

Ruamāhanga major rivers - Information for setting objectives: Ammonia toxicity, nitrate toxicity

River name	Where on river monitored or modelled?	Attribute - toxicity	What is the current state?		What is the likely change under this scenario from scenario baseline to 2080?			FMU type
			From monitoring data (to 2017)	From modelling of baseline scenario	BAU	Silver	Gold	
Tauanui River	Mouth	Ammonia		A	-	-	-	Aorangi rivers
		Nitrate		A	-	-	-	
Turanganui River	Mouth	Ammonia		A	-	-	-	Aorangi rivers
		Nitrate		A	-	-	-	
Taueru River	Gladstone	Ammonia	A	A	-	-	-	Eastern hill rivers
		Nitrate	B	A	-	-	-	
Makahakaha Stream	Mouth	Ammonia		A	-	-	-	Eastern hill rivers
		Nitrate		B	-	-	-	
Huangarua River	Ponatahi Bridge	Ammonia	A	A	-	-	-	Eastern hill rivers
		Nitrate	A	A	-	-	-	
Eastern hill streams	NA	Ammonia						Eastern hill streams
		Nitrate						
Ruamāhanga at Wardells	Wardells	Ammonia		B	-	-	-	Main stem Ruamāhanga
		Nitrate		A	-	-	-	
Ruamāhanga at Gladstone	Gladstone Bridge	Ammonia	B	B	↑	↑	↑	Main stem Ruamāhanga
		Nitrate	A	A	-	-	-	
Ruamāhanga at Waihenga	Waihenga	Ammonia		B	↑	↑	↑	Main stem Ruamāhanga
		Nitrate		A	-	-	-	
Ruamāhanga at Pukio	Pukio	Ammonia	A	B	↑	↑	↑	Main stem Ruamāhanga
		Nitrate	A	A	-	-	-	
Ruamāhanga at US of Lake Wai outlet	US of Lake Wai outlet	Ammonia		A	-	-	-	Main stem Ruamāhanga
		Nitrate		A	-	-	-	
Kopuaranga River	Stuarts	Ammonia	A	A	-	-	-	Northern rivers
		Nitrate	A	B	-	-	-	
Whangaehu River	250m from Rua confl	Ammonia	A	B	-	-	-	Northern rivers
		Nitrate	A	B	-	-	-	
Parkvale Stream	Weir	Ammonia	B	B	-	-	-	Valley floor streams
		Nitrate	B	B	-	-	-	
Otukura Stream	Mouth	Ammonia		B	-	-	-	Valley floor streams
		Nitrate		B	-	-	-	
All other valley floor streams	NA	Ammonia						Valley floor streams
		Nitrate						
Upper Ruamāhanga River	Te Ore Ore	Ammonia	A	A	-	-	-	Western hill rivers
		Nitrate	A	A	-	-	-	
Waipoua River	Colombo	Ammonia	A	A	-	-	-	Western hill rivers
		Nitrate	B	B	-	-	-	
Waingawa River	South Road	Ammonia	A	A	-	-	-	Western hill rivers
		Nitrate	A	A	-	-	-	
Mangatarere Stream	SH2	Ammonia	B	C	-	-	-	Western hill rivers
		Nitrate	B	B	-	-	-	
Waiohine River	Bicknells	Ammonia	A	B	-	-	-	Western hill rivers
		Nitrate	A	A	-	-	-	
Tauherenikau River	Websters	Ammonia	A	A	-	-	-	Western hill rivers
		Nitrate	A	A	-	-	-	
Western lake streams	NA	Ammonia						Western hill rivers
		Nitrate						
South coast streams	NA	Ammonia						South coast streams
		Nitrate						

Monitoring data for sites not in the NOF A Band

NOF Grades Nitrate Nitrogen - Monitoring Data									
Site name	2010-2011			2014-2015			2016-2017		
	Attribute State	Annual Median	95th Percentile	Attribute State	Annual Median	95th Percentile	Attribute State	Annual Median	95th Percentile
Mangatarere River at State Highway 2	B	1.190	1.729	B	1.055	2.290	B	1.090	1.939
Parkvale Stream at Renalls Weir	B	1.450	2.770	C	1.505	3.87	B	2.150	2.890
Parkvale tributary at Lowes Reserve	No Data			C	4.4	7.085	C	4.4	6.86
Taueru River at Gladstone	B	0.605	1.604	A			B	0.615	1.510
Waipoua River at Colombo Rd Bridge	B	0.880	1.582	B	0.660	1.764	A		

NOF Grades Ammoniacal Nitrogen - Monitoring Data									
Site name	2010-2011			2014-2015			2016-2017		
	Attribute State	Annual Median	Annual Maximum	Attribute State	Annual Median	Annual Maximum	Attribute State	Annual Median	Annual Maximum
Mangatarere River at State Highway 2	B	0.0389	0.1873	B	0.0579	0.2710	B	0.0435	0.2300
Parkvale Stream at Renalls Weir	B	0.0179	0.0539	B	0.0106	0.1341	A		
Ruamāhanga River at Gladstone Bridge	B	0.0121	0.1358	A			B	0.0025	0.1720

NOF bands for nitrate and ammonia toxicity

Nitrate (Toxicity) - mg NO3 - N/L			
Attribute State	Numeric attribute state		Narrative attribute state
	Annual median	Annual 95th percentile	
A	≤ 1.0	≤ 1.5	High conservation value system. Unlikely to be effects even on sensitive species.
B	> 1.0 and ≤ 2.4	> 1.5 and ≤ 3.5	Some growth effect on up to 5% of species.
C	> 2.4 and ≤ 6.9	> 3.5 and ≤ 9.8	Growth effects on up to 20% of species (mainly sensitive species such as fish). No acute effects.
National bottom line	6.9	9.8	
D	> 6.9	> 9.8	Impacts on growth of multiple species and starts approaching acute impact level (ie risk of death) for sensitive species at higher concentrations (> 20mg/L).

Ammonia (Toxicity) - mg NH4-N/L			
Attribute State	Numeric attribute state		Narrative attribute state
	Annual median	Annual maximum	
A	≤ 0.03	≤ 0.05	99% species protection level: No observed effect on any species tested
B	< 0.03 and ≤ 0.24	> 0.05 and ≤ 0.40	95% species protection level: Starts impacting occasionally on the 5% most sensitive species
C	> 0.24 and ≤ 1.30	> 0.40 and ≤ 2.20	80% species protection level: Starts impacting regularly on the 20% most sensitive species (reduced survival of most sensitive species)
National bottom line	1.3	2.2	
D	> 1.30	> 2.20	Starts approaching acute impact level (i.e. risk of death) for sensitive species

Likely future state

>1 band worse	1 band worse	No change	1 band better	>1 band better
↓↓	↓	-	↑	↑↑