

## Landscape Perception of Takao Quasi-National Park Using by Visitor-Employed Photography and Spatial Information Technologies

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### 1. Introduction

Mt. Takao is, a famous natural tourist site, designated as Quasi-National Park. For landscape planning 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. Certainly, using a Global Positioning System helps effectively pinpoint photographed locations. Providing GPS logger (hereafter GPS) to visitors and gathering geospatial information offers the possibility of thoroughly understanding each photo's location. Additionally, GIS analysis enables to give the spatial distribution, other characteristics of the photos locations. This study conducted a survey combining VEP and GPS in order to understand landscape perception in Takao Quasi-National Park, in Hachioji, Japan.

### 2. Method

A survey was conducted with 30 respondents, and the Inariyama trail of Takao QNP in the suburbs of Tokyo, was selected as a site. The respondents were instructed to use their own cellphones or digital-camera and take over 15 photos of landscapes which respondents prefer. They were also instructed that carrying GPS. Following this activity, respondents selected 15 photos, and noted down 15 photos profile (contents of photos). Each 15 photos were evaluated four item 1) aesthetic, 2) naturalness, 3) rareness, 4) atmosphere by five scale. From the collected photos and geospatial information, we analyzed the places which visitors prefer and its landscape types in Takao Quasi-National Park by using GIS. To identify the place that were particularly popular area called hot spots, whole of trail was divided 5m lines. Then, the number of viewpoints (location where photos were taken) within each line was calculated. After this, Getis-Ord  $G_i^*$  statistic was used (chosen for its superior ability to extract locations with distance damping), so as to identify statistically significant hot spots.

### 3. Results

450 photos were collected from 30 respondents. These photos were categorized based on the viewing objects and viewing way. As a result, based on the trail as a viewpoint, "surroundings" (the photos of sceneries within the woods) counted most with 117 photos. "Panoramic views" (82 photos) were also common. We analyzed the collected geographic information with the Getis-Ord  $G_i^*$  statistic and identified the viewpoints of visitors' preference (Fig. 1). The results showed that three highly preferred locations called hot spot were extracted ( $p < .001$ ). 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 at the top of the mountain, 2) panoramic view at the perspective field on the way, 3) locations with a shrine, and 4) around entrance of the trail.

### 4. Conclusion

In this research, we clarified the places which visitors prefer and its landscape types in Takao

Quasi-National Park by the survey combining VEP and GPS. By extracting the places and its landscape types which visitors prefer, the spatial condition which visitors prefer can be found by using GIS in future study. Lastly, the necessity of an on-site survey, including spatial analysis, was discussed in order to analyze landscape experience at natural landscape area.

Keywords: Landscape, GIS, GPS

