# 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).

**Mid Mokau-Pio Pio**

Water quality over 2022 was generally moderate across sites. Results indicate that *E. coli*, sediment and nitrate, in relation to its potential ecological effects, are the main contaminants to be aware of. Analysis of samples collected over 2021 and 2022 indicate that the concentration of nitrate was higher during winter and lower during summer. *E. coli* concentrations were lower in autumn and variable the other seasons, with some sites hitting peak concentrations in winter and others in spring or summer. Suspended sediment (as indicated by water clarity) was higher in spring and winter and lower in summer and autumn.

* ***E. coli*** was low at 12-Mangakowhai Strm (246) and elevated at all other sites (≥ 352). The highest values were recorded at 13-Mokau R. HWY 4 (827). No sites had values greater than the sub-catchment (SC) baseline (5yr baseline = 5,000). Concentrations peaked at different times for different sites over winter, spring and summer and were at their lowest in autumn.
* **Nitrate** concentrations were below toxicity levels at all sites. Concentrations were lowest at 13-Mokau R. HWY 4 (median 0.39 mg/L; 95th percentile ≤ 0.73 mg/L) and highest at 12-Mangakowhai Strm (median 1.88 mg/L; 95th percentile 2 mg/L). Two sites (7-Mokau R and 12-Mangakowhai Strm) had median nitrate concentrations above the SC baseline and 12-Mangakowhai Strm also had a 95th percentile value above the baseline (5yr baseline = median 0.54 mg/L; 95th percentile ≤ 1.00 mg/L). Concentrations were consistently higher at Mangakowhai Strm and peaked across most sites in winter and were lower in summer.
* **Ammonia** concentrations were below toxicity levels at all sites and were exceptionally low at 12-Mangakowhai Strm and 15-Mapara Stm (median < 0.005 mg/L; 95th percentile ≤ 0.008 mg/L). The highest median value was calculated for 16-Mokau R. (0.020 mg/L) and the highest 95th percentile value was calculated for 14-Mangapehi R. HWY 4 (0.063 mg/L). Four out of six sites had median values greater than the SC baseline and 14-Mangapehi R. HWY 4 had a 95th percentile value above the SC 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 3 out of 6 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 ≤ 0.007 mg/L; 95th percentile ≤ 0.010 mg/L). Concentrations were elevated at 12-Mangakowhai Strm (≥ 0.017 mg/L; 95th percentile ≥ 0.026 mg/L), the only site where median and 95th percentile values were greater than the SC baseline (5yr SC baseline = median 0.009 mg/L; 95th percentile ≤ 0.022 mg/L). DRP was consistently high at Mangakowhai Strm and were generally higher in summer and lower in winter.
* **Water clarity** was poor at all sites (≤ 0.98 m), relative to the national bottom line (1.34 m). Two sites (14-Mangapehi R. HWY 4 and 15-Mapara Stm) had median annual water clarity values 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.







