



Roebuck Bay Working Group

Newsletter 5

December 2011



National Heritage Listed Roebuck Bay. © Rod Hartvigsen

ROEBUCK BAY ADDED TO AUSTRALIA'S NATIONAL HERITAGE LIST



Federal Minister for the Environment Hon Tony Burke visited the Dampier Peninsula on August 31st 2011, to announce that 200,000km² of the West Kimberley has been added to the National Heritage Register. Roebuck, Beagle and Pender Bays on the western coastline of the Dampier Peninsula are included as well as the Kimberley coastline and islands north from Cape Leveque.

As stated in the RBWG's support letter to the National Heritage Council, *"The Roebuck Bay Ramsar site holds outstanding Indigenous, historical and natural heritage values significant for the nation and world. These values are deserving of recognition, protection and the social and economic opportunities that will come with this prestigious listing.*

ROEBUCK BAY WORKING GROUP IMPRESSES MINISTER LUDWIG

The Roebuck Bay Working Group (RBWG) impressed Agriculture, Fisheries and Forestry Minister Joe Ludwig in July this year as he toured natural resource management projects.

RBWG Project Coordinator Kandy Curran explained to the minister and others during a tour of the bay, that RBWG was bringing together groups who might otherwise find it difficult to work together – the shire, Traditional Owners, NGOs, industry, agencies and community members.

Mr Ludwig said he was pleased to see firsthand the work being done. "The Rangelands NRM projects include working with the RBWG to protect the Roebuck Bay wetlands from blue-green algae and provide a healthy habitat for local species. "This funding will assist work in Roebuck Bay, improve fire management and work with pastoralists and land managers in the Kimberley and across the broader WA rangelands region to increase vegetation cover, manage weeds, improve carbon retention and implement improved grazing practices." Rangelands NRM will also look at coastal dune erosion and management of human impacts from activities such as beach driving.



The RBWG presented Minister Ludwig with the book *Life along land's edge*, the DVD *The Life and Tides of Roebuck Bay* and a letter outlining the RBWG's significant achievements since 2004! © Kandy Curran

DEVELOPMENT OF THE NYAMBA YAWURU CULTURAL MANAGEMENT PLAN



The Nyamba Yawuru Cultural Management Plan which is currently being finalised, will be presented to members of the RBWG at the February 2012 meeting. The Yawuru Cultural Management Plan provides a framework to guide all future planning for terrestrial and marine areas of the Roebuck Bay catchment.

The geographic areas covered in the Nyamba Yawuru Cultural Management Plan are the sub-tidal area (the sea), Willie Creek to Cable Beach, Cable Beach to Burrgagun, Kanin to Mangalagun (Crab Creek), Roebuck Plains and Jangu (Thangoo). invaluable

Yawuru land owners Dean Mathews and Jimmy Edgar gathering information for the of the Nyamba Yawuru Cultural Management Plan.

WHAT HAS THE ROEBUCK BAY WORKING GROUP BEEN UP TO IN 2011?

REDUCING THREATS TO THE ROEBUCK BAY RAMSAR SITE

The RBWG has focused on reducing threats to the Ramsar site, prioritising five projects for Rangelands NRM funding:

1. DEC's Yawuru Rangers are **monitoring stormwater drains** in Roebuck Bay this wet season to find out the levels of pollution flowing into our bay. Data loggers will be installed in the drains to capture the nutrient and sediment loads.
2. Conservation Volunteers Australia are **eradicating weeds** on the northern shores of Roebuck Bay to stop further spread. Weeds being targeted are Coffee bush (*Leucaena leucophala*) and Neem trees (*Azadirachta indica*).
3. DEC's Yawuru Rangers are **blocking off then rehabilitating beach vehicle tracks** on the northern shores and developing signage to educate the public about the importance of the Ramsar site and the cultural and natural heritage values.
4. Dr Sora Estrella is **researching Nutrient Enrichment in the Food Web of Migratory Shorebirds** in the Bay.
5. The Broome Community Seagrass Monitoring Project has expanded to include the **monitoring of Lyngbya**.



KEEP OUR BAY CLEAN CAMPAIGN – FUNDED BY RANGELANDS NRM

Since 1999, blooms of toxic blue-green algae *Lyngbya majuscula*, have been found in our Bay, forming thick mats over the mudflats and seagrass in our wet seasons. Lyngbya blooms pose a threat to human health and biodiversity. Indeed, anglers report that fish avoid waters where Lyngbya is blooming, dugongs avoid feeding on affected seagrass and Lyngbya can cause rashes and breathing difficulties if touched. Lyngbya also impacts mud-dwelling invertebrates, the food of thousands of hungry shorebirds who migrate here from the northern hemisphere. **In an effort to reduce pollutants that are known triggers of algal blooms from entering our Bay, the RBWG has developed a KEEP OUR BAY CLEAN campaign which is being funded by Rangelands NRM.**



The cause for Lyngbya blooms is likely to be linked to run-off and polluted groundwater coming from the Broome town site. Pollutants such as treated wastewater, fertiliser and garden waste enter the Bay directly through our stormwater drains during the wet season. Similarly contaminants (fertiliser, sewage effluent) enter indirectly, leaching through our soils into the groundwater flowing under Broome to discharge into Roebuck Bay and the Indian Ocean. These nutrients help Lyngbya grow and spread. Another possible contaminant helping Lyngbya bloom is our pindan soil, which contains a large amount of iron and often phosphate. Once washed into the Bay iron breaks down with sunlight and helps Lyngbya grow. This means that large volumes of pindan flowing into our drains from land clearing are likely to be contributing to Lyngbya blooms.

Whilst research is urgently needed to confirm the cause of Lyngbya in our Bay, the RBWG is responding proactively with a KEEP OUR BAY CLEAN campaign which includes:

- Development of campaign mascots Sally the salmon and Dodie the dugong as severely impacted by Lyngbya.
- A regular newspaper column in Broome Advertiser.
- Talks, excursions and displays e.g. Library, Science Week, schools.
- Stickers, Tattoos, bookmarks, fridge magnets and student activities with 10 tips on Keeping Our Bay Clean.

HELP STOP ALGAL BLOOMS IN ROEBUCK BAY www.roebuckbay.org.au/lyngbya.php



DODIE the DUGONG & SALLY the SALMON are WATER QUALITY WARRIORs in ROEBUCK BAY

DODIE eats about 50kg of seagrass every day in Roebuck Bay. Sadly, the blue green algae LYNGBYA, smothers and kills his seagrass. SALLY the SALMON loves feeding in mud, but not where LYNGBYA grows. DODIE and SALLY have ideas how YOU CAN HELP STOP LYNGBYA

TAKE ACTIONS TO KEEP ROEBUCK BAY CLEAN



18th August 2011 Advertiser News

Keen students get muddy for science

Kandy Curran
IT'S not every primary teacher who gets to go on a field trip to the mud for two hours.

Broome Primary School year one and two teacher Anthony Cotter says he and his students had "hands-on" science at the marine wonderland of Roebuck Bay.

With the tide receding, mud flats were exposed and the students were let onto the exposed mud flats to learn about mud life and the understanding of what lives in the mud.

What the enthusiastic and well-behaved year one and two students achieved over nearly three hours

Scuttled crabs scurrying into burrows, mud hoppers, tiny paperbills making early tracks on the mud flats, and the students came home with the foot to hang, a mummified mudskipper, a mudskipper, unexploded dodecaphop and a starfish.

"They mainly experienced getting their hands dirty and getting the water out of their shoes," Mr Dobroth said.

Mr Dobroth said the students learned why the mud flats are so important to the marine life.

Mr Dobroth said,



Roebuck Primary students discovering the extraordinary life on Town Beach mudflats.

Mr Dobroth said,

"The mud flats in Roebuck Bay are quite unique because they contain high levels of dissolved salts which provide food for diggers and tiny organisms that live there."

They also discovered the blue

green algae, tentacles, like

seaweed in Roebuck Bay since 2005.

If you would like to learn more about preventing lyngbya blooms in Roebuck Bay, contact Kandy Curran via email: kcurran@roebuckbay.org.au

■ Kandy Curran is the coordinator of the Roebuck Bay Working Group.

- Fridge magnets with 10 tips on how to Keep Our Bay Clean have been delivered to every household in Broome just prior to the break of the 2011 wet season!
- Two new programs on RBWG's website about Lyngbya and seagrass:

Nutrient Enrichment of Roebuck Bay <http://www.roebuckbay.org.au/lyngbya/index.html>

The web program has six sections to lead viewers through the *Lyngbya* story and illustrate the serious impact of *Lyngbya*. As algal blooms in the Bay are likely to be caused by nutrients in the seawater, the program lists actions you can take to reduce nutrients entering the bay. Thanks to Ricki Coughlan (Tasty Pixels) and RBWG member Jan Lewis who designed the program and Rangelands NRM who provided the funding.

Nutrient enrichment of Roebuck Bay

Lyngbya: understanding the risks, possible causes and management strategies to address this threat to the Ramsar values of Roebuck Bay

Pollution is getting into Roebuck Bay through street drains, soil leaching & seepage from sewerage. Nutrients from fertilizer, gardens & septic tanks help the algae LYNGBYA to grow and spread in Roebuck Bay, which is bad for dugongs, fish & us!

Produced by Roebuck Bay Working Group for our KEEP OUR BAY CLEAN campaign www.roebuckbay.org.au/lyngbya.php

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Life in the seagrass: <http://www.roebuckbay.org.au/seagrass/index.html>

This seagrass program, designed by Ricki Coughlan with the help of Len McKenzie at Seagrass Watch, was funded by Coastwest. Beautifully illustrated, the program shows the different types of seagrass in Roebuck Bay and then draws attention to the thousands of marine creatures that depend on these highly productive meadows for their survival.

The Web of Life on Roebuck Bay

Explore the amazing diversity of life on the mudflats of Roebuck Bay

Life among the seagrass

Seagrass is an integral provider of energy and shelter for the broad range of organisms which comprise the seagrass food web. Because it relies on a number of those organisms to thrive, we cannot properly say that seagrass is at the bottom of the food chain. Rather, seagrass is of fundamental importance to these shallow water marine environments and surrounding ecosystems.

Seagrass grows in mud and sand. It needs nutrients which settle into that mud or sand to feed on, as well as sunlight for photosynthesis - to create the energy for healthy growth. The nutrients in the sand and mud come from decaying seagrass, deceased animal life and waste products from living organisms, also known as "detritus".

Seagrass provides a home to a number of parasitic algae, or epiphytes, and sponges which attach themselves to seagrass as a base where they filter surrounding water. Rotting seagrass also feeds many detritus feeders, including shellfish, worms, crabs and sea urchins, to name but a few.

Letters to Agencies, Industry, Local and State Government to urge for more science, improved infrastructure and environmental practices to Keep Our Bay Clean:

- Need for a Broome Drainage Management Plan to prioritise drains for re-engineering and replanting works.
- Need for new industrial estates to go onto sewer (not septic) to reduce seepage of nutrients into aquifer and Roebuck Bay.
- Need to reduce land clearing shortly before or during the wet season to reduce pindan run-off in heavy rain.
- Need to undertake scientific research to identify cause of Lyngbya in Roebuck Bay.
- Need to undertake scientific research to develop an ocean circulation model for Roebuck Bay to understand where Lyngbya will deposit in a large bloom and where a pollution spill and dredging plumes will be likely to impact.

THE CONNECTION BETWEEN DRAINS, PINDAN & LYNGBYA

By RBWG member Jan Lewis

Research in Queensland has shown that Lyngbya blooms appear to be caused by a unique combination of increased bioavailability of iron caused by the interaction between organic matter, iron and UV light, phosphorus availability and atmospheric nitrogen fixation.

How does this work in the Broome situation? Our soil is called pindan. It is naturally rich in iron. Each wet season rain carries loose pindan eroded from construction sites, empty blocks, un-vegetated verges and drain margins into the Bay. Pindan is also naturally eroded from coastal cliffs during extra-high tides. In the marine environment, with sufficient sunlight, the iron complex breaks down making iron bio-available to Lyngbya.



Do a good deed for Roebuck Bay and pick up rubbish in a drain near you to stop it washing into Roebuck Bay in the wet. ©J Lewis

Pindan is also naturally rich in phosphorus, so this chemical gets washed into the Bay's stormwater drains along with loose soil. Other ways phosphorus gets into the Bay is from swimming pool discharges, detergents and fertilisers. When large amounts of chemical fertilisers are used on gardens, plants can't use all the chemicals. Surplus chemicals soak into the ground, sink down into groundwater and then gradually seep out onto the shore and into the creeks of Roebuck Bay. If your sprinkler system is badly designed or poorly maintained, chemicals may get washed onto the road. When the first rains come, they are flushed into stormwater drains which flow into Roebuck Bay.

Many people in Broome protect themselves from the sun by swimming in their clothes. But if their clothes have been washed in 'normal' laundry detergent, they have a high phosphorus content which is washed into pool water. Rotting leaves in pools also release phosphorus. Cleaning a pool involves removing high levels of phosphorus from pool water. Many swimming pool owners discharge wastewater onto roads or into stormwater drains, rather than into the sewage system. This phosphorus, and that from detergents used to clean cars and boats on the road, also finds its way into stormwater drains.

The 2010-2011 rainy season revealed two major problems in Broome. Large volumes of pindan were eroded from construction sites in Broome North and Januburu. Some of this soil is still on suburban roads, the rest has been washed into stormwater drains. Broome's stormwater drains are designed to maximise run-off from roads in a short period of time. As there are few detention or retention structures and few litter traps, most of the stormwater entering the Bay contains all the pollutants that were flushed into the drain. At the beginning of the 2010-2011 rainy season large volumes of rubbish and loose plant material were washed into the Bay. This was followed by high volumes of pindan.

A strategic way forward is for the RBWG to work with the Shire to develop a Broome Drainage Management Plan. The plan would include a description of all the drains/drain margins in the town-site, drain design issues (erosion, sediment control, pollution, spread of weeds, identification of uncontrolled drains which are priorities for re-engineering, identification of drain margins which are a priority for rehabilitation, a list of plants to vegetate drains to maximise nutrient uptake, drain designs that manage quality/quantity pre discharge, cost estimates for remediation works, identified funding sources to meet costs and development of environmentally sensitive maintenance practices for Broome's stormwater drains.

RESEARCH BEGINS WITH FIRST SIGNS OF LYNGBYA IN ROEBUCK BAY

By the Department of Environment and Conservation, Broome

As the build-up begins and the wet season approaches, DECs Yawuru Rangers are assisting researchers from the University of Western Australia (UWA) to delve into the triggers for blooms of the blue-green algae *Lyngbya* in Roebuck Bay.

Funding from a Rangelands NRM grant sourced by the RBWG is contributing to UWA PhD student Gayan Gunaratnes' research into the hydrology of, and nutrient flows into, Roebuck Bay.

The first year of research aims to characterise runoff patterns within Broome and surrounds, compare natural and urbanised runoff and quantify nutrient loading from different areas of Broome into the bay. This initial information will be gathered by drain sampling at eighteen sites during rainfall events over the 2011/12 wet season, with particular importance placed on the first rain of the season to capture 'first flush' data.



Yawuru rangers Curtis Robinson and Jason Fong with PhD student Gayan Gunaratne, testing the water quality in Roebuck Bay. © Querida Hutchinson

Lyngbya can occur naturally at low levels but it is thought that high wet season temperatures, pindan and nutrients present in run-off and groundwater cause it to bloom, and this research will help confirm that theory.

SOCIALISING IN ROEBUCK BAY

By Marine wildlife ecology researcher Dr Deb Thiele

Roebuck Bay is a very special place for our endemic Australian snubfin dolphins. The bay is one of only a couple of known locations in Australia where snubfins are the most abundant dolphin species. In most shallow, turbid, near shore, tropical environments they inhabit, snubfins are outnumbered by the Indo-Pacific humpback dolphin or inshore bottlenose dolphin. This makes Roebuck Bay a special place to research, investigate and eventually understand the mysteries of this little known species, life history.



Protect dolphins, dugongs & turtles by keeping boat speed less than 5 knots around creeks, mangroves, seagrass & shallow turbid water. ©Deb Thiele

This article is the first in a series about the types of marine wildlife and dolphin studies being conducted in the bay, the methods and equipment used, what has been learned from the surveys and analysis, and where and when individual snubfin dolphins have been spotted in the bay. **The exciting news is there will be competitions to name individual dolphins.**

Long term life history research is based on studies of individual animals and over time yields an in depth understanding of breeding success, survival rates, birth rates, longevity, social structure and relationships, kinship structure of populations; the scale and timing of movements of animals and much more. All are critical to understanding population ecology and evolutionary biology, including population dynamics (whether populations are stable, increasing or decreasing) and so are key to determining conservation status and making informed decisions on management action for long-lived species.

One of the most important tools in life history research is individual photo-identification. This is a simple tool which can be used to understand many aspects of life history and to track individuals over time and space. Photo-ID has been used since the 1970's when humpback whale researchers found they could identify most of the whales from unique markings and colouration on parts of the body. The aim is to try to photograph all snubfins in groups we encounter. To identify individual snubfin dolphins we need to photograph the whole surfacing sequence of the animal, both sides of the body and the tail flukes so to have the best chance of matching or 'recapturing' them. This allows us to track changes in the 'marks' (scratches from other dolphins, shark bites, cuts and unusual colour patches) on the body, dorsal fin or tail flukes. Digital SLR cameras are used with a long (300 - 400mm) zoom lens set for fast frames. So, after each full survey we know which dolphins were in the bay, who they were with, what they were doing - the key to understanding dolphin social relationships in Roebuck Bay.

Taking photos might sound easy, but in fact this species can be difficult to photograph depending upon their behaviour at the time. Snubfins tend to stay low in the water when surfacing and are very adept at disappearing altogether, no matter how many experienced spotters are on board! The best time to photograph this species is when they are socialising. **When snubfins socialise they bunch up together (like a pack of sausages) and roll around rubbing each other, calves often leap and the dolphins pay little attention to anything else.** We are lucky that snubfins spend so much time socialising in Roebuck Bay because further north in the Kimberley this species is very shy and difficult to photograph.

The snubfin dolphin research in Roebuck Bay has been supported by the Australian National University, WA-DEC, WWF-Australia, ING-Direct, Enviros Kimberley, WA State NRM program community grants and the Commonwealth Government.



Discoveries of new mammals are extremely rare, making the Australian Snubfin Dolphin finding in Roebuck Bay in 2005 very exciting. Coastal and river dolphins are considered the most threatened species of mammal in the world (WWF 2009), so it's essential we look after them and keep our bay clean. © Deb Thiele

MAKE A NEW YEARS' RESOLUTION TO VOLUNTEER IN A PROJECT THAT HELPS INFORM BETTER MANAGEMENT AND PROTECTION OF BROOME'S COAST

TO FIND OUT ABOUT VOLUNTEERING FOR 2012, go to the Roebuck Bay Working Group website which has a volunteering calendar and information about the many projects and activities on Broome's coast.

<http://www.roebuckbay.org.au/pdfs/Roebuck-Bay-Volunteer-Calendar.pdf>



TURTLE MONITORING AT CABLE BEACH

AT THE CRACK OF DAWN FROM NOVEMBER 1st to February 28, small teams of volunteers and visitors patrol six kilometres of Cable Beach looking for signs of overnight turtle activity. Three teams patrol two kilometres each, recording new nests or, later in the season, details of hatched nests. If you are lucky you might even see a little hatchling or two making its way into the ocean at the start of a journey that will, 20 or 30 years from now, bring it back to these shores to start the process again. Full training and equipment is provided.

Contact Conservation Volunteers Broome Sea Turtle Information

P 9192 6198 E broome@conservationvolunteers.com.au

Bring Sandshoes, hat, sunscreen and water. Children need to be accompanied by an adult.



TURTLE MONITORING AT ECO BEACH

FOR 40 NIGHTS FROM EARLY NOVEMBER, volunteers monitor Eco Beach at night, recording nests, tagging turtles, taking DNA samples and adding to CVA's satellite tracking program. From late December through to late February, a hatchling program records hatched nests and exhuming those nests adds further data to scientific knowledge about the rare flatback turtle.

Contact Conservation Volunteers Broome Sea Turtle Information

P 9192 6198 E broome@conservationvolunteers.com.au

Bring Sandshoes, hat, sunscreen and water. Children need to be accompanied by an adult.



RUBBISH CLEAN-UPS OF BROOME'S BEAUTIFUL BEACHES

EVERY YEAR ROEBUCK BAY NEEDS TO BE CLEANED UP. This environmental work is rewarding and worthwhile – we can often work out who is doing the polluting!

Next Rubbish Clean-up for 2011

Friday December 2nd 2011, 12.00 to 15.30 at Town Beach (Keep Australia Beautiful)

Bring sandshoes, hat, sunscreen and water. Children need to be accompanied by an adult.



SEAGRASS MONITORING

Seagrass Monitoring

Four times a year community volunteers gather on the shores of Roebuck Bay to enjoy fresh muffins and a hot coffee and monitor the health of Broome's seagrass meadows - one of our bay's most fundamental yet fragile ecosystems. March out onto the mudflats, follow the dugong trails and learn about our unique intertidal creatures and seagrass ecology, whilst contributing to an important dataset that helps us monitor the health of Roebuck bay.

Monitoring Dates for January 2012

January 26	05.30 (hrs) for a 5.45 start	Port slipway
January 27	05.30 (hrs) for a 5.45 start	Demco Beach car park
January 28	06.30 (hrs) for a 6.45am start	Town Beach car park

Contact Kylie Weatherall and Jules Rau P 9192 1922 E seagrass@environskimberley.org.au

Bring sandshoes or mud booties, hat, sunscreen and water. Children need to be accompanied by an adult.



Turtles lay their eggs on the same beach they were born. © Barbara Langford

Roebuck students are stars. They cleaned up drains at their school and our beaches. © K Curran

Sea anemones are often found in the seagrass meadows during monitoring. © Kandy Curran

A GOOD NEWS STORY FROM 2011

Roebuck Primary students have demonstrated a lot of enthusiasm for Roebuck Bay this year. Students participated in the Great Northern Cleanup of the Bay, visited the Broome Bird Observatory to learn about the migratory shorebirds and 80 year fours participated in an excursion to learn about the invertebrates in the mudflats.

Science Specialist Anthony Collopy helped students make the link between rubbish in stormwater drains and the health of Roebuck Bay. In October this year, Anthony



Roebuck students removed 83 kilos of rubbish from drains near their school. © Kandy Curran



Students are now aware that lunch wrappers have been blowing into nearby drains. © Kandy Curran

took his upper school science classes into the drains that border Roebuck Primary. The students picked up 83 kg of rubbish from the 396 m of stormwater drains which they then lugged back to school, and classified, based on what each item was made from and its weight. Year seven student Mathew Berry explained, "We cleaned the drains to research how much rubbish is going into the ocean and there was a lot. It was hot and sweaty, but good to know we were doing our part to reduce pollution from going into our oceans."

Next they analysed the types of rubbish, where it was located in the drain as well as probable causes and possible actions that students could suggest to reduce future litter in the stormwater drains, as 13 year old Adam T'Hart explained. "The majority of rubbish was plastics, soft drink cans and heaps of chip packets, but we also found a dead cat, socks, car rims, glass, a roll of barbed wire and metal pickets."

Linkages from the analysis were revealing, with most plastics found downwind from where the students eat lunch. Building rubble was found close to the newly constructed Spoonbill Block and houses behind the oval. Bio waste was mainly found under the footbridge between the school and park.

Whilst the students didn't collect or measure green waste as there was just too much, they didn't find any dumped green waste. This was pleasing as green waste and fertiliser washed into the stormwater drains are known triggers for toxic blue-green algal blooms of Lyngbya which have been worsening in Roebuck Bay each wet season since 1999.

The student's next challenge is to research how many metres of stormwater drains there are in Broome and calculate an approximate total weight of rubbish waiting to be flushed into Roebuck Bay during our first wet season downfalls. **What a cool school!**

WHAT'S AHEAD FOR ROEBUCK BAY WORKING GROUP?

In December members workshopped priorities for the year ahead with the help of RBWG's new Chair Sharon Griffiths and Vice Chair Rachel Green, focusing on RBWG stated objectives and projects funded by Rangelands NRM.

FOR RBWG NEWSLETTERS & ROEBUCK BAY NEWS GO:
www.roebuckbay.org.au

FOR ANY FURTHER ENQUIRIES ABOUT THE ROEBUCK BAY WORKING GROUP PLEASE CONTACT:

RBWG Project Coordinator Kandy Curran
P 0400 003864
E info@roebuckbay.org.au



RBWG planning for 2012 - Bel Catcheside (DEC), Kandy Curran (RBWG Coordinator), Kylie Weatherall (Seagrass Project), Sarah Katz (Bird Observatory), Rachel Green (DOF) and Sharon Griffiths (community). © Sharon Ferguson

Disclaimer

The Roebuck Bay Working Group has made every effort to verify all facts in this newsletter.