

## Influence of existing scenery in an on-site forest environment in terms of Subjective Appraisal, Restorativeness, Affect

TAKAYAMA, Norimasa<sup>1\*</sup> ; FUJIWARA, Aki<sup>2</sup> ; SAITO, Haruo<sup>2</sup> ; HORIUCHI, Masahiro<sup>3</sup>

<sup>1</sup>Forestry and Forest Products Research Institute, <sup>2</sup>The University of Tokyo Forests, <sup>3</sup>Yamanashi Institute of Environmental Sciences

### INTRODUCTION

Many stressors of urban life are increasingly driving humans to seek some form of stress relief (Frumkin, 2001). Natural environments, including typical urban parks and natural, secondary or artificial man-made forests are generally associated with stronger positive health effects compared with urban environments (Velarde, Fry & Tveit, 2007). For instance, natural scenes bring higher tranquility and a reduced feeling of danger compared to urban scenes (Herzog & Chernick, 2000), while outdoor recreation in a green environment has been shown to relieve stress among urban inhabitants (Li et al., 2008), hence the evidence to date seems to indicate the positive health effect of a natural setting. However, the question of how the existence of scenery as a sight stimulus produces a psychological effect in an on-site forest environment and to what extent remain unclear.

Therefore, during this research conducted in an on-site forest environment (a mixed forest including Larch, Giant dogwood), we set out our research purpose, namely to clarify the psychological healing effect of forest scenery as visual stimuli on respondents.

### METHOD

With eleven male and four female adult respondents respectively, we conducted a viewing experiment to investigate the appraisal (Semantic differential method; abbreviated to SDM; 25-paired adjectives), the affect (Positive And Negative Affect Schedule; abbreviated to PANAS; 16-queries), subjective restorative quality (Restorative Outcome Scale; abbreviated to ROS; 6-queries) and degree of attention restoration (Perceived Restorativeness Scale; abbreviated to PRS; 26-queries) using four types of research questionnaires. The viewing experiment was conducted in the forest inside the Forest Therapeutic Research Institute (Fuji Iyashi-no-mori Institute) and managed by the University of Tokyo Forests in early May 2013. The experiments were conducted one-by-one during fine weather throughout the experimental period (four days). Each respondent was given respectively from the opening session (with well-managed forest scenery) to the closing session (forest scenery covered by tarpaulin) or vice versa to eliminate any order effect.

### RESULT AND CONSIDERATION

Consequently, in terms of the comparison of appraisal, the opening session saw scores higher than the closing session for many measurement indexes and the degrees of score difference were cleared. Conversely, it became clear that a difference would emerge in both the opening and closing sessions, even if it was a measurement index not corresponding to visual senses but directly to other senses. Finally, based on the result of multiple regression analysis, it emerged that the basic links between them included aspects of difference and commonality for the integrated index appraisal such as likableness, comfort, beauty and sense of security when comparing the opening and closing of the forest landscape respectively, and this was an appraisal of concrete environmental factors which resulted in such differences and commonality. Furthermore, in terms of affect, even though neither a positive nor negative affect could be confirmed from statistical interaction when comparing the opening and closing sessions, there was a statistical decline (reduction) in the before (pre-viewing experiment) compared to after (post-viewing experiment). As for the quality of subjective restorative, the interaction between the opening-closing and before - after sessions was confirmed as well as individual statistical differences when comparing before and after in the opening session and opening and closing sessions in the after session sequentially. Regarding the degree of attention restoration, subsequent results of the opening-closing comparison clarified that the criteria of run away, fascination, scope and compatibility were statistically higher in the opening rather than closing session.

Keywords: Attention restoration theory, Positive affect, Negative affect, Subjective restorative outcome, Appraisal, Forest therapy

## Evaluation of Landscape Conservation at Green Space on Campus Based on the Level of Willingness to Work

TAKASE, Yui<sup>1\*</sup> ; FURUYA, Katsunori<sup>1</sup>

<sup>1</sup>Graduate School of Horticulture, Chiba University

### 1. Introduction

A university campus with a large-scale green space is precious access to green for the residents in the surrounding vicinity. However, very often only a very low budget is granted for management of green space on university campuses in Japan. Volunteer activities among students are expected for management of the landscape and maintenance of those green spaces on campus. In this study, landscape conservation of green space on campus has been evaluated, based on the level of students' willingness to work.

### 2. Study Methods

Matsudo Campus of Chiba University in Japan has been selected as a subject. The total area of this campus is 15 hectares, and 13.7 of which counts for green space. A survey was conducted in July, 2013, with students who belong to the Faculty of Horticulture at Chiba University. The number of respondents was 77. The following four items were surveyed: 1) Attribute of respondents (gender, participation experience in green space conservation activities, and willingness to participate), 2) future vision of green space on campus from nature experiences, 3) ecosystem services expected from green space on campus, and 4) desired participation hours to spare for green space conservation activities.

### 3. Results and Considerations

Regarding respondents' attributes, the number of valid responses was 59, with 35 males (59%) and 24 females (41%). The number of people who have participation experience in green space conservation activities counted 27 (46%). The number of those who are willing to participate in those activities was 48 (81%).

With regard to the future vision of green space on campus, an free answer question was provided and 65 valid responses were obtained. The two most common opinions were as following: 1) " Increasing of nature experience events " (19 respondents, 29%), and 2) " Increasing of facilities such as restrooms, benches, gathering area, and lighting " (19 respondents, 29%). The next most significant answer was " Better management of gardens and woods " (15 respondents, 23%).

The next topic about ecosystem services expected from green space on campus was captured from 59 valid responses. Approximately 90% of them had certain expectations from ecological services related to green space on campus: examples, " to create beautiful landscape in the area " and " space where people can enjoy nature " .

Finally, as for the number of participation days to spare for conservation activities on Matsudo campus, 59 students provided valid answers. The average number of days that they are willing to participate is 14.2. Since the participation hours per day had been specified and presented as four hours, the average hours figure is 56.8, converted from the number of days. The grand total of days willing to spare among all valid respondents counted 841 days. Next, the number of desired days to spare was computed for each activity location within the campus. " Ohisama Garden " , which is a flower garden managed mainly by students' initiatives earned the highest number of days among all the campus locations. Thirty-five respondents (59%) are willing to spare time here with an average of 6.4 days, which totals 225 days. On the other hand, traditional garden is the most popular in terms of the number of respondents who are willing to spare time. Forty respondents (68%) indicated their interest in sparing time in the traditional garden. The average counted 4.8 days, which totals 191 days. While the main reason of the location choice for Ohisama Garden was " interest in the activities " (14 respondents), the one for the traditional garden was " to acquire knowledge and know-how " (12 respondents).

### 4. Conclusion

In this study, students' willingness to participate in landscape conservation was clarified by gauging their willingness to work. In doing so, the specific number of days and the available labor in scenery maintenance have been drawn.

Keywords: Willingness to Work, Landscape Conservation, Green Space on Campus

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Table. Result of the number of participation days to spare for conservation activities on Matsudo campus

Traditional Garden	Ohisama Garden	Bamboo Grove	Around School Grounds	Sloping Forest	Other
					
Average of days 4.7 days	Average of days 6.4 days	Average of days 3.4 days	Average of days 3.2 days	Average of days 4.9 days	Average of days 4.8 days
Number of Respondents 40 (68%)	Number of Respondents 35 (59%)	Number of Respondents 36 (61%)	Number of Respondents 20 (34%)	Number of Respondents 32 (54%)	Number of Respondents 16 (27%)

## Landscape Evaluation Method by Visitor-Employed Photography with Usage of Cell-phones - Case Study of Mount Gwanak, Korea

MIZUUCHI, Yusuke<sup>1\*</sup> ; SON, Yonghoon<sup>2</sup> ; KANG, Moonseok<sup>2</sup> ; FURUYA, Katsunori<sup>1</sup>

<sup>1</sup>Graduate School of Horticulture, Chiba University, <sup>2</sup>Graduate School of Environmental Studies, Seoul National University

### 1. Introduction

For spatial planning and designing such as natural parks, it is important to understand how users percept and evaluate landscapes. The relationship between viewpoints and a viewing object has been regarded important in the landscape perception model which has been studied in Landscape architecture, Geography and some sciences. One of the study methods to understand such landscape perception uses a camera called Visitor-Employed Photography (VEP), and this method is considered effective in extracting visual images of a space. However, while existing VEP is effective in understanding viewing objects, it still has shortcomings. It requires interviews and descriptions separately in order to extract viewpoints. Therefore, in order to develop a study method of landscape perception to overcome these limitations, we conducted experiments to get viewpoints by using the GPS function of cellphones which visitors to the sites possess for their daily usage.

### 2. Outline of the experiment

A research was conducted with 60 subjects, and the trail of Mount Gwanak in the suburbs of Seoul, Korea, was selected as a site. This location is designated as Urban Eco-Park. The subjects were instructed to use their own cellphones and take photos of landscapes which subjects evaluate. They were also instructed that Geotag must be attached to the photos. In addition, geographic information of the subject's action was simultaneously collected by GPS logging application of their cellphones. Following this activity, a questionnaire survey about subject's profile was conducted. From the collected photos and spatial characteristics of Mount Gwanak, we analyzed landscape objects which are appreciated by the visitors.

### 3. Results

1,119 photos were collected from 60 respondents. Among these, the redundant photos of the same composition taken by the same subject (121 photos) were eliminated. In addition, geographic information were not available from 6 subjects, hence theirs (99 photos) were also eliminated. Further eliminated were the other photos with geographic information errors (45 photos), and the remaining 842 photos were used for analysis. These photos were categorized based on the viewing objects and viewing distance. As a result, based on the trail as a viewpoint, the photos of landscapes within the woods counted most with 120 photos. Panoramic views (105 photos) and closer shots of the space with a river as a main subject were also common. We analyzed the collected geographic information with the Kernel density estimation, and identified the viewpoints of visitor's preference (Fig. 1). This result was combined with the categorized viewing subjects for further analysis, and it was found that photo shooting density tends to be high at the following locations: 1) panoramic view, and the rock and the building at the mountain top in the surrounding area of the mountain top (Fig. 1.1), 2) the touching points of the trail and the river (Fig. 1.2 and 1.3), and 3) locations with a temple (Fig. 1.4)

### 4. Conclusion

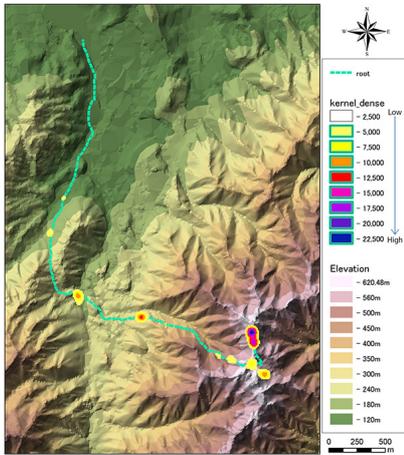
In this research, landscapes within the woods, panoramic views, and river views from the trail are highly appreciated at Mount Gwanak. While panoramic views and river landscapes were concentrated in certain locations, there was no spatial tendency detected with the landscapes within the woods. From the questionnaire survey, 42 respondents (70%) responded comfortable. Eighteen (30%) responded not comfortable; and among those, two (3.3%) were about GPS and others were about the course. Thus, the load of study method itself can be considered light. As described above, this study method can be useful as a future development of a landscape perception research method. It enables visual extraction of viewpoints and viewing objects as shown in this research. Furthermore, this method can be applicable to international comparative studies to identify cultural differences in landscape recognition.

Keywords: landscape evaluation, GPS, GIS, Visitor Employed Photography

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## Comparison of natural landscape appreciation between Russia and Japan: landscape exoticism evaluation

PETROVA, Elena<sup>1\*</sup>; MIRONOV, Yury<sup>2</sup>; AOKI, Yoji<sup>3</sup>; MATSUSHIMA, Hajime<sup>4</sup>; EBINE, Satoshi<sup>4</sup>; FURUYA, Katsunori<sup>5</sup>; PETROVA, Anastasia<sup>6</sup>; TAKAYAMA, Norimasa<sup>7</sup>; UEDA, Hirofumi<sup>8</sup>

<sup>1</sup>Lomonosov Moscow State University, Faculty of Geography, <sup>2</sup>Vernadsky State Geological Museum of the Russian Academy of Sciences, <sup>3</sup>Haiku International Association, <sup>4</sup>Research Faculty of Agriculture, Hokkaido University, <sup>5</sup>Graduate School of Horticulture, <sup>6</sup>Institute for Oriental Studies of the Russian Academy of Sciences, <sup>7</sup>Forestry and Forest Products Research Institute in Japan, <sup>8</sup>School of Design, Sapporo City University

People belonging to different cultures differ by their landscape preferences due to a number of ethno-cultural features as well as historical, social, and environmental factors. It is very important to reveal and consider these differences. The purpose of this study is to compare perception, visual and emotional evaluation of natural landscapes in Russia and Japan, that are situated so close to each other and share a common border, but differ so greatly in cultural aspects, while both have deep-rooted traditions of landscape appreciation. We have interviewed respondents in university centres of Russia (Moscow in Central Russia, Irkutsk in East Siberia, and Petropavlovsk-Kamchatsky in Far East) and Japan (Sapporo, Chiba, and Miyazaki); metropolitan areas of both countries and two outermost areas, which differ most strongly in their natural environment, were represented. Young respondents (17 to 30 years old men and women) have taken part in the survey. During the interview, each respondent received the same set of 70 photos of natural landscape. For evaluating the exoticism, we asked respondents to use the 3-point scale, on which exotic landscape got a mark "+1" and usual landscape - "-1". When respondents could not decide between these categories, they were suggested to use an average value "0". Data obtained were analyzed using elementary and multivariate statistical methods.

Exoticism is very important parameter in landscape appreciation and evaluation. As we have learned during the interview, respondents consider attractive landscape as beautiful and comfortable not only for a long-term stay, but for living in. Exotic landscape is "unfamiliar" to respondents; even if it were unsightly, it would be interesting to look at, at least once. Therefore, when assessing attractiveness of landscape, respondents focus primarily on their aesthetic feelings, but in the evaluation of exoticism dominates their educational interest to an unknown. As we revealed, practically no correlation exists between Russian and Japanese respondents to evaluate exotic landscapes ( $R = 0.26$ ). The majority of Russian respondents evaluate mountain landscapes, waterfalls, and sea coasts as the most exotic, but forests, rivers, and treeless plains as the most usual. At the same time, coastal areas are usual and treeless plains are exotic for the Japanese. All the other types of landscapes vary considerably in their exoticism degree for Japanese respondents. All groups of Japanese respondents assess the exoticism of landscapes virtually identical (the correlation coefficients between their scores are:  $R = 0.90-0.96$ ), while the groups of Russian respondents show some differences.

To discover the ethno-cultural aspect, we compare the survey data from Kamchatka to that from Hokkaido, which are similar in terms of natural conditions. In their assessments of the exotic landscapes residents of Kamchatka are closer to the representatives of their culture, living in fundamentally different environmental conditions, than to the representatives of the Japanese culture, living in a similar environment. At the same time, Kamchatka respondents evaluate some of exotic landscapes virtually identical to the estimates of Japanese respondents and very different to those of Russian respondents from other regions. This applies to seacoasts and mountain landscapes that are both the most remarkable and most similar elements of natural environment of Kamchatka and Japan. Thus, if all respondents evaluate the attractiveness of landscapes almost equally, which may indicate the existence of universal human concepts of their aesthetics, then when assessing the exoticism, important role play both ethno-cultural differences and features of natural environment where the respondents live or that they have experience to communicate with. For Russian respondents the most exotic landscapes are also the most attractive, although we cannot see such a tendency for Japanese respondents.

**Keywords:** landscape appreciation comparison between Russia and Japan, visual and emotional evaluation of natural landscapes, exotic landscape, attractive landscape, ethno-cultural differences, features of natural environment

## Exploring reasons for residents use and appreciation of informal urban greenspace in Sapporo and Brisbane

RUPPRECHT, Christoph<sup>1\*</sup>

<sup>1</sup>Environmental Futures Research Institute, <sup>2</sup>School of Environment, Griffith Univ.

Informal urban greenspaces (IGS), such as vacant lots, street verges and river banks are an important new topic in urban recreation and landscape studies. At last year's JpGU 2013 I showed that residents in Sapporo (Japan) and Brisbane (Australia) use and appreciated IGS as adults and during their childhood. But two important questions remained: (1) What role does IGS play for residents in comparison to formal green space, such as parks?, and (2) Why do residents in Brisbane evaluate IGS more positively than in Sapporo? This presentation reports preliminary answers to these questions.

To examine the first question, I used a GIS analysis to compare the amount of formal greenspace within 500m of the sites where the questionnaire on IGS use and perception was distributed to Sapporo and Brisbane residents. A negative correlation between formal greenspace area and IGS use would imply residents indeed use IGS as a substitute for parks. But the results showed no correlation. This suggests residents deliberately choose to use IGS. IGS therefore plays a unique role in residents' recreation - different from formal greenspace.

But why did residents in Sapporo feel IGS made their daily life both better and worse, while residents in Brisbane felt IGS had a mostly positive impact on their daily life? Looking for potential reasons for this difference in IGS appreciation, I measured IGS quantity, accessibility and vegetation structure in both cities. The type of IGS (e.g. lot, street verge, brownfield, railway, gap space, powerline, waterside etc.) was determined using a IGS typology. Accessibility of IGS was categorized in three levels: accessible, partially accessible and not accessible. Vegetation structure was recorded by measuring coverage of four strata: tree, bush, herb and ground cover.

The results show IGS makes up a surprisingly large percentage of city land use in both cities (~5% of total surveyed land use), but there were differences in the amount of IGS types and vegetation structure. We analysed the questionnaire data and field survey data, and found these different IGS types and vegetation structure could explain why residents evaluate IGS differently. Understanding how residents appreciate IGS may in turn help us to unlock the potential of IGS for recreation.

Keywords: urban geography, recreation, wildscape, urban planning, naturalness, spontaneous vegetation