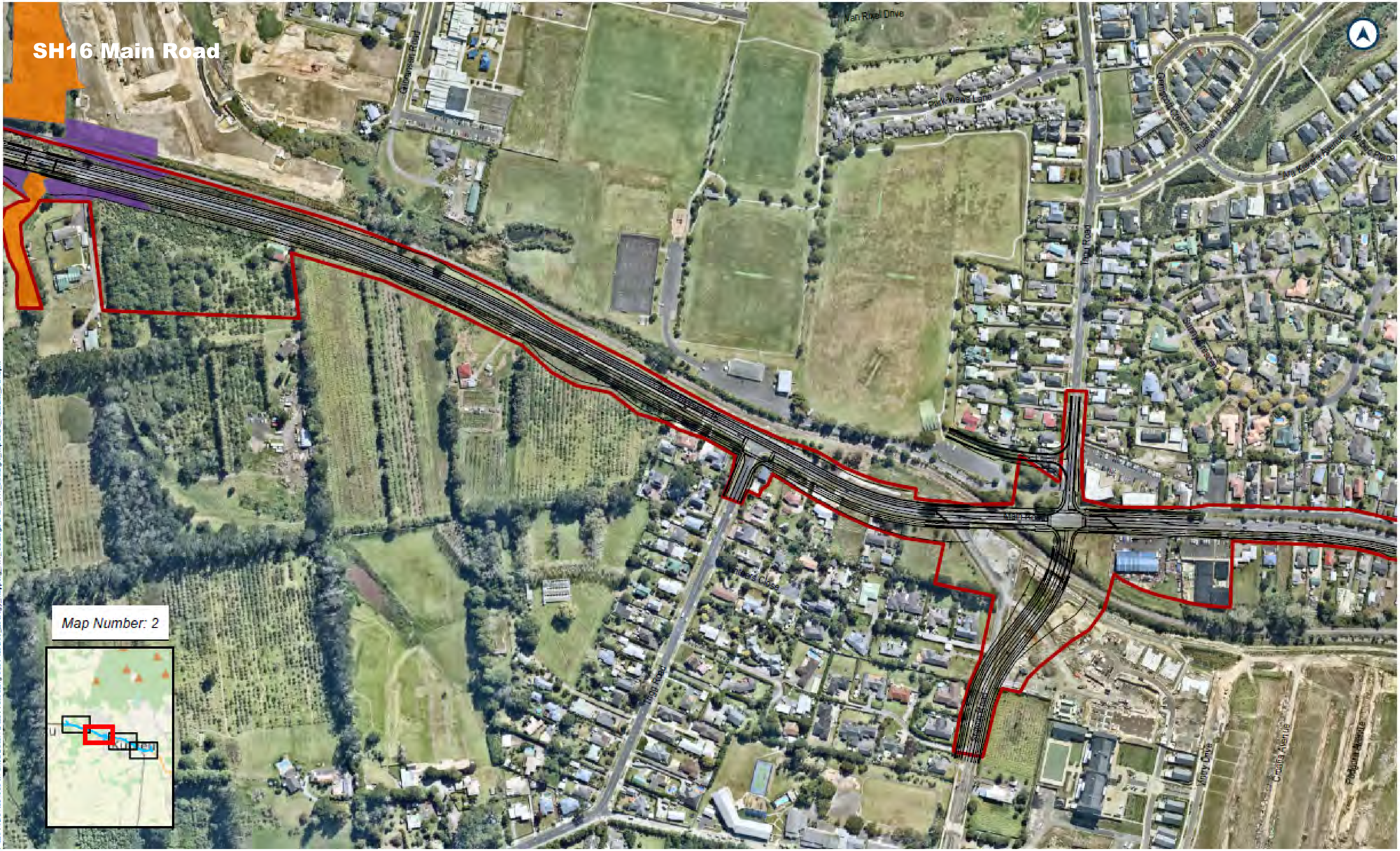
LEGEND

- Route Options
- Designation
- Buffer habitat & hop-over/ under - A
- Buffer planting & hop-over/ under - C
- Hop-over/under - A
- Hop-over/under - C

0 80 160
Metres

- *A = Retain vegetation*
- *B = Early-stage planting /mature tree planting*
- *C = Late-stage planting*

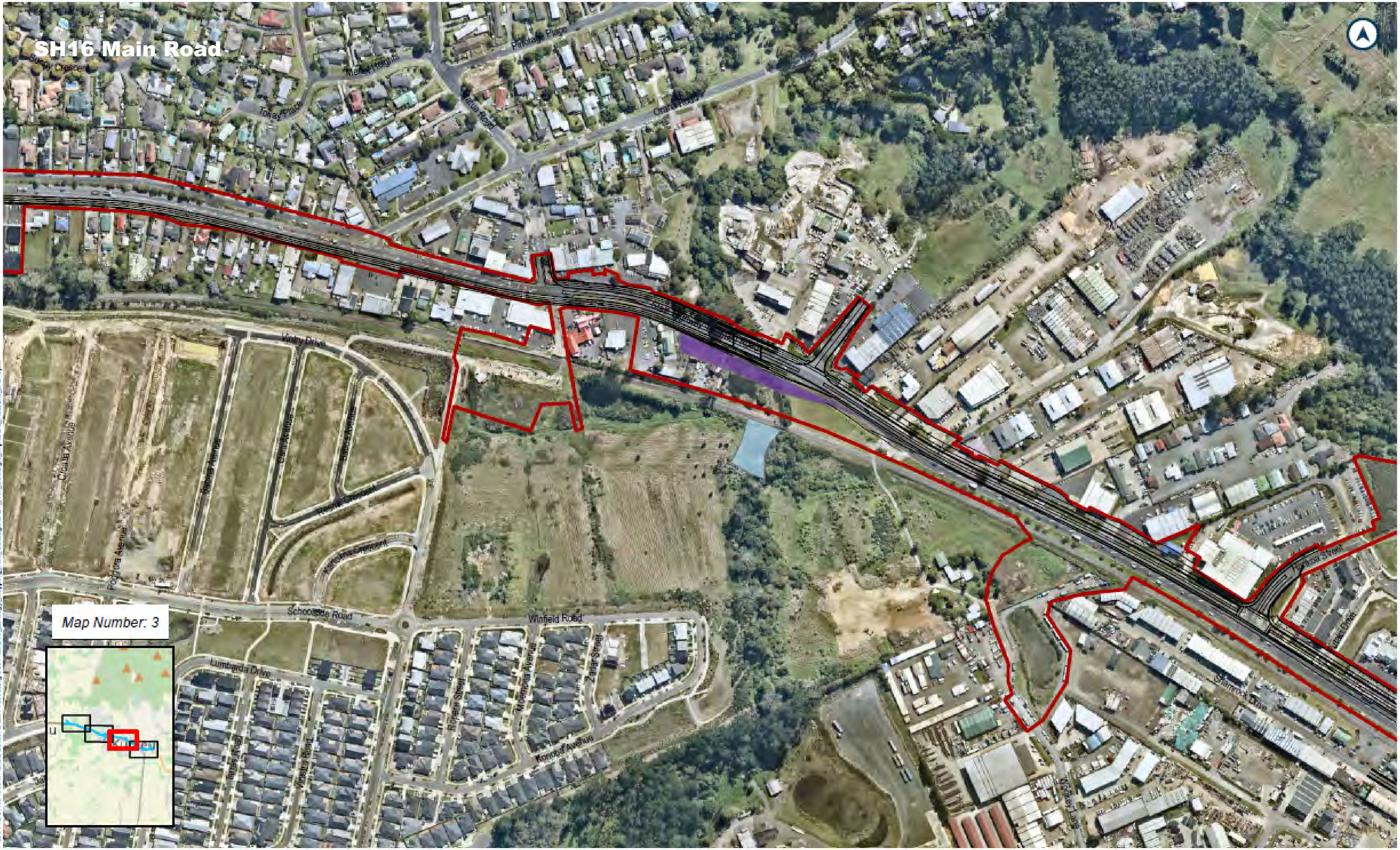


LEGEND

- Route Options
- Designation
- Hop-over/under - A
- Hop-over/under - C

0 80 160
Metres

- A = *Retain vegetation*
- B = *Early-stage planting /mature tree planting*
- C = *Late-stage planting*

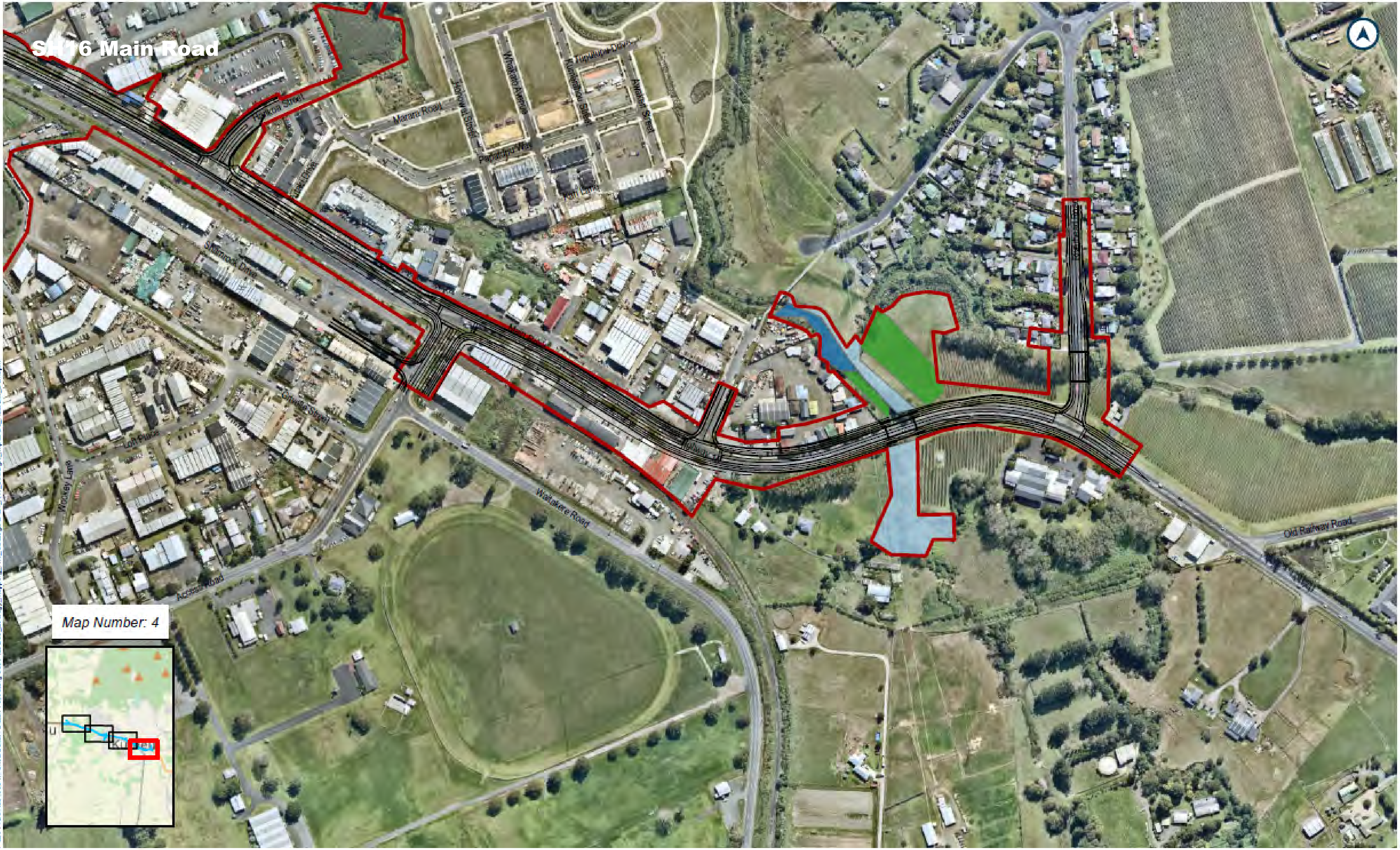


LEGEND

- Route Options
- Designation
- Buffer habitat & hop-over/ under - A
- Hop-over/under - C

0 80 160
Metres

- A = *Retain vegetation*
- B = *Early-stage planting /mature tree planting*
- C = *Late-stage planting*

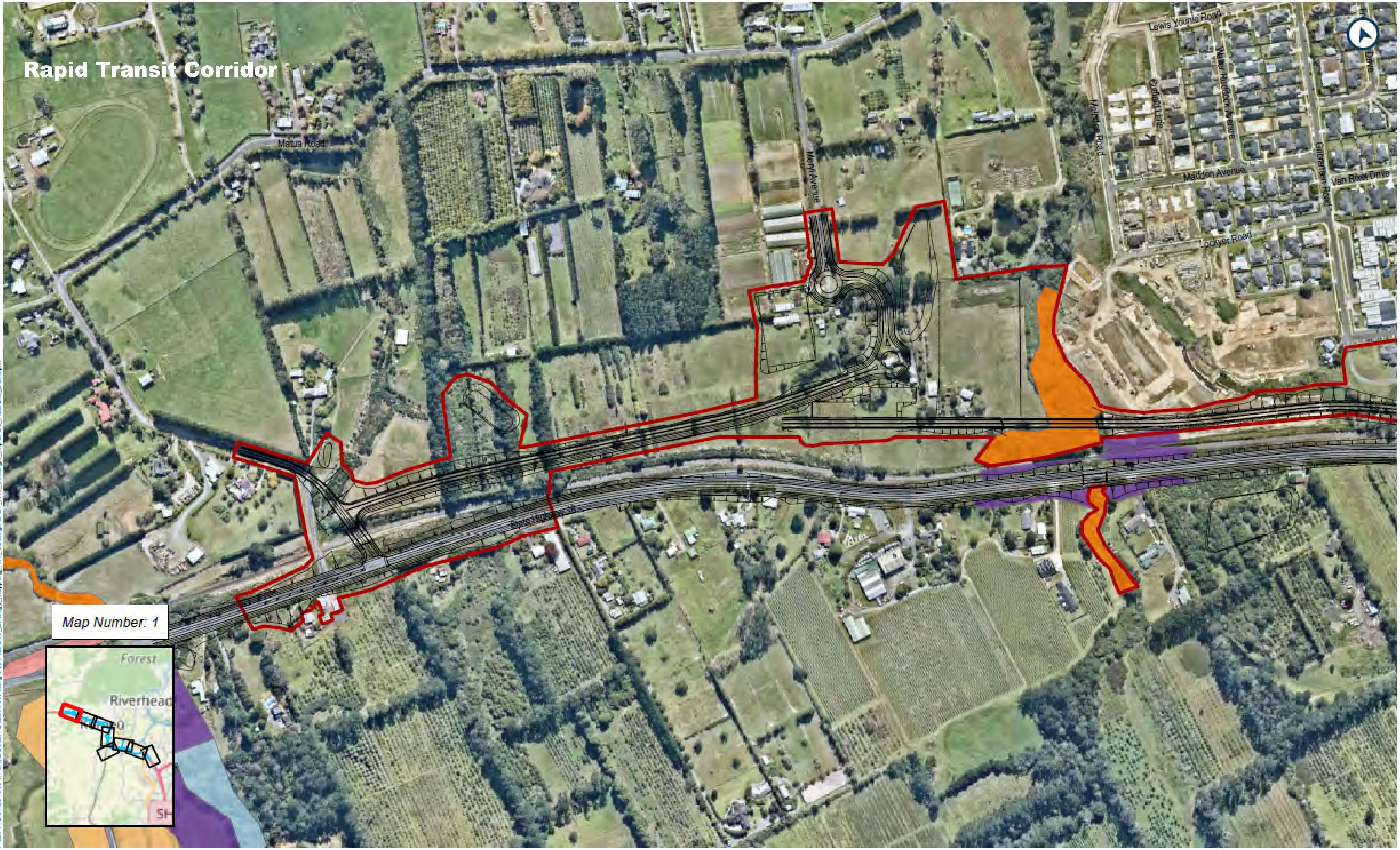


LEGEND

- Route Options
- Designation
- Buffer habitat & hop-over/ under - A
- Buffer habitat - A
- Buffer planting & hop-over/ under - B

0 80 160
Metres

- *A = Retain vegetation*
- *B = Early-stage planting /mature tree planting*
- *C = Late-stage planting*

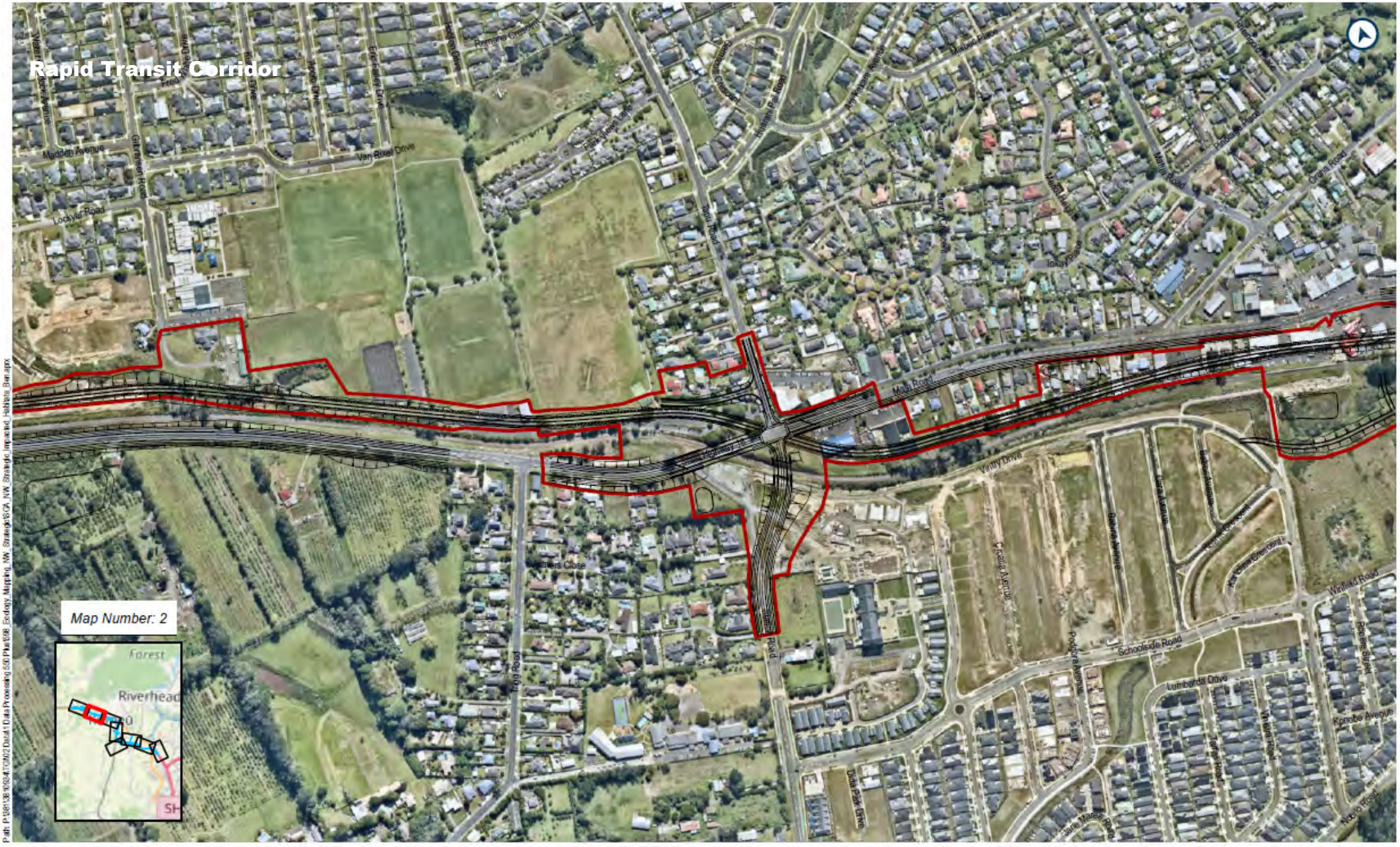


LEGEND

- Route Options
- Designation
- Buffer habitat & hop-over/ under - A
- Buffer planting & hop-over/ under - A
- Buffer planting & hop-over/ under - C
- Buffer planting - C
- Hop-over/under - A
- Hop-over/under - C

0 100 200
Metres

- A = *Retain vegetation*
- B = *Early-stage planting /mature tree planting*
- C = *Late-stage planting*



LEGEND

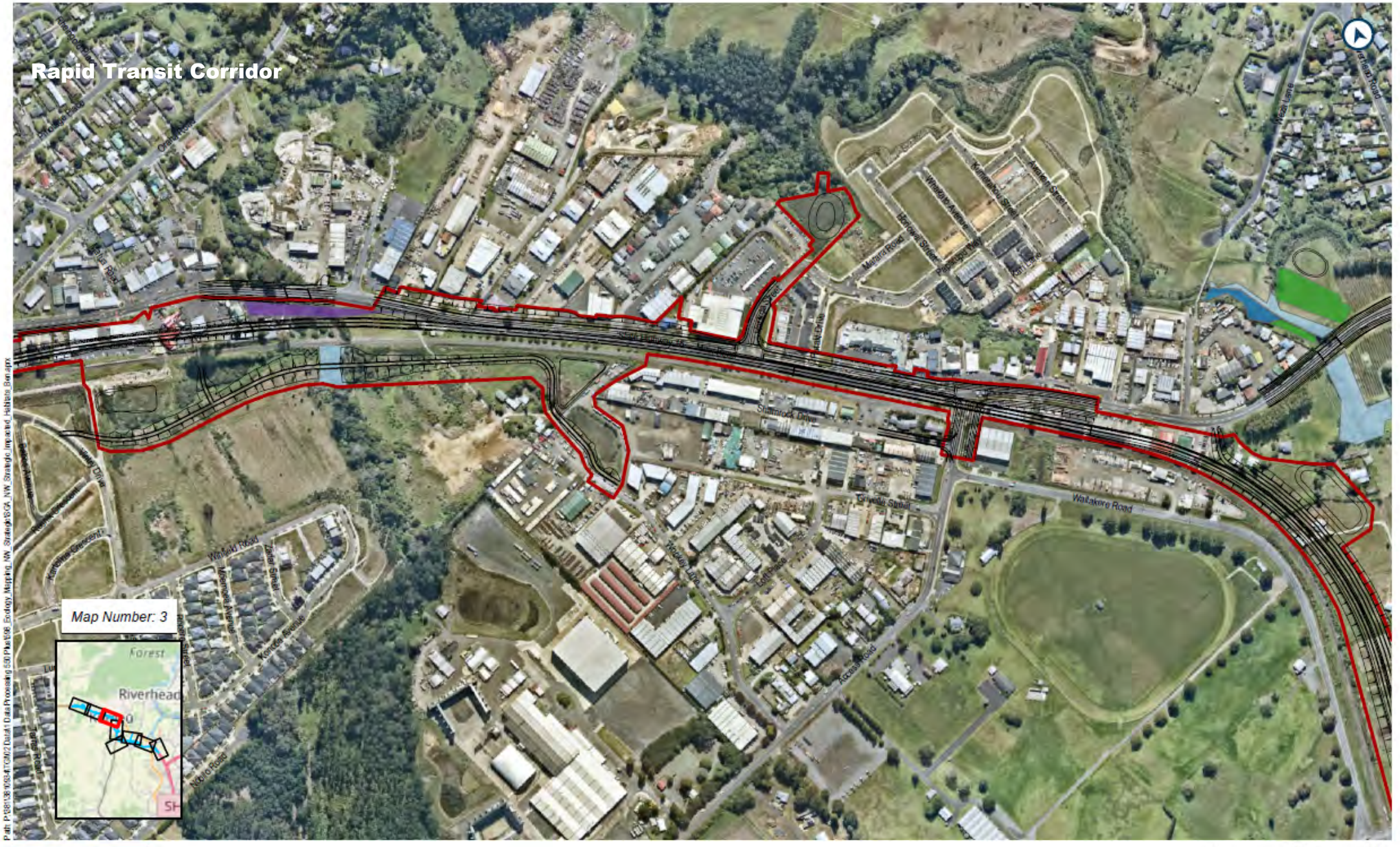
Route Options

Designation

0 100 200

Metres

- *A = Retain vegetation*
- *B = Early-stage planting /mature tree planting*
- *C = Late-stage planting*



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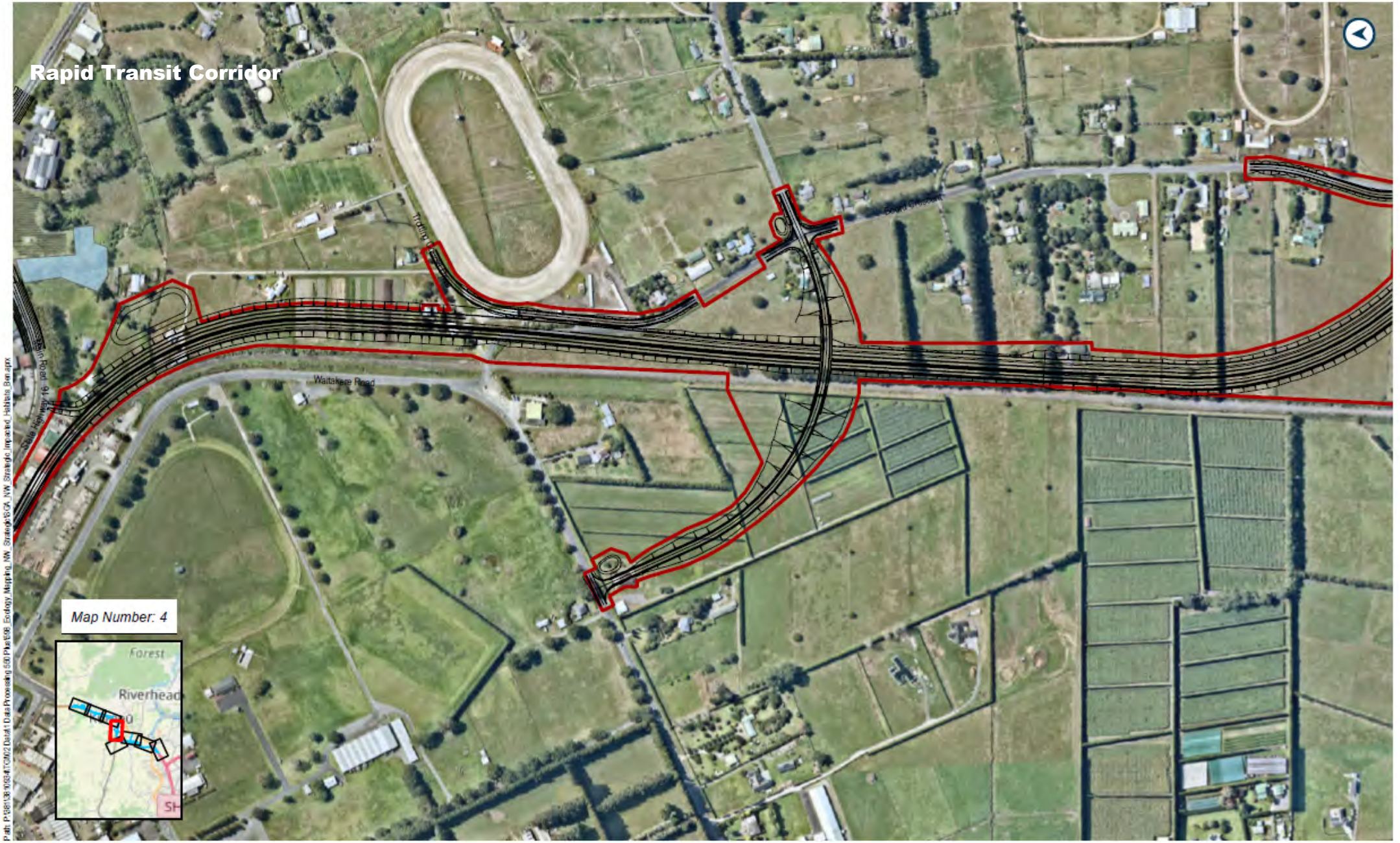
LEGEND

- Route Options
- Designation
- Buffer habitat & hop-over/ under - A
- Buffer habitat - A
- Buffer planting & hop-over/ under - B
- Hop-over/under - C

0 100 200
Metres

- *A = Retain vegetation*
- *B = Early-stage planting /mature tree planting*
- *C = Late-stage planting*



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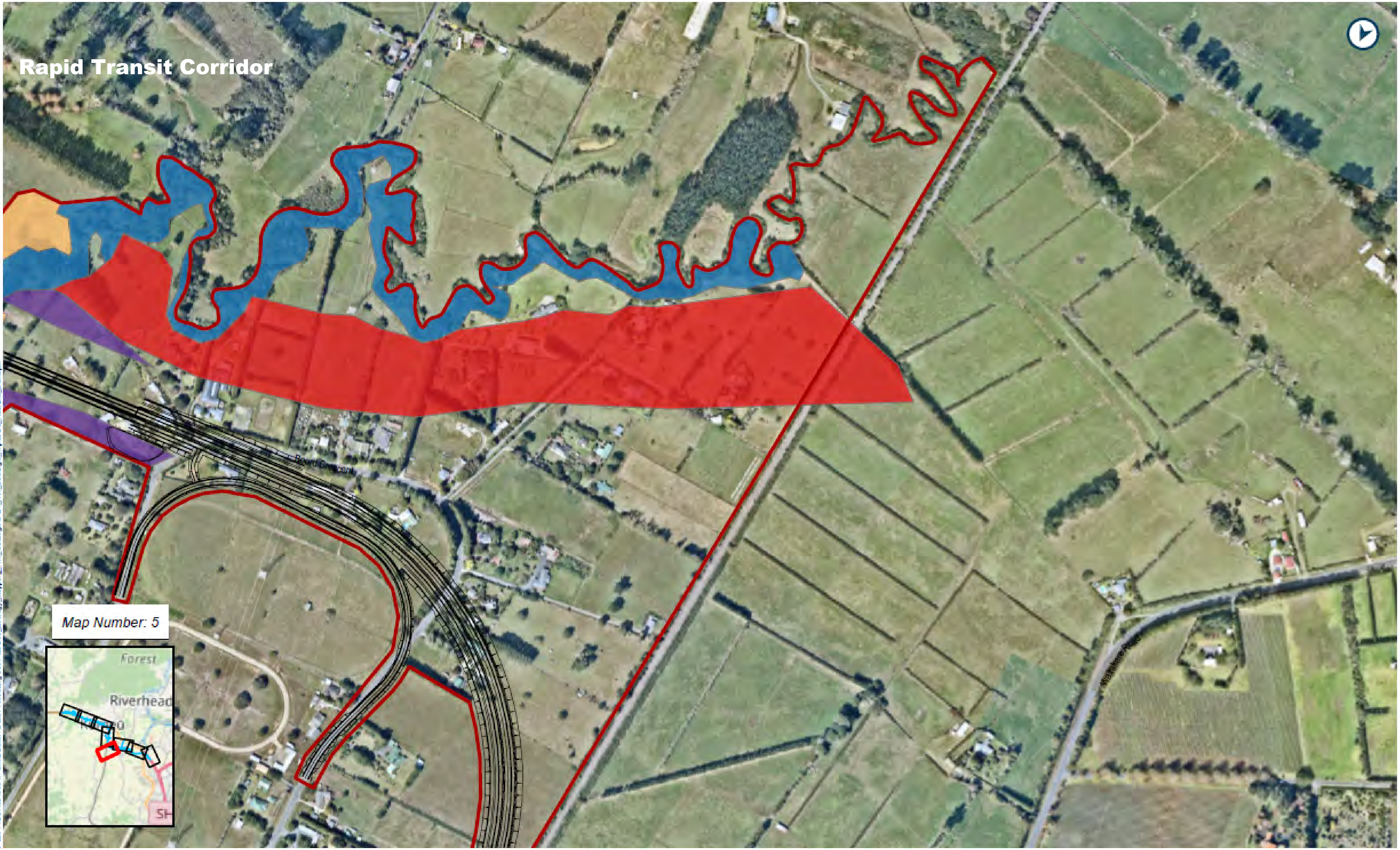
LEGEND

- Route Options
- Designation
- Buffer habitat & hop-over/ under - A

0 100 200

Metres

- *A = Retain vegetation*
- *B = Early-stage planting /mature tree planting*
- *C = Late-stage planting*

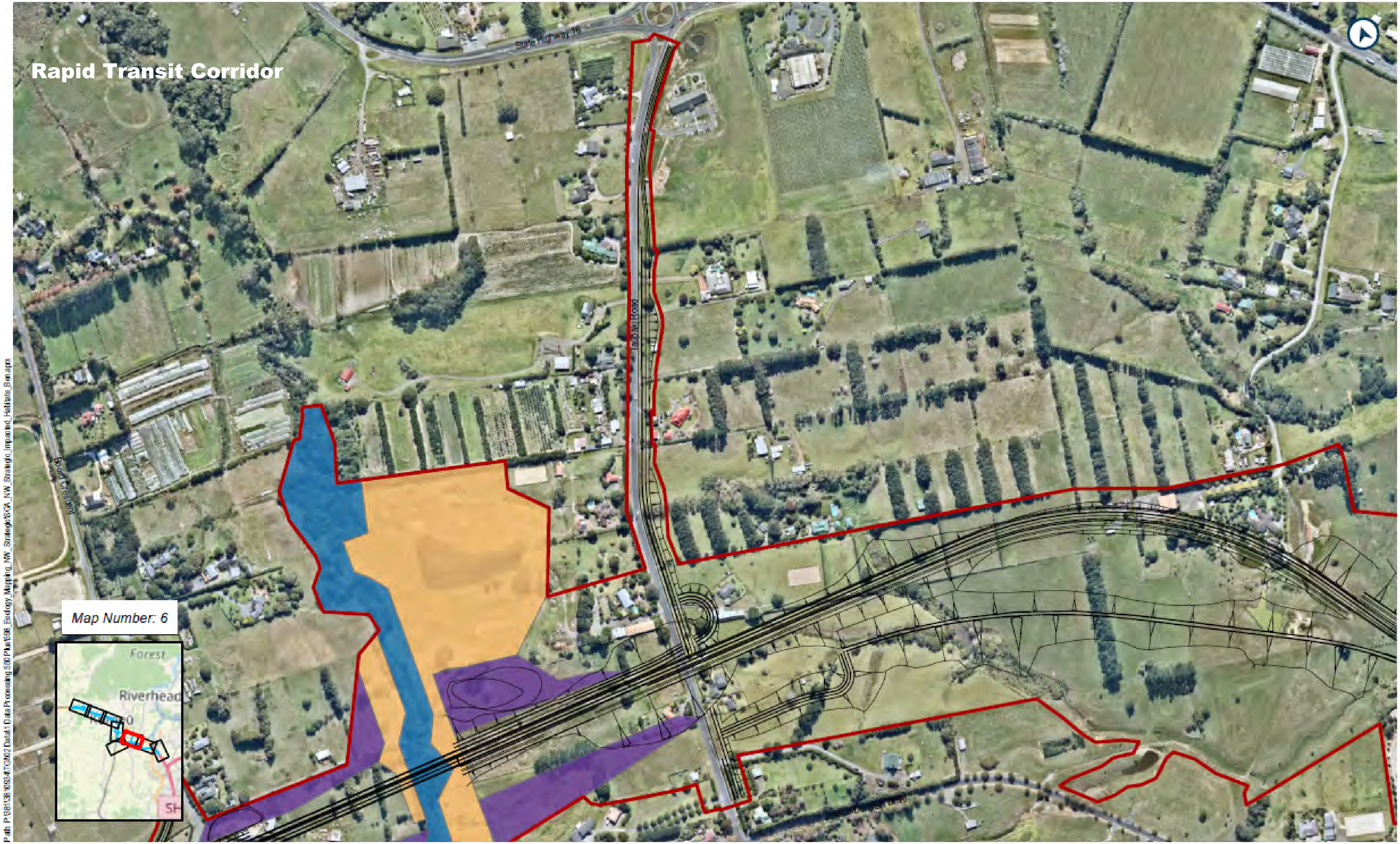


LEGEND

- Route Options
- Designation
- Buffer habitat - A
- Buffer planting - B
- Buffer planting - C
- Hop-over/under - C

0 100 200
Metres

- A = *Retain vegetation*
- B = *Early-stage planting /mature tree planting*
- C = *Late-stage planting*

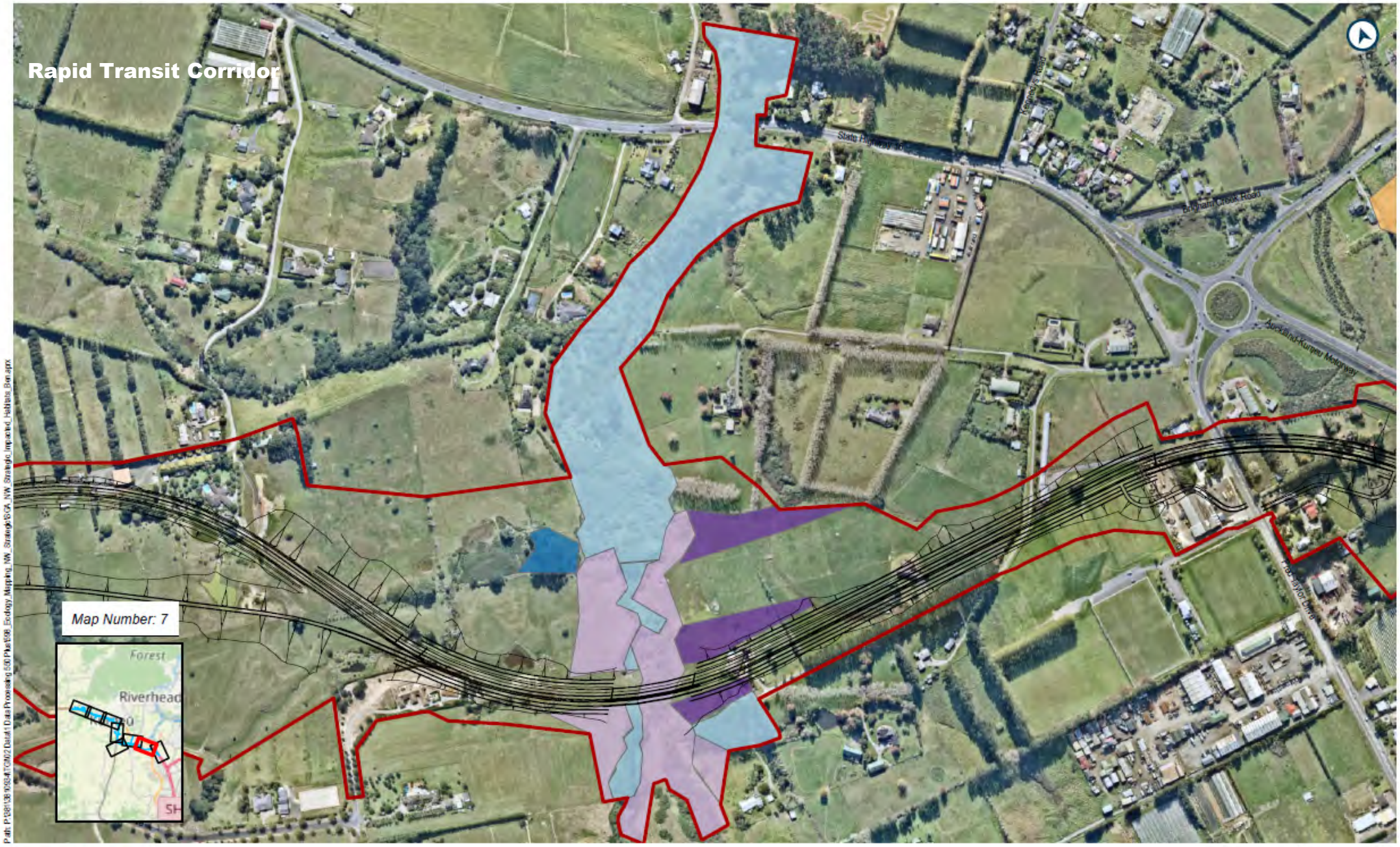


LEGEND

- Route Options
- Designation
- Buffer habitat - A
- Buffer planting - C
- Hop-over/under - C

0 100 200
Metres

- A = Retain vegetation
- B = Early-stage planting /mature tree planting
- C = Late-stage planting



LEGEND

- Route Options
- Designation
- Buffer habitat & hop-over/ under - A
- Buffer habitat - A
- Buffer planting - C
- Hop-over/under - B
- Hop-over/under - C

0 100 200
Metres

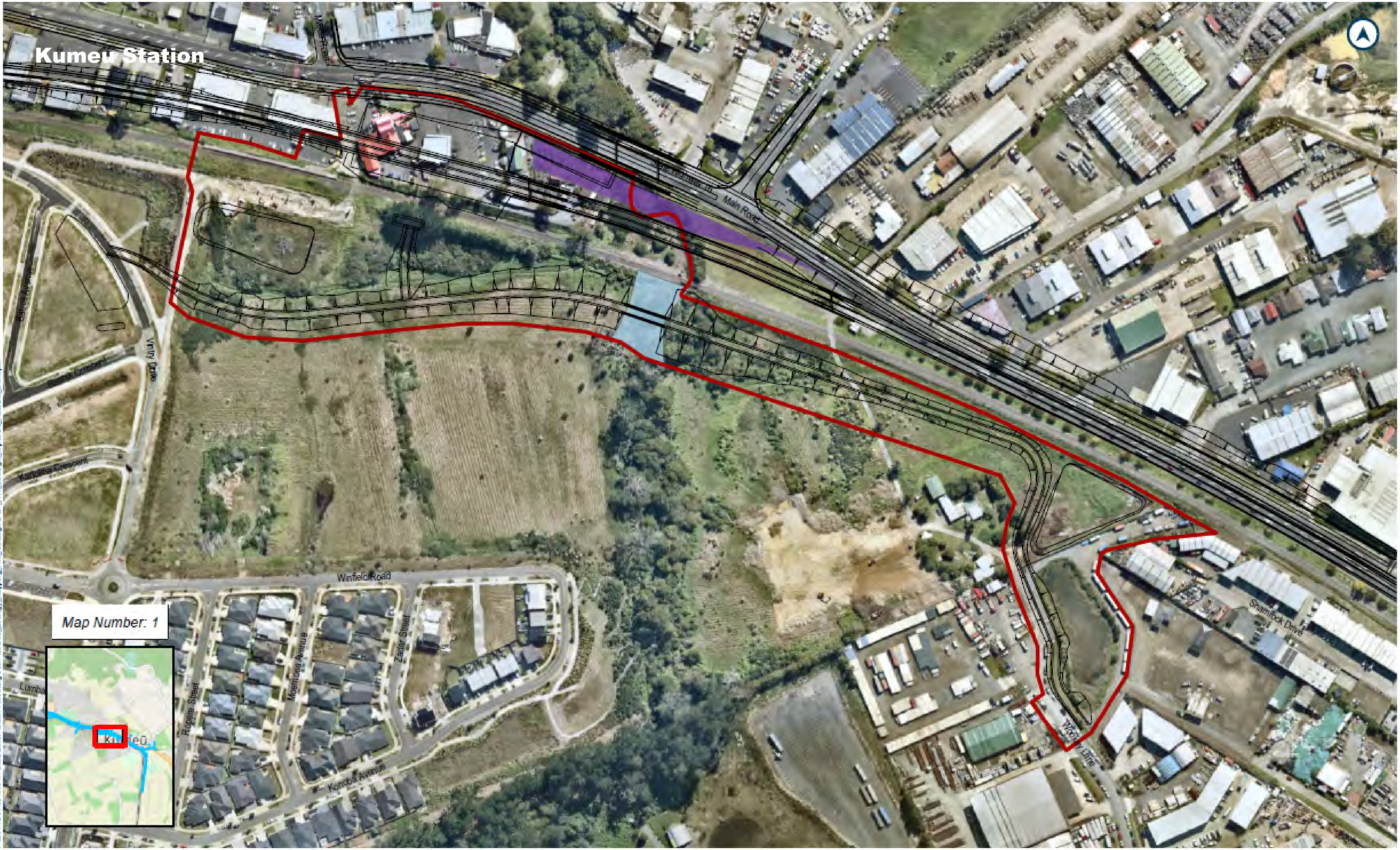
- *A = Retain vegetation*
- *B = Early-stage planting /mature tree planting*
- *C = Late-stage planting*

LEGEND

- Route Options
- Designation
- Buffer planting - C
- Hop-over/under - B
- Hop-over/under - C

0 100 200
Metres

- *A = Retain vegetation*
- *B = Early-stage planting /mature tree planting*
- *C = Late-stage planting*

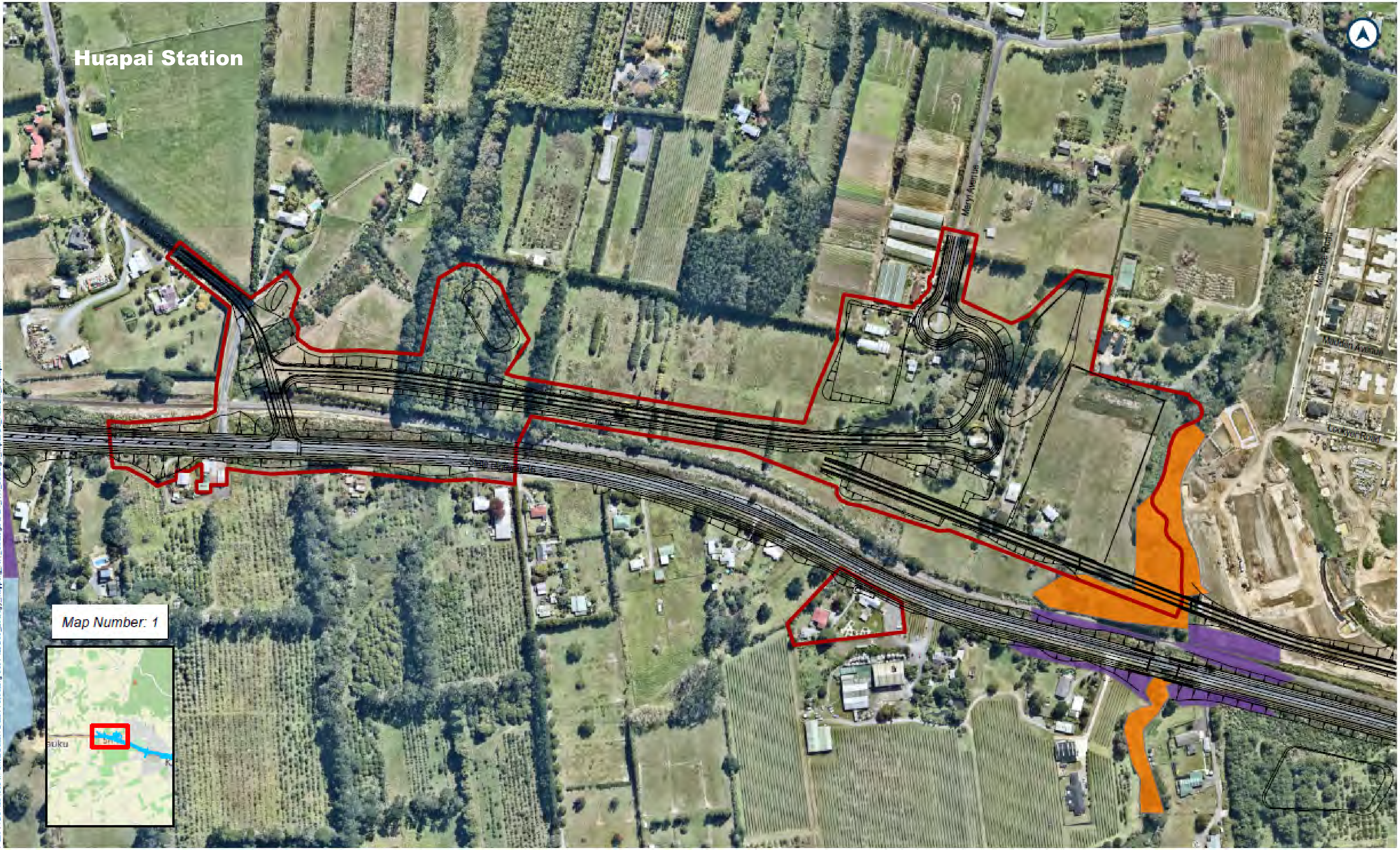


LEGEND

- Route Options
- Designation
- Buffer habitat & hop-over/ under - A
- Hop-over/under - C

0 50 100
Metres

- A = *Retain vegetation*
- B = *Early-stage planting /mature tree planting*
- C = *Late-stage planting*



LEGEND

- Route Options
- Designation
- Buffer habitat & hop-over/ under - A
- Buffer planting & hop-over/ under - C
- Hop-over/under - A
- Hop-over/under - C

0 80 160
Metres

- A = Retain vegetation
- B = Early-stage planting /mature tree planting
- C = Late-stage planting

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LEGEND

——— Route Options

Designation

0 80 160

Metres

- *A = Retain vegetation*
- *B = Early-stage planting /mature tree planting*
- *C = Late-stage planting*

LEGEND

- Route Options
- Designation
- Hop-over/under - A

0 80 160

Metres

- *A = Retain vegetation*
- *B = Early-stage planting /mature tree planting*
- *C = Late-stage planting*