



NOETZIE CONSERVANCY OWNERS' ASSOCIATION

# Newsletter

*July 2017*

## KNYSNA FIRES

7 JUNE 2017

*Editorial*

The sympathy of the Noetzie Conservancy Owners goes out to all who lost their homes in these fires, especially to those in the Noetzie Community; Aubrey and Liz Wynne-Jones, Tim and Niki Everett, and Chris and Iona Everett, whose Noetzie homes were completely destroyed in the fires, Julie Gosling and Wendy Dewberry whose home at Noetzie was very badly damaged by the fires, Steve and Barbara Gettliffe whose Knysna home was destroyed and Tim Gwyn-Jones whose Pezula house was burnt out. It is heart rending to see the ruins and ash of the homes which have had love and care poured into them for many years. In addition there was damage to the new Thompson house still under construction, as well as to Shimmin, Fabian and Marriott's.

We would also like to thank the wonderful Noetzie community for their commitment to fighting the fires when Noetzie was understandably a low priority for the Fire Department. Thanks to those who

came to Noetzie from Knysna, Rheenendal, Plett, Cape Town, Johannesburg or wherever. We have a caring community and it shows!



This Newsletter is dominated by fire related items but I hope you will still find it interesting. I have also placed at the end of this newsletter a very interesting article **Knysna Fires : Five factors that produced the Perfect Inferno, by Mark Dixon, a resident of Sedgefield**, on why the fires were so devastating.

As I write this, the fires in the forest above the river houses are still burning – photo 3 July.



This is SANPark's, official stance on forest fires:-

*Smouldering forest fires: Gaps play an important role in the maintenance of species diversity and successional dynamics in closed-canopy forest. The forest of the Garden Route is considered "fine grain" forest, with dying trees and windfalls the most common causes of canopy gaps. However, lightning-ignited fire gaps or spot-fires from intense fynbos fires also occur, often associated with periods of prolonged drought. These ground fires could smoulder for months, until they are*

*put out by good rains. Although forest recovery and regrowth in these larger fire-disturbed areas is slow, it forms part of the natural disturbance dynamics of the forest.*

*In terms of the recent fire, smouldering fires in the larger forest area should not be of concern with the current climatic conditions. However, with smaller, more fragmented forest patches where natural processes have been disturbed (for example, with a heavy fuel load on the forest edge), management intervention may be required. Such fires would be monitored, and management action taken, when required.*

I would like to finish this introduction with a quote from an article in the 1922 journal that became Veld and Flora. Perhaps we can replace the word Kirstenbosch with Noetzie and hope that peace soon returns as the green shoots push their way through the ash.



*After all, there is nothing so soothing amidst all the turmoil and the deepening chaos of the present evil days, than a day spent with Nature. It matters not what your mood may be, you will find her responsive. Amidst the trees you will hear her whisper to you in low tones, words of consolation and peace. Not a jarring sound mars the stillness of the scene, but there amidst all the discordant clamour attending the affairs of men, our minds turn to the peaceful Kirstenbosch, for here indeed is rest, and here can be heard the silences and the voices of God.*

G.J. Porte

Article Kirstenbosch the Beautiful, published in The Journal of the Botanical Society of South Africa Part V11 1922

## Chairman's Chat

*E J (Robby) Robertson*

*NCOA Chairman 2017*

The recent devastating fires in the Southern Cape have shaken us all, and we can only commiserate with both the Everett families, the Wynne-Jones family and with Julie Gosling whose homes were severely, if not totally gutted. But many more suffered damage, and we hope that circumstances

allow the opportunity for you all to rebuild and again enjoy Noetzie, and the Noetzie community.



### ***Aubrey's and Julie's houses***

An amazing feature of the past few weeks has been community spirit, and the willingness of so many to do what they can to assist in managing a very bad situation, and show care for those who were

unable to be at Noetzie. Sasha Watkins' action in getting the WhatsApp Group functioning certainly contributed hugely to keeping all informed.

The big question is whether any of what happened at Noetzie was avoidable, what actions are needed to reduce future risks, and if disaster does strike again, what is the disaster management plan. This suggests some future work for the NCOA Committee.

Permit me to dwell on the first point. You may recall there have been concerns expressed in the past about the fire risk. The issue of the zoning conditions of the Pezula Private Estate (PPE) which required planned fynbos burning had been raised. Both Audrey Wynne-Jones & Julie Gosling had approached PPE, and more recently initiated the removal of fire fuel-load in the vicinity of their houses. The Committee had met with the Southern Cape Fire Protection Association, (SCFPA), together with the PPE Manager earlier in the year. SCFPA had promised a plan in an attempt to get PPE active in complying with or adapting the zoning conditions, as it is recognised that there are practical constraints to the controlled burning requirements, thus an alternate approach was then to be considered by PPE & the Knysna Municipality. Unfortunately events have overtaken us. Had there been compliance would the outcome have been different? Who can tell?

As indicated above, we have some work to do going forward.

### ***Tim and Nikki Everett's house***



←**Now**  
**and**  
**then**→



# Fire Disaster - A Wake-Up Call

***Melanie Gosling***

KNYSNA'S entire disaster management plan would be changed "drastically" in the wake of the massive fires that wiped out 846 houses and damaged another 307, according to Councillor Mark Willemse. (**Ed's note** – Latest figures as at 2 July are 1,024 destroyed and 423 damaged).

"The fires have been a good kick up the butt to wake us up to just what disasters can cause. We will be looking at anything and everything to make sure it doesn't happen again," Willemse told residents at a Council report-back meeting at Leisure Isle on Tuesday.

Willemse said one of the major problems in managing the fires that ravaged the Garden Route was poor communications. Landlines were down and so was MTN and Cell C. Vodacom had been working. Another problem was that the Joint Operating Centre had been without electricity.

"Comms was an issue. We used SMSes and loud hailers. One thing we can work on better and change is communications," he said.

Executive mayor Eleanore Bouw-Spies said at the meeting that another major lesson learned was the difficulty in getting in and out of Knysna in the event of extensive fires.

“The road network is a problem. At one time both exits from Knysna were closed because of fires. At one stage we were looking at evacuating 6000 people from Rheenendal, but we couldn’t get the Go George buses in from George. Luckily we didn’t have to evacuate them,” Bouw-Spies said.

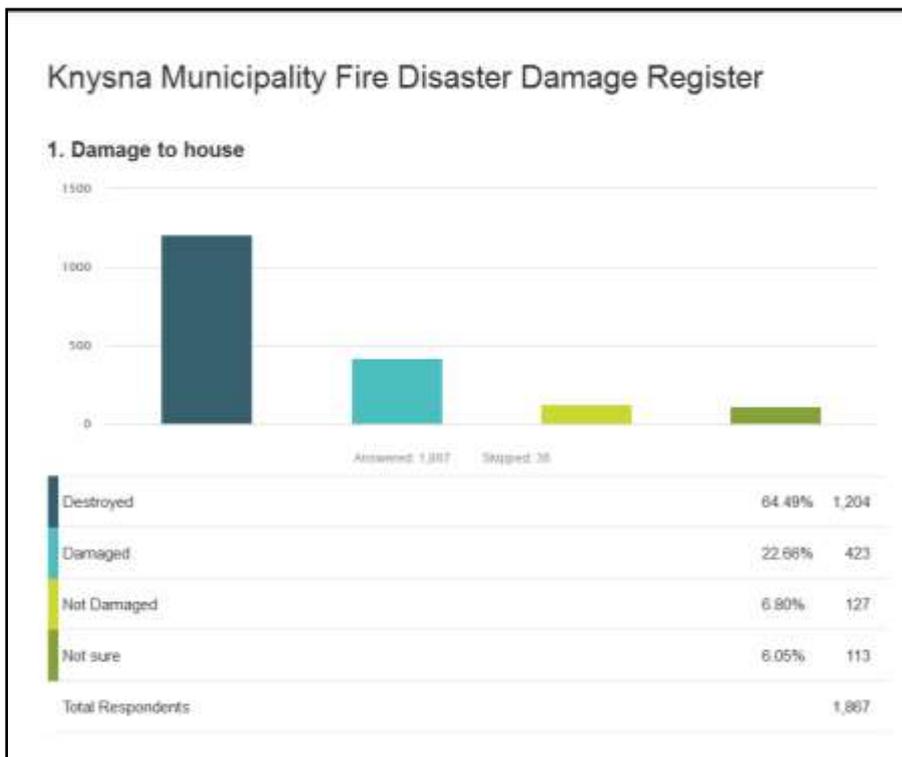
Experts have said the number of natural disasters such as fires, floods, droughts and extreme weather events is increasing as a result of global climate change. Asked if Knysna would take the reality of climate change into account in its future disaster management plan, Bouw-Spies said: “We will adopt a climate change adaptation strategy. It is time for us to make sure that we do that.”

Another issue that the Council would tackle was the enforcement of alien tree clearing. Landowners are legally bound to clear their properties of certain alien vegetation, much of which consumed large quantities of water and was a fire hazard, burning hotter and faster than indigenous vegetation.

Asked if the Council would ensure that controlled burns were done at Knysna’s large housing estates, where this was a condition of approval by the provincial government when the estates were given development approval, Willemse said the Council would do so.

The total monetary cost of the fires was still being assessed, the mayor said.

Of the 846 houses destroyed, 150 were informal structures, and the rest formal dwellings. The area hit hardest was Knysna Heights, where nearly 22% of houses were destroyed. The percentages of houses destroyed at other areas are: White Location (18.3%); Noetzie (13.3%); Paradise (7.6%) and Brenton on Sea (7.5%), Eastford (6.8%); Knysna CBD (5.7%); Nekkie (3.3%) Concordia (3%); Rheenendal (1.6%); Upper Place (1.5%). Many other areas had less than one percent of houses destroyed.



*This is the Survey Monkey Damage register as of 2 July 2017 Ed's Note*

The mayor said a concern was that more than 50% of the houses destroyed had not been insured. Of those who filled in the fire damage survey, 765 people said they needed relief aid.

There were some 25 tourist establishments damaged, which represents about 500 beds. About 2,500

people had lost jobs. The mayor said another concern was the many domestic workers and gardeners who would also lose their jobs where their employers had lost their houses.

Bouw-Spies said once the Provincial Government had submitted its report on the full extent and cost of the fire damage, the National Government would indicate how much it would contribute in relief

aid. She said National Government had already said they could help immediately with the creation of 500 jobs in the fire clean-up programme.

The Council was worried that some residents who were insured would decide not to rebuild but would take their insurance pay-outs and leave Knysna. This would have a negative effect on the rates base. The Council was considering incentives to prevent this, and as a start would waive building plan fees for those houses that were rebuilt according to the original plans. The Council was also discussing how it could ensure that houses were built in a more sustainable way, incorporating rain water tanks and renewable energy.

“We really need to be greener in this town,” Willemse said.

The town had more than enough donations of clothing and did not need more. What it needed now was tinned food, toiletries and “white goods” like toasters, kettles and microwaves.

It was suggested at the meeting that as Knysna had a wealth of expertise in its retired residents, the Council should use these residents to help where ever they could in the after math of the fire. Willemse agreed and said anyone who could offer expertise should please contact the council.

Bouw-Spies said many people from all walks of life had come to help during the fire.

“I have really been humbled by all the assistance and help, and all the people who just want to do something, anything,” she said.

## A last, very personal, Peep into the Past

*Chris Everett*

I imagine that Noetzie means something slightly different to each person who comes to this extraordinary place and in my mind there are really two Noetzies. One might call the first the public face of Noetzie - the beach, the golden rocky headlands, the castles, the steep road or the steps. For many visitors this is just a gawping moment with a few clicks of the camera and perhaps a swim; or a few hours lazing in the sun and a picnic while the kids play in the sand. For most of them, once they have forgotten the castles, it is no different from a visit to Plett or Buffalo Bay. I can't speak at all for the residents of the beach houses, but probably they look on with detached amusement and wait for the trippers to struggle back up to their cars, before they each reclaim their own Noetzies.

But there is a second Noetzie - and for me this has always been the heart of Noetzie; those few houses tucked away at the foot of the cliff, out of sight of the beach and looking up the placid lagoon. For me and the wider Everett Family our old house Nou en Dan has been the focus of our lives for 57 years – in my case nearly eighty per cent of my life. We have been part of the lives of our parents John and Pat here, watched our children and nephews and nieces grow up here and they have brought their children in turn. We have celebrated Christmas lunch here almost every year; sometimes only ten around the table, often many more, once or twice nearly forty. Friends have come to stay too and we have made new friends from the Noetzie community.



Nou en Dan was perhaps not beautiful, but it was stately and dignified, imposing without being dominating. It was framed by the cliff face, the forest behind, the grass and twisted old Milkwood tree and lagoon in front and in summer the magenta glow of the bougainvillea at the steps provided a startling cascade of colour. Each time we arrived we would walk out onto the stoep and stand for a few moments breathing in the beauty and serenity of the lagoon and the green forest-clad hills opposite before we even

started to unpack. Here we relaxed away from the crowds, read, paddled up the river, sat companionably on the stoep with a glass of wine as the moon rose over the hills or sat cosily inside with the fire on a chilly winter evening.

Over the years the family improved it and then Iona and I took over the old house and did a lot more to make it warm, comfortable and welcoming, while Tim, Trish and Cathy built their own houses, each very different. But Nou en Dan still kept its place as the wider family's centre of gravity.

Noetzie has been my life, my love and my labour. Committees and Council took up fourteen consecutive years. I think I can claim to have achieved some successes there and another labour of love – my History of Noetzie will remain as one of my proudest achievements. Iona too has worked tirelessly for Noetzie and loved it and Nou en Dan as much as I have.

The house was built in 1948 and it was called Nou en Dan when my parents bought it in 1960. We have no idea who decided on the name, but it was always appropriate, now tragically doubly appropriate. Its **Now** is a burnt-out shell, walls cracked, gaping blackened holes where the windows were, plaster spalled off the walls, tiles shattered, a few bed frames lying twisted, crockery smashed, glass in molten runnels. It will never rise again as it was, but its **Then** lives in our memories and our lives, for Nou en Dan made me and Iona and our family what we are.



*Multas per annos et multas per vias vectus*

*Advenio ut mutam nequiquam alloquerer cinerem.*

*Ave atque vale.<sup>1</sup>*

# Rainfall Graph

No graph this time as unfortunately Wendy's records of rainfall were burnt in the fire.

## Noetzie Social Media

*Sasha Watkins*

When I joined the committee in January, I suggested that we, the NCOA committee, could use social media better to communicate with Noetzie homeowners about important matters. No one could have imagined that social media would serve such a key role during the fires. After trying to coordinate communication on the Noetzie Conservancy Facebook page, I realised we needed a faster means of communicating, given the nature of the fire danger. A WhatsApp Group was created so that fire updates could be communicated quickly. I think everyone was relieved to get quick updates and the group communication highlighted what a special community we have at Noetzie.

Going forward, I would be keen to hear from NCOA members how we can use the WhatsApp Group (or if we should even keep it going) and if we should consider some rules of engagement. Social media channels can be invaluable tools for communication, especially given most NCOA members are not permanent residents at Noetzie, but it is important they are used appropriately.

## Baptism of Fire, the story on the Noetzie Riverside

*By Laetitia Nienaber-Oosthuizen*

We witnessed the start of the Knysna fires from the relative safety of our apartment in Knysna, watching the flames racing up towards Brenton-on-Sea, with a big lagoon in between.

Little did we know that evening we would be forced to evacuate our apartment.

It was Wendy Dewberry and Julie Gosling's FB posting, early Wednesday morning on 7 July 2017, that triggered the fear of the validity of our insurance at Lugkasteel, as we were changing providers at the time. We learned later that more than 50% of burnt and damaged properties in Knysna were not insured.



Johann Oosthuizen is co-owner of Lugkasteel at Noetzie, the last house up river, in the forest. Six months a year he travels the world as Information Technology Officer on a Crystal Cruises, and is thus used to fire drills and evacuation plans. When he asked us what evacuation plans we had in place, we smiled, he takes things so seriously. But he insisted that we pack a backpack with basics, IDs, cash, important documents. Buy extra torch batteries and supplies like bitter chocolates and water. Reality still did not sink in while listening on Wednesday afternoon to Johann on the phone trying to find the best route out from Brenton-on-Sea for his friends. Mobile phones were still working then. The fire was miles away from us. It was on Wednesday around 4 pm, that we saw in total dismay what looked like a 'voorbrand' being started to safeguard a multi-million-rand property, running totally out of control.

We were evacuated that night. I woke up in the car, around 3 am on Thursday, next to the lagoon. There were fires right around Knysna. It was like a ring of fire. Some houses were exploding. Flames looked five, six meters high on the eastern Heads around Pezula.

At last, back at the apartment in the early hours of Thursday morning, Johann did his neighbourhood watch stint, every 2 hours. By six am he was still assisting a fire-fighting team to save yet another house in Knysna Central. East Coast Radio tracked him down for an interview. He says the most surreal was a huge oak tree burning only in its crown.

Eventually we could get to Noetzie on Thursday afternoon, when roads via Nekkies were opened again. By this time, we already heard the recording posted by Julie and Wendy of their ordeal and their evacuation to the Noetzie beach – chilling; and about the Gettliffe property in town; the Wynn-Jones house at Noetzie - sobering.

We were not prepared for what we saw. Fires go uphill, not downhill.

There were patches of fire in the forest on the riverside. Above the van Gend house and above the Moultrie house, and the McDonogh house. Sinclair's was burning. Difficult spots to get to. But reality only hit, on our return from Lugkasteel, when new fires started in the forest parking area, and across the stream. Pails of water from the Loubser water tanks took care of some.

Only then we saw Chris and Iona Everett's house, everything burnt, but the gas bottles were intact.

The nothingness left of Tim and Niki Everett's house, but the staircase, was overwhelming.

Running past the Shimmin house, fires started around their wooden outbuilding. Pails of water were not enough. The fires were licking at the wooden staircase leading to the house. That's when we saw the externally installed fire extinguisher, appropriately marked. (*A tip for the Noetzie Fire Management Plan.*) The fire was by now flaring up again below the Shimmin house, next to the house, and above the house. We planned how to use the Nicolson water tanks, as a last resort. (*Tip for the Fire Management Plan, permission to use the water tanks on other properties.*) The Fabian water tank was gone by this time; the stream of water was like a rake, clearing the forest path.

But by now Johann and I were in trouble, too many fires, too few hands. Officer or not, a mother makes the last call.

We bailed out of Noetzie, on Thursday late afternoon, when breathing became very difficult, our eyes were swollen, teary. The most difficult was to find a safe path out from the riverside. There was nothing guiding us out. No signs. No escape routes identified. The normal routes were too dangerous or blocked. The steep river road was unsafe and rock slides threatening, how inevitable I later learnt.

The forest path to the beach by now was burning again and blocked by fallen trees. Sinclair's was burning at the beach, and at the top. The forest parking was burning. Flying embers from Pezula triggered new fires in the forest behind our houses on the riverside. The route to the Pezula forest on the most eastern side on the Noetzie riverside was blocked by fallen trees.

One way out was rolling down through the fire to the river, keeping your head close to the ground, or running up through smaller fires, between the Fabian and Marriott houses to Old Wagon Road. (*A tip for the Fire Management Plan, there is actually a path, an escape route.*)

Johann returned to Noetzie around midnight on Thursday. The fires in the forest had not moved significantly. Next check was again the Shimmin, Fabian, Marriott and Suckling properties. By now, it was not necessary to use the water from the Nicolson water tanks. The fire had consumed nearly all the fuel. Visibility was about 10 metres at midnight, max travelling distance was 5 minutes, and max time without a mask was 10 minutes.

So, the drama played out for each of us, and the more posted on social media, the more we all panicked.

By Friday, the fire brigade made a judgement call, the fuel at Noetzie was depleted, burnt out, and this meant Noetzie was not in an immediate threat. We felt differently, with persistent wind the forest was in grave danger. Fynbos thrives on fire, while a forest dies in fire.

Johann met some of the pilots and fire-fighters at a social in Plett. And like an officer and a gentleman, he wined and dined the group, with a plan. To have Noetzie water bombed. It took three such socials over the next week. We left Johann to sleep in on that Saturday morning.

There was no wind at Noetzie, it was too quiet, eerie. Walking down the riverside road was the biggest wake-up call ever.

When your time is not up, your time is not up.

For no reason whatsoever, this time we parked the bakkie at the gate house garage, and walked down. We were halfway down the riverside road, I was in front, when I heard a deep crunching rumble, my legs just started running downhill, an involuntary action. When I looked over my shoulder, there was a rock higher than me and twice as wide, followed by millions small rock bullets, dust, sand, and debris tumbling where Lourens stood. I saw how the rock cracking into hundreds of pieces.

In the longest seconds, ever ... I looked down where the mass was falling towards the burnt-out Everett properties, I cried in disbelief: "Lou I'm too \*&\$n! old and too tired to move the rocks and carry you back!"



"Ek is OK!" he answered. The rockfall passed between myself and my husband, the father of our children.

Walking in a daze along the boardwalk, as tears caused my spectacles to steam up, I became aware of many birds following us, flying ahead of us, more than I have ever seen at Noetzie. The birds found the safest spot at Noetzie - the indigenous forest along the river. Not sure whether they sang 'get out of here' or 'happy to see you again'.

The water bombing eventually happened.

## Treasurer's Report

*Margi Dane*

A big thank you to folk who have paid 2017 subscription fees. Please remember that the subscription fees for 2017 are R550.00 per owner/ordinary member.

The Knysna/ Noetzie fire of June 2017 has made it clear to us to be better prepared for another such emergency. Being better prepared involves having funds available, equipment available in suitably accessible places and a committee designated to manage this. Input from all the members will be appreciated.

# Fire Management Plan

By Laetitia Nienaber-Oosthuizen  
Conservation

At Noetzie, for the past decade or seven, we were so busy saving the forest, and the river and the fynbos, our lifestyle, and our sense of place, that we lost focus on guarding our assets in the right order. The core principle of the National Environmental Management Act is “... *environmental management must place people and their need at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably ...*”.<sup>1</sup>

“The primary purpose of wild land fire protection is the protection of assets.”<sup>2</sup>

An environmental management plan, includes a fire management plan, and it starts with life, then property, then environmental priorities. Noetzie was simply not prepared for a fire of this scale. Can one ever be prepared for this?

With the river, we have the perfect body of water to control a fire. Providing one has a water pump in working condition that can pump at least 1,000 litres per minute, a long enough fire hose, and a team to hold the water snake; And off course, enough petrol the run the engine. Or else a helicopter.

Cardinal is to be on site.

“At Lugkasteel we have fixed underground pipes running from the river to the house to extract water in an emergency. It was a matter of just starting the portable water pump and pointing it at a fire.”

“The pump is not working! When last did we check that!?” Someone must be blamed.

A gazillion years ago, I was taught that a fire needs oxygen, heat and fuel. One does not comprehend this until one is fighting that fire. And it is the order of control that is important.

We cannot control the weather, but drought conditions for more than six months at Noetzie should have been our first warning signal in our environmental management plan. Check and clear fuel ladders. Everything was bone dry. Are the firebreak systems enough and defensible spaces around our houses sufficient to keep a fire away? The Noetzie town planning scheme allows for a three metre clearing around the houses. Is that enough?

We cannot control oxygen, this means we cannot control the wind.

We mostly cannot control the heat. Radiant heat is the deadliest, because it can get to you long before the fire arrives.

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<sup>1</sup> <https://www.environment.co.za/documents/legislation/NEMA-National-Environmental-Management-Act-107-1998-G-19519.pdf>

<sup>2</sup> Dirk Smit, Eastern Regional Manager, SCFPA, in the Living in Plettenberg Bay, 2017 version.

But we can, to some extent, control fuel. The fuel load in and around our houses make us most vulnerable, and under extreme fire weather conditions, even firebreak systems and defensible spaces may not be enough.

Sources of fuel at Noetzie ...

- Gas bottles, locked with chains or in a locked wire cages, or simply too large to move.\*
- Heaps of dry twigs in dry grass, dry leaves, dead branches, cut offs, ten metres too close to the house - fuel ladders.
- Firewood stacked against the house or under the house.
- Patches of dead and dry ferns or shrubs too close to a wooden structure.
- Tree branches three metres too close to the chimney, or gas bottle station.
- Half dead trees, with shoulders sky high just waiting for that jumping ember.
- Glass litter, the perfect magnifier to kick-start a fire.
- Masses of dry reeds, too close to the forest.
- Leaves in gutters and on roofs.
- A wooden structure.
- Fynbos.



Would Noetzie have received more attention from the Municipality during this disaster if we were zoned within the Knysna urban edge? Of all the areas, Noetzie was 3<sup>rd</sup> on the list of the hardest hit suburbs, with 13.3% of the properties burnt down, next to Knysna Heights and White location.

But life continuous at Noetzie. And we have new wisdom in experience, and the first plants started sprouting seven days after the fire.

*\*Editor's note: The chaining and caging of gas bottles is a legal requirement by Knysna Fire Department.*

# Congratulations

## Wedding

A very happy occasion that needs celebrating was the marriage of Lauren Shimmin and Craig Masson. This took place on the lawns in front of Nou en Dan under the big Milkwood tree. What a perfect day!



## Robertson grand-daughter

Congratulations to the Roberson Family on the birth of Harriet Laurel Robertson, Rowan and Cara Robertson's first baby, on 24 May 2017.



# Knysna Fires :

## Five factors that produced the Perfect Inferno

*By Mark Dixon*

With thanks and acknowledgement.

June 2017 will be remembered by South Africans for decades to come as an historic moment when Mother Nature showed her true power and the only option was to get out of her path and watch in awe.

For a week preceding the fires, extreme weather warnings had been issued with predictions of flooding in drought stricken Cape Town and surrounds and strong winds in the Garden Route. Waking up on the 7<sup>th</sup> June, little did anyone know that within 72 hours 10,000 hectares and in excess of 900 structures in the Garden Route would be burnt, some houses simply reduced to a heap of rubble and vast swathes of pine plantations burnt.

While fires aren't uncommon in the Garden Route, this fire had all the conditions to make it the 'Perfect Fire'. With hindsight, understanding the fire has produced insight into the five core conditions that, in combination, made this fire so unique, namely:

- The regional drought conditions,
- The fuel load in the environment and suburbs,
- Topography of the area,
- Hot ambient air conditions,
- The speed of the wind.

Each of these conditions would contribute to a fire, indeed the combination of two or three conditions would generate a formidable fire, but the combination of all five factors produced an historic fire.

### **Drought Conditions:**

The Garden Route, along with the rest of the Western Cape has been in the grip of a severe drought for 12 months. While Cape Town exhibits an established winter rainfall, the Garden Route between Mossel Bay and Storms River doesn't have a regular rainfall season.

The impact of the current drought on vegetation and the resultant increase of fuel for a fire has been substantial. One drought survival mechanism of plants is to reduce the surface area of trans- evaporation, or simply put, to defoliate and drop leaves. The defoliation can represent up to 40% of the tree's leaf mass.

With the accumulation of extra leaf mass, the usual systems of decomposition by chemical means (fungal) and mechanical processes (earthworms, crickets, Pill Millipedes etc), is retarded and thicker layers build up. This build up can result in the formation of natural compost heaps. Normal composting is an exothermic (heat generating) process which can reach internal temperatures between 45 and 77°C. Under certain conditions a compost heap can spontaneously combust. Thus the additional leaf litter and potential compost heaps have a potential for starting a small fire, or series of fires.

## **Accumulation of Fuel:**

It is important to understand the different vegetation types in the Garden Route to appreciate the contribution to the build-up of flammable material for fires.

Apart from Knysna Forest and the Fynbos in the Garden Route, there are also pine plantations, alien stands, coastal thicket and Milkwood Forest, plus agricultural practices which comprise crop production, orchards and pastures for dairy and livestock. Each of these vegetation types has a different contribution to the progression of a fire, some retarding fire and others fuelling fire.

Afro-montane forest is fire retardant with the border species preventing the spread of fire to the interior of the forest. This has evolved as a means of protection against the fire climax vegetation of Fynbos. Milkwood forest is also fire retardant which can be clearly seen on the eastern end of Lake Pleasant where the fire was stopped dead in a straight line by this vegetation type.

Coastal Thicket is in some part fire retardant, but the leaf litter, when dry, and dead branches burn and smoulder. While not completely stopping a fire, it can slow the progress of the fire. The biggest danger of this vegetation type is the potential of flare ups after the main fire has stopped.

Fynbos fires are fast, furious, extensive and most times unstoppable, as fynbos is a fire climax vegetation and needs fire. There is no exact frequency period of a burn, but it does need to burn. Not burning it has two results - firstly the build-up of flammable material and secondly the intrusion of either coastal thicket or forest species.

Pine and Eucalypt plantations are also prone to burning. Depending on the age and maintenance of the plantations, the leaf litter layer can build up and add to the fuel base for a fire. Representing the largest surface area burnt in this fire, the contribution as fuel of the mosaic of plantations has to be addressed.

Finally, the gradual intrusion of alien vegetation, which burns readily, in the form of extensive stands of Black Wattle, has also contributed vastly to the provision of fuel to the recent fire.

The collection of fuel biomass from pine plantations, alien stands and fynbos without partitioning corridors of fire retarding forest was a major contributing factor in the rapid spread of the fires.

## **Regional Topography:**

Ask any old farmer or fire fighter where to run to when a fire gets out of hand and they will all direct you to the kloofs. This isn't random advice, but the wisdom of experience. Fire likes to race up slopes and along ridge lines, bypassing gorges. The Elandskraal fire did exactly that, twice splitting along ridge lines and then joining up again. A good indication of the traditional fire paths, because the vegetation has been controlled by fire for millennia, is to check the vegetation that prevails. Again, if Afro-montane Forest occurs naturally in an area, then the chances are that fire hasn't travelled that way in the past and is unlikely to do so in the future.

## **Hot ambient Air Conditions: Berg Wind**

Dendrochronological studies from trees in the Afro-montane forest show a lack of any clear seasonal growth patterns in their growth rings, which indicates a lack of a clear and defined rainfall seasons in the region over a time frame that extends back at least 650 years.

The relevance of this distinction in rainfall patterns is important. When a winter storm is predicted for Cape Town, the anticyclonic weather mechanisms of the Southern hemisphere results in the pressure system veering North East from Cape Town and passing slightly North of the Garden Route, which then creates a North Westerly wind into the region, resulting in hot dry air known as a Berg Wind. The mechanics of a Berg Wind are simple - as air descends from altitude, in this case over the Outeniqua Mountain Range, it compresses and heats up to approximately 32°C, but can be as high as 38°C. In addition to being hot, the air is extremely dry.

These hot dry conditions played a major role as a predisposition for the fires of 7<sup>th</sup> June. In the preceding week there were two days of Berg Winds which dried and wilted vegetation in the area. This, added to the extra layer of defoliated material as a result of the drought, prepared ample fuel that required a simple spark to ignite it.

### **Wind Speed:**

Something beyond all human control is the speed of the wind. When a barometric chart indicates a large pressure differential, then expect strong wind. On the 6<sup>th</sup> June, the barometer started dropping from 1024mbar at 00:00 to approximately 997mbar by 15:00.

Accounts of how fast the wind was travelling on the 7<sup>th</sup> June vary, but it was recorded at between 90km/h and 100km/h with gusts exceeding 110km/h, strong enough to divert one aircraft from landing at George Airport and to close the airport till the late afternoon.

Winds of this speed fan the fire and superheat it to temperatures in excess of 2,000°C which is exactly what occurred on the 7<sup>th</sup> June 2017.

### **Thermal Wave:**

Add all the above conditions in with the strong wind blowing from the North West and there are the makings of the perfect fire and the creation of a phenomenon known as a Thermal Wave. Referenced in literature but rarely seen, a thermal wave is a sine wave flow of super-heated air associated with a fire.

The superheated air rises from the flames and moves laterally, driven by the wind, before it descends into the trough of the sine wave form, touches down and ignites a new fire and then again bounces off downwind. The wave length of this thermal wave can vary between 300m and 1,000m, thus allowing it to jump over valleys and rivers and resulting in the seemingly random effect of single houses exploding into flames while those around them are left unscathed.

The air at a very high temperature heats everything before it, be it trees or a structure, which then erupt into flame spontaneously before any flame reaches the area. When this wave descends on a structure like a house, it forces the roof down with immense pressure while the extreme heat melts glass and disintegrates bricks. The result is a collapsed pile of rubble.

Eye witness accounts of this leading edge of the thermal wave describe it as a rolling 'tumbleweed' flying through the air at between 100km/h and 110km/h. One account even related how the fire overtook their car at 110km/h. The area beneath the peak of the thermal wave has been described by Knysna Fire Chief Clinton Manual as being beneath the 'dome', a smokeless zone of eerie silence and no wind.

In the Garden Route, during a few days starting on the 7<sup>th</sup> June, we lived through an historic event, the like of which has only ever previously been recorded in 1869. Nothing could have prepared us for this fire and nothing could have combated it. It was the perfect fire, a combination of factors which fuelled the inferno.

It is to be hoped that we have learnt from this event and will formulate plans to never again allow Mother Nature to play a Royal Flush of all five contributing factors to produce a thermal wave through the Garden Route. We can't prevent droughts or stop the Berg Wind or retard the wind speed, but we can manage the fuel load of the region and establish corridors of fire retardant vegetation and plan a mosaic of safe zones.

## Research Projects

Aubrey and Liz Wynne-Jones have been kindly sponsoring research by various students at Noetzie and they were assisted by Wendy Dewberry.

The Theses of the four students who did a study at Noetzie as part of their post graduate degree in Environmental Studies have been passed on to me. I will be including an edited summary from one of the reports in each newsletter this year. Please feel free to contact me or Aubrey if you want any further information from the report.

*Iona Everett*

### **Impacts of water quality on frog species diversity in the Noetzie River, Western Cape, South Africa**

*R. Fourie*

The purpose of this study was to determine whether frogs can be used as indicators of water quality and specifically to look at the impacts of water quality on frog species diversity at Noetzie, in the South Western Cape. It was decided that for the purpose of this study, Noetzie would be compared to a site which would be used as a form of benchmark, which would represent a so called "pristine" system. The Kaaimans River was selected as a comparative site, and surveys of both water quality, as well as of frog species diversity and abundance were carried out at each of the sites. The results showed Kaaimans to have lower pollutant levels, which would be expected as it was chosen as a "pristine" site, and it also hosted a greater abundance of frogs, as well as species diversity. Noetzie had a lower water quality, with marginally higher levels of pollutants, and significantly higher levels of total coliforms within the water. This was reflected in the frog population, which had a lower species diversity, as well as a lower abundance of frogs overall when compared to the Kaaimans River. From the study it was ascertained that frogs can be used as an indicator of water quality, and that there was a significant difference between the two sites in terms of frog diversity and abundance. It remains difficult to find the reason for difference between the sites, but it is most likely that this would be water related

Using indicator species has great appeal to conservationists, and any form of land manager. Indicator species provide a cost effective, and time efficient means of assessing environmental

disturbances, and ecosystem health (Carignan & Villard 2002). As it is often not possible to measure and monitor all aspects of an ecosystem, the choice of what to monitor as an indicator is therefore of utmost importance (Cape Action For People And The Environment 2008). A good indicator should display a clear correlation between their natural response to environmental impacts and ecosystem change, as well as indicate the cause of change (Hilty & Merenlender 2000; Carignan & Villard 2002). Further considerations when selecting an indicator species, are to select organisms which are not overly mobile or migratory. Organisms which are unable to escape unsuitable conditions are more likely to display signs of stress in their population (Hilty & Merenlender 2000).

Amphibians and frogs in particular, display high sensitivity towards human induced environmental change. This high sensitivity makes them particularly useful as indicators, due to:

- Permeable skin which absorbs water and solvents contained within it.
- A life cycle which includes both aquatic and terrestrial components, frogs are thus affected by changes in either of these environments.
- A relatively basic immune system.
- Food contaminants, Tadpoles are often bottom feeders, and are susceptible to ingesting chemicals, compounds and metals contained within sediment.
- Accessibility, frogs are convenient to monitor, are relatively easily seen, and heard, and can be found in a wide variety of environments. (Boyer et al. 1995; du Preez & Carruthers 2009; Kerby et al 2010).



**Figure 1:** Image showing the location of the Noetzie settlement, as well as the study site marked by the pin on the image. (Image adapted from Google Maps)

## Water Quality

Water Quality comparisons were made using the drinking water (Appendix 1), as well as aquatic ecosystem standards required by the George Municipality Laboratory services (Appendix 2). Furthermore the South African water quality guidelines for domestic use (1996), published by the

Department of Water Affairs and Forestry, was used to make deductions about the water quality at Noetzie, and Kaaimans rivers respectively.

## Results

A total of 154 frogs, and 5 different species were sampled. The frog totals for Noetzie and Kaaimans were 72 and 82 respectively. In this regard, it can be noted that the total for Kaaimans is higher than that of Noetzie. From the results it is evident that the general trend between the two sites in terms of frog abundance, as well as species richness, shows a consistently higher count for Kaaimans over Noetzie. The mean frog numbers per transect were 2.88 for Noetzie, and 3.28 for Kaaimans, and the mean species diversity per sampling session was 2.4 for Noetzie, and 3.8 for Kaaimans.

## Discussion

From the results it appears that an increase in pollutants leads to a decrease in frog abundance, as well as a poorer species diversity. The data shows that Kaaimans appears to have a healthier frog population, both in terms of species richness, as well as frog abundance. Kaaimans also had marginally lower pollutant levels than Noetzie. This is confirmed by the statistical analysis and outcome of the Mann-Whitney U test. The null hypothesis for the Mann-Whitney U test is that the medians of samples are equal, and the assumption is that the samples can be ranked. In light of this, it can be seen that the p-value for this test was  $p=0.026$  which is  $<0.05$ , indicating significance. As a result, the null hypothesis is rejected, as there is a significant difference between the two samples of Noetzie and Kaaimans.

This is supported by the data from the water tests. Although there is not a great difference between the two, Kaaimans has lower levels of pollutants when compared to Noetzie. Most levels of pollutants such as the total dissolved solids, Nitrate, Ammonia, and Ortho phosphate were well within the SANS 241:1:2011 limits displayed in Appendix 1. However, there was a noticeable change in the E-coli count of the Noetzie River. Harrison *et al.* (1995) described the E-coli count of the Noetzie River as  $8/100 \text{ ml}^{-1}$  whereas the current count stands at  $18/100 \text{ ml}^{-1}$ . Although this is still well within the limit of  $130/100 \text{ ml}^{-1}$  required for recreational use, it does not fall within the limits required for drinking water. The effects of a faecal or E-coli count of between 10-20, as described for human health, can lead to a risk of infectious disease transmission with continuous exposure, and a slight risk of disease with occasional exposure. The total coliform count in the Noetzie River was  $>2420$ , whereas Kaaimans was 166. The effect of total coliforms  $>100/100 \text{ ml}^{-1}$  in terms of human health leads to a significant and increasing risk of infectious disease transmission, this is also indicative of poor water treatment in the river. (Department of Water Affairs and Forestry, 1996).

In spite of this, there was no evidence that the levels of pollutants were high enough, specifically from agricultural fertilizer, to have a negative impact on frog species specifically. The overall condition of the water may however affect other aspects of the lifecycle of frogs, such as prey abundance, which in turn could be affecting the observed trends. In this regard it is difficult to make a definitive conclusion as to why a difference between Noetzie and Kaaimans exists. It was however interesting to note that a definite decline in the water quality was noted since the last study in 1995. This can most likely be attributed to development and informal settlements within the catchment area of the Noetzie river since this time.

## Conclusion and Management Implications

In order to better understand each of these ecosystems, it is likely that further testing and research would be required. This could possibly involve more intensive water testing, as the accuracy and range of pollutants tested for could be increased in order to cover a broader spectrum of water related issues. Further sampling of frogs should be done over a longer period of time, and sampling methods should be re-evaluated in order to find the most effective manner of data capturing.

There is a marked difference between the Noetzie and Kaaimans Rivers; however, from the data collected, it remains unclear as to the exact cause of this difference. Ecosystems are complex systems which cannot be regarded as being in a static state. They are constantly changing as various factors affect them. A simple study such as this is not sufficient enough to be able to determine the specific reason for differences between the two sites in question. Both systems supported relatively healthy populations, and much the same, both systems had a relatively high water quality. The trend between frog species diversity and water quality was further strengthened by subtle differences between the two sites in terms of water quality, which showed a higher species diversity and greater frog abundance present in the less polluted river sampled.

In terms of management implications for members of the Noetzie conservancy, the long term and continuous monitoring of both the water quality as well as aquatic fauna such as frogs and invertebrates is necessary in order to be able to pick up changes over time. As mentioned earlier, it would most likely be beneficial to include further surveys, such as a SASS 5 survey, in order to increase the sensitivity of monitoring. This provides a cost effective manner, as opposed to laboratory testing of water, to be able to monitor change over time, as small invertebrates can be extremely sensitive, and are also good indicators of water quality.

# Finally

We hope the information contained in this Newsletter and the others sent out during the year is of interest and value to all homeowners, particularly those who only visit for short periods of the year. We would like to thank all those who support the NCOA and its activities.

Particular thanks are due to the committed homeowners who volunteer their time and efforts to assist in various ways, all helping to make Noetzie a special place and a destination worth looking forward to when holidays come around.

The Committee of the NCOA would like to thank their families whose support is enormous and without whom the NCOA would be unable to function to the benefit of all owners.

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<sup>i</sup> Carried through many years and many roads

I come, vainly to address the silent ashes.

**Hail and farewell.**

Adapted from Gaius Valerius Catullus - Carmen CI