

**THE ROLE AND EFFECTIVENESS OF SIGNAGE SYSTEM  
IN KIRISHIMA-YAKU NATIONAL PARK**

by

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# **The Role and Effectiveness of Signage System in Kirishima – Yaku National Park**

## **Abstract**

Concern about the trade-off between economic growth and environment quality and the effort to promote balance among the 3 major Es, economy, environment and equity has resulted in sustainable development practices in many sectors, including tourism as one of the fastest growing industries. Ecotourism which mostly takes part in national parks or protected areas due its reliance on natural environment is generally believed to be a desired form of sustainable tourism. One of the essential aspect and key component of ecotourism is in its environmental education aspect. Visitor education is significant to sustainable design as well as to environmental and management system. By visiting ecotourism destination, visitors are expected to learn and acknowledge how to minimize their environmental impacts.

Signage is one of the visual graphic media that has the purpose of delivering and displaying information to a particular audience. Signage systems are visually oriented information systems, consisting of signs, symbols, colors, images and also typographic elements. Signs and notices are the simplest delivery mode of interpretive approach essential for learning experiences, thus used as primary tools to promote education in park. The usage of infrastructure designs such as signs for visitor education is one of the important mechanisms for shaping tourist behaviors.

Kirishima- Yaku is the first park officially considered as national park in Japan, and nowadays it serves as a place for eco-tourism practices, this research paper presents findings from a study conducted in Kirishima – Yaku National Park, specifically at the site of Yakusugi Land in Yakushima, examining the usage of signage system there and whether it fits and functions accordingly regarding the educational aspect of ecotourism.

Research method includes observation and survey research as strategies of acquiring quantitative data, and the instruments used is questionnaire for both visitors and park guides. Descriptive analysis is used to analyze visitor knowledge, experiences and opinions as well as park guides' attitudes towards the signs implemented in the park. Preceding studies have related the importance between signage usage and visitor knowledge and behavior, however this study provides an addition in which opinions from park guides are also taken into consideration, two point of views provide better insight about the need of both sides. This study also serves as a form of evaluating signage system implemented in ecotourism destination such as national park.

Findings show the kind of signs implemented at Yakusugi Land and the discussion about their content component and artistic component effectiveness. Visitors showed great interest in learning about natural, cultural, and environment aspects, supported by guides' intention to deliver them. Findings suggest that accompanying guide has significance over visitors exposure to signs, however it not necessarily beneficial to the retention ability. Visitors show more positive favor to the signage system while guides gave pretty specific responses of improvement. Both visitor and guides agreed that signs function as tool providing learning opportunity, however guides were concerned about the lack of environmental education content. In the end, this paper summarizes as a list of suggestion of improvement.

## CHAPTER 1: INTRODUCTION

According to The International Ecotourism Society, the definition of ecotourism is "*Responsible travel to natural areas that conserves the environment and improves the well-being of local people.*" (TIES, 1990). Ecotourism which involves travel that related to nature and wildlife has become a popular and rapidly growing sector in tourism industry. As a result, nature based tourism also experiences significant growth. Therefore, the number of visitors visiting national parks is also increasing, as national parks also become an appealing destination of ecotourism, since national park is an area which environmentally protected by government.

Some of the characteristics of ecotourism are: involves travel to natural destinations and builds environmental awareness. Ecotourism put its emphasis on education, to learn about the place and people to be visited and also to minimize negative impact while visiting sensitive environment and culture. So it is very important to use effective communication to produce desired interpretation and awareness (Honey, 1999).

Considering tourists' on-site experiences is important to promote sustainable tourist behaviors. Long-term change of tourist behavior can be achieved by re-educate them. By shaping the tourist behavior, it's expected that it will lead tourist actions into sustainability, and to actually resulting in a global consciousness and awareness of sustainability issues. One of the mechanisms for shaping tourist behaviors is infrastructure design, for instance the use of signs for visitor education. Quality interpretation of the information delivered using signs will promote learning and understanding which lead to promote visitors' on-site behaviors to sustainable behavior (Pearce, 2005).

Signage is one of the visual graphic media that has the purpose of delivering and displaying information to a particular audience. Signage systems are visually oriented information systems, consisting of signs, symbols, colors, images, and also typographic elements. Interpretive signage system means to present information and promote learning opportunities (Wandersee, 2007).

This research examines about the usage of signage systems in Kirishima – Yaku National Park particularly in a site called Yakusugi Land in Yakushima . As we know a signage system is one of tools of information deliverance which can also promote the process of educating the audience. A National park which is a nature-based tourism destination can be put in the category of ecotourism, thus education as one of the core functions of ecotourism should be implemented in national park.

Kirishima- Yaku is one of the first parks officially designated as a National Park in Japan, and nowadays it serves as a place for eco-tourism practices, therefore it is interesting to learn about the usage of signage system in this particular national park, whether it fits and functions accordingly regarding the educational aspect of ecotourism.

This suggested several research questions that should be addressed:

1. What are the signs used in the Kirishima – Yaku National Park?
2. What is the kind of information contained in this signage?
3. What is the information that visitors are eager to know?
4. What is the information wanted to be delivered by the park guides?
5. How well are the signs in facilitating the needs and expectations from both visitors and park guides?

The goal of this study is to know about what crucial information the park guides want to deliver as well as what information is expected by the visitors. On top of that, finding the role and effectiveness of the signage system implemented in protected areas, as the bridge between both side expectations as well as the tool to promotes better awareness and educate visitors, is the most important objectives of this study.

The literature review chapter of this paper provides the background information related with aspects of research, for instance tourism, sustainability, ecotourism, environmental, and visitor education, National Parks of Japan, research site of Kirishima-Yaku National Park, signage system, graphic design theories, interpretive signs, and application of signs. The methodology chapter explains about research design and the instruments used, as well as the applied analysis and how the research was administered. The findings chapter consists of gathered data from observation and summary of both visitors and guide questionnaires analysis. The last chapter compromises the conclusions. The results of this study will provide a better understanding about the usage of signage system in national park and its effectiveness, as well as providing further knowledge about the expectation from both sides, visitor and park guides. Furthermore, the research will conclude about the evaluation of the signage system role in delivering the message for the sake of educating the visitors toward better ecological awareness, especially in an ecotourism destination such as national parks as well as provides suggestion to the improvement of signage system in the research site.

## **CHAPTER 2: LITERATURE REVIEW**

Tourism, as fragmented as it is, is one of the world's largest industries regarding its continuous growth and diversification. It can be seen as a major socio-geographical phenomenon as well as economic phenomenon formed by fundamental human activity so called travel as the foundation. Why people travel? In this modern world, travel can be seen as one of the necessities in human life. Curiosity perhaps is the major reason that motivates people to set their feet on different places. Nevertheless the tourism industry keeps on growing with enormous number of people travelling domestically and globally. As UNWTO predicts a 4.1% long-term forecast growth rate of international tourist arrivals through to 2020, with international arrivals expected to surpass 1.5 billion people by 2016.

One of the most significant points in tourism development within the centuries is the package tour created by Thomas Cook, who later on was considered as the founder of modern tourism and whose package tour being labeled as the birth of mass tourism. Therefore, tourism as a product of modernism (Franklin, 2003) is strongly related to innovation and technology advancement of transportation and communication. Growth in economic that made people can spend outside their primary needs and afford travelling, supported by the ease provided by modern transportation and communication system has made modern tourism to grow full force.

As an industry, tourism is related with many sectors and elements, in which enormous number of business, corporations and organizations comprised and involved together to keep the whole system working. Along with its growth, tourism became even

more diverse and could be classified in several different categories. For instance tourism can be differentiated based on the activities involved, purposes or destinations, although it can be helped that they tend to overlap in several segments. Tourism can be seen as a ritual, such as heritage, carnival, and pilgrimage (Franklin, 2003). Based on its purposes there are relaxation, scenic, learning, religious and ethnic, adventure, ecotourism, sport and recreation, special interest, weekend, and special needs tourism. On the other hand, factors related with destinations defined tourism are recreation, culture, nature, education, event, health, religion, visiting friends and relatives, and business. Tourism has gained a broad characteristics and broad usage of its term.

## **2.1 Tourism and Sustainability**

### *2.1.1 Ecotourism, the desired form of sustainable tourism*

Within recent decades people's awareness and concern has increased to the level where they realized the significant trade-off between economic growth and environment quality, which the basic model of economic activity cannot illustrate this aspect anymore. Looking at the current environment condition, we can see what economic growth costs. Environmental economist has expanded the basic model of economic activity into a broader one, material balance model, which includes the nature and also represents the linkage between economic growth and the environment. Environmental issues we're facing nowadays must be taken into account so that economic growth won't degrade the environmental quality even more, thus we came up into what is called sustainable development, which stands for long-term development ensuring the preservation of natural resources (Callan, 2010). Sustainable development is seen as the most appropriate practice to fulfill those objectives. As one of the fastest growing economic sectors, it is



believed that tourism also play major role in causing environmental pollution and degradation, for instance overdevelopment in Galapagos Island, disturbances in East African safari, coral-reef damages in Australia and degradation of Himalayan Mountains (Leung, Marion, & Farrell, 2001), therefore tourism industry also has to embrace the concept of sustainable development. Environment is closely related with social and cultural system, hence it is important to assess the impact of economic growth on these tourism major domains.

Sustainable tourism talks about what tourism should be, what it should and should not do, more importantly to put sustainable development concept into practice to ensure balance in economic, environment and socio-cultural development. As said by Middleton (1998) that the focus for sustainable tourism is to create more positive contribution in two directions which are towards the physical environment as well as the social and cultural environment. Sustainable tourism always revolved on three important aspects, balancing the three Es, economy, environment, and equity. Sustainable tourism is defined as balanced mix of sustaining local economies, local cultures, and local environments (Mitchell, 2001). Agenda 21 of sustainable development, the commitment with sustainable establishing system and procedures, serves as the basis for proposing strategies to achieve sustainable tourism (Weaver, 2006). Sustainability aims for a symbiotic balance between prosperity and environmental quality, which can be achieved by participation of many sectors and management of visitor, place and host community relationship.

There are many ways to address sustainability in tourism, one as said by McCool and Moisey (2001) that sustainable tourism is a kinder, gentler form of tourism that is generally small in scale, sensitive to social-cultural and environmental impact and respects the involvement of local people in policy decisions, also commitment to future

generation and long term development. Tourism is expected to sustain cultures as well as the environment. McCool and Moisey (2001) see tourism as a tool in sustainability which can support economic as well as community development.

Sustainable tourism is small in scale, designed to benefit local peoples and communities, and protect the resources (McCool & Moisey, 2001). Sustainability concerns about reducing impact of human activity opposing the conventional mass tourism. The term alternative tourism then emerged to engage with the idea of sustainability with its contrasting ideals against mass tourism. Alternative tourism according to Weaver (2006), is demanded by free and independent travelers who travel individually or in small group for an extended period, are interested in destination's unique sense of cultural, historical, and natural attractions, prefer small-scale accommodation and facilities that enable interaction with locals, minimize leakage, and encourage local communities' contribution, involvement, management and regulations. Fennel (2003) stated that alternative tourism comprises of socio-cultural tourism and ecotourism. Ecotourism, which is nature and natural resources oriented, can be put under the big umbrella of nature-based tourism and closely shares the characteristics with adventure tourism and wildlife tourism. As a segment within the nature based tourism, ecotourism which focus on evenly distributing benefits among visitors, environment, and local community with its consideration in positive and negative impacts of tourism development itself is generally believed to be a desired form of sustainable tourism.

### *2.1.2 Ecotourism, environmental education and learning*

The International Ecotourism Society (TIES, 1990) defined ecotourism as responsible travel to natural areas that conserves the environment and improves the well-

being of local people. There are huge number of other ecotourism definition can be found in literatures, although to summarize all of the definition, they revolve with the term nature, responsible, interest in nature, minimal impact and maximum benefit to the environment and local people, conservation, higher awareness, and satisfying learning experiences to the visitors. Ecotourism is demanded by people, the emerging green consumers, who have higher awareness and made their purchasing decisions for form of tourism that practices sustainability. All the attempts to define tourism are solely to state what is ecotourism and what is not. According to Honey (2000), there are seven characteristics of real ecotourism:

- Involves travel to natural destinations.
- Minimizes impact.
- Builds environmental awareness.
- Provides direct financial benefits for conservation.
- Provides financial benefits and empowerment for local people.
- Respects local culture.
- Support human rights and democratic movements.

Explained under the characteristic of building environmental awareness that ecotourism means education, for both side tourist as well as the local communities, information must be delivered to make tourists learn about places and the people, ensure they minimize the impacts of their visits. Ecotourism is required to be sensitive to environment and local communities where participants attempt to respect, learn, and benefit both.

Four key components of ecotourism as stated by Buckley (2009) are nature-based product, minimal-impact management, environmental education, and contribution to

conservation. Can be seen that education or environmental education is a key component which constructs almost all definition of ecotourism and seen as a necessary principle to follow and put into practice.

Learning is an essential aspect of ecotourism, it is about the necessity to acquire knowledge on site through interpretation and information, usually facilitated by guides, also pointed out by Fennel (2003). Strong interest in understanding and learning about local ecosystems and communities in the visited areas either using provided educational component or not, is one characteristic that distinguishes ecotourist from common tourist (Buckley, 2009). According to Buckley (2009), ecotourists satisfaction can be reached when they are given the education they want, it may be in simple and informal way or in a higher level like formal education. Such education is about the content and delivery by guides. Learning is considered as the primary motivation of ecotourist.

Therefore as ecotourism is focused on high quality environmental education as a fundamental part of the product, the educational quality becomes an important component that determines visitor satisfaction. For instance, regarding educational tourism factor, the role of guides become extremely important, good guides with professional guiding skill which can aid visitors in logistics, ensuring health and safety, connecting visitors to culture and society, towards client comfort and satisfaction are most expected. Several different measures of quality of education may include: the accuracy, relevance, completeness and level of information, the degree of retention of this information, and the efficiency of delivery (Bukley, 2009). Style of delivery and retention of accurate and relevant information are closely correlated and greatly affecting each other. Moreover, regarding relationships and meaning, interpretation is essential for learning experiences, encouraging behavioral change and achieving visitor satisfaction.

Off-site interpretation is no less important as on-site interpretation. Effective interpretation especially on-site interpretation according to Weaver (2008) should be exciting, enjoyable, relevant and meaningful, well organized, and focus on theme, while off-site interpretation can be gained from guidebooks and brochures prior to the visit and affecting the destination decisions.

The kind of information that needed to be delivered to the visitors are those for knowing and caring about how to control the environmental impact. Education of tourist to reduce their environmental impacts is considered at four different levels of details regarding the environmental impacts as proposed by Buckley (2009). The first level is simply by encouraging visitor's general attitude towards protecting the environment based on basic common sense decisions. The second level is through broad rules applicable to all outdoor users. The third level is by using specific techniques which require more than general knowledge or skills in minimal impact guidelines but can be more effective when taught by practical demonstration by a guide. The highest level is that visitors learn and evaluate their own practices with sufficient skill to minimize impact. It is best to have the ability to convey accurate and relevant information in an interesting and informal style which can develop visitor enthusiasm and promote conversational participation for getting the best outcome of the education towards tourist satisfaction. Nevertheless, no matter valuable the information and entertaining the presentation, the utmost expected result is that visitors can remember and apply the knowledge and skill involves because attitude or behavior is far more important than knowledge or skill. Thus education program is usually designed together with retention enchantment evaluation, for instance a test on practical information such as demonstration, or theoretical information, such as presentation of hypothetical scenario

thus asking and answering question. Estimated that visitors can quickly learn and apply techniques into practices hence they can immediately realize the minimization of impacts.

### *2.1.3 Education in parks and protected areas*

There is a long history associated with the designation of protected areas. From the protection of natural resources to protected areas for hunting ground approximately a century ago in Europe, the idea is basically worldwide, protection of special places. Rulers in Europe were the first to designated protected areas, which at the time serve as royal hunting reserves. But later open to public use. The first designated national park was Yellowstone, as a public park, serves for people recreation and enjoyment. Great areas with superb natural features are more and more designated into national park, place providing natural recreation for public. From the beginning, national parks creation encompasses two purposes, protecting national environment as well as providing visitation.

Protected area is an area especially dedicated to protection and maintenance of biological diversity as well as natural and cultural resources, its primary purpose is oriented towards protection and preservation of natural environment and biodiversity. Description of national park according to the World Conservation Union (IUCN) is: natural area of land and/or sea, designated to:

- a. Protect the ecological integrity of one or more ecosystems for present and future generations.
- b. Exclude exploitation or occupation inimical to the purposes of designation of the area.

- c. Provide a foundation for spiritual, scientific, educational, recreational, and visitor opportunities, of which must be environmentally and culturally compatible.

National park which can accommodate both preservation and form of recreation activity belongs in one of the categories of protected area.

Ecotourism relies on natural environment, therefore many of ecotourism practices take part in national parks or protected areas. It also has a very close relation with protected areas in term of benefits as well costs, in attempt to get the balance between tourism and conservation. Most of ecotourism activities depend on the existence of conservation reserves and the profit gained from charged fee can be used for conservation, on the other hand, further resources consumption, waste production, addition and expansion of accommodation, infrastructure, and transport network, are several impacts upon natural environment. Ecologically, ecotourism can help providing incentive and fund to protect, rehabilitate, maintain natural environment and even expand protected areas, ecotourism also can foster environmentalism and shape environmental-sensitive ecotourist. It also can provide employment opportunities as the economic benefit.

However, it's crucial to remember that highest priority among park principles is about conservation and sustainable resources, so that any form of recreation should be supported by low impact management, thus tourism practiced in parks should provide benefit for conservation. Although parks are a most critical core component in maintaining biodiversity conservation, tourism in parks where tour operators provide valuable visitor interpretation can play a valuable role in natural areas to visitor.

Ecotourism focus on appreciation of natural environment using adequate site interpretation, thus by facilitating education and learning, ecotourism should be able to enhance the natural quality value of nature-based protected area.

As the national movement growth and tourism grew, protected area is not simply protecting an area while providing recreation and enjoyment, but its planning and management grew on conservation, economic and benefits and cost. Having its benefits and costs, tourism planning and development for protected areas is very important, to maximize its potential benefits such as enhancing economic opportunity, protecting natural and cultural heritage and enhancing quality of life (McCool & Moisey, 2001). Tourism in protected areas should focus on its primary established reason, which is for preservation, and tourist who came there should understand and appreciated the value of that area.

Growing interest in sustainable tourism and ecotourism reflects the increase of demand in tourism which activities are closely related with experiencing natural environments. Concerns in social and environmental issues as well as appreciation of natural and cultural resources have made protected areas to an attractive tourism destination. And as levels of education also increase, tourist now seeks higher level of quality in educational and learning experiences. They have higher expectation in form of demands for explanatory materials, interpretive facilities and interpretive guiding (McCool & Moisey, 2001). Visitors of protected areas expect to find facilities, programs, recreational and learning opportunities within the park.

Wearing and Neil (2009) mentioned that education and interpretation as the key component of ecotourism and protected areas serves as the essential ingredient for successful park management. The recognition of education and interpretation makes ecotourism different from other nature-based tourism. Interpretation aims towards raising awareness, enhancing understanding and shaping perspective and attitude in conservation value goal (McCool & Moisey, 2001). Signage is one of the interpretive facilities that can provide information and orientation to reach those aims.



## **2.2 National Parks of Japan**

In Japan, the Natural Parks system was created based on Natural Parks Law enacted in 1957 as the legal basis, with the purpose of protecting places with natural scenic beauty and brings contribution to health, recreation, and culture of the people by the promoted utilization (MOE, 2008). Ministry of Environment is the one to administer the designation of National Park based on the Natural Law , in which further revision of Natural Law divided the National Park system in Japan to consist of National Parks, Quasi National Parks, and Prefectural National Park. Nature parks have two missions, which are conserving natural resources as well as providing public access for nature-enjoyment (MOE, 2008), both conservation and visitor use are main objectives of National Parks. The state, local public bodies, park workers and the visitors are all responsible for aiming to environmental conservation, fauna and flora protection, and maintain the scenic beauty and ecosystems diversity.

One unique characteristic of the Natural Parks is that land ownership mingled among private land, state land and local government land. As a densely populated small island country with long history of private ownership, land for natural parks cannot be exclusively allocated as government-owned park. Japan adopted the system in which authority can designate natural parks and impose regulations without actually owned the land (MOE, 2008), government creates natural parks not necessarily on its owned land but wherever nature preservation is deemed necessary. In Japan, landscape of a park is maintained by cooperative work of various land owners.

### *2.2.1 National parks planning and development*

National Parks of Japan are designated by the Natural Environment Bureau of Ministry of Environment (MOE) after acquiring opinions from the prefecture and Central Environmental Council (Council). Its dissolution or alteration intended by the MOE shall also acquire opinions from the prefecture and the Council (MOE, 2008). Since it is obvious that protecting the beauty of the nature while relate it to the human activities as well as attracting visitor are the aims of National Parks, the planning and development for National Parks of Japan, in a sense, also encompasses planning and development of tourism purpose. Gunn (1994) and Sellars (1997) also once mentioned that National Parks are not only protecting valuable natural and cultural resources but also attracting millions of visitors. Based on those thoughts, MOE establishes the rules and regulations of protection of pristine beauty of the many landscapes of Japan where human activities can be part of it. Thus it is essential in the planning process to create regulations that ensure National Parks protection, which areas are mostly comprised of private-owned land, in which appropriate development activities where agriculture, forestry, tourism and recreational industry can be carried out at the same time. In addition to that, planning should also account to facilitate appropriate visitor access and accommodation, and develop the facilities regarding traffic system and activities entailed in national parks (MOE, 2008). The two types of planning concerning regulations or developing facilities for protection or utilization are named regulatory plans and facility plans. These plans are decided by the MOE after acquiring opinions from the prefecture and Council and revised every five years.

Regulatory plans are formulated to protect the natural landscapes by controlling or restricting human activities inside the parks, consisting of protection regulatory plans (zone classification based on conservation need) and utilization regulatory plans

(regulated-utilization-zones designation for ecosystem conservation and controlling sustainable use of the park). Facility plans are formulated to plan facilities needed for the appropriate use of parks. The utilization facility plan is related to development of visitor facilities, such as campsites and trails, while on the other hand, the protection facility plan is related to nature restoration facilities needed to restore degraded natural environments and ensure safety precautions. (MOE, 2008).

The protection regulatory plans classify National Parks into several zoned based on the natural grade of ecosystem and scenic beauty, degree of human impact to the natural environment and of importance for visitor use. National Parks land is divided into ordinary zones, special zones, and marine park zones, which are classified furthermore (MOE, 2008). Zoning, one method of land management to balance parks twin goals for preservation and visitation system, is considered as a form of sustainable planning and used throughout National Parks worldwide because it determines zone to place infrastructures and facilities in ways so that they won't disturb the natural environment. In Japan, the MOE has the right to designate or dissolve Special Zones, Special Protection Zones, Marine Parks and Facility Complex, in regard to the National Park and the prefecture governor, (MOE, 2008). The activities in these zones shall be carried out under the permission of the MOE. The MOE in regard to the National Park and the prefecture governor may also designate or dissolve Regulated Utilization Area, and regulate the entry approval. The MOE regulates the permission for entry approval. The activities carried in Ordinary Zones shall be known by the MOE, and MOE may restrict or take measure of inappropriate behavior.

Parks works regarding the facilities for protection or utilization of national parks are based on the Park Plans. This works are decided by the MOE after acquiring opinions from the Council and executed by the State. Planning process is led by the government. In

attractions such as National Parks, government plays the primary role (Gunn, 1994; Hall, 1998). Planning and development are dominated by the MOE; it has the authority for enactment and implementation of laws, regulations and policies. However public bodies may execute a part of the Park Work after consulting with the MOE. MOE also can give authorization to those other than the State and public bodies may execute a part of the Park Work (MOE, 2008). Discontinuation or alteration of Park Plans or Park Works intended by the MOE shall acquire opinions from the prefecture and the Council (MOE, 2008).

### *2.2.2 National parks policies and programs*

National Parks planning also takes into account of how the park is protected and used as well as how tourism and development activities will be managed using the regulations and policies. In regards to conservation and management, for increasing tourism benefits and minimize the costs as well as for preventing and solving likely problems, these following policies and programs are implemented in National Parks of Japan (MOE, 2008):

#### 1. Controlling human activities and restricting acts of development

Permission for carried out human activities is regulated under the MOE. The MOE has the right to prohibit any activities that lead to deterioration of natural environment. Installation of building or structures that may impact costs on natural environment or landscape is also restricted. Permit, notification system and zoning system are ways to protect the natural resources.

## 2. Authorization fees

Despite one objective of National Parks to provide visitors and nature interaction, increasing number of visitors can cause damage to the natural environment, thus Regulated Utilization Areas are designated. Visitors are subject to authorization fees for the access to the Regulated Utilization Areas or reissuing an entry authorization certificate. Number of visitors and period of stays are appointed at the time access authorization is granted. These fees will fund the administrative cost of authorization, also will be used to maintain the area and promote experiences at higher quality.

## 3. Restricting vehicular access

Access Restriction Zones are designated to prevent a deterioration of natural landscape and the habitats and breeding grounds of plants and animals due to the vehicle access.

## 4. Regulation of private cars

This regulation is made by the MOE to prevent excess use of automobile and its waste to expose in vulnerable natural environment, also to solve problems such as insufficient parking space, traffic jams and damage to the natural environment.

## 5. Animal and Plant Protection

Species are designated and monitored to ensure their survivability.

## 6. Nature restoration

This program attempts to restore degraded ecosystem, improve the quality of local ecosystem as well as restore the biodiversities of the area.

7. Scenic landscape protection agreement

In this system, the MOE commissions the Park Management Organizations to manage and protect the land on behalf of the landowner, thus reducing the burden on landowner.

8. Beautification activities

Voluntary groups consist of MOE, NGOs, local governments, concessionaires, scientists, and local peoples have been established and organized to clean parks areas and remove trash. Budget for various beautification programs is subsidized by the MOE, prefectural governments, municipal authorities, and local businesses. First Sunday of August is “Natural Parks Cleanup Day”, a nationwide natural park cleanup campaign in cooperation with local governments and volunteers designated by the MOE.

9. Green worker program

This program from better management is administrated in 2001 by the MOE, to employs local residents with needed knowledge.

10. Special private land purchase system

The MOE purchased privately owned land and changed it into public land to prevent conflict of interests.

11. Provisions and Improvement of facilities

Public facilities are provided by the Environment Agency and by prefectures with assistance of the Environment Agency. Licenses and permissions for the provision of facilities are granted to local public bodies and private bodies. Promotion of communion with nature, safe and pleasant use, conservation and restoration of nature and multi-dimensional consideration are four principles of facility improvement. The MOE intensively improve facilities and also giving financial assistance supported by central, local and prefectural government.

#### 12. Interpretation and Visitor Centers

Established by the MOE and prefectural government, both have the purpose of environmental education.

#### 13. Penal Provision

Penal servitude or fine is the form of punishment for anyone who violates the order.

In the fragmented tourism sector, planning and development should cover the whole of it considering many factors, for instance involved sectors, decisions makers, development process, costs, impacts and benefits, for the sake of satisfaction in for both developers and visitors (Gunn, 1994; Hall, 2008). The decision and policy making should be made in favor of community and motivate cooperation among government, local communities and international organizations (Eagles, McCool and Haynes, 2002). In Japan, overall tourism planning and development is under management of strong federal role. Although it is heavily bureaucratized (Gunn, 1994; Hall, 1998), tourism is also a

cultural industry in which there are many opportunities for local area and national tourism organization to be integrated into overall federal governance emphasized on natural and cultural resources. There is cooperation among department of tourism and its three divisions of planning, travel agencies, development council, inter-ministerial liaison council, local organizations, prefectural governments, private organizations, NPOs, and JNTO.

Stakeholders' involvement is essential to sustainable national parks tourism, where local community actors (local nature guides and interpreters, other local tourism service providers, local people engaged in fishing and agriculture, local people engaged in resource-extracting industries such as forestry and construction, members of local environmental non-governmental organizations (NGOs), and park volunteers) and stakeholders (Ministry of the Environment, Forestry Agency, Ministry of Land Infrastructure, and Transport, local government authorities with jurisdictions that cover park area, private enterprises in the service sector, landowners, national environmental NGOs, and tourists).

### *2.2.3 National parks management*

Below are the parties involved in National Parks Management:

1. Nature Conservation Bureau has the primary responsible, three section under
  - The National Parks Division, responsible for conservation and utilization policy
  - The Division of Park Facilities and Conservation Technology, responsible for facilities improvement.



- The Office of Nature Appreciation, responsible for promoting visitor appreciation towards nature.
2. Regional Environmental Affairs Offices, responsible for regional environmental administration.
  3. Park Rangers, employed by the MOE as the locally stationed managers. Duties of park rangers comprise promoting conservation and restoration, promoting education and interaction with nature, working with permission and authorization and involved in formulation of Park Plans, conducting research, survey, and inspection, upgrading visitor facilities and carrying out established programs.
  4. Active Park Rangers, Park Volunteers, Natural Park Advisers, and Junior Park Rangers, supporting Park Rangers.
  5. Partnership with local government. MOE together with local government are responsible for establishing trails and picnic sites and for administering some licensing procedures.
  6. Partnership with local communities, including local-authorities and local residents. Instituted the Natural Park Leader System, The Natural Parks Foundation, conduct Council Meetings, and Establishing Foundations for Regional Administration.
  7. Partnership with local residents and private-sector organizations, for instance national parks clean up day and doing green worker program and upgrading waste disposal system.

(MOE, 2008).

National Parks are created by government action not only for environment protection and biodiversity conservation; visitation allow visitors-environment experience and financial support, therefore recreation and tourism grew and became central pillar of

the National Parks movement (Eagles, McCool, and Haynes, 2002). For National Parks, planning and development is extremely important in order to achieve environmental protection as well as sustainable tourism attractions. Park tourism as one vital aspect supporting National Parks, where good park management will foster visitor appreciation into producing positive attitude and action toward conservation (Eagles and McCool, 2002). With a proper planning we can foster conservation and resolve visitor management issue towards sustainability among economy, environment and community (Hall, 1998; Hall, 2008; Frost and Hall, 2009). National Park, a multi-functions orientated place, plays a great role as a form of sustainable development especially nowadays where people orientation has changed into global awareness (Eagles and McCool , 2002; Frost and Hall, 2009). Several examples of good practices which can be done are: ecotourism, implementing visitor fee, and creating visitor center for the sake of environmental education (Gunn, 1994).

### **2.3 Kirishima-Yaku National Park**

National Parks in Japan is officially designated by the Ministry of Environment, as of September 2007, so far there are twenty-nine locations have been designated as a National Park across the country. They cover a total of approximately 2.08 million hectares of land and account for approximately 5.5% of the total land area of Japan. Kirishima-Yaku National Park is one among the first National Parks in Japan established in 1934 together with Setonaikai and Unzen, three years after the National Park year enacted in 1931.

Kirishima-Yaku National Park which is designated in March 16, 1934, is located in southern part of Kyushu and covers both mountainous and sea area of total 60,794

hectares wide, spread from Miyazaki Prefecture to Kagoshima Prefecture, comprises Kirishima area, Kinki Bay area, and Yakushima area. Included in this area are more than twenty volcanoes and national forest that comprises many species of chinquapin, oak, Japanese red pine trees, and Yakusugi, the 1,000 years old Japanese cedar tree. Japanese government believes that National Park is one place where knowledge of nature can be cultivated, thus visitor center, pedestrian walkways, guided tour, and guide signs has been installed in to support of this effort.

### *2.3.1 Kirishima area*

- Ebinokogen Area

At the height of 1,200 meters above the sea level, Ebinokogen area is an important mountaineering base located in the northern section of the Kirishima mountain range which comprises number of volcanoes (includes Mt. Karakuni-dake as its highest peak at 1,700 m, Mt. Koshiki-dake, Mt. Hinamori-dake, and Mt. Shiratori). Kirishima volcanic group actually consists of 23 volcanoes, fifteen of them having round-shaped crater in which ten are covered with water, Onaminoike Crater Lake is one of the examples. Attractions of this area consist of conifer forest, crater lakes, sulfurous plateau, as well as its flora and natural landscape. Makino tree, a designated National Natural Monument, is one special trait of Ebinokogen area.

- Takachihokawara Area

At the height of 970 meters above the sea level, Tachihokawara area is also an important mountaineering base located in the southern section of the

Kirishima mountain range (includes Mt. Takachihono-mine at 1,574 m, Ohachi Crater, Mt. Ya-dake, Mt. Naka-dake). Attractions of this area are the vertical distribution of vegetation from Oike Pond to Mt. Takachiho-mine, a volcanic desert area, and Kyushu azaleas as the result of volcanic activity around Ohachi Crater and Mt. Naka-dake. Mt. Takachiho-mine, the former site of Kirishima Jingu Shrine, is a sacred beliefs related destination.

- **Miike Crater Lake**

As the largest crater lake in the Kirishima area, attractions of this area consist of its aquatic organisms and National Miike Wild Birds' Forest as a part of surrounding dense broad-leaved evergreen forest. The lake is also popular as fishing destination, with facilities such as campground and rental boat pier.

- **Kurinotake Area**

As a part of Kirishima volcanic group, Mt. Kurino-take is one of the oldest volcanic peaks formed tens of thousands years ago. Attractions of this area are fir and skimmia trees natural forest and Kurinotake Onsen with its volcanic gas phenomenon.

### 2.3.2 *Kinko Bay area*

- **Sakurajima**

Connected to the Osumihanto Peninsula, as central volcanic cone in the Aira Caldera, Sakurajima is one of Japan's major active volcanoes besides Kitadake, Naka-dake, and Minami-dake in Minami-dake Crater. Attractions of

this area are the lava fields (Anei Lava, Taisho Lava, and Showa Lava) and its vegetations such as moss and black pines.

- Cape Sata

Located at the southernmost tip of the Osumihanto Peninsula on Kyushu mainland, attractions of this area consist of numbers of tropical and subtropical vegetation and observatory view of Yakushima and Tanegashima.

- Ibusuki

As famous destination for spa resort located in the southern end of Satsumahanto Peninsula, attractions of this area are Ibusuki Onsen, open-air beach sand baths, Ibusuki National Park Resort Village, Chirigashima islet, Mt. Kaimondake (a 924 m high volcano with conical peak), and Lake Ikeda (Kyushu's largest caldera lake of protected giant mottled eel).

### 2.3.3 *Yakushima area*

Yakushima is an island located sixty kilometers south-southwest of Cape Sata, Osumi Peninsula, in Kagoshima Prefecture, the southernmost point of Kyushu mainland. With its 130km circumference, this circular shaped island covers area of 500km<sup>2</sup> wide and is home to 13.600 people. Most of the landscape of this island constitutes of mountainous areas which include highest peak in Kyushu. Forest covers about ninety percents of the whole island, supported by high precipitation as the result of the climate and current surrounding the island which also serve as the foundation of multitude of flora and fauna that grow and live in Yakushima. Based on its landscape, nature, people

and spiritual aspect, Yakushima is known as the island of water, trees, people, and gods (Kagoshima Prefectural Government Conservation Division, 2000). Mountains in Yakushima are worshipped as sacred places in which people do pilgrimages. One main special feature of Yakushima is the vegetation of Japanese cedar tree forest. Yakusugi or Yaku cedar, one key interest in Yakushima, is not just any common cedar tree, the naming of Yakusugi refers to cedar trees of more than 1000 years old. Yakushima with its ancient natural beauty is promoted as place where there are mutual coexistences between human and nature (Kagoshima Prefectural Government Conservation Division, 2000).

The island of Yakushima comprises several zoned areas, which are national park (further categorized into special protection zone, class I special zone, class II special zone, class III special zone, marine park zone and ordinary zone), wilderness area, forest ecosystem reserve, special natural monument, and world heritage area. Yakushima is the first World Heritage site in Japan, the convention for the protection of the world cultural and natural heritage was ratified in 1992, in hope for this heritage area protection to assure its sustainable use for future generations. Yakushima natural heritage site consists of lowland evergreen laurel leaves forest which encompasses subtropics and tropic elements, dwarf bamboo grassland, as well as mountains of Yakusugi forest. UNESCO pointed out that the value of Yakushima natural heritage site is contained in its preserved nature although being a populated island, and how the preservation of forest ecosystem has been maintained in spite of heavy foresting in the past.

As a destination, Yakushima is a very appealing place to people whose best interest is nature related activities. Several well known points of interest of Yakushima include the mountain peaks, natural recreation forests, forest paths, Jomon Sugi mountaineering trail, coast of pillow shaped lava, ocean hot springs, fruit garden, mangrove site, waterfalls, sea turtle beaches, and botanical garden. Forest walking,

climbing, mountaineering, swimming, mountain biking, kayaking, diving, snorkeling, are the kind of activities can be enjoyed in this island.

- Oku-dake Mountains

At the height of 1,800 meters above sea level, Oku-dake Mountains are a landscape of granite rocks in the central region of the island which consists of Mt. Miyanoura-dake (1,936m) as Kyushu highest peak, Mt. Nagata-dake, Mt. Kurio-dake, Mt. Okina-dake, and Mt. Kuromi-dake. The famous key mountaineering trail which requiring a journey of two days and one night, the Jomonsugi-Miyanouradake route, takes place in this area. Attractions of this area consist of the scenery of mountainous landscapes and forest of natural primeval cedar trees.

- Mae-dake Mountains

Similar to Oku-dake Mountains, peaks of Mae-dake Mountains also serve as sacred worship places. The attractions of this area consist of several climbing trails that offer beautiful view of nature environment and villages. From Yakusugi Land, visitors can climb to Mt. Tachu-dake which offers views of Yakushima forest and Awa village. From Senpiro-taki waterfall, visitors can climb to Mt. Mocchomu-dake which offers views of Onoaida and Hara villages. From Koseda, visitors can climb to Mt. Aiko-dake which offers views of Mt. Oku-dake while enjoying the various natural floras along the mountaineering trail.

- Nagata Beach

This largest sandy beach of Yakushima island is very famous as a sea turtles' nesting site, it has the highest numbers of shore-landings and eggs laid by loggerhead sea turtles in Japan. Observing loggerhead sea turtles come ashore to

the sandy beach for laying their eggs in spring and summer is the main attraction in this place.

- Kurio Marine Park

Located in Tsukasaki on the southwest end of the island, Kurio Marine Park Zone offers visitors with unique biota of tropical and subtropical fish living in their coral reefs habitat. Swimming and exploration of tide pools and life forms along the beach are several of the activities can be enjoyed by visitors in this place, besides visiting the Youth Travel Village.

- Kuchinoerabushima

Because of its volcanic landscape, Kuchinoerabushima which is located 12km offshore northwest of Yakushima is referred as Green Volcanic Island. The sceneries of this landscape range from steep sea cliffs, pasture land, to underwater seascape of coral reefs and fish. It is also the habitat of protected endangered species of Ryukyu flying fox.

Besides several tourism spots explained above, there are nine places in Yakushima which are promoted as environmental learning spots by Yakushima Environmental Culture Foundation.

- Yakushima Environmental Culture Village Center provides facilities that enable visitors to learn about Yakushima and familiarize them with natural environment, culture, and lifestyle of its people. Exhibitions consist of relief models and film of Yakushima, symphony of forest and water.



- Yakushima Environmental Culture Learning Center provides programs and seminars in which visitors can learn the importance of relationship between nature and people.
- Yakushima World Heritage Conservation Center provides exhibits that enable visitors to learn about the background and facts of national park designation and world heritage site designation.
- Kamiyaku Town History and Folk Museum provides exhibition of artifacts that shows history of Yakushima and lifestyle of its people from Jomon period.
- Yaku Town Municipal Yakusugi Museum provides visitors with extensive information related to Yakusugi. Exhibits show models of variety of plants species, facts of cedar tree, utilization of cedar trees, tools used for logging, history of the forest and the relation between people and Yakusugi in the past especially in forest harvesting period. One interesting fact discovered by visiting Yakusugi Museum is The Sister Tree Relationship between Yakushima Jomon Sugi and Tane Mahuta, a famous giant kauri tree in New Zealand, which was signed on April 23, 2009.
- Yakushima Comprehensive Nature Park provides visitors with hand in hand experience with natural environment of Yakushima, supported by its nursery house containing special plants of Yakushima.
- Shakunage no Mori Park provides visitors with experience of thousands rhododendrons, alpine roses, rivers, and laurel forest covered mountains.
- Yakushima Natural Recreation Forest.

## 2.4 Yakushima Natural Recreation Forest

There are two sites of natural recreation forest in Yakushima, Shiratani Unsuikyo Ravine and Yakusugi Land. Natural Recreation Forest was designated with the purpose to serve as a forest recreation area accessible to hikers and visitors. To gain access in both sites, visitors are asked to pay 300 yen as voluntary donations to promote woodland environment preservation and used for forest environmental enhancement fund. This contribution is used for safety inspection and cleaning, environmental beautification, maintenance and repair of the observation trails, facilities and signboards, and other receiving and handling funds. Forestry Agency of Yakushima Forest Environment Conservation Center and Conservation and Stewardship Council for Yakushima Recreation Forest are the authorities who administer Natural Recreation Forest.

### 2.4.1 *Shiratani Unsuikyo Ravine* – The Home of the Grandeur of Nature

“Become one with nature on the trail”; “Let us show you this forest of mysteries”

At the height of 800 meters above sea level, Shiratani Unsuikyo Ravine is located in Shiratani District, 12 km from Miyanoura. Shiratani Unsuikyo Ravine covers area of 424 hectares wide, mainly of primeval forest of Yakusugi cedar trees. Yayoisugi is the famous cedar tree of this are. Besides the Yakusugi forest, another attraction of this site is the waterways such as rivers and waterfalls, as well as flowery bushes which grow on the stony patch on the river. In this site, visitors can choose from several selections of trails ranged from one hour to five hours:

- Yayoisugi Cedar Course (1 hour)

- Kusugawa Hiking Course (1 hour, 40 minutes)
- Forest of Mononoke Hime Course (2 hours)
- Taikoiwa Rock Trip Course (4 hours)
- Genseirin (Primeval Forest) Course (3 hours)
- Sanbon-ashisugi Round Trip Course (1 hour)
- Genseirin and Taikowa Rock Course (5 hours)

#### 2.4.2 *Yakusugi Land* – Natural Beauty of Yakushima

“A Symphony of Greenery Weaving Together Primeval Natural Beauty and Human History”

At the height of 1.000-1.300m above sea level, Yakusugi Land is located in Arakawa district, approximately 16 km from Anbo. Land covers area of 270.33 hectares. The thousands years old Yakusugi trees are the main interest of this area, however deer and macaques have become another attractive point of interest for visitors. Kigensugi, Hahakusugi, Odasugi, Butsudasugi, Techusugi, and Mitsunesugi are the six major cedar trees in Yakusugi Land. At this site there are four different courses for visitors to choose, which are 30 minutes course, 50 minutes course, 80 minutes course, and 150 minutes course. Visitors can stroll through Tokimekinomichi trail, Sennensugi hiking trail, Arakawa hiking trail, Kohana hiking trail, Butsudasugi hiking trail and Fureainomichi trail. In Yakusugi Land there is entrance to mountain climbing path which enable visitors to continue climbing to Tachudake Peak.

Having many registered and zoned areas as well as the status as a World Heritage Site and part of Kirishima-Yaku National Park, also promoted as a place with good example of coexistence between human and nature has facilitated many researches to be done in Yakushima. Study by Tokumaru (2003) talked about the nature conservation in Yakushima, addressing several issues such as unmaintained facilities in mountainous areas, damaged vegetations, lack of waste disposal system, overuse of routes, quality and fee systems for eco-tourism guides program, as well as other expenses and fees. The MOE also did research in relation to maintaining the value of the area as a World Heritage Site and its conservation aims. The study discussed about basic policy, protection of animals, plants, and natural scenery, appropriate enjoyment of nature, the implementation of management programs, research, and monitoring. Hiwasaki (2004) did a study about the of participation fee in voluntary cooperation. This 300 yen cooperation fee is considered as good practice of successful implementation of voluntary fees towards environmental conservation and has impacts in term of increasing local people and visitors' awareness about the importance of contribution to the conservation of nature.

## **2.5 Signage System**

"Signage is not just about direction and getting the customer's attention. It's also about keeping shoppers interested and giving them the information they need to make the right decisions. At Barnes & Noble, we tried to create a communication system that not only makes the retailer a music authority but helps customers become more knowledgeable about music."

(Signage that educates, not just directs, 1998).

Basically, signage is a communication tool, a presentation of visual messages. Signage is made because there are information ought to be delivered, messages to be conveyed, sign is created to stand out, to appeal, to gain attention and interest from its viewers. The creation of sign can be traced back to the very early age of human civilization, as a social being, human always has the intention to communicate with each other, visually as well as verbally. Based on this very basic intent to communicate visually, human then create marks on objects and in their surrounding environment (Calori, 2007). Cave painting is one of the earliest examples. Human started making signs, and these marks carry meaning that can be understood and shared among them (Calori, 2007). The creation of signs also fosters indirect communication between people. Nowadays signs are used everywhere, both outdoor and indoor, we can easily encounter signs anywhere because they are the inseparable component that is huge part of our surrounding, for instance simple letter signs of shopping mart, shop, restaurant, as well as road signs. Signage can be classified into several different categories based on its location, purpose, theme, content, and form.

In interpretation, signage is a very important factor due to the basic nature of information receipt share of human sensory organs. Lee (2003) mentioned about result of the aforesaid study as followed, the gustatory nerve accepts about 1% of the entire information, the organ of touch accept 2% of the entire information, the organ of smell accept 4% of the entire information, and the auditory organ accepts 10% of the entire information, meanwhile visual organ accepts 83% of the entire information. From this finding we can deduce that visual objects are enormously influential and important in human life (Lee , 2003).

Seeing the great importance of visual objects, it's necessary for us to understand deeper about several basic elements, principles, and theories of graphic design or visual communication design, before delve further into specific graphic elements related with signage and signage usage in places like national parks. More so because sign is one of visual communication tools certain to comply with the very basic of graphic design principles and theories.

### *2.5.1 The elements and principles of visual communication design*

Design is a visual synthesis of ideas that has purpose of delivering message using words and images. Design puts design elements into composition and works on the hierarchy of revealing the message. Dot, line, shape, form, texture, and color are what we called elements of design in theories of visual communication design. Besides design elements, theories of visual communication design also discuss about the principles of designs, which are balance, rhythm, tone, accent, contrast, movement, direction, harmony, and unity. Each element of design should work complementary to produce a final product where there are harmony and unity apparent. Visual communication design is also very closely related with semiotics theories, and according to semiotics, there are three fundamental factors that can amplify the effectiveness of one visual communication media, namely syntactic, semantic, and pragmatic. Syntactic points out about the structural relationship between one representation and another representation, between one visual sign to another visual sign in the whole context of design system. Semantic points out about the relationship between the representation and the object, between one visual sign and the reality or the idea associated with it, between a design and its meaning. The last factor of semiotics is pragmatic, which is the relationship between the

representation and its interpreter or viewer, it mentions the relationship of visual sign with its audience or consumer.

#### 2.5.1.1 Color

Color is a very important element in design and there have been a huge number of theories tried to explore this particular element alone. A single color comprises four essential qualities, namely hue, saturation, value, and temperature. Hue is the identity of a color, where saturation explains about the intensity or the vividness of the color, value is related to the amount of light contained in a color, and temperature made possible to differentiate colors into warm color and cold color (Samara, 2006). Munsell's color wheel is a model of color relationships and it defines analogous and complementary color. Compared to other design elements, color has the ability to convey message and meaning quicker than any of them. Human brain reacts to the color seen through the eyes and interprets it immediately, before picture and text can even form a shape in our mind. Besides that, color does not just simply deliver message, it can also contain nuances and emotions. This psychological component of color affects humans in their base instinctual and biological level. Color is a very effective communication tool to deliver information without using words or text. Moreover viewers' comprehension of color is greater than of large sized text.

#### 2.5.1.2 Typography

Typography is a very important essential of communication design, it is a visible language that can be accessed visually. Typefaces have gone through long centuries of

evolution, since the first character and alphabet were used and the booming of industrial press printing era. It will continue evolving over time and adapting to each new coming era, regardless typefaces always contain message beyond the words they spell out, and extort emotional responses from the viewers (Samara, 2006). Type is designed by modifying the aspects of letterform anatomy, which are case, weight, contrast, width, posture, and style. The typeface designed may evolve, become popular, or even be discarded, that's why due to these various possible outcomes, typefaces often carry some sort of attachment to certain period of time or place, and obtain certain feel about it, that can add another layer of communication to the initial message (Samara, 2006).

Classification of typefaces can be put into five most distinctive classifications by examining the typeface anatomy, brush strokes, and the shapes of serif, which are Old Style, Transitional, Modern, Slab Serif, and Sans Serif.

Readability, clarity, visibility, and legibility are the four primary pillars in typography usage. Readability points out about the extent of how text can easily be read and understand in relation to the complexity of the words usage in the sentence. Clarity is related to the kind of typefaces chosen. Good selection of typeface or font will encourage people to read the text, on the contrary, poor choice of typeface will act as a hindrance, obstructing people from reading further. Visibility points out about good composition, the usage of typeface in relation to other design elements, such as color and image.

Positioning of text should be well thought-out, text blocked by images as well as text indistinguishable from the background will surely cause viewer with reading difficulties.

Legibility points out about the visual clarity in writing the text in a form of body text. It concerns about the kind of typefaces selected, type size, contrast, text block, spacing, leading, kerning, and tracking in between each character.



### 2.5.1.3 Layout

Layout is the composition of design elements related with the space containing them and the harmony with the aesthetic overall view (Ambrose & Hariss, 2005). Good layout can be achieved by having the understanding of the principles of design. Davis (2003) said that successful layout will be able to convey the message that is represented by the words while giving the most effective visual environment supporting the message deliverance. In design, layout is the final process of combining every element into one unity to produce a design with well and accurate visualization. According to Jefkins (1985), there are seven laws that need to be followed in designing layout:

- The Law of Unity, to produce visually good design.
- The Law of Variety, to prevent monotone impression while keeping focused on the main concept.
- The Law of Balance, to produce harmony out of the design elements.
- The Law of Rhythm, to use similarity and repetition of shape, repetition of color, and repetition of element placement in layout.
- The Law of Harmony, to create a sense of comfort and beauty indicated by the relation among layout elements. Harmony can be achieved by using repetition of elements such as shape, line, type, and color, while preventing to be monotone.
- The Law of Proportion, to use combination of size.
- The Law of Scale, to create contrast by using combination of black and white, bright and dark color, big and small elements.

#### 2.5.1.4 Grid

Besides layout, grid is another factor to be considered in designing. Series of intersecting axes, that divide space horizontally and vertically are called grid (Cullen, 2005). Grid makes the placement of design elements become easier and also creates virtual connection of organization among elements. Working with grids means working with columns and margins. Grid functions to foster harmony, it is used to control and organize composition in harmonic layout space. Cullen (2005) stated that to order and unify are the goal of utilizing grid.

#### 2.5.1.5 Illustration

Zegen (2005) stated that the essence of illustration is thinking of how to transform idea and concept into a communicative image. To illustrate means to bring a visual form of a text or message. And human brain is able to recall information for pictures better than for words. Because there is idea that needs to be conveyed, creating illustration is similar to storytelling, there should be a good story supported by a good way of narration. It then will affect the viewer to understand the message actively. Furthermore good illustration encourages viewers to think and become actively involved so they can understand the greater concept and more in-depth knowledge that would be impossible to gain in just a blink of eye.

### *2.5.2 Environmental graphic design systems and wayshowing*

Signage utilization and usage have been pretty much developed from its very beginning, signage has become much more than a simple stand alone aspect of communication design which functions to deliver visual message. Nowadays, signage is incorporated in greater scale in architecture as well as interior design as a whole. Sign is a graphic, it's a design, when it incorporated more in the overall architecture, surroundings, or environment, it can be seen as a form of art that can improve visual or perception and enhance the look of the environment. This is the reason of the start of deeper attention and development in the field of environmental graphic, signage and wayfinding. Signage starts to elaborate concept of nationwide level. It works in broader realm of wayshowing, environmental sign does not only work on its own but also make use of its surrounding environment. Environmental signs both make use of the environment and enhance it at the same time.

Calori (2007) proposed a model of Signage Pyramid Model to provide solution to the problems in complex signage and wayfinding design. The three main components of this model are information content system, graphic system, and hardware system. Information content system discusses about the information displayed on signs, how it is worded and where it is located, in relation to another signs to create a network. The graphic system discusses about the usage and arrangement of graphic elements applied to signs. The last system, hardware system discusses about the shape, the size, the stylistic relationship to execute signs into physical or three-dimensional objects.

### 2.5.2.1 Functions, contents, and form

Mollerup (2005) divided the categorization of sign based on its functions into four divisions, which are identification, direction, description, and regulation.

Identification signs refer to signs which content consist of title or name, this type of signs functions to identify certain position or the object located at the particular position.

Directional signs refer to signs that show and point viewer to certain destination and mention what will be found in the indicated direction. Arrow signs are simple example of directional signs. Descriptive signs refer to signs that provide explanation of certain location or object. Both directional and descriptive signs are explanatory kind of signs.

Regulatory signs refer to signs which contents are usually notification, warning, command, and prohibition. Rules which usually become part of regulatory signs content are displayed to maintain order and safety of a certain location.

Several paragraphs in the preceding section have already explained about the basic elements in visual communication design, now let us examine more specifically about the graphic elements contained in signage and construct it, for instance typography, pictograms, symbol, arrows, diagrams, and maps. Many signs are constructed by typography alone, or consist of only body of text. As mentioned before the usage of typography should follow the rules of legibility, clarity, readability, and eligibility. Legibility factor is extremely important factor in sign design and become even more crucial in the case where viewer only have limited amount of time to read the sign, for example road signs are read while the viewers are moving, they can't stop and move backward to reread the sign for the second time. Pictograms, symbols and arrows, are picture and sign at the same time, they're able to stand alone and carry their meanings to the viewers. The usage of pictograms as non-verbal communication has been dated preceding the development of written languages. Pictograms work best as a sign when

they're used to overcome problems of language barrier, for example icon for toilets and icon of wheelchair for the disables are the most recognizable pictograms. However since pictograms are basically icons or images, they should be standardized enough for people to understand. Furthermore, one significant point needs to keep in mind while designing pictograms is that the comprehensible factor of pictograms is far more important than its artistic factor. Diagrams and maps are other elements that construct signs, they are two dimensional illustrations that represent three dimensional world. The term maps are usually associated with topographical maps while diagrams stand for structural maps. Maps signs deal with issues of projection, scale, and signatures, as well as orientation. Orientation is essential issue in map signs related to the viewers' directional sense, maps signs should not only enable viewer to know exactly their location in the area but also enable viewers to know the direction they are facing, triangular shape symbol followed by 'you are here' text are usually used to aid this issue.

Typography, pictograms, symbols, arrows, diagrams, and maps are communicative graphic elements that construct the content of signage. Other graphic elements such as color, size, shape, grids, and grouping are useful to help constructing the form of signage.

Due to the nature of how color is able to be processed faster by human brain than any other graphic elements even from a distance, differentiation becomes the biggest accountability of the color usage besides harmonization, augmentation, and decoration (Mollerup, 2005; Calori, 2007). Mollerup (2005) then further discussed this differentiation role of color and divided it into four practical usability examples in relation to signage. First, it can make signage easily noticeable from its background environment. Second, it can support the legibility of the sign content from the signboard where it was printed. Third, it can be used to differentiate many types of signs used on a

site from one another. And fourth, it also can be used to differentiate parts of content inside the sign itself, it can differentiate message and build hierarchy. Color contrast can be analyzed into hue contrast, chromatic contrast, and brightness contrast. Color coding provides to be helpful in multi languages signs, and can be very effective as a wayshowing tool. These show the way of how color contrast and color coding assist the effectiveness of signage. Nevertheless, utilizing color should always be done carefully where visual impairment issues and people disabilities, such as color blindness, are also taken into account. Besides that, color is one element of signage that can be easily worn out, color tends to be dull over time and reduces the overall visual quality. Right choice of materials and finishes can provide help to maintain the quality of color.

Layout deals with all design elements combined together and is affected by size, position, and proportion of the content. Layout design is crucial to ensure the eligibility of content from viewing distance. Content of the sign should be sufficiently designed in which there is harmony among each design elements used and here grids play important role to make the content aligned and fit into the signboard. There are cases where a collection of signs should be installed at the same exact point on one location, this is where grouping takes part. The effective rules of grouping signs are equal width for vertically grouped signs and equal height for horizontally grouped signs. For signs containing arrow symbol, the positioning of the signs should follow in which direction the arrows are pointing.

#### 2.5.2.2 Signs in practices

Shape, format, mounting, materials, finishes, and lighting are the hardware system of signage (Calori, 2007). Those are the key factors of the physical tangible

execution of the signage at a particular site. Shape and sign format can add empathize to message conveyed, such as arrow shaped sign. There are many types of mounting can be applied to signs either they are located indoor or outdoor, such as flat mounted, protruding, suspended, freestanding, floor-signs and in the air (Mollerup, 2005). Mounting functions to position sign at a site and accentuate its presence. Choice of sign materials and finishes is relevant to whether the sign is located indoor or outdoor and should be selected very carefully. Selection should be made based on material that is most supportive to the sign characteristic. Finishes are responsible as the final touch to prolong the span of sign usage and protect it from possible damages. As mentioned before, finishes also useful to prevent color from fading away.

In application, signs should be located where they are needed, eligible to their viewers, and can be differentiate easily from its surrounding but not too loud to disrupt the nature of the environment. The following are explanations that compare the difference is signage qualities based on the location of where the sign is installed, for example hospitals, airports, stations, and museums as mentioned by Mollerup (2005).

Hospitals have far more complex signage system from any other places. This is due to the fact that hospital is basically a complex site where users of signs mostly have disabilities, furthermore they may come from many different places and not at all familiar with the hospital. Moreover, signs in hospital not only function to serve patients and visiting users, but also apply to all the staff of the hospital, including the doctors, nurses, and suppliers. In place like hospital, it is very important for user to be able to go and return back from place to place, and to pinpoint his or her current location fast and easily. Positioning sign is very important in hospital, where it should be easily accessed by those with disabilities, for example Braille signs and signs that considering the height of wheelchair users. Airports and stations share many similarities, both are places where

people from many places and background come and go, changing different mean of transportation. Timing is the utmost important in these places, where users need to reach long distance in a short amount of time, and they need to reach their destination fast. The usage of pictograms is substantial to overcome the language barrier issues as well as the utilization of color coding.

The concept of signage system in museums is quite similar to the one in national parks, but hugely different with the one in hospitals and airport where time is very crucial in those places and people don't want to stay for long. However what happens in places like museums, parks, or any other cultural institutions is the exact opposite. Similar with the reason of people going to museums, people visit place like national parks to spend their time there, they intentionally go to the place to 'be' at the place and spend their time generously. Visitors of museums and national parks desire to enjoy and experience the site as much as possible before they leave. They wish to know something new and learn new knowledge. They want to be there to gain more understanding and leave the place enriched. However, it is very important to remember that in this kind of places signs functions as supporting component, they are significant but they should never dominate the place, information overload is the common mistake of the signage system in these places (Mollerup, 2005).

### *2.5.3 Interpretative signs*

Interpretation which is facilitated by signs, brochures, pamphlets, guided tour, exhibits, refers to educational activities which explain the significance or meaning of what visitor is experiencing, in places like national parks, heritage sites, museums, or zoos (Moscardo, Woods & Saltzer, 2004). Interpretive communication can be done in



personal and non-personal way. Visitors usually more involved with self guided media, such as visitor center exhibits, self-guided trails, wayside signage and other printed materials, than in personal interpretive communication method which incorporates interaction with guides (Jensen, 2006).

We encounter interpretive signs in national parks as they are used to provide access to information and regulations, and then to enhance self experience in places with captive settings or natural areas where visitor is dispersed and visitation is sporadic (Moscardo, Woods & Saltzer, 2004). Interpretive signs are considered effective based on these two factors, which are, the impact on visitor knowledge and conservational attitude, and the influence on visitor thought and believes.

Interpretation favors the usage of illustrative media (Tilden, 1997), provides visitors with sufficient information, promotes further learning, and intends to form better understanding about the value of heritage and environment which expectedly results in positive attitude and behavior towards environment, natural and cultural heritage, and conservation. Interpretation works in process of first, experience, then education, and followed by change in attitude and behavior. It also promotes visitor satisfaction. Exposure to nature-themed and nature-based places such as national parks is potentially beneficial to increase conservation related knowledge, attitude, and behavior. These are the reason why the term interpretation is commonly intertwined with sustainable tourism.

In study by Jensen (2006), it was mentioned that artistic design of interpretive signs significantly affect attracting power, holding time, and memory recall. The four key qualities of interpretive design according to Ham (1992) are: pleasurable, relevant, organized, and thematic. Ham (1992) stated conceptual component, which refers to the copy writing, and artistic component, which refers to the design elements, are the two

aspects of interpretative design. Jensen (2006) also mentioned about the concept on limited capacity, the ability of human brain to retain certain amount of information in short-term memory before going overload, for examples how many string of letters and numbers people can recall from a sequence of letters or sentences. This ability revolves around subjects of selectivity, motivation, concentration, focus, perceive, and distraction. In addition, Bitgood (2000) discussed the evaluation of successful interpretation by measuring its impact to audience, attracting power, holding power, collateral behaviors, knowledge gain, as well as communication power. Signs are most effective when they complement the objects. Evaluation is applicable to implement in planning stage, to assess audiences' pre-knowledge, misconceptions, attitudes, preferences, and interests, in preparation stage, to test the ideas and media, and after installation, to make some favored adjustments. The cognitive process of attention covers the characteristic of selectivity, motivated focusing, and limited capacity. Excitement, interest, curiosity, to converse and share knowledge are examples of internal motivators (Screven, 1992).

Good interpretive design emerges from successful combination between psychology and communication design, which comprises psychology of attention, psychology of learning, persuasive communication and attitude change, and attitude behavior links (Screven, 1995; Moscardo, Woods & Saltzer, 2004). Thus good interpretive design works as a process as shown by the followings. First, it attracts visitors and keeps their attention. Second, it initiates learning desire. Third, it persuades visitors to accept the information, changes their belief and attitude. Fourth, it changes visitor behaviors. Increased awareness in conservation issue and minimization of impacts are the expected positive outcomes of good interpretive design.

Interpretive sign also follows similar design principles as mentioned in previous section. To achieve effectiveness, these are things need be considered: relevance,

comprehensiveness, content clearness, placement, location, attractiveness (using color, accent, contrast), basic typographic rules, active voice, short sentences and familiar words usage, format, grid, margin, and illustrations (Moscardo, Ballantyne & Hughes, 2003). It's also helpful to provide varieties, avoid repetition, and present theme based information in logical order.

#### *2.5.4 Signs in national parks assisting both visitors and guides*

At the site of tourism destination, it's clear that interpretive signs have essential role in delivering knowledge and enhancing visitor experience. Furthermore in ecotourism which one of the fundamental ideas is about educational experience, sign plays its significant part in fostering visitor education. However, as ecotourism is also about natural environment, the implementation and presence of signs should not disrupt or pollute the surrounding natural environment. Interpretation attracts attention that foster interaction, learning, enjoyment, as well as satisfaction. Interpretation, especially its educational element, contributes to core principles of sustainable tourism (quality, continuity, and balance) (Moscardo, Woods & Saltzer, 2004).

To achieve maximum visitor learning, Jensen (2006) suggested using distinct and unique signs that maximize the best practices of artistic design. For instances are the application of color contrast and color coding, short messages, sizing, serif or sans serif typefaces, visual aids (photos, pictures, illustrations), and interactivity. The usage of broken down paragraph, bulleted list, and hierarchy are also proved to be helpful.

Another factor that needs to be considered is about how much information can be absorbed by visitor. Although it's evident that signs have significant effect in increasing visitor knowledge (Cole, Hammond, & McCool, 1997), it's greatly influenced by factor

such as the reading and attention span. It has always been challenging working on environmental design system promoting visitor education in ecotourism destination. Information presented in the signs should be in appropriate amount within the ability of visitors to absorb it. Additionally, information contained in the signs should not be far too simplified, but leave enough space for the site to speak for itself and for the visitors to explore deeper and interpret it (Hughes & Morrison-Saunders, 2002).

Studies have been done in the past examining the design of interpretive signage and its impact regarding visitor education. Those studies were done mostly to the effectiveness of signage in place like museums, botanical garden, zoos, and less to one implemented in national parks (Hughes & Morrison-Saunders, 2002; Jensen, 2006). In addition, most of the available researches into interpretive effectiveness have focused on either changes in knowledge, levels of visitor enjoyment and/or changes in behavior as the outcome being measured and less of actual changes in conservation attitudes (Moscardo, Woods & Saltzer, 2004).

Although survey assessing visitor knowledge post experience to both textual component and artistic component was conducted, Jensens' study was emphasized to evaluate the effectiveness of artistic component of interpretive signage, which and how messages were effectively delivered. Knowledge assessment is usually used to evaluate visitor experience. Experimental design method was used in this study elaborating manipulated sign with exactly similar text copy but modification in several design aspects, namely typeface, color and size of text, color of background, use of vivid color photos, addition of flip-panels, and the sign shape (Jensen, 2006). Results showed that artistic elements have significance to all attracting power, holding time/power, and short-term knowledge gain/memory recall. Furthermore, artistic component is quickly noticed by visitor.

Content analysis study done by Wandersee (2007) examined the potential educational value of a trailside interpretive signage system particularly on quality and quantity of textual content of the sign. This study concluded that 70 words per sign are pleasantly sufficient and satisfying and then presented a list of suggestion for sign content writing. This provides boundary enabling visitors to fully develop idea and avoid it from being underdeveloped or overdeveloped. Opportunity to learn offered by the signs is highly influenced by quality writing and even more so by focus on meaning making to ensure memorable/message retention (Wandersee, 2007).

A study by Hughes and Morrison-Saunders (2002) was done by administering experimental research on installation of trail-side interpretive signs, based on the need of having signs alongside the trails rather than limiting the information on the visitor information center. The main conduct of the research was done by employing knowledge assessment test prior and post experience. Findings from this research emphasize that increase on visitor knowledge is affected by the length and quantity of the text contained in the signs and how many second visitors spend their attention on it. Cole, Hammond, & McCool (1997) proposed that visitor doesn't spend more than 25 seconds of attention on each sign. The installation of signs alongside the trails was found preferably by visitors. Visitors stated that it created fulfilling education experiences while didn't necessarily have significant impact on visitor knowledge. Repeated visitors however have a different argument about it, installation of trail-side signs provide less learning experience for them compared to first time visitors, although it has a significant impact on repeated visitor knowledge. Therefore it's necessary to develop a design where the signs can retain a favorable learning experience even for repeated visitors.

Hughes and Morisson-Sanders (2002) described signs as interpretive tool of passive method of education in which learning is influenced by what experienced on site.

This statement explains why the engagement of park rangers and guides as the active party is beneficial to yield stronger impact, especially because basically visitors have weak or limited understanding about environmental education, value of protected areas, conservation values, and minimum-impact visitor behaviors. For signs to have impact in visitor behavior, it needs to be noticed, read, and understood, it needs to be presented in a way that enhance its potential in persuading visitors to act in desirable manner. Message presented in signs and its retention factor should also be considered to formulate messages that can be easily absorbed in one reading.

Besides studies about interpretive sign and its relation with visitor knowledge, there're also studies about park rangers and guides' role in visitor education. Rangers and guides presence is important due their responsibility in delivering messages of minimal impact behavior, heritage values, conservation issues and protected areas management to visitors. Guides provide active way of interpretation which may affect visitors' thought, feeling, and behavior. In natural based tourism, interpretation is actually part of park management agenda, in their study, Armstrong and Weiler (2002) examined what kind of message delivered by tour operators and how this message is received by visitors as well and their motivations.

Guides are very useful, especially in destination with high visitation, because they're involved in personal interpretive method and offer active interpretation. The availability of guides can be advantageous for improvement in many aspects of visitor education, for example attracting attention, fostering interaction, providing demonstration, and engaging on-site activities. Minimizing impacts in protected areas, management of protected area related with roles and action of management agencies, significance of heritage value of the protected area, conservational message in general, and encouraging individual conservation action, are examples of environmental conservation messages.

Study by Armstrong and Weiler (2002) observed whether those message, in relation with park objectives, are delivered sufficiently by tour operators to the visitor, and how well visitors received them, as well as which messages left unmentioned and disappeared in the process.

Many fruitful recommendations have been resulted from researches examining effective use of sign especially related to aspects of its content component and artistic component. Many studies have also examined the signs' fundamental functions, as well as its fostering role in relation with visitor education, especially where it's found that interpretation playing a really vital role. Most of the studies done were emphasized on relation and effects of signs on visitors. Besides examining the functions of signs as it is and visitor experiences of them, my research included remarks from the guide side as well. This research was done not only as an evaluation to the usage of signage system in national parks, but also examined the relation of signs to both visitors and guides, thus including guides' point of view regarding the effectiveness of usage of the signage system.

## **CHAPTER 3: METHODOLOGY**

As already stated previously, the main purpose of this study is to find out the role and effectiveness of the usage of signage system usage in Kirishima-Yaku National Park. This study wished to examine whether the signage system used in National Parks, which of ecotourism destinations, serves its function as an educational tool that can increase visitors' knowledge and awareness towards conservational issues, and at the same time meets the expectation of the park guides regarding messages that need to be delivered. In regards to the objectives of describing the extent of role and effectiveness of signage system, this study falls into the category of a descriptive study. Therefore, it is the quantitative data gathered that will answer those objectives.

Survey research was employed as the strategy of acquiring quantitative data. Survey was done at one point in time with number of respondent are taken representatively from wider population, this kind of survey can be put into category of sample survey and cross-sectional survey. This study took place in Yakusugi Land, one of the Yakushima Natural Recreation Forests, which is also belonged to Kirishima-Yaku National Park. Consequently, target population for the survey is the visitors at that site. The kinds of instruments used in this study are observation and questionnaire.

Observation was done as the first stage in data gathering. Data gathering was started by visiting the island of Yakushima on the period of three days, from the 3<sup>rd</sup> until the 5<sup>th</sup> of July 2010. Nevertheless, during those three days both sites of Yakushima Natural Recreation Forests, Shiratani Unsuikyo Ravine and Yakushima Land, were visited. This first visit to Yakusugi Land was done to examine the implementation of



signage system at the site. All the courses and trails were experienced first-handedly. All kinds and types of signs were studied; signs were photographed, the information contents were taken into note, and the locations were recorded. Information collected was used to develop knowledge assessment component of visitors' questionnaire. From this stage, data about kinds of signs installed in Yakusugi Land, information contained in the signs, their location, and how they're presented were obtained.

The next step of data gathering was done by distributing the questionnaire. Basically there were two kinds of questionnaire developed for this survey based on who the respondents was. One set of questionnaires was directed to the visitors and the other one was filled in by the park guides.

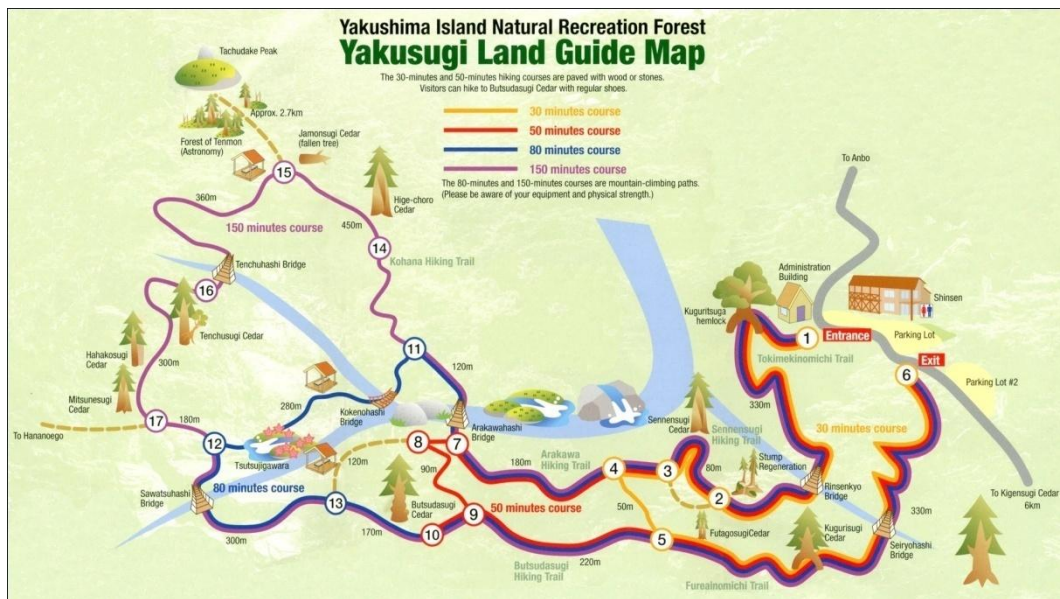
A total of 400 visitor questionnaires were distributed in a ten days period, from September 24 until October 7, on the second visit to Yakusugi Land. Questionnaires were self-administered at the entrance/exit point near the location of the Shisen trail store and rest house to randomly selected visitors post their experience of the trails. The first part of the visitors' questionnaire records data related to visitors' demographic aspects, such as gender and age, and factors of their visit. The second part of the visitors' questionnaire is the knowledge assessment component where visitors respond to a series of statements, which is made based on the information that can be found at the site, by answering 'true', 'false' or 'don't know'. Then the next part employs a five point Likert scale to assess visitors' attitudes towards several aspects related to the signage system at the site, such as its usage, presentation and content, as well as its impacts. The last part of questionnaire comprises open-ended questions to obtain more comments and opinions from the visitors about signage system, their expectations, experiences, and suggestions.

Questionnaires were also distributed to the park guides. Guides' demographic aspects as gender and age also recorded. The first part of guides' questionnaire is similar five-point Likert scale series of statement to assess guides' attitudes towards signage system usage and impacts as well as their satisfactory regarding the presentation and content. The second and last part of the questionnaire comprised open-ended questions to gain insight about guides' point of view regarding the importance of information which is necessary to be delivered to visitors as well as their experiences and suggestions. Guides' views concerning the role and effectiveness of the signs are gained by this set of questionnaire.

All data collected were then processed and analyzed. The data analysis process used in this study is mainly descriptive analysis, thus measurement taken is for frequency, averages, and most frequent value. Cross tabulation, Mann-Whitney, and Kruskal Wallis was also applied to analyze several aspects of the results.

## CHAPTER 4: FINDINGS

Yakushima is indeed a beautiful island. Visitors will come to this sudden realization as soon as they set their feet down in Yakushima. Just by looking at the diverse species of vegetation, it's instantly known for sure why Yakushima is designated as one of the World Heritage sites. Mountains are covered by lush color from numerous different tones of green, and the entire island is rich with flowers and fruit trees which can usually be found in tropical climate, this condition is made possible by the extremely high rainfall amount as well as the climate current surrounding the island.



Picture 4.1 Map of trails and courses at Yakusugi Land

## 4.1 Signage System in Yakusugi Land

All the following signs were photographed and taken into note by firsthand experience of all the trails available in Yakusugi Land. The kinds of signs installed at the site consist of information signs, map signs, route signs, trail name signs, cedar trees name signs, bridge names, plant species signs, and notification signs.

### 1. Information signs



Picture 4.1.1. Information sign example 1



Picture 4.1.2. Information sign example 2

Information signs are one type of signs installed in Yakusugi Land. The first picture shows a sign that is located near the entrance to Yakusugi Land just besides the administration building. By providing visitors with new knowledge, this kind of sign promotes learning opportunities. Information that is contained in this sign for instance are unique and special aspects of Yakushima related with its natural environment as well as history, such as logging in Edo period and facts about cedar trees. Several of these signs are also supported by illustration as shown by the second example above. Information signs can be found in several particular places along the trail near the designated walkways where the object of discussion is located.

Most of the information signs at the sites are written in Japanese, however the signs that are located along the trail of 30 minutes course are accompanied by the English version of the information. For the bilingual sign, the English version is printed on the right side of the sign as seen from second example. It applied the usage of sans serif typeface and left alignment while the

Japanese one uses justified alignment. The information contained in descriptive signs is quite extensive, there are average 100 words in English on each sign.

## 2. Map signs



Picture 4.1.3. Example of map signs

The most essential purpose of map signs is to point out the whereabouts of visitor's current location. As shown by its title, as a guide map, it provides visitors with visual imagery of the whole trails at Yakusugi Land. Number shown at the top right corner of the sign represents the current location of the visitors which can be referred easily in the map. We can see the utilization of color coding to differentiate one course to each other. In the diagram also shows the name of cedar trees of interest, trails name, bridges name, and rivers name.



### 3. Route signs



Picture 4.1.4. Directional sign example 1



Picture 4.1.5. Directional sign example 2



Picture 4.1.6. Directional sign example 3

The pictures above show several types of directional signs installed at the site. The type of signs shown on the first example are installed constantly along the trails at the site, the presence of these particular signs is very important because they mark the direction of the trail and prevent visitors from getting lost, especially in 80 minutes course and 150 minutes course where the trails are actually mountain climbing path and the board walkways are no longer present. On the other hand, the second and third example of directional signs can be found in every intersection of the trails. On the first and second example we can also see the usage of arrow symbol incorporated in the signs, while on the third example the signboard itself is designed into arrow shape.



#### 4. Trail name signs



Picture 4.1.7. Trail name sign example 1



Picture 4.1.8. Trail name sign example 2



Picture 4.1.9. Older version of trail name sign (1992)

There are six trails in Yakusugi Land, namely Tokimekinomichi Trail, Sennensugi Hiking Trail, Arakawa Hiking Trail, Kohana Hiking Trail, Butsudasugi Hiking Trail, and Fureainomichi Trail. Trail name signs are installed at the very beginning of the trail as well at the intersection of the trails to make easier for visitors to be aware of their location. The last picture above shows the older version of signs, and there are several kinds of this older sign can still be found at the site.

## 5. Cedar trees name signs



Picture 4.1.10. Cedar tree name sign example 1



Picture 4.1.11. Cedar tree name sign example 2





Picture 4.1.12. Cedar tree name sign example 3

From the first two pictures we can see how the Yakusugi names are presented on different signs. Shown on the last picture, there are several signs that contain more information about the trees, such as the height, diameter, and the age of the yakusugi cedar. These cedar tree name signs are installed immediately next to the related cedar trees.

## 6. Bridge name signs



Picture 4.1.13. Example of bridge name signs



Picture 4.1.14. Older version of bridge name sign (1993)

There are six bridges in Yakusugi Land, namely Rinsenkyo Bridge, Arakawahashi Bridge, Tenchuhashi Bridge, Sawatshuhashi Bridge, Kokenohashi



Bridge, and Seiryohashi Bridge. Bridge name signs are installed in front of each bridge.

## 7. Plant species signs



Picture 4.1.15. Plant species sign example 1



Picture 4.1.16. Plant species sign example 2



Picture 4.1.17. Plant species sign example 3



Picture 4.1.18. Plant species sign example 4

There are several kinds of signs used for plant species. The information contained in this kind of sign are the name of the plants, the species name of plants in Latin, the plants' another name, the classification of plants' family and

genus, the distribution of the plants and their location in Japan, the plants' type, the color of the flower, and the blooming season. A clear difference between each example is the usage of images, first example shows illustrated picture of the plant, the second example provides photo of the plants, and the third example shows both photos and distribution map of the plants, while the last example has no picture of the mentioned plant.

## 8. Notification signs



Picture 4.1.19. Warning sign example 1





Picture 4.1.20. Warning sign example 2



Picture 4.1.21. Warning sign example 2

Smoking is prohibited inside natural recreational forest and visitors can smoke only in one designated smoking area, such as in front of the Shizen trail store and rest house outside the entrance to Yakusugi Land. Along the trail we can constantly find the smoking prohibition warning. The second and third

example above show another type of notification or warning, for instance sign that tell visitors to be cautious of slippery area and sign that tell visitors to mind fallen branch at their head level.

## 9. Other signs



Picture 4.1.22. Sign to Tachudake Peak



Picture 4.1.23. Sign of bird species in Tachudake





Picture 4.1.24. Sign of insect species in Tachudake

From Yakusugi Land, visitors can continue climbing to Tachudake Peak, the entrance of this mountaineering trail is located at the far end of the 150 minutes course in Yakusugi Land. These signs are put into category of other signs because the content of the signs is specific about Tachudake and just situated at the beginning of the climbing trail.

Above we have seen the examples of the kind of signs that are installed in Yakusugi Land and can be found throughout the entire available course at the site. By examining the signs, we also can see that all the examples fit into four categorizations of sign based on function by Mollerup which is mentioned in the previous section. Signs that can be put into category of identification signs are signs that contain name or title, such as trails name signs, cedar trees name signs, and bridge name signs. Directional signs and description signs are both explanatory signs. Signs that can be put into category of directional signs are maps signs and route signs. Signs that can be put into category of

description signs are signs that provide information such as natural environment of Yakusugi Land as well as history of logging and relation between the people and nature. There are also several instructional signs, such as smoking prohibition sign and precaution of slippery area and tree branches at head level.

From the picture we can see that except one which is the arrow shaped directional signs, all the other of the sign are rectangular in shape. The presentation of the sign is very practical and formal. Useful application of color coding is represented in map signs. Despite the lack of color coding in any other signs apart from map signs, color contrast is used effectively, where content of the signs or its body text can be easily differentiated from the background signboard where it is printed. We can see the most basic usage of black font color over white background and vice versa, for example white font on dark colored signboard as on the arrow shaped directional sign. Directional and descriptive signs are installed on eye level height. The mounting used for the sign are made of wood or shaped to look like wood, this shows the effort to prevent signage being too loud and disrupt the basic nature of the national parks.

## 4.2 Contents Used for Knowledge Assessment Component

The following are information extracted from several signs which then used for knowledge assessment component of the visitors questionnaire.

- Yakushima Island Natural Recreation Forest Arakawa District

In 1971, in order to allow visitor to experience Yakusugi cedar primary forest, this district is designed as Yakusugi Cedar Appreciation Forest, then in 1973, this forest is designated as natural recreation forest. The vegetation species of this area compromises cedar trees, fir, hemlock, stewaria, wheel tree, etc.

- Yakusugi Cedar Harvesting in the Past

Yakusugi was worshipped as god tree in the past before the harvesting period.

- Domaiboku (Burried Wood)

Since the main purpose of Yakusugi harvesting was for making shingles, people only used part of trees which is easily to split and to work with, while branches, trunks, and stumps are abandoned in the forest. The harvesting was done during Edo period (1600-1867). Nowadays yakusugi cedar crafts are made from this abandoned domaiboku. Yakusugi cedar contains high level of resin that prevents it from being rotten 200-300 years after harvesting.

- Kirikabu Koushin (Regeneration on Stump)

Kirikabu koushin is one of the unique types of tree regeneration where seed of new trees germinate and grow from moss covering the stump supported by high amount of rainfall and high humidity. New tree from this regeneration is called

second generation cedar. Second generation cedar can also produce third generation cedar.

- Tameshigiri (Tree Sampling)

Since the main purpose of Yakusugi harvesting was for making shingles, tree sampling was done to sample wood that is easily to split to avoid labor waste because yakusugi cedar was huge and transporting them needs great amount of effort.

- Futago Sugi (Twin Cedar)

Futago Sugi is example of second generation cedar that germinates and grows from harvested parent tree.

- Touboukujou Koushin (Regeneration on Felled Trees)

Touboukujou Koushin is another unique type of tree regeneration where seed of new trees germinate and grow on felled trees, supported by moss created by high amount of rainfall and high humidity.

## **4.3 Visitor Questionnaire Results**

### *4.3.1 Profile of visitors*

Yakusugi Land receives a high number of visitors throughout the year aside from during winter season where mountaineering activities such as forest walking, climbing, and hiking are not encouraged due to the weather and the condition in which trails could be slippery and dangerous. As for 2010, total annual visitation of Yakusugi Land reached number of 80.000 visitors. Visitation peak happens in May due to the one week long Japan's national holiday called the Golden week. In addition, this site also serves as a well visited school trip destination which usually occurs during the month of October. From observation, it is known that Yakusugi Land receives visitation from a quite diverse range of visitors, they not only come from different backgrounds but age range as well, for instance students, young couples, families, businessmen, and seniors.

Another important observation found regarding the visitation to Yakusugi Land is related to the mean of transportation available in Yakushima. Public bus services in Yakushima run on a not so frequent schedule, especially to the destination as natural recreation forest which is located deep into the central of the island and also high on the mountainous area. In the case of Yakusugi Land, there are only three times a day where public bus service reaches the site, and that is the reason why many people make use of the rental car services which are available plentiful on this island. Based on this mean of transportation, we can make another categorization of visitors. First are visitors who use public bus services. Second are visitor who drive their own (rental) car. Third are groups of visitors who travel with their own chartered bus, for example company vacation tour. Fourth are the groups of visitors who travel on excursion bus tour provided by the bus companies in Yakushima. The last one is small number of visitors who travel by taxi.

At the end of the survey period, a total of 365 responses were received out of 400 questionnaires distributed.

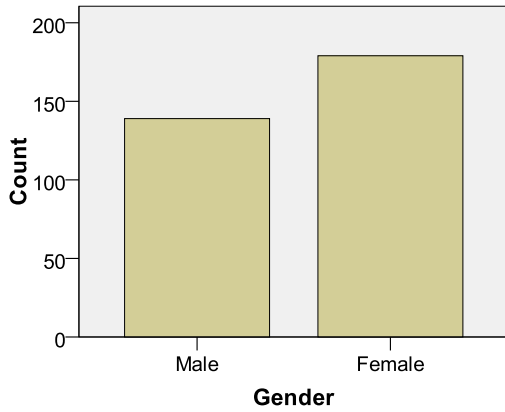


Figure 4.3.1.1. The number of respondents by gender

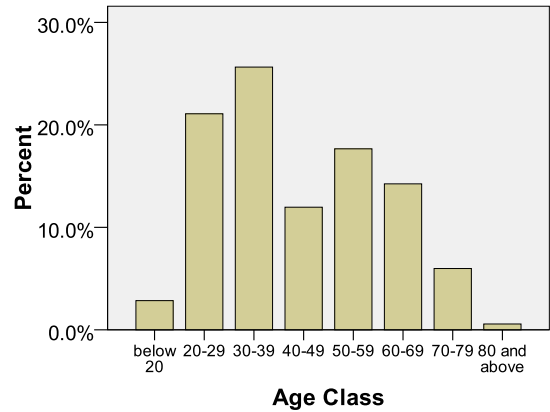


Figure 4.3.1.2. Percentage of respondents' age class

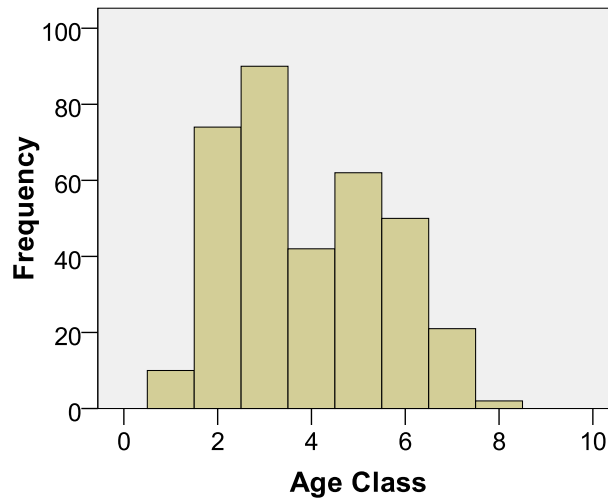


Figure 4.3.1.3. Frequency of respondents' age class

The number of female respondents outnumbered male respondents with the gender ratio between female and male is 4:5. From the figure above can be seen that half of the respondents was constructed of visitors between the age 20 and 39.



Regarding the visitors' visitation history to national park, 60% of respondents said that they had experiences of previous visit to other national parks, in Japan and outside Japan, prior coming to Yakushima. Eighty four percent of the total respondents stated that their visit to Yakushima was their first time. Besides that, the majority of them (89%) was also first visitors to Yakusugi Land.

Regarding visitor's familiarity with the site, 81% of respondent stated that they knew about the presence of Yakusugi Land prior their arrival in Yakushima. Printed materials such as brochures became the major source of how visitors gained knowledge about the accessibility to Yakusugi Land (39%).

Sightseeing was the main reason for most of the visitors to visit Yakusugi Land which corresponds to 58% of the total respondents. The majority of visitors (76%) were travelling with friend, partner, family, or relative. Seventy percent of the respondents were not signed up to any excursion bus tour package. Only 33% of the respondents were accompanied by a guide, while the rest of them experienced the site by their own.

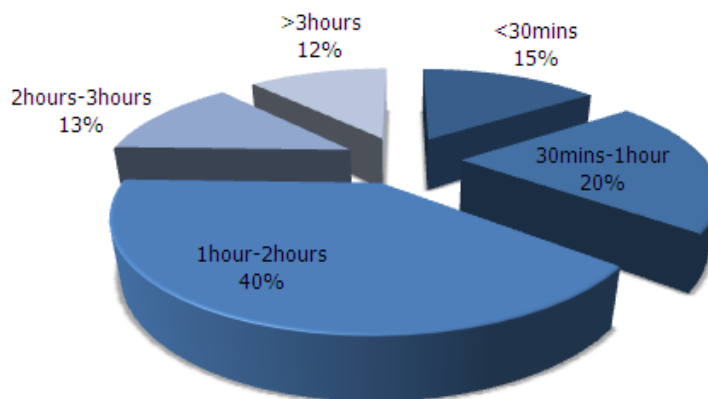


Figure 4.3.1.4. Percentage of time spent in Yakusugi Land

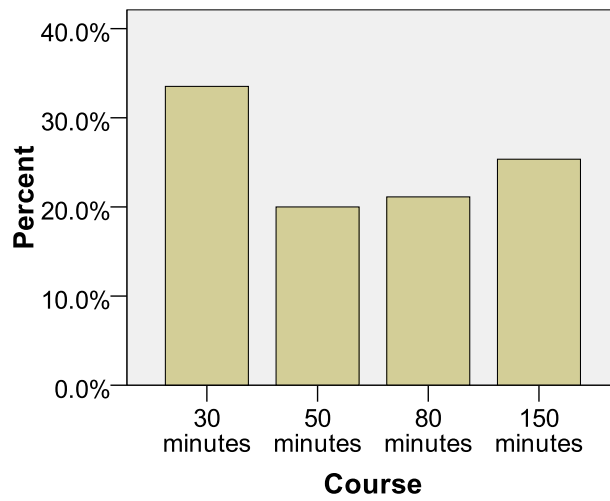


Figure 4.3.1.5. Percentage of course selection in Yakusugi Land

Forty percent of the respondents spent an average of one to two hours time in Yakusugi Land, 33% of the total respondents chose to experience 30 minutes course trail, however the selections of course were spread quite evenly.

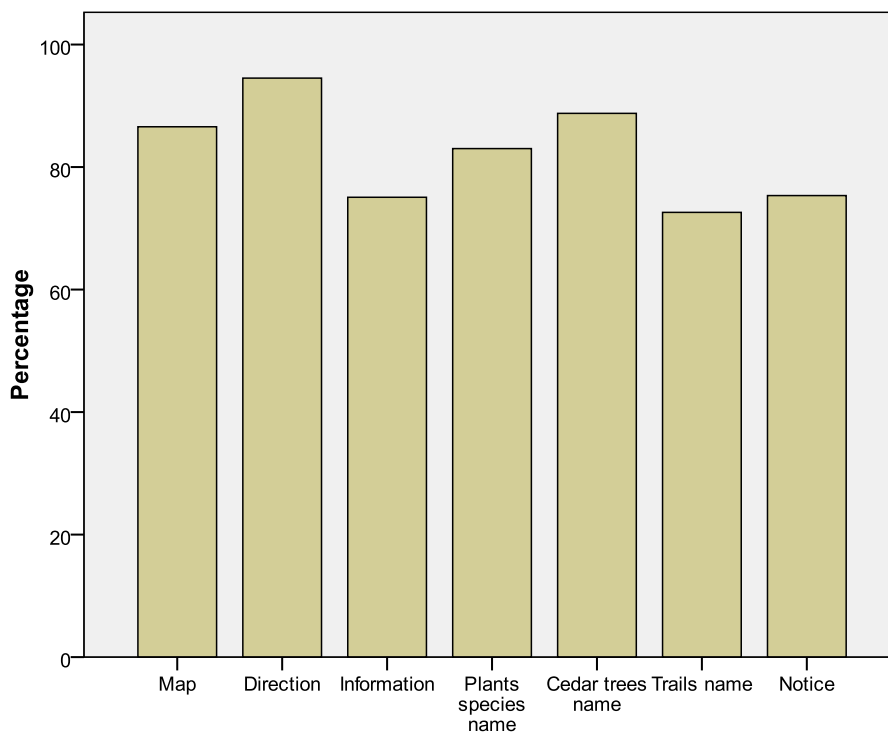


Figure 4.3.1.6. Percentage of visitors encounter to the signs

	<b>Map</b>	<b>Direction</b>	<b>Information</b>	<b>Plants species name</b>	<b>Cedar trees name</b>	<b>Trails name</b>	<b>Notice</b>
Percentage of visitors who didn't found the particular signs	13%	6%	25%	17%	11%	27%	24%

**Table 4.3.1.1. Percentage of visitors encounter to the signs**

Map signs, direction signs, information signs, plants species name signs, cedar trees name signs, trail name signs, and notice signs are all the kind of signs which can be found by visitors even on the shortest course available which is the 30 minutes course. The figure above represent the percentage signs that encountered by the visitors. Thirteen percent of visitors stated that they didn't come across map sign, six percent didn't come across direction signs, twenty five percent didn't come across information signs, seventeen percent didn't found plant species signs, eleven percent didn't come across the name of cedar trees signs, twenty seven percent didn't come across the name of the trails signs, and twenty four percent didn't found notification signs.

This sign encounter possibility was also examined in regards with several aspect such as accompanying person as well as length of time spent at the site, it's found that the presence of accompanying person such as friend or family had no significance on encounter of signs ( $z=-1.506$ ;  $p>0.05$ ), on the contrary there was a great significance to most of the signs ( $p<0.001$ ) when visitors was with guides, expect for plant species name signs ( $z=-1.037$ ;  $p=0.300$ ) and cedar tree name signs ( $z=-2.269$ ;  $p=0.023$ ). The length of time spent at the site had significance on the encounter of map signs, information signs, plant species name signs, trails name signs, and notice signs but not to direction signs ( $\chi^2=5.323$ ;  $df=4$ ;  $p=0.256$ ) and cedar trees name signs ( $\chi^2=6.488$ ;  $df=4$ ;  $p=0.166$ ). In addition, the selection of courses was significant with the encounter to map signs ( $\chi^2=13.469$ ;  $df=3$ ;  $p=0.004$ ), information signs ( $\chi^2=18.699$ ;  $df=3$ ;  $p<0.001$ ), and trails name signs ( $\chi^2=12.329$ ;  $df=3$ ;  $p=0.006$ ).

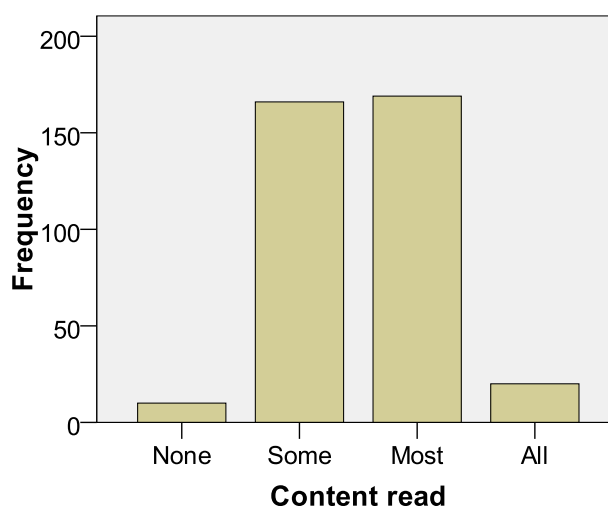


Figure 4.3.1.7. Frequency of sign content read

Regarding the attention that visitors spent to the signs, the number of visitors who read some and most of the sign content share a close percentage. Forty six percent of total respondents stated that they read only some of the content of the signs along the trail in Yakusugi Land, while the other 46% of the respondent stated that they read most of the content of the signs. Similar with the case of encounter with signs, accompanying person had no significance over the amount of message read by visitor ( $z=-0.288$ ;  $p=0.774$ ), while guides is significant ( $z=-5.734$ ;  $p<0.001$ ). On the other hand, both time spent ( $\chi^2=16.833$ ;  $df=4$ ;  $p=0.002$ ) and course taken ( $\chi^2=20.660$ ;  $df=3$ ;  $p<0.001$ ) had significance over the amount of message read. This suggests that guides increase the visitor awareness to signs and its content as well, and the longer amount of time spent and course selection there's more attention towards directive signs.

### 4.3.2 Knowledge assessment component result

The following is the result of knowledge assessment component of the questionnaire which statements are made from the information mostly contained in the descriptive signs found along the walkways in the 30 minutes course trails. The letter inside the bracket in front of each statement show the correct answer to the statement, T means the statement is true while F means the statement is false.

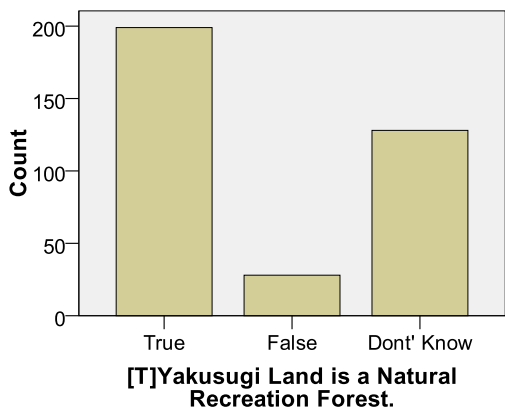


Figure 4.3.2.1. Responses to Question 1

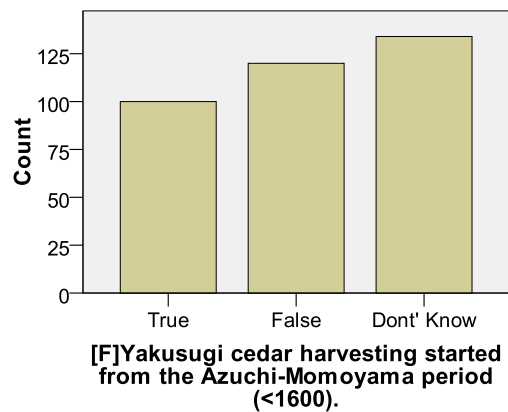


Figure 83. Responses to Question 3

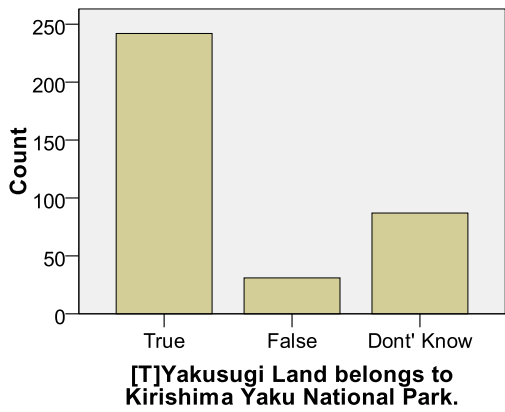


Figure 4.3.2.1.2. Responses to Question 2

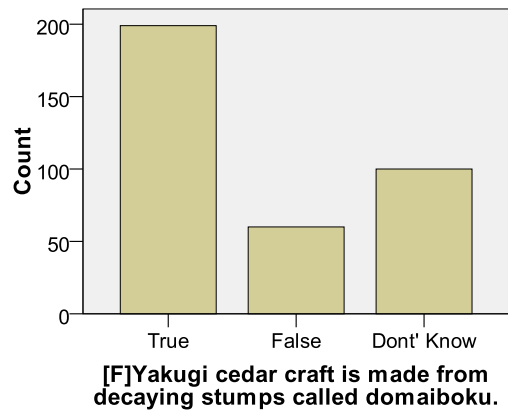


Figure 4.3.2.1.4. Responses to Question 4

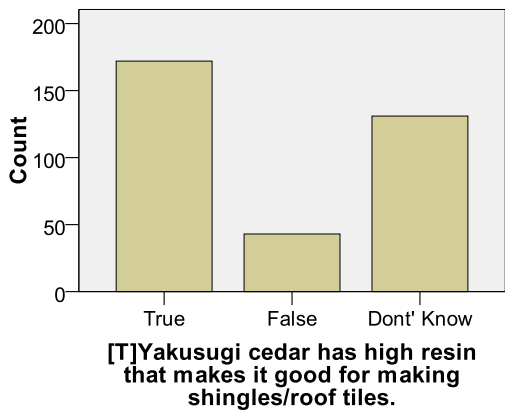


Figure 4.3.2.1.5. Responses to Question 5



Figure 4.3.2.1.8. Responses to Question 8

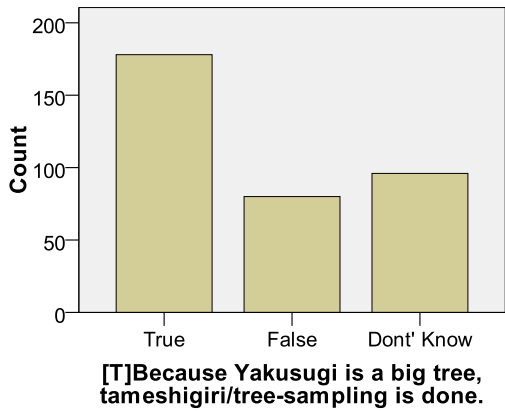


Figure 4.3.2.1.6. Responses to Question 6

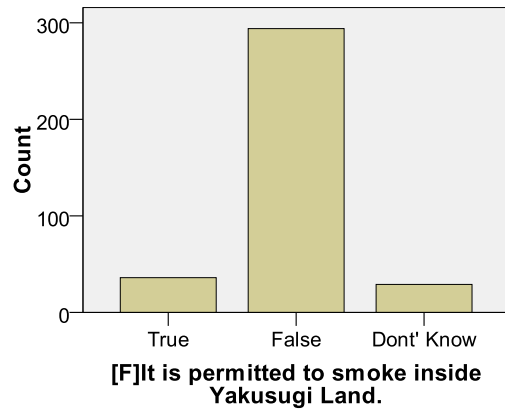


Figure 4.3.2.1.9. Responses to Question 9

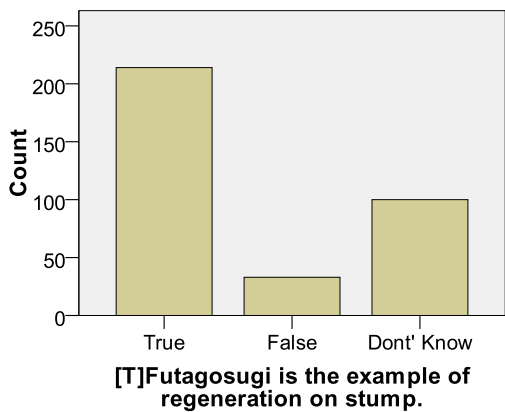


Figure 4.3.2.1.7. Responses to Question 7

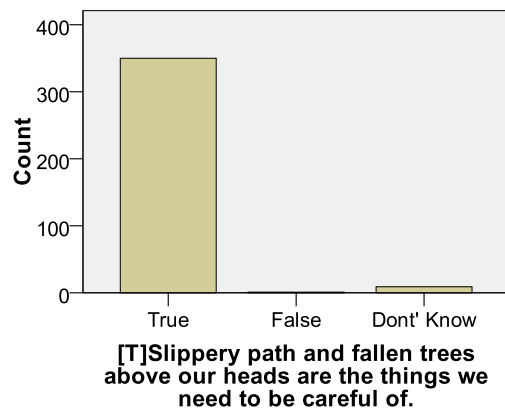
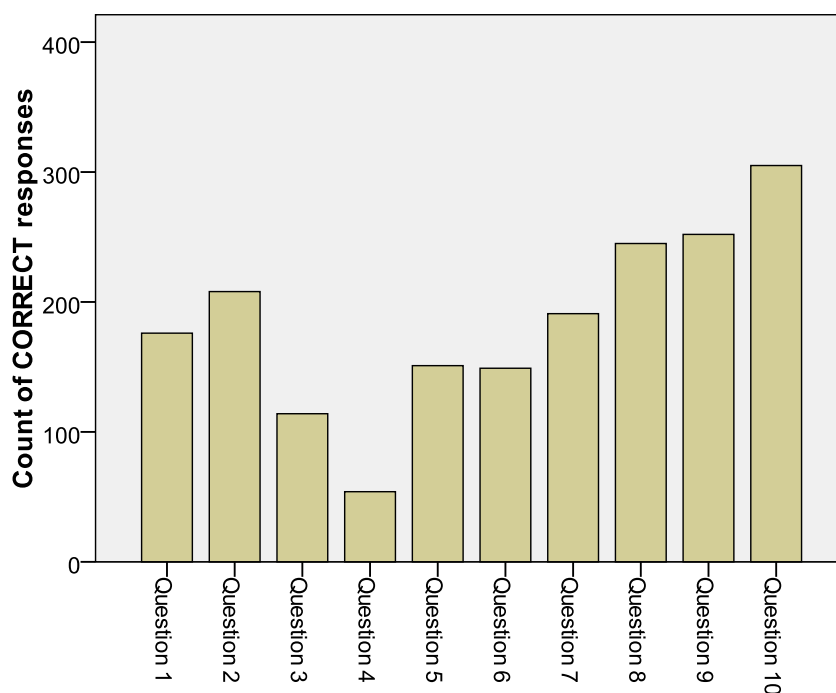


Figure 4.3.2.1.10. Responses to Question 10



**Figure 9. Correct responses**

The figure above shows that 55% of the respondents answered correctly to question one, 66% of the respondents answered correctly to question two, 33% of the respondents answered correctly to question three, 16% of the respondents answered correctly to question four, 47% of the respondents answered correctly to question five, 49% of the respondents answered correctly to question six, 59% of the respondents answered correctly to question seven, 76% of the respondents answered correctly to question eight, 81% of the respondents answered correctly to question nine, and 96% of the respondents answered correctly to question ten.

Correct responses were classified together and examined with several aspects, which results is interesting. It's found that selection of course is the only aspect that has significance over number of correct responses visitor could answer ( $\chi^2=9.499$ ;  $df=3$ ;  $p=0.023$ ). However if examined specifically with each question, the company of guides has significance over Q4, Q6, and Q7, which basically related to Yakusugi crafting and tree regeneration.

### 4.3.3 Attitudes regarding experience on site

This component of questionnaire was designed to assess visitors' attitudes towards the installed signage system.

	N	Minimum	Maximum	Mean	Mode	Std. Deviation
The sign is located in appropriate location.	362	1	5	3.83	4	.704
The sign is attractive.	356	1	5	3.29	3	.832
The sign is easy to find.	357	1	5	3.81	4	.793
The content of the sign is easy to read.	360	1	5	3.76	4	.787
The information contained in the sign is easy to understand.	361	1	5	3.73	4	.813
The information provided is useful.	361	1	5	3.91	4	.687
Valid N (listwise)	350					

**Table 4.3.3.1. Usage of the sign visitors result**

Regarding the usage of the signs, the summary of visitors' attitudes are: agree that the sign is located in appropriate location (constitutes 74% of respondents), neutral about the attractiveness of the sign (constitutes 48% of respondents), agree that the sign is easy to find (constitutes 61% of respondents), agree that content of the sign is easy to read (constitutes 61% of respondents), agree that the information contained in the sign is easy to understand (constitutes 63% of respondents), and agree that the information provided is useful (constitutes 70% of respondents).



	N	Minimum	Maximum	Mean	Mode	Std. Deviation
Font/Text	350	1	5	3.59	4	.695
Layout	352	1	5	3.57	4	.708
Shape	351	1	5	3.58	4	.683
Color	351	1	5	3.56	4	.714
Size	348	1	5	3.60	4	.739
Valid N (listwise)	341					

**Table 4.3.3.2. Satisfactory of the sign form visitors result**

	N	Minimum	Maximum	Mean	Mode	Std. Deviation
Information quality	349	1	5	3.63	4	.693
Information quantity	349	1	5	3.60	4	.682
Valid N (listwise)	348					

**Table 4.3.3.3. Satisfactory of sign content visitors result**

Regarding the satisfactory about the form of the sign, the summary of visitors' attitudes are: quite satisfied to the font (constitutes 50% of respondents), quite satisfied to the layout (constitutes 51% of respondents), quite satisfied to the shape (constitutes 50% of respondents), quite satisfied to the color (constitutes 49% of respondents), and quite satisfied to the size (constitutes 54% of respondents).

Regarding the information provided, the summary of visitors' attitudes is quite satisfied to both information quality and information quantity, which constitutes 55% of respondents and 53% of respondents respectively.

	N	Minimum	Maximum	Mean	Mode	Std. Deviation
We learned something from the information provided.	356	1	5	3.96	4	.640
It provides the opportunity to learn about nature.	360	1	5	4.01	4	.657
It provides the opportunity to learn about historical and cultural tradition.	360	1	5	3.93	4	.708
It made us aware of environmental issues.	360	1	5	3.89	4	.765
It provides the opportunity to learn about the effort and importance of conservation to preserve natural beauty and natural resources.	358	1	5	4.00	4	.765
It made us appreciate and respect nature more, thus made us want to protect and treasure it.	360	1	5	4.13	4	.774
Valid N (listwise)	351					

**Table 4.3.3.4. Impact of the sign visitors result**

Regarding the impact of the sign, the summary of visitors' attitudes are: agree that they learned something from the information provided (constitutes 71% of respondents), agree that it provides the opportunity to learn about nature (constitutes 70% of respondents), agree that it provides the opportunity to learn about historical and cultural tradition (constitutes 63% of respondents), agree that it create awareness about environmental issues (constitutes 59% of respondents), agree that it provides the opportunity to learn about the effort and importance of

conservation to preserve natural beauty and natural resources (constitutes 58% of respondents), and agree that it creates appreciation and more respect towards nature (constitutes 55% of respondents).

#### 4.3.4 *Inputs about signage system in Yakusugi Land*

- Regarding the information that visitors wish to learn and find on the signs installed in Yakusugi Land.

Based on the responses given, respondents' range of interest can be put into the three major categories, which are nature, environment, and history. Respondents expected to find signs which contain information about the area vegetations, such as trees, especially one related to cedar trees as the main feature of the site, flowers, as well any other plants. They wanted to know about different types and names of trees, plants, and flowers at the sites, also the supporting explanations such as trees' age and height, and flowers' blooming seasons. There are significant amount responses that showed specific interest in moss as well.

Not only about vegetation, respondents also wanted to learn about inhabiting animals that they might encounter, such as deer and monkeys, which are common sight in Yakusugi Land. Respondents wish for information about weather and river, visual description about seasonal sceneries changes, and comparison about current forest situation to the past assisted by photos. There is interest in geological aspect, such as rocks, geological layers, and caverns. Respondents also expected to find proper signs of directions, maps, and precaution signs. However several responses showed the desire to have more detailed directional signs, such as the one that showing direction to resting places and highlighted points of the site, also signs explaining the opening and closing time of Yakusugi Land.

There were several amounts of responses that showed deep interest in learning about history, not only limited to the forest history, but also history that comprises interaction between forest and human. Science of forest growth, relation between trees' age and height, and craft history are the examples. However the most significant aspect that evoked visitors' curiosity is the history of cedar trees names. Respondents showed keen interest in knowing the background or

reason behind the naming of cedar trees. Foreign visitors expected to see more signs accompanied by English version.

- Regarding the signs that visitors found interesting.

One quarter of the total responses showed that signs which content explains about tree renewal were considerably appealing for the respondents. They felt that the particular signs were easy to understand, but more importantly the reason why visitors found the signs explaining kirikabu koushin and toubokujou koushin interesting is because the signs provide them with new knowledge about how cedar trees regenerate. The usage of illustration element also makes the signs more attractive and promotes better understanding. Another significant sign of interest is the sign which content explains about history and logging. Respondents stated that they gained knowledge about how people lived in the past specifically in Edo period, history of Yakusugi logging, and the close relation among people, trees, island and god in the past. Respondents also found maps signs interesting due to the informative content and the usage of illustration. Foreign visitors found smoking prohibition signs were interesting because the English translation doesn't sound quite right.

- Regarding the things that visitors are able to learn in Yakusugi Land.

Thirty percent of the total responses showed that respondents considered information about tree regeneration very interesting. Information which is considered second most interesting is the information about history of logging and how people used to live in the past and their relation with nature.

- Regarding information that visitors wish to be provided in the future.

The responses to this question are closely related with responses to the first question, in which visitors were unable to experience the information they want to learn at the sites related to their prior expectation. As mentioned before, respondents hope to find information about

moss, animal inhabitant of Yakusugi Land, such as deer and monkeys, and Yakusugi crafts.

Respondents want to know about the limitations of nature interaction, such as with trees, river, and animals. Besides wanting for more detailed descriptive signs, respondents also wish for the addition of visual elements such as illustration or photograph on the signs.

There are significant responses wish for more detailed directional signs. Many respondents stated the necessity to include information about how much time needed, or how many kilometers left to reach next destination point on the trails elaborated into directional signs.

- Regarding the improvement of the signs.

There are many various responses to this question. Size and location were the main issues. Visitors stated that several signs are situated too far from the walkways or located in position where the sun or shades may result in difficulties to see them clearly. Senior visitors especially concerned about the typeface size used and wish for bigger font. However, the usage of natural color mounting is favorable. Respondents mentioned the benefits of adding picture or photo into the signs. First, it can promote better understanding. Second, it can increase the signs attractiveness especially for younger visitors, and more so when combined with the effective usage of eye-catching colors. Third, it can reduce the difficulties faced by the respondents in finding plants referred in the sign due to the lack of visual elements. Other respondents stated the occurrence of redundant signs because they found several signs with similar content. Rusty signs and proper signs maintenance are other issues that need to be taken care of. One respondent stated the idea of using headphone to aid the sign usage, so that it possible to have less complex content in the signs, and less signs at the site. Despite varieties of responses, respondents agreed that nature is the utmost importance of the site, and the signage system usage should not disrupt the beauty of the nature.

#### 4.4 Park Guide Questionnaire Results

During the ten days survey period in Yakushima, questionnaires were also distributed to the guides who operate in Yakusugi Land as well as direct visit to several of the guide offices.

##### 4.4.1 Profile of guides

There are more than a hundred guide agencies operating in Yakushima registered at Yakushima Tourism Information Association, from individual guide to small agency consists of small group of people. Responses were collected from 35 guides who operate in Yakusugi Land.

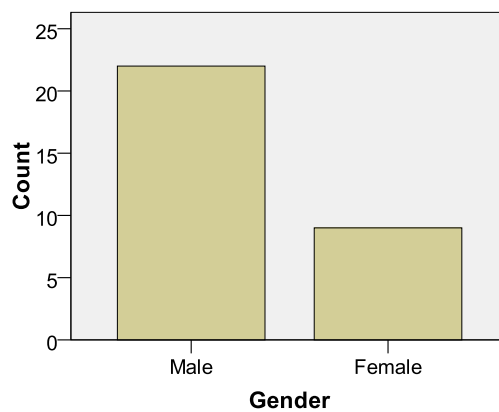


Figure 4.4.1.1. The number of guides by gender

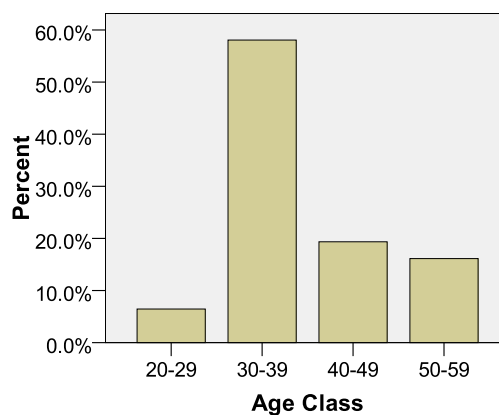


Figure 4.4.1.2. Percentage of guides' age class

The number of male respondents outnumbered female respondents with the gender ratio between male and female is 2:1. From the figure above can be seen that more than fifty percent of the respondents is composed of guides between the age 30 and 39.

	N	Minimum	Maximum	Mean	Mode	Std. Deviation
The sign is located in appropriate location.	35	2	5	3.14	3	.810
The sign is attractive.	34	1	5	2.79	3	.880
The sign is easy to find.	35	2	5	3.71	4	.789
The content of the sign is easy to read.	35	1	5	3.40	4	.881
The information contained in the sign is easy to understand.	35	1	5	3.34	3	.938
The information provided is useful.	35	2	5	3.51	4	.742
Valid N (listwise)	34					

**Table 4.4.1.1. Usage of the sign guides result**

Regarding the usage of the signs, the summary of guides' attitudes are: neutral that the sign is located in appropriate location (constitutes 43% of respondents), neutral about the attractiveness of the sign (constitutes 46% of respondents), agree that the sign is easy to find (constitutes 57% of respondents), agree that content of the sign is easy to read (constitutes 46% of respondents), neutral that the information contained in the sign is easy to understand (constitutes 46% of respondents), and agree that the information provided is useful (constitutes 49% of respondents).



	N	Minimum	Maximum	Mean	Mode	Std. Deviation
Font/Text	35	1	5	3.26	3	.741
Layout	35	1	5	3.06	3	.765
Shape	35	1	5	3.11	3	.867
Color	35	1	5	3.11	3	.758
Size	35	1	5	3.17	3	.891
Valid N (listwise)	35					

**Table 4.4.1.2. Satisfactory of the sign form guides result**

	N	Minimum	Maximum	Mean	Mode	Std. Deviation
Information quality	35	1	5	2.94	3	.938
Information quantity	35	2	5	3.03	3	.891
Valid N (listwise)	35					

**Table 4.4.1.3. Satisfactory of sign content guides result**

Regarding satisfaction about the form of the sign, the summary of guides' attitudes are: neutral to the font (constitutes 66% of respondents), neutral to the layout (constitutes 60% of respondents), neutral to the shape (constitutes 51% of respondents), neutral to the color (constitutes 60% of respondents), and neutral to the size (constitutes 54% of respondents).

Regarding the information provided, the summary of guides' attitudes is neutral to both information quality and information quantity, and both constitutes 49% of respondents.

	N	Minimum	Maximum	Mean	Mode	Std. Deviation
We learned something from the information provided.	35	1	5	3.43	4	.884
It provides the opportunity to learn about nature.	34	1	5	3.15	3	1.019
It provides the opportunity to learn about historical and cultural tradition.	35	1	5	3.23	3	.910
It made us aware of environmental issues.	35	1	4	2.57	2	.917
It provides the opportunity to learn about the effort and importance of conservation to preserve natural beauty and natural resources.	35	1	5	2.60	3	.976
It made us appreciate and respect nature more, thus made us want to protect and treasure it.	35	1	5	2.83	3	1.272
Valid N (listwise)	34					

**Table 4.4.1.4. Impacts of the sign guides result**

Regarding the impacts of the sign, the summary of guides' attitudes are: agree that they learned something from the information provided (constitutes 54% of respondents), neutral that it provides the opportunity to learn about nature (constitutes 40% of respondents), neutral that it provides the opportunity to learn about historical and cultural tradition (constitutes 40% of respondents), disagree that it create awareness about environmental issues (constitutes 37% of respondents), neutral that it provides the opportunity to learn about the effort and importance of conservation to preserve natural beauty and natural resources (constitutes 43% of respondents),

and neutral that it creates appreciation and more respect towards nature (also constitutes 43% of respondents).

#### 4.4.2 *Inputs about signage system in Yakusugi Land*

- Regarding the information that the guides usually deliver to the visitors in Yakusugi Land.

Based on the responses from the guides, there are three major categories of information delivered, which are information regarding natural environment of Yakushima, information about history and culture, and information regarding preservation and environmental conservation. On the subject of natural environment of Yakushima, guides usually deliver knowledge about ecosystem of Yakushima such as its flora, fauna, and forest. On the subject of history and culture, guides usually empathized on knowledge about history of Yakushima logging and how people used to live in the past, as well as their relation to nature and environment. Regarding the environmental conservation, guides usually deliver message about conservation and forest restoration. They also talked about ecotourism practices, national parks rules, and regulation to ensure appropriate visitors' behavior in such protected areas.

- Regarding the purpose of the signs installed in Yakusugi Land.

Although the great percentage of signs installed national parks are directional signs that prevent people from getting lost and work as guidance to show where people should walk, most of the guides agreed that one importance of the sign is to promote environmental understanding. Especially in national parks, sign should provide visitors with information about natural environment of the area and its uniqueness. Signs are used to educate people about nature and teach them to have better behavior towards it. According to the responses given, the guides believed that signage system usage should bring higher visitors' awareness about the importance of conservation and nature protection, and related environmental issues as well. They hoped that as the end result, people can treasure nature more.

- Regarding whether the signs installed serve their purposes and functions properly.

	N	Minimum	Maximum	Mean	Mode	Std. Deviation
Q3	32	2	4	2.91	3	.641
Valid N (listwise)	32					

**Table 4.4.2.1. Guide question 3 result**

Summary of the responses showed that guides' attitude about whether the signs installed serve their purposes and functions properly is neutral. There several reasons accompanying the responses. The positive responses stated that the signs have functioned to introduce many aspects of Yakushima natural environment, history, and culture. They also provided information of how to behave in protected area, for example guidance of where to walk and notification to be careful of the tree roots. Signs served as assisting tools for guides as well. On the other hand, there were concerns about several of the sign contents being inaccurate and the lack of signs about danger prevention. Guides also mentioned about inappropriate location of some signs, in which there are old signs referring to object which is no longer around. Enriched content supported by attractive design elements so that it can be more appealing not only for adult visitors but also children is one suggestion offered in the responses.

- Regarding whether the signs installed useful in tem of environmental education.

	N	Minimum	Maximum	Mean	Mode	Std. Deviation
Q4	32	1	4	2.81	2	.896
Valid N (listwise)	32					

**Table 4.4.2.2. Guide question 4 result**

Summary of the responses showed that guides disagree whether the signs installed useful in tem of environmental education. Although the signs installed in Yakusugi Land have functioned to bring knowledge about nature, history, and culture to the visitors, and informed visitors how to walk in the forest, guides stated that environmental education is still lacking. They stated that there are still not enough content in term of environmental education. One suggestion given is to correct any inconsistent signs, especially old signs that no longer appropriate, and then improve the richness and details of the signs. Another important response stated that there is age gap issue to overcome. This means signs should be appealing to all range of age to be effective in environmental education, and as mentioned before, incorporating attractive design elements can prove to be useful in this matter.

- Regarding whether the signs installed is supportive to eco-tourism practice.

	N	Minimum	Maximum	Mean	Mode	Std. Deviation
Q5	31	2	5	2.97	3	.752
Valid N (listwise)	31					

**Table 4.4.2.3. Guide question 5 result**

Summary of the responses showed that guides' attitude about whether the signs installed is supportive to eco-tourism practice is neutral. Responses showed that signs have functioned to broaden visitors' knowledge about nature, history and culture, and served as a tool to assist guide's explanations as well. It was stated that the availability of signs increases the likeliness of self-guide, and visitors will pay attention to the location where the sign is installed when they're not accompanied by guides. However guides also mentioned that sometimes sign content is too simplistic and need to be increased in quantity and have higher level of persistency as well.

Nevertheless, guides still play essential role to extend the knowledge delivered beyond what is contained in the signs by their guidance.

- Regarding whether there is necessary information not yet facilitated by the signs.

Responses to this questions mostly corresponding to what information visitor wish to be provided at the site. Guide also wanted knowledge about moss, river, water, climate, inhabiting animals, geology, and highlighted point at the site provided to the visitors. They mentioned about the need to balance what kind of content delivered by the signs, for instance information about nature environment with information about national parks itself. And balance between signs of living inhabitants at the site, not only to include information about vegetations but animals as well. There are responses about the need of notification signs and environmental danger prevention signs, such as to be cautious in walking or climbing when raining, to pay attention to the condition of tree skin since too much interaction can result negatively for the tree, and to not step on the roots. Signs that no longer appropriate should be removed, and various recent improvement of study result should be reflected in the new signs. However excessive sign content and usage should be avoided, more than one third of the total responses stated that the current state of signs in Yakusugi Land is adequate.

- Regarding what necessary for visitor to know.

## The importance of delivered message

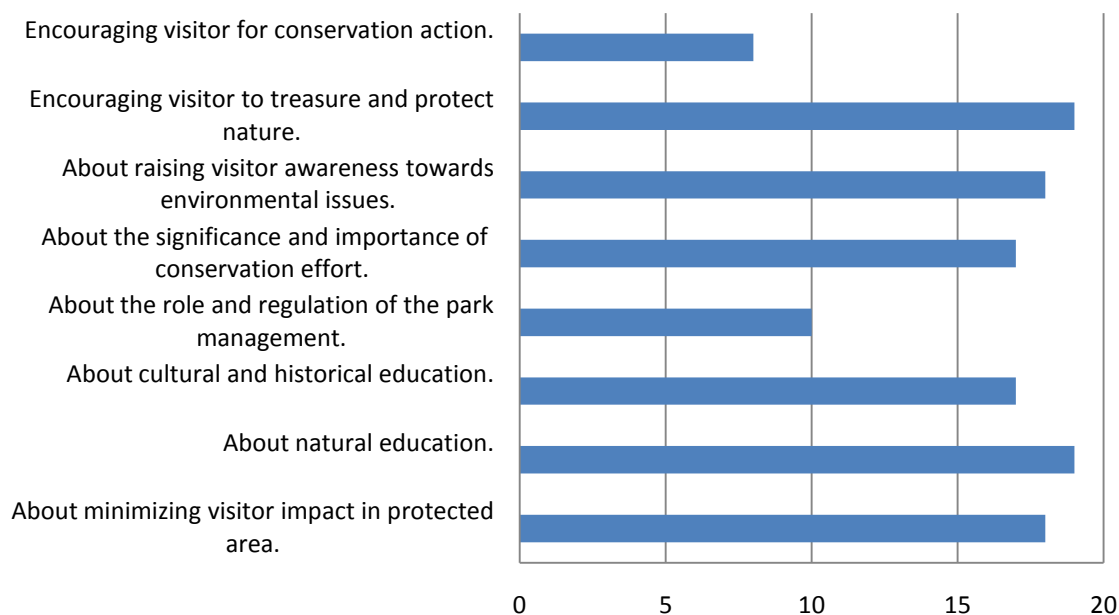


Figure 4.4.2.1. The importance of delivered message

According to the guides, information about natural education and information that can encourage visitor to treasure and protect nature have the utmost priority to be known by visitors. Followed by important information are about minimizing visitor impact in protected area and raising visitor awareness towards environmental issues.

- Regarding frequently asked questions.

Visitors showed great interest in learning about many aspects of natural environment of Yakusugi Land, such as the plants, moss, animals, birds, insects, trees age, season changes, climate, rainfalls, ecology, as well as history of how people transport Yakusugi during logging in the Edo period. Visitors showed curiosity about the reason behind the naming of the site and cedar trees. They also asked about another tourism destination in Yakushima such as Jomonsugi and Tachudake, the latest is a climbing destination which entrance is located in Yakusugi Land.



Visitors wanted to know about how far they can interact with nature such as river and whether the water is drinkable. Visitors also asked about management and administration, the opening hours of the site, and the utilization of cooperation fee.

- Regarding possible signs improvement.

As mentioned before, a significant 40% of total responses from the guides showed particular concerns about how old signs are inferior to the new ones. Guides stated how the old signs are very distinguishable from the new one, in the case where they were broken or fallen and seen as litter rather than useful. Guides recommended that the old signs to be renewed and all the signs should share the same unity in design. They also wanted the mistake in the content to be corrected. Several other suggestions consist of relocating sign situated too far from the walkways, considering using bigger font, and elaborating more colors into the signs and images as well. Guides also recommended the usage of images of past and present scenery in signs that contain forest history, to show the changes in the forest related to its relation to the people. Guides mentioned to have signs about highlighted points of the site and signs that prevent people to touch certain plants.

## CHAPTER 5: CONCLUSIONS

The findings collected from the observation state of data gathering show us the kinds of signs used in Kirishima-Yaku National Park, at the site of Yakusugi Land, which are information signs, map signs, route signs, trail name signs, cedar trees name signs, bridge names, plant species signs, and smoking prohibition signs. All the signs installed in Yakusugi Land serve all the function of identification signs, directional signs, descriptive signs, and regulatory signs.

The content of identification type of sign are title or name of trails, cedar trees, and bridges. The content of directional type of sign are arrow symbols, indicated locations, and diagram of Yakusugi Land showing all the trails and courses at the site. The content of descriptive type of sign are information about natural environment, culture, and history related to the site, such as history of logging, interaction between people and nature, and explanations about tree regeneration. The content of regulatory type of sign are smoking prohibition, and notification of slippery area and tree branch.

The responses from the visitors' open-ended questions show us visitors' expectancy about the kind of information provided by the signs. Visitors showed great interest in many aspects related to the area, such as nature, culture and especially history. They wanted to know about the reason and unique factors that made the site a national park. They wanted to know the interaction between nature and people in the past as well as in the present and what kind of change that has happened. They're also interested in knowing about the fauna, flora, weather, season, climate, as well as geology. Visitors also expected to find signs of directions, maps, and precautions to assist them while experiencing the site.

The responses from the guides' open-ended questions show us the guides' point of view of what important messages are necessary to be delivered to the visitors. According to the guides, information about natural education and information that can encourage visitor to treasure and protect nature are the most important message that visitors need to know. Besides that information that can raise visitor awareness towards environmental issues and minimize visitor impact in protected areas are also important. Guides expected that message delivered should result in better visitors' behavior. The majority of messages delivered by the guides at the site consist of information regarding natural environment of Yakushima, information about history and culture, and information regarding preservation and environmental conservation, for instance, flora, fauna, forest, ecosystem of Yakushima, logging, human relation to natural environment, and forest restoration. They also talked about ecotourism practices and national parks rules and regulations to ensure appropriate visitors' behavior. By comparing these responses, we can see that there is a match between both sides' expectancies. Visitors wish to learn about nature, culture, and history, and the information delivered by guides are mostly about nature, culture, and history too. However, guides also emphasize on the importance of delivering message about environmental education to raise visitors' awareness towards environmental issues and shape appropriate visitor's behavior.

Analysis of responses of Likert Scale from both visitor and guides showed that there are great significant differences between visitor and guides opinions, with only one exception in statement of whether the sign is easy to find ( $p > 0.394$ ). This suggest that visitors showed more favor in evaluating the signs, while guides felt that there are needs for revision and improvement to be made to the existing signs. Findings also showed that visitors gave more positive responses than guides. The following paragraphs compare summaries of responses between visitors and park guides' experience on site associated with signage system effectiveness may provide further explanation about the significant differences.

Regarding several factors of sign usage, both visitors and guide gave positive responses (mode is 4; agree) at these statements: the sign is easy to find, the content is easy to read, and the information provided is useful. Although visitors agreed that the sign is easy to find, around twenty five percent of the total visitors stated that they didn't come across information signs, trails name signs, and notification signs. To the statements: the sign is located in appropriate location and the content is easy to understand, visitors gave positive responses to those two statements while guides' responses are neutral about both of them. Guides mentioned about the presence of sign which is situated too far from the walkways, and sign without the object referred in the content. An average of fifty percent of total visitors answered correctly on knowledge assessment component shows that even though visitors stated that the sign content is easy to understand, it doesn't guarantee high retention ability. While to the statement that mention: the sign is attractive, both visitors' responses and guides' responses are neutral. Both visitors and guides stated that the usage of illustration or photos can increase the attractiveness of the signs.

Regarding satisfactory of the sign form and content, visitors gave positive responses (mode is 4; quite satisfied) to all factors of sign form, which are font/text, layout, shape, color, and size and all to all factors of content which are information quality and quantity. On the other hand guides gave all of those factors neutral responses. While there are several responses wished for bigger font size, visitors approved the usage of natural colored mounting. Visitor loved signs that provide new knowledge, they also stated that the usage informative content and illustration are two factors that make signs interesting. On the other hand, guides concerned about the balance of the type of sign content.

Regarding the sign impact, visitors gave positive responses to all the statements (mode is 4; agree). On the other hand, guides gave positive responses (mode is 4; agree) only to this statement: visitors learned something from the information provided, and neutral to the other

four statements: sign provides opportunity to learn about nature, sign provides opportunity to learn about historical and cultural tradition, sign provides opportunity to learn about the effort and importance of conservation to preserve natural beauty and natural resources, and sign made visitors appreciate and respect nature more, thus protect and treasure it. However, guides gave negative responses (mode is 2; disagree) to a statement that mention: sign made visitor aware of environmental issue. While both visitors and guides agreed that signs promote learning, especially about nature, culture and history of the area, guides were concerned about the lack of environmental education. They stated the need for more detailed signs that can increase visitor awareness about environmental issues. Guides also stated the importance of regulatory signs that will ensure proper visitors' behavior.

Visitors wished to see information such as about moss, animals, weather, season, climate, and geology, to be provided on the signs in the future. Guides also stated that they want visitors know about those things as well.

Many aspects of content component and artistic component of the signs have been discussed based on what observed at the site, as well as how visitors and guides experienced them. Several of the examples as already mentioned before are: message contained in the sign is between the average sufficient number of words, signs are located in appropriate location (near the trail walkways as well as complementary to the mentioned object), and that the signs' physical appearance is distinguishable from the surroundings without disrupting the nature. Both visitors and guides agreed that the signs installed at Yakusugi Land serve as the essential educational tool that provides visitors with learning opportunity. Visitors agreed that signs have impact on increase in their nature appreciation, consequently support ecotourism. The signs also provide the knowledge expected both by visitors and guides. That interpretation and sign have the purpose of environmental education has already stated by MOE, therefore it's very important to take into notice that guides stated their concern regarding the lack of environmental

education content. Guides mentioned the need of signs other than the one explaining objects or facts regarding Yakushima, the need of signs that deliver conservational education. Information about how to care about environmental impacts and how visitors can contribute to conservational practices are some examples of environmental education contents. Findings also suggest the significance of guides in increasing visitor awareness to signs and the information contained. This goes along with the statement of guides and park rangers promoting education about nature interaction, conservation, and restoration written by MOE. Thus these lead to another important findings suggestion which is the less impact the sign had on conservational attitude compared to its impact on visitor knowledge.

Regarding research limitations, firstly, it's well known that Japan tourism destination is designed with pretty much emphasize on domestic visitors in mind. This research was done in Yakusugi Land and most of the responses came from domestic visitors (98%), therefore this study need to be considered quite specific to the point of view of Japanese tourists and their view regarding their relation with nature. Second, there was a significant number of visitors coming by the mean of bus tour, but weren't favorable subjects to the survey because they spent the shortest time possible at the site and could not prolong their stay to answer questionnaire without disturbing their scheduled tour. Regarding research implications, there is possibility to extend the research and focus on the side of guides, park administrators, or forest agency responsible for the designation and management of the site, since findings showed that visitors were more content about the sign effectiveness. Furthermore, guides showed specific inputs about improvement, revision, and maintenance of the signs. Research which is more focused in colleting qualitative data from in-depth interview will provide more detailed results of what kind environmental education need to be implemented in the sign. In addition, as also mentioned in preceding researches, findings showed that although visitors stated strong interest in learning new knowledge or even accompanied by a guide, it didn't guarantee memorization and retention. Even with strong desire to learn something new, visitors came with various

reasons and especially at site as national park, they're more likely to enjoy the nature and pay less attention to the signs. Observation showed that Japan has a good system of signage throughout national parks in the country in both content component and artistic component, and the latest is much credited for impact in increasing learning and interpretation. Nevertheless, it's interesting to expand the research to examine the signs by Japanese graphic and interpretive environmental sign design theories, as an instance the typographic rules for Japanese character surely are different than the ones we use for Latin alphabet. Another important observation needs to be mentioned is that park administrators could come up with immediate printout notifications or warning signs, nevertheless in relation to the safety measure it's very important to provide the accompanying English signs as immediately.

The following list contains several suggestions that can be done to improve the effectiveness of signage system in Yakusugi Land summarized from inputs provided by both visitors and guides:

- Relocate signs to proper location.
- Remove old signs which the object they referred to is no longer available.
- Do maintenance to the signs, such as repairing rusty, broken, and damaged signs.
- Correct mistakes and update the signs.
- Maximize the usage of illustration, photos, images and color.
- Create more detailed route signs, especially by including information about the time needed or distance in kilometers to reach the pointed destination.
- Consider providing information wished by visitors, especially about moss, reason behind cedar tree naming, and highlighted points of the site.
- Consider adding regulatory signs, which contain notification such as reasonable limit of interaction to tree, animals, and river, whether water is drinkable, how to walk

when raining, on slippery area, or to avoid roots, how to pay attention to the tree skin condition, and danger prevention signs.

- Revise the signs to make it appealing to adult as well as to children.
- Consider using bigger fonts.
- Consider re-designing old signs so that there will be unity in overall design.
- Incorporate English version of content to more signs.

Visitors and guides both agreed that in place like national park, nature is the utmost important, and signage system should be implemented in considerable amount to avoid sign fatigue and disruption of natural environment, information overload should be prevented as well.



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## **APPENDIX**

## Natural Parks System

<b>Natural Parks</b>			
	<b>National Parks</b>	<b>Quasi-national Parks</b>	<b>Prefectural Parks</b>
Designating party	Minister of the Environment	Minister of the Environment	Prefectural governors
Requirements for designation	Must constitute a landscape that is representative of Japan relative to the places with the same type of landscape as well as constitute a prominent natural landscape that can be introduced to the world with pride	Must constitute a prominent major natural landscape comparable to the landscape found in Natural Parks	Must constitute a prominent natural landscape that is representative of landscapes at a prefectural level
Governing law	Natural Parks Law	Natural Parks Law	Prefectural ordinances
Party responsible for administrative management	Minister of the Environment	Prefectural governments	Prefectural governments

Source: National Parks Systems.

Retrieved from <http://www.env.go.jp/en/nature/nps/park/system/teigi.html>

## National Parks Zoning

Special Zone	Special protection zone	Areas required to maintain scenic beauty strictly	Erection of structures is prohibited in principle.
	Class I special zone	Areas ranking after special protection zone and required to maintain scenic beauty somewhat strictly and required to conserve the present scenic beauty as far as possible	Erection of structures is prohibited in principle. Namely, the regulation of special protection zone applies correspondingly to this zone.
	Class II special zone	Areas required to adjust the activities of agriculture, forestry and fisheries as far as possible	Establishment of facilities required for the daily life of local people such as housing and other facilities relating to normal activities of agriculture, forestry and fisheries, is permitted in principle. Also establishment of resting facilities, villas, cottages and the like which are not obstructive to scenic beauty will be allowed.
	Class III special zone	Areas other than Class I special zone and Class II special zone, and where there is little fear of	Regarding erection of structures, regulation is almost same as in the Class II special zone. With



		affecting the maintenance of scenic beauty in principle even though ordinary activities of agriculture, forestry and fisheries are performed.	regard to forestry, clear cut is allowed.
Marine park zone	Areas where seascapes are excellent due to abundant marine animals and plants		Same regulation as in the special protection zone.
Ordinary zone	Areas surrounding special zone of scenic beauty and they are required to conserve scenery as buffer zones in a sense. In many cases there are some settlements and farms. Sea area is also included in this zone.		As for large buildings which may obstruct scenic beauty, administrative action can be taken for the purpose of conservation.

Source: MOE.

Retrieved from <http://www.env.go.jp/en/nature/npr/ncj/index.html>

Gender: M/F

Age: .....

Visitor Questionnaire

**A. Please choose one answer for the following questions.**

1. How many times have you visited Yakushima?
    - a. This is my first time.
    - b. This is my second time.
    - c. Three times or more.
  2. How many times have you visited the National Park?
    - a. This is my first time.
    - b. This is my second time.
    - c. Three times or more.
  3. How many times have you been to Yakusugi Land?
    - a. This is my first time.
    - b. This is my second time.
    - c. Three times or more.
  4. When do you find information about Yakusugi Land?
    - a. Prior arrival in Yakushima
    - b. After arrival in Yakushima
  5. How do you know about Yakusugi Land?
    - a. Friend
    - b. Internet
    - c. Printed material/Brochure
    - d. TV
    - e. Travel agent
    - f. Tourist information center
  6. What is your main reason for this visit?
    - a. Recreation
    - b. Sightseeing
    - c. Hiking/Mountain Climbing
    - d. Study
    - e. Others  
(.....)
  7. Are you travelling with a friend?
    - a. No, I'm travelling alone
    - b. Yes, with ..... friend(s).
  8. Are you using a bus tour?
    - a. Yes
    - b. No
  9. Are you accompanied by guide?
    - a. Yes
    - b. No
    - If you are accompanied by guide, from which agency he/she belongs to?
      - b. Bus tour guide
      - b. YNAC
      - c. NCP
      - d. Others (.....)
  10. How much time have you spent inside Yakusugi Land?
    - a. <30min
    - b. >30mins
    - c. >1hour
    - d. >2hours
    - e. > 3 hours
  11. Which course did you take in Yakusugi Land?
    - a. 30 minutes course
    - b. 50 minutes course
    - c. 80 minutes course
    - d. 150 minutes course
- Below are the contents of the signs in Yakusugi Land, please tick every one you came across:
    - Map
    - Direction/route
    - Information/Knowledge/Explanation
    - Plant species
    - The name of cedar trees
    - The name of trails
    - Notice/prohibition/warning
  - Do you read all the text content contained in the sign?
    - a. None
    - b. Some
    - c. Most
    - d. All

**B. Please indicate whether you consider the following statements to be true or false.**

1. Yakusugi Land is a Natural Recreation Forest.	True	False	Don't Know
2. Yakusugi Land belongs to Kirishima Yaku National Park.	True	False	Don't Know
3. Yakusugi cedar harvesting started from the Azuchi-Momoyama period (<1600).	True	False	Don't Know
4. Yakugi cedar craft is made from decaying stumps called domaiboku.	True	False	Don't Know
5. Yakusugi cedar has high resin that makes it good for making shingles/roof tiles.	True	False	Don't Know
6. Because Yakusugi is a big tree, tameshigiri/tree-sampling is done.	True	False	Don't Know
7. Futagosugi is the example of regeneration on stump.	True	False	Don't Know
8. Moss plays important role in regeneration on fallen trees.	True	False	Don't Know
9. It is permitted to smoke inside Yakusugi Land.	True	False	Don't Know
10. Slippery path and fallen trees above our heads are the things we need to be careful of.	True	False	Don't Know

**C. To the scale 1 to 5, please circle one that indicate the extent to which the following statements apply to your experience on site.**

Regarding the usage of sign:	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1. The sign is located in appropriate location.	1	2	3	4	5
2. The sign is attractive.	1	2	3	4	5
3. The sign is easy to find.	1	2	3	4	5
4. The content of the sign is easy to read.	1	2	3	4	5
5. The information contained in the sign is easy to understand.	1	2	3	4	5
6. The information provided is useful.	1	2	3	4	5
Regarding your satisfactory:	Highly dissatisfied	Quite dissatisfied	Neutral	Quite satisfied	Highly satisfied
1. About the sign form:					
a. Font/Text	1	2	3	4	5
b. Layout	1	2	3	4	5
c. Shape	1	2	3	4	5
d. Color	1	2	3	4	5
e. Size	1	2	3	4	5
2. About the information provided:					
a. Quality	1	2	3	4	5
b. Quantity	1	2	3	4	5
Regarding the impact of the sign:	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1. We learned something from the information provided.	1	2	3	4	5
2. It provides the opportunity to learn about nature.	1	2	3	4	5
3. It provides the opportunity to learn about historical and cultural tradition.	1	2	3	4	5
4. It made us aware of environmental issues.	1	2	3	4	5
5. It provides the opportunity to learn about the effort and importance of conservation to preserve natural beauty and natural resources.	1	2	3	4	5
6. It made us appreciate and respect nature more, thus made us want to protect and treasure it.	1	2	3	4	5

**D. Please answer the following questions.**

1. What kind of information do you wish to learn and find on the signs in Yakusugi Land?

- a. ....
- b. ....
- c. ....

2. Are there any particular signs you found interesting in Yakusugi Land? Please explain.

.....  
Reason: .....  
.....

3. Among all the things you learned in Yakusugi Land, is there any information that you found interesting?

.....  
.....  
.....

4. Can you write down name of tree of plant species you found in Yakusugi Land besides the cedar tree itself?

- a. ....
- b. ....

5. Is there any information that you wish to see provided on the signs in the future?

.....  
.....  
.....

6. What improvement do you wish for the signs in Yakusugi Land? Please write down your comments and suggestions.

.....  
.....  
.....

Gender: M/F

Age: .....

Guide Questionnaire

**A. To the scale 1 to 5, please circle one that indicate the extent to which the following statements apply to your experience in Yakusugi Land.**

Regarding the usage of sign:	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1. The sign is located in appropriate location.	1	2	3	4	5
2. The sign is attractive.	1	2	3	4	5
3. The sign is easy to find.	1	2	3	4	5
4. The content of the sign is easy to read.	1	2	3	4	5
5. The information contained in the sign is easy to understand.	1	2	3	4	5
6. The information provided is useful.	1	2	3	4	5
Regarding your satisfactory:	Highly dissatisfied	Quite dissatisfied	Neutral	Quite satisfied	Highly satisfied
1. About the sign form:					
a. Font/Text	1	2	3	4	5
b. Layout	1	2	3	4	5
c. Shape	1	2	3	4	5
d. Color	1	2	3	4	5
e. Size	1	2	3	4	5
2. About the information provided:					
a. Quality	1	2	3	4	5
b. Quantity	1	2	3	4	5
Regarding the impact of the sign:	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1. We learned something from the information provided.	1	2	3	4	5
2. It provides the opportunity to learn about nature.	1	2	3	4	5
3. It provides the opportunity to learn about historical and cultural tradition.	1	2	3	4	5
4. It made us aware of environmental issues.	1	2	3	4	5
5. It provides the opportunity to learn about the effort and importance of conservation to preserve natural beauty and natural resources.	1	2	3	4	5
6. It made us appreciate and respect nature more, thus made us want to protect and treasure it.	1	2	3	4	5

**B. Please answer the following questions.**

1. What kind of information that you usually deliver to the visitors in Yakusugi Land?
  - a. ....
  - b. ....
  - c. ....
2. What do you think are the purpose of the signs in places like national park such as Yakusugi Land?
  - a. ....
  - b. ....
  - c. ....

3. Do you find the signs in Yakusugi Land serve their purposes and functions properly?(choose one answer)  
a. Strongly disagree      b. Disagree      c. Neutral      d. Agree      e. Strongly agree

Reason: .....  
.....

4. Do you find the signs in Yakusugi Land useful in tem of environmental education? (choose one answer)  
a. Strongly disagree      b. Disagree      c. Neutral      d. Agree      e. Strongly agree

Reason: .....  
.....

5. Do you find the signs in Yakusugi Land is supportive to eco-tourism practice? (choose one answer)  
a. Strongly disagree      b. Disagree      c. Neutral      d. Agree      e. Strongly agree

Reason: .....  
.....

6. Is there any information that you think visitors need to know but is not yet facilitated by the signs?

.....  
.....  
.....

7. Please tick every statement that you think is necessary for visitor to know:

- About minimizing visitor impact in protected area.
- About natural education.
- About cultural and historical education.
- About the role and regulation of the park management.
- About the significance and importance of conservation effort.
- About raising visitor awareness towards environmental issues.
- Encouraging visitor to treasure and protect nature.
- Encouraging visitor for conservation action.

8. What questions do visitors often ask you in Yakusugi Land?

a. ....  
b. ....  
c. ....

9. What improvement do you wish for the signs in Yakusugi Land? Please write down your comments and suggestions.

.....  
.....  
.....

性別: 男性/女性

年齢: .....

## A. 下記の質問に当てはまる答えをそれぞれ1つずつお選びください。

1. これまでに何度、屋久島を訪れたことがありますか？
    - a. 初めて
    - b. 2度目
    - c. 3度目もしくはそれ以上
  2. これまでに何度、国立公園を訪れたことがありますか？
    - a. 初めて
    - b. 2度目
    - c. 3度目もしくはそれ以上
  3. これまでに何度、屋久杉ランドを訪れたことがありますか？
    - a. 初めて
    - b. 2度目
    - c. 3度目もしくはそれ以上
  4. 屋久杉ランドに関する情報をいつ見つけましたか？
    - a. 屋久島に到着する前
    - b. 屋久島に到着した後
  5. どのようにして屋久杉ランドを知りましたか？
    - a. 友人から
    - b. インターネット
    - c. 広告・小冊子
    - d. テレビ TV
    - e. 旅行代理店
    - f. 観光センター
  6. 訪れた主要目的は何ですか？
    - a. 休養
    - b. 観光
    - c. ハイキング/山登り
    - d. 学習
    - e. その他  
(.....)
  7. ご友人との旅行ですか？
    - a. いいえ、ひとりで。
    - b. はい、.....名の友人と共に。
  8. バスツアーをご利用ですか？
    - a. はい
    - b. いいえ
  9. ガイドは同行していますか？
    - a. はい
    - b. いいえ
    - もしガイドが同行している場合、どちらの代理店からですか？
      - a. バスツアーガイド
      - b. YNAC
      - c. NCP
      - d. その  
(.....)
  10. 屋久杉ランドではどれくらいの時間過ごされましたか？
    - a. 30分以内
    - b. 30分～1時間
    - c. 1時間～2時間
    - d. 2時間～3時間
    - e. 3時間以上
  11. 屋久杉ランドではどのコースをまわりましたか？
    - a. 30分コース
    - b. 50分コース
    - c. 80分コース
    - d. 150分コース
- 下記は屋久杉ランドの看板の内容です。あなたが目にした全ての看板にチェックをしてください。
    - 地図
    - 順路
    - 情報・知識・説明
    - 植物の種類
    - 杉の名前
    - 歩道の名前
    - 注意事項・禁止事項・警告
  - あなたは看板に書かれている全ての内容を読みましたか？
    - a. 全く読んでいない
    - b. 少しだけ読んだ
    - c. ほとんど読んだ
    - d. 全て読んだ

## B. 下記の説明が正しいか正しくないかをお答えください。

1. 屋久杉ランドは自然休養林である。	正しい	正しくない	分からない
2. 屋久杉ランドは霧島屋久自然公園に属している。	正しい	正しくない	分からない
3. 屋久杉伐採は安土桃山時代から始まった。 [1600年以前]	正しい	正しくない	分からない
4. 屋久杉工芸品は土埋木という腐敗した切株から作られる。	正しい	正しくない	分からない
5. 屋久杉から屋根板/瓦を作るのに良い樹脂が採れる。	正しい	正しくない	分からない
6. 屋久杉が大きいため、ためし切りが行われる。	正しい	正しくない	分からない
7. 双子杉は切株更新の例である。	正しい	正しくない	分からない
8. 倒木上更新においてコケは重要な役目を果たす。	正しい	正しくない	分からない
9. 屋久杉ランド内でタバコを吸うことは許可されている。	正しい	正しくない	分からない
10. 滑りやすい小道や頭上に落ちる木々に注意する必要がある。	正しい	正しくない	分からない

## C. 1から5のうち、あなたの感想としてふさわしいものに○をしてください。

看板の設置について	全くそう 思わない	そう 思わない	どちらも 言えない	そう 思う	強くそう 思う
1. 看板は適切な場所に設置されている。	1	2	3	4	5
2. 看板自体は魅力的だ。	1	2	3	4	5
3. 看板は容易に見つけられる。	1	2	3	4	5
4. 看板の内容は読み易い。	1	2	3	4	5
5. 看板内の情報は理解し易い。	1	2	3	4	5
6. 与えられた情報は役に立つ。	1	2	3	4	5
満足度について	大変不満	不満	どちらも 言えない	満足	大変満足
1. 看板の書式について:					
a. フォント/テキスト	1	2	3	4	5
b. レイアウト	1	2	3	4	5
c. 型	1	2	3	4	5
d. 色	1	2	3	4	5
e. サイズ	1	2	3	4	5
2. 与えられた情報について:					
a. 質	1	2	3	4	5
b. 量	1	2	3	4	5
看板の影響について	全くそう 思わない	そう 思わない	どちらも 言えない	そう 思う	強くそう 思う
1. 与えられた情報にいくらか教えられた。	1	2	3	4	5
2. 自然について学ぶ機会を得た。	1	2	3	4	5
3. 歴史的、文化的伝統について学ぶ機会を得た。	1	2	3	4	5
4. 環境問題について意識する機会を得た。	1	2	3	4	5
5. 自然の美しさや資源を保つための保護努力や重要性について学ぶ機会を得た。	1	2	3	4	5
6. より自然に対し感謝し恩恵の念をもつようになったため、保護・尊重していきたい。	1	2	3	4	5



D. 以下の質問にお答えください。

1. 屋久杉ランドにどのような情報があれば良いと思いますか？

a.....

b.....

c.....

2. 屋久杉ランドで特に興味深いと感じた看板はありますか？もしあればご記入ください。

.....

理由: .....

.....

3. 屋久杉ランドで得た情報の中で興味深いと感じた情報はありますか？

.....

.....

.....

4. 屋久杉以外の屋久杉ランド内の木々の名前が分かるものがあればご記入ください。

a.....

b.....

5. 将来看板としてあれば良いと思う情報は何かありますか？

.....

.....

.....

6. 屋久杉ランドの看板についてどのような改善を求めますか？コメントや提案をご記入ください。

.....

.....

.....

性別: 男性/女性

年齢: .....

## 屋久杉ランドについて

A. 1から5のうち、屋久杉ランドであなたの感想としてふさわしいものに○をしてください。

看板の設置について	全くそう 思わない	そう 思わない	どちらとも 言えない	そう 思う	強くそう 思う
1. 看板は適切な場所に設置されている。	1	2	3	4	5
2. 看板自体は魅力的だ。	1	2	3	4	5
3. 看板は容易に見つけられる。	1	2	3	4	5
4. 看板の内容は読み易い。	1	2	3	4	5
5. 看板内の情報は理解し易い。	1	2	3	4	5
6. 与えられた情報は役に立つ。	1	2	3	4	5
満足度について	大変不満	不満	どちらとも 言えない	満足	大変満足
1. 看板の書式について:					
a. フォント/テキスト	1	2	3	4	5
b. レイアウト	1	2	3	4	5
c. 型	1	2	3	4	5
d. 色	1	2	3	4	5
e. サイズ	1	2	3	4	5
2. 与えられた情報について:					
a. 質	1	2	3	4	5
b. 量	1	2	3	4	5
看板の影響について	全くそう 思わない	そう 思わない	どちらとも 言えない	そう 思う	強くそう 思う
1. 与えられた情報にいくらか教えられた。	1	2	3	4	5
2. 自然について学ぶ機会を得た。	1	2	3	4	5
3. 歴史的、文化的伝統について学ぶ機会を得た。	1	2	3	4	5
4. 環境問題について意識する機会を得た。	1	2	3	4	5
5. 自然の美しさや資源を保つための保護努力や重要性について学ぶ機会を得た。	1	2	3	4	5
6. より自然に対し感謝し恩恵の念をもつようになったため、保護・尊重していきたい。	1	2	3	4	5

B. 以下の質問にお答えください。

1. 屋久杉ランドで普段どのような情報をお客様に提供していますか？

a. ....

b. ....

c. ....

2. 屋久杉ランドのような国立公園における看板の目的は何だと思えますか？

a. ....

b. ....

c. ....

3. 屋久杉ランドの看板はその目的と機能を適切に果たしていると思えますか？(答えを1つお選びください。)

- a. 全くそう思わない b. そう思わない c. どちらとも言えない d. そう思う e. 強くそう思う

理由: .....  
.....

4. 屋久杉ランドの看板は環境教育としての役目を果たしていると思いますか？

- a. 全くそう思わない b. そう思わない c. どちらとも言えない d. そう思う e. 強くそう思う

理由: .....  
.....

5. 屋久杉ランドの看板はエコ・ツーリズムを手助けするものだと思いますか？

- a. 全くそう思わない b. そう思わない c. どちらとも言えない d. そう思う e. 強くそう思う

理由: .....  
.....

6. あなた自身が、お客様が知る（知らせる）必要があると思う情報で、屋久杉ランドでまだ看板になっていないものはありますか？

.....  
.....  
.....

7. お客様が知る（知らせる）必要があると思われること全てにチェックを入れてください。

- |   |   |
|---|---|
| <input type="checkbox"/> 保護区における訪問者からの影響を最小限にすること | <input type="checkbox"/> 保護努力の意義と大切さ        |
| <input type="checkbox"/> 自然教育                     | <input type="checkbox"/> 環境問題に対する関心を高めること   |
| <input type="checkbox"/> 文化的、歴史的教育                | <input type="checkbox"/> 自然を大切にして保護するよう促すこと |
| <input type="checkbox"/> 公園運営の役割と規則について           | <input type="checkbox"/> 保護活動を促すこと          |

8. 屋久杉ランドで訪問者にどのような質問をよくされますか？

- a. ....  
b. ....  
c. ....

9. 屋久杉ランドの看板について、どのような改善を求めますか？あなたのコメントや提案をご記入ください。

.....  
.....  
.....