The Expert Panel

Bendigo-Ophir Gold Project - FTAA-2507-1089

NON-EXPERT EVIDENCE OF CHELSEA MCGAW

Introduction

1. My full name is Chelsea Kim Jessie McGaw and I am employed by the Royal Forest and Bird Protection Society of New Zealand Inc ("Forest & Bird") as a Regional Conservation Manager for the Otago and Southland region. I hold a Bachelor of Applied Science – Environment and a post-graduate Diploma in Communication Studies. I have worked for Forest & Bird for 3 years and 10 months in my current position, providing regional advocacy, submissions on Resource Management Act and Local Government Act processes and various other duties that the role requires. I am providing these comments in my capacity as an employee of Forest & Bird, and not as an independent expert.
2. Forest & Bird is New Zealand's largest and longest-serving independent conservation organisation. Its mission is to be a 'voice for nature'. Its constitutional purpose is to "take all reasonable steps within the power of the Society for the preservation and protection of the indigenous flora and fauna and the natural features of New Zealand."
3. Forest & Bird's advocacy and legal teams help to achieve the organisation's purpose by participating in consenting processes for projects that are likely to have significant adverse impacts on the natural environment.
4. Forest & Bird has five volunteer branches in my region, all of which hold a strong interest in the Bendigo-Ophir Gold Project (BOGP) due to its local proximity and potential effects in the region. Those branches are:
    - Southland (based mainly in Invercargill)
    - South Otago (based mainly in Owaka/Papatowai)
    - Dunedin (based in Dunedin)
    - Central Lakes (based mainly in Wanaka)
    - Waitaki (based in Ōamaru)

5. Our branches are concerned with the environmental effects of the application, particularly those on terrestrial invertebrates (primarily lepidoptera, orthoptera and coleoptera), herpetofauna and avifauna. They are also concerned with the overstated economic benefit, the offsetting and compensation package, long term maintenance of the tailings dam, including once the mine has reached end of life, and the risk of a catastrophic failure of the tailings dam.

Lepidoptera comments

6. To understand the effect of the project on lepidoptera, I consulted with ecologist, entomologist and renowned lepidoptera expert Brian Patrick. Brian has published 340 scientific and popular articles, most on lepidoptera (moths and butterflies), and contributed to 18 published books.

7. Brian considered that the Alliance Ecology Ltd Assessment of Ecological Effects: Terrestrial Ecology and the Habitat NZ Ltd Terrestrial Invertebrate Survey are well done overall.

8. Brian identified two important references which were left out of the reports and should have been included in the literature review/s:

    - Patrick, B.H. 1989. The Lepidoptera of Central Otago salt-pans. Dept of Conservation, Dunedin; and
    - Peat, N; Patrick, B (1999) Wild Central - Discovering the Natural History of Central Otago[1]

9. Brian also wondered why the Tūhura Otago Museum collection was not considered as an important resource for information on lepidoptera, given it is the largest collection of lepidoptera in the country.

10. Given Brian's extensive knowledge and experience of New Zealand lepidoptera, especially in Central Otago, he has the following recommendations to lessen effects on moths, in particular *Sporophyla oenospora*:

    - Total avoidance of:
        - any natural salt pans; and
        - olearia shrubland; and

[1] Peat, N; Patrick, B (1999) Wild Central - Discovering the Natural History of Central Otago https://oup.nz/library/wild-central-2/

- large schist tors.

11. Brian stated that the avoidance areas would need buffer zones (approximately 50 metres) and stressed that this avoidance is much more important to lessen effects on lepidoptera than anything planting and revegetation would achieve.

Avifauna comments

12. The avifauna potentially affected by the BOGP includes 18 taonga species, as recognised under the Ngāi Tahu Claims Settlement Act 1998, including several classified as nationally threatened or at-risk[2]:

- Kārearea/NZ falcon
- Mātātā/South Island fernbird
- Pihoihoi/NZ pipit
- Māpunga/Black shag
- Miromiro/Tomtit,
- Kawau paka/Little shag
- Tarapiroe/Black-billed gull
- Kāhu/Australasian harrier
- Kuruwhengi/Australasian shoveler
- Korimako/Bellbird
- Riroriro/Grey warbler
- Tētē-moroiti/Grey teal
- Piwakawaka/Fantail
- Pūtangitangi/Paradise shelduck
- Poaka/Pied stilt
- Kōtare/Kingfisher
- Karoro/Southern black-backed gull
- Matuku moana/White-faced heron

13. To understand the effects of the project on avifauna, I consulted with Francesca Cunninghame, ornithologist and Forest & Bird's Otago Projects Manager. Francesca has extensive knowledge and experience on New Zealand avifauna and has authored or co-authored numerous academic papers on the subject.

14. Francesca considered that the RMA Ecology Ltd Avifauna Values Assessment has been conducted and completed to a good level of thoroughness, noting that the authors recognise where most of the limitations are.

15. Francesca felt that the authors accurately presented both the species and their status/values and considered it appropriate that they went with the highest threat ranking

[2] New Zaland Legislation (1998) Ngāi Tahu Claims Settlement Act 1998 https://www.legislation.govt.nz/act/public/1998/97/en/latest/

from either national or regional criteria to assess value and the likely impacts, including at the local level.

16. Francesca is concerned about the effects on the avifauna on site, both in the direct disturbance zone and surrounding areas, that may be killed or displaced and the number that will have their home ranges, including nesting areas, totally destroyed. Even though the native species which will be affected are present in low numbers, or not of an alarming threat status, cumulative effects on these species should be considered including those from increased fragmentation of their natural habitat and nesting areas by developments both already occurred or proposed across the region and more specifically in the Mata-Au Clutha catchment area. These are developments which involve native vegetation clearance and landscape modification as well as other large-scale proposed projects like the Hawkeswood Mining expansion at Miller's Flat and the Clutha Pumped Hydro project at Lake Onslow.

17. Francesca identified that the authors missed out potential impacts for two species which were not considered in the report:

    - Matuku-hūrepo Australasian Bittern (Nationally Critical) – this species could be impacted as while they were not detected in any of the surveys and the habitat there is not suitable, they are recognised Highly Mobile Fauna[3] and there are records of them in wetlands surrounding the Bendigo area (Maniototo, Whakatipu, Wānaka) and therefore may use the area to move through, this is often done at night. The report[4] notes Bendigo Wetland and that threatened wetland birds are highly mobile, but there was no specific mention of bittern.

    - Tōrea South Island Pied Oystercatcher (declining) – another species of Highly Mobile Fauna[3] which radio tracking studies have shown move through after dark and furthermore recognise that flyways for such species, especially between breeding and nonbreeding populations, are poorly known[5]. The authors did not attempt in their surveying to determine nocturnal movements of avifauna. Therefore, the statement that

[3] Ministry for the Environment, National Policy Statement for Indigenous Biodiversity (2023) Appendix 2: Specified highly mobile fauna, pp 38-40
[4] RMA Ecology Ltd (2025) Avifauna Values Assessment. p. 49: https://www.fasttrack.govt.nz/__data/assets/pdf_file/0023/15539/3ae57c4f0beb2db9e0c4f53affc693f118c2fc26.pdf
[5] Schlesselmann, Ann-Kathrin V., et al. (2024) Conservation Challenges in Mobile Birds: What Do We Know and Need to Know for Effective Conservation of Endemic Inland Migrants? *New Zealand Journal of Ecology*, vol. 48, no. 1, 2024, pp. 1–15. *JSTOR*, https://www.jstor.org/stable/48807028. Accessed 30 Mar. 2026.

the project area is not a well-used flying route for birds cannot be relied on and a more cautious approach should be taken when drawing conclusions here.

Herpetological comments

18. Forest & Bird have engaged a herpetologist, Samuel Purdie, to provide expert evidence, which will be provided to the Expert Panel together with these comments.

19. Otago is home to 31 lizard species, making it a diverse region for lizards in Aotearoa New Zealand[6]. Some of these species are Nationally Critically Endangered and highly specialised. Our branches, particularly Central Lakes branch, are highly concerned about effects on lizards from developments and projects such as BOGP, especially given how threatened many reptile species are in New Zealand.[7]

20. BOGP involves disturbance of habitat and the probable death and displacement of an astoundingly large number of lizards, approximately 500,000 - 750,000 individuals[8]. Despite the species found on site not being critically threatened or endangered, the sheer scale of effect on so many native species is unprecedented, and the Wildlife Act approval will permit an unprecedented number of lizards to be disturbed or killed on a single development project in New Zealand (to my knowledge). In addition to this, an estimated 7% of Kawarau Gecko habitat nationally (and globally) will be permanently lost and as stated by Dr. Mandy Tocher 'a loss of this scale is likely to influence extinction risk and long-term population viability[8].

21. If this were any other type of native species, such as a species of bird with the same At Risk – Declining status (Fiordland crested penguin/tawaki, banded dotterel, North island fernbird, yellow-crowned parakeet/kakariki, yellowhead/mohua as examples), then it is doubtful that this scale of destruction/fragmentation of habitat, disturbance and probable death of individuals would be permitted.

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[6] Otago Regional Council (2025) Reptiles of Otago https://www.orc.govt.nz/environment/biodiversity/otagos-species/reptiles/

[7] 94 percent of reptile species (116 of 124) are categorised as threatened with extinction or are at risk of becoming threatened. Stats NZ Tatauranga Aotearoa (2023) Extinction threat to indigenous species https://www.stats.govt.nz/indicators/extinction-threat-to-indigenous-species/

[8] Department of Conservation (2026) Statement of advice, Dr Mandy D Tocher, Technical Advisor Herpetofauna https://www.fasttrack.govt.nz/__data/assets/pdf_file/0016/22921/Appendix-C-Expert-Statement-Lizards-BOGP-Dr-M-Tocher.pdf

22. Due to the Lizard Management Plan being fully redacted from the application documents, it is impossible to comment on whether the proposed monitoring and management of lizards is appropriate.

Terrestrial flora comments

23. The BOGP as proposed would result in severe, permanent and irreversible loss of ecologically significant dryland ecosystems, primarily through the loss of large numbers of Nationally and Regionally Threatened and At-Risk plant species[9].

24. The BOGP site includes the largest known population of Threatened - Nationally Critical *Ceratocephala pungens,* one of only three species of annual herbs in New Zealand. This species is a rare example of an annual species which unlike other flora, completes a life history from seed to seed during a favourable season of the year, a special feature developed in adaptation to the seasonally dry environments of eastern New Zealand[10]. The BOGP site is the national stronghold for this species, and loss of this area puts the species at high risk of extinction[11].

25. As confirmed by DOC in their s51 report[10], the actual extent of native vegetation loss in general is unknown due to insufficient data provided, and the proposed effects management does little to adequately address the loss of these highly significant biodiversity values.

Tailings dam failure

26. As previously stated, our local branches and members are concerned about the devastating environmental effects of a potential tailings dam failure.

27. Major recent incidents include the 2014 Mount Polley breach in Canada and the 2019 Brumadinho disaster (at the Córrego do Feijão Mine) in Brazil.

28. Despite best efforts in maintenance and monitoring, there is still a risk of a catastrophic tailings dam failure, especially from uncontrollable events such as Seismic activity and extreme weather.

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[9] Department of Conservation (2026) Fast-track Approvals Act Conservation covenant report (p4): https://www.fasttrack.govt.nz/__data/assets/pdf_file/0017/22850/DOC-s512b-report-conservation-covenant-BOGP.pdf

[10] Rogers, G *et al.* (2002) Ecology and conservation status of three "spring annual" herbs in dryland ecosystems of New Zealand. New Zealand Journal of Botany, 2002, Vol. 40: 649-669

[11] Department of Conservation (2026) Fast-track Approvals Act Conservation covenant report https://www.fasttrack.govt.nz/__data/assets/pdf_file/0017/22850/DOC-s512b-report-conservation-covenant-BOGP.pdf

29. The 2019 dam failure of the Córrego do Feijão Mine in Brazil, killed at least 278 people. In addition, large extensions of aquatic and terrestrial ecosystems were destroyed, directly compromising the environmental and socioeconomic quality of the region. The failure also resulted in soil enrichment of cadmium (Cd), arsenic (As), mercury (Hg), copper (Cu), lead (Pb) and nickel (Ni). Over time, the persistence, reactivity and bioaccumulation of metals (predominant components in mining tailings) in the terrestrial environment result in ecotoxic effects on flora, fauna and human life, leading to physiological and metabolic stress, as well as imbalances in biodiversity and the performance of its functions within ecosystems. Even after five years post the CFM dam failure, intensive changes caused in the soil properties still remain unchanged, and natural attenuation has not been evidenced in the investigated areas[12].

30. Failure of the tailings dam with environmental, social and financial implications have not appropriately accounted for or formed part of the Economic Impact Assessment.

31. Tailings dams are indefinite pieces of infrastructure which exist forever, not just for the life of the mine.

32. According to the application documents, the tailings dam will adopt a conventional wet slurry impoundment approach, which has been identified as the highest-risk form of tailings storage in terms of failure mechanisms, including liquefaction, overtopping and long-term instability. There is a well-documented global history of the selected type of storage facility failing, with significant environmental and human consequences.

33. Although a tailings dam failure is a worst-case-scenario event, due to the risk not being able to be fully controlled (with elimination of risk not possible), the panel needs to consider failure (either when the mine is operational or post-activity for perpetuity) as part of their decision on the BOGP. The panel must also recognise the applicant's failure to address and account for this risk.

Economic comments

34. In conjunction with Sustainable Tarras, Forest & Bird has provided expert economics evidence prepared by Dr Richard Meade.

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[12] Buch, Andressa Cristhy *et al.* (2024) Assessment of environmental pollution and human health risks of mine tailings in soil: after dam failure of the Córrego do Feijão Mine (in Brumadinho, Brazil). *Environmental Geochemistry & Health, Mar 2024, Environment Complete*

35. Dr Meade drew several conclusions as part of his evidence, decreasing the economic impact of the BOGP from what has been stated by the Applicants economic impact report. This included not accounting for the fact that 60% of the Applicants are not New Zealanders, so shareholder-related project impacts should only be counted for the Applicant's 40% New Zealand shareholders, mischaracterising project costs as benefits and using multipliers that are widely recognised as overly-inflating claimed impacts, not quantifying or accounting for economic disbenefits of the project and not accounting for loss of residual effects on indigenous biodiversity, landscape values and so on. It is Dr Meades expert opinion that economic benefits are overstated, disbenefits are not accounted for, benefits are immaterial at national level (and modest at regional Otago level) and more. Dr Meade also mentions that a Cost-Benefit Analysis should have been undertaken rather than an Economic Impact Assessment.

36. The market for gold is volatile. If and when the mine experiences low gold markets which make it unprofitable, the returns to government will not be a stable revenue stream and will almost certainly be significantly less and delivered in a fluctuating fashion over those fourteen years. Dr Meade also mentioned this in his evidence and stated that it is implausible to expect that record high gold prices will continue for each and every year of the Project's 16-year life.

37. OceanaGold's Macraes mine, located not too far from the BOGP and the largest gold producer in the country, paid no corporate income tax in 2021 or 2023 on gold production worth hundreds of millions of dollars, thus proving that mineral resource companies cannot be regarded as stable sources of government revenue[13].

38. The overall benefits in the economic impact report[14] are almost certainly overstated, and the author acknowledges this, saying that the extent of the local benefits depends a lot on the development of local suppliers and so on, continuing that the 'theoretical maximum' indirect multiplier effects are dependent on 'downstream investment to lift capacity within other industries' (p.15). This reliance on other industries brings to light that there are several

[13] Banks, G (2025) The hard questions NZ must ask about the claimed economic benefits of fast-track mining projects - Opinion https://www.nzherald.co.nz/nz/the-hard-questions-nz-must-ask-about-the-claimed-economic-benefits-of-fast-track-mining-projects-opinion/6ZME6F5XR5E3FHK6AVHIEFAGVA/

[14] Benje Patterson (2025) Economic impacts of the Bendigo-Ophir Gold Project – October 2025 update https://www.fasttrack.govt.nz/__data/assets/pdf_file/0017/15551/B.01-Benje-Patterson-People-and-Places-Economic-Impacts-of-the-Bendigo-Ophir-Gold-Project-Benje-Patterson-2025.pdf

unknowns and assumptions of the economic benefit of this project, which cannot be relied upon to deliver the impact that will counteract the environmental effects of the mine.

39. The economic and anthropogenic value of ecosystems and ecosystem services has not been considered in this application. Globally, there is a declining capacity to provide ecosystem services as natural capital continues to be degraded and exploited at unsustainable rates[15]. The supply of ecosystem services are biophysical conditions and processes derived from natural capital to generate a benefit for society, irrespective of being realised or used by society[16]. Considering the significant loss of biomass due to the BOGP, it is assumed that there will be an equally as significant loss in ecosystem services, the economic value of which has not been considered in the application.

Conclusion

40. In conclusion, the extremely significant and inevitable effects on flora, fauna and habitat of this project have not been shown to be outweighed by its potential economic benefits. Although the applicant's proposals go some way to compensating and offsetting these effects, there would still remain a substantial loss of native species which is unaccounted for and will result in a net loss, potentially of hundreds of thousands of individuals and nationally/globally important habitat.

41. A catastrophic infrastructure failure at the mine, of the tailings dam in particular, is still a possibility, and that risk has not been accounted for. In fact, the Applicant has increased the risk by choosing the highest-risk form of tailings storage.

42. There are also significant gaps in information which have not allowed full assessment of the effects on native biodiversity, such as the lack of nocturnal avifauna monitoring, insufficient data on native vegetation loss, inadequate economic assessment where the status-quo of existing industry is not taken into account, the lack of identification of the volatility of the sector meaning income could be significantly reduced (or not realised at all) in some years and so on.

Thank you for the opportunity to comment on this project. I am happy to discuss this non-expert evidence and any points within it if required.

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[15] Brander, L.M. *et al.* (2024) Economic values for ecosystem services: A global synthesis and way forward https://www.sciencedirect.com/science/article/pii/S2212041624000123

[16] Boldy, R *et al*. (2021) Understanding the impacts of mining on ecosystem services through a systematic review

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