The Consequences for Wilderness Conservation in the Development of the National Park System in Tasmania, Australia

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Abstract
Statewide extents of wilderness are mapped and calculated for four historic time-slices that reflect major periods of national park development in Tasmania. The representation of wilderness in the Tasmanian reserve system is calculated for 1937, 1970 and 1992. National parks were established in wilderness areas during all major periods of reserve development. While the total core wilderness area in Tasmania decreased by 63% between 1916 and 1992, the core wilderness area captured in the reserve system increased by 618%, with the largest increase being in the post-1970 period. However, those parks established prior to 1970 suffered an enormous attrition of their wilderness resource. This reflects management policies inconsistent with the maintenance of wilderness during early periods of national park development. The huge increase in wilderness area captured in the reserve system after 1970 suggests that wilderness conservation only became a significant motive behind the expansion of the reserve system in the later decades of the twentieth century.

KEY WORDS: wilderness; Tasmania; national parks; conservation; historic wilderness maps

Introduction
Wilderness is a rapidly diminishing resource, and its preservation is heavily dependent on systems of secure reserves, or natural defences such as remoteness or lack of resources. Although the conservation of wilderness has been a major driving force in the promotion and development of national parks and reserves in many areas of the world (Runte, 1979; Nash, 1982; Oelschlaeger, 1991; Miles, 1995; Sellars, 1997), other reasons such as the preservation of scenery or the protection of fragile environments have also been used to justify the creation of such areas. This study seeks to measure the extent of what can be defined as wilderness in Tasmanian national parks through time and to demonstrate whether the presence of wilderness was a major motive in the creation of the Tasmanian national park system. This is achieved by mapping and calculating the historic extents of wilderness in Tasmania for the beginning and end of each period under investigation (1916, 1937, 1970 and 1992); determining the extent of wilderness in national parks and equivalent reserves proclaimed over the three historic periods of 1916–1937, 1938–1970 and 1971–1992, and
assessing the relative significance of wilderness conservation in the development of the national park system.

No other studies have reconstructed historic patterns of wilderness and assessed representations of the physical resource of wilderness in national parks and equivalent reserves over time. Further, there is no evidence that wilderness conservation was a significant motive for the creation of early national parks in Australia (Mosley, 1966a; 1978; Frawley, 1988). This is unlike the situation in the United States, where the concept of wilderness and its preservation was an important factor in the creation of early national parks (Runte, 1976; 1979; Nash, 1982; Oelschlaeger, 1991; Miles, 1995; Sellars, 1997).

The time-slices used in this study reflect periods of growth in the Tasmanian reserve system. The first national parks in Tasmania were proclaimed from 1916 under the Scenery Preservation Act 1915. An initial flurry of reservation activity to 1922 was followed by a long period of stasis with few additions to the reserve system until the end of the 1930s. From 1937 there was a period of growth in the reserve system, corresponding to the appointment of Colin Pitt, an enthusiastic individual concerned with the protection of the environment, as Surveyor-General of Tasmania and Chairman of the Scenery Preservation Board (the body responsible for managing national parks and reserves at this time). Reservation activity again dropped off from the late 1940s to the late 1960s, with occasional additions to the reserve system during this time. Conflicts over the conservation or development of southwest Tasmania during the 1960s led to the proclamation of a new National Parks and Wildlife Act in 1970 and a new authority (the National Parks and Wildlife Service) to manage reserves. The period from 1970 was marked by a massive expansion of the reserve system, culminating in the creation of the Tasmanian Wilderness World Heritage Area and its subsequent additions in the later decades of the twentieth century (Figure 1).

The idea of wilderness has historically had many different meanings, ranging from those derived from classical and biblical traditions to those reflecting contemporary eco-philosophies or postmodern critiques (Nash, 1982; Oelschlaeger, 1991; Cosgrove, 1995; Gill, 1999). The wilderness idea is also personal and experiential, with meanings varying between individuals or in different social groups or cultural settings (Cosgrove, 1995; Cronon, 1995). It is, however, widely advocated that the modern concept of wilderness has its roots in the nineteenth century romantic movement (Nash, 1982; Oelschlaeger, 1991). Emerging against the growth of industrialism and the powerful world view of modernism, the romantic's ideals were expressed through philosophy, art and literature. To the romantics, nature was viewed in aesthetic terms, varying from ideas of beauty to sublimity, where pleasure lay in its disordered and chaotic character (Williams, 1993). Human-centred, ordered landscapes and the industrial machine were rejected as distasteful and a new focus was placed on wild and natural landscapes. Nature was viewed not just in instrumental terms as fodder for the industrial machine but as having intrinsic values independent of human use.

In recent geographical and environmental discourses there has been considerable debate and criticism of the wilderness concept that evolved from these romantic traditions. It has been argued that this wilderness idea is part of a broader Western view of nature, which is inescapably linked to colonial legacies and notions of empire, gender and race relations and social order (for a more detailed discussion of these ideas, refer to Cosgrove, 1995 and Gill, 1999). In particular, it has been suggested that in the modern Western wilderness idea, nature and culture are separated — wilderness is distanced from civilisation. One consequence of this concept of wilderness, where people apparently have no physical place, is that indigenous people may be marginalised and dispossessed. This debate is gaining increasing attention by some involved in critically examining conservation movements and the dominant romantic idea of wilderness (for example, Cosgrove, 1995; Spence, 1996; Gill, 1999; Mulligan, 2001).
Translating the notion of wilderness to a mapped and measured spatial entity thus poses numerous difficulties, derived from a swath of factors including philosophical standpoints, variations in personal perception of wilderness, differences between popular, scientific and official views of wilderness, and purpose of study. Some areas described as wilderness are proclaimed as such by advocates of the protection of other natural values in order to aid their political debates, since wilderness is a popular and emotive idea. The political nature of conflicts surrounding the preservation of wilderness has necessitated the delineation and calculation of wilderness areas to facilitate wilderness debates and achieve particular conservation and management aims.

That the wilderness idea has been highly politicised is evidenced in the United States, where it has been extensively used in resource debates between different interest groups. For example, in an attempt to block proposals from the National Parks Service for new parks in the 1920s, the Forest Service (unsuccessfully) proposed a new land classification which included 'wilderness areas' and 'semi-wilderness areas', in which varying degrees of resource extraction and development would be permitted, thus offering little real protection (Miles, 1995). Continued conflicts and pressure from conservationists ultimately led to wilderness areas being officially recognised in the law through the creation of the United States Wilderness Act 1964.
Wilderness debates in Australia have been as political as those in the United States, as any review of those Australian States that have created legislation to specifically enable wilderness conservation will show, such as New South Wales (1987), Victoria (1975 and 1992) and South Australia (1992).

Methods of wilderness definition
In Tasmania, as in many other areas of the world, national parks are large reserves primarily dedicated to nature conservation and afforded the highest level of security of land tenure within the reserve system. ‘Equivalent reserves’ in this study refers to other large reserves (>2000 ha) dedicated to nature conservation and having the same level of security of land tenure as national parks under the Tasmanian National Parks and Wildlife Act 1970 (these constitute State Reserves and Nature Reserves). Unlike the situation in some other States of Australia, there is no official classification for wilderness areas in the Tasmanian reserve system.

In the New South Wales, Victorian and South Australian Wilderness Acts, wilderness has been legally recognised as an identifiable physical entity, defined by particular attributes or qualities. However, the ways in which these wilderness areas are specifically identified, delineated and mapped tend to be vague. For example, in order to qualify as wilderness in the New South Wales and Victorian Acts, land must be substantially unmodified by European settlement (or be capable of being restored), must be of a sufficient size for its maintenance to be feasible, and be capable of providing opportunities for solitude and appropriate self-reliant recreation. However, no parameters are provided as to what constitutes ‘substantially unmodified’ or ‘sufficient size’, making the apparently explicit criteria open to varied interpretation and ensuring that wilderness areas are difficult to identify and map.

The State of Tasmania has incurred an enormous loss of its area of wilderness since European settlement. While recognising the problems associated with wilderness mapping, quantifying the extent of wilderness loss and capture of wilderness in the Tasmanian reserve system over time necessitates the construction of historic wilderness maps for the State. This requires a method that is replicable over time and applicable to the available historic data.

While modern definitions and concepts of wilderness vary, in most recent wilderness inventories there is broad agreement that wilderness areas are natural areas, free from significant disturbance by non-indigenous peoples (Council of Nature Conservation Ministers, 1985; Hall, 1987; Land Conservation Council, 1990; Lesslie, 1991). While naturalness, or primitiveness, and remoteness from settlement, disturbance and access comprise inherent wilderness attributes, the actual methods used to delimit wilderness areas have varied between studies.

Several wilderness inventories have been conducted in Australia from the mid-1970s, the earliest of which drew on American wilderness inventory procedures (Hall, 1987; Helman et al., 1976). The first large-scale study of wilderness was undertaken in eastern New South Wales and southeastern Victoria. The study defined wilderness as having a minimum core area of 25 000 ha, free of major indentation and at least 10 km in width, surrounded by a buffer zone of about 25 000 ha (Helman et al., 1976). Wilderness areas were plotted using satellite images and topographic maps, according to the absence of human disturbances (including vehicular roads, clearings and transmission lines). While a number of large wilderness areas were identified, this procedure has been criticised for its lack of consistent method, with resultant variations in the minimum distances of core wilderness areas from vehicular roads/tracks and other human disturbances, and in the width of wilderness buffer zones (Hall, 1987).

Other early studies in Queensland (Stanton and Morgan, 1977), Victoria (Feller et al., 1979) and Tasmania (Russell et al., 1979) loosely followed these procedures in identifying wilderness areas. These studies similarly have been criticised for their lack of consistency of approach (Kirkpatrick, 1979; Kirkpatrick and Haney, 1980). Using concepts of remoteness and primitiveness
as essential wilderness attributes. Kirkpatrick (1979) developed a wilderness quantification procedure in Tasmania that was designed to be a replicable method for delineating wilderness areas. Remoteness from access and environmental disturbances from modern technological society was measured from the nearest access point for mechanised vehicles, and primitiveness as the arc of visibility and distance from any disturbance. Wilderness core areas were delimited by the distance travelled by walking a minimum half day (four hours) from access points and a minimum distance from disturbances, required to negate negative impacts on the wilderness experiences of users. Although the distance travelled on foot may vary according to vegetation type or topography, 5 km in four hours was considered the minimum walking distance, based on track estimates provided by the Parks and Wildlife Service, as well as the author’s personal experience (Kirkpatrick, 1979).

These criteria resulted in wilderness core areas being delimited as a minimum of 5 km from mechanised vehicle access points, surrounded by a buffer zone that extends from the core to the points of access. ‘Mechanised vehicles’ did not include boats, with the exception of artificial landing points, or aircraft. Including the latter would essentially mean that there is no wilderness at all in Tasmania (or elsewhere).

The extent of helicopter use over the Tasmanian Wilderness World Heritage Area is currently the subject of much debate in the State.

Other wilderness inventories in Tasmania have used alternative minimum distances from access points for delineating wilderness areas. Hawes and Henley (1985), for example, identified wilderness in Tasmania as land whose direct remoteness was 8 km from major intrusions. However, their initial assumptions in defining and assessing wilderness, and the use of an 8 km distance as a measure of direct remoteness, have been criticised as being arbitrary (Hall, 1987). The 5 km distance used by Kirkpatrick (1979) could also be criticised as being arbitrary; however, the figure was derived from actual minimum walking distances and visibility.

The concepts of remoteness and primitiveness that comprised essential wilderness attributes in Kirkpatrick’s study (1979) formed the basis for a ‘wilderness continuum concept’, used by the National Wilderness Inventory (NWI). This inventory scaled wilderness areas according to the criteria: remoteness from settlement; remoteness from access; aesthetic primitiveness, and biophysical primitiveness (Lesslie and Taylor, 1983; Lesslie and Taylor, 1985; Lesslie et al., 1988a,b; 1993; Lesslie, 1991). Wilderness areas were rated according to their quality on a relative scale from low to high. While this procedure allows greater flexibility in interpretation of wilderness areas, it avoids the issue of delimiting core wilderness areas and leaves the question of where wilderness areas begin and end open to varied interpretation. Some of the methods used to map wilderness quality also require data that are difficult to access and interpret historically.

In the context of this study of Tasmania, the methods selected to delineate and calculate wilderness areas are consistent with those used in similar mapping exercises, most of which have been based on the underlying premises of remoteness and primitiveness. In the present study, wilderness areas were mapped using the methods developed by Kirkpatrick (1979). Moreover, these methods are replicable over time, having been used previously to map wilderness areas in Tasmania (Kirkpatrick, 1979; Kirkpatrick and Haney, 1980), and are applicable to the nature of the available historic data. Wilderness core areas were mapped as areas more than 5 km from access points for mechanised vehicles, surrounded by a buffer zone of 5 km in width. As has been the case in all wilderness inventories, disturbances resulting from modern technological society were excluded from wilderness core and buffer zone areas. These include artificial constructions, such as dams and associated hydroelectric developments, mining activities and other disturbances such as hotels and tourist developments. Any roads suitable for mechanised vehicles, including fire access trails, were considered to have the potential to significantly reduce wilderness values and were also excluded.
from wilderness zones. However, walking tracks and huts were considered acceptable human artefacts in wilderness areas — this is consistent with methods used in most wilderness inventories. Coastal areas were included in wilderness zones, except where there were human-constructed access points such as wharves.

Archival and modern maps showing the statewide extent of settlement, major and minor vehicular roads, and walking tracks, were used as the data sources for the wilderness mapping exercise, which required a high level of mapping detail. Where suitable maps were not published in the exact years under study, maps published in the closest year were used.

Four maps were created to show the extent of wilderness core areas and buffer zones at the beginning and end of each major period of national park development; 1916, 1937, 1970 and 1992 (Figures 2 to 5). The maps encompass the mainland of Tasmania and minor offshore islands. Bass Strait islands (including Flinders, King and Cape Barren Islands) were not included due to a lack of relevant mapped data in the earlier time periods. Historic reserve boundaries were overlain on the constructed historic wilderness maps, and the extent of core wilderness and buffer zone wilderness in reserves was delimited and areas calculated for the end of each time period.

The mapped data sources used were:


*Visitors Map of Tasmania*, 1994, Tasmania Department of Tourism, Sport and Recreation and Land Information Bureau, Department of Environment and Land Management. Scale — 1:500 000.

**Results**

**Historic statewide extents of wilderness, 1916–1992**

The statewide area of wilderness before European settlement was 6 833 100 ha (encompassing the entire area of Tasmania, with the exception of Bass Strait islands). By 1916, this was reduced to a core of approximately 2 941 200 ha — a wilderness loss of 57% from the original pre-European area (Table 1). Over one half of the core wilderness in the State in 1916 encompassed a large area of southwest and central-west Tasmania (Figure 2). Three large fragmented blocks occurred in the northwest, with ten substantial blocks of wilderness in the central-east coast and northeastern sectors of the State. Those areas of Tasmania most affected by wilderness loss were the southeast, Midlands and northern

<table>
<thead>
<tr>
<th>Year</th>
<th>Statewide area (ha)</th>
<th>Loss from pre-European area (ha)</th>
<th>% loss from pre-European area</th>
</tr>
</thead>
<tbody>
<tr>
<td>1916</td>
<td>6 833 100</td>
<td>3 891 900</td>
<td>57.0</td>
</tr>
<tr>
<td>1937</td>
<td>2 941 200</td>
<td>4 099 700</td>
<td>60.0</td>
</tr>
<tr>
<td>1970</td>
<td>1 924 000</td>
<td>4 909 100</td>
<td>71.8</td>
</tr>
<tr>
<td>1992</td>
<td>1 098 100</td>
<td>5 735 000</td>
<td>83.9</td>
</tr>
</tbody>
</table>

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coastal areas, reflecting patterns of settlement and land use in the more accessible parts of the State after more than a century of occupation.

In the period between 1916 and 1937, the statewide loss of wilderness area was relatively small (7%), with approximately 2,733,400 ha of core wilderness (40% of the pre-European area) remaining in 1937 (Table I; Table II). In this period, the large core wilderness area of south-west and central-west Tasmania was split by the construction of the Lyell Highway to link the east and west coasts, and new access roads across the Central Plateau area (Figure 3). With the exception of small reductions to wilderness areas on the Freycinet Peninsula (central-east coast) and around the northeast coast, all other wilderness areas remained the same between 1916 and 1937.

Between 1938 and 1970, there was a 30% decrease in the statewide wilderness area, with only 1,924,000 ha, or 28% of the pre-European

<table>
<thead>
<tr>
<th>Wilderness loss (ha)</th>
<th>% loss over period</th>
</tr>
</thead>
<tbody>
<tr>
<td>1916–1937</td>
<td>207,800</td>
</tr>
<tr>
<td>1938–1970</td>
<td>809,400</td>
</tr>
<tr>
<td>1971–1992</td>
<td>825,900</td>
</tr>
</tbody>
</table>

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area of core wilderness remaining in 1970 (Table I; Table II). Three wilderness areas disappeared completely during this period (two in the northeast and one in the northwest) and, with the exception of two, all other wilderness cores were reduced in size (Figure 4). The largest of the northwest wilderness areas expanded and a wilderness area re-emerged on the west coast, due to the abandoning of old mines and the roads that served these areas. It is widely held in official definitions of wilderness that it is possible for land to return to wilderness or be restored to wilderness after being altered by human activities. This is the case, for example, in both the NSW Wilderness Act (1987) and the Victorian National Parks and Wilderness Acts (1975 and 1992). However, this a topic of debate, with some suggesting that a return to 'real' wilderness is not possible (Ouderkirk, 1992).

By 1970, the largest remaining wilderness areas were in the western and southwestern parts of the State, although these had been increasingly fragmented and reduced in area over time. The remaining wilderness areas in the east of the State had been significantly reduced in size and become increasingly isolated.

The greatest loss of wilderness occurred between 1971 and 1992. By 1992, the Statewide area of wilderness core was 1 098 100 ha, a loss of 43% over the period and an 84% reduction in the pre-European area of wilderness (Table I; Table II). During this period, there was sig-
significant attrition of the southwest wilderness core, with the flooding of Lake Pedder and associated dam and road construction works for hydroelectric development (Figure 5). The northwest wilderness areas were reduced in size and, with the exception of small wilderness areas on the Freycinet Peninsula, Maria Island and on the northeast coast at Mt William, all wilderness areas in the east of the State had disappeared by 1992.

**Representation of wilderness in reserves**

By the end of the early period (1937), there were three large national parks proclaimed in the State, all of which were established in wilderness areas (Figure 3). A total of 138,380 ha of core wilderness and 5200 ha of wilderness buffer zone was captured in the reserve system, with a wilderness core:buffer zone ratio in reserves of 26.6:1 (Table III). The total land area reserved in national parks and equivalent large reserves (>2000 ha) during this period was 143,968 ha. Of this area, 96.0% was in wilderness core areas, 3.6% in wilderness buffer zone areas and 0.4% in non-wilderness. While these early reserves were established in wilderness areas, the total Statewide extent of core wilderness in 1937 was nearly three million hectares, with only 5.1% of this being represented in the reserve system (Table III).

At the end of the middle period (1970), five additional national parks had been established

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in the State, and three equivalent large reserves over 2000 ha in area (Figure 4). A total of 351 130 ha of core wilderness and 53 210 ha of buffer zone wilderness was captured in the reserve system in 1970, with a wilderness core: buffer zone ratio in reserves of 6.6:1 (Table III).

With the exception of Rocky Cape National Park on the northwest coast, all large reserves established during this period were in areas of wilderness. In 1970, the total area of the State reserved was 416 627 ha, with 84.2% of this in wilderness core areas, 12.7% in wilderness...
buffer zone areas and 3.1% in non-wilderness. While the total Statewide area of wilderness core was reduced by over 800,000 ha between 1937 and 1970, the representation of core wilderness in reserves increased from 5.1% in 1937 to 18.3% in 1970 (Table III).

By the end of the late period (1992), the reserve system had expanded considerably to cover 1,578,919 ha of the State (national parks and equivalent large reserves >2000 ha in area). A large share of this expansion was in the creation of the Tasmanian Wilderness World Heritage Area in the southwest and central-western areas of the State, encompassing the largest remaining block of statewide wilderness (Figure 5). Nearly one million hectares of wilderness core (993,070 ha) were captured in the reserve system in 1992, and 292,960 ha of wilderness buffer zone, with a wilderness core:buffer zone ratio in reserves of 3.4:1 (Table III). Of the 1.5 million ha reserved in 1992, 62.8% was in wilderness core areas, 18.6% in wilderness buffer zone areas and 18.6% in non-wilderness. Despite there being a large attrition of the Statewide extent of wilderness between 1970 and 1992 (a loss of 39%), the representation of wilderness core in the reserve system increased over this period, from 18.3% in 1970 to 90.4% in 1992 (Table III).

Conclusion
This study of Tasmania used one method for measuring the extent of wilderness in the State and its capture in the national park system at four different time periods. Although other methods can be devised, the approach here is sufficient to demonstrate several key features. First, there was a massive decrease in the Statewide extent of wilderness in the twentieth century (63% between 1916 and 1992). At the same time, the representation of wilderness in national parks and equivalent reserves increased enormously. By 1992, 993,070 ha of core wilderness were captured in the reserve system, an increase of 618% from the end of the early period of national park development (1937).

The reservation of core wilderness increased over all time periods, with the largest growth occurring during the late period (1970–1992). The ratio of core wilderness to wilderness buffer zone in reserves decreased over the three periods of national park development, reflecting the general pattern of Statewide wilderness loss and increasing fragmentation and indentation of core wilderness blocks over time.

While there was a large increase in the total area of wilderness represented in the reserve system, the areas where reserves were established across all time periods were predominantly in tracts of wilderness. However, no historical documentary evidence has been identified in the debates surrounding early reserve creation in Tasmania to suggest that wilderness conservation was a goal of early national park establishment (Mosley, 1966a,b; 1978; Mendel, 1999). Furthermore, the extent of wilderness in many of the early reserves has decreased over time, reflecting management policies that are inconsistent with wilderness conservation.

The three large national parks established in the early time period have all suffered a loss of their wilderness resource over time, through the opening up of reserves by road construction and alternative land use activities in areas surrounding reserves. By the end of the middle period (1970), there was no wilderness remaining in Mt Field National Park, and the extent of wilderness in both Cradle Mt–Lake St Clair National Park and Freycinet National Park had been reduced. Similarly, by 1992 there was no wilderness remaining in Ben Lomond National Park in the north-east of the State, and the wilderness areas in Cradle Mt–Lake St Clair National Park and other reserves in the west and southwest of the State had been reduced in size.

The policy of increasing access to national parks is consistent with the viewing of these areas as scenic attractions and tourist destinations, but is inconsistent with the maintenance of the wilderness resource. This suggests that wilderness conservation was not a significant theme in the early periods of national park development in Tasmania. Other research has shown that the idea of wilderness conservation first appeared in the debates surrounding the
promotion of national parks in Tasmania in the mid-1960s during the early stages of the conflict over the flooding of Lake Pedder in the southwest of the State (Mosley, 1966a,b; 1978; Mendel, 1999). Both quantitative and qualitative historic studies have also demonstrated that in Tasmania other conservation motives such as the preservation of scenery were a significant driving force behind the establishment of national parks in the pre-1970 period (Mendel and Kirkpatrick, 1999).

It has been suggested that it was not until the late 1960s/early 1970s that the concept of wilderness developed as a major focus of conservation debate in Australia (Mosley, 1978; Frawley, 1988; Land Conservation Council, 1990). This study supports these ideas, arguing that wilderness conservation was a significant theme in the creation of reserves in the post-1970 period. The creation of the Tasmanian Wilderness World Heritage area, for example, encompassing the largest remaining block of wilderness in the State, is evidence that wilderness conservation was a major driving force in the expansion of the reserve system between 1970 and 1992. The location of reserves in wilderness areas during the first five decades of national park creation in Tasmania appears to have been coincidental, rather than by design. There is no evidence that the motive of wilderness conservation can be ascribed to the promoters of parks or the decision-makers. While this could be considered to have proved fortunate for wilderness conservation in the longer term, the early reservation of wilderness in Tasmanian national parks has also resulted in a great loss and attrition of those wilderness areas through the opening-up of national parks with roads and other developments. This wilderness attrition within national parks may have also been the case in other areas of the world with similar national park histories, such as the United States, Canada and New Zealand, where it has been argued that early national parks were largely established in lands then considered worthless and were promoted and developed for tourism and recreation (Runte, 1976, 1979; Hall, 1988; Hall and Shultis, 1991).

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NOTE
1. The research for this paper was undertaken while Louise was a doctoral student in the School of Geography and Environmental Studies, University of Tasmania, Australia.

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