

Consequences of raising minimum flows

Updated 16 August 2017

For the Upper Ruamāhanga River and Waipoua River sub-catchments, the RWC has indicated a preference for relatively substantial increases to the existing minimum flows. The main consequence for existing water users in these catchments will be a reduced reliability of supply (i.e. minimum flows will be struck more often and for longer periods than currently).

The tables and figures on the following pages show the likely changes in reliability for each sub-catchment based on an analysis of observed flow records at the relevant minimum flow control site. Tables 1 and 2 show the average summer reliability experienced under the existing minimum flows (presented in the green shaded columns) and how reliability in the same years would progressively reduce with higher minimum flows (blue columns to the right). Figures 1 and 2 show how reliability would change during the peak irrigation months of summer, both on average (across all years of available flow record) and during an especially dry year (using 2014/15 as an example).

The ultimate target minimum flow is called ‘Stage 3’ in these tables and ‘Stage 1’ and ‘Stage 2’ minimum flows are intermediate steps towards the target (reflecting the RWC desire to see preferences phased in progressively over time).

A summary of the number and type of existing consents in each sub-catchment is provided below to help interpret how many users will potentially be affected by higher minimum flows.

Some key assumptions:

- The reliability analysis assumes the future climate will be same as the past (i.e. it is based on historical flow/climate data). With a drying climate you would expect background reliability to be reducing further than indicated in the tables.
- The analysis simply shows the frequency with which the minimum flow thresholds are struck. The actual future reliability for any given user will be determined by what actions the RWC decide should be imposed at the minimum flow (e.g. should they be partially or fully restricted?).

Summary of existing consents in Upper/Middle Ruamāhanga sub-catchment

	Number consents	Total take (L/s)
Surface water takes	11	630.1
Category A takes	61	1150.4

Summary of existing consents in Waipoua sub-catchment

	Number consents	Total take (L/s)
Surface water takes	6	65
Category A takes	3	60

Upper Ruamāhanga (Wardells)

Table 1. Average reliability changes based on a six month summer (Nov – Apr): minimum flow increased in 3 equal steps

Summer reliability - Upper Ruamahanga River (Wardells)							
Year	Existing minimum flow (2,400 L/s)	Stage1 minimum flow (2,680 L/s)	Stage1 reduction in reliability	Stage2 minimum flow (2,965 L/s)	Stage2 reduction in reliability	Stage3 minimum flow (3,250 L/s)	Stage3 reduction in reliability
1993	96%	85%	11%	77%	18%	70%	26%
1994	100%	99%	1%	96%	4%	91%	9%
1995	100%	100%	0%	99%	1%	97%	3%
1996	100%	100%	0%	100%	0%	100%	0%
1997	99%	98%	1%	97%	3%	94%	6%
1998	94%	89%	5%	87%	8%	84%	11%
1999	96%	94%	2%	93%	3%	89%	7%
2000	96%	88%	8%	82%	14%	77%	19%
2001	100%	100%	0%	100%	0%	100%	0%
2002	91%	81%	11%	74%	17%	65%	26%
2003	100%	100%	0%	98%	2%	98%	2%
2004	98%	97%	2%	96%	3%	94%	4%
2005	100%	98%	2%	97%	3%	96%	4%
2006	94%	89%	5%	86%	9%	78%	16%
2007	74%	66%	8%	57%	17%	48%	26%
2008	91%	87%	4%	82%	8%	78%	12%
2009	100%	100%	0%	100%	0%	98%	2%
2010	100%	98%	2%	92%	8%	87%	13%
2011	100%	100%	0%	100%	0%	100%	0%
2012	79%	72%	7%	68%	11%	67%	12%
2013	100%	100%	0%	99%	1%	94%	6%
2014	88%	82%	6%	74%	14%	67%	21%
Mean	95%	92%	3%	89%	7%	85%	10%
Worst year	74%	66%	11%	57%	18%	48%	26%
95th Percentile	79%	73%	10%	68%	17%	65%	26%

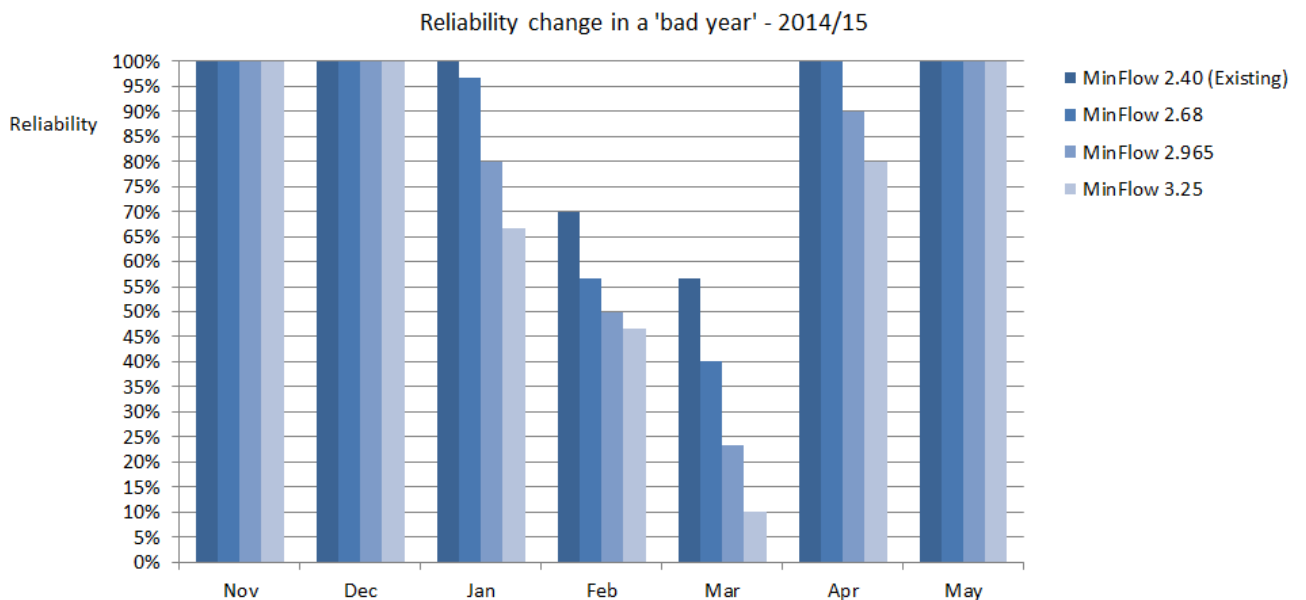
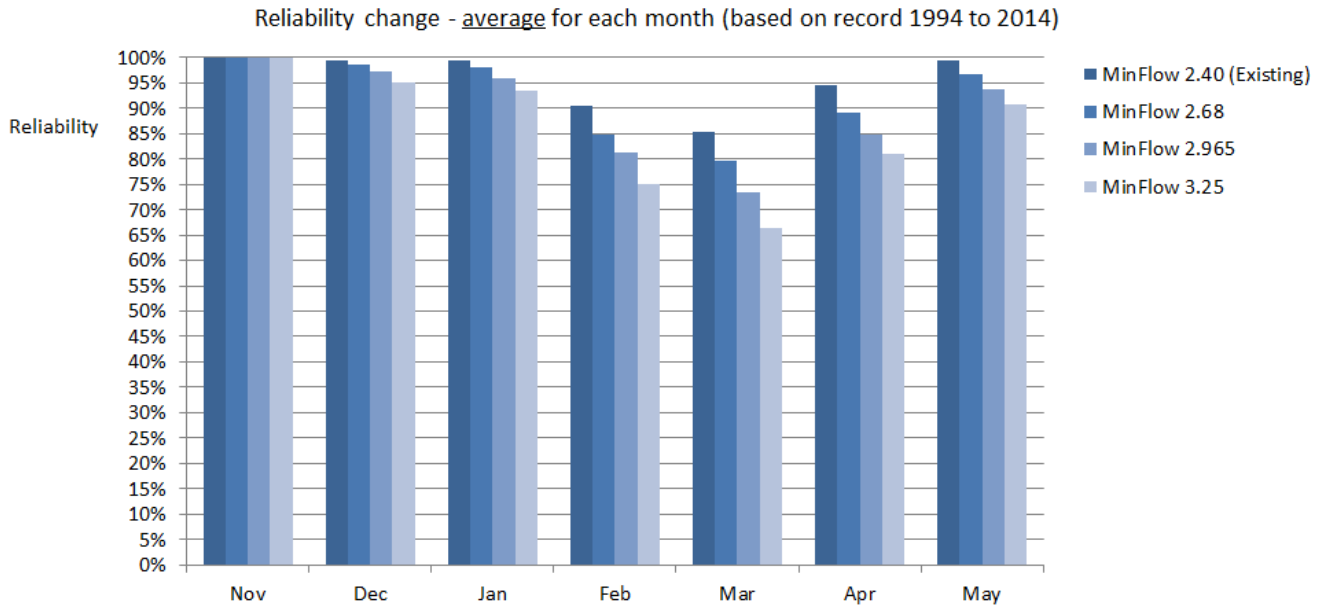
Waipoua River (Mikimiki)

Table 2. Average reliability changes based on a six month summer (Nov – Apr): minimum flow increased in 3 equal steps

Summer reliability - Waipoua River (Mikimiki Bridge)							
Year	Existing minimum flow (250 L/s)	Stage1 minimum flow (280 L/s)	Stage1 reduction in reliability	Stage2 minimum flow (310 L/s)	Stage2 reduction in reliability	Stage3 minimum flow (335 L/s)	Stage3 reduction in reliability
1993							
1994							
1995							
1996							
1997							
1998							
1999							
2000							
2001							
2002							
2003							
2004							
2005							
2006							
2007	78%	72%	6%	69%	8%	67%	11%
2008	90%	89%	1%	88%	2%	87%	3%
2009	100%	100%	0%	100%	0%	100%	0%
2010	98%	96%	2%	92%	6%	87%	11%
2011	100%	100%	0%	100%	0%	100%	0%
2012	74%	68%	6%	63%	11%	61%	13%
2013	98%	98%	0%	98%	0%	98%	0%
2014	85%	79%	6%	73%	12%	69%	16%
Mean	90%	88%	3%	86%	5%	84%	7%
Worst year	74%	68%	6%	63%	12%	61%	16%
95th Percentile	75%	70%	6%	65%	11%	63%	15%

Upper Ruamāhanga (Wardells)

Figure 1. Reliability changes on a monthly basis (minimum flow increased in 3 equal steps). Top graph is average reliability for each month over all years (1993-2014) and bottom graph is a dry year.



Waipoua (Mikimiki Bridge)

Figure 2. Reliability changes on a monthly basis (minimum flow increased in 3 equal steps). Top graph is average reliability for each month over all years (2007-2014) and bottom graph is a dry year.

