This annual report covers the period February 2019 – February 2020.

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Photo: Front cover, echidna engraving
Inside cover, turtle engraving
Back cover, engraving of two marine species

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2019 Annual report on the implementation of the strategy

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1. Background

1.1 The petroglyphs of Murujuga

The Dampier Archipelago, including the Burrup Peninsula and surrounds, is traditionally referred to as Murujuga and is in the Pilbara region of Western Australia. Murujuga, meaning ‘hip bone sticking out’ in the Ngarluma-Yaburara language, refers to both Land and Sea Country and consists of a narrow peninsula of land and 42 coastal islands, islets and rocks and the surrounding sea up to 40 km from the port of Dampier.

Murujuga is home to one of the largest, densest and most diverse collections of petroglyphs (rock art) in the world. It is estimated to contain more than one million images, which provide an archaeological record of traditional use of the area over thousands of years. The engravings show human images and extinct animal species such as megafauna and thylacines (Tasmanian tiger), as well as existing birds, and marine and land animals. The area also features middens, fish traps, rock shelters, ceremonial places and stone arrangements. The rock art

Photo: Turtle with eggs engraving
The Government of Western Australia is committed to protecting the rock art of Murujuga. It considers that the unique Aboriginal cultural and heritage values of Murujuga can continue to coexist with well-regulated industry and new economic opportunities that deliver benefits to the local community. Industry is required to apply best-practice emission standards and technologies consistent with approvals under the EP Act.

The expanding tourism industry also provides important local employment and economic opportunities. The Murujuga Aboriginal Corporation (MAC), which represents the Traditional Custodians of Murujuga, is proposing to develop the Murujuga Living Knowledge Centre. This state-of-the-art interpretative centre will showcase Murujuga’s rich culture and history. The Living Knowledge Centre will be the centrepiece of the proposed Conzinc Bay Tourism Precinct.
1.2 Development of the Murujuga Rock Art Strategy

In September 2017, the State Government released the draft Burrup Rock Art Strategy for public consultation. Consultation closed in December 2017 and 18 submissions were received.

A number of submissions suggested that consultation on the draft strategy should await the outcome of the Australian Senate Environment and Communications References Committee’s inquiry into the protection of Aboriginal rock art of the Burrup Peninsula. The Senate Committee’s report was released on 21 March 2018.

In March 2018, the consultation period for the draft strategy was extended for a further two months to provide an opportunity for stakeholders to respond to the Senate Committee’s report. The extended consultation period closed in May 2018 and an additional nine submissions were received.

The strategy was finalised considering the issues identified in the submissions on the draft strategy and in consultation with the Murujuga Rock Art Stakeholder Reference Group (Section 1.6).

The Murujuga Rock Art Strategy was released on 15 February 2019.
1.3 Murujuga Rock Art Strategy

The purpose of the Murujuga Rock Art Strategy is to protect the Aboriginal rock art on Murujuga from the potential impacts of anthropogenic (caused by humans) emissions. The strategy establishes the framework for long-term monitoring and analysis of changes to the rock art to determine whether the rock art is subject to accelerated change. The framework provides a transparent, risk-based and adaptive approach for the management of impacts to the rock art that is consistent with the State Government’s responsibilities under the EP Act.

The scope of the strategy is to:

♦ establish an Environmental Quality Management Framework, including the derivation and implementation of environmental quality criteria

♦ establish governance arrangements to ensure that:
   ◊ monitoring, analysis and reporting are undertaken in such a way as to provide confidence to the Traditional Owners, the community, industry, scientists and other stakeholders about the integrity, robustness, repeatability and reliability of the monitoring data and results
   ◊ government is provided with accurate and appropriate recommendations regarding the protection of the rock art, consistent with legislative responsibilities

♦ develop and implement a communication strategy in consultation with stakeholders (Section 1.5).

Five-yearly reviews of the strategy, or earlier as determined by the Minister for Environment, will ensure that the strategy remains relevant, supports appropriate governance procedures, and reflects the best available scientific knowledge and management practices applicable to protecting the rock art on Murujuga.

1 Scientifically based limits of ‘acceptable’ change.
1.4 Strategy implementation

The State Government is partnering with MAC to oversee the implementation of the Murujuga Rock Art Strategy (Section 2.1). The Department of Water and Environmental Regulation (DWER) has primary responsibility for the day-to-day implementation of the strategy.

DWER and MAC are working in partnership to oversee the development and implementation of a scientific monitoring and analysis program that will determine whether the rock art on Murujuga is subject to accelerated change (Section 2.2).

In 2019/20, the State Government allocated $649,000 to support the implementation of the strategy. This included funding:

- to support MAC with the implementation of the strategy and monitoring program
- for the independent peer review of the Murujuga Rock Art Monitoring Program and scientific studies
- to support an investigation into a proposed low sulphur fuel region for ships operating near Murujuga
- for the operation of the Murujuga Rock Art Stakeholder Reference Group
- to support the implementation of the strategy by DWER.

DWER is required to provide an annual report on the implementation of the strategy to the Minister for Environment. This annual report provides an overview of the implementation of the strategy and key achievements since the release of the strategy in February 2019.

1.5 Communication and Engagement Strategy

The Department of Biodiversity, Conservation and Attractions (DBCA) and DWER have prepared a Communication and Engagement Strategy for the Murujuga World Heritage Nomination and the Murujuga Rock Art Strategy (April 2019).

The Communication and Engagement Strategy provides a holistic approach to effectively and efficiently engaging with stakeholders, and delivering key and consistent messages about the State Government’s commitment to protecting Murujuga’s rock art and the initiatives by which this will be achieved.

Central to the Communication and Engagement Strategy is the release and implementation of the Murujuga Rock Art Strategy and the preparation of a World Heritage nomination.

The Communication and Engagement Strategy is primarily implemented by DBCA and DWER, in consultation with MAC. Where appropriate, other State Government departments may also be consulted on the implementation of this strategy.

1.6 Murujuga Rock Art Stakeholder Reference Group

The Minister for Environment has established the Murujuga Rock Art Stakeholder Reference Group to facilitate engagement between MAC and key government, industry and community representatives on the development and implementation of the Murujuga Rock Art Strategy.

The Terms of Reference for the Stakeholder Reference Group are to:

1. contribute constructively to the monitoring and protection of rock art, being considerate of the views of all stakeholders. This includes the provision of advice to DWER and the Minister for Environment on the design, implementation and analysis of the scientific monitoring and analysis program
2. consult, inform and educate other stakeholders on other matters referred by DWER for input or comment, including further development of the strategy, implementation of the strategy and five-yearly reviews
3. inform the State Government’s broader consideration of other strategic issues relating to the protection of the rock art on Murujuga.

The Stakeholder Reference Group includes representatives from MAC, the Australian Government and State Government departments, as well
as the Pilbara Development Commission, the Pilbara Ports Authority, the Western Australian Museum, the City of Karratha, industry and scientists. Dr Ron Edwards has been appointed as the independent Chair of the Stakeholder Reference Group. The membership of the Murujuga Rock Art Stakeholder Reference Group is provided in Appendix A.

MAC is a permanent member of the Stakeholder Reference Group. The initial term of appointment for the Chair and other members is three years, after which the membership will be reviewed by the Minister for Environment.

The Stakeholder Reference Group meets at least annually, or as determined by the Chair. Secretariat support is provided by DWER.

The Stakeholder Reference Group has developed a Communication and Engagement Implementation Plan. The Implementation Plan is included in the Communication and Engagement Strategy for the Murujuga World Heritage Nomination and the Murujuga Rock Art Strategy (Section 1.5). The Implementation Plan identifies key communication and engagement activities and timelines for engagement with stakeholders.

1.7 World Heritage nomination

In August 2018, the State Government and MAC announced that a World Heritage nomination would be progressed for Murujuga. MAC is working in partnership with the State Government to prepare the World Heritage nomination, in collaboration with the Australian Government and stakeholders.

On 23 January 2020, the Australian Government formally transmitted a Tentative List Submission for the Murujuga Cultural Landscape to the United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Centre. It was added to Australia’s World Heritage Tentative List.

The next step in the process is the preparation of the formal World Heritage nomination dossier. The nomination must demonstrate that the World Heritage value of the area can be adequately protected and conserved through a thorough management framework and appropriate boundary. The Murujuga Rock Art Strategy and Murujuga Rock Art Monitoring Program are important components of the management framework supporting coexistence between the Aboriginal heritage values and industry on Murujuga.
A technical advisory and governance framework has been established to ensure the complex requirements of the World Heritage nomination can be successfully achieved.

DWER supports the development of the nomination through participation on the Interagency Taskforce and Murujuga Heritage Committee.
2. Key achievements

2.1 DWER and MAC Partnership

The State Government is partnering with MAC to oversee the implementation of the Murujuga Rock Art Strategy. This was formalised on 15 November 2019, when DWER and MAC signed a Partnership Agreement. This establishes the working arrangements for effective and efficient cooperation to support the implementation of the strategy and the Murujuga Rock Art Monitoring Program (Section 2.2), and other matters of mutual interest for the protection of Murujuga’s rock art.

The Partnership is based on the principles of:
- mutual respect for knowledge, roles and responsibilities
- open, honest and transparent communication and consultation
- planning and working collaboratively.

The State Government provided $150,000 in 2019/20 (Section 1.4) to support MAC’s involvement in the development and implementation of the Murujuga Rock Art Monitoring Program and to assist with building MAC’s organisational capacity. This was formalised through a Funding Agreement signed on 15 November 2019.

2.2 Murujuga Rock Art Monitoring Program

MAC is the central organisation for developing and managing all research within Murujuga. MAC has an important leadership role in linking research to the cultural and strategic plan of Murujuga, under the governance and direction of the Circle of Elders. The *Murujuga Research Protocols* have been developed as a set of governing laws and principles to ensure that research is conducted in a respectful and culturally appropriate manner. The protocols form the basis on which to build ethically and mutually beneficial research partnerships.

MAC and DWER are overseeing the development and implementation of a new global best-practice rock art monitoring program at Murujuga. The procurement process for the Murujuga Rock Art Monitoring Program has been managed by DWER in accordance with the *State Supply Commission Act 1991* and government procurement policies. The development of the Request document and evaluation of offers received has been undertaken with MAC and in consultation with national and international technical specialists.

Puliyapang Pty Ltd, a joint venture between Calibre Ventures Pty Ltd and Tocomwall Pty Ltd, has been awarded the contract for the Murujuga Rock Art Monitoring Program. Puliyapang is partnering with subject matter experts from Curtin University, Artcare and ChemCentre to bring
together a team with specialised expertise, qualifications and experience in:

- rock art recording, interpretation and analysis
- air quality and atmospheric deposition
- mineralogy of rocks and weathering
- microbiology/geomicrobiology
- analytical chemistry and geochemistry
- design of monitoring programs
- data management and statistical analysis
- project management.

Funding for the monitoring program is being provided by Woodside Energy, Rio Tinto and Yara Pilbara.

As a long-term objective, MAC would like to assume responsibility for the Murujuga Rock Art Monitoring Program. MAC rangers will be directly involved in the development and implementation of the monitoring program. This will include working alongside the team of scientists undertaking:

- field work to collect field measurements and samples
- data management
- analysis of monitoring data and presentation and interpretation of monitoring results
- report preparation and the communication of results from the monitoring program.

This will provide the rangers with training and opportunities to gain new skills as the custodians of Murujuga.

The purpose of the monitoring program is to monitor, evaluate and report on changes and trends in the integrity of the rock art and whether the rock art is being subject to accelerated change; specifically to determine whether anthropogenic emissions are accelerating the natural weathering of the rock art. This will enable timely and appropriate management responses by the State Government, industry and stakeholders to emerging issues and risks.
The objectives of the monitoring program are to:

- obtain data for comparison against the environmental quality criteria to ascertain whether the environmental quality objective\(^2\) is being achieved and the environmental value\(^3\) (the rock art) protected
- provide the State Government, MAC, industry and the community with robust, replicable and reliable information on changes and trends in the integrity or condition of the rock art on Murujuga
- ensure decisions regarding the protection of the rock art are based on the best available science
- inform the evaluation of the effectiveness of any measures taken to mitigate adverse effects on the rock art, including efforts to protect the rock art.

The development and implementation of the monitoring program will be informed by the findings and lessons from the past 15 years of scientific studies and monitoring of the rock art on Murujuga. The monitoring program will address the limitations of the previous studies to deliver a scientifically rigorous approach to monitoring and analysis.

An important part of the monitoring program will be the establishment of an atmospheric monitoring network on Murujuga. This will provide data on the composition and concentrations of contaminants that are potentially transferred from the atmosphere to rock surfaces, for the assessment of effects on the rock art.

Independent peer review processes will be established to provide assurance that the best scientific information is available to guide management actions.

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2 A specific management goal for a designated part of the environment that signals the level of environmental quality needed to protect the environmental value.
3 A beneficial use or ecosystem health condition that requires protection from the effects of emissions or environmental harm.
2.3 Ambient air quality monitoring network

The State Government is considering the establishment of a long-term, coordinated ambient air quality monitoring network on Murujuga and in the surrounding area. The introduction of a centralised and coordinated monitoring network will expand the knowledge base to manage the air quality in the region and result in more informed decision-making.

GHD has been commissioned to provide advice to support the development of a network suitable for monitoring human health impacts at Murujuga and neighbouring population centres, taking into consideration the existing and future emissions from industry, shipping, vehicles, port operations and other anthropogenic activities.

This includes making recommendations on:

♦ suitable locations for monitoring stations, based on consideration of population exposure, location of major industrial sources and required type of monitoring station (background, neighbourhood or peak [industrial] sites)

♦ at each identified location, key pollutant sources to be monitored, the type of instrumentation required and the need or otherwise for complimentary meteorological monitoring at the site

♦ issues to be considered, including suitable sites within a location, land tenure, access to power, security and proximity to industrial or other local sources

♦ compliance with relevant Australian standards for siting air monitoring equipment.
Photo: Quoll engraving
2.4 Low sulphur fuel region for shipping at Murujuga

Shipping emissions include nitrogen oxides ($\text{NO}_x$), fine particles ($\text{PM}_{10}$ and $\text{PM}_{2.5}$), sulphur dioxide ($\text{SO}_2$) and volatile organic compounds (VOCs). In Australia, shipping emissions are primarily regulated under the *International Convention for the Prevention of Pollution from Ships* (MARPOL) Annex VI, which establishes legally binding international standards for controlling ship emissions.

On 1 January 2020, the limit for sulphur in bunker fuel was reduced from 3.50 per cent mass/mass (% m/m) to 0.50% m/m under MARPOL, which will significantly reduce emissions from shipping.

Under MARPOL, emission control areas (ECAs) can be established which prescribe low sulphur limits for bunker fuel (0.10% m/m). Low sulphur fuel (0.10% m/m) regions can also be implemented through Marine Notices and formal directions issued by the Australian Maritime Safety Authority (AMSA) under the Commonwealth *Navigation Act 2012*.

In December 2018, the Minister for Environment and the then Commonwealth Minister for the Environment, Hon Melissa Price MP, agreed to investigate a proposed low sulphur fuel region (0.10% m/m) for shipping near Murujuga under the *Navigation Act 2012*.

Ramboll Australia Pty Ltd has been commissioned to undertake a study on the cumulative impacts of air emissions from existing and proposed industries, shipping and aggregated sources within the Murujuga airshed. This study will include an assessment of annual emission loads from existing and proposed future shipping movements in the area.

The outcomes from this study will inform the scope of work to investigate a low sulphur fuel region for ships operating near Murujuga. This future work will be developed in collaboration with the Commonwealth Department of Agriculture, Water and the Environment and the WA Department of Jobs, Tourism, Science and Innovation, in consultation with the Murujuga Rock Art Stakeholder Reference Group.
3. Murujuga Rock Art Stakeholder Reference Group

3.1 Stakeholder Reference Group activities

The Murujuga Rock Art Stakeholder reference group has convened six meetings since its establishment in September 2018. Two of these meetings were held at the MAC head office in Dampier and the other four meetings were held in Perth.

The Minister for Environment opened the inaugural meeting of the Stakeholder Reference Group on 10 September 2018. The Minister also participated in the meeting on 15 November 2019, which included a Welcome to Country at Ngajarli (Deep Gorge).

Members undertook MAC cultural awareness training at the first meeting held on Murujuga in November 2018.

Key achievements of the Stakeholder Reference Group include:

- providing advice to DWER to facilitate the finalisation of the Murujuga Rock Art Strategy that was released in February 2019, including providing advice on the State Government’s response to submissions on the draft strategy (Section 1.2)
- developing and implementing a Communication and Engagement Implementation Plan (Section 1.6)
- convening two community forums in Karratha (Section 3.2)
- recommending potential international and national peer reviewers who may be engaged in the future to undertake independent reviews of the Murujuga Rock Art Monitoring Program and associated reports and documents (Section 2.2)
- collating information on the scientific studies and monitoring programs commissioned and overseen by the Burrup Rock Art Monitoring Management Committee and the Burrup Rock Art Technical Working Group.

The Stakeholder Reference Group has received briefings and updates on a number of key matters relevant to the Murujuga Rock Art Strategy, including:

- activities undertaken by the Chair and the Chief Executive Officer, MAC
- the Murujuga Rock Art Monitoring Program procurement process and the scope of works
- the Murujuga World Heritage nomination
- the Australian Government response to the Senate inquiry into the protection of Aboriginal rock art of the Burrup Peninsula
The Stakeholder Reference Group also progressed the publishing of data from the previous monitoring program and scientific studies, as well as the sharing of scientific monitoring data collected by industry on Murujuga. The Stakeholder Reference Group considers it is important that data and information are made available to the contractor awarded the contract for the Murujuga Rock Art Monitoring Program (Section 2.2). The data and information can then be used to inform the development and implementation of the monitoring program.

Following each Stakeholder Reference Group meeting, the Chair provides a communiqué to the Minister for Environment. Communiqués are published on the Murujuga Rock Art webpage (www.der.wa.gov.au/our-work/programs/36-murujuga-rock-art-monitoring-program).

The Murujuga Rock Art Stakeholder Reference Group can be contacted via email at murujugarocksrg@dwer.wa.gov.au
3.2 Community forums

One of the roles of the Stakeholder Reference Group is to consult, inform and educate other stakeholders on the development, implementation and review of the strategy (Section 1.6). To support this role the Stakeholder Reference Group hosts regular community forums in the Pilbara.

The Stakeholder Reference Group has held two community forums in Karratha:

♦ In November 2018, the community was invited to a ‘meet and greet’ by the members of the Stakeholder Reference Group. The forum included presentations on the role and membership of the Stakeholder Reference Group, the Murujuga Rock Art Strategy and the Murujuga World Heritage nomination. There was also a ‘Question and Answer’ session.

♦ In November 2019, the community was invited to an update on the activities of the Stakeholder Reference Group. The forum included updates from the Chair and other members, as well as on the strategy and World Heritage nomination. There was also a ‘Question and Answer’ session.

Following each Stakeholder Reference Group community forum, the Chair provides a communiqué to the Minister for Environment. Communiqués are published on the Murujuga Rock Art webpage (www.der.wa.gov.au/our-work/programs/36-murujuga-rock-art-monitoring-program).
Photo: Fish engraving
3.3 Engagement with key stakeholders

To support the implementation of the Stakeholder Reference Group’s Communications and Engagement Implementation Plan, the Chair regularly meets with key stakeholders. This has included meetings with:

- the Minister for Environment, the Minister’s Chief of Staff and Ministerial officers
- the Western Australian Chief Scientist, Professor Peter Klinken
- Directors General and Executive Directors of DWER and other government agencies and public authorities represented on the Stakeholder Reference Group
- the Chair of the Environmental Protection Authority (EPA), Dr Tom Hatton
- Dr Ken Mulvaney from the Centre for Rock Art Research and Management at the University of Western Australia
- representatives on the Stakeholder Reference Group and senior officers from their respective organisations.

In April 2019, the Chair and DWER’s Director General and Executive Director Strategy Policy provided the MAC Board with a briefing on the role of the Stakeholder Reference Group and an overview of the Murujuga Rock Art Strategy and the Murujuga Rock Art Monitoring Program.

The Chair has also regularly engaged in media opportunities, including radio interviews, media articles and press releases.
## Appendix A: Murujuga Rock Art Stakeholder Reference Group – members in 2019

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<tr>
<th>Name</th>
<th>Affiliation</th>
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<tbody>
<tr>
<td>Dr Ron Edwards</td>
<td>Independent Chair</td>
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<tr>
<td>Mr Peter Jeffries</td>
<td>Murujuga Aboriginal Corporation</td>
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<tr>
<td>Ms Sarah McEvoy</td>
<td>Department of Water and Environmental Regulation</td>
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<tr>
<td>Mr Ben Peden</td>
<td>Department of Jobs, Tourism, Science and Innovation</td>
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<tr>
<td>Mr Jeremy Elliott</td>
<td>Department of Planning, Lands and Heritage</td>
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<td>Mr Allisdair MacDonald</td>
<td>Department of Biodiversity, Conservation and Attractions</td>
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<tr>
<td>Mr Robert Brock</td>
<td>Pilbara Ports Authority</td>
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<tr>
<td>Mr Terry Hill</td>
<td>Pilbara Development Commission</td>
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<tr>
<td>Ms Anneliese Carson</td>
<td>Western Australian Museum</td>
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<tr>
<td>Cr Peter Long</td>
<td>City of Karratha</td>
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<tr>
<td>Mr David Williams</td>
<td>Australian Government Department of the Environment and Energy</td>
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<tr>
<td>Mr Luke Blackbourn</td>
<td>Yara Pilbara</td>
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<tr>
<td>Ms Linda Dawson</td>
<td>Rio Tinto Iron Ore</td>
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<tr>
<td>Mr Tim Walster</td>
<td>Woodside Energy Ltd</td>
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<tr>
<td>Professor Jo McDonald</td>
<td>Centre for Rock Art Research and Management, University of Western Australia</td>
</tr>
<tr>
<td>Dr John Black</td>
<td>Independent scientist, John L Black Consulting</td>
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Photo: Turtle engravings