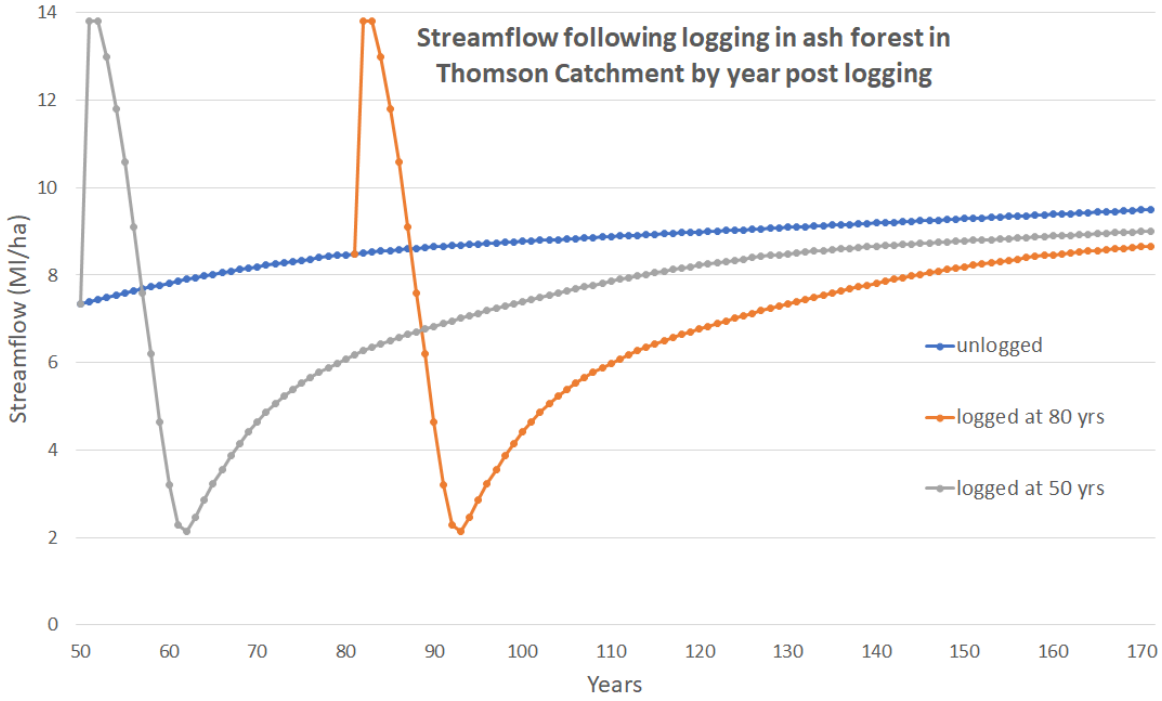
The cost of water loss from logging the Thomson catchment

Decades of research into the hydrology of Melbourne's water catchments have examined the diminished streamflows that follow the conversion of mature ash forests, whether through logging or bushfire, to dense and thirsty regenerating forests. Thus, for a decade or so after bushfire or logging streamflows rise but as the ash forest and its leaf area grow, flows start to decline.

A report by the CRC for Catchment Hydrology published the modelled water loss profile in the Thomson catchment[10] assuming no intervening bushfires. An adaptation of this profile for alpine ash is shown below[11], with the modelled impact of logging in 1939 regrowth at ages 50 years and 80 years.



The difference in areas under the blue line and under the grey line equates to the water lost over 120 years as a result of logging one hectare of 50-year-old ash forest in the Thomson catchment. Similarly, the difference in areas under the blue line and under the orange line equates to the water lost over 90 years as a result of logging one hectare of 80-year-old ash forest in the Thomson catchment. So, knowing the area logged allows the water loss over time to be calculated for any particular forest age.

The area of ash forest logged within the Thomson catchment since catchment logging ramped up has been extracted from data maintained by DELWP in its MapShare application. This is set out below:

Year	Area (ha)	Year	Area (ha)	Year	Area (ha)	Year	Area (ha)
1980-81	33	1990-91	190	2000-01	131	2010-11	168
1981-82	45	1991-92	80	2001-02	130	2011-12	143
1982-83	0	1992-93	108	2002-03	120	2012-13	145
1983-84	29	1993-94	190	2003-04	123	2013-14	216
1984-85	40	1994-95	276	2004-05	122	2014-15	102
1985-86	38	1995-96	185	2005-06	93	2015-16	133
1986-87	52	1996-97	150	2006-07	37	2016-17	152
1987-88	45	1997-98	158	2007-08	49	2017-18	46
1988-89	168	1998-99	93	2008-09	134	2018-19	110
1989-90	268	1999-00	157	2009-10	120	2019-20	na

[10] Peel, M et al. 2000. Predicting the water yield impacts of forest disturbance in the Maroondah and Thomson catchments using the Macaque model. Technical Report 00/14. Cooperative Research Centre for Catchment Hydrology.

[11] Ibid. Fig 7.7, p.55

The Code (MSPs clause 3.5.1.5(a)) permits an average of 150 ha of ash forest in the Thomson water catchment to be logged each year and it is assumed that logging will continue at this rate, as it has done over the past three decades.

Thus, if 150 ha of ash forest is logged in 2020 the average annual loss in dam inflows between now and 2100 will be 238 megalitres. This may seem a small amount, just 0.15% of the 150 gigalitres per year that the Wonthaggi desalination plant is slated to deliver, or under 0.1% of Melbourne's annual water consumption, but it nevertheless it has a significant and measurable cost.

An appropriate price for free-flowing river water is to be found in a recent study by researchers in Melbourne University's School of Engineering[12]. It priced additional water entering Melbourne's storages at from $400 - $1,000 per megalitre, depending on the spare storage capacity. With Melbourne's catchments likely to be well below capacity for the foreseeable future the appropriate figure to use is $1,000 per megalitre.

Calculations of the 'present value' of losses (or gains) in the future generally requires the use of a discount rate to reflect the uncertainty of the future, including technological changes, and a general preference to forgo a future benefit in order to realise a more certain immediate value. However, with a rapidly growing population, a drying climate, increased bushfire risk, growing demands to maintain environmental flows, and with water having no feasible economic substitute and significant new storage capacity impossible, the use of a discount rate that reduces future value is certainly inappropriate. Indeed the real price of water can only be expected to increase over time.

So continued logging the ash forests in the Thomson catchment at current rates between now and 30 June 2030 will result in reduced streamflows between now and 2100 of 213,700 megalitres valued at $213 million – more than double the price VicForests will receive for the timber sold.

However, since the water flowing into the Thomson dam is all profit since it has no collection cost the correct comparison is not with the sale price of the wood but with VicForests' profit. Given their proximity to Maryvale and Heyfield, Thomson coupes are probably VicForests' most profitable, but even so this will be a few million annually at most. So, allowing for it to make a profit from these coupes of, say, $20 million from now until 2030, by far the highest economic benefit to which the ash forests of the Thomson catchment can be put is to be left unlogged.

Clearly a major fire, would change the picture, but given the major bushfires Victoria has already experienced this century, killing vast areas of mature ash forest, preserving the dwindling area of mature ash forest in Victoria must take priority.

RUBICON FOREST PROTECTION GROUP

[12] Western, A W. et al.2017. The economic value of water in storage. School of Engineering University of Melbourne