



The Quarry Life Award

Final Project Report

Kanyana Wildlife Rehabilitation Centre Inc and Gaskell Sand Quarry

1. Contestant Profile

• Contestant name:	Helen Riley
• Contestant occupation:	Chairperson
• Organisation	Kanyana Wildlife Rehabilitation Centre Inc
• Number of people in your team	Variable. 1 to 3 Education coordinators plus Education volunteer presenters and tour guides

2. Project overview

Title:	Individuals can make a difference. It's what we do - look, listen, learn and lead in our daily life.
Contest:	Community
Quarry Name:	Gaskell Sand Quarry



Abstract:

The Quarry Life Award competition “Help promote nature at mining sites. Mining sites have a high degree of biodiversity due to the great variety of landscapes and the different habitats they offer.” are the very words that offer the inspiration and outline the basis for the project proposal.

It is important to balance nature, if possible, whilst mining is being carried out. This process includes the rehabilitation and restoration of the site with the aim of maintaining a healthy biodiversity for future generations. Interaction between a working quarry, a wildlife rehabilitation centre and educating the general public at the same time can be a very complex process. How can this be achieved?

Introduction:

- Project objectives

Kanyana’s aim will be to educate the public about our fragile environment, the need to understand the importance of balancing nature and maintain healthy biodiversity for future generations. This project may assist Gaskell Sand Quarry to successfully continue maintaining best practice with their restoration and rehabilitation programs in the Banksia Woodlands on the Swan Coastal Plain.

- Short description

The Gaskell Sand Quarry is a working quarry, covering 1300 Hectares, situated in Lexia, Western Australia, 40 Kilometres north of Kanyana Wildlife Rehabilitation Centre, which is situated in Lesmurdie, Western Australia. Both the quarry and the rehabilitation centre are located on the outskirts of the Perth metropolitan area. Suburbia is encroaching on the quarry site, as is the construction of the major NorthLink WA, Perth to Darwin National Highway, which is well underway.

The team consist of interaction between Zoe Keller, Kanyana Volunteers and respondents from other organisations. The target audience was mainly the general public; however the flow on effect could include workers at the quarry site, visitors and people from other interested organisations.



Actions and activities:

Our Journey

Vern Newton, from Hanson Construction Materials, was the initial point of contact from the quarry, suggesting we enter the award after they won the 2017 Golden Gecko Award for Environmental Excellence for producing the book "Banksia Woodlands - a restoration guide for the Swan Coastal Plain" Hanson Construction Materials and Kings Park Botanic Gardens. The book was published in 2016. Jason C. Stevens, Deanna P. Rokich, Vernon J. Newton, Russell L. Barrett and Kingsley W. Dixon. This was the result of 22 years research.

The decision to gift their monetary winnings to Kanyana came about after Kanyana gave an Educational presentation about Australian wildlife whilst visiting the family school. They were very impressed with the presentation of the animals, the work and the environmental message that Kanyana was giving.

This set a seed of thought that led to the start of the project. Vern, along with Jason Stevens, from Kings Park Botanic Gardens, visited Kanyana where I gave a tour of our organisation and the various aspects of the work that we do. Vern recognised that the sand we use in our enclosures, and purchase from an independent supplier, is the same sand that they supply to the independents and comes from the Gaskell Sand Quarry. Kanyana uses washed sand for its Bilby breeding program enclosures and the quartz river sand for the rehabilitation enclosures and aviaries. To support Kanyana and our cause, Vern was suggested that we could arrange for sand to come directly from the Quarry. He also suggested that we may like to enter the Quarry Life Award, Community stream as an Environmental Educational project.

After the visit, Vern suggested I contact Zoe Keller, the Environmental Compliance and Planning officer and subsequently, I arranged to meet her at the quarry for an induction and tour of the Gaskell Sand Quarry. This proved very interesting and enlightening, with their small but dedicated team running a very efficient site. This is a hidden working area but it serves the world with its supply of high grade silica and other sands, whilst having to negotiate their everyday operations to manage the environmental considerations. Many people remain unaware of the existence of the quarry, although prior to the NorthWest road link works, the truck traffic onto the main road may have indicated some type of industry in operation, especially to the local communities.

Entering the award seemed a thoughtful way to give back and support the environmental research already in progress at the Gaskell Sand Quarry. How could we assist with spreading the knowledge about the many areas involved? As human beings, we can't say "*don't mine*", as the items we use everyday result from the processing of sand mined at the Gaskell Quarry. E.g. the high grade silica sand used for silica components in technology, phones, computers, sands used during the construction of houses, hospitals and other essential buildings. The list goes on and on.



Kanyana's educational programs include schools, along with many other types of educational programs, whereby we either visit them or they visit us. I was particularly interested in becoming involved with the programs that could be created if we introduced the information into our STEM presentations (**S**cience, **T**echnology, **E**ngineering and **M**athematics). These are core areas that form the basis of the Australian Schools Curriculum and are further subdivided to cover many topics. I hoped that by involving our Educational presenters, Kanyana could help to increase the sharing of knowledge and therefore I presented the project proposal to the Kanyana Management Committee and the Education presenters.

On the 2nd February 2018, 2 Kanyana Education coordinator volunteers and I visited Gaskell Sand Quarry, this being my second visit to the site. I introduced them to Zoe, and it allowed them the opportunity have an induction, an overview of the organisation and to ask any questions that helped them understand how we could interact with the Quarry.

Some of the questions that we had to think about were -

Who are the current authorities that the Quarry still is involved with?

How do they to operate and will it have an impact on our project?

Do we need to get special permission and if so, from whom?

Who do we need to contact to help the project proceed?

How will we deliver the information?

The main Quarry stakeholders were the Government departments of Environmental and Land Planning, the Water Corporation, the Main Roads Department and local communities. These authorities have strict guidelines and many references to consider. Permission for any surveys to be conducted on site would only be required from the Gaskell Sand Quarry.

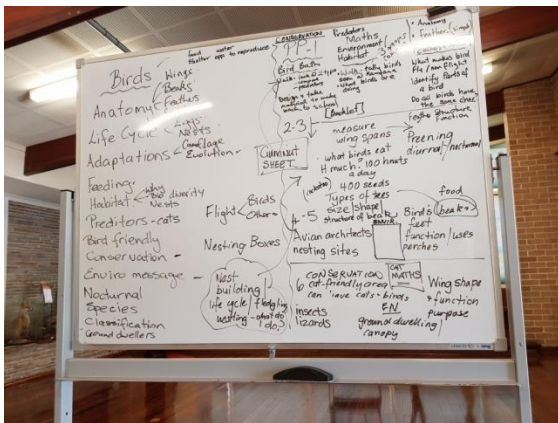
How would Kanyana conduct the project?

- School programs to include STEM – (Science, Technology, Engineering and Mathematics)
- Outreach, via schools, events, visiting senior groups
- Incursions, whereby schools visit Kanyana for educational close encounters with wildlife
- As part of our regular Discovery Tours and Nocturnal Tours for the general public and overseas visitors
- Running training courses including, first Aid courses for Mine sites
- Citizen Science project via ALA (Atlas of Living Australia) and BioCollect.
- Invite other organisations to be part of the surveys

Kanyana's education team reach up to 30,000 adults and children during the course of their presentations for the year. Wildlife admissions have reached nearly 3000 this year and rising on an average of 200 admissions annually. A different emphasis is placed on the learning of how and why animals are admitted to our rehabilitation centre. This knowledge is then incorporated and shared with other fields of leaning. Many people don't know that Kanyana even exists, however those who do are

always willing to share the fact that we do good work in rehabilitation, education, endangered breeding programs and research. These areas are all interrelated and are essential to encourage the balance of nature

The initial period was a time to collect information about the Quarry activities, operations and research that has already been undertaken, such as published in the book and other reference materials. School curriculum requirements were researched and Kanyana team meetings were held to work out ways to integrate the information into programs for education presentations. The presentation content development is ongoing.



a STEM “what and how” working session

I approached Kanyana Volunteers, Naturalists Groups and Schools to gauge their interest to be part of the actual survey. Contacts suggested a few schools to liaise with as the teachers may be interested in becoming part of the project within their allocated curriculum. The response was varied, some felt it was too far away from their location. One school in particular that had a high possibility of being involved did not respond despite repeated contact with them. The point of contact person is very proactive in environmental awareness programs and had children attending this school, so it proved a disappointment for everyone. There may be opportunities for this to be established in the future. The Main Naturalists Group contacted all their members by Facebook asking for expressions of interest to assist with any surveys. A total of 20 responded by expressing interest in helping with the survey work.

Methods that can be used for the research will be by accessing completed research data and facts already known about species, citizen science activities, mapping and teaching applications.

A Citizen Science project was required to allow the prospective participants a central area for recording. Permission was required to set up a database on the Living Atlas of Australia and BioCollect that was specific to the Gaskell Sand Quarry. This was completed; however, there were problems initially in setting up the site as The Atlas of Living Australia, (ALA) BioCollect, had a system error in uploading and incorporating spatial information. Contact was made with the ALA head office liaison officer in Canberra, who was very helpful. Their technology department had noted this was

happening with a few other applications and were working on it. Once it was fixed, I could reload the information required to commence the project.

The project had to be user friendly so that any age could use it and understand the impact on the flora, fauna and of the mining process itself. A basic worksheet was developed so that surveys could be completed on any given day and then entered at a later time onto data bases. In particular, its simplicity was aimed as being suitable for school age children. This could be expanded to different levels of knowledge. If the survey scribe (recorder) is confident of the species, they are able to complete the worksheet and enter it onto a data base.

BIRD	REPTILE	MAMMAL	INSECT	FLOWER	TREE/BUSH	FUNGI
New Holland Honeyeater		Rabbit - pest species		1		

For example – the scribe notes a flower or a bush seen but is unsure what type of flower it is. A photo of the flower is taken for identification and recorded as a Banksia. Further identification is recorded as a Banksia menziesii at the next level and can be recorded on the ALA, BioCollect site.



To conduct a mass survey, groups with a minimum of 3 people, would be given a set time and a set area to cover. All 3 people were involved with the observations; however, one person would specifically act as the scribe, whilst one person took photographs and the other observing. It was not limited to how many people took photos or notes but it was established in this format for recording consistency.



Planned site survey dates were suggested, although one only separate survey took place. A visit to the Gaskell Quarry in April did result in some recording of species although not conducted on the lines of a survey. Correspondence included information and directions about the survey. The planned survey in August has to be postponed for two weeks to due thunderstorms and high winds making it an Occupational Health and Safety risk factor. The response to participate in surveys was initially promising (20) however this was not the case on the day of the survey when it became a total of 3 participating. The main reasons for not being available on that day were work, University timetables, transport and illness.

Planned outline of survey on the day

10.00 am - meet at the main site office for an induction, briefing, information and overview of the project. Distribution of any equipment, reference books, clipboards and paperwork required.

10.30 am - transfer to the area of remanent bushland for the initial survey

12.00 md - transfer to a rehabilitated area for comparative purposes

2.00 pm –completion of survey and collection of data and comparisons

Individuals are able to set their own login to the Atlas of Living Australia, BioCollect and become part of the Citizen Science team. This gives them the ability to enter data at any time in the future, not necessarily only relevant to this project.

Weekend surveys may have been more successful, although this may not be practical as a mine site supervisor is required to be present with the group and it is out of business hours.

Discussion:

The weather on the day of the survey was exceptionally good, 20 degrees Celsius, sunny and minimal wind after previous rain. The survey was very basic due to the short time and immediate knowledge available, which is reflected in the results. It would have been preferable to have more than one survey completed for comparison and disappointing that there were not more people able to participate. This information could then have been incorporated into future Kanyana presentations. Limited fauna were seen, most probably due to the time of day. Early morning, late afternoon and evening have proven the best time to monitor Fauna. Flora is variable depending on the season with spring having the most noticeable flowerings.

Kanyana's presentations to various groups between March and August have reached potentially 4697 adults and children. This has been achieved through visits to and away from Kanyana both with school age children and our tours or public events. Information about wildlife, habitat and other Environmental messages are the basis of each presentation. The Education team are looking at developing ways that can include more information about how sand is used, the impact of mining and its relevance to the importance of biodiversity and the environmental message.



It was not possible for Kanyana to take a group of students to the quarry to conduct a survey. This is an area we feel the school could investigate if given the appropriate curriculum pathway to follow after interaction with one of our presentations and they could design their own classroom project to include biodiversity and the web of life. Teachers are given preparatory work and suggested activities that can be carried out before and after Kanyana visits.

Deliverables:

This is a very low cost project. Minimal equipment was required. Today, technology allows individuals instant access to photography and recording of uploads via their mobile phones, I pads or tablets. The more dedicated photographers have access to high quality cameras that can be used for capturing the minute details of flora or long distance aspects required for fauna. Binoculars are also an important piece of equipment for field surveys.

Field guides and Apps are also available as downloads, some requiring payment. Many individuals already have them due to their interest in the environment. Reference books were available for use on the day or suggested as options.

Materials bought were files, clipboards, pens and storage boxes for the field trip and reams of paper for photocopying information and recording purposes.

Time for the survey was given on a voluntary basis.

The project is flexible and can be adapted by anyone, depending on the category required.

Individuals or groups with specialised knowledge can contribute by giving input at any stage.

Kanyana's presentations for delivering the information to students were dependant on school bookings taking place. The content was also variable due to the age of the children and the requirement of the curriculum.

Suggestions for the future include

- Encourage Gaskell Quarry staff to join Citizen Science and participate whilst they are on site. During their break, they may see a particular species of fauna or flora that can be added to the database.
- Surveys could coincided with the 6 Noongar Seasons
 - Birak (Dec-Jan): Dry and hot.
 - Bunuru (Feb-Mar): Hottest part of the year.
 - Djeran (Apr-May): Cooler weather begins.
 - Makuru (Jun-Jul): Coldest and wettest time of the year; more frequent gales and storms.
 - Djilba (Aug-Sept): Mixture of wet days with increasing number of clear, cold nights and pleasant warmer days.
 - Kambarang (Oct-Nov): Longer dry periods.



- Invite other groups to participate in the survey during their time on site eg, the Seed Collection group and Birdlife WA.
- Fauna and flora surveys relative to the separate rehabilitated sites to determine their density
- Link the increase and progression of the fauna species to the seasons and relative to the regrowth of the rehabilitated sites
- Survey at different times of the day and days of the week. Early morning, middle of the day, evening and nocturnal, subject to the time of the year and seasonal relationships.
- The flora studies are very comprehensive, encourage more focus on the return of fauna species.

Final Conclusion:

The initial idea of the project was understand the impact of mining on a site and its relationship with the return of fauna and flora to a rehabilitated area. It would also allow Gaskell Sand Quarry staff to be able to upload their sightings and photos during their time on site. The result of that entry is an instant update rather than waiting for the end of the time frame or survey to collate the information. This would be an ongoing project that could be taken over by Hanson to monitor biodiversity in the future. As an Environmental officer is able to oversee many mine sites, this application could potentially be used at any of the mine sites and for future planning.

This project does not have completion time. At the end of the competition, the ALA, BioCollect site will be handed over to Gaskell Sand Quarry for their own future use.

Kanyana would like to continue to receive updated information regarding the restoration and rehabilitation of the Banksia woodlands. By learning and understanding interaction between mining, restoration and rehabilitation best practises, we can use our daily life observations to produce a better outcome. Education and collaboration are vital and allows us to continue to share our knowledge about the fragile environment and the importance of biodiversity for future generations.