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Fascinating Remoteness: The Dilemma of Hiking Tourism Development in Peripheral Mountain Areas

Results of a Case Study in Southern Switzerland

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Remote areas devoid of roads and tourist transport infrastructure are increasingly appreciated in urbanized countries because they provide the opportunity to experience tranquillity, solitude, and pristine nature, which are recreational qualities that contrast with the stress of urban life. In Switzerland as a whole, larger roadless areas are rare, but they are still common in southern Switzerland as the "inventory of remote areas," which was established in this study, shows. A crucial dilemma for tourism development in remote areas is the paradoxical situation that the installation of tourism facilities and services can reduce the experiential qualities of these areas that attracted the tourists in the first place. This study seeks possible solutions for this dilemma by analyzing the attitudes of 230 visitors to 2 remote areas of southern Switzerland with a questionnaire-based survey. The case study areas represented one "moderately remote" area (Val Cama) and one "extremely remote" area (Val di Lodrino). The respondents were divided into 3 different visitor types along the "purism scale": purists, neutralists, and nonpurists. The percentage of purists was 45% in the "extremely remote" Val di Lodrino versus 24% in the "moderately remote" Val Cama. There was a consensus among all visitor types that the existing traditional cultural landscape and the path network should be preserved and that the construction of new road or cable-car access should be avoided. The development of new huts, paths, and services was found to be controversial. A major policy recommendation of the study is to gear tourism supply in remote areas to the needs of different visitor types by carefully assessing the impact of measures on remoteness and concentrating new facilities and services in the more accessible parts of a remote area, while preserving more remote conditions in the other zones.

Keywords: *Remoteness; hiking tourism; visitor survey; purism scale; landscape preferences; natural areas; nature-based tourism; Switzerland.*

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Introduction

Defining remoteness

The fascinating aspect of remote and wild areas is that they offer the opportunity to experience solitude and relatively pristine nature (Hall and Boyd 2005). These qualities are increasingly appreciated in largely urbanized countries for providing a contrast to the stress of urban life (Newsome et al 2002). Together with the general growth in nature-based tourism (Mehmetoglu 2007; Fredman et al 2009), this appreciation could lead to a rising demand for wilderness and remoteness in the near future. In Europe, however, larger remote areas have become rare and are located primarily in Scandinavia, Scotland, Corsica, Sardinia, and in mountainous areas, namely in the European Alps, the Carpathians, and the Pyrenees (Fritz et al 2000). An inventory of these areas, along with recognition of their essential qualities according to human perception, is the necessary first step toward their management and preservation (Hall 1992). But progress in this direction requires terminological agreement.

We define "remoteness" as the distance from the places where the structures, populations, and activities of modern civilization are concentrated (settlements, roads, etc). Like other authors (Helburn 1977; Kirkpatrick and Haney 1980; Lesslie and Taylor 1983; Lesley et al 1995; Newsome et al 2002; Hall and Boyd 2005; Hall and Page 2006), we considered various dimensions of distance, such as Euclidean distance and time distance (ie walking time required to reach the area from the nearest access point for mechanized vehicles), as well as other factors that contribute to perceived isolation, such as the rarity of artificial structures, the scarcity of signs of the presence of

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others, and visual and auditory separation from the sources of modern disturbances. Compared with similar terms, such as "peripherality," "marginality," and "otherness" (Müller and Jansson 2007), the concept of remoteness is less colored by economic and social judgments and may better express physical or perceived distance without necessarily implying centers (inside) and peripheries (outside). The concept of "remote areas," areas of great remoteness, better suits the European context and mountain regions in particular, where the remains and ruins of past traditional cultures, such as rural buildings, historical pedestrian routes, abandoned pastures, and other pristine elements of cultural heritage may be interesting components of remoteness. Other expressions, such as "wilderness areas," even while recognizing the possibility of the influence of indigenous cultures (Hall 1992), convey the idea of "undisturbed biophysical areas," an "untouched state of nature," and "complete absence of human influences" (Lesslie and Taylor 1985; Kliskey and Kearsley 1993). These expressions only partially represent most European mountain territories, which are in fact semi-abandoned cultural landscapes, "wild lands," or "secondary wilderness" (Habron 1998; Fritz et al 2000) long settled, managed, and exploited by traditional agro-silvo-pastoral alpine civilizations.

Hiking tourism as an opportunity in remote mountain areas

Since the beginning of the 20th century, peripheral mountain areas in the Southern Alps have faced a decrease in population and economic decline (Bätzing 2005; Höchtl et al 2005). These regions offer relatively remote, natural, and seminatural landscapes with a high potential for recreation (LEADER 2001). In the efforts of regional managers to generate economic value from this potential, hiking tourism is often regarded as an important option (Bühler 1999). The main supply elements of hiking tourism include a trail network (eg footpaths), services (eg accommodation, guided tours), information (eg signposting, maps, books), and the natural and cultural landscape of a region (LEADER 2001). In mountain areas, the promotion of hiking tourism plays an important role in several policy actors. Probably the most important actor is the public sector (states and communities), which plans and finances the network of trails and other attractive elements (eg national parks, natural reserves). Other important actors in this field are private companies (eg cableway enterprises, mountain guides) and alpine clubs or other organizations that own cabins in the mountains.

The dilemma of tourism development in remote areas

As described by Cole (2001), the experience of pristine nature and solitude is an important motivation for visitors to wilderness areas in the United States. However, most visitors demand facilities or services, such as mountain huts, which, in turn, are seen as an income opportunity for the regional economy. This leads to the crucial dilemma of tourism development in both remote and wilderness areas: provision of facilities and services harbors the risk of reducing the essential qualities that attract the visitors in the first place (Buhalis 1999; Lynn and Brown 2003; Hall and Boyd 2005). This dilemma is a long-term issue in outdoor recreation research, particularly in North America (Cole 2001) but also in Australia (Hall 1992) and other regions that contain wilderness areas (Hall and Page 2006). Related research has often been described as investigation of the "resource and social carrying capacity" of natural areas (Manning and Lawson 2002).

State of research

Recreation carrying capacity, crowding, and encounter norms issues have been researched intensively in the past 30 years but almost exclusively in North America (Shelby and Heberlein 1986; Vaske et al 1986; Kuss et al 1990; Patterson and Hammitt 1990; Manning 1999; Manning and Lawson 2002; Vaske and Shelby 2008) and only rarely in the European Alps (Arnberger and Brandenburg 2007), with only a few studies outside national parks and natural reserves. Furthermore, there are serious difficulties in quantifying the overcrowding threshold in a reliable way (Newsome et al 2002). Hall and Page (2006) summarized empirical findings from surveys in different regions in investigating the acceptance of different activities and facilities in wilderness areas from the visitors' point of view.

A promising approach to the dilemma has been developed by Helburn (1977), who recognized that every individual has his or her own recreational preference for areas, with a certain degree of wildness along a "wildness continuum" from completely untouched areas to congested urban places. According to the author, the task of recreational planners is to offer different degrees of wildness to meet the expectations and capabilities of different visitor types. A similar approach of offering diverse settings for different users is proposed by the Recreation Opportunity Spectrum framework (Clark and Stankey 1979).

Stankey (1973) identified different visitor types according to a so-called "purism scale." He analyzed attitudes toward 14 elements of recreational settings in natural areas and separated visitors into a range between "purists," who look for pure wilderness, and "nonpurists," who accept certain human impacts. Scandinavian researchers adapted and extended the original 14 "purism items" to 18 (Ankre 2005; Fredman et al 2006). These purism items cover the different dimensions that constitute the tourism setting of a particular place (Table 1). To our knowledge, there has been no implementation of the purism scale in the Alps to date.

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TABLE 1 The 18 purism discrimination items ordered in 7 categories (adapted from Ankre 2005). For every item the most purist answer is specified, ie −2 ("very negative" with the meaning of "strongly undesirable") or +2 ("very positive" with the meaning of "strongly desirable").

Category	Purism discrimination item	Most purist answer
Management/service	Increase in comfort of the huts	Very negative (−2)
	Build new huts	Very negative (−2)
	Improve the offer of guided tours	Very negative (−2)
Accessibility	Build new roads	Very negative (−2)
	Cableways for passenger transport	Very negative (−2)
	Construct new trails	Very negative (−2)
Safety	Improve cellular phone coverage	Very negative (−2)
	Difficult meteorological conditions	Very positive (+2)
Naturalness of the physical environment	Debris fields (large accumulations of rock debris)	Very positive (+2)
	Abandoned and decaying agricultural buildings	Very positive (+2)
	Terrain completely covered by bushes	Very positive (+2)
Social factors/other users	Soft promotion of hiking tourism	Very negative (−2)
	Encounters with other tourists	Very negative (−2)
Human impact	Helicopter flights	Very negative (−2)
	Renovated buildings with modern architecture	Very negative (−2)
	Sound of power saws	Very negative (−2)
Legal rights/freedom	Unconditional permission for backcountry camping	Very positive (+2)
	Conditional permission for backcountry camping	Very positive (+2)

Research aims and questions

The present article aims to provide useful indications for achieving a balance between developing tourism facilities and retaining the specific experiential qualities of remote areas. The procedure used should be easy to apply to represent a valid option even for practitioners in the field of hiking tourism who are engaged in managing large undeveloped areas. By following Helburn's "wildness continuum" (1977) and Clark and Stankey's "Recreation Opportunity Spectrum" (1979), optimal development of hiking tourism in a given area may be obtained if the demands of the different visitor types are known and the appropriate supply put into practice in the right locations. We, therefore, assume that areas with a high degree of remoteness will attract hikers who seek a pure remoteness experience with no compromise, and less remote areas will attract hikers who prefer a middle course between experiencing pristine nature and a sufficient level of comfort and safety.

The following specific research questions were identified:

1. How can we effectively define the degree of remoteness of a given area?
2. Do visitors' attitudes differ according to the degree of remoteness of the areas and affiliation to visitor groups along the purism scale?
3. How can hiking tourism supply be organized and optimized in areas of different remoteness to satisfy the demands of different visitor groups?

Methods

Study area

The study area (Figure 1) is represented by the 2 neighboring regions Sopraceneri and Moesano (46.1–46.6°N; 8.4–9.3°E), which together cover 2800 km^2 and are the main mountainous areas of southern Switzerland. Most of the remaining roadless areas in Switzerland can be found in these regions. There also are 2 important national park projects (*Adula* and *Locarnese*), managed by private organizations and strongly supported by the public sector (even on a national level), which should facilitate the recognition and preservation of exceptional natural and cultural heritage and the development of hiking tourism.

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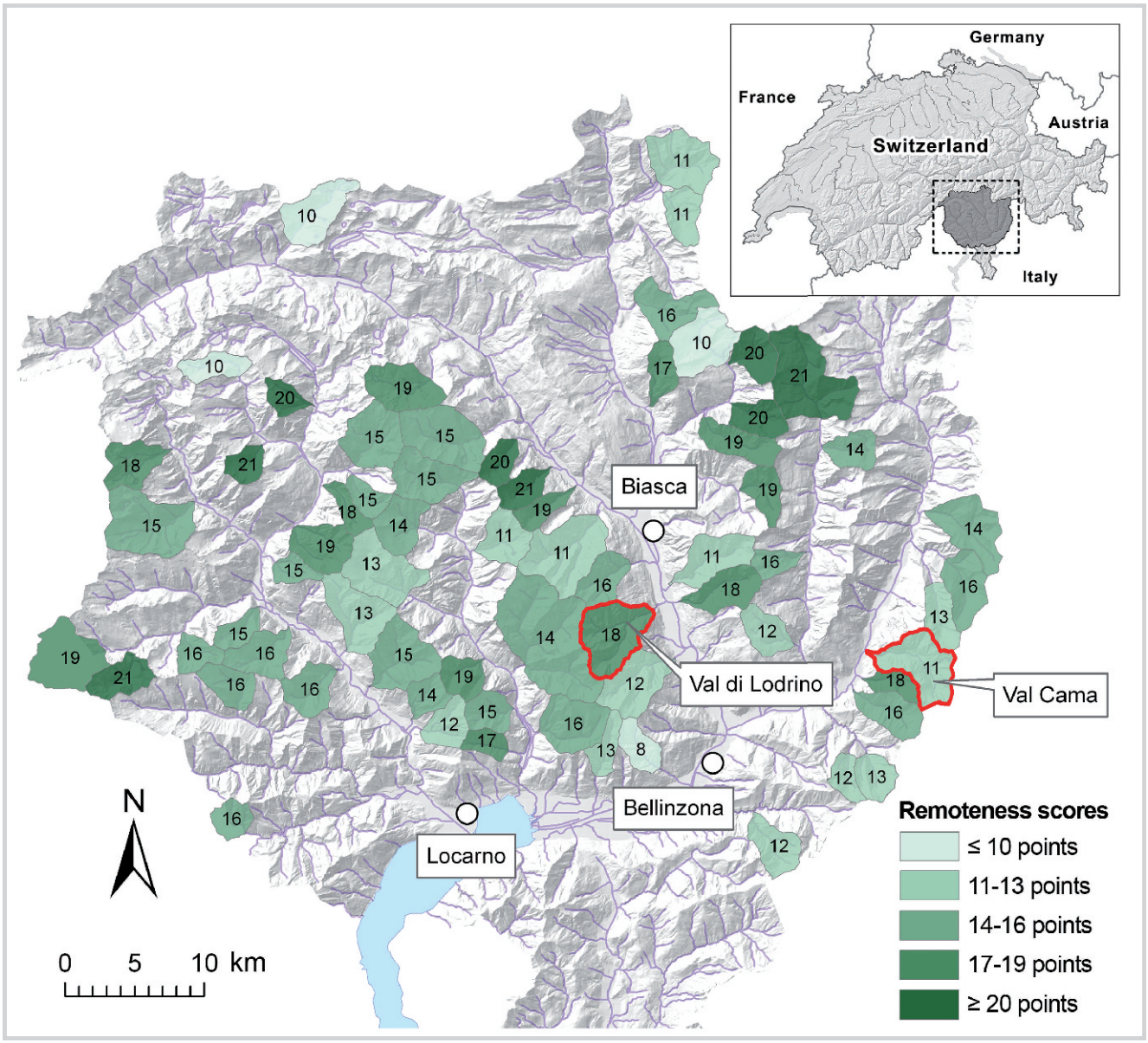
FIGURE 1 Inventory of remote areas in the study area of Sopraceneri and Moesano (southern Switzerland) with the 2 case study areas (with red boundaries) chosen for conducting the surveys. (Map by Florian Boller)



Mapping remoteness

In the study area, tributary and secondary alpine valleys devoid of roads and tourist transport infrastructure probably represent the most important reserves of remoteness. In fact, the absence of access for motor vehicles is the best insurance against the emergence of noise, crowding, and other human disturbances. Moreover, these valleys are usually encircled by high and rugged peaks and ridges that considerably increase perceived remoteness. In contrast, the main valley floors are heavily affected by urban processes. The negative auditory and visual impacts of these bottom lands may spread widely, being perceptible even on the higher flanking slopes. To exclude from study such areas with indirect disturbance, we defined remote areas as roadless areas that correspond to a drainage basin larger than 5 km^2 calculated from the uppermost points accessible on a road or by tourist transportation (Figure 1). The degree of remoteness of each area considered was then determined on the basis of 9 "factors of remoteness" (see Box 1) that cover aspects of Euclidean distance to the urban living space (1, indirectly determined by measuring the surface of the remote area), temporal distance (2 to 4), artifactualism (4 to 8), and solitude (9) that are often

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BOX 1: The 9 factors of remoteness of a remote area

1. Size of the remote area. Calculated values ranged from 5.1 to 43.6 km^2.
2. Travelling time by public transport from the nearest town with more than 10,000 inhabitants to the closest hiking starting point in the remote area. Calculated values ranged from 13 to 121 minutes.
3. Walking time from the closest car parking area to the nearest attractive hiking destination (a place with a panoramic view suitable for resting and picnic) inside the remote area. Calculated values ranged from 9 to 249 minutes.
4. Walking time from the closest car parking area to the top of the valley. Calculated values ranged from 121 to 518 minutes.
5. Standard of the main trail to the nearest hiking trip destination (4 trail classes: hiking trail with official signposts; continuous trail without signposts; discontinuous path; trackless route). Values ranged from 0 to 4.
6. Standard of the main trail to the top of the valley. Values ranged from 0 to 4.
7. Number and standard of the mountain huts (huts with wardens were counted 3 times, whereas huts without wardens were counted only 1 time). Calculated values ranged from 0 to 11.
8. Number of large modern infrastructure elements (eg high voltage lines, hydroelectric reservoirs). Calculated values ranged from 0 to 4.
9. Number of Google links appearing when the area's official name is searched (eg "Val di Lodrino"); this serves as an indicator for human involvement in the area. Calculated values ranged from 0 to 687 links.

recognized among the principal elements of remoteness and wilderness perception (Hammitt 1982; Kearsley 1990; Hall and Boyd 2005).

The data on 9 factors of remoteness were obtained through geographic information system (GIS) calculations (1, 3, and 4), published information (5 to 8; Gabuzzi 2004; Swisstopo 2005), and Internet research (2 and 9). The walking times (3 and 4) were calculated with a Swiss Army refinement of Naismith's basic walker's rule (Fritz and Carver 2003). This corresponds to a speed of 4 km/h on level ground, with half an hour added for every 200 m of ascent, the result then being multiplied by a trail quality coefficient (1 for continuous track, 1.2 for discontinuous track, and 2 for off-track hiking). For each factor of remoteness, the data collected were then assigned to 5 homogeneous classes that ranged from the minimum to the maximum value obtained. The lowest class obtained zero "remoteness points" (not remote at all) and the highest 4 (very remote).

The unweighted sum of remoteness points for the 9 factors accounted for the total remoteness score of an area. Consequently, the theoretical minimum was zero points, and the theoretical maximum was 36 points. This remoteness reconnaissance-level mapping methodology is based on a limited set of criteria chosen in a rather arbitrary way (Lesslie and Taylor 1985), but this weak point is common to many wilderness inventories, and there is no single recommended method for defining and mapping wildlands (McCloskey and Spalding 1989; Hendee et al 1990; Hall 1992; Aplet et al 2000; Hall and Page 2006; Blair et al 2009). In contrast, our methodology is quite simple and easily repeatable, and does not require prior survey of the multiple and subjective perceptions of remoteness and wilderness of visitors to remote areas (Kliskey and Kearsley 1993; Carver et al 2002).

This simplicity is an important advantage when, as in our case, no specific statistics are available and an initial appraisal of the state and distribution of remoteness reserves in the study area is necessary. Consequently, there are factors of artifactualism, primitiveness, wilderness, or solitude that were not considered in our mapping procedure, such as aircraft traffic, helicopter and paragliding flights, logging and hunting activities, global positioning system (GPS) and cellular phone coverage, terrain ruggedness, and many others. The impact of some of these factors on wilderness visitors' perceptions is becoming an interesting field of research: see for example Fidell et al (1996) and Booth (1999) for aircraft and Holden (2004) for cellular phones. But, in general, these factors seem to be less important for remoteness perception, more difficult to represent through GIS coverage, and seldom a consideration in wilderness mapping approaches (Lesslie et al 1988, 1995; Kliskey and Kearsley 1993; Aplet et al 2000; Carver et al 2002; Flanagan and Anderson 2008; Comber et al 2010). However, to assess their importance, many of these factors were taken into account in the visitor survey.

Visitor survey

With the intention of gaining the most tangible and precise indications possible, we focused our examination on the attitudes of actual visitors to remote areas because of their personal on-site experiences. A visitor survey based on self-administered written questionnaires was carried out in 2 remote areas that display a distinctly different degree of remoteness (Figure 2) and present a single main access trail along which most of the hiking visitors have to pass.

Because of the very low frequency of hikers in remote areas, a convenience sampling method was applied, following the example of Fredman et al (2006). Similar survey procedures are reviewed in Ankre and Wall Reinius (2010). Questionnaires were deposited from 1 July to 30 September 2007, in boxes on the wayside of the main access trails (Figure 3) and in huts in the valleys. To increase participation, stamped addressed envelopes were included in the boxes and the questionnaires were available in both Italian and German.

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FIGURE 2 Impressions from the extremely remote Val di Lodrino (A) and the moderately remote Val Cama (B). (Photos by Florian Boller)

The questionnaire consisted of an introductory sociodemographic part (age, sex, place of residence, education, and membership in an environmental organization) and a main part that involved the evaluation of 37 elements of hiking tourism supply in remote areas (ie structures, services, and landscape characteristics; see *Supplemental data*, Appendix S1, http://dx.doi.org/10.1659/MRD-JOURNAL-D-10-00018.S1). The

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FIGURE 3 Box with questionnaires adjacent to the trail in Val di Lodrino. (Photo by Florian Boller)

respondents rated these elements on a 5-part scale that ranged from "very negative" (value: −2) to "very positive" (value: +2).

Visitor segmentation

We classified visitors to remote areas as "purists," "neutralists," and "nonpurists" according to an adapted form of the "purism scale" originally developed by Hendee et al (1968) and Stankey (1973), and revised in many other studies (Kliskey and Kearsley 1993; Shafer and Hammitt 1995; Flanagan and Anderson 2008; SæÞórsdóttir 2010). We applied the same procedure as in the Swedish purism studies (Ankre 2005; Fredman et al 2006), but several of the "purism discrimination items" had to be replaced to fit conditions in the Alps. The 18 items used are presented in Table 1 and are part of the 37 studied elements of tourism supply and landscape characteristics in remote areas (see *Supplemental data*, Appendix S1, http://dx.doi.org/10.1659/MRD-JOURNAL-D-10-00018.S1). To classify visitors, individual evaluations of the 18 items (ranging from −2 to +2, see previous chapter) were at first adjusted to always give the highest score (+2) to the most purist answer (Table 1). That is, we inverted the signs of the score for the 12 items having "very negative" (value: −2) as the most purist answer, and then added up the adjusted scores for each respondent. The resulting purism score had a potential range from −36 (lowest level of purism) to +36 (highest level of purism). Those respondents who scored higher than 0.5 standard deviations above the overall sample mean were classified as purists, those who scored lower than 0.5 standard deviations below the overall mean were grouped as nonpurists, and those who remained (scores within mean ± 0.5 standard deviations) were grouped as neutralists. For details on this procedure, see Ankre (2005). Chi-square tests and analysis of variance, depending on the data being considered, were applied by using SPSS statistical software to check for statistically significant differences.

Results

Inventoried remote areas

Sixty-seven remote areas were identified within the study area (Figure 1). Taken together, these areas cover 962 km^2 of land surface, which represents 34% of the study area. The average size of a remote area is 11.9 km^2. The calculated remoteness scores varied between 8 and 21 "remoteness points," and the median was 15 points. On the basis of their calculated remoteness scores, Val Cama (11 points) was chosen as an example of a "moderately remote area" (MR) and Val di Lodrino (18 points) as an example of an "extremely remote area" (ER). The main difference between the 2 areas is that hiking facilities in Val Cama include several signposted trails and accommodation in guarded huts, whereas Val di Lodrino has no signposted trails at all and just a handful of small self-catering shelters (Figure 2).

Visitor segmentation

In all, 504 questionnaires were collected from the boxes; 232 were sent in and 230 (160 from Val Cama and 70 from Val di Lodrino) were usable, even though not complete throughout. Unfortunately, 46 respondents did not evaluate all purism items: for this reason, only 184 respondents could be classified according to the purism scale. Because of the limited human resources of the research project and the very low number of visitors, it was not possible to ascertain the rate of visitors who picked up a questionnaire.

Purism scores ranged from −17 to +22, with a mean value and standard deviation of 1.32 ± 8.03. Among those who responded to all 18 purism items, 56 were classified as purists, 67 as neutralists, and 61 as nonpurists. The relationship between degree of remoteness of an area and category of tourists is demonstrated by the statistically significant differences between MR and ER in terms of visitor segmentation on the purism scale (chi-square = 9.2, $P = 0.010$, Cramer's V = 0.224). Purists predominated in the ER (45% of all visitors), whereas, in the MR, their share was only 25% (Figure 4).

No statistically significant differences between MR and ER visitors were found in terms of age cohorts (with a slight dominance of the cohort of 40–59 years in both cases), level of education (in total, 59% of the respondents had some tertiary education), and membership in environmental organizations (50% of all respondents). The significant differences observed when using chi-square on the sex and origin of the respondents are summarized in Table 2. The ER appears to receive more male visitors than the MR and to attract more visitors from outside southern Switzerland than the MR.

The multivariate analysis of variance revealed significant differences in terms of purism scores between respondents with different sociodemographic characteristics. In particular, visitors who live near the

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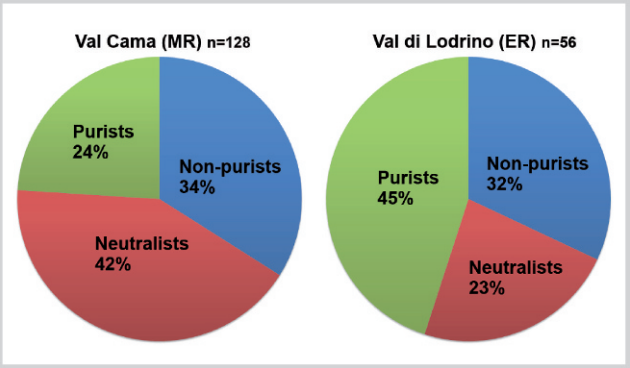
FIGURE 4 Comparison between visitor segmentation in Val Cama and Val di Lodrino.



remote area are more likely to be nonpurists than visitors who come from further away (data not presented). Sociodemographic characteristics that in general match high purism scores are "residence in urban area," "age group 20–39 years," and "membership in an environmental organization" (data not presented).

Visitors' preferences and expectations

Generally speaking, 59% of all the hikers and 80% of the "purists" would not like to encounter more than 10 persons during a hiking day. It is interesting to note that the visitors' assessment of social carrying capacity differed significantly (chi-square = 14.7, $P = 0.005$, Cramer's V = 0.253) between the 2 case study areas (Figure 5).

The mean evaluation of hiking tourism supply elements in remote areas (*Supplemental data*, Appendix S1, http://dx.doi.org/10.1659/MRD-JOURNAL-D-10-00018.S1) reveals that there are many similarities between purists, neutralists, and nonpurists. On average, the preservation of existing infrastructure, elements of the traditional cultural landscape, and improvement of signposting were assessed positively by all visitor types. The construction of new road and cableway access and modern buildings was opposed by a large majority of all 3 visitor types. However, the creation of new infrastructure, encounters with others, and signs of natural rewilding were, as one would expect given the method used, revealed as controversial; on average, these elements were supported by nonpurists but refused by purists.

Discussion

Inventory of remote areas

The inventory of remote areas revealed that remoteness is an important property of the landscape in the study area because it characterizes 34% of the land surface. This is in close agreement with what Fürst (1999) obtained when analyzing lateral valleys of glacial origin in southern Switzerland. Although it lacks a weighting procedure for remoteness factors, the proposed approach effectively detects differences in the degree of remoteness and, therefore, proved to be a useful way to map and categorize remote areas in mountain regions. The minimal surface of a remote area for inclusion in the inventory, which was set at 5 km^2, can also be criticized, because in certain cases, smaller areas might also be regarded as providing great contrast to urban stress. However, it is undeniable that the perceived remoteness of an area strongly depends on its vastness in terms of pristine space and hiking possibilities. In comparison with the wilderness areas in North America, Scandinavia, and Australia (Hall 1992; Hall et al 2009), the inventoried remote areas are rather small, but the ruggedness of the relief may compensate, at least in part, for the reduced dimensions.

Visitor segmentation

As observed in other nature tourism destinations (eg by SæÞórsdóttir 2010), we expected to find clear differences in visitor segmentation, depending on the remoteness of the areas considered. This was partly confirmed by the results; purists are the dominant visitor type in the ER, with a share of 45% (Figure 4). However, they showed up

TABLE 2 Significant sociodemographic differences between Val di Lodrino and Val Cama.

Variable		Observed frequency (% of total sample)	
		Val Cama	Val di Lodrino
Sex[a]	Female	62 (39)	14 (20)
	Male	96 (61)	55 (80)
Place of residence[b]	Sopraceneri and Moesano (S&M)	54 (33)	23 (33)
	Canton Ticino apart from S&M	35 (22)	5 (7)
	Switzerland apart from Ticino	49 (31)	32 (46)
	Outside Switzerland	22 (14)	10 (14)

[a] Chi-square = 7.7, $P = 0.005$, Cramer's V = 0.185.
[b] Chi-square = 9.2, $P = 0.026$, Cramer's V = 0.201.

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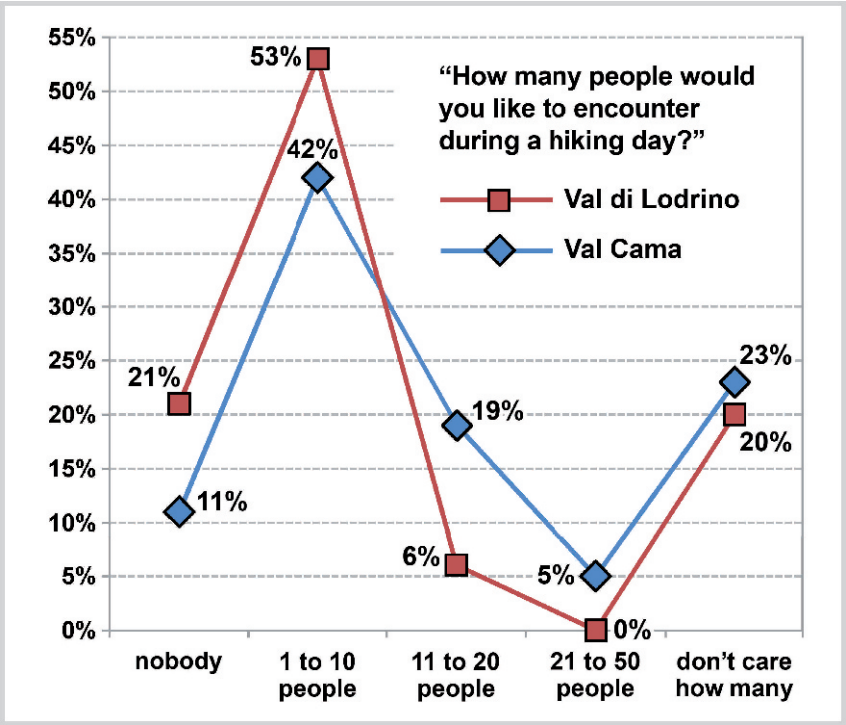
FIGURE 5 Visitors' assessment of the 2 areas' social carrying capacity.



in the MR as well (24%), which could be explained by the presence of zones with ER characteristics even within the MR Val Cama. Furthermore, the share of nonpurists was similar in both areas (32% versus 34%). One possible interpretation of this is that, even in the extremely remote Val di Lodrino, some parts of the lower valley are quite easily accessible and, therefore, could also offer suitable conditions for nonpurist visitors.

The dominance of male visitors and visitors with higher levels of education was similar to research findings on natural areas of northern Italy (Höchtl et al 2005; Vogt 2008), Sweden (Ankre 2005), and North America (Ewert 1998). However, it must be acknowledged that the high proportion of people with higher levels of education could reflect a bias in the survey: because it was based on lengthy written questionnaires, people with less education probably participated less than those with more education. Missing data on the "pick-up rates" of the questionnaires is arguably the most important limitation of the survey.

Attitudes toward tourism development

The visitors surveyed generally preferred a low number of encounters with other visitors. This is in close agreement with the outcome of surveys in North America (Ewert 1998) and Sweden (Wall 2003; Fredman et al 2006). The high acceptance of traditional cultural landscape elements even by the purists surveyed differs from the results of visitor surveys in North American, Australian, and New Zealand wilderness areas (Hall and Page 2006), and corresponds with the results of other studies in the European Alps (Hunziker 1995). In fact, these rural elements are even more appreciated than some aspect of pure wilderness (*Supplemental data*, Appendix S1, http://dx.doi.org/10.1659/MRD-JOURNAL-D-10-00018.S1). From this point of view, hiking activities in the study area represent an interesting mix of nature-based and rural heritage tourism going beyond the usual subdivision of tourism supply (Hall et al 2009).

Interestingly, this positive attitude toward certain human impacts also corresponds with other visitor surveys in wild or natural areas of Europe (SæÞórsdóttir 2004; Bauer 2005; Höchtl et al 2005; Fredman et al 2006). On the question of improvement of road access, however, the respondents in this study were more critical than in natural areas of northern Italy (Höchtl et al 2005), Sweden (Fredman et al 2006), and New Zealand (Higham 1998), and more critical than the Swiss population in general (Bauer 2005). In fact, roads, terrestrial motor vehicles, and aircraft (including helicopters) received the worst rating in our survey, much lower than for the severest natural elements such as large accumulations of rock debris or terrain completely covered by bushes. This aversion to roads and terrestrial and aerial motor vehicles might be explained by the fact that pristine areas devoid of traffic have become rare in the Swiss Alps, especially along the main transalpine corridors, and, therefore, the absence of

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this widespread disturbance has become a very valuable quality.

Conclusions

The present study highlights the heterogeneity of the degree of remoteness within the study area and the need for a suitable method for assessing this precious recreational resource. The approach used to define and map remoteness proved to be effective, despite the absence of any internal weighting of the individual factors of remoteness. In future, this gap may be filled empirically through a new visitor survey that assesses the relative weights of these factors. Such an improvement could involve a more rigorous mapping of remoteness by adapting wilderness perception mapping methodologies (Kliskey and Kearsley 1993; Kliskey 1994) to the Swiss Alps and by taking into account other important disturbances, such as air traffic. The analysis of visitors' preferences enabled us to identify the elements that managers should avoid or reduce, in particular, certain anthropogenic disturbances that were generally evaluated as inopportune by all hikers, irrespective of their category of purism. Among these, we may mention many noise-generating landscape components and, in particular, roads and motor vehicles. However, many measures are evaluated variously by visitors and, therefore, should be planned for carefully, being placed by and large in MR. Thus, for instance, purists dislike certain "improvements" (such as cellular phone coverage, more comfortable huts, new trails, new huts, and new guided tours) that are appreciated by the other visitors.

Bearing in mind the results obtained, a solution to the dilemma of tourism development in the remote areas of the study area, and presumably also in other mountain regions still containing areas with little tourism development, could lie in sustainable management of remoteness. A strategy along these lines could be summarized as follows:

1. The remoteness vocation of each single area (from MR to ER) should be defined and emphasized within the framework of a tourism plan at a regional level that could be worked out in a public–private partnership between public planning authorities, park developers, alpine clubs, and tourism organizations. This would provide a differentiated and optimized hiking supply, meeting the expectations of a wide range of potential target groups.
2. Spatial planning authorities at the national, regional, and local levels, developers of park projects, and private tourism developers, such as cabin owners, should carefully assess the potential impact of hiking development measures on remoteness, and, if possible, select measures with lower impact (eg the creation of new huts through the renovation of existing traditional buildings, rather than through the construction of new modern buildings).
3. It appears reasonable for the public sector to concentrate efforts on the preservation of existing hiking supply (trails, huts, traditional landscape elements), which is per se a labor-intensive task in remote areas, because this was positively assessed by all visitor groups.
4. The preference for a low number of encounters with other visitors and the presence of purists even in MR support a policy by public authorities and park developers that concentrates new facilities and services in the more accessible parts of a remote area, and preserves higher remoteness conditions in the other zones.
5. The planning permission authorities should refuse the construction of new nonpedestrian access facilities in the remaining remote areas.

The sequence of establishing a remoteness inventory and thereafter analyzing visitor preferences in areas of differing remoteness based on the "purism scale" appears to be logically consistent and, at the same time, economical in terms of temporal and financial resources. Therefore, we regard it as a useful tool to face the dilemma of tourism development in remote areas. We suggest that our study approach could also be applied in other regions of the Alps and, perhaps in a regionally adapted form, in other mountain areas of the world. Because the experiential qualities of remote areas, tranquility, solitude, and pristine nature are appreciated by the growing urban population, our approach could be particularly suitable for areas with little tourism development that are close to urban areas.

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Supplemental data

APPENDIX S1 Evaluation of 22 landscape elements and 15 measures to develop hiking tourism in remote valleys by the respondents to the survey on a 5-part scale between "very negative" (−2) and "very positive (+2).

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