

Implementing the IUCN RHINO approach at Boddington mine, Western Australia



About the IUCN RHINO approach

The IUCN RHINO approach is an implementation-ready framework for companies, governments, and civil society to deliver Rapid, High-Integrity Nature-positive Outcomes (RHINO). It guides organisations on what to do, where to act, and how to measure progress, contributing to the Kunming-Montreal Global Biodiversity Framework and the UN Sustainable Development Goals. Organisations can apply it through three tracks – Direct Impact, Value Chain Impact, and Investor Impact – depending on their interface with nature.

IUCN RHINO's core metric, aligned with the Taskforce on Nature-related Financial Disclosures (TNFD) and Nature Positive Initiative guidelines, is the Species Threat Abatement and Restoration metric (STAR), derived from the IUCN Red List of Threatened Species™.

STAR quantifies how conservation actions could reduce global species extinction risk through two components: threat abatement ($STAR_T$) and restoration ($STAR_R$), both spatially explicit and aggregable across sites, portfolios, and jurisdictions, to support consistent planning and monitoring. IUCN RHINO pilots currently focus on $STAR_T$, as reducing threats where biodiversity persists is the most effective way to prevent further loss.

$STAR_T$ is calculated for threatened and Near Threatened species, weighting each species' Area of Habitat in the assessed area by its extinction risk category. The score is broken down by threat, showing which pressures drive extinction risk so interventions can be prioritised where they matter most. $STAR_T$ can then be used to set targets for conservation action, and measure progress towards these targets.



Background, objectives and implementation of the pilot

Since 2014, Newmont has committed to integrate biodiversity and ecosystem considerations into its global mining business. Their Biodiversity Management Standard outlines the company's approach to managing and mitigating biodiversity risks, achieving No Net Loss and providing net gain, when possible, of Key Biodiversity Values in all new projects and expansions.

Newmont and IUCN are collaborating to build on lessons from a series of biodiversity net gain (BNG) reviews¹, implemented across four Newmont operation sites between 2018 and 2024, to refine Newmont's nature strategy. This work further aims to align Newmont's biodiversity management with emerging global frameworks for biodiversity net gain and Nature Positive.

In this context, Newmont and IUCN decided to complement the activities of a BNG follow-up review at Newmont Boddington mine, Western Australia, with the pilot test of the IUCN RHINO approach. The aim was to explore how STAR_T could help identify and refine tangible biodiversity outcomes that are consistent with measurable No Net Loss or net gain, and nature positive contributions. The pilot testing took place over a seven-month period between May and November 2025, while the independent site review took place in July with the support of a team of experts. It involved participation from Newmont's Head of Biodiversity and Climate, site-based environment managers and teams, and IUCN technical input.

Implementing IUCN RHINO's Direct Impact Track

A1. Locate

The Locate phase pinpoints where an organisation's operations intersect with areas of biodiversity importance, helping to establish priorities for further assessment and action. For this pilot, the phase focused on bringing together spatial information and local knowledge to better understand biodiversity priorities around Newmont's Boddington site.

Screen and prioritise location

Boddington was selected as a pilot site because it had previously undergone an IUCN Biodiversity Net Gain Review, including a site visit and recommendations, and because the area is characterised by high endemism and significant biodiversity risks and opportunities. This was further supported by STAR_T analysis indicating a high prevalence of threatened species within the Area of Influence.

Gather location information and data

Newmont Boddington is a gold and copper mine located about 140 km southeast of Perth and 13 km northwest of the town of Boddington, in Western Australia. The operation includes two open pits, waste rock dumps, tailings facilities, and supporting infrastructure such as water reservoirs and an on-site village for mine personnel.

As part of the 2025 BNG review, Newmont documentation was reviewed alongside relevant policy, legislative and industry guidance. Two Western Australian Biodiversity Science Institute (WABSI) reports were particularly valuable in understanding the site context and conservation priorities within the Northern Jarrah Forest.

The mine sits within the Northern Jarrah Forest, part of the globally significant forests and woodlands of southwest Western Australia, which is a recognised centre of high endemism within the Southwest Australia biodiversity hotspot.

¹ On the methodology, see [IUCN review protocol for biodiversity net gain - resource 1](#). About BNG reviews implemented with Newmont, see links for [Nevada operations \(USA\)](#) in 2018, [Boddington \(Western Australia\)](#) in 2019, [Akyem \(Ghana\)](#) in 2022, and [Merian](#) (Suriname) in 2024.



Dominated by jarrah (*Eucalyptus marginata*) and associated forest types on laterite gravels, this ecosystem supports a rich diversity of specialised flora and fauna, including three species of black-cockatoo, and marsupials such as the Numbat (*Myrmecobius fasciatus*), Chuditch (*western quoll*, *Dasyurus geoffroii*), Phascogale (Brush-tailed Phascogale, *Phascogale tapoatafa*) and Woylie (Brush-tailed Bettong, *Bettongia penicillata*).

Map stakeholders at the landscape level

Newmont engages with a wide range of stakeholders across the Northern Jarrah Forest. The landscape is shaped by multiple land uses. These include mining, such as bauxite operations with concessions surrounding Newmont Boddington, as well as agriculture and forestry, all of which place pressure on sensitive, globally significant biodiversity. STAR₊ analysis has elucidated the extent to which these sectors affect biodiversity (see section A2).

State and Federal governments are also key stakeholders as regulators of land use and natural resource protection, including the Department of Biodiversity, Conservation and Attractions (DBCA), which manages the significant area of State Forest in the region.

Traditional Owners and their Corporations, the Gnaala Karla Booja (GKB) Aboriginal Corporation, the Ballardong

Aboriginal Corporation and Whadjuk Aboriginal Corporation, manage cultural land and heritage, engaging in consultation regarding land access and environmental management within the Noongar Nation territory. These Corporations ensure that the cultural, social, and economic interests of the Noongar people are represented in the management of the forest ecosystem and crown land.

Define the Area of Influence

The 'Area of Influence' refers to the geographic area where impacts to ecosystems and threatened species are most likely to occur due to a site's activities and associated facilities. It may encompass zones of direct, indirect, and cumulative effects. For the purposes of IUCN RHINO, it also defines the area within which meaningful and accountable actions can be planned, helping to ensure that interventions are targeted, proportionate and ecologically relevant.

The project team agreed that the area of influence of the Newmont Boddington mine should be identified as Newmont's legal tenure under the Mining Act, which covers 1,429 km². This enabled a focal area of sufficient scale to enable potential nature positive opportunities to be identified, whilst avoiding areas managed by neighbouring mining companies, where such opportunities would be harder to realise (Figure 1).



Figure 1: Map of the Area of Influence of Newmont Boddington operations.



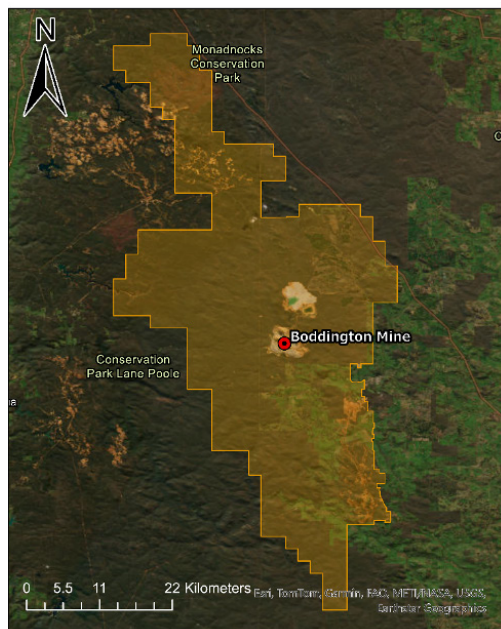


Figure 2: Zoom on the Area of Influence of Newmont Boddington operations.

Compile preliminary threatened species and associated threat data

An *IBAT Species Report* (estimated $STAR_T$) was generated for the area of influence. This provided an initial screening of globally threatened species potentially occurring in the area, the threats associated with those species, and their relative contribution to the estimated $STAR_T$ value.

The report identified 16 globally threatened species and calculated an initial estimated $STAR_T$ value of 3,545 centi-STAR for the area. The scaled unit, centi-STAR, is calculated by multiplying the $STAR_T$ value by 100, allowing results to be presented as more readily interpretable whole numbers. The value provides a numerical indication of the relative extinction-risk significance of the globally threatened species occurring within the area, based on their threat status and the proportion of their global ranges overlapping the area.

This value is not a measure of the mine's current biodiversity performance, nor can it be interpreted in isolation as indicating that the operation has a comparatively high or low biodiversity impact. Estimated $STAR_T$ values are influenced by factors including the size of the area of influence, the threatened species potentially present, their extinction-risk status, the proportion of their global ranges overlapping the area, and the threats attributed to them. The preliminary results were therefore

used as a screening tool to identify species and threats requiring further validation and to support subsequent prioritisation of potential management actions.

Relationship with national and state conservation priorities

The preliminary $STAR_T$ analysis draws on the global IUCN Red List of Threatened Species™ and is designed to identify opportunities to contribute to reducing global species-extinction risk. Consequently, the species included and their relative weighting may differ from priorities established under Australian Government or Western Australian threatened-species legislation. For example, the Forest Red-tailed Black-cockatoo (*Calyptorhynchus banksii naso*, a subspecies of the Red-tailed Black-cockatoo) is listed as Vulnerable under Australian and Western Australian frameworks but is assessed as Least Concern globally and therefore is out of scope for STAR.

These differences do not mean that nationally or regionally important species should be excluded from site biodiversity management. Rather, STAR and IUCN RHINO provide a global-priority lens that should be applied alongside statutory obligations, local ecological evidence and the mine's Biodiversity Management Plan or Biodiversity Action Plan. Species of high local, state or national importance may therefore warrant management action even where they do not emerge as the highest priorities through STAR.

The initial STAR results also require validation against site-specific information. A species' modelled range overlap with the area of influence indicates its potential presence but does not, by itself, confirm how the area is used for breeding, feeding or roosting. For example, although the mapped range of Baudin's Black-Cockatoo (*Zanda baudinii*) overlaps the broader Boddington area, the recommendation concerning breeding-habitat action should be reviewed against local survey records and expert knowledge.



A2. Evaluate

During the A2 phase of the IUCN RHINO approach, the project team validated and revised the occurrence of species and the presence of associated threats within the Area of Influence. This assessment drew on existing site data and studies of mammals, birds and flora, including fauna trapping, camera surveys and flora inventories, supplemented by expert knowledge. No additional field data were collected.

A calibrated STAR_T score was then calculated to provide a more accurate baseline estimate of the potential contribution that threat-abatement actions within the area could make to reducing global species-extinction risk.

Confirm species

The species in the *IBAT Species report* presenting estimated STAR_T scores were compared against Newmont's existing surveys and expert knowledge. As a result, five of the sixteen species identified in this report were confirmed to be present in the area and included in the STAR_T calibration: three mammals with status Vulnerable (VU, one species), and Near Threatened (NT, two species); and two birds, one with the Critically Endangered status (CR) and one with the Endangered status (EN).

Newmont also confirmed the presence of Numbat (*Myrmecobius fasciatus*, NT) and Red-tailed Phascogale (*Phascogale calura*, NT), which had not been identified

in the screening and were therefore added to the STAR_T calibration. For these species, IUCN and Newmont teams worked together to refine each species' area of habitat, improving the spatial accuracy of the calibrated results.

Confirm threats

During an internal workshop, the team assessed the scope and severity of each threat using available academic evidence – including WABSI 2025 report 'Identifying Gaps in Knowledge, Management and Conservation in the Northern Jarrah Forest' – and local expert knowledge.

Scope refers to the proportion of the species' population within the area that is affected, or is expected to be affected, by the threat. Severity refers to the expected decline in the part of the population affected by a threat over 10 years or three generations, whichever is longer. It was assessed using structured expert judgement, informed by available evidence and local knowledge, and assigned to one of six qualitative categories.

Scope and severity were then combined, following the approach described by Mair et al. (2021)², to estimate the percentage population decline attributable to each threat, as illustrated in Table 1. This was the most labour-intensive part of the calibration, but it was also critical because it provided a more locally grounded understanding of the relative importance of different threats and helped identify priorities for management action.

The Newmont team reviewed the threats associated with each confirmed species in the IBAT Species Report and assessed whether they were present in the area. Threats were classified using Level 2 of the IUCN-CMP [Threats Classification Scheme](#).

		Severity					
		Very rapid declines	Rapid declines	Slow, significant declines	Negligible declines	No decline	Causing/ could cause fluctuations
Scope	Whole (>90%)	63	24	10	1	0	10
	Majority (50-90%)	52	18	9	0	0	9
	Minority (<50%)	24	7	5	0	0	5

Table 1: Translating population decline into numeric percentage (based on Mair et al. 2021)

² Mair L. et al (2021) A metric for spatially explicit contributions to science-based species targets, *Nature Ecology and Evolution* (Vol 5, pp 836-844)



Calculate first version of baseline

In total, the final calibrated STAR_T score amounts to 8,825.7 centi-STAR, about 2.5 times the estimated value of 3,545 centi-STAR.

This difference comes from replacing global modelled assumptions with site-level data on species occurrence, habitat distribution and threat intensity, and does not reflect any change in biodiversity condition or in the mine's impacts.

The calibrated value was higher partly because some threats were assessed as more intense locally than indicated by the global average assumptions used in the estimated STAR_T results.

It was also influenced by the inclusion and refinement of species with restricted global ranges and relatively small populations that were not identified in the Estimated STAR_T results. For example, approximately 11% of the Numbat's area of habitat was identified within the area. As a result, the Numbat accounted for more than 20% of the calibrated STAR_T value. Table 2 presents the calibrated STAR_T results for the confirmed species.

Three species account for more than 80% of the calibrated STAR_T score: The Baudin's Black-cockatoo (44%), the Numbat (21%) and the Carnaby's Black-cockatoo (16%), indicating that they should be prioritised for threat abatement and conservation action.

Common Name	Scientific Name	Taxonomic group	IUCN Red List status	Global AOH (km ²)	% AOH within area	STAR _T score (centi-STAR)	% STAR _T score
Baudin's Black-cockatoo	<i>Zanda baudinii</i>	Bird	CR	28,360.82	4.5%	3,849.5	44%
Numbat	<i>Myrmecobius fasciatus</i>	Mammal	NT	1,535.11	11.1%	1,895.8	21%
Carnaby's Black-cockatoo	<i>Zanda latirostris</i>	Bird	EN	59,229.57	2.3%	1,453.7	16%
Quokka	<i>Setonix brachyurus</i>	Mammal	VU	15,284.59	1.7%	593.6	7%
Red-tailed Phascogale	<i>Phascogale calura</i>	Mammal	NT	6,649.81	2.8%	478.6	5%
Chuditch	<i>Dasyurus geoffroyi</i>	Mammal	NT	62,558.13	2.2%	419.6	5%
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	Mammal	NT	172,015.56	0.8%	134.9	2%

Table 2: Calibration results by species. The STAR methodology can be found in Mair et al. (2021). AOH stands for Area of Habitat



A3. Assess

Through this phase of RHINO, a company will identify the threats that are most important to mitigate and consult with stakeholders to refine the analysis. This informs where to begin prioritising action, targeting the threats that are most important to prioritise for abatement.

Assess most important threats

The top three threats contributing the most to the calibrated STAR_T score were livestock farming and ranching (15%), annual and perennial non-timber crops (13%), mining and quarrying (11%), and reflect the most important human activities in the area. While individually less significant, the remaining threats also have an important cumulative impact.

Figure 3 shows the main threats.

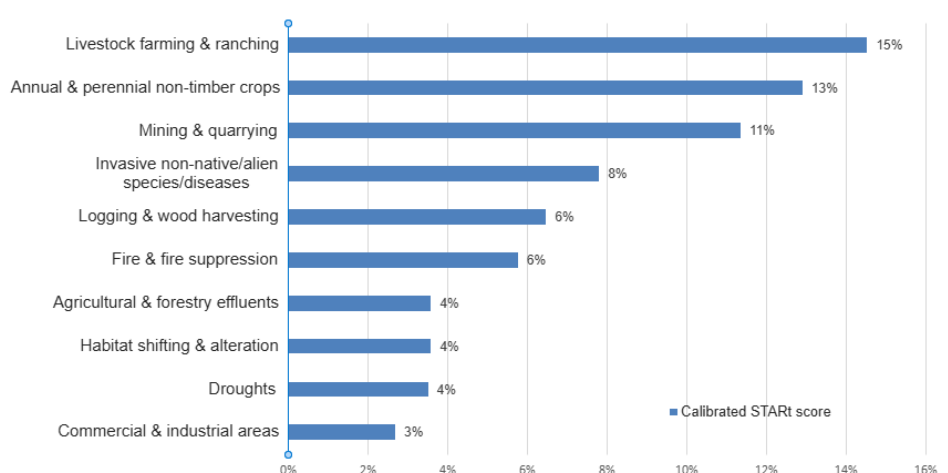


Figure 3: Ranking of the main drivers of species extinction risk in the area of influence (calibrated STAR_T values)

The ranking differs slightly by taxonomic group. For mammals, mining and quarrying is the main threat (24% of the STAR_T score), followed by invasive non-native species and diseases (10%) and livestock farming and ranching (8%). Introduced predators such as cats and foxes are known to eliminate Australian mammal populations within months to years.

For birds, mining and quarrying represents only 3% of the score. Livestock farming and ranching and annual and perennial non-timber crops each contribute 19%, followed by logging and wood harvesting (9%). The different threat profiles of mammals and birds suggest that management actions should be tailored to each group.



The 2025 assessment of the recommendations made to Newmont during the 2019 BNG review identified several priorities that can contribute to reducing identified threats and improve species survival. Among others:

- *'Design and delivery of offsets that deliver absolute gains wherever possible'* directly addresses mining and quarrying identified as the main threat to threatened species in the STAR_T analysis. Ecological restoration is a central component of Newmont's strategy to achieve No Net Loss, helping to compensate for the residual impacts associated with the clearance of native vegetation at Boddington mine.
- Restoration is a fundamental prerequisite to any nature positive contribution and absolute gains are key to achieving recovery of the threatened species identified. However, as restoration takes time, specific measures could be taken to reduce the species extinction risk identified with STAR_T. These include installing artificial breeding hollows for black-cockatoo species that breed in the area, such as Carnaby's Black-cockatoo, where the availability of nesting sites limits recovery.
- *'Building new and strengthening existing partnerships and collaborations focussed on achieving landscape-wide biodiversity outcomes in the Northern Jarrah Forest'*: Partnerships would be essential in addressing threats related to livestock farming and agricultural exploitation, as well as the problem of invasive alien species, which Newmont cannot easily tackle on its own.

Therefore, the design of the action plan to achieve No Net Loss can be refined using insights gained from the STAR_T assessment, resulting in a plan aligned with a No Net Loss/Net Gain objective that can deliver potential nature positive contributions.

Socialise results

The IUCN RHINO approach recommends socialising results of the STAR_T calibration to discuss results and share a common understanding of the key threats to reduce the species extinction risk. Workshops with stakeholders are also an opportunity to ensure alignment in terms of priority for the State and to identify partners to implement targeted action.

Enhanced engagement with stakeholders, building on the stakeholder outreach already being done by Newmont, could result in refinement to the calculation of calibrated STAR_T to include the perspectives of other stakeholders: this could lead to an improved baseline in response to new data and insights, which is the last step of the IUCN RHINO 'Assess' phase.



A4. Prepare

The IUCN RHINO approach suggests that, once results are available, organisations share them with relevant stakeholders and use the priority threats identified to develop or refine their nature action plan, translating them into clear, practical actions and measurable targets. For each priority action, responsibilities would need to be clearly assigned, and delivery could involve a range of partners and stakeholders, depending on the actions identified. This collaborative process could help refine the actions required and support credible nature-positive contributions alongside Newmont's no-net-loss commitments.

Subject to further evaluation and applicable internal approvals, Newmont may consider sharing results with stakeholders of the area and refining its nature action plan under the Prepare phase.

This case study reflects IUCN's assessment, prepared using its methodologies and frameworks; the findings and conclusions are those of IUCN. References to potential future actions, plans or outcomes are for information only and are not commitments, guarantees or representations by Newmont. Any future action remains subject to Newmont's further evaluation, applicable approvals and decision-making processes.

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Picture credit: Tessa Purcell, Newmont
(Red-tailed Black-cockatoo)

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