



## NEWSLETTER November 2019

**OUR VISION** | To be a highly effective and well-supported champion of the environment.

**OUR MISSION** | To implement high impact environmental and conservation projects which promote public participation in caring for the Earth.

Dear Friends of the Environment,  
as Annemarie, who organised the tour wrote:

*As far as I know, this is a first for our Newsletter – a report-back from our hosts! Isn't that just marvellous??!!*

### **WESSA OUTING: DE VLUGT, Saturday 26th of October**

*Dear WESSA visitors,*

*Our heart-felt thanks go to the people who braved the weather and made it to the slippery slopes of De Vlugt. Without you our day would not have been successful.*

*Many, many thanks for your royal contribution to our coffers (I am sure that I am speaking on behalf of Katot as well). It is a most welcome cash injection as the current funds had been depleted. Now we can continue with vim and vigour! You are amazing. The committee will receive, as always, a spread sheet at the end of each month to fill you in on our progress.*

*The weather turned out much better after our discussions had been concluded in Die Skoolhuisie by which time we all ventured up the Poortjie in convoy. John and I felt really proud to show you our labour of love over the last 5 and half years. It is truly gratifying to see nature in its natural state. It should have never been allowed to deteriorate to such an extent. The *Psoralia* sp. have really come up in numbers after the fire and the *Ornithogalum dubium* (yellow Chinchinchee, Geeltjenk) are about to burst into flower.*

*Colin Ralston, one of the geologists and past WESSA Eden Chairman, spotted what we thought to be the shot-hole borer beetle in a huge black wattle. However, on reflection, it may be another, yet unidentified parasitic beetle species? How we wish that we could make them species specific, i.e. *Acacia mearnsii**



(black wattle). After the Poortjie we had a brief look at the big patches of *Opuntia ficus-indica* (sweet prickly pear) which will, hopefully, be dead soon! We by now have been working on them for about two years! By the time that we all had returned home, the sun had come out and we all enjoyed a picnic lunch at the old school.

Folks were interested in how to go about getting rid of alien invasive species, especially black wattle:

- Small plants are best pulled out by hand (after some rain it's even easier!)
- Middle size trees can either be ring-barked (pull layers off the trunk) or cut off with a pull-saw and then sprayed with herbicide on the exposed cut surface. There are many products on the market – Astra, Lumberjack, Garlon or Timbrel. The active ingredient of those products is **Triclopyr**. The instructions on each of those products are very thorough, so please be sure to read them. We mix approximately 20ml/litre of water in a spray bottle (1,5 litre).
- Big trees must be either ring-barked or cut down. Cut an incision with a chain-saw and apply herbicide. We fell most trees for the visual effect and cut up the stumps.

Thanks again for each and every one being present and/or having contributed to our coffers.

Kind GREEN regards from De Vlugt!

John and Ursula

[ursulapeter55@gmail.com](mailto:ursulapeter55@gmail.com)



Please diarise the upcoming WESSA Eden attractions



### **FRACKING IN THE KAROO – potential impacts on ecological systems**

WESSA Eden invites you to attend an up-to-date, informative presentation on fracking in the Karoo.

**DATE: 16 November 2019    TIME: 9:45 for 10:00**

**VENUE: Environmental Education Centre, Garden Route Botanical Garden**

Jan Arkert, a consulting engineering geologist with 30 years of mining experience, will give us a presentation on the process of fracking and its socio-ecological impact on the affected areas, shown in the map below.

Hydraulic fracturing (fracking) is the combined application of drilling technology together with the ability to inject a chemical cocktail of fluids into shale rock formations to liberate methane gas.

In July, earlier this year, environmentalist lobby groups won a court battle to halt the process of fracking. However, this is not the end of this persistent saga of fracking.

Attend this event to get the latest insight on what is really happening regarding this destructive process.

Space at the Environmental Centre venue is limited to about 60 – 70 people, so it is advisable to book your seat well in advance via e-mail to Annemarie: [angebhar@telkomsa.net](mailto:angebhar@telkomsa.net)

Entrance R20 includes tea and biscuits. Donations to our coffers always welcome.

### **Introduction**

In a world environment in which continued and unabated economic growth is perceived to be the sole means of improving the socio-economic circumstances of humanity, environmental considerations are often reduced to lower order priorities. Concomitant with growing economies is the continued reliance on energy, which for the past century has been dominated by the use of hydrocarbon-based sources. Coal, oil and gas are the non-renewable fossil fuel resources that have traditionally been used to drive the growth of economic output. Growing populations and increasing commercialization compounded by rapidly dwindling fossil fuel resources has compelled societies to apply greater technological innovation to enable exploitation of remaining energy reserves. Hydraulic fracturing is the combined application of drilling technology together with the ability to inject purpose designed fluids into impermeable rock formations to liberate methane gas. Fracking is the colloquial term for the highly industrialised mining process currently applied in the USA, with significant direct economic benefit. The environmental costs, however, are still to be determined and with the application of relevant temporal and spatial scales, may prove to be considerable.

With the economic benefits recorded in the USA, many other nations that are host to vast reserves of technically recoverable shale methane gas, have begun to review the potential of fracking gas-bearing geological formations. It is upon the Nama-karoo, a semi-arid, biogeographical region located in south western South Africa, that it is proposed that fracking will be imposed.

In 2008, three companies submitted applications to the South African government for the rights to explore for shale gas in the Nama-karoo. These applications and the subsequent outrage expressed by a variety of environmental organisations led to a plethora of opinions expressed and published primarily in the popular media. Initial and oft quoted concerns referred to the potential risks to ground and surface water resources, which are more apparent given the arid climate of the Nama-karoo and the predominant reliance on agriculture in the area. This argument has largely been counteracted by the promise of job opportunities and regional economic growth. Whilst negotiating between the concerns expressed by both extremes, the government is expected by its citizens to make appropriate decisions with regard to fracking which are based on the best interest of its peoples, both present and future.

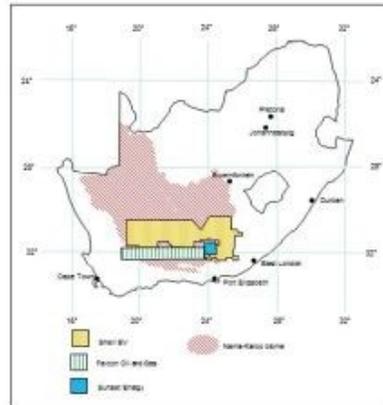


Figure 1. Map of the Nama-karoo biome and the three shale gas exploration areas.

It is within the confines of this debate, which has been somewhat simplified here, that another variable must be introduced. Economic growth and social improvement cannot proceed in a moribund and degraded natural environment. All life is beholden to functioning ecosystems, which include the abiotic and biotic aspects of the biosphere. The complexity of ecosystems, the temporal and spatial scales over which they operate, and the well-being that humanity derive from them is poorly understood. Whilst the mysteries of ecosystem functioning are continually being unravelled, humans continue to persevere with a single-minded obsession to applying monetary values to tangible and intangible natural systems, in order to add them to the list of national assets or liabilities.

Although the Nama-karoo is a rural area, with little economic activity other than pastoral agriculture and tourism, it is an area that has been affected by anthropogenic activities during the course of millennia. Over-grazing, abuse of water resources and introduction of alien species are

amongst the activities that have resulted in environmental degradation and associated disruption to ecosystems.

### Hydraulic fracturing.

Combinations of improved drilling technology and the ability to pump fluids under sufficiently high pressures that have been developed in the USA over the past two decades, have enabled methane gas trapped within low permeability shale formations to be mined. Drilling several wells from a single pad, the ability to direct the drill string horizontally and drill long laterals of up to 2500 m in length and then to pump purpose designed fluids into the borehole at well head pressures in excess of 50mPa, to fracture the host shale and liberate the associated gas, is referred to as high-volume horizontal slickwater fracturing (HVHSF), more commonly known as fracking.

Typically, well pads in the USA occupy a surface area of 1.5-3.0 ha that are required to accommodate the drilling machines, control centre, water storage facilities for up to 20 000 kl, waste-water ponds, as well as chemical and sand storage facilities. Suitable roads are required to enable the transport of all personnel, equipment, water, chemicals and proppants. Upon completion of fracking, all the waste products including flow back water (returned fracking fluids) and produce water (brine water pumped to surface during production phase) must subsequently be removed to appropriate treatment facilities.

The volume of water required for each fracking event is determined by unique geological conditions in each well and figures ranging from between 2 000 kl to 38 000 kl per fracking event are quoted in the literature. Approximately 90% of the fracking fluid consists of water and the balance is made up of 9% fine silica sand or similar material that is used as a proppant and 1% includes a selection of chemicals. The chemicals include acid, friction reducers,

The environmental costs, however, are still to be determined and with the application of relevant temporal and spatial scales, may prove to be considerable.

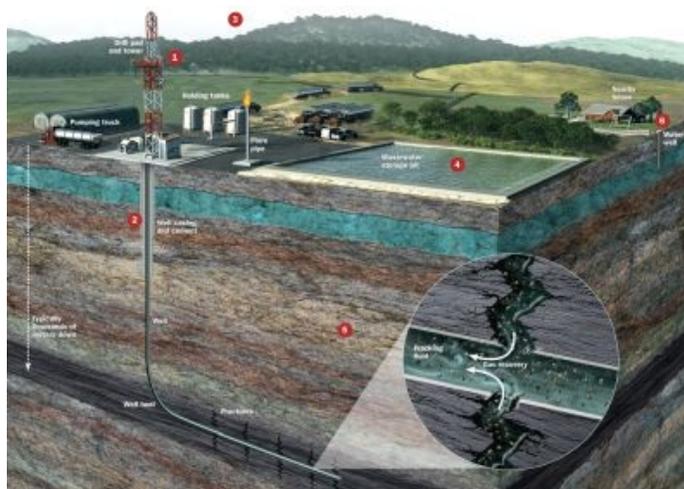


Figure 2 Schematic diagram showing the fracking process

1. Drill rig and surface infrastructure
2. Vertical borehole drilled up to 5000m deep, horizontal leg up to 2500m
3. Surface area of 1.5 to 3.0ha required.
4. Toxic waste-water storage
5. Shale fractured by hydraulic fluids to release gas
6. Proximity to existing farms and shallow water table

#### Environmental impacts.

Shale gas production, which includes the highly technological process of hydraulic fracturing, is both spatially extensive and the remnants of the operations will leave long temporal impacts. It is estimated that infra-structure associated with the mining activities will result in the direct degradation of approximately 3000 to 4000 ha of land and the indirect impact on more extensive areas.

Potential migration of fracking fluids and hyper-saline brine into groundwater resources in the Nama-karoo may be exacerbated by the ubiquitous presence of geological faults and intruded igneous dolerite dykes and sills. Elevated concentrations of naturally occurring radioactive materials (NORM) and volatile organic compounds contained in brine that is flushed to the surface during the production phase may further compound the difficulties associated with environmentally acceptable disposal of the waste product.

Habitat degradation and fragmentation have known undesirable consequences on plant and animal population dynamics. Migration and recruitment of species are affected by roads that effectively become barriers to habitat specialists and sedentary species. Exacerbated by edge effects due to dust, road pollution and storm water runoff, the spatial extent of activities associated with fracking may impact on the viability of species well beyond the immediate area of industrialisation. Although the Nama-karoo is not a biome enriched by a high prevalence of plant or animal endemism, extensive gas mining operations will affect biodiversity, and therefore by extension, the ongoing sustainability of existing ecosystems. Direct and indirect effects such as habitat loss, reduced breeding success and loss of keystone species such as the aardvark may impact upon nutrient cycling as well as the distribution of plant seeds and reduced recruitment within existing patches of higher plant diversity.

Shale gas mining in the Nama-karoo will introduce a widely distributed industrial process to the region in which extensive linear infra-structure will be required and large volumes of water may potentially be made unavailable to alternative use. The extent of roads, pipelines and drilling pads that will be developed will require extensive loss of existing habitat and the total removal of vegetation, will in turn, exacerbate the rate of removal of topsoil from the area due to increased stormwater run-off. Concentrated run-off of water from un-vegetated and unprotected surfaces

will reduce water infiltration into the soil horizon and will reduce groundwater recharge, thereby increasing the severity of periodic flood events. Head ward extension of erosion gullies and rills due to increased flow velocity will cause loss of viable land and deterioration of water quality which can be translated as a reduced quality of a viable ecosystem service.



**Figure 3.** The vast extent of fracking

“Saw these strange new human-made landscapes on my flight from Sacramento to Houston. Not farming, not subdivisions, but many miles of rectangular patches etched out of the earth, some with pools next to them, all with roads to them. I doubt that people see these when driving on major roads – I never have – but they were very visible from a plane. Welcome to your new landscape!”  
Amy Youngs Photographer

### **Conclusions**

Considerable debate around the moral and ethical relevance of applying monetary value to ecosystem services as well as the lack of universally accepted methods to determine the value does not render the process of considering the impact on ecosystem services meaningless. The recognition that fracking in the Nama-karoo will have an impact upon several ecosystem services should be sufficient for decision makers to identify the need to proceed with caution. Reflection on all aspects of human well-being as well as the intrinsic option that future generations must be allowed to derive benefits from intact and functioning ecosystems must be respected.

Jan Arkert

### **Biography**

Jan is a geologist and a registered natural scientist, with 30 years experience in the field. Having always had a strong passion for the environment, Jan recently went on to complete a masters degree in conservation and his thesis focused on the potential impacts on ecosystem services in the Nama-karoo in the event of fracking being permitted to go ahead.

Jan has been involved the anti-fracking and uranium mining campaigns in the Karoo since 2014, representing TKAG and SAFCEI. Jan and his wife Linda, recently started the Karoo and Coast

Environmental Engagement Project (KCEEP). With increasing public awareness of the causes and impacts of climate change, KCEEP, is engaging with communities in the region to create awareness of the impacts of off-shore oil and gas exploration as well as the severe impacts that fracking may have on current and future generations.



Join us on the **8th of November**, on a night tour around the Garden Route Botanical Garden, and try spot our local night life!

Be on the lookout for the Knysna dwarf chameleon, interesting insects, birds as well as our 11 different species of frogs!

You'll need • a flashlight and • a very good ear to track their calls, and lastly • lots of enthusiasm!

Joining us on our tour will be Amphibian Expert Ferdie de Lange and Expert of all things living the Garden Route Botanical Garden, Colin Ralston. R30.00 to participate

Garden Route Botanical Garden Bush Hats and Caps now available!

Pop by the GRBG office to get yours 😊

Bush Hats – R180.00

Caps - R100.00

## THANK GOODNESS FOR VISIONARIES!

On Wednesday 13 November, the Wilderness Ratepayers Association are following up their talks on Fire Safety and Shark Conservation with a trio of speakers who will be looking into the future of Wilderness and its surrounds.



Addressing the increasing social and ecological challenges associated with environmental change in the Garden Route, Dr Chloé Guerbois, a sustainability scientist, will share her thoughts on the 'rewilding the Wilderness' and its societal implications. Dr Guerbois has lived in Wilderness Heights for four years and works with the NMU Sustainability Research Unit. She will explain her research on global change adaptations and integrated conservation along the coast, reflecting on how our interactions with nature, as well as with other humans, influence everyone's capacity to cope with uncertainties in the long-term. Are you ready to ride the changes?

A second 15-minute talk will provide a practical guide to 'fire-scaping' your property. All Garden Route residents would like a future where they can rest easier despite living in a high fire-risk area! So this talk will explain the many aspects that raise a property's fire-risk profile and how to address them: cleaning gutters, the role of fire-breaks, clearing invasive alien vegetation and road verges, plants that resist fire, etc. Speaker Andre Hacquebord heads up the WRRRA Fire Forum that represents the seven volunteer-based Fire Management Units in the greater Wilderness area.

The final speaker is Melissa Dalton of 'The Precious Tree Project' whose vision is the reforestation and the regenerative development of Wilderness and Hoekwil. Planting indigenous trees in forest patches has a range of benefits for the natural environment such as reducing greenhouse gases, producing oxygen, providing shade and cooling, biomass and biodiversity, food and shelter for a myriad of differing life forms, cleaning our air and water and soil, and much more. Dalton, a Wilderness Heights resident since 2003, has focused her academic training and work experience on environmental health and resource management. She will share what The Precious Tree Project has already accomplished and how we can all get involved.



Don't miss this Three Visions evening: 6.00pm for 6.30pm on Wednesday 13 November at the Wilderness Hotel. Entry: R10 for WRRRA members and R20 for non-members. A cash bar and an opportunity to become a Wilderness Ratepayers and Residents Association member will be available.

For further details contact: John Miller 084 959 4243

Photo: Melissa Dalton of The Precious Trees Project planting for a better future.



INVITATION TO ATTEND THE 2019 C@W  
SYMPOSIUM:

Keeping the end in mind - pristine natural  
environments managed by passionate people

to be held at the GRAHAM BECK SKILLS CENTRE on  
18-19 NOVEMBER 2019

It is with great pleasure that we announce the  
successful finalization of details for the upcoming  
Conservation at Work Symposium:

Conservation at Work is hosting the 3rd annual symposium and hope it to be another special  
event, following the success of the 2017 and 2018 Symposiums. This event will be showcasing  
some of the top experts in South Africa in their varied subjects related to conservation and  
conserving our extremely valuable and unique natural resources and heritage.

As you can see from the attached invitation (not attached to this Newsletter) there is a charge of  
R1900 pp to attend the Symposium, to assist us in recovering some of the costs incurred over the  
two days. The fee covers attendance, lunch for both days and the Cape Fox Awards Dinner on the  
evening of the 18th.

Please contact Ingrid at [conservation.at.work@gmail.com](mailto:conservation.at.work@gmail.com) and request your booking form so that  
we can finalize your payment and booking.

We would be happy and grateful for you to forward the Invitation and Program to your network

Warm Regards Liz Eglington

Chairperson: [Conservation@Work](mailto:Conservation@Work) 0836533635

Conservation at Work Office, The Green House, WCC offices, Hermanus, (+27) 028 316 2774

[www.conservationatwork.co.za](http://www.conservationatwork.co.za)



I hope you enjoy the read.



Regards, Christine Ridge-Schnauffer

*Honorary Secretary WESSA EDEN*

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