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Study of the Relation between Location Characteristics of Observation Platforms and Natural park Plans in the Hakone Region of Fuji-Hakone-Izu National Park

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It is important not only to conserve the beauty of a natural landscape but also to allow visitors to enjoy it at a Natural park, and observation platforms play important roles to achieve this purpose. This study examined future observation platform development in landscape planning by understanding: 1）location characteristics of observation platforms, 2）the maintenance situation, and 3）Natural park plans. The subject of this study was the Hakone region in the Fuji-Hakone-Izu National Park. The result exhibited functions of observation platforms that have been damaged due to growth of vegetation, mainly trees. In particular, installation of observation platforms on ground level is rather easily affected by this factor; and it has been found that the more strict conservation planning is in the surrounding area, it is more difficult to maintain the functions. In this study, many observation platforms have been observed where functions have been deteriorated due to vegetation growth and aging. This study enables the prediction of the future status of observation platforms to some degree by examining characteristics of location, conservation planning, and usage planning; therefore, it provides direction for landscape plan development with future impact kept in perspective.

1. Introduction

Interaction with nature is considered important for usage of a Natural park, and the purposes of visits are typically mountain climbing, nature sightseeing, camping, and scenery viewing. Magnificent natural scenery attracts visitors, as the designation criteria of a national park in fact include the representative natural scenery of the nation and magnitude and complexity of the view. For these reasons, appropriate locations for scenery viewing are equipped with facilities such as observation decks, observation squares, and parks. National parks prepare national park plans（referred as "Natural park plan" hereafter）based upon Natural parks Law in order to guide conservation of scenery and appropriate park usage. Facilities for Natural park plans are ruled in Article 1 of the enforcement ordinance of the above Law, and observation platforms are positioned to serve for scenery viewing purposes. In addition, "Notice Regarding Supplementary Facilities Related to Execution of National Park Projects"[1)] specifies supplementary facilities that may be established along with the basic facilities which would be built based on the Natural park plan. According to this notice, observation platforms may be established as supplementary facilities along with basic facilities such as parks, roads, cycling roads, walkways, and rest houses.

Various studies of natural scenery observation exist, such as a study by Higuchi[2)] which captures a viewing subject and a view of an object as a landscape structure, a study of the evaluation on structures for likeability of landscape[3)], study of the evaluation on natural factors of landscape[4)], a study of images and evaluation of landscape view[5)], a study of influence of manmade structures such as buildings and power towers to a natural landscape[6) 7)], and a study of the relation between landscape view and weather[8)]. These studies have contributed to improvement of technologies for natural landscape conservation. However, this is the first study to focus on: 1）characteristics of locations of observation platforms related to landscape view, and 2）relation between observation platforms and Natural park plans, in a national park. Designating the Hakone region in the Fuji-Hakone-Izu National Park as a subject, this study evaluates the characteristics of locations of existing observation platforms related to landscape view, and examines the future state of landscape planning from perspectives of relation between observation platforms and Natural park plans.

2. Study Methods

The subject of this study is the Hakone region in the Fuji-Hakone-Izu National Park. First, viewing points with observation platforms have been collected from the Hakone region, and observation platforms to be studied were screened. Second, as a result of the field survey of the selected observation platforms, location conditions, landscape structures, and maintenance conditions were analyzed. Finally, investigations on observation platforms in relation to Natural park plans were concluded.

（1） Summary of Hakone Region

The Hakone region spreads across four towns and five cities in the areas of south of Kanagawa Prefecture and east of Shizuoka Prefecture. Hakone-machi, Ashigara-simo District, Kanagawa Prefecture occupies a majority of this area. The park area of the Hakone region counts for 11,185 hectare, and the majority of the Hakone region is designated as

Photo 1. View and Entrance of Hakone-Ashinoko viewpoint Park

a Special Zone of national park.

The Hakone region has a long history as a national park which was designated before World War II, and enjoys a large number of visitors due to population density in the accessible areas such as Tokyo and Yokohama. Therefore, this region in the Fuji-Hakone-Izu National Park is well equipped with many observation platforms. Also, this park provides a stereotypical Japanese landscape including Mount Fuji, just as the government promotes to foreign visitors. It has been thus determined that this area is appropriate as a subject to study characteristics of locations of observation platforms related to landscape view and the relation between observation platforms and Natural park plans; and it is also determined that proactive examination of landscape planning would be necessary.

(2) Selection of Observation Platforms

Viewing points in the Hakone region were collected from interviews and field studies. The collected viewing points were screened, and observation platforms to be studied were selected according to selection criteria.

In terms of a definition of observation platforms, it is stated in the Guideline of Facility Maintenance Technique of Natural park (1987)[9] that they are facilities for the park visitors to view natural scenery such as observation decks, observation gazebos, etc. Purposes of these observation platforms in Natural parks are defined as: 1) park visitors can use safely and comfortably; and 2) they can effectively enjoy the natural scenery of their interest. According to structures, observation platforms are generally classified as observation decks, observation terraces, semi-basement observation decks, observation gazebos, and observation squares. Surveys and classifications for this study followed these classifications.

A viewing point in this study signifies a space where a viewpoint exists: it is a space surrounding a viewpoint[10]. In other words, it is a place to view scenery; therefore, conditions of a viewing point would affect the quality of the view and the viewers' state of mind. Since viewing points can be a variable factor upon planning and designing a landscape, superior design of a viewing point could present a landscape with better impressions.

Interviews were conducted on Friday, August 19, 2005. The interviewees were two people: a staff at Hakone Visitor Center and a representative of Hakone volunteer staff. The two interviewees have been assessed to be qualified for this interview, as they both have had long experiences in Hakone. A topographical map (including areas of Gotemba, Susono, Mishima, Sekimoto, Hakone, Atami, north area of Odawara, south area of Odawara, and Manazuru) in 1/25,000 scale was prepared, and the two interviewees were asked to place stickers on the topographical map according to our verbal questions; such as "places where you can view a landscape", and "places with observation decks, etc.".

Field survey is conducted from August to September in 2005. Investigations were managed with reference literature and materials such as visitors' guidebooks[11)12)13)], brochures, study reports for non-visitors[14)15)], a topographical map in 1/25,000 scale, road maps[16)], etc.

(3) Survey Methods of Observation Platforms

The following factors were investigated in the survey of observation platforms: 1) location conditions (six items), 2) landscape structures (seven items), and 3) maintenance conditions (12 items).

(i) Location Conditions

Six items were investigated as location conditions: 1) location, 2) altitude, 3) geographical features, 4) platform features, 5) convenience of transportation, and 6) barrier-free design. The location was gauged by GPS (Pocket Navigator GPS38EX, Empex Instruments,Inc.); and the altitude data of the GPS that were also used were cross checked with altitude indications of the locations on the topographical map. Geographical features were classified as "old somma", "caldera", and "central cone" based on the classifications in Landscape of Hakone (1996)[15)17)], etc. Platform features were classified into five types[9)]: observation deck type, observation gazebo type, observation terrace type, semi-basement observation deck type, and observation square type. Convenience of transportation was measured by conditions of roads and walkways and also by the walking time between the nearest base (a parking or a station) to an observation platform. Lastly, applications of barrier-free design were surveyed with conditions at each entrance of observation platforms, such as steepness of a slope, width, and gap at the footstep.

(ii) Landscape Structures

Seven items were studied pertaining to landscape structure: 1) visual object, 2) angles of elevation and depression, 3) visual range, 4) view angle, 5) main point of the compass, 6) maximum angles of elevation and depression, and 7) a vertical angle of vision. A visual object was classified into "Mount Fuji", "somma", "Mount Ashitaka", "central cone", "Lake Ashinoko", "city (except for the Hakone region)",

"ocean", and "others" among the objects that can be recognized from observation platforms. Angles of elevation and depression of visual objects were measured with a hand level (Sokkia Topcon Co., Ltd.). In addition, landscape structural elements were confirmed between the angle of depression of eight degrees and 30 degrees. The angle of depression at eight degrees refers to the highest limit of an angle for "main area" whose angle of depression ranges between eight and ten degrees, and the angle of depression of 30 degrees refers to the lowest limit for "optimal area of display" [2] as well as the lowest limit for a landscape to look down. Visual range was calculated based on measurements on a topographical map between the location of an observation platform and that of a visual object. In the field study, it was measured towards the direction with the most open visibility from the approximate center point of the platform as a base point. View angle was defined as a range with a clear visibility at the base point. It was measured with a compass (military compass C9-45) horizontally leveled at approximately 150 centimeters high. The main point of the compass was defined as a direction of a main object from the base point, and measured accordingly. When multiple objects were visible, the following order was applied to determine a main object in order of priority: Mount Fuji, Lake Ashinoko, central cone, somma, ocean, Mount Ashitaka, damaged areas, and others. Maximum angles of elevation and depression were defined as the ones at the base point, hence measured with a hand level at the base point. The maximum angle of elevation was further defined as an angle that connects a viewpoint and the edge of a fence within the observation platform premise, and measured accordingly. Vertical angle of vision was calculated as a sum of measured maximum angles of elevation and depression.

(iii) Maintenance conditions

Table 1 displays surveyed items on maintenance conditions. Items to check existence of obstacles to a landscape were listed first as critical criteria for quality of observation platforms, and then others to check maintenance conditions of a space were added.

We judged each observation platform to be bad condition, if we confirm an obstacle to a landscape or over half checked a damage of the observation platform. And each observation platform are categorized 4 groups; confirming an obstacle to a landscape and damages of the observation platform (Ⅰ), confirming an obstacle to a landscape (Ⅱ), confirming damages of the observation platform (Ⅲ) and good condition (Ⅳ).

Table 1. Check list of Maintenance condition

Obstacle in the viewing line	Short Maintenance	
①Trees are the obstacle in the viewing line	③Weed grew too much	⑧Drawing graffiti
②Objects are the obstacle in the viewing line	④Upsetting the waste	⑨Trees are damaged
	⑤Uneven the ground	⑩Eroding the ground
	⑥The objects (bench etc.) are damaged	⑪The objects (bench etc.) can't use
	⑦Damaged coating	

3. Results

(1) Selection of Observation Platforms

Fifty three viewing points in the Hakone region were collected from interviews and field studies, and 27 observation platforms were selected among them (Fig 1). These observation platforms must have been able to be identified during the filed studies, and those viewing points that had been naturally developed at the top of a mountain or in middle of a hiking trail were screened out.

(2) Characteristics of Location

Distribution of observation platforms exhibited density in the southwest part of the Hakone region (Fig 1). This tendency can be derived from the fact that somma ridge, where Hakone Turnpike and Ashinoko Skyline pass through, and the lake side of Lake Ashinoko fulfill conditions of altitude and geographical features to serve as viewing points.

Fig 2 indicates actual status of altitude. Altitude of each observation platform and visual object were compared. (An object at the highest altitude was selected in case multiple objects were identified in a visual object group.) As a result, the landscape structure with which one can observe both upwards and downwards over a landscape has been identified as a characteristic of the Hakone region.

As a result of location conditions, connections between geographical

Fig 1. The Map of Hakone and location of observation Platforms

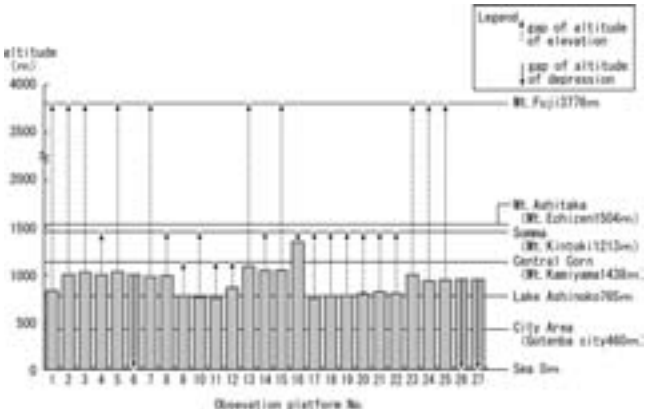

Fig 2. Altitude of observation platforms and gap during the observing objects

features and platform features were detected; therefore, these two elements were sorted and grouped accordingly, and five geographical characteristics were identified as shown in Table 2.

Geographical characteristic I represents that the locations are situated inside a caldera, and the platform feature is an observation deck type. The distinctive characteristic is that all the observation platforms are located at the lake side of Lake Ashinoko. Geographical characteristic II represents that the locations are also situated inside a caldera; however, platform features are either an observation terrace type or an observation square type. Geographical characteristic III means the locations situated at an old somma, with platform features of either observation deck type or observation terrace type. Geographical characteristic IV also represents locations situated at an old somma, but with an observation square type of platform. This characteristic IV, in general, accompanies a parking area next to observation platforms; therefore, it has a tendency to provide convenience for automobile transportation. Finally, the characteristic V represents locations at a central cone with either an observation deck type or an observation square type of platforms.

Table 2. Categories of location conditions

Location Conditions	Landform	Observation Platform Type
Ⅰ	Caldera	Observation deck type
Ⅱ	Caldera	Observation terrace or square type
Ⅲ	Old somma	Observation deck or terrace type
Ⅳ	Old somma	Observation square type
Ⅴ	Central cone	Observation deck type or square type

(3) Landscape Structures

From the perspectives of visual objects, observation platforms were successfully grouped into four characteristics of landscape as shown in Table 3. Fig 3 indicates distribution of observation platforms by each landscape structure.

Landscape characteristic I represent a view of Mount Fuji, including Mount Ashitaka and city areas outside the Hakone region, depending on locations. In addition, a central cone, a somma, and Lake Ashinoko in the Hakone region can be also observed. It is a complex landscape of Fuji-Ashitaka-Hakone caldera. Among all the landscape characteristics, this characteristic marks a maximum angle of depression (average angle of 20 degrees).

Landscape characteristic II is a view of the Fuji Ashitaka landscape in city areas outside the Hakone region. Mount Fuji can be observed at a close angle of elevation, 5 degrees, at which a beautiful view of the shape of a mountain can be witnessed.

Landscape characteristic III provides a view of the Hakone caldera

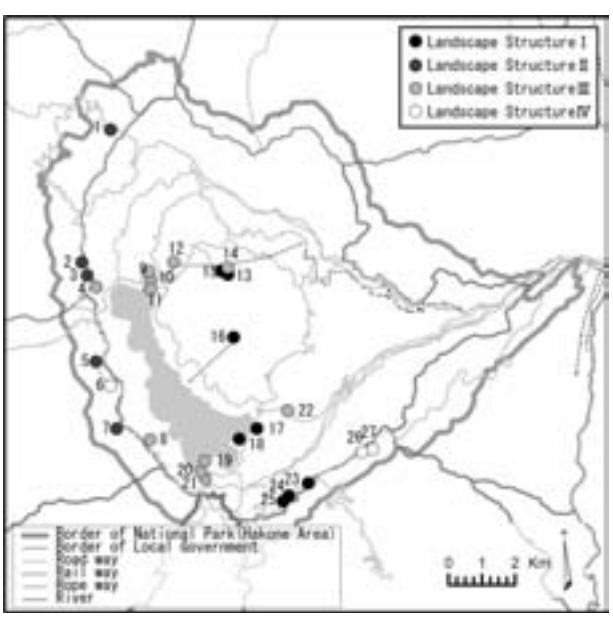

Fig 3. Type of Landscape Structure

Table 3. Categories of Landscape structure

Landscape Structure	Observing objects							
	Mt. Fuji	Mt. Ashitaka	Central corn	Somma	Lake. Ashinoko	City Area	Ocean	The others
Ⅰ (Complex landscape of Fuji-Ashitaka-Hakone caldera)	○	△	○	○	○	△	△	
Ⅱ (Fuji-Ashitaka landscape)	○	○				○	△	
Ⅲ (Hakone caldera landscape)			○	○	○			△
Ⅳ (ocean view)						△	○	

* ○ : 50≦Observable rate≦100, △ : 1≦Observable rate＜50
Observable rate = Observable sites／Whole of observatories in each Landscape Structures

landscape with a central cone, a somma, and the Lake Ashinoko. Observation platforms provide a very large degree of the maximum angles of elevation as well as depression; therefore, they provide a wide range of vision to observe top to bottom and left to right.

The next landscape characteristic IV is an ocean view of either Suruga Bay or Sagami Bay. No visual object exists to look up to, and the structure looks over the ocean at "an optimal angle of display (0 to 30 degrees of angle of depression)"

(4) Maintenance Conditions

Status of maintenance conditions is indicated in Fig 4. "①Trees are the obstacle in the viewing line[18]" was observed most, with nine cases. This result implies that current status requires maintenance work in order to secure the important viewing line of observation platforms. "⑤ The ground surface is obviously uneven" followed with eight cases, and "⑥ manmade structures exhibit visible damages" with six. Observation platforms with poor maintenance conditions were thus discerned in many cases. All the other conditions were also detected with one or more cases; and as a result, it is suggested that the observation platforms in the Hakone region are in need of maintenance work.

(5) Relation between Observation Platforms and Natural park Plan

(i) Relation with conservation planning

Table 4 has been completed after categorizing relations between observation platform and Natural park plan of 27 locations. No observation platforms existed in the Special Protection Zone. Inside the caldera which is a high altitude areas of somma, the area of Daigatake, Owakudani, and Sounzan, and the south slope of Komagatake are classified as Special Zone 1, and among these locations, there are three observation platforms at Owakudani. Owakudani is located at the foot of a mountain, Kamiyama, which is in the inner rim of a volcanic crater; therefore, a magnificent view of a caldera and Mount Fuji can be observed from this location. Nature study trails for sightseeing of volcanic phenomenon and Hakone Natural Science Museum has been established here with a cable car station also on site.

According to the section 2 of Article 9 of the Natural parks Law enforcement regulations, Special Zone 2 has been designated as an area where adjustments with industrial activities such as agriculture, forestry, and fishery are necessary, and it applies to a vast area in the Hakone region. "Natural park Plan Preparation Guideline for National Parks"[19] states that facility complex are to be arranged in Special Zone 2 in principle. There are two facility complexes in this zone: Kojiri and Hatabikiyama. In addition, various individual facilities such as parks and accommodations are also in plan. As a reflection of these Natural park plans, many observation platforms have been located in Special Zone 2,

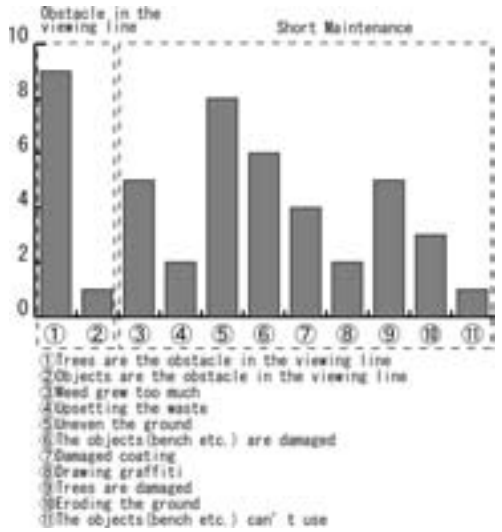

Fig 4. Number of Maintenance conditions

Table 4. Relation with conservation planning

Conservation planning	Observation platform No.	N
Special protection Zone	Nothing	-
Special Zone 1	13,14,15	3
Special Zone 2	9,10,11,12,16,17,19,20,21,22,24,25	12
Special Zone 3	1,2,3,4,5,6,7,8,23,26,27	11
Ordinary Zone	Nothing	-
Other area	18	1

which counted for 13 out of 27 platforms studied, which is nearly half.

Special Zone 3 is designated for surrounding areas of parks; however, mountain sightseeing roads such as Hakone Skyline, Ashinoko Skyline, Hakone Turnpike, etc. are well established around a somma, and good views can be observed along the roads; therefore, observation platforms exist where parking spaces can be secured, and 10 out of 27 were found in this zone.

As stated above, a significant tendency has been detected that many of the observation platforms in the Hakone region are established in the areas of Special Zones 2 and 3. Special Protection Zone and Special Zone 1 bear strict regulations upon changing views in the area, hence the Natural park plan specifies scenery viewing at observation platforms must be conducted in Special Zone 2 and 3, except for the case of Owakudani.

(ii) Relation to usage planning

As a result of studying the Natural park plan of the Hakone region, observation platform plans did not exist in usage planning. Therefore, the observation platforms in the 27 locations, which are actually in use now for viewing, have been maintained together with other park facilities. From these findings, four types of relations have been derived as

shown in Table 5.

The first usage planning is as park facilities in a facility complex. Six observation platforms in Kojiri and Hatabikiyama facility complexes fall under this group. The second usage planning is for supplementary facilities such as parks and roads specified by "Notice Regarding Supplementary Facilities Related to Execution of National Park Projects". Seven observation platforms are maintained as a supplementary facility of a park and nine of a road, which summed up to sixteen cases. The third type has three cases: the garden of the Narukawa Museum, an observation square at a rest house along Ashinoko Skyline, and Michi-No-Eki on the Hakone mountain path. They are maintained by manmade facility establishment in a Special Zone. The last is a usage planning without relation to the Natural park plan: Otome Observation Deck and an observation deck at Benten-No-Hana at Onshi Hakone Park. Onshi Hakone Park is a prefectural urban park, and its observation platform was built as an urban park facility; however, this is one of the representative observation platforms in the Hakone region, as the view includes Mount Fuji with Lake Ashinoko in front.

Table 5. Relation to usage planning

Usage planning	Observation platform NO.	N
Facility complex	Kojiri facility complex : 9,10,11,12 Hatabikiyama facility complex : 19,20	6
Facility parks and roads specified	Parks : 4,13,14,15,16,22,23 Roads : 2,3,5,6,7,24,25,26,27	16
Other		
Manmade facility establishment	8,17,21	3
Other	1,18	2

4. Considerations

In this section, significant characteristics will be drawn as a result of a cross tabulation of information which has been discussed thus far: maintenance situations, characteristics of location and landscape, and conservation and usage planning (Table 6, Fig 5). Characteristics of location and landscape comprise characteristics of observation platforms. The analysis is based on a hypothesis that relations must be detected between maintenance conditions of observation platforms and location characteristics, conservation planning, and usage planning of observation platforms.

First, in terms of observation platform features, observation deck type was often found under the maintenance conditions I and II, where landscape obstruction is occurring. On the other hand, observation

Table 6. Matrix of the whole results

Observation platform No.	Maintenance Condition	Location condition		Landscape Structure	Conservation planning	Usage planning
		Location	Observation platform type			
13	Ⅰ	Central corn	Square	Ⅰ	Special Zone 1	Parks
22	Ⅰ	Caldera	Square	Ⅲ	Special Zone 2	Parks
11	Ⅰ	Caldera	Deck	Ⅲ	Special Zone 2	Facility complex
20	Ⅰ	Caldera	Deck	Ⅲ	Special Zone 2	Facility complex
24	Ⅰ	Old somma	Deck	Ⅰ	Special Zone 2	Roads
25	Ⅰ	Old somma	Deck	Ⅰ	Special Zone 2	Roads
8	Ⅱ	Old somma	Square	Ⅲ	Special Zone 3	-
15	Ⅱ	Central corn	Deck	Ⅰ	Special Zone 1	Parks
10	Ⅱ	Caldera	Deck	Ⅲ	Special Zone 2	Facility complex
19	Ⅱ	Caldera	Deck	Ⅲ	Special Zone 2	Facility complex
16	Ⅲ	Central corn	Square	Ⅰ	Special Zone 2	Parks
23	Ⅲ	Old somma	Square	Ⅰ	Special Zone 3	Parks
2	Ⅲ	Old somma	Square	Ⅱ	Special Zone 3	Roads
3	Ⅲ	Old somma	Square	Ⅰ	Special Zone 3	Roads
4	Ⅲ	Old somma	Square	Ⅰ	Special Zone 3	Parks
5	Ⅲ	Old somma	Square	Ⅱ	Special Zone 3	Roads
6	Ⅲ	Old somma	Square	Ⅳ	Special Zone 3	Roads
7	Ⅲ	Old somma	Square	Ⅱ	Special Zone 3	Roads
18	Ⅲ	Caldera	Deck	Ⅰ	Other	-
12	Ⅲ	Central corn	Deck	Ⅲ	Special Zone 2	Facility complex
21	Ⅲ	Caldera	Deck	Ⅲ	Special Zone 2	-
9	Ⅳ	Caldera	Terrace	Ⅲ	Special Zone 2	Facility complex
1	Ⅳ	Old somma	Terrace	Ⅱ	Special Zone 3	-
17	Ⅳ	Caldera	Square	Ⅰ	Special Zone 2	-
26	Ⅳ	Old somma	Square	Ⅳ	Special Zone 3	Roads
27	Ⅳ	Old somma	Square	Ⅳ	Special Zone 3	Roads
14	Ⅳ	Central corn	Deck	Ⅲ	Special Zone 1	Parks

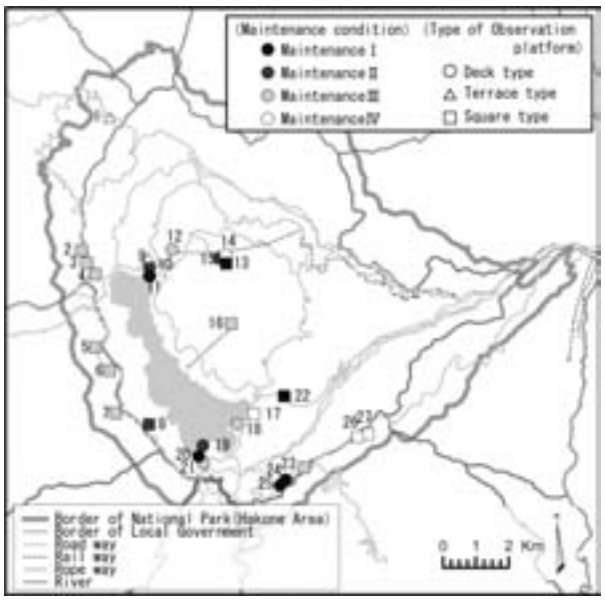

Fig 5. Type of maintenance condition and observation platform

square type was often found under the situations III and IV, where no landscape obstruction is observed. This relation relates to the characteristics of landscape features in the Hakone region, where both looking up and down over the landscape is possible. As exhibited in Fig 5, many observation decks are located in a caldera, where lower level ground continues into the surrounding area. These facts indicate that the designer selected an observation deck type in a caldera in order to secure a height for a landscape to both look up and down. Therefore, a possibility can be pointed out that an observation deck type tends to be affected by surrounding trees and vegetation growth, and its viewing line would be interfered upon; because this type of observation platform would be set up in a location where there is only little height difference from the surrounding area.

On the other hand, an observation square type has been often set up at an old somma, especially along ridges with a clear view. Therefore, as exhibited in Fig 5, a possibility can be pointed out that an observation square type tends not to suffer from landscape obstructions, because the height is different from the surrounding area and influence on the viewing line remain insignificant. In fact, many of the observation square type platforms have a steep slope in front; hence no viewing obstacles have been occurring. However, observation platform No. 8, 13, and 22, where the slope in front is not steep, experience landscape obstructions; yet the degree of a slope angle which triggers landscape obstructions cannot be determined, as slope angles have not been measured in this study.

In relation to conservation planning, damages to a landscape at observation platforms in Special Zone 1 and 2 were significant, whereas the functions of observation platforms have been somewhat maintained in Special Zone 3 despite lack of maintenance efforts within the observation facilities. It is assumed that the original view, which seems to have been secured when an observation platform was first established, cannot be easily maintained any longer as they are in a challenging environment where it is difficult to pursue pruning and clearing of trees due to strict regulations in the area.

In relation to usage planning, observation platforms in complex facilities and parks tend to suffer landscape obstructions. This point may relate to the earlier discussion that many complex facilities and parks are built on level ground, where observation decks are easily built. It is also possible that the original plan may have arranged surrounding trees to maintain functions of the observation platform; however, growth of trees inside and outside of the park resulted in difficulties to secure sufficient vision. Also, observation platforms that are built as a supplementary facility have been evaluated to be characterized by poor maintenance work. It should be noted that these platforms tend to be set up at a curve of a mountain path and protection of vision is rather easy; however, very little maintenance work seems to have been performed after establishment.

5. Conclusion

Natural parks Law celebrated its 50th anniversary in 2007, and there are many Natural parks whose situations have changed since the time they were established. According to opinions and attitudes towards nature and scenery, expectations towards facilities, their characteristics and locations may have changed along the way as well.

The result obtained from this study indicated that functions of observation platforms have been damaged due to growth of nature, mainly trees. In particular, installation of observation platforms on level ground is rather easily affected by this factor; and it has been found that the more strict conservation planning is in the surrounding area, the more difficult it is to maintain the functions. However, observation platforms on level ground are often located in facility complexes and parks, and it is highly possible that these platforms have been installed in locations with frequent usage; therefore, this is not a problem that can be evaluated only from cost perspectives.

The Hakone region embraces symbolic visual objects such as Mout Fuji and Lake Ashinoko, yet on the other hand, many cases have been observed where the observation platforms are not sufficiently maintained. With this situation taken into account, it may be necessary to rediscuss what kind of landscape should be presented, re-develop landscape plans, and reevaluate existing observation platforms. This study, at least, enables prediction of the future status of observation platforms to some degree from characteristics of location, conservation planning, and usage planning; therefore, it would be helpful for landscape plan development with future state kept in perspectives.

In the future, it is necessary to further clarify prioritization of maintenance efforts by applying the relation between characteristics of observation platforms and maintenance conditions. For example, influences of a slope angle of surrounding geographical features and trees on the slope on a viewing line can be analyzed. Also, once current maintenance efforts, frequency and age of observation platforms are studied, more concrete maintenance methods can be suggested. Furthermore, it is necessary to analyze relations between maintenance efforts and the Natural parks Law as well as to examine maintenance efforts of plants and vegetations. This is suggested because the Natural parks Law prohibits pruning and clearing of trees in national parks. In addition, applications of a barrier-free design would provide easier usage for senior citizens and the disabled, and it would be expected to obtain further understanding towards national parks from the general public.

Finally, with regards to future studies to provide comfortable observation platforms, it is expected that further field studies be conducted to suggest effective maintenance methods derived from more appropriate evaluations.

Notes and References

1) "Notice Regarding Supplementary Facilities Related to Execution of Park Projects at National Parks" was established on May 13, 1980; and upon revision of the Natural parks Law enforcement ordinance on July 5, 1991, it was revised as "Notice Regarding Supplementary Facilities Related to Execution of National Park Projects". However, there was no amendment in terms of facilities that would allow supplementing of observation platforms.

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18) Viewing line refers to the line that connects an observation platform and a visual object in a main direction, such as Mount Fuji and Lake Ashinoko.

19) "Natural Park Plan Preparation Guideline for National Parks" was established on April 1, 1979, and it was entirely revised on May 28, 2003, following the revision of the Natural parks Law in 2002. However, there was no amendment with facility complexes to be designated in Special Zone 2 in principle.

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富士箱根伊豆国立公園箱根地域における展望施設の立地特性と公園計画との関係

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自然公園では自然景観の美しさを保護するだけではなく，楽しむことも重要な役割であり，その上で展望施設は重要な役割を担っている。そこで富士箱根伊豆国立公園の箱根地区を対象として，展望施設の立地特性，管理状況，公園計画を把握し，今後の景観計画における展望施設の展開について検討した。成果として樹木を中心とした植物の成長により，展望施設の機能が損なわれていることが明らかとなった。特に，平地における展望施設の設置はその影響を受けやすく，周囲の保護計画が厳しいほど機能の維持が難しいことが分かった。今回の研究では，展望機能が植物の成長や設備の老朽化などで低下しているものが多く見られた。展望施設の立地特性や保護計画，利用計画によって展望施設の行く末をある程度予測することができ，将来を見据えた景観計画の作成の道筋を示すことができた。