The Leeuwin Group

Facing the 'facts': What does the science say about Alcoa's public relations claims?

SCALE OF IMPACT

1. **"Only 2% of the NJF has been cleared for mining." Evidence shows:**
   - 85% of bauxite mining bauxite occurs in the highest quality, most biodiverse parts of the jarrah forest.
   - 15% of this is already cleared, and nearly 50% is at more than double the wildfire risk from Alcoa's 'fuel ladder' rehabilitation.
   - > 300 sq km already cleared by Alcoa, with exploration drilling happening from Harvey and planned for near Perth (Mundaring Weir) within 2 years[1].
2. **"We don't mine old-growth forests or in national parks." Evidence shows:**
   - Mining clears ~80,000 trees every year that are 100 – 300 years old.
   - Mining also removes centuries-old grasstrees and understory species
   - Alcoa actively lobbied the state government from creating national parks (e.g. large sections of Lane Poole Reserve are not protected from mining[2]).
   - Alcoa removed references to 'older-growth' forest areas from the vegetation assessment report for the MMP 2023-2027 PER documentation[3].

WORLD'S BEST PRACTICE

3. **"We go beyond compliance." Evidence shows:**
   - Compliance falls far short of current environmental expectations and fail global mining standards[4].
   - In 60 years of operation the government has not accepted ANY areas as restored and completed[5].
4. **"We our doubling our rehabilitation efforts." Evidence shows:**
   - This only covers the area that is currently being cleared every year under the Exemption Order[6].
   - This will not address the >70 sq km of forest that has been cleared, and mined but rehabilitation has not started (25% of the area cleared to date).

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[1] EPA Assessment 2385, Chapter 1, Figure 1-11
[2] Review of the Expansion to Wagerup Alumina Refinery, and Compliance with Approved Conditions, Alcoa October 1989.
[3] EPA Assessment 2253 Appendix B2-1, Figure 20. This figure has been removed from a later version issued as EPA Assessment 2385, Appendix 15.
[4] Campbell et al. 2024 *Standards-based evaluation inform ecological restoration outcomes for a major mining activity in a global biodiversity hotspot*, Restoration Ecology. https://doi.org/10.1111/rec.14236
[5] WA Hansard 29 May 2025
[6] Environmental Protection (Darling Range Bauxite Mining Proposals) Exemption Order 2023

- Alcoa has in 60 years not been able to restore a jarrah forest[5]; Alcoa's rehabilitation will result in larger areas of failed restoration.

SUCCESS OF REHABILITATION

5. **"75% of the mined area has been rehabilitated." Evidence shows:**
   - Alcoa defines this 'success' by claiming that areas that have had seedlings planted are rehabilitated yet the science shows only a quarter survive beyond the first decade [7].
   - Alcoa's rehabilitation had not been successful in re-establishing a Jarrah forest with the government not accepting ANY areas as rehabilitated in the 60years of operation[5].
   - Rehabilitation areas decline dramatically as a result of:
     - Over-abundance of legumes that crowd out remnant understorey species.
     - Permanent loss of understorey diversity over time.
     - Missing charismatic and key ecosystem functional species including centuries old grasstrees and zamias.
     - Drought failures.
6. **"We return 100% plant species richness in rehabilitation." Evidence shows:**
   - Rehabilitation areas lose over half of the plant species over time[8].
   - Rehabilitation fails to represent a quarter of species diversity of the forest[4].
   - Key plant groups that define the NJF's flora are effectively absent and, despite 40 years of research, there is no ecological capacity for the natural migration of any species to return[4].
7. **"We planted 500,000 seedlings last year" The evidence shows:**
   - Most species remain missing in rehabilitated sites[4].
   - Alcoa need to plant over 12,000,000 seedlings per year just to keep up with current annual rehabilitation areas, let alone address the >1 billion shortfall across legacy rehabilitation accumulated over the last 60 years.
8. **"Nearly 100% of the forest fauna are in our rehabilitation" yet the scientific evidence shows that:**
   - Behavioural studies (compared with Alcoa's 'detection' studies) show fauna pass through rehabilitation and do not use the areas as habitat like the forest[4].
   - In a similar manner, over 250,000 cars are found on Perth's freeways every day, but no one lives there.

[7] Alcoa ceo repeats misleading spin about its jarrah forest rehabilitation. https://www.boilingcold.com.au/alcoa-ceo-says-bauxite-miner-can-handle-later-wa-approvals/

[8] Standish et al. 2023. *Correction to "Beyond species richness and community composition: Using plant functional diversity to measure restoration success in jarrah forest"*, Applied Vegetation Science. https://doi.org/10.1111/avsc.12746

OFFSETS

- Alcoa's proposed offsets programs are predicated on:
    - Improving the quality of forest already rated as 'high quality' by Alcoa's own rating system (9 out of a possible 10 quality rating).
        - The two offset areas were previously declared biodiversity 'exclusion zones' by Alcoa, based on Alcoa's admission of high environmental quality.[9]
    - Without Alcoa's help, the jarrah forest ecosystem will degrade within the next 20 years (and Alcoa is apparently capable of preventing this) which is not supported by scientific evidence
- Alcoa use their own forest clearing history to state the forest is at *risk of clearing* without their help.
- Birdlife state that the proposed 'improvement' plan for cockatoos will produce marginal benefits at best, and even these are 'highly uncertain' and does not justify the 5-fold larger clearing of high-quality forest Alcoa aim to 'offset'[10].
- For the offset areas to even be marginally effective at offsetting the loss of proposed expansion high-quality forest, Alcoa need to deliver their proposed improvements over an area of 1,800 sq km – this is an larger than Perth , and more than 5 times larger than Alcoa's current offset proposal
- Their estimate for 'cost-effective' offsets is less than 10% of the likely minimum cost, just for cockatoo impacts.

[9] Alcoa commits to no mining zone to protect environmental and social values around Dwellingup. https://www.alcoa.com/australia/en/news/releases?id=2023/06/alcoa-commits-to-no-mining-zone-to-protect-environmental-and-social-values-around-dwellingup&year=y2023#:~:text=Alcoa%20also%20recently%20committed%20to,its%20three%20local%20alumina%20refineries.

[10] Better offsets for Western Australia's black-cockatoos. *Threatened Species Recovery Hub*. https://www.nespthreatenedspecies.edu.au/publications-and-tools/better-offsets-for-western-australia-s-black-cockatoos

SCIENCE-LED ADAPTIVE MANAGEMENT

- **"We use research-led adaptive management in rehabilitation.[11]" Evidence shows:**
  - Increased plant species richness in early rehabilitation?
    - → No improvement after 15 years (still <50% of forest richness)[4].
  - Changing fertilizer and species mix?
    - → After 30 years, no difference in species richness[12].
    - → Research sites that are "70% similar to the forest" ranked as 'degraded' vegetation quality in recent Alcoa-funded surveys[13].
    - → Fertilizer trial sites have failed the species richness completion criteria and should have been remediated.
  - Improved fauna habitats?
    - → Ground fauna habitat woody features are that provide protection, breeding dens and forage are greater than 10 x less common than in the forest[14].
    - → Constructed habitat features in rehabilitation will degrade more than 50y before rehabilitation might start producing replacements..[15]
  - Advanced cultivation techniques to plant hundreds of thousands of seedlings every year?
    - → Only propagate 15 species[16] of the > 100 'difficult to grow' species of the jarrah forest.
    - → These 15 species are planted at <10% of the density needed.
  - Optimised topsoil handling methods and technology?
    - → The overabundance of two legumes species that smother any other understorey species is a result of 'best practice' topsoil use and is irreversible overdominance.[17]

  There is a significant topsoil deficit for >70 sq km of unrehabilitated land – these areas will have alarmingly lower species richness and density than average rehabilitation areas as 70% of Alcoa's forest species richness comes from topsoil replacement.

[11] Commander et al. 2024. *Research-led adaptive management in rehabilitation*. Mine Closure 2024: 17th International Conference on Mine Closure. https://doi.org/10.36487/ACG_repo/2415_30

[12] Daws et al. 2023. *Overstorey-understorey interactions reveal trade-offs for achieving competing land-use goals in jarrah forest restored after bauxite mining: Initial prescription and targets affect restoration success over 32 years*, Ecological Engineering. https://doi.org/10.1016/J.ECOLENG.2023.106913

[13] EPA Assessment 2253 Appendix B2-1.

[14] Craig et al. 2014. *Does coarse woody debris density and volume influence the terrestrial vertebrate community in restored bauxite mines?* Forest Ecology and Management. https://doi.org/10.1016/j.foreco.2014.01.011

[15] Grigg & Steele, 2011. *The longevity of constructed log pile fauna habitats in restored bauxite mines in relation to recurrent wildfire in the jarrah forest of Western Australia*, Ecological Management and Restoration. https://doi.org/10.1111/J.1442-8903.2011.00589.X

[16] EPA Assessment 2385, Appendix 70.

[17] Koch et al. 1997. *Ecological aspects of soil seed-banks in relation to bauxite mining. I. Unmined jarrah forest*, Australian Journal of Ecology. https://doi.org/10.1111/j.1442-9993.1997.tb00656.x