

Shoreline Management Plan Ecological Processes

Human Impacts on Sandy Beach Environments Information Sheet, May 2007

How do humans affect the ecology of beaches?



Currumbin Creek

Sandy beaches are the most popular area of the seashore: more people use sandy beaches than any other type of marine or coastal habitat. The human use of beaches is increasing sharply, mainly as a consequence of burgeoning coastal population growth and an increasing number of visitors. Overtime, global climate change will raise sea levels and increase storminess and beaches will face stronger erosion and landward migration. Direct human impacts on beaches come from many sources, such as recreational activities, coastal development, beach cleaning and beach nourishment.

Erosion and changes to beach shape



Palm Beach, 1996

The profile of eroding beaches is frequently changed by importing sand from elsewhere ('nourishment') or shifting sand from the lower to the upper beach ('reprofiling'). This is common practice on the Gold Coast when our beaches face erosion from large storm events. Both activities aim to provide recreational amenity, safety and protection from storm events. They can also have impacts

on the beach fauna, potentially lowering the number and biodiversity of animals substantially. Natural storm events such as Tropical Cyclones or East Coast Lows may have similar impacts. Both forms of disturbance may have effects on the fauna but it is not known how long it takes for the environment to recover. Given the long term effects on beach ecology of constructed solutions to erosion (e.g. seawalls, groynes etc) beach nourishment is the preferred method to deal with erosion on Gold Coast beaches.

Mechanical beach cleaning methods



Beach sweeper

Mechanical cleaning of beaches provides a beach free of rubbish and natural debris to improve safety and aesthetic appeal for people. It also severely disrupts the natural ecological processes and modifies the function and structure of the beach ecosystem. Cleaning machines can kill organisms near the sand surface and can crush deeper-living invertebrates inside their burrows. Wrack (the build-up of debris consisting of seagrass/weed, marine organisms and other material deposited on the beach with the tides and waves), which is removed by beach cleaning, is a vital element in maintaining the ecology of sandy beaches. Wrack provides essential habitat for intertidal organisms and is an important food source for many animals. Wrack lines may also help to stabilise wind blown sand and start the growth of dunes. In essence, beach cleaning reduces the number and type of organisms living in the beach. These environmental impacts need to be considered along with public expectations of a safe and clean beach environment.

Human trampling

Dunes are highly sensitive to trampling associated with recreational activities. Gold Coast City Council spends

hundreds of thousands of dollars each year maintaining dedicated public access ways to direct beach users away from damaging the dune vegetation. This involves building new fences as the dunes build up and replacing older and broken fences. This is an expensive operation but essential for dealing with the very high levels of beach usage on the Gold Coast. Humans walking in the fragile dunes cause strong negative effects: a few passes can destroy the vegetation and the fauna. Also the physical characteristics of dune sands are changed through compaction, which influences soil moisture, run-off, erosion, vegetation and the micro-organisms. Many animals of the beach itself appear more resilient to human trampling, but this is poorly understood. Certainly, birds are highly sensitive to intense human use of beaches, and frequent disturbance of birds results in lower survival of chicks, reduced feeding times and ultimately population declines.



Pied Oystercatchers on Gold Coast sand dunes. Source: L. Upton

4WD vehicles

Next to the destruction of habitat through development, driving of 4WD vehicles is the most harmful of all human activities on sandy beaches. Cars dramatically change the physical properties of beaches leading to deep rutting. Fragile dune vegetation is easily destroyed by vehicles. Animals inhabiting beaches are highly susceptible to vehicle impacts: 4WDs can destroy nests and kill chicks of shorebirds, turtle hatchlings show lower survival rates on beaches open to 4WD vehicles, and ghost crabs are crushed in large numbers by night traffic. Many other smaller, buried invertebrates of the beach may also be impacted by beach traffic. A recent study on beaches in South-East Queensland showed that beaches open to 4WD vehicles have substantially fewer species of invertebrates and these occur at much reduced densities. Gold Coast beaches (with the exception of South Stradbroke Island) are not open to recreational four wheel driving. Only emergency vehicles or those related to beach dependent activities such as life saving, beach management and limited commercial fishing licenses are allowed on our beaches. There are designated vehicle access points that restrict the damage to dune vegetation. Vehicle speeds are restricted to ensure safety of other beach users.



4WD tracks on South Stradbroke Island

How do I get more information?

More information is available online at:

Gold Coast Shoreline Management Plan
www.griffith.edu.au/centre/gccm/gcsm

Or contact:

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Gold Coast's Seaway

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