THE BEAUTY OF LANDFORMS

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Dvojno jezero Lake is the symbol of beauty.

The beauty of landforms

ABSTRACT:
This article determines which landforms attract people the most and whether one can speak of collective patterns in the aesthetic evaluation of a landscape. It therefore concerns enjoying the beauty offered by a more or less reshaped natural environment. This study is based on the Triglav Lakes Valley (Dolina Triglavskih jezer) in Slovenia which, due to the few man-made changes introduced there, includes hardly any anthropogenic »unnecessary noise.« The online survey included more than six hundred people and used photos of various landforms. Lakes were found to be the most attractive to the respondents, and fractured rock areas were the least attractive.

KEY WORDS: geography, aesthetics, photography, nature, landscape online survey, Dolina Triglavskih jezer, Triglav National Park, Slovenia

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1 Introduction

The word *aesthetics*, coined in 1735 by the German philosopher Baumgarten, is derived from the Greek verb *aisthanomai* 'to sense, perceive'. To an observer, aesthetics is the feeling of or the ability to experience beauty that develops as part of his or her subjective feeling (Šmid Hribar 2011). Hence, this is about enjoying the beauty offered by both the natural environment and human creations. Aesthetics is usually limited to the beautiful/ugly dichotomy. This dichotomy has stimulated philosophical debate, and hence the object of aestheticism is a logical consequence of manipulating the topic at hand (Barett et al. 2009).

The question of what is beautiful offers as many answers as there are philosophers (Lothian 1999). The main change in the past two millennia has been the shift from conceiving beauty as an object's feature (objective aesthetics) to the subjective feeling of an object in the eyes of the observer (subjective aesthetics). From the Greek philosophers to the Renaissance, beauty was recognized merely as an objective physical feature. In the seventeenth century, Locke was the first to understand beauty as an objective and subjective feature (Lothian 1999). The greatest leap in understanding beauty can be found in Kant's theory of aesthetics, where he did not address the dilemma of the objective and subjective, but defined aesthetic judgment as a reflexive judgment. According to Kant, the beauty of an object is judged in terms of the feelings that this object arouses in an individual and not the object directly (Elden and Mendieta 2011). Proceeding from Kant's theory, philosophers developed many views on aesthetics. Thus in a large number of modern theories of aesthetics one can find close parallels with Kant's theory (Lothian 1999).

The important question is whether the need to feel the beautiful is a fundamental human need. The psychologist Maslow (1943) ranked human needs by importance, from basic biological needs to higher psychological needs. Physiological needs, which must be fulfilled in order to stay alive, are ranked the lowest, and aesthetic needs – for instance, reflected in the interest in various art products or the landscape – are ranked the highest, right below the top of the pyramid. Postrel (2003) disagrees with Maslow's theory, arguing that aesthetics is something that people (as a species) have reacted to since time immemorial, regardless of economic development, income, or cultural context.

Everything is connected in a landscape and has its value and importance. This refers not only to physical reality, but also to the organization and conception of the social elements of human existence (Urbanc 2008). When individuals observe a landscape through their own perception and understanding, there must be hundreds of reasons why they believe a specific landscape is exceptional to them (Staut, Kovačič and Ogrin 2007). This evaluation is personal and depends on the level of awareness and knowledge of an individual and society as a whole (Hlad 2002). The majority of people have their own opinion about the beauty of a specific landscape, but differences occur according to age, education, and cultural environment (Kaplan and Herbert 1987).

The effect of landscape beauty on people's wellbeing is gaining increasing importance in modern life (Kaplan, Kaplan and Ryan 1998; Hartig et al. 2003). Hence, it is not surprising that the ten criteria for defining UNESCO World Heritage sites (Internet 1) also include aesthetic value, which refers to »superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance.« Empirical studies of the influence of beauty on various economic and social outcomes carried out over the past decades show that aesthetics is not an end in itself (Florida, Mellander and Stolarick 2011).

The majority of studies of landscape beauty are based on extremely limited conceptual issues that rely on landscape photos. These are used as substitutes for actual views of the landscape (Daniel 2001). Studies in which researchers examined the expressed subjective beauty of selected landscapes show that there are no statistically significant differences between assessments of landscape beauty in photos and the assessments of the beauty expressed while perceiving these same landscapes directly on site (e.g., Stamps 1990; Hull and Stewart 1992). The criticism raised against these types of studies is primarily based on potential subjectivity, deficient standardization of methods, and repeatability of results (Bruns and Green 2001; Daniel 2001). Research results are increasingly applicable in planning, managing, and even monitoring changes in the landscape (Tress et al. 2001; Tahvanainen et al. 2002). In Europe, the applicability of these results became even more topical with the ratification of the European Landscape Convention (European Landscape Convention … 2000; Dramstad et al. 2006).

Despite many methodological challenges, there is also increasing interest in the visual evaluation of the landscape among geographers because the link between visual evaluation and geography is the strongest in the case of the landscape in particular (Urbanc, Gašperič and Kozina 2015). Even though many studies of this type have been conducted in cultural landscapes (Farina 2006), where there have been instances

of land development, some have also been carried out in landscapes that were only slightly reshaped, such as in semi-natural and close-to-natural landscapes.

This article uses an online survey to determine which landforms in a natural environment where there is not much human influence are the most attractive to people and whether one can speak of collective patterns of perceiving beauty. The problem that this study focuses on proceeds from Kant's claim that the evaluation of an object's beauty is not based on interest – that is, its applicability or utility is irrelevant (Elden and Mendieta 2011) because one is only interested in the beauty itself. In a landscape as a complex system, it is of course extremely difficult to isolate such »pure« aesthetic judgment. In order to reduce »unnecessary noise,« this study is limited to landforms in which man-made changes can hardly be perceived. Slovenia has few landscapes left in which the effects of man-made changes are as minute as in the Triglav Lakes Valley (Dolina Triglavskih jezer), which this study focuses on.

2 Methods

2.1 Study area

This study used the example of the Triglav Lakes Valley, which lies in the central part of Slovenia's only national park, the Triglav National Park. The lakes give the main character to this nearly ten-kilometer-long mountain valley between the Bohinj and Trenta valleys, which lies at an elevation between 1,300 and 2,000 m. Its karst surface was reshaped by glaciers during the Pleistocene. Large karst surface features include high-mountain closed depressions, dolines, solution pans, grikes, and shaft entrances, and smaller ones mostly include rills and solution pans. The effects of glacial erosion can be seen in the rock surfaces polished by glaciers. Typical features include cirques, rock drumlins, roches moutonnées, glacier crevasses, and alvars. Accumulation glacial features include moraines. Many taluses can be observed below rock walls (Hrvatin et al. 2015). Due to its karst landscape, the lakes in the Triglav Lakes Valley are exceptional features, home to a diverse and unique community of flora and fauna (Brancelj 2015). Various human activities (forestry, mountain pasturing, and charcoal burning) created a cultural landscape. Before the Triglav Lakes region was designated a protected area, it included three mountain pastures: Dvojno jezero Lake, Pri Utah Pasture, and Lopučnica Pasture. After their abandonment due to nature conservation demands, this area is being overgrown with forest (Zorn et al. 2015). The protection regime in place in the valley only allows hiking. Two mountain lodges are currently operating in the area, and the valley is one of the most popular hiking destinations in the Slovenian Alps (Peršolja 2015).
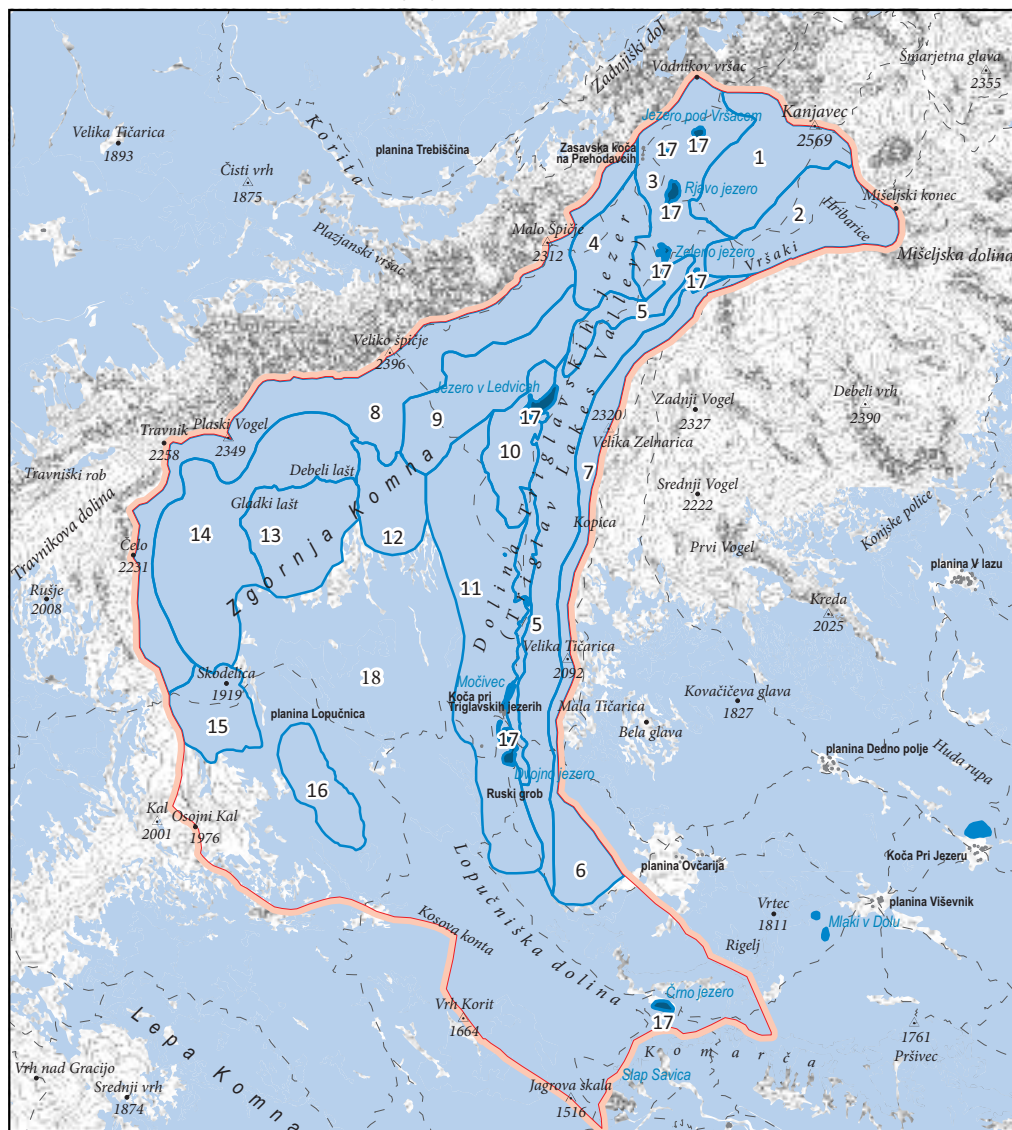
The exceptionality of the Triglav Lakes Valley already fascinated visitors more than two centuries ago. In 1795, Hochenwart wrote the following while taking in the surrounding rock faces and taluses: »it looks so peaceful that it strongly stirs the heart … of the observer because in all the Carniolan mountains one cannot find more beautiful and charming views« (1838: 52). Something similar is true of the lakes (Hacquet 1778). Hochenwart (1838: 52) wrote that »in all of the Carniolan mountains [Carniola was part of Austria-Hungary at that time] one cannot find more beautiful and charming views« than the ones opening up from the Štapce Saddle onto the Triglav Lakes Valley. The number of visitors to the valley increased after 1880, when the Austrian Tourism Club built a mountain lodge at Dvojno jezero Lake in the central part of the valley. The awareness that this was a natural gem that needed to be preserved gradually became stronger (Šmid Hribar and Lisec 2011). In 1924, the idea of protecting the valley finally became a reality; this was the first case of any region being designated a nature protection area in the then Yugoslavia. Later on this led to the establishment of Triglav National Park as it is known today.

2.2 Selecting the landforms studied

The Triglav Lakes Valley was divided into four types in terms of landforms (Erhartič 2012):
- Peaks and ridges with appertaining taluses;
- Plains, rocky plateaus, and alvars;
- The valley bottom;
- Forest and mountain pine belt.

Figure 1: Landforms in the Triglav Lakes Valley (adapted from Erhartič 2012). ➤

Map labels (as visible on the map):

Šmarjetna glava 2355
Zadnjiški dol
Vodnikov vršac
Velika Tičarica 1893
Jezero pod Vršacem
Kanjavec 2569
planina Trebiščina
Zasavska koča na Prehodavcih
17 17
Čisti vrh 1875
Korita
3
Rjavo jezero
1
17
Miseljski konec
Hribarice
2
Malo Spičje 2312
4
Zeleno jezero
Miseljska dolina
Plazjanski vršac
17 17
Vršaki
5
Dolina Triglavskih jezer
Veliko špičje 2396
Jezero v Ledvicah
17
Zadnji Vogel 2327
Debeli vrh 2390
8
9
2320
Velika Zelharica
Travnik 2258
Plaski Vogel 2349
Debeli lašt
10
7
Srednji Vogel 2222
Travniški rob
Gladki lašt
Kopica
Travnikova dolina
14
13
12
Prvi Vogel
Konjske police
Čelo 2231
11
Kreda 2025
planina V lazu
Rušje 2008
5
Velika Tičarica 2092
Kovačičeva glava 1827
Skodelica 1919
18
Močivec
Koča pri Triglavskih jezerih
Mala Tičarica
Bela glava
planina Dedno polje
15
planina Lopučnica
Huda rupa
Kal 2001
Osojni Kal 1976
16
17
Dvojno jezero
Ruski grob
6
planina Ovčarija
planina Viševnik
Koča Pri Jezeru
Lopučniška dolina
Vrtec 1811
Mlaki v Dolu
Rigelj
Kosova konta
Vrh Korit 1664
Črno jezero
17
1761 Pršivec
Lepa Komna
Komarča
Vrh nad Gracijo
Srednji vrh 1874
Jagrova škala 1516
Slap Savica

Legend:

1	Mount Kanjavec	13	Gladki lašt Alvar
2	Hribarice Pass	14	Za Dolino and Pri Bajti plateaus
3	Upper Triglav Lakes Valley	15	Velika vrata Pass
4	Rocky plateaus south of Prehodavci	16	Kosmata lašta Alvar
5	Moraines on east side of Triglav Lakes Valley	17	Lakes
6	Lake Ridge	18	Forest and mountain pine belt
7	Taluses below Lake Ridge		
8	Ridge along Veliko Špičje, Mount Plaski Vogel and Mount Čelo		
9	Tectonically fractured area below Veliko Špičje Ridge		
10	Alvars and roches moutonnées between Jezero v Ledvicah Lake and Pri utah Pasture		
11	Alvars below forest with interspersed karst depressions		
12	Debeli lašt Alvar		

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Source: GURS, 2015
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0   0.5   1   2 km
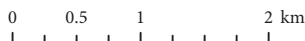
Within these types, typical examples of landforms were defined (e.g., taluses or lakes) and photographed. All of the photos were in color, taken in nice weather. Thirteen photos of various landforms in the valley were prepared in addition to three control photos of similar landforms in other Slovenian regions. Among other things, the photos of the Triglav Lakes Valley feature Mount Kanjavec, Hribarice Pass, Veliko Špičje Ridge, fractured surface, roches moutonnées, forest, and lakes.

2.3 Survey

In the spring of 2013, an online survey was conducted to determine which landforms attract respondents the most (Smrekar and Erhartič 2013). The questionnaire was HTML-based. The respondents viewed the questionnaire and completed it using a web browser, and their replies were then sent directly to the research institute's server (Vehovar et al. 2002). The invitation to complete the questionnaire was sent to several Slovenian nature-related interest groups, using their e-mailing lists: for example, to hikers (e-news of the
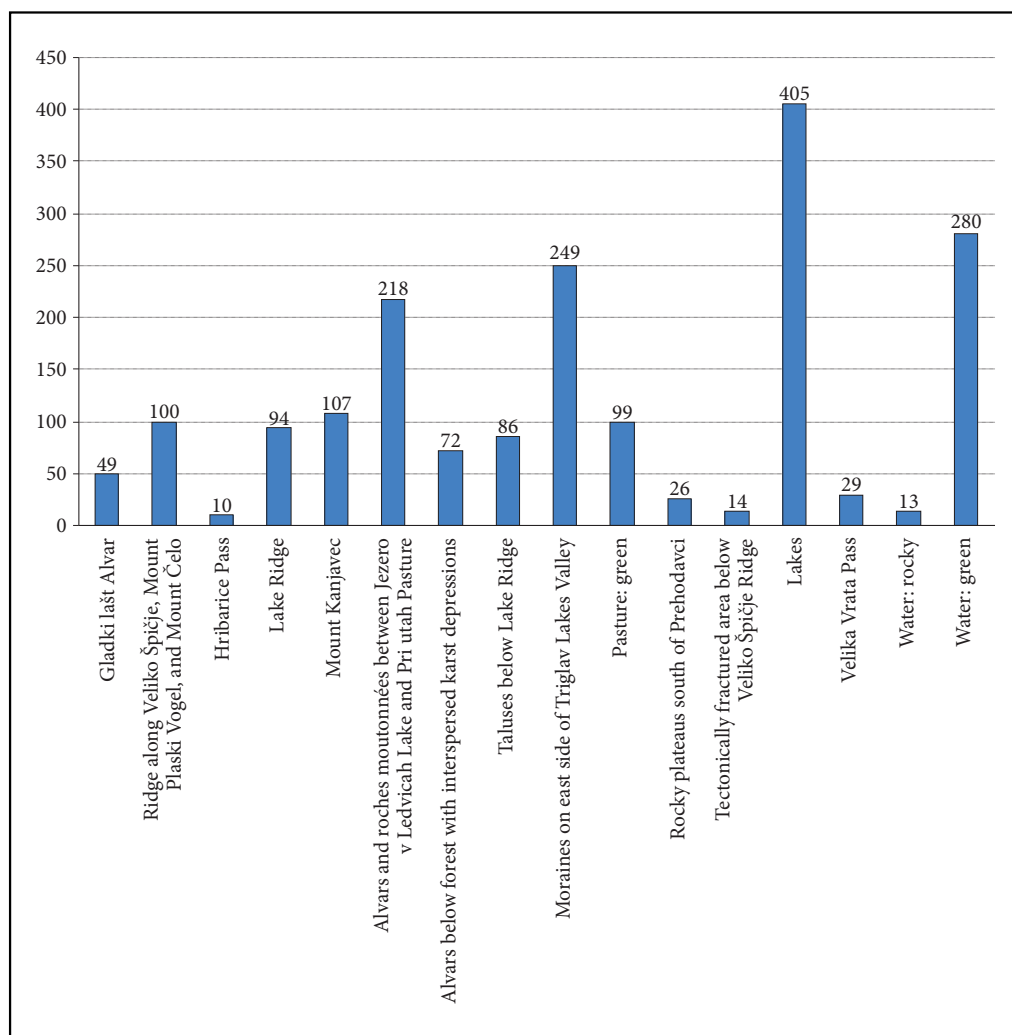

Figure 2: Aesthetic evaluation of the Triglav Lakes Valley according to respondents' opinions (Smrekar and Erhartič 2013).

Slovenian Alpine Association) and geographers (Geolista). The invitation was sent to a total of over eight thousand e-mail addresses. Employing the snowball sampling method, the recipients were invited to forward the invitation letter to others.

In the online survey, the respondents first selected three photos from a total of sixteen in terms of how attractive they found the landforms displayed. The photos were displayed in random order. In addition to the target landform, other landforms were also partly visible in some photos; these were blurred out to focus the respondents' attention on the target landforms. In photos in which the target landform was not visible in sufficient detail, insets were added to create a photo within a photo.

The respondents then ranked the three photos selected according to the subjective criterion (beauty) and added a maximum of three keywords to each photo that, in their opinion, best described the landform depicted.

Then three previously selected photos were shown to the respondents one after the other; these differed significantly from one another and featured the following: a lake with large rocks, the forested Triglav Lakes Valley, and a »rough« high-mountain rock surface. It was only at this stage of the survey that the respondents learned that the photos were from the Triglav Lakes Valley.

Respondents that had already been to the Triglav Lakes Valley had to select three landscape elements (not landforms) among the fifteen listed (and not shown on photos) that they found the most attractive. These included a rock face, forest, dynamic terrain, animals, alpine flowers, mountain pines, a lake, a green alpine meadow, a moraine, rills and grikes, a talus, a mountain ridge, an alvar, a boulder, and the sky.

Finally, the respondents were shown the same photo of Jezero v Ledvicah Lake as in the first step of the survey, only that now the photo showed a little bit more of the surroundings (i.e., more landforms). The respondents were asked to rank six landforms in the photo in order of preference. The area was divided into the following six parts (landforms): lake, sparse forest, taluses, high-mountain peak, bare rocks, and alpine meadow. Respondents were asked to rank each one of these from most to least beautiful on a six-point scale, whereby they could only assign individual values from 1 to 6 once.

2.4 Survey sample

The online survey carried out in the spring of 2013 yielded 606 answers, provided by 60% women and 40% men. In terms of sex structure, the sample obtained significantly deviates from a representative sample, considering that the share of women living in Slovenia is 50.5% (Število prebivalcev … 2013). In terms of age structure, the sample also deviates considerably from a representative sample because it includes an above-average share of young people: the questionnaire was completed by only 2.0% of people over 65, whereas their share in the total population is 18.7%. In addition, in the questionnaire just over half (52.0%) of the respondents were under 35, whereas their share in the total population is just under a third (30.7%). The biggest gap between the sample obtained and the actual population characteristics is evident from the education structure. Just over three-quarters (74.0%) of the participants in the survey were university graduates, whereas their share in the total population is just under a fifth (19.4%); the share of secondary-school graduates amounted to just above one-fifth (23%), which approaches the 30.6% in the total population, but only 3% of participants had a vocational school certificate or lower (whereas their share in the total population is 50.2%).

3 Results

Among the thirteen landforms photographed in the Triglav Lakes Valley, the respondents unambiguously selected Jezero v Ledvicah Lake as the most attractive (Figures 3 and 4), followed by the slightly undulating and partly grassed-over moraines on the east side of the Triglav Lakes Valley (Figures 5 and 6). Third place went to the exposed bare rocky landscape comprised of alvars and roches moutonnées between Jezero v Ledvicah Lake and Pri Utah Pasture (Figures 7 and 8). Views of water and vegetation proved to be considerably more attractive than views of exposed bedrock. Hence it is not surprising that respondents least often selected the tectonically fractured rocky area below the Veliko Špičje Ridge and the rocky slopes of the Hribarice Pass (Figures 9 and 10).
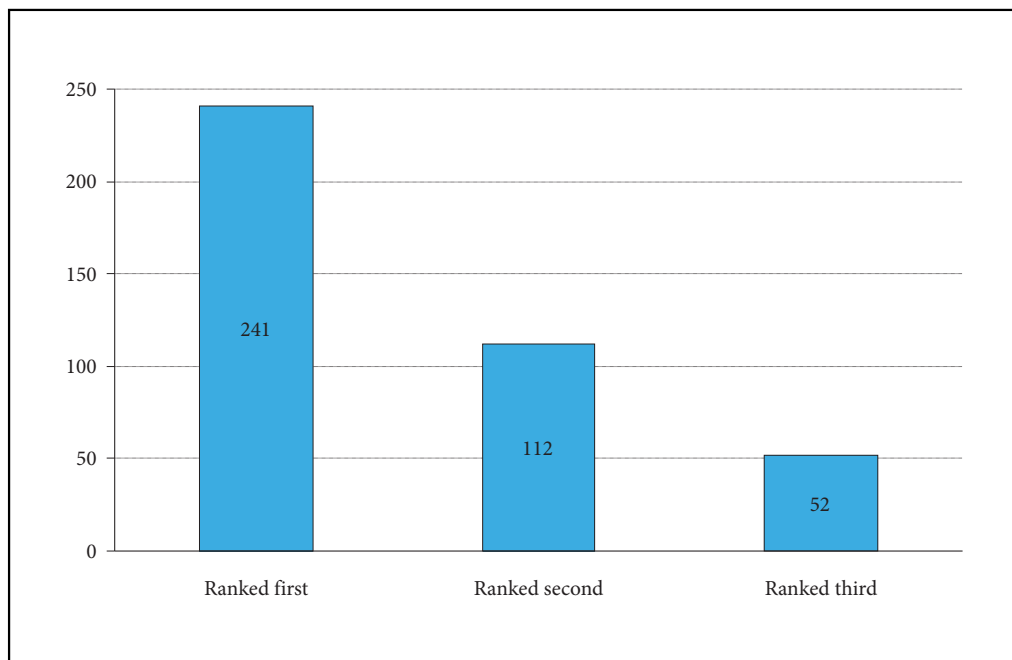
Figure 3: Respondents found the lakes by far the most attractive landforms (ranked first, second, or third; Smrekar and Erhartič 2013).

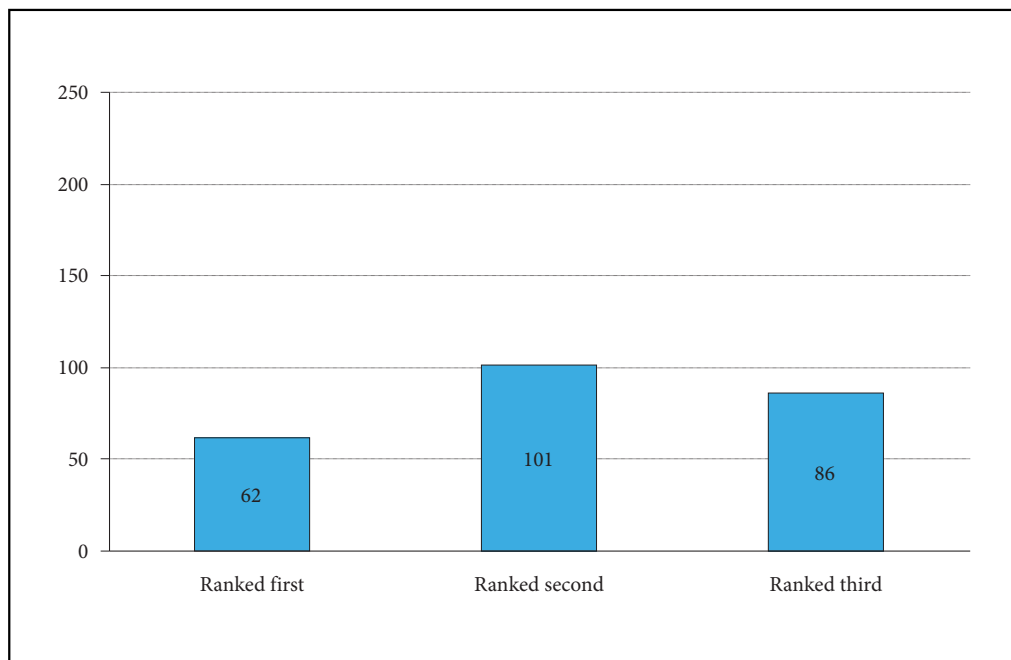Figure 4: Jezero v Ledvicah Lake as shown in the survey.

Figure 5: Moraines were the second most attractive landform (ranked first, second, or third; Smrekar and Erhartič 2013).

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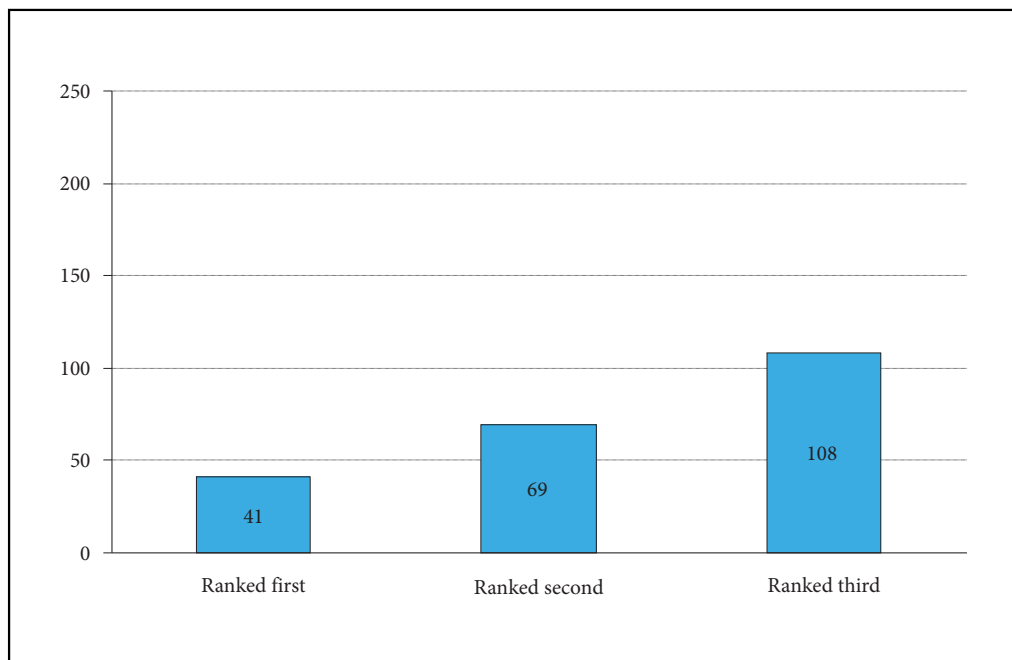
Figure 6: Glacial moraines as shown in the survey.

Figure 7: The third most beautiful landform according to the respondents was the alvars and roches moutonnées (ranked first, second, or third; Smrekar and Erhartič 2013).

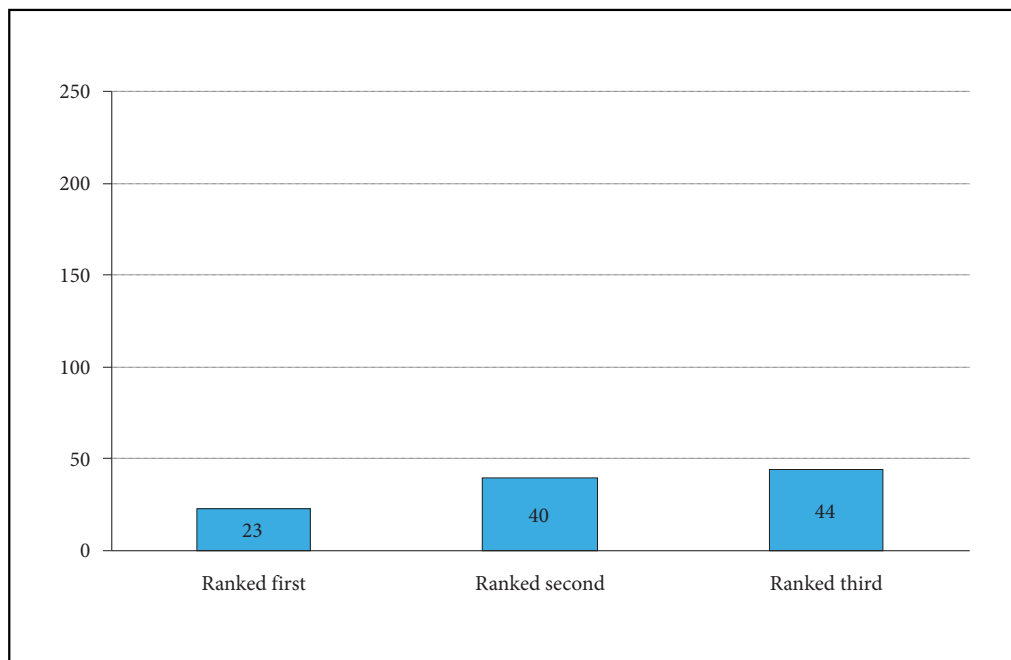Figure 8: Roches moutonnées between Jezero v Ledvicah Lake and Shed Pasture as shown in the survey.

Figure 9: Rock slopes were found least attractive by respondents (ranked first, second, or third; Smrekar and Erhartič 2013).

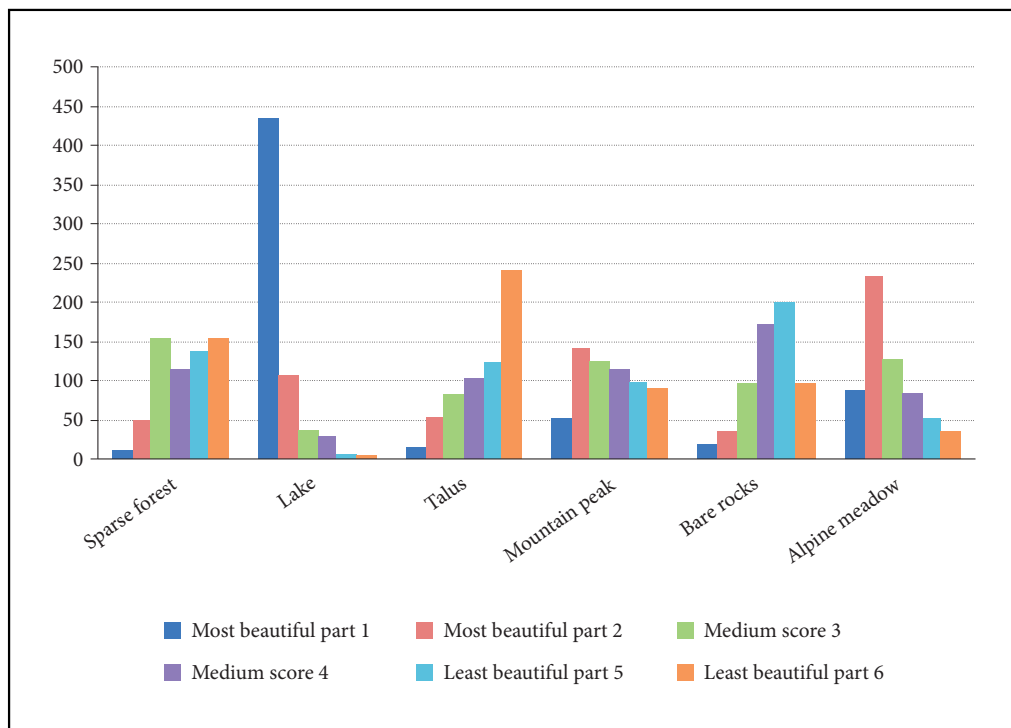Figure 10: The Hribarice Pass as shown in the survey.

Figure 11: Ranking landforms from most to least beautiful (Smrekar and Erhartič 2013).

The respondents that had already been to the Triglav Lakes Valley most frequently selected the photos of the lake (407), the green alpine meadow (245), and alpine flowers (170) as the most beautiful among the fifteen landscape elements listed. Taluses were found the least attractive (8).

At the end, the respondents were once again shown the photo of Jezero v Ledvicah Lake and asked to rank six landscape elements in the photo from most to least beautiful. Respondents most often ranked the lake (541), the alpine meadow (320), and the mountain peak (191) in the top two classes according to attractiveness; the last two are perhaps surprising given the results of the first step of the survey, in which the rocky high-mountain landscape (zoomed in on) was found the least attractive by the respondents. In line with this finding, the respondents ranked bare rocks among the two least attractive classes (53).

4 Discussion

The results show the complexity of evaluating what is beautiful or what attracts people in a landscape. In the area studied, people were most attracted to landforms filled with water and covered with vegetation. In contrast, bare rocks were less interesting from the aesthetic point of view, even though they include exceptionally interesting relief forms, such as alvars, moraines, rock faces, ridges, and so on. The question is whether one can at least speak about collective, if not even universal, patterns of perceiving the beauty of the natural environment or landforms.

The results of the analysis of the online survey that used a non-random sample showed considerable deviations from the total population characteristics. These primarily involve differences in the demographic and education structure. One of the reasons for the unrepresentative sample may be the fact that the elderly, less-educated population groups, and hence most likely the lower socioeconomic classes, do not use the internet. This means they do not have the opportunity to participate in this type of survey. Regardless

of all of this, it can be concluded that the respondents included interested individuals that are active in this region, considering that nearly three-quarters had already visited the valley studied.

The aesthetic value of the Triglav Lakes Valley is among the most apparent or visible values, which, on the other hand, is exceptionally difficult to measure because the evaluations simply refer to the looks or the visual effect created by the natural environment. The findings of this research revealed which part of (non-living) nature in the Triglav Lakes Valley can be evaluated as having high aesthetic value. The authors were stimulated to explore this issue by a previous study conducted in the same region, in which they comprehensively evaluated surface landforms (Erhartič 2012) using a method developed by Reynard et al. (2007). The criteria for the comprehensive evaluation of surface landforms (Erhartič 2012) also include the aesthetic value, which, in turn, is comprised of two simple criteria: the object's visibility and landscape perception; greater value is ascribed to more diverse and dynamic locations with greater relief energy.

The results obtained by using the method that Erhartič (2012) applied to the Triglav Lakes Valley and the method presented in this article show that lakes are ascribed the highest value. This is not surprising because it is a well-known fact that even in different cultural environments people have similarly high agreement scores with regard to the aesthetic value of water (Scholte et al. 2015). In terms of an object's visibility, units covered with forest are usually ascribed lower values because surface landforms without vegetation are less visible (Reynard et al. 2007) and hence the surface itself is given a lower aesthetic value. In addition, respondents were not found to be enthusiastic about the forest. The similarity of the results using both methods is also shown in the evaluation of mountain ridges, which were ranked high both times.

It is interesting that the respondents selected Jezero v Ledvicah Lake as the most attractive landform and that the authors previously decided the same for the same feature, except that it also included the surrounding area. It was displayed with several landforms included, which the respondents had to rank into six classes. In the authors' opinion, this is a very attractive landscape that includes extremely diverse landforms, such as lakes, alpine meadows, sparse forests, taluses, bare rocks, and mountain peaks, in a relatively small area.

The non-uniformity of answers regarding the fifteen landscape elements listed was surprising, excluding the lake as clearly the most attractive element (chosen 407 times) among the three most attractive. It is interesting that living nature is not grouped together, considering that »green alpine meadows« were ranked second (chosen 245 times) and »alpine flowers« were ranked third (chosen 170 times) – that is, just below the top – whereas »forest« (placed tenth, chosen 56 times) and »mountain pines« (placed twelfth, chosen 30 times) were ranked just at the beginning of the last third of a total of fifteen places. Only »animals« placed close to the two-thirds out of fifteen (ranked ninth, chosen 60 times). At first glance, this contradicts the claim that one sees an »it« in the flora and a »thou« in the fauna (Rolston 1987), according to which one would expect higher values for fauna than flora. As a rule, people establish more direct contact with animals, which is supposed to increase the value of landscapes rich in fauna. Knowing the fauna in the Triglav Lakes Valley, visitors do not encounter many animals, except for a few species, such as the marmot and chamois.

5 Conclusion

In professional circles, the aesthetic importance of landforms is often an unjustly and intentionally ignored criterion in defining the importance of landforms. This has especially been the case over the past decades due to the increasing objectification of science, research, and perception. This survey evaluated the landforms in the protected area of Triglav National Park using various cases and proved that people are the most attracted to water features; hence, it can be concluded that collective patterns exist in connection with the perception of the beauty of the natural environment. It can be confirmed with considerable certainty that green areas (e.g., meadows and forests) are more attractive than bare, rocky landscapes. Parallels with this finding can be found in the fairytale about the chamois Goldenhorn (Baumbach 1886), which tells about miraculous gardens in the Triglav Lakes Valley. The cinquefoil species known as the »Triglav flower« (*Potentilla nitida*) was said to be a plant that gave living creatures a special life force. Thus it is not surprising that the respondents appreciated a landscape with water and greenery more. Of course, it is important to once again emphasize the finding above about the representativeness of the respondent sample.

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