Technical Note

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CONSIDERATIONS OF REMOTENESS TO THE DESIGN AND PROTECTION OF WILDERNESS AREAS

Prepared by the IUCN WCPA Wilderness Specialist Group

KEY MESSAGES

Remoteness – the degree to which localities or areas of land are physically or perceptually isolated from the evidence and direct influences of modern technological society – can contribute to the values and viability of a wilderness area.

This technical note explains how remoteness can contribute to the values and viability of wilderness areas. For situations where such contribution is or may be possible, this note provides guidelines for taking remoteness into account in the design and management of Category 1b areas. These guidelines are also relevant to other protected areas (PAs) that include wilderness.

The intention of this technical note is to add remoteness to the existing hierarchy of attributes related to wilderness designation, management, and experience, not to prioritize its value over other attributes or to consider it a required criterion for designation as wilderness.

Definitions

In this technical note the terms 'remote' and 'remoteness' refer to the degree to which a locality or an area of land is physically and perceptually isolated from the infrastructure, evidence and direct (as opposed to global/pervasive) influences of modern technological society – for example from roads, industrial infrastructure and land cleared for agriculture. Thus defined, remoteness is a variable or set of variables whose values will generally vary across a landscape. The terms 'remote' and 'remoteness' are *not* used here to refer to the geographical locations of PAs as a whole.

The word 'area' is used here to mean simply 'an area of land', except where an alternative or more specific meaning (e.g. wilderness area, protected area, aerial extent) is specified or clearly implied.

IUCN's *Guidelines for applying protected area management categories* define category 1b areas (wilderness areas) as 'usually large unmodified or slightly modified areas, retaining their natural character and influence, without permanent or significant human habitation, which are protected and managed so as to preserve their natural condition'. The guidelines also list the primary and other objectives for each category of PA. The primary objective for Ib areas is 'To protect the long-term ecological integrity of natural areas that are undisturbed by significant human activity, free of modern infrastructure and where natural forces and processes predominate, so that current and future generations have the opportunity to experience such areas.'

The *Management guidelines for IUCN Category 1b protected areas* discuss the range of meanings associated with the word 'wilderness'. The guidelines state, 'In a biological context, wilderness can be defined broadly as a landscape that is biologically and ecologically largely intact…mostly free of industrial infrastructure, and without significant human interference.' The guidelines note that in addition to ecological values, wilderness can have Indigenous, cultural, spiritual, experiential and intrinsic values.

Remoteness and its significance to wilderness

The experiential and recreational values of wilderness are often linked to remoteness (Hammitt 2012, Pheasant & Watts 2014). Remote settings can provide opportunities for solitude (Boller et al. 2010) and for challenging and self-reliant recreation (Ewert & Hollenhorst 1997). Remoteness can also contribute to perceptions of tranquillity (Jackson et al. 2008), viewshed naturalness (Nutsford et al. 2015) and opportunities for experiencing natural quiet (Carruthers-Jones et al. 2019). The Ib *Management guidelines* state, 'Wilderness decision makers should manage technology and infrastructure to maximize visitor opportunities for solitude and a sense of remoteness.'

The remoteness of an area can also contribute to the protection and viability of its ecological values, for example by buffering ecosystems and vulnerable species against disease spread, invasive species, anthropogenic fire, trampling, poaching, and some types of pollution (Landres 2013, Pires 2012). For example, Balme et. al (2010) found that edge effects weakened the protection of leopards in the Phinda-Mkhuze Complex, South Africa, although leopards were adequately protected in its core. As explained below, remoteness is linked to the largeness, connectivity and spatial intactness of wilderness areas, which contribute to their suitability for protecting ecological values on a landscape scale (Durán et al. 2016), for example by facilitating animal migrations (e.g. Almasieh & Kaboli 2019), and to their resilience to climate change and other anthropogenic pressures (Casson et al. 2016).

Remoteness from roads is particularly important, since roads facilitate the influx of invasive species and human activity, and the impacts of roads extend several kilometres beyond their immediate footprint (Benítez-López et al. 2010, Ibisch et al. 2016). Remoteness can also help to protect cultural and archaeological features (such as sacred sites) from impacts such as theft, vandalism, and unsanctioned visitation (Steinbring 2010).

Measuring remoteness

Remoteness can and should be measured using metrics and thresholds that are appropriate to the environmental conditions, management requirements and geographical and cultural context of the region under consideration. For example, the criteria for measuring remoteness in Austria are likely to be different from those that are appropriate in Alaska or Antarctica. The capacity to measure remoteness will also depend on the availability and accuracy of relevant geodata.

The simplest measure of remoteness is physical (i.e. linear) distance from specified types of infrastructure such as buildings, dams and roads, and from intensively modified landscapes such as land cleared for agriculture. Linear remoteness provides a first-degree approximation of the isolation of a location from factors such as human access, visual impacts, traffic noise, and some types of pollution.

Another common measure of remoteness is access-time remoteness, i.e. time by non-mechanised travel (e.g. walking, rafting, skiing etc.) from points of mechanised access. Times can be calculated by assuming standard travel speeds across different types of terrain and along formed walking trails. The correlation between linear remoteness and access-time remoteness may be low in areas where rates of travel vary widely, due to terrain for example. Calculations of access-time remoteness may take account of mechanised access outside wilderness boundaries, or within them in rare instances where such access is permitted.

Other measures of remoteness, such as access-time remoteness from settlements and assessments of perceptual remoteness (e.g. taking viewsheds and soundscapes into account) may be appropriate in some cases.

Remoteness thresholds, if set, should also be relevant to the region under study. A half-day threshold has particular relevance for access-time remoteness, as visiting areas more than half a day remote requires the additional commitment, effort, self-reliance and isolation associated with at least one overnight stay in a remote setting.

Remoting areas

For an area to be physically remote, it must (logically) be surrounded by a tract of land or sea that makes it remote. This 'remoting area' must be free of the kinds of geographical features relative to which physical remoteness is defined. For example, for an area to be at least 5 km remote from roads it must be surrounded by a 5-km-wide remoting area of roadless land or sea. Remoting areas can also be defined for other types of remoteness, such as access-time remoteness, and need to be kept free of mechanised access (except under approved variance) if remoteness is to be protected.

This technical note is not proposing that 'remoting areas' be used as a management designation. Rather, it is pointing out that the identification of remoting areas may be useful when determining appropriate boundaries for protected areas and appropriate management regimes (including zoning, where relevant) for protecting remoteness within them.

Largeness and remoteness

The remoting areas associated with physically remote locations typically encompass large tracts of undeveloped country. For example, if a location is at least 5 km remote from roads, the areal extent of its associated remoting area will be at least the area of a circle of radius 5 km, i.e. at least 78.5 km^2 (7,850 ha). Hence, the presence of remote locations within an area will generally ensure that the area meets the 'usually large' criterion for 1b areas.

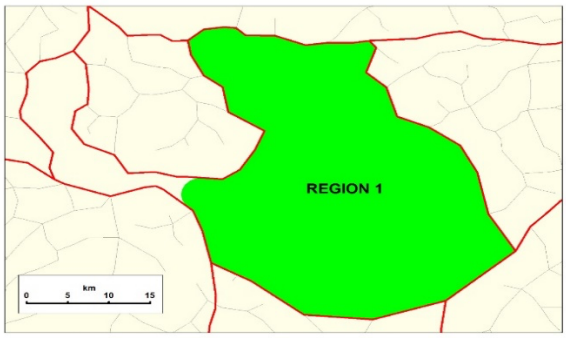

Figure 1. The green area indicates a roadless region (Region 1). Major and minor roads are indicated with red and grey lines respectively.

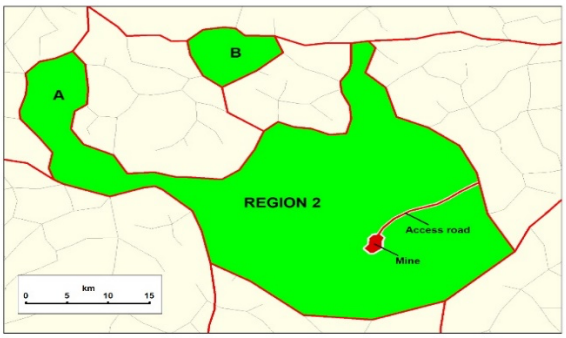

Figure 2. Region 2 (which includes area B) is also roadless, and has the same area (i.e. areal extent) as Region 1. The region excludes a narrow corridor of land bordering a mine and its access road.

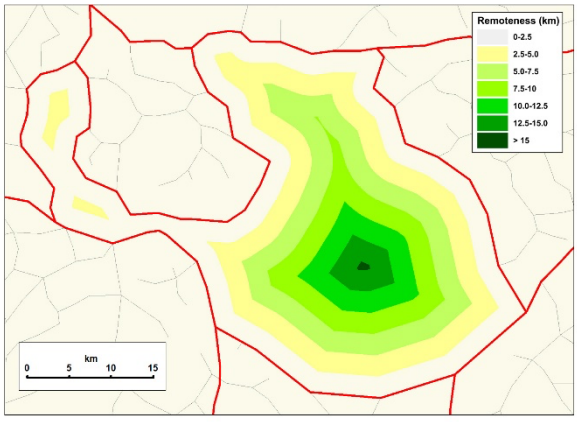

Figure 3. Isolines of remoteness from roads, shaded in 2.5 km intervals, within Region 1.

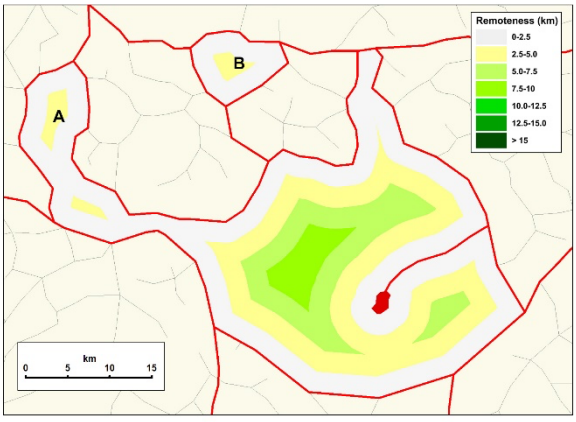

Figure 4. Isolines of remoteness from roads, shaded in 2.5 km intervals, within Region 2.

The converse is not true, as large size doesn't guarantee that an area will contain remote country. Rather, the extent and remoteness of remote country within an area will in general be dependent not only on the area's size but also on its shape. This is demonstrated in figures 1-4 (from Hawes & Dixon 2020). The areas shaded green in figures 1 and 2 represent roadless regions bordered by roads. Region 2 excludes a narrow corridor of land bordering a mine and its access road.

The two regions have the same surface area. Yet it is clear from figures 3 and 4 that Region 1 encompasses substantially larger areas of remote land, and land with substantially higher remoteness, than does Region 2. In simpler words, Region 1 has a larger core. Indeed, mapping remoteness provides a precise method for defining and measuring the core of a PA in spatial terms.

In general, the smaller, more fragmented and more indented an area is, the less remote country it will contain. Hence, the presence, extent and remoteness of remote country within an area is linked to its largeness, connectivity and spatial integrity, which as noted above contribute to its suitability for protecting ecological values on a landscape scale.

Wilderness mapping and remoteness

Wilderness mapping techniques are useful for identifying and monitoring the location, extent and quality ('wildness') of wilderness areas. They are also useful for assessing the potential impact on wilderness quality of actual or potential landscape or management changes (such as road closures or the construction of buildings) (Plutzar et al. 2016).

Most wilderness mapping techniques incorporate one or more measures of remoteness (Carver & Fritz 2016). Where this is the case, it may be practical to use the component remoteness data as a basis for identifying the location of remote regions and their associated remoting areas.

Wilderness mapping has been used to assess wilderness values in a number of countries including Australia (Lesslie et al. 1988), Italy (Orsi et al. 2013), Iceland (Ólafsdóttir et al. 2016) and China (Cao et al. 2019). It has also been used to assess the impacts of proposed developments in wilderness areas, for example a proposed helicopter-accessed tourism development in a remote part of the Tasmanian Wilderness World Heritage Area (Dixon 2020).

Protecting and managing remoteness

Protecting and maintaining remoteness is one of many factors in a hierarchy of objectives of Category 1b areas and of other PAs that include areas of wilderness. While it is generally compatible with other objectives, it does not supersede them and it is secondary to the primary objectives listed in the *Guidelines for applying protected area management categories*. As far as practical and consistent with this proviso, consideration should be given to including remote areas together with the entirety of their associated remoting areas within the boundaries of PAs. This technical note recommends consideration that both types of area should be kept free of roads and other infrastructure relative to which remoteness is measured. This may be most effectively achieved by designating management zones from which such infrastructure and certain types of use (such as mechanised access and intensive tourism) are explicitly excluded.

Since the perception of remoteness is an important component of the experience and enjoyment of wilderness, the designation and management of wilderness areas where recreational visitation is likely to occur should aim to optimise factors that protect and enhance this perception, for example by minimising noise and light pollution and by protecting the naturalness of viewsheds.

Remoteness is an additional factor to consider when assessing wilderness quality, including assessments of the potential impacts of projected management or infrastructure changes (such as the construction of buildings or changes to motorised access).

Restoring remoteness

Restoring remoteness can be a relatively fast and low-cost way of restoring wilderness values and of increasing the extent and quality of wilderness areas (Plutzar et al. 2016). This might be achieved by measures such as road closures, the removal of infrastructure such as buildings, fences and ski lifts, and limiting access by off-road vehicles. For example, Plutzar et al. (same reference) calculated the increases in wilderness quality (using formulas that took remoteness into account) that could be achieved in Austria by removing infrastructure and activities such as skiing, cable cars and forest tracks. Restoring remoteness may aid the restoration of ecological values; for example, closing a vehicle track may minimise disturbance to an area where revegetation is occurring. In some situations the restoration of remoteness can also effect the defragmentation of a PA: for example, a road closure could re-join two previously disconnected parts of a PA.

This IUCN WCPA Technical Note should be cited as: Hawes, M. & Dixon, G. 2022. Considerations of remoteness to the design and protection of wilderness areas. Technical Note No. 10. Gland, Switzerland: IUCN WCPA. 6pp.

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