# 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).

**Mangaotaki-Mairoa**

Water quality over 2022 was generally good across all sites. Results indicate that nitrate, in relation to its potential ecological effects, is the main contaminant to be aware of as it was elevated at all sites. *E. coli*, sediment and dissolved reactive phosphorus (DRP) were each elevated at two sites. Analysis of samples collected over 2021 and 2022 indicate that the concentration of nitrate was higher during winter and lower during summer. *E. coli* was higher in spring and lower in winter. Suspended sediment (as indicated by water clarity) was generally higher in spring and winter and lower in summer and autumn, although the pattern varied by site.

* ***E. coli*** was low at 4 out of 6 sites (≤ 227) and elevated at all other sites (≥ 353). The lowest values were recorded at 10-Waitanguru Stm (147), the highest values were recorded at Mangaotaki River-SH3 Br (9,465). Mangaotaki River-SH3 Br was the only site with values above the sub-catchment (SC) baseline (5yr baseline = 5,000). Concentrations peaked in spring and were at their lowest in winter.
* **Nitrate** concentrations were below toxicity levels at all sites. Concentrations were lowest at 11-Mangaotaki R. (median 0.54 mg/L; 95th percentile ≤ 0.87 mg/L) and highest at 30-Kihikihi Stm (median 1 mg/L; 95th percentile 1.15 mg/L). Five out of six sites had median nitrate concentrations above the SC baseline and three sites (10-Waitanguru Stm, 30-Kihikihi Stm and Mangaotaki River-SH3 Br) 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 exceptionally low at all sites (median < 0.01 mg/L; 95th percentile ≤ 0.019 mg/L) and below toxicity levels at all other sites. All sites had median and 95th percentile concentrations below baseline concentrations (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 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.
* **Dissolved reactive phosphorus (DRP)** concentrations were low at 4 out of 6 sites (median ≤ 0.010 mg/L; 95th percentile ≤ 0.011 mg/L). Concentrations were elevated at Mangaotaki River-SH3 Br and 10-Waitanguru Stm (≥ 0.012 mg/L; 95th percentile ≥ 0.015 mg/L). Three sites (Mangaotaki River-SH3 Br, 10-Waitanguru Stm and 11-Mangaotaki R.) had median DRP concentrations that exceeded the 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 were consistently high at 10-Waitanguru Stm across all seasons with an exceptional measurement recorded in February 2021 (0.135 mg/L). DRP was otherwise variable across the remaining sites, showing no discernible seasonal pattern.
* **Water clarity** was good at 4 out of 6 sites (≥ 1.65 m) and poor at 30-Kihikihi Stm and Mangaotaki River-SH3 Br (≤ 0.80 m), relative to the national bottom line (1.34 m). One site (30-Kihikihi Stm) had a median annual water clarity value less than the SC baseline (5yr SC baseline 0.79 m). Water clarity was generally higher in autumn and summer and lower in winter and spring, indicating a higher suspended sediment load during winter and spring and a lower suspended sediment load in summer and autumn. However, there was some variability across sites.









