# Mokau River - Water Quality Summary 2022

Sampling occurred between January and December 2022

**All sub-catchments**

* ***E. coli*** was low in 28% of all sites (A & B band, ≤ 246) and 24% had moderate (C band, concentrations between 295 - 512), 48% of all sites exceed health recommendations for human contact (D & E band, >550). Across all sub-catchments Mangaotaki-Mairoa had the highest proportion of sites (67%) with low concentrations (147 - 227) and the Lower Mokau had the highest proportion of sites (100%) with elevated concentrations (352 – 10,050).
* **Nitrate** concentrations were below toxicity levels at 100% of all sites (A & B band, median ≤ 1.88 mg/L; 95th percentile ≤ 2 mg/L).
* **Ammonia** concentrations were below toxicity levels at 100% of all sites (A & B band, median ≤ 0.070 mg/L; 95th percentile ≤ 0.262 mg/L).
* **The combined concentration of Nitrate and Ammonia** exceeded 0.5 mg/L at 52% of all sites. Ecological impacts, including problematic growth of algae and/or aquatic plants and loss of sensitive aquatic species are likely when the combined concentration of nitrate and ammonia regularly exceed 0.5 mg/L. Across all sub-catchments Mokauiti-Aria and Mapiu-Mapara had the most sites (83%) with low concentrations (< 0.002 – 0.010 mg/L) and Lower Mokau had more sites (100%) with elevated concentrations (0.54 – 1 mg/L).
* **Median dissolved reactive phosphorus (DRP)** was low in 83% of sites (A & B band, ≤ 0.010 mg/L) and 17% of sites had elevated concentrations (C band, between 0.012 - 0.017 mg/L). 95th percentile DRP concentrations were low in 97% sites (A & B band, ≤ 0.026 mg/L) and one site had elevated concentrations (D band, 0.153 mg/L). Across all sub-catchments Mokauiti-Aria and Mapiu-Mapara had the highest proportion of sites (83%) with low concentrations (0.1 – 0.4 mg/L) while Mangaotaki-Mairoa and Upper Mokau-Mangapehi each had two sites with elevated concentrations (0.012 – 0.017 mg/L).
* **Water clarity** was good in 24% of sites (A or B band), 3% had moderate clarity (C band) and 72% of sites had poor clarity (D band). Bands for each site relate to the national bottom line for water clarity, which is either 1.34 m or 0.61 m, and is dependent on the local geology, climate and elevation. Across all sub-catchments Mangaotaki-Mairoa had the most sites (67%) with good water clarity (165 – 3.21 m) while Lower Mokau and Mid Mokau-Pio Pio had 100% of sites with poor water clarity (≤ 0.98).

**Lower Mokau**

Water quality over 2022 was variable. Results indicate that *E. coli* and sediment are the main contaminates to be aware of. Nitrate, in relation to potential ecological effects, was elevated at four sites. Analysis of samples collected over 2021 and 2022 indicate that the concentration of *E. coli* was significantly higher in spring followed by summer and lower over autumn and winter, while nitrate and suspended sediment (as indicated by water clarity) were generally higher during winter and lower during summer.

* ***E. coli*** was elevated at all sites (≥ 352). The lowest concentrations were measured at 7 Mokau River (352), the highest concentrations were recorded at Totoro Road (10,050). Two sites (Mangaotaki River-SH3 Br and Totoro Road) had concentrations above sub-catchment (SC) baseline (5yr baseline = 5,000). Concentrations peaked significantly in spring and summer, to a (relatively) lesser extent, and were at their lowest in autumn and winter.
* **Nitrate** concentrations were below toxicity levels at all sites. Concentrations were lowest at 8-Paraheka Stm (median 0.23 mg/L; 95th percentile ≤ 0.57 mg/L) and highest at Mangaotaki River-SH3 Br (median 0.69 mg/L; 95th percentile ≤ 1.18 mg/L). Three out of six sites had median nitrate concentrations above the SC baseline and four sites had 95th percentile levels above the baseline (5yr baseline = median 0.54 mg/L; 95th percentile ≤ 1.00 mg/L). Concentrations peaked in winter and were at their lowest in summer.
* **Ammonia** concentrations were low at all sites (median ≤ 0.021 mg/L; 95th percentile ≤ 0.042 mg/L). All sites had median ammonia concentrations above the SC baseline but all sites were below the 95th percentile baseline (5yr baseline = median 0.009 mg/L; 95th percentile ≤ 0.047 mg/L).
* **The combined concentration of Nitrate and Ammonia** exceeded 0.5 mg/L at four out of six sites. Ecological impacts, including problematic growth of algae and/or aquatic plants and loss of sensitive aquatic species are likely when the combined concentration of nitrate and ammonia regularly exceed 0.5 mg/L.
* **Dissolved reactive phosphorus (DRP)** concentrations were low at 5 out of 6 sites (median ≤ 0.010 mg/L; 95th percentile ≤ 0.015 mg/L) and elevated at Mangaotaki River-SH3 Br (median 0.012 mg/L; 95th percentile ≤ 0.015 mg/L). Two sites (Mangaotaki River-SH3 Br and Totoro Road) had median DRP concentrations which exceeded SC baseline but all sites were below the 95th percentile baseline (5yr SC baseline = median 0.009 mg/L; 95th percentile ≤ 0.022 mg/L). Concentrations are variable across sites during the year, showing no clear seasonal trend.
* **Water clarity** was poor at all sites (≤ 0.87 m), relative to the national bottom line (either 0.61 m or 1.34 m). Four out of six sites had water clarity values below the SC baseline (5yr SC baseline 0.79 m). Water clarity was lowest in winter and highest in summer and autumn, indicating a higher suspended sediment load during winter and a lower suspended sediment load in summer and autumn.







