Part I

Setting the Scene

1 · *Anthropogenic Influences in Hluhluwe-iMfolozi Park: From Early Times to Recent Management*

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1.1 Introduction

Early humans (*Homo* spp.) have been an integral component of African savannas since their origination around 2 million years ago. These early humans influenced their environment by harvesting edible plants, hunting large animals, and at some stage through igniting fires, during the prolonged period while their tools remained constructed of stone. People with implements and weapons made of iron immigrated into southern Africa from the north nearly 2000 years ago, absorbing some of the hunter-gatherers, and displacing wild ungulates from where they grazed their herds of domestic sheep and cattle. Over 500 years ago, people in ships travelling from Europe towards East Asia set foot on South African shores. They established temporary settlements that soon became permanent and spread to become initially Dutch and later British colonies. Firearms were brought and an expanding trade in ivory and other wildlife products developed. Eventually the disappearance of the wild animals prompted legislation to establish 'game reserves' where hunting would be prohibited. Two of these game reserves became consolidated to form the Hluhluwe-iMfolozi Park (HiP).

The initial history of these game reserves was turbulent, because local white farmers fought to have them deproclaimed to eliminate

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the wildlife that formed a reservoir for cattle diseases. After a series of campaigns aimed at the eradication of tsetse flies (*Glossina* spp.), which transmitted blood parasites (*Trypanosoma* spp.) that infected cattle, a provincial authority was established to administer and eventually consolidate the game reserves. Management philosophies evolved from simply protecting the surviving wild animals to restoring the former fauna. This proved so successful that culling was introduced to alleviate perceived overgrazing. Eventually a more scientifically informed approach to management was adopted, aimed at fostering the ecological processes that had formerly operated on a vaster scale. HiP currently persists as a fenced island surrounded by increasingly dense human settlements.

It is the purpose of this chapter to describe these changing anthropogenic influences on the ecology of HiP as context for the chapters that follow. As will become evident, both the vegetation (Chapter 3) and wildlife (Chapter 4) have undergone continual flux. Expanding human populations and consequent land transformation in the surrounding region increasingly threaten conservation objectives within the protected area.

1.2 Archaeological History: Middle to Later Stone Age

Humans living as hunter-gatherers with tools made of stone were present in most parts of South Africa from far back in time, and had become anatomically modern around 120,000 years ago (Mitchell, 2002). Their presence in HiP is confirmed by stone implements or rock paintings recorded at more than 65 sites (Penner, 1970). It is uncertain until what time they inhabited the region that now includes HiP, but as recently as 1593 survivors of the wrecked Portuguese ship *Santo Alberto* met people armed with spears and arrows, who were not farmers, about 40 km northwest of HiP (Vernon, 2013). There are no historical reports of hunter-gatherers, i.e. people of Khoi-San ancestry, in this region of KwaZulu-Natal during the nineteenth century. Nevertheless, the click consonants that are typical of Khoi-San languages became incorporated into Zulu and related Nguni languages spoken by the people with Iron Age culture who displaced and absorbed these earlier inhabitants from around 500 AD.

It is unclear whether hunting by Stone Age people affected wildlife populations to any great extent. Humans were thinly scattered and their weapons were of short range with limited power. Probably more important ecologically would have been the practice of these people to use fire

to attract ungulates for hunting (Deacon and Deacon, 1999). As a consequence, humans would probably have changed the fire regime throughout the summer rainfall region of southern Africa and elsewhere (see Chapter 10). More-or-less random ignition by lightning in spring or early summer probably gave way to regular veld burning in autumn or winter, once the field layer became dry enough to burn. The changed fire regime probably commenced well before the appearance of anatomically modern humans in South Africa over 120,000 years ago and was perpetuated from then into modern times (Deacon and Deacon, 1999; Kingdon, 2003).

Some indication of the predominant animal species that Stone Age hunters killed is provided by archaeological excavations conducted at Sibudu Cave, located alongside the Tongati river approximately 150 km south of HiP (Plug, 2004; Clark and Plug, 2008). Sedimentary layers there span the Middle Stone Age from 77,000 to 38,000 years ago as well as more recent layers from 900 to 1000 AD, and contain abundant bones of large mammals, particularly Burchell's zebra (*Equus burchelli*), hartebeest (*Alcelaphus* sp.), African buffalo (*Syncerus caffer*) and the extinct giant buffalo (*Pelerovis antiquus*) (see Chapter 4 for a detailed account). The people inhabiting this cave gathered plant material for bedding as well as for food, and thus had impacts on vegetation besides their use of fire (Wadley *et al*., 2011).

1.3 Early to Late Iron Age

Early farmers with spears, axes, and hoes made of iron arrived in South Africa from the north nearly 2000 years ago (Hall, 1987; Huffman, 2007). Initially, their geographical distribution was confined to savanna and forest regions where fuel wood for their iron smelters was available (Feely, 2004). Two periods associated with metal smelting have been distinguished in South Africa as the Early Iron Age and the Late Iron Age. The Early Iron Age commenced around 300 AD and ended during the eleventh century. Settlements were clustered into villages, separated by half a kilometre or more, usually occupied for two or more generations, even for a century or longer (Maggs, 1984; Hall, 1987; Huffman, 2007). Indeed, the KwaGandaganda site near present Durban was continuously occupied for four centuries (Whitelaw, 1994). Besides constructing dwellings, clearing fields, and grazing livestock (initially sheep and soon after goats and cattle as well), these Iron Age people needed to gather huge amounts of wood for smelting iron ore (Feely, 1980).

Some of the earliest Iron Age sites, dated to the third–fifth centuries AD, occur along the coastal strip of KwaZulu-Natal, from the northern border with Mozambique southward to near the Mzimkhulu river mouth (Maggs, 1984). One example exists near Lake Mphangazi north of St Lucia estuary about 30 km east of HiP (Hall, 1981). Between the sixth and eighth centuries AD, farming settlements in KwaZulu-Natal expanded inland along the entrenched valleys of perennial streams (Maggs, 1984). In HiP, a seventh-century site from this period has been identified close to the Hluhluwe river (Hall, 1979a,b, 1981). Two other Early Iron Age sites have been found along the southern bank of the Black Mfolozi river (J. M. Feely, unpublished records, KwaZulu-Natal Museum). All three of these sites are located on fertile, valley bottom soils close to rivers, as is typical of this period elsewhere in south-eastern Africa (Hall, 1981; Maggs, 1984).

The Early Iron Age was succeeded by the Late Iron Age during the eleventh century AD (Maggs, 1984; Huffman, 2007), probably indicating the arrival of new settlers with a distinct culture. No sites between the tenth and fourteenth centuries have been firmly identified in KwaZulu-Natal, suggesting that farming people may have moved away from this region in response to unfavourable climatic conditions during this period (Prins, 1996). An archaeological survey conducted by Penner identified 134 sites representing the Late Iron Age within HiP, mapped by Hall (1979a,b; Figure 1.1). Artefacts from this period are relatively more obvious than those at sites from earlier in the Iron Age, which may have been buried by soil and revealed only after subsequent erosion or the activities of animals (J. M. Feely, personal observation, 1973–1982). Hence, mapped Late Iron Age sites are probably biased towards the youngest sites from the eighteenth and nineteenth centuries. The most important change occurring in KwaZulu-Natal during the Late Iron Age was in the size and location pattern of settlements. They were generally small and occupied by a single family for perhaps only one generation and were situated on the slopes and crests of hills and ridges (Maggs, 1984). The change in the location of settlements probably reflects Late Iron Age farmers wanting to avoid increased parasite infection risks for their cattle near rivers (Feely, 2004). Within HiP, Late Iron Age sites are commonly present near the 280-m contour, adjoining dolerite outcrops (Hall, 1981). The numerous Zulu place names for every hill, stream, or other place of note within HiP (see the Appendix in the Preface) attest to how thoroughly settled or traversed the region was by these Late Iron Age inhabitants.

The Iron Age peoples harvested wood as fuel for cooking, smelting, and working metals, mainly iron, and for the construction of dwellings,

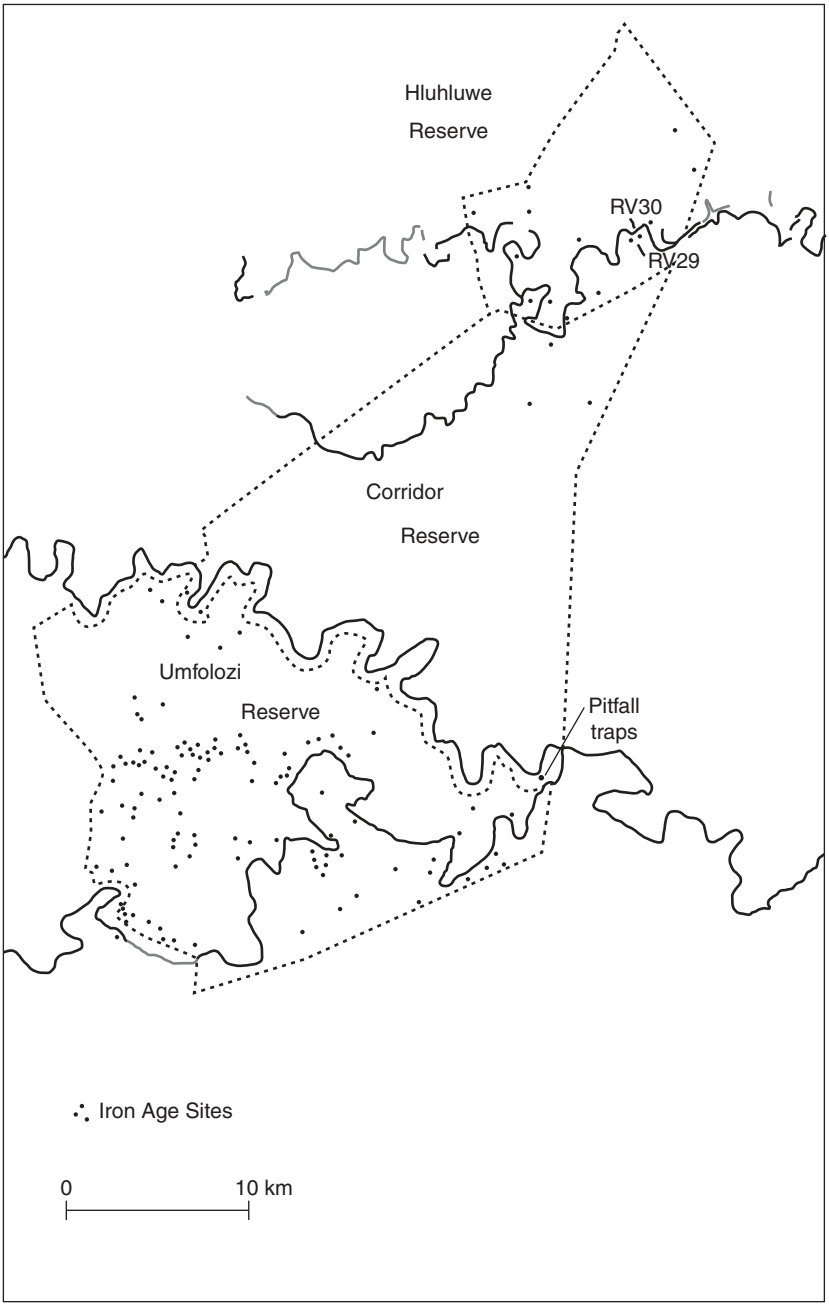

Figure 1.1 Positions of known Iron Age sites within HiP. RV29 and RV30 refer to two sites in the Hluhluwe river valley that were originally recorded by Penner (1970) and investigated and described in detail by Hall (1979b). The pitfall traps refer to a third site that has been investigated in detail by Hall (1977). It consists of a line of pitfall traps which lie near the confluence of the two Mfolozi rivers. (Reprinted with permission from Ezemvelo KZN Wildlife; Hall, 1979b.)

as well as grass for thatching (Maggs, 1984; Hall, 1987; Huffman, 2007). Staple crops grown were the grasses sorghum (*Sorghum bicolor*) and pearl millet (*Pennisetum glaucum*), and after the mid-seventeenth century also maize (*Zea mays*). Accumulations of cattle dung within the livestock enclosures and ash from cooking fires enriched mineral nutrients in soils around these settlements. Early African farmers would also have gathered plants for medicines, fruits, bark, and other natural resources, as rural people do today (van Wyk and Gericke, 2000). Fruits of marula trees (*Sclerocarya birrea*) were evidently esteemed as early as the first millennium AD in the nearby Thukela valley (Maggs, 1984). Pitfall traps for the hunting of large game remain evident near the confluence of the Mfolozi rivers within HiP (Figure 1.1). These probably date to the reign of King Shaka in the 1820s (Hall, 1977).

Among the Late Iron Age sites mapped by Penner (1970), 15% showed signs of being used either for smelting iron ore (Hall, 1980) or as forges for iron-working (Hall, 1979b, 1981; Huffman, 2007; J. M. Feely, unpublished records, KwaZulu-Natal Museum). Hardwoods such as tamboti (*Spirostachys africana*) and red bushwillow (*Combretum apiculatum*) would have been selectively felled to produce charcoal for smelting and forging. At a smelting site near the Hluhluwe river in HiP, clearance apparently initiated a succession over 200–300 years towards domination by magic guarri (*Euclea divinorum*) by the late 1970s (Hall, 1980, 1981, 1984).

Grazing and browsing by herds of domestic livestock kept by the Iron Age settlers would have had additional impacts on vegetation (Hall, 1987; Huffman, 2007). Besides selective grazing and browsing in the vicinity of settlements, a wider impact would have been the burning, in most years, of the grass layer (Hall, 1981). Burning would probably have been carried out in autumn or winter, once grasses were dry enough to burn. This would have reduced the incidence of lightning-caused fires during the following spring and early summer.

Natural vegetation would have been cleared for the cultivation of grain crops, although such fields are no longer evident (Hall, 1979b, 1981, 1984; Feely, 1980). Dwelling sites are indicated by the remains of pottery and grinding stones. Circular depressions in the ground, 1–2 m in diameter, indicate collapsed grain pits. These were dug beneath cattle kraals centrally placed in the dwelling area. Trees such as marula, jacket-plum (*Pappea capensis*), weeping boer-bean (*Schotia brachypetala*) and buffalo thorn (*Ziziphus mucronata*) left to provide fruit or shade, or for spiritual reasons, may still remain standing (Feely, 1980).

In Mfolozi, former Iron Age settlements show a distinct grass community characterized by bushveld signal grass (*Urochloa mosambicensis*) on the locally compacted soils (Hall, 1981, 1984; J. M. Feely, personal observation, 1973–1982). These sites are favoured by wild grazers including white rhinos (see also Chapter 6). Many of these sites could represent homesteads destroyed a century earlier, in 1883, during the southward invasion by Mandlakazi (Ndwandwe) people, under Zibhebhu kaMaphitha, from north of the Black Mfolozi river (Laband, 1995).

1.4 Early Historical Period 1790–1887

The historical record spans the last part of the Late Iron Age. The early history of KwaZulu-Natal has been recorded beginning sketchily from the sixteenth century in the form of reports by survivors of shipwrecks (Vernon, 2013), and expanded through the eighteenth to nineteenth centuries following the arrival of white explorers, hunters and later settlers. Towards the end of the eighteenth century, the region of KwaZulu-Natal north of the Thukela river, labelled Zululand, was partitioned among distinct chiefdoms who warred with one another over land and livestock. The territory north of the Black Mfolozi and combined Mfolozi rivers was the domain of the Ndwandwe, while the Mthethwa ruled to the south (Laband, 1995; Wright, 2008). The Zulu were a small group under the hegemony of the Mthethwa, occupying land to the west of current-day HiP in the basin of the White Mfolozi river. By the early nineteenth century, the Mthethwa had largely abandoned the low-lying land between the Mfolozi rivers, due either to the incidence of nagana (trypanosomiasis), transmitted by tsetse flies to their cattle (McCracken, 2008), or to tensions with the Ndwandwe (Wright, 2008). At that time the Mthethwa leader, Dingiswayo kaJobe, occupied a site south of the White Mfolozi river and east of uDadethu ('our sister') pan. He is said to have named this feature for his sister after she was killed by a crocodile while fetching water there (Magqubu Ntombela, personal communication to J. M. Feely in 1960). This would have happened before Dingiswayo's death in 1817 (Laband, 1995).

The Mthethwa and other groups became consolidated into the Zulu Kingdom after Shaka rose to power in 1819. Shaka's military forces drove out the remaining occupants between the Mfolozi rivers, leaving behind broken pottery and grinding stones. According to oral tradition, the hunting of wild animals thereafter became restricted seasonally. Species such as buffalo, greater kudu (*Tragelaphus strepsiceros*) and waterbuck (*Kobus*

ellipsiprymnus) were largely protected, and white rhino (*Ceratotherum simum*) were not regarded as edible (McCracken, 2008). Following Shaka's conquest of the Mthethwa, a great game drive took place between the Mfolozi rivers, with animals funnelled into concealed pits dug just above the confluence (Hall, 1977). Elephant hunts directed from uNqolothi hill overlooking the White Mfolozi river have been described (McCracken, 2008), although Shaka's royal hunting ground is reputed to have been in the Mbhekamuzi Valley, to the west of the present-day park boundary (Vincent, 1970). The killing of wild animals was restricted mainly to intermittent ceremonial hunts, such as 'the washing of the spears' following the death of a chief. Possibly the last such hunt took place in the Somkhele area a little to the east of HiP's present Nyalazi Gate in 1955, after the death of Chief Matubatuba. Some 300 men armed with spears and accompanied by many dogs took part (J. M. Feely, personal observation, May 1955). Killing was accomplished by spear, snare or pit trap before guns became available (McCracken, 2008).

During Shaka's rule, the first white settlers arrived at Port Natal (later renamed Durban), and were granted permission by Shaka to stay. In 1824, Messrs Farewell and Fynn met with Shaka, requesting permission to trade with his people in ivory (Laband, 1995). Trading in wildlife products was already ongoing by that time, with ivory being exported through Delagoa Bay (now known as Maputo) in southern Mozambique. Fynn remarked on the abundance of game in the Zululand region coexisting alongside the people (Fynn, 1950). Elephant and buffalo were targeted especially by the white hunters and the African hunters whom they employed. By 1832, hunting had greatly reduced the populations of these and other big game around Port Natal, but wildlife still abounded to the north of the Thukela river (Herman and Kirby, 1970; McCracken, 2008). Delegorgue described seeing buffalo, greater kudu, eland (*Taurotragus oryx*) and zebra, along with white rhino, elephant (*Loxodonta africana*), wild dog (*Lycaon pictus*), and spotted hyena (*Crocuta crocuta*) between the White and the Black Mfolozi rivers while hunting there in 1840 (Delegorgue, 1847). This area was apparently free of settlements at that time. Hunting expanded from the 1830s onwards, but wild ungulates remained abundant in wooded lowlands where malaria and tsetse fly inhibited occupation by people and their livestock into the 1850s.

Dutch-speaking farmers who had trekked from the Cape to avoid British rule (Boer Voortrekkers) had established a republic called Natalia at Port Natal in 1839. They fought the British in the Battle of Congella in 1840. In 1843, the area to the south of the Thukela river as far as

the Mzimkhulu river was formally annexed by Britain and became the colony of Natal in May 1844 (Laband, 1995). Until 1856 it was administered from the Cape Colony. The area north of the Thukela river remained the independent kingdom of Zululand under Shaka's successors, the kings Dingane, Mpande, and Cetshwayo.

During the 1870s, guns became more widely available and the abundance of wildlife declined due to the escalation in hunting (McCracken, 2008). The decimation of cattle by an outbreak of lung-sickness in 1874/5 (Laband, 1995) also forced people to rely more on wild ungulates for food. Ivory exports from Delagoa Bay and later Durban peaked in 1854 with an annual total of 85,000 kg and then declined during the 1880s. Hide exports from Durban peaked in 1872, representing 417,000 animals during that year (McCracken, 2008), but ceased in 1885. A substantial portion of these hides would have originated from inland parts of southern Africa rather than from Zululand (Boshoff and Kerley, 2013). Rhino horn exports peaked in 1884 at 679 horns, but declined after 1888 (McCracken, 2008).

1.5 Initiation of Game Protection: 1887–1897

The Anglo-Zulu war of 1879 ended with British victory and led eventually to the annexation of most of Zululand under British colonial rule in 1887 (Laband, 1995). The first game law came into effect in Natal in 1884 and was extended to Zululand in 1890 (Brooks, 2001). Wild animals were categorized into species designated as 'royal game', given maximum protection (e.g. black (*Diceros bicornis*) and white rhino, elephant, buffalo, kudu), 'closed season' (e.g. bushbuck (*Tragelaphus scriptus*), blue duiker (*Cephalophus monticola*), oribi (*Ourebia ourebi*), and steenbuck (*Raphicerus campestris*)), and 'not listed' (e.g. red duiker (*Cephalophus natalensis*) and mountain reedbuck (*Redunca fulvorufula*)) (McCracken, 2008). In subsequent proclamations (1893, 1897) many species were downgraded from 'royal game' to 'closed season', including black and white rhino, which reflected the growing concerns with the disease nagana killing large numbers of cattle (Brooks, 2001; McCracken, 2008).

The Zulu people recognized the association between infection of their cattle with nagana, or animal African trypanosomiasis, and contacts with wild ungulates. They attributed an increase in the incidence of nagana to an increase in large game brought about by the protection afforded by the game laws (Pringle, 1982). In 1894 Dr David Bruce, who was stationed in Ubombo in northern Zululand, experimentally confirmed the role of the