# 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).

**Mokauiti-Aria**

Water quality over 2022 was generally good across all sites. Results indicate that *E. coli* and sediment are the main contaminates to be aware of. Nitrate, in relation to its potential ecological effects, was elevated at one site. Analysis of samples collected over 2021 and 2022 indicate that the concentration of *E. coli* was higher in spring and autumn and lower in winter, while nitrate was higher during winter and lower during summer. Suspended sediment (as indicated by water clarity) was variable across seasons and sites, with no clear seasonal trend.

* ***E. coli*** was low at 23-Whareroa Stm and 24-Mangawhata Stm (≤ 163) and elevated at all sites (≥ 295). The lowest reading was at 23-Whareroa Stm (139), the highest concentration was at Mokauiti Stm-3 Way Point Aria (4,250). No sites had concentrations 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 23-Whareroa Stm (median 0.15 mg/L; 95th percentile ≤ 0.20 mg/L) and highest at 27-Ramaroa stream (median 0.69 mg/L; 95th percentile < 0.74 mg/L). One site (27-Ramaroa stream) had median nitrate concentrations above the SC baseline and one site (Mokauiti Stm-3 Way Point Aria) 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 23-Whareroa Stm and 27-Ramaroa stream (median < 0.005 mg/L; 95th percentile ≤ 0.008 mg/L) and below toxicity levels at all other sites. The highest concentrations were recorded at 22-Huioteko Stm (median ≤ 0.070 mg/L; 95th percentile ≤ 0.262 mg/L). Four out of six sites had median ammonia concentrations above the SC baseline and one site (22-Huioteko Stm) had 95th percentile above 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 27-Ramaroa stream. 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 all sites (median ≤ 0.010 mg/L; 95th percentile ≤ 0.014 mg/L). One site (27-Ramaroa stream) 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 are variable across sites during the year, showing no clear seasonal trend.
* **Water clarity** was good at 23-Whareroa Stm and 27-Ramaroa stream (≥ 1.05 m) and poor at all other sites (≤ 1.33 m), relative to the national bottom line for each site (either 0.61 m or 1.34 m). One site (Mokauiti Stm-3 Way Point Aria) had a median annual water clarity value less than the SC baseline (5yr SC baseline 0.79 m). Water clarity varied in each site over seasonal sampling with some sites having a higher clarity in winter and others during autumn. Water clarity is influenced by suspended sediment (usually increasing with rainfall or disturbance) but it may also be reduced by algal blooms during warm, dry weather when streams and rivers have a reduced water level and flow.







