

Fraser Island's significance for its intact Dingo population

This Backgrounder is taken from the National Heritage Nomination of Fraser Island for the significance and purity of its dingo population.

The dingo as a native species

The dingo, having existed in Australia for some 4000 years prior to European settlement, has interacted with indigenous animals and responded to and changed aspects of the environment, and thus is considered to be a native species (Corbett 1995a). This is reflected in the management objectives of many conservation agencies, which seek to conserve the dingo as part of Australia's natural heritage.

The most recent evidence from mitochondrial DNA (Savolainen et al. 2004) suggests that dingoes arrived on the continent around 5,000 years ago and possibly up to 10,800 years ago.

The dingo as a pure species

Research has clearly demonstrated that dingoes can be defined on the basis of skull morphology, body size, coat colour and some reproductive data. Although there is only one dingo species in Australia, there are statistically distinct subpopulations associated with tropical, desert and alpine climates and habitats in northern, central and south-eastern Australia respectively (Corbett 1995a). These subpopulations are sometimes referred to as tropical dingoes, desert dingoes and alpine dingoes.

The so-called pure dingo refers to the original dingo type first described about the time of European settlement of Australia, and may also represent the ancestral dingo type that was transported to Australia some 4000 years ago.

The dingo as a threatened species

The dingo *Canis lupus dingo* (Meyer 1793) is listed by The World Conservation Union (IUCN) as Vulnerable VU: A2e (Corbett 2004). The criteria for this classification is a reduction in population size of 30% over the last three generations, where the reduction or its causes may not have ceased based on the effects of hybridisation (with introduced domestic dogs); and the pure dingo is therefore considered to be facing a high risk of extinction in the wild.

According to Wilton (2001) the dingo in the wild is endangered due to hybridisation with domestic dogs. Wilton (in Dickmann and Lunney 2001) states that estimates of the proportion of hybrids in populations are as high as 78% in some areas, while Corbett

(2001) notes surveys in NSW, in which 100% of samples were hybrids. According to Corbett (2001) the dingo in the wild is endangered due to hybridisation with domestic dogs. Wilton (in Dickmann and Lunney 2001) states that estimates of the proportion of hybrids in populations are as high as 78% in some areas, while Corbett (2001) notes surveys in NSW, in which 100% of samples were hybrids. According to Corbett (2001) given the current rate of hybridisation it is likely that most populations of pure dingos will be extinct by the end of the 21st century, and Australia would then become a land of hybrids and feral dogs.

Wild dog control is a major cause of decline in pure dingoes. It is believed that 1080 baiting campaigns not only directly reduce local dingo populations, but also facilitate hybridisation with wild dogs. Fleming (2001) states that the behavioural differences between dingoes and domestic dogs are great enough to make it difficult for dogs to infiltrate dingo society and breed. Dingoes typically live in tight knit packs with one dominant breeding female, which breeds only once a year. Barry Oakman (pers. comm., March 2005), states that 1080 baiting appears to be breaking up packs, particularly through the loss of dominant animals. This loss of social cohesion encourages increased fecundity and a higher likelihood of dingoes breeding with immigrant domestic and particularly hybrid dogs. Furthermore evidence presented by Fleming et al. (1996) showed that aerial baiting was efficient in reducing wild-living dogs by 66-84%, however dog numbers returned to their initial abundance within one year. (Meek and Shields 2001). There are countless numbers of dogs in rural districts and these dogs flow into the dingoes domain after a 1080-poisoning event. Thus 1080 baiting causes the amount of hybrids to increase at the expense of dingoes (Barry Oakman pers. comm. March 2005).



The dingo as a keystone species

The importance of top-order predators in maintaining ecosystem function has been demonstrated in a number of marine and terrestrial systems (eg. Paine 1966, 1980; Ripple and Larsen 2000). By limiting populations of their prey and or subordinate competitors, top-order predators can modulate the diversity of a system, and may ultimately increase plant biomass and or animal biodiversity via a series of trophic links. Species which perform this function are known as keystone predators.

Where keystone predators have been removed from a system, the effects on species richness and abundance at lower trophic levels can be profound. Previously subordinate predators may increase unchecked, potentially decimating prey populations. Some herbivores may become over-abundant, leading to overgrazing on plant populations. Competitive relationships between prey species may be altered, and in some cases, these effects may ultimately lead to community-level trophic cascades in which plant biomass is redistributed throughout a system.

In Australia, a wealth of observational evidence, backed by a small but growing body of experimental work, indicates that the dingo fulfils the role of a keystone predator in many ecosystems (Corbett 1995a, Glen and Dickman 2005). One example concerns three relatively recent arrivals in Australia - the introduced red fox, feral cat and European rabbit - that have become major threats to biodiversity and agriculture (Rolls 1969). All three of these species interact with the dingo and with each other. Rabbits, in turn, are linked to plant biomass, vegetation structure and diversity through direct grazing effects. Thus, loss of dingo populations (via persecution or loss of habitat), could have impacts that reverberate through the trophic levels from predator to mesopredator to herbivore and ultimately to primary producers.

The dingo and Aborigines

The dingo plays a vital role in Aboriginal culture, both past and present, as illustrated by the following excerpts:

The Dreamtime is the spiritual past of the Aboriginal people. There is no one Dreaming which is accepted by all aboriginal people as the creation story, and this is recognised by different names and different stories in different areas.

From the Dreamtime comes the belief that the dingo can see into the supernatural, it is a watchdog, warning of the approach of evil spirits. In dog dreaming their ancestor was part human, part dingo from which all people came, this was the belief in some areas. Aboriginal stories of the mythical giant creatures of the Dreamtime are passed from

generation to generation and enshrine memories of the past (see Roughsey and Trezise 1973).

In many Dreamtime stories the ancestral beings metamorphosed during the story to become a natural landmark that may still be in existence today. Mountains and rock formations are often said to represent ancestral beings, and their existence is often explained by a Dreamtime story. Similarly, caves and hills, watercourses, lakes, trees and celestial formations also are often linked to Dreamtime stories. Dreaming stories also provide a set of rules governing and explaining behaviour and relationships amongst people, animals and with areas of land.

Fraser Island meets criteria

- (a) the dingo was important in the course or pattern of the history of Indigenous Australians. Dingoes were (and still are) an integral part of Aboriginal life and culture and helped to shape not only their way of life, but also their spiritual past. The dingo also has an importance in Australia's more recent history. Australian people have long been fascinated with this animal. The dingo holds an important place in Australia's identity.
- (b) The Fraser Island dingo population is regarded as the most pure strain of dingoes remaining in the world, and is an outstanding example of the tropical type dingo subpopulation.
- (c) The pure dingo is becoming increasingly rare in Australia (and the world) and is threatened with extinction. (d) While other temperate areas hold dingo populations, the Fraser Island dingo population is an outstanding example of the tropical type dingo subpopulation (Corbett 1995a).
- (e) The population size is large and self-sustaining and likely to remain so due to the management strategies of the Queensland National Parks and Wildlife Service.
- (f) The Fraser Island dingo population is regarded as the most pure strain of dingoes remaining in the world and stands as the Australian and world icon of the pure dingo. This icon is a major drawcard for the hundreds-of-thousands of Australian and overseas visitors to the island, annually.
- (g) The dingo has a significant place in Australian culture. Indigenous Australians have a special cultural and spiritual association with this animal.
- (h) The dingo also has a strong social cultural significance to Australians after European settlement.
- (i) The dingo has a vital place in Indigenous tradition. There is a continuing traditional association between Aboriginal people and dingoes throughout the region.