Reconnaissance survey, Jarrahdale forest, April 2024

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Summary Dramatic patterns of death and recovery of jarrah and bullich have been observed near rocky outcrops and in gully head sites for 22 and 13 years respectively. These can be readily explained in terms of soil depth, water-holding capacity, rainfall and drought.

Introduction Winter rainfall at Jarrahdale in 2023 was 884 mm, about 15 percent below the 10 year average. This was followed by the driest period on record, 22 mm over six months, with several days of 40 degrees or above. There were reports of stressed vegetation on the Swan coastal plain, as well as from Busselton. I have monitored a number of sites near Jarrahdale for drought since 2002 and decided to re-survey these.

Survey method A reconnaissance by road covered 50 kms along Nettleton, Jarrahdale, Chandler, White gum, Jarrah and 31 Mile brook roads, as well as the Albany highway. Stops at nine sites allowed for closer observation, photography and comparison with previous visits. Old- growth and regrowth, thinned and un-thinned, high-quality and low quality, jarrah and bullich stands were inspected.

Results There were signs of stress, ranging from thinner crowns on the better sites with deeper soils (Nettleton, Jarrah and Jarrahdale roads), to severe crown scorch and some deaths on shallow soils above clay (Nettleton, Chandler and White gum roads) or adjacent to basement rock (Jarrahdale road and Albany highway). On some sites the understorey appeared stressed, with occasional dead Banksia. Scorch on shallow soil sites was the most significant since 2011, but is not as serious.

Discussion Since 1966, the average rainfall at Jarrahdale has been 1045 mm, about 17 percent below the 1911 to 1965 average of 1251mm. Since 2000, there have been six years with low rainfall : 2001, 2006, 2010, 2015, 2019 and 2023. Rainfall in 2001, 2010 and 2023 was 29, 37 and 15 percent below the average.

Surveys of crown scorch, drought deaths and then recovery show these are most noticeable on sites with shallow soil. Areas of higher quality regrowth forest and sites that have been thinned show much less stress, but may have thinner crowns.

In summer 2002, a small area of regrowth jarrah saplings, growing on shallow soil above basement rock, adjacent to Chandler road, was affected by drought. In some stems the crowns were fully scorched, while others were killed. Over time most recovered, either with epicormic shoots or by sprouting new stems from the root collar. These saplings were again scorched in 2007 and recovered. In summer 2011 most of the saplings were killed, only to re-sprout again from the collar. Minor crown scorch was also observed in summer 2016 and 2020 and a more severe scorch in 2024. This pattern of alternate drought and recovery has been observed for twenty-two years.

In summer 2011 a hectare of bullich (E megacarpa) in a gully-head site above clay collapsed. A re-survey in 2020 showed substantial recovery from epicormics, coppice from the collar and seedlings. This site has substantial levels of scorch in 2024.

The more dramatic patterns of death and recovery have been associated with rocky outcrops and gully head sites. These changes can be readily explained in terms of soil depth, water-holding capacity and drought.

Old growth (left) and 140 year old regrowth plot thinned in 1956 (right), Jarrahdale road

Bullich in gully head, White gum road, recovery in 2020 post 2011 collapse (left) and scorch in 2024.

Severe scorch in 2011 (left) and recent scorch in 2024 , Albany highway, shallow soil.

Severe scorch and previous deaths, Chandler road, 2024, very shallow soil.