AgulhasNPark eBulletin

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South African NATIONAL PARKS

Marine Month 2021

The world's oceans generate most of the oxygen we breathe; help feed us; regulate our climate; are the primary producer of moisture to the atmosphere which leads to rain; clean the water we drink; that global trade is dominated by sea transport; offer us a pharmacopoeia of potential medicines and provide limitless inspiration! National Marine Month creates awareness of South Africa's marine and coastal environments and the benefits that our oceans bring to our nation. South Africa is nestled between two currents: the warm Agulhas Current with rich ocean biodiversity, but not a large fish stocks and the cold Benguela system that supports large fisheries such as those focused on the small pelagic (anchovy and sardine) and the demersal (hake) stocks. These currents, in addition to the cold southern oceans, are key drivers of South Africa's climate and rainfall conditions. South Africa's different climatic zones, with its different biodiversities, agricultural and economic activities, are shaped by the availability of one of our scarcest resources, namely fresh water. Rainfall patterns dictate many activities as it is vital to defining natural habitats and ecosystems. Oceans, being the primary producer of moisture to the atmosphere that eventually produces rain over the country, are therefore playing a critical role in shaping the socio-economic activities in our land. (SOURCE: https://www.gov.za/MarineMonth2021)

The ocean and climate change

The ocean is being disproportionately impacted by increasing carbon dioxide (CO_2) and other greenhouse gas emissions (GHG) from human activities. This causes changes in water temperature, ocean acidification and deoxygenation, leading to changes in oceanic circulation and chemistry, rising sea levels, increased storm intensity, as well as changes in the diversity and abundance of marine species. Degradation of coastal and marine ecosystems threatens the physical, economic and food security of local communities, as well as resources for global businesses. Climate change weakens the ability of the ocean and coasts to provide critical ecosystem services such as food, carbon storage, oxygen generation, as well as to support nature-based solutions to climate change adaptation. The sustainable management, conservation and restoration of coastal and marine ecosystems are vital to support the continued provision of ecosystem services on which people depend. A low carbon emissions trajectory is indispensable to preserve the health of the ocean.
(SOURCE: https://www.iucn.org/resources/issues-briefs/ocean-and-climate-change)

The actual impact of climate change on the oceans

At the front line of climate change, the ocean, the coastlines and coastal communities are being disproportionately impacted by increasing carbon dioxide (CO_2) and other greenhouse gas (GHG) emissions from human activities. The ocean plays a central role in regulating the Earth's climate. The Fifth Assessment Report published by the Intergovernmental Panel on Climate Change (IPCC) in 2013 revealed that it has thus far absorbed 93% of the extra energy from the enhanced greenhouse effect, with warming now being observed at depths of 1000m. As a consequence, this has led to increased ocean stratification (prevention of water mixing due to different properties of water masses), changes in ocean current regimes, and expansion of depleted oxygen zones. Changes in the geographical ranges of marine species and shifts in growing seasons, as well as in the diversity and abundance of species communities are now being observed. At the same time, **weather patterns** are changing, with **extreme events** increasing in frequency. Atmospheric warming is leading to the melting of inland glaciers and ice, causing **rising sea levels** with significant impacts on shorelines (**coastal erosion**, saltwater intrusion, habitat destruction) and coastal human settlements. Extreme El Niño events are predicted to increase in frequency due to rising GHG emissions. CO_2 emissions are also making the ocean more acidic, making many marine species and ecosystems increasingly vulnerable. Ocean acidification reduces the ability of marine organisms, such as corals, plankton and shellfish, to build their shells and skeletal structures.

2021 Environmental calendar days

The sustainable development goals for October are No hunger, Quality Education, Climate Action and Life below Water.

October

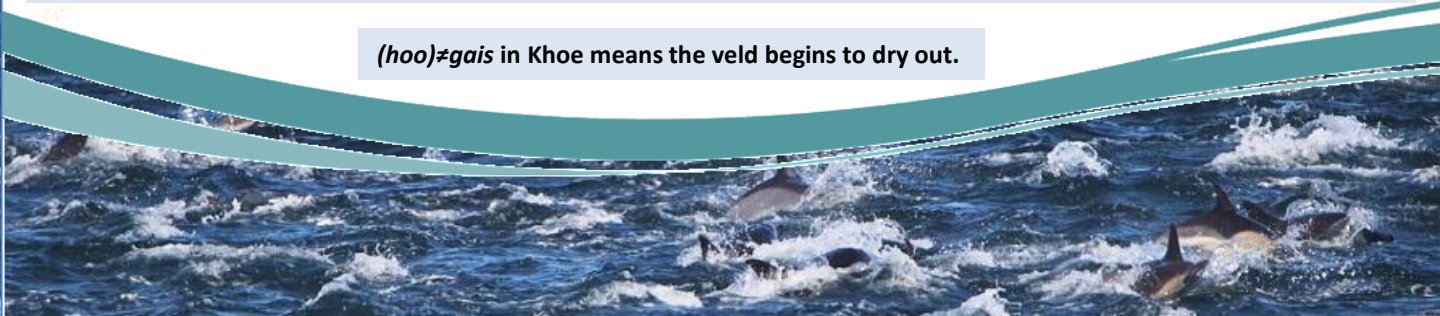
Marine Month

4	World Animal day
5	Worlds Teachers' day 4
7-11	National Marine week 14
9	African Penguin day
16	World Food day 2
24	Int day of Climate Action 13
21	Earth Worm day
16	World Hunger day 2

What is the phenological shift?

Researchers explored the change in the timing of jacaranda blossom in a paper published in the *Journal of Urban Forestry and Urban Greening*. Phenological shifts are species and location specific – in some areas. And for some species, events are even being delayed as a result of specific climate drivers. There is very little phenological data for South Africa, and so very little research has been conducted compared with the work in countries across Europe, Asia and North America. Newspapers of the past and social media now were scanned to compile a list of flowering dates of jacaranda trees spanning 1927 to 2019. This allowed for the chance to contribute to the global attempts at recording phenological shifts. The records confirmed the advance in flowering dates, and from these a mean rate of advance of 2.1 days per decade could be quantified. The climatic drivers of this advance were then explored. The flowering dates to meteorological data from across Gauteng were compared. The advance in flowering took place against a backdrop of warming temperatures, ranging from 0.1-0.2°C per decade for daily maximum temperatures and a more rapid 0.2-0.4°C per decade for daily minimum temperatures. Rainfall changes during this time were less uniform. If plants flower too early in the year they are at risk of frost damage during the late winter months, and often do not complete their dormancy. Therefore, although phenological shifts represent an adaptation in plants and animals, these advances in flowering dates cannot continue indefinitely. At a critical threshold, the flowering season will become unsuccessful. (SOURCE: https://www.enca.com/analysis/jacarandas-parts-sa-are-flowering-earlier-why-its-warning-sign)

***(hoo)≠gais* in Khoe means the veld begins to dry out.**



Extra-limital species and conservation – Marna Herbst, Regional Ecologist: Cape Parks, Cape Research Centre

Species are called extra-limital species when they are native to the country, but found outside of their natural geographical distribution range. A study in the early 2000s revealed a large degree of large mammal introductions to areas outside their natural distribution range. These introductions were mostly intended to enhance local diversity so as to improve the economic viability of many wildlife operations. However, it has been argued that the loss of local sensitive species (those confined to certain microhabitats, endemics, etc.) as a result of competition with extra-limital species and the associated effects ultimately leads to loss of regional landscape diversity, as well as global diversity and ecosystem functioning. There is a delicate trade-off between ecological costs and economic costs and benefits of introducing species outside their distribution ranges. Many ecotourism destinations believe that having a larger range of species to see will increase the tourism experience. High numbers of extra-limital species have been introduced into many private protected areas in the Eastern Cape to increase the number of different animals available for viewing, under the assumption that this is what tourists want. Even though the ecological and economic costs of extra-limital species are known, managers were reluctant to remove extra-limital species as they assume that without these species tourist numbers will drop. A study in the Eastern Cape has found that certain extra-limital species, typically the large and charismatic species such as giraffe and white rhino contributed to tourist satisfaction, while tourists showed little interest in the smaller extra-limital species such as impala and nyala, and concluded that tourists do not prefer to see extra-limital species per se. However, extra-limital introductions may be important to consider in future scenarios. Many of our reserves have fixed fences with limited movement of wildlife past these fences. As global climate and environmental conditions may change over time, many of the habitats may not be that suitable for some species anymore and it may be necessary to think outside our current reserve borders. The introduction of extra-limital species should always be approached with caution because of the risks to, and sustainability of, conservation areas. These considerations should be driven by ecological reasons and conservation benefits and a thorough risk, benefit analysis and consultation with the relative conservation agencies are needed.


Red Hartebeest


Eland


Sable Antelope

These three antelope would be considered extra-limital species in the Agulhas Plain. Long ago, when there were no farms and fences, these animals would have been seasonal visitors, except the Sable Antelope which is a savanna woodland species.

Nature's laws the answer to the environmental crisis - Leon Hugo and Jean Hugo

The origin of, or reason for, the looming "**environmental crisis**" is not simplistic. What is clear is that Nature in itself does not have a crisis. The crises lie in human hands: people are experiencing a major problem, namely, to adapt successfully to their habitat. Plants and animals fit harmoniously into the system that functions according to specific laws. The universe is governed by dependable, immutable, absolute, universal, mathematical laws; of an unspecified origin. A law of physics can be defined as a pattern that nature obeys without exception. By example, gravity remains steady, never random; the speed of light remains constant; the earth rotates in 24 hours - always. We could not imagine a universe where there were no hard-and-fast laws. It would have been complete disordered chaos. Seasons changing at random will e.g., obviously jeopardize all animal life. Movement will not be possible if gravity is to change all the time. An example is the law of Allometric growth which states that Nature adheres to balanced growth; e.g., there is always a specific ratio between small and larger branches in a tree; and the streams of different orders in a drainage basin have the exact same ratio as that of a tree; so has the veins in the human heart and lungs. As shown in the last picture below, the same ratio develops on a beach where water drains from the land to the sea when a wave recedes. Can this be by chance or is there a design behind?

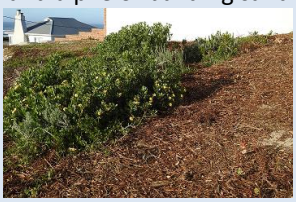
At this point, one could pre-empt the discussion of these laws of physics by asking: How did these laws come into existence in the first place? The answer to this question is beyond the reach of the theory of evolution or ecological intelligence or philosophy, and of all of science; all we know is that we can identify natural laws of nature that applies not just here on earth, but everywhere in the universe, observe them in action, and use them to explain and predict natural phenomena and guide us to live in effective harmony with nature. What is important is that humankind has elevated itself above these laws and is paying the price. By studying the natural laws, we can explain much and thus adapt our management strategies to stay in tune with Nature. But we cannot overrule these laws. (FROM: HUGO, Leon et al. 2021. *An Ecological guide to Sustainable Land use for Southern Africa.* Ecoplan. www.econatics.co.za)

If you violate Nature's laws, you are your own prosecuting attorney, judge, jury and hangman - L. Burbank

Listen to the Ocean's message at https://youtu.be/rM6txLtoaoc

Restoring the Fynbos in my garden – Leonora Ferreira

Every garden has its story and this is ours: how we preserved and re-established the Agulhas fynbos on our plot. Building is destructive towards nature; biodiversity is under threat and we feel responsible for the patch we have custody of. Our plot has a sand layer over limestone on a slope in L'Agulhas. We get wind from all directions. Wind is detrimental to the organisms in the top layer of the soil and leads to the soil not absorbing water. All remaining exotic plants were cleared before building started. The building contract clearly stated that the fynbos must be protected and clearing to be done only where essential. Eventually one third of the remaining fynbos was destroyed with one third still growing. In the end the builder left behind all his builder's rubble and a pile of building sand. The first objective was to protect the topsoil. Mulch, made with an ancient garden shredder, was a slow process. Big rolls of hessian to cover the bare soil were bought and secured with rocks, bricks and wire hooks. The municipal team cleared two plots nearby and shredded huge piles of plant material. Wheel barrowing it in was hard work, but rewarding. It gave the garden a first layer of mulch over the hessian.



Finding locally indigenous nursery plants was problematic. We engaged with a landscaper to buy, bring and plant what could be found in Cape Town and surrounds, also from Kirstenbosch. The fact that our fynbos grows in alkaline soil was news to us and to most nursery staff! Irrigation was installed and the plants watered for five to 10 minutes every morning. Rainwater from downpipes strategically placed results in rainwater from the roof being absorbed on the plot. Perches were put up for birds to "plant" pioneer plants with good effect.

Maintenance since planting consisted of replenishing mulch keeping an eye out for invaders. Gentle pruning encourages Bietou, Blue Kuni-bush (Kroestaaibos, *Searsia glauca*) to grow higher rather than wider. A **Cape Grysbok** has a "toilet" in the garden, tortoises have territorial disputes and breed here. Striped Mice live happily under the vegetation. The bird life is increasing, a laughing dove is incubating eggs in a nest in one of the bigger Bietou plants.

It is just over two years since we started the garden. We had some casualties where some plants simply could not handle the wind off the sea. As the Bietou and Blombos gained height it protected the remaining plants. If a plant appears and it is indigenous it is allowed to stay. The garden is very low maintenance, with no lawn - we have no need for a weed eater or lawn mower.

We say good-bye to …

Carmen Gagiano, Section Ranger Agulhas East

Carmen is taking up a position with Cape Nature, Conservation Officer – Off Reserve and will be based in Oudtshoorn. We wish her all the best with this new adventure.

Rainfall figures March – September 2021

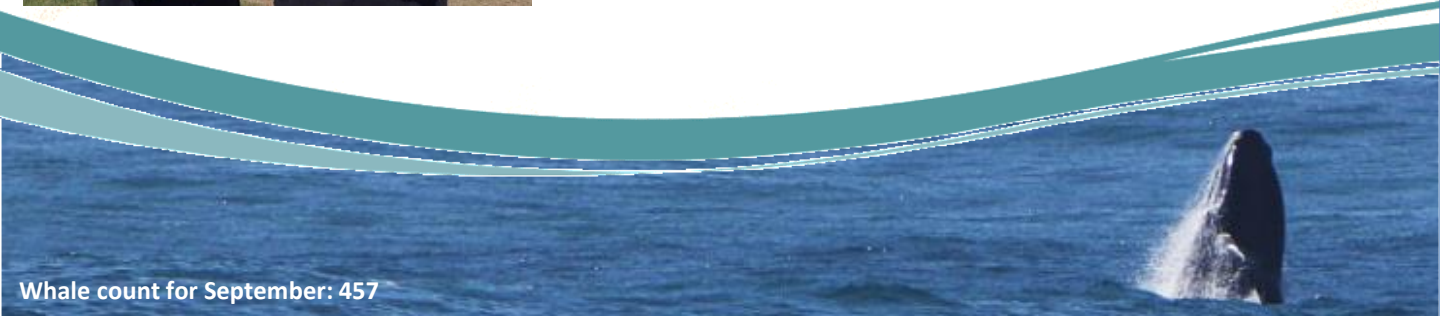
Agulhas Admin Office: 705,5mm

Exceptional rainfall in the Agulhas Plain resulted in the Saltpans, a depression wetland with no outlet, overflowing and flooding the Brandfontein road since May.

How best to clear invasive alien vegetation

A new practical guide on how to manage alien invasive plants, funded and developed by a range of stake holders including WWF – SA and the Fynbos Trust is now available. Four copies were donated to the Agulhas Working for Water project. Free copies in Afrikaans and English can be downloaded at https://www.wwf.org.za/our_research/publications/?34703/practical-guide-invasive-alien-plants&mc_cid=4b8f9ef8f3&mc_eid=b466061035.

Receiving the copies are Thys Ahrends (2001) and Wilmine Cupido (2005), members of the management team of the Agulhas Working for Water project. Thys started in 1999 with the Elim Working for Water project and is now the Assistant Cluster Manager for the Cape Region.



Whale count for September: 457