

Discuss the problem of 4x4 vehicles on our sandy beaches and coastal dunes. Under which circumstances are these activities detrimental, when and where can it be allowed, and how can it be effectively controlled? Refer to examples where possible.

With the advent of the 4 wheel drive jeep in World War 2, use of sandy beaches and dunes has become more wide spread. Technology has made vehicles more comfortable, easier to drive and more affordable to the average person. With the movement of people to coastal areas, the use of off road vehicles has also increased. This along with the mind-set of getting 'off the beaten track' which has been firmly planted into modern society by local media and clever marketing schemes, has caused a major increase in vehicle purchases as well as using the vehicles for off road out back activities.

Many studies have presented anecdotal evidence that beach driving contributes to the overall erosion rates and could increase the amount of sand pushed into the surf zone. Many factors involved in the natural erosion of the beaches will obviously enhance the influence caused by vehicle traffic. These include slope steepness, sand compaction, number of vehicles using the areas, width and pressure of tires, and weight of the vehicles. Very little quantitative research is available as there a lack of base line studies, no one is entirely sure if the tracks left by vehicles influences the beaches' natural rhythms.

When a vehicle drives on the beach, the force of a vehicles' forward propulsion will push the sand beneath it in the opposite direction. This is often found affecting the top 30 cm of sand affecting the fauna that is found in this area. At various times of the day there is different activity in regards to the vehicle and fauna traffic. Depending on the species of animal, the ghost crab for example, there is increased foraging activity at night time which means that any vehicle activity would be detrimental to the continued survival of the species. One study showed that with one vehicle passage there was a mortality rate of as high as 500 ghost crabs (*Ocypode quadrata*) per kilometre of beach travelled. On the other hand fauna that are able to burrow or live buried in the sand had minimal fatalities. Other fauna such as birds and turtles would be adversely affected. In one study of hooded plovers showed that approx. 6% of nests were run over in a 24 hour period indicating that during the breeding season approx. 81% of nests would have been run over. A similar fate was determined for the local black oyster catcher, white fronted plover and the Damara tern.

Research has also indicated that dune driving is extremely detrimental to fauna and has more of an impact on vegetation than actual beach driving. Generally the first pass by a vehicle causes

the most damage, with continued passes in the same area over a season causing complete destruction of the above surface vegetation. After a period of inactivity or rest, over the winter or off season, the remaining roots rhizomes and bulbs allowed for relatively quick recovery of pioneer species. As the plants regrow there is increased stability of the dunes by the roots holding the soil together.

A document entitled “A Policy for Controlling Off-Road Vehicles in the Coastal Zone of South African Beaches” (Atkinson and Clark, 2003) made two important suggestions. Firstly it was recommended the prohibition of all non-essential vehicle use unless such use could be regulated in terms of a permit system. Secondly, it prohibits the use of all vehicles on bathing beaches and in ecologically sensitive areas. Examples of this have been seen in the Plettenberg Bay area where all vehicles are banned from beaches other than in the following exceptions:

1. Vehicles may only enter a beach area through a designated launch site. This area is deemed a sacrificial zone and vehicles are limited to this area only.
2. All other areas will only have access by emergency vehicles, ie life guards using quad bikes to travel between lifeguarding stations and National Sea Rescue using quad bikes or 4x4's for emergency situations. Any training sessions for the above mentioned faculties would require approval by local authorities.

This led to the development of seven principles (Celliers et al, 2004) that would immediately disqualify an area as a recreational use area.

1. Any area outside the hard sand of the intertidal zone
2. Fragile, rare, relict or vanishing vegetation
3. Wildlife sanctuaries and reserves
4. Unsuitable physical attributes of beach or natural barriers
5. Areas of fragile natural features or scientific interest
6. Areas of potential beach user conflict
7. Unidentified or unexplored key ecological processes.

The issue of recreation vehicle use is becoming more wide spread and is a consequence to the natural processes that occur on the beaches. The use of beach on a daily or weekly basis is considered to be insignificant compared to storm generated beach erosion. However, research has indicated that small and continues modifications to the physical environment can be significant on an exponential basis. This could render the beach more susceptible to erosion due to storms in the future. This has been seen in Plettenberg bay with storms having occurred over

the past years removing as much as two metres of sand depth on the beach where this traffic has been allowed. This is something that has not occurred in Plettenberg Bay's history. In the past three years it has occurred three times and each year causing greater damage. The most of the storm damage occurred where the sacrificial zone is situated. This is also due to the direction of the sea swell as it approaches the beach and its intensity. If this level of damage occurs in the sacrificial zone and only there, we have possibly succeeded in protecting the beaches, because if the entire beach had the same amount of traffic, the devastation would be astronomical.