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**THE CASE OF OZE AREA: CASE STUDY ON THE JAPANESE EXPERIENCE
CONCERNING ECONOMIC ASPECTS OF CONSERVING BIODIVERSITY**

by Planning Division, Nature Conservation Bureau, Japanese Environment Agency

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FOREWORD

This paper is one of a series of 22 case studies that describe practical experiences in OECD Member countries with the use of incentive measures for the conservation of biodiversity and the sustainable use of its components. These case studies were submitted by OECD Member countries to the OECD Working Group on Economic Aspects of Biodiversity as a contribution to the OECD study of the design and implementation of appropriate incentive measures for biodiversity conservation and sustainable use. In order to ensure maximum comparability between the case studies, all were developed under the common methodology described in “Incentive Measures to Promote the Conservation and the Sustainable Use of Biodiversity: Framework for Case Studies” [OECD/GD(97)125].

The practical experiences described in the 22 case studies were used as the basis for the policy advice developed in the *Handbook of Incentive Measures for Biodiversity: Design and Implementation* (OECD, 1999). This *Handbook* combines the lessons learned through the various experiences described in the case studies – covering a wide range of ecosystems, economic pressures on biodiversity, and utilising various incentive measures – with sound economic theory to develop a practical, step-by-step guide for policy-makers on the design and implementation of successful incentive measures for the conservation and sustainable use of biodiversity.

This paper was written by the Planning Division, Nature Conservation Bureau, Environment Agency of Japan. It is released as an unclassified document under the responsibility of the Secretary-General of the OECD with the aim of bringing information on this subject to the attention of a wider audience.

This study, and the other 21 case studies submitted by Member countries, are available on the world wide web at <http://www.oecd.org/env>.

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**THE CASE OF OZE AREA:
CASE STUDY ON THE JAPANESE EXPERIENCE CONCERNING
ECONOMIC ASPECTS OF CONSERVING BIODIVERSITY¹**

by
**Planning Division
Nature Conservation Bureau
Environment Agency
January 1998**

It is surprising to find the nature like Oze in such close distance from Tokyo. I hope that everybody will learn the importance of nature conservation through Oze.

Sir Edward Hillary, on visiting Oze, in August 1997

EXECUTIVE SUMMARY

This case study describes the conservation measures in use in the Oze National Park in Japan, a primarily marshlands area with some lakes and ponds. The Park is run as a not-for-profit concern and is partly owned by a private company (60 per cent) and partly by the national government (40 per cent). Tourism activities exert the main pressures on biodiversity in the park. There are restrictions on the use of some areas (and boardwalks are provided to protect sensitive, heavy-use areas), on lodge sizes and capacity, and on traffic volumes during peak season. There are also various voluntary measures – such as a voluntary fee for toilet use, a voluntary restriction on shampoo use, a ‘trash carry home’ campaign and a suggested no bathe day. In 1995 a trust fund was established under the Oze Conservation Foundation with 1.4 billion yen per annum (half from public and half from private sources) for the purposes of undertaking educational and institutional building work as well as making management decisions for the Park. Conservation efforts have benefited from the high national profile of Oze National Park, including through its representation in a popular cultural song and a national figure who fought for its conservation.

Ecosystems studied: inland freshwater ecosystems, forests

Incentive measures used: access and facility restrictions, removal of adverse incentives, environmental fund, education, information provision, voluntary restrictions and fee payments

Main lessons learned: The co-operation of government bodies, private owners, and environmental NGOs is essential; public awareness and media interest in biodiversity issues can be important tools for facilitating the realisation of conservation objectives, especially on private lands.

¹ Because all the reference materials are in Japanese, a bibliography was not attached to this paper. Those interested in further information about Oze should contact the Planning Division directly.

1. GENERAL DESCRIPTION

1.1. Description of ecosystem

1.1.1. *Marshland*

Ozegahara, which is situated in the Oze² area and is surrounded by mountains of over 2000m above sea-level, is the largest high marshland on the main island of Japan. It covers 7.6 km², and measures 2 km from North to South and 6 km from East to West.

The spout of the surrounding volcanoes in the Cenozoic era intercepted the streams, creating the original form of Ozegahara and Ozenuma. The flow of the earth and sand from the latent volcanoes and rivers, as well as the washouts from Mount Hiuchi, have since flattened the Ozegahara. At the same time, the changes in the river flow and floods formed the back marshland and the crescent lakes, which became the basis for producing the peat soil of Ozegahara.

Today the Ozegahara area is a flat basin covered by marshland which can be classified into three types: low marshland, high marshland, and middle marshland. Low marshland is the marshland whose surface peat is more-or-less under water. Since both underground water and surface water nourish the plants, the vegetation of the low marshlands is eutrophic. The vegetation of the high marshland is atrophic instead — poorly-nourished with water, the vegetation on the surface peat must rely on rain or mist. The soil is also acidified by the decomposition of organic matter. The middle marshland is the marshland in between: it develops around the high marshland, or at the foot of the mountains where it is strongly affected by underground water supplies and inorganic salts. The concentration of these different types of marshland in such a relatively small area ensures the richness of Ozegahara's flora. It also contributes to the high value of Oze from the perspective of biological diversity.

1.1.2. *Lakes and small ponds*

There are plenty of small ponds scattered around Ozegahara, as well as in the other marshlands in the Oze area. The size of these ponds varies, from very small ones of only 2-3 metres wide and a few centimeters deep, to larger ones of about 100 metres wide and more than 3 metres deep. It is estimated that there are more than 1 500 such ponds in Ozegahara.

These ponds originate from two sources: either they were formed from the narrow-stripped hollows in the peat, or they are the crescent lakes formed by the course of the rivers. The former have skewed shores, while the latter are kidney or horseshoe shaped.

There is also one large lake in the Oze area, called Ozenuma. This was formed when the lava rushed out from Mt. Hiuchi, which is on the North side of Ozenuma, stopped the flow of a river (now called the River Oe), and created Ozenuma. Ozenuma covers about 1.67 km², with a depth of about 10m. The waters which run off of the surrounding mountains are primarily carried downstream by the River Oe, which becomes the River Tadami further down, and eventually extends to the Sea of Japan. Some of these

² "Oze", which is the name of an area, comprises the region around Ozegahara (Oze Marshland) and Ozenuma (Oze Lake), which lies in the east of Nikko National Park, 120km north of Tokyo, or about 4 hours drive by highway and narrower rural roads. "Oze" is usually used to refer to the area composed of Ozegahara and Ozenuma (which lies at the foot of the mountains and is a shallow, flat-bottomed valley), and the surrounding mountains like Mt. Hiuchi (2 362m), Mt. Shibutsu (2 228m), and Mt. Shirao (2 003m).

waters go through a power station sluice water gate and on to the River Katashina, which merges with the River Tone and extends to the Pacific Ocean.

In Ozenuma and the other smaller ponds there are floating-leaf plants such as water lilies, and emergent plants such as bullrushes. There are also freshwater fishes, such as char and trout. It is very rare to find these plants and fish in ponds and lakes these days in such an urbanised country.

1.1.3. Forests

There is a zone of woodlands twisting on the marshland from the top of the mountains surrounding Ozegahara. It is the gallery forest which follows a small stream. It is only on the marshland beside such streams that earth and sand carried from the surrounding mountains is accumulated. Trees can be sustained and nourished on such accumulated earth, and elm trees and the like are growing in this particular area.

Because the gap in altitude between the basin (which lies at about about 1 400m above sea level at Ozegahara) and the surrounding mountains (with Mt. Hiuchi lying at about 2 350m altitude) is about 950m, the vertical distribution of the forest is diverse. There is a beech tree zone at the lower end (at about 1 400m-1 600m altitude), a white fir zone at about 1 600m-1 850m, a *Betula Ermani* zone at 1 850m-2 100m, and a creeping pine zone at the highest end (2 100m and above).

1.1.4. Wildlife

Oze is located on the backbone of Honshu island between the Sea of Japan and the Pacific Ocean, so the weather of Oze is affected from both sides. This climate, together with the unique formation of marshland and lakes described above, results in a wide variety of wildlife in Oze, some of which are endemic species.

There are 918 kinds of advanced plants above Pteridoophyta; 19 families with 42 species of original plants which have been first found in Oze; and 14 families with 21 species of special plants which cannot be found outside of Oze. In addition, there are 18 species of plants and 19 species of animals whose names contain the word "Oze" or "Shibutsu" (the name of one of the mountains around Oze, formed by the serpentinite). These special plants and animals are densely populated in this rather limited area.

Three unique characteristics of the flora of Oze can be noted: (1) the distribution of the so-called "Sea-of-Japan-Side type plants" which are said to have survived the harsh cold spells since the New Era by the buffer of thick snowfalls; (2) the abundance of "sub-boreal" types of plants, which are the heritage of the ancient ice age; and (3) the existence of another "sub-boreal" type of species that is affected by the magnesium ion provided by the serpentinite in some areas on Mt. Shibutsu. Other "sub-boreal" types of species survive on cold and acid marshlands such as Ozegahara.

Thirty-four types of mammals are found in Oze. Large mammals such as white-collared bears or Japanese serows live in the mountainous areas of Oze. Smaller mammals can also be found, such as dormice, weasels and minks. Birds are abundant, with 42 families and 159 species having been identified in Oze. Many winter birds are found during their breeding season, which is one of the effects of the "sub-boreal" characteristic of Oze.

1.2. Description of main impacts

1.2.1. Impacts caused by “trampling”

The marshland is quite vulnerable to “trampling” by tourists. This has led in the past to some areas becoming entirely bare, which then led to the erosion of top soil and the destruction of vegetation. Significant efforts are required after such devastation in order to recover the natural state, and re-vegetation work continues today. The trampling damages mountaineering routes as well.

1.2.2. Impacts caused by wastewater

The impact on water resources and the marshland caused by sewage and domestic liquid wastes from the lodges and public toilets is one of the major problems for nature conservation in Oze. It creates problems in terms of water pollution, over-nourishment, and through changes to the surrounding vegetation.

It is also one of the most difficult problems faced in Oze, because such liquid wastes always accompany human activities. But, as Oze is a National Park whose purpose is to provide a natural environment for use by the general public as much as possible, human activity and visitors should be encouraged.

In response to this dilemma of balancing the requirements for promoting Oze for use by the general public and conserving the natural environment, a variety of measures have been implemented since the late 1980s. As described in more detail below, these include the establishment of facilities such as domestic treatment systems for all household wastewater, pipelines to carry dirty water downstream from Oze, the introduction of voluntary-based user-fees for public toilets, and restrictions on lodges.

1.2.3. Impacts caused by exotic species

As with other national parks or reserved areas around the world, exotic species have been introduced to Oze via earth caught on the shoes of tourists. Clumps of earth transported in this way bring the seeds of species alien to the local environment.

The problems of imported fauna species are not so great, but some fear that sightings of water rats and crows are indicative of a changing environment. These species increased substantially with the introduction of garbage cans; but today the number is said to be decreasing as a result of promotional efforts to encourage visitors to bring their wastes home with them, and improvements to the waste management system.

1.2.4. Impacts caused by other human activities

Seasonal and locational concentration of tourists

There are two issues related to the “concentrated” use of Oze by the tourists. One is the problem related to seasonal concentration. Peak tourist times are the season of Lysichiton camtschaticense (Japanese Skunk Cabbage, *Mizubashou*) in early June, summer holidays (late July to the middle of August), and the season for coloured foliage (early October). Particularly on the weekends of these seasons, the entire Oze area is so crowded that tourists have to queue on the wooden boardwalks. Another problem is the concentration of tourists at the “gateway” to the Oze area. About 80 per cent of the visitors

enter Oze through the two major entrances (Hatomachi-Pass and Numayama-Pass), with over half arriving through Hatomachi-Pass. These concentrations constitute a problem because of the heavier burden such use places on the ecosystem, and because of the hindrance and inconvenience these blockages cause to the users.

Issues related to motor vehicle usage

Visitors arrive either by bus (chartered or scheduled), or by private car. Buses take the tourists to the gateways; while private cars must be parked at the parking areas at the gateways or the foot of the mountains. In the latter case, buses take the tourists to a gateway. The main environmental effects of the vehicles come from air pollution and its impacts on the surrounding flora, and the effects of car lights and noises on the fauna. Furthermore, motorisation has made access to the Park easier, and unprepared and casual entrance to the mountains and walkabouts, illegal parking, entrance to off-road areas, and traffic jams take place, creating problems from the perspective of safe and convenient use of the park.

To improve the situation, entrance to the Park by private cars has been restricted during peak seasons.

Issues related to waste and litter

As the number of tourists increases, the amount of waste and litter generated will increase as well. It is said that, other than mountain-climbers, visitors are generally not very aware of the impact of their activities on the environment. As mentioned above, the problem of waste is one of the main problems that faces conservation efforts in Oze National Park, and this is partly caused by a lack of awareness.

The problem of waste has been tackled since the early 1970s. Since 1972, there has been a “trash-carry-home-movement”. This has included the abolition of trash cans, the distribution of trash bags, etc. (more details provided below). It is believed that waste levels in Oze have been substantially reduced as a result of this programme.

1.3. Identification of incentive measures

The incentive measures are introduced and implemented by a number of different organisations — including both public bodies [the Environment Agency (its Visitor Center), local authority of prefectures and villages, and the local police authority] and private bodies (individual lodges or their association, volunteers³, the private land owners in Oze⁴, nature conservation organisations, etc.). A full description of the incentive measures undertaken by these bodies will be given below.

³ In order to accept and utilise voluntary help and services from the public in natural parks, Park Volunteer Programs have been carried out nation-wide by the Environment Agency since 1986, with 22 National Parks now having such programmes. Under the programmes, about 1 700 volunteers provide various services, including maintenance, research, etc.. The Environment Agency provides orientation and training seminars for them every year. In addition to volunteers co-ordinated by the Environment Agency, there are also “Oze Volunteers” that are co-ordinated by the *Oze Hogo Zaidan* (Oze Conservation Foundation).

⁴ About 60 per cent of the land of Oze is owned by a private company (Tokyo Electric Power Company (TEPCO)). The rest is owned by the national government, of which more than 90 per cent belongs to the Forestry Agency, and less than 1 per cent to the Environment Agency. The Japanese National Park system operates under the zone designation system, under which the Director General of the Environment Agency can designate the protected areas according to the provisions of the Natural Parks Law, even on the private property in the area. Oze Forest Management Co. is the subsidiary company of TEPCO; TEPCO delegates the daily management of the property to the company. Oze Forest Management Co. runs five lodges in Oze (four of which are in the Special Protection Zone), implements conservation practices on their own land

1.3.1. *Laws and regulations*

Oze is in Nikko National Park, designated as a Park as early as 1934 under the Natural Parks Law by the Director General of the Environment Agency. Within the National Park, Oze was designated as a Special Protection Zone⁵ in 1953⁶, for which it is “required to maintain scenic beauty strictly”, and the strictest regulations must be enforced.

Other related laws used for the protection of Oze are the Cultural Properties Protection Law (it was designated as a Specially Protected Area under the law in 1960), the Forest Law (designated as Reserved Forest), and the Wildlife Protection and Hunting Law.

The regulation of traffic in some areas of the park during the most congested seasons has been enforced under the authority of the local police agency. The Road Traffic Law allows them to enforce these occasional regulations with the purpose of enhancing the smooth flow of traffic, indirectly contributing to the protection of nature in Oze by buffering or reducing the environmental impacts caused by the cars.

In addition to those measures which are compulsory or legally enforced, other “voluntary regulations” are also used in Oze, and contribute to the prevention of overuse of the resources. These include, the “cap” on the maximum capacities of the lodges, the restriction on the use of soap and shampoo, and the introduction of the “no-bathe day”.

1.3.2. *Facilities and equipment*

Two major types of facilities and equipment are used in the efforts to conserve the environment of Oze: the wooden boardwalk constructed on the marshland in an environmentally-sound manner, and the provision of facilities for improving the quality of wastewater. Through the use of the wooden boardwalk over the marshland and other mountaineering roads in Oze, tourists can walk around without trampling. The wastewater treatment system has been installed in every lodge and public toilet.

1.3.3. *“Adjusting the asymmetry” (environmental education and promotional activities)*

Various bodies organise promotional and educational activities for the conservation of Oze. At visitor centres, activities include on-site lectures, displays, and brochure distribution. For the “trash-carry-home-movement”, most of the bodies concerned undertake various promotional activities. In addition to these more “visible” activities, the history of the nature conservation of Oze — such as the legendary story of a native man who defended Oze — is important, as are the discussions and debates held nation-wide. Essentially, this is the origin of the Japanese nature conservation movement in Oze and the rest of Japan, and it has significantly contributed to raising public awareness of the importance of nature conservation in Oze and other areas.

through the establishment of facilities such as a wooden boardwalk, and manages the forest for the purpose of harnessing the water source for the power plant.

⁵ The area of the National Park is classified into six types of zones. Four are classified as “Special Zones”, the other two are Marine Park Zone and Ordinary Zone. Special Zones are further classified into four types: Special Protection Zone, Class I Special Zone, Class II Special Zone, and Class III Special Zone. Special Protection Zones are those in which the strictest regulations are enforced, such that the erection of structures; changes in topography; the felling, damaging, or planting of trees; etc. are prohibited unless a permit from the Director of the Environment Agency is obtained.

⁶ Before that, under the old system, Oze was designated as a “Special Area”, for which the strictest regulations are applied as compared with other areas in National Parks.

1.4. Identification of economic sector(s) targeted by incentive measures

As stated above, this analysis focuses on the pressures placed by tourists on Oze. Particularly in recent times, their concentrated usage has been the main conservation challenge, as described above. The discussion below includes descriptions of some of the incentive measures aimed at the tourism industry through the tour operators.

2. IDENTIFICATION OF CAUSES AND SOURCES OF PRESSURES

2.1. Identification of sectoral activities and resulting pressures

2.1.1. *Pollution*

All human activities are accompanied by the production of sewage waste. These wastes constitute one of the largest pressures on the marshland and lakes. Before the establishment of a wastewater treatment system in Oze, as will be described further below, sewage was dumped in a hole dug around the toilets or released directly into the streams. According to those who knew Oze in those times, the small streams — which are now rich with trout and chars — smelled almost like drains in the cities. Such an unpleasant situation no longer exists today.

Other pollution generated by the tourists include air pollution from car exhaust gases, although this is not significant enough to have caused a visible impact as has the water pollution. On peak season weekends, more than twenty thousand people enter Oze in a day, much of them on large tour buses which can accommodate over fifty people. In addition, many people drive to Oze in their own cars.

Human-generated wastes other than water-borne wastes have not been a problem in Oze because of the efforts of the “trash-carry-home-movement”, as mentioned above. Further details of this movement will be discussed below.

2.1.2. *Conversion and land-use*

Since the only private landowner in Oze is the electric company, most of the forest area of Oze has been protected as “Reserved Forest” under the Forest Law, such that industrial use is basically banned. As a result, the problems that occur as a result of land conversion for agricultural purposes are not found in Oze. Plans for conversion to other uses, such as a reservoir for power plants or the building of prefectural or national roads, were abolished. These potential threats to conservation can now be seen as issues of the past.

Today, the use of Oze for commercial purposes is limited to tourism activities. The most significant problem related to land use is the problem of over-use and the seasonal concentration of tourists. Today Oze attracts more than 600 000 visitors per year.⁷ On the most crowded 10 days of the year, more than 100 000 tourists enter Oze. There are several gateways to Oze, but about 80 per cent of the visitors enter Oze through the main two entrances, which are the most convenient for access to Ozenuma and Ozegahara, and are the gateways used by local buses as well. Such heavy use in so few areas in such a short period of time has placed a huge burden on the environment. Another problem has

⁷ Average duration of the visiting season for Oze is about 200 days, lasting from mid-May to late October.

been the popularisation of Oze. Because of the development and traffic improvements, the numbers of day-trippers are said to be increasing. Tourists joining package tours and school trips are also increasing. While generalised criticisms of the tourists should be avoided; they are usually less prepared than the mountaineers in terms of either bringing the appropriate equipment or in moral terms for their visits to Oze, which is not an easy-to-visit attraction, but a mountain.

2.1.3. *Unsustainable use*

The devastation of marshland and other areas caused by the trampling can be said to be an unsustainable use of the nature of Oze. Today, at Ozegahara and other marshlands in Oze, the paths for tourists are paved with wooden boards about one metre wide, with wooden “feet” on both sides of these boards so that they do not cover the soil directly. Tourists can walk through the entire Oze area on these boardwalks without trampling. In the 1950s and 1960s before the boardwalk was built, the destruction of the vegetation on the marshland prevailed.⁸ Historic photographs of tourism in those days show that it was popular to dip into the small ponds on the marshland for fun. Today, the type of intentional trampling are rarely seen, but unintentional or smaller scale trampling, such as taking a few side-steps from the wooden boardwalk, have not yet been fully extinguished. Thus, the recovery of the marshland of *Ayamedaira* has not yet finished, despite almost thirty years of efforts.

The other environmental problem other than the pollution that is caused by tourists is that of the introduction of exotic species, which are a threat to the existence of native species.

As the entire forest of Oze is protected under the Natural Parks Law and the Forest Law, the possibility for unsustainable use of the woods of Oze is very low.

2.2. Identification of underlying causes of biodiversity loss

2.2.1. *Missing markets or non-existent property rights*

As discussed above, the use of Oze for tourism purposes is long established, and a strong tourism market now exists for Oze.

Unlike the famous “tragedy of the commons”, the possibility of the environment of Oze deteriorating because of non-established property rights over valuable resources is not the case in Oze. The property rights of the land have already been established. Economic (monetary) incentives for conservation by the land owners do not exist (although non-monetary incentives such as pressures from the general public for the protection and conservation of the “nationally-famous” Oze may exist). The only private owner is TEPCO (Tokyo Electric Power Company), and they do not make money on the tourism in Oze.⁹ Despite this, the nature of Oze has been well protected.

⁸ In 1949, the song of Oze was broadcasted by the radio. Then, together with the economic recovery of Japan, there occurred a nation-wide “boom” in tours of Oze. At the time when television was not accessible by the general public, the beautiful melody of the song captured the heart of the Japanese people who were in devastation. This indicates the importance of public consensus for the protection of nature (as described below) but, on the other hand, such widespread recognition can also be a pressure on the environment.

⁹ Oze Forest Management Co., the subsidiary company of TEPCO, does own lodges within Oze. However, the earnings from the lodges are directly plowed back into investments such as the establishment of wastewater treatment systems or solar-powered generators, and the maintenance of other facilities like the wooden boardwalk. Their management activities go beyond the mere cultivation of the water source for the power plant.

2.2.2. *Information failure*

It is indeed a difficult task to make all the tourists and the tourism industry understand that visits to Oze in themselves are a pressure, and can be a potential menace to the nature conservation. It is difficult because (1) the harmful effects on the environment are often “invisible” to them because of their lack of knowledge or consciousness of each impact; (2) the harm to the environment may only be realised at a later stage by the accumulation of many small impacts; and (3) the “utility” to the tourists of a visit to Oze can be gained in a relatively short period of stay, so that they tend to be ignorant of the longer-term effects of their activities.

However, because of the many promotional activities undertaken by both public and private bodies about Oze Park, its value and vulnerability are widely recognised by the general public. It can be assumed that an “ordinary” tourist is a person of “good will” but short-sighted, i.e., they would like to behave so as not to destroy the environment, but does not know the effects of their own actions. If the asymmetry of the information on the effects of each action on the environment is re-balanced through the provision of information about how individual actions damage the environment in the long run, the visitor’s behaviour would improve dramatically, thus reducing the impacts on the environment and the costs of conservation significantly.

2.2.3. *Institutional failure*

Two institutional “failures” can be highlighted: the limitations of the Japanese national park system, and the seasonal peaks in visits to Oze.

As mentioned above, Oze has been designated as a Special Protection Zone within Nikko National Park, for which the strictest regulative measures are enforced. But at the same time, the most effective measures for conserving nature in the face of human pressures — entrance restrictions — cannot be exercised under the limited authority given to the national parks management body. Most of Oze is privately-owned, and under the Japanese national parks system and zone designation system, it is only the owner of the land who can restrict entrance to their property. Of course, with the consent of the private owner and the Forestry Agency who owns most of the rest of the Park, restrictive measures — such as limiting the number of people who enter a day — might be possible to implement and enforce. However, even if this is possible, there is still an issue of whether such restrictive measures “should” be enforced, given that the aim of designating Oze as a national park is not limited to conservation, but also for the enhancement of sustainable use in order to provide the benefits of nature to the entire Japanese population. The management of national parks has been exercised in such a manner as to accord such occasionally conflicting aims, and the enforcement of such restrictive measures throughout the entire region would provoke hot debates.

Another incentive measure that could be applied at the entrance — the charging of fees for entering Oze — will be unlikely to be introduced as well, again, because of the primarily private ownership of the land.

The second “institutional failure” is the problem of the seasonality of visits. The most popular season for visiting Oze is limited. The concentration of use on weekends is also a problem; this is because it is difficult to take long vacations other than when all other ordinary Japanese workers take them, during the mid-August week. As Oze is located a day-trip distance from Tokyo¹⁰, this proximity to the most populated area also contributes to the concentration of visits.

¹⁰ The distance of driving to Yosemite National Park from San Francisco.

2.2.4. *Enforcement failure*

As highlighted earlier, the land ownership of Oze is shared by both public and a private body. The local administrative districts are divided as well: three prefectures are involved with one village authority in each. This division of the public authorities makes it more difficult to centrally manage, as does the limited authority given to the Environment Agency under the provisions of the Natural Parks Law.

It is easier for management authorities (such as the Environment Agency) to manage such protected areas under the jurisdiction of one body. If such a single-manager system is seen as the ideal for nature conservation, the situation in Oze, as with all other National Parks in Japan, can be considered a “failure”. But taking into account the proliferation of private ownership since the early periods of history, and the dense population in a not very large country, such a situation should be understood not so much as a “failure”, but as a “premise” to be worked from. In order to practically enforce the environmental conservation measures in the country, it is more effective to accept the situation as it is. The importance of efforts for mutual understanding and co-operation should be stressed because of the existing situation.¹¹

2.3. Identification of adverse incentives

In those days when the main conservation issues were the construction of a power plant or prefectural and national roads, subsidies and tax breaks for the promotion of such construction activities can be seen to have been adverse incentives.¹² But today, when the major impact is that of tourists, adverse incentives are non-existent.¹³

¹¹ The establishment of “*Oze Hogo Zaidan*” (Oze Conservation Foundation) can be seen as another effort for the co-ordination of different authorities.

¹² There is a long history of the conservation of the natural environment of Oze, as well as legends of the people who sacrificed their lives for the protection of Oze. The history of the conservation can be divided into three phases. The first phase can be called “the era of national project and nature conservation”. This is the era from the middle Meiji-era (late 19th century) to the 1960s, when the Japanese economy needed electricity for rapid industrialisation and recovery after World War II. At that time, the main issue was the construction of the water power plant. Initially, the entire Ozegahara was planned to be under the reservoir, but the plan was later changed to a more moderate one. Both plans were strongly protested by the nature conservation organisations, and were abandoned almost entirely, except for the construction of a sluice water gate at Lake Ozenuma, as described in Section 1.1.2.. The second phase can be called “the era of road construction and nature conservation”, and took place in the 1960s and 1970s. Plans for the construction of prefectural or national roads which would be built just beside Ozenuma were made. The story of a man native to Oze who directly appealed the abolition of the plan to the Director General of the Environment Agency is so popular as to now be used in textbooks for Japanese elementary school. Again, the plan was abandoned. Now we are at the third phase, which can be called “the era of appropriate usage and conservation”, and involves the tackling of the problems associated with the tourists who visit Oze. Potentially, both the development of water power plants and the construction of the prefectural or national road could have had a significant impact on the environment of Oze. Since both plans have now been dismissed, the analysis here focuses on the impacts caused by tourists. It is a more difficult problem because the usage itself is an act that should be encouraged because it provides for the public the beautiful nature of Oze.

¹³ Some point out that the establishment of facilities for the use of tourists — such as the establishment of toilets or wooden-paved rest points — are adverse incentives from the perspective of nature conservation. They say that the establishment of such infrastructure allows more tourists to come in to Oze, which then leads to even more deterioration of the environment.

3. IMPACTS ON ECOSYSTEM

3.1. Impacts on genetic and species diversity

3.1.1. *Impacts on vegetation*

Impacts on marshland

The major impacts on the marshland can be classified into three types: the “trampling”, the generation of wastewater, and the introduction of exotic species.

The season when the tourists are most common — the season of *Lysichiton camtschaticense* (Japanese Skunk Cabbage, *Mizubashou*), which takes place immediately after the snow melts — coincides with the sprouting season of the marshland species. The trampling that occurs during this season is fatal to those plants which grow in the area of Ozegahara, and whose growth season is confined to only half a year. In addition, the tourists tend to walk on the marshland avoiding the bared and wet peat which has been exposed by the trampling of earlier tourists, thus making the exposed areas even wider. Such a “vicious circle” has taken place for a long time. Even today, some tourists still walk off the boardwalk and trample the wet peat when it gets crowded and on the days when the wooden boardwalks are slippery due to snow or frost.

The over-nourishment of the soil and adverse effects on the marshland vegetation result from wastewater disposal. Unusual growth and spread of reeds in the marshland are reported to be an indication of such harm.

As mentioned above, the distribution on non-native species such as plantain or *erigeron annuus* are an old but continuing problem in Oze. These days, cress has joined the line-up of alien species in the marshland.

Impacts on serpentinite vegetation of Mount Shibutsu

Trampling also destroys the vegetation along the mountaineering road. The road from Ozegahara to the top of Mount Shibutsu was closed for eight years until 1997 for the recovery of this vegetation. The plants are killed by the trampling of tourists, and the surface earth is bared. Soil is washed away, and the serpentinite rock is exposed. The magnesium ion which seeps out from this rock prevents plant roots from absorbing water. The devastation process proceeds in such a manner.¹⁴

3.1.2. *Impacts on lakes and small ponds*

As with the marshlands, the wastewater from the lodges and public toilets and the spread of exotic species are two of the major impacts on the lakes and small ponds.

¹⁴ The impact caused by deer on the vegetation has become a recent concern in Oze. At another area of the Nikko National Park, the alpine flora are severely diminished by the grazing of the deer. Since Oze is rich with the favourite plants of the deer (such as lilies), the danger of over-proliferation of deer is a serious concern. Research on the habits and lives of the deer in Oze is now taking place.

Although the BOD and COD data have not shown significant deterioration of the water quality of Ozenuma, and various measures — such as the establishment of domestic treatment systems for all household wastewater and other compulsory or voluntary regulations — have taken place, the impacts caused by wastewater are still a serious concern.

Elodea nuttalli (*Kokanadamo*) are waterplants native to North America, but were found in Ozenuma in 1981 for the first time. The propagation of *Elodea nuttalli* (*Kokanadamo*) continues today, and threatens the domestic waterplants, such as *Potamogeton perfoliatus* (*Hirohanoebimo*) and *Potamogeton maackianus* (*Senninmo*). Some believe that the deterioration of water quality and over-nourishment of Ozenuma is the result of the proliferation of alien species. But others point out that the nature of *Elodea nuttalli* (*Kokadanamo*) which multiplies even in clear water, as well as the effect of the life-cycle of *Elodea nuttalli* which grows in early spring, are the reasons for this proliferation.

3.1.3. Impacts on forests

Though it has not turned out to be a problem yet, vehicle emissions are a potential menace to the forests as well as the marshland and other plain fields. The vehicle emissions, especially from the tour buses which form a line along the narrow and winding road during the peak season of Oze tours, has been a concern from the perspective of nature conservation.

Emissions from diesel engines which are used to generate electricity in one area where electric cables do not reach might also turn out to be a problem in the future. The introduction of the water treatment system to all public toilets and lodges has provoked more demand for electricity, enhancing the usage of the diesel engines equipped there.

The combustible wastes generated in the lodges or other sites are burnt in incinerators provided in each area. A problem of air pollution from the incinerators is not reported.

3.1.4. Impacts on wildlife

In addition to the pressures caused by exotic species on domestic flora such as *Potamogeton perfoliatus* (*Hirohanoebimo*) or *Potamogeton maackianus* (*Senninmo*), other pressures have also been taking place for a long time. Typical imported species include Plantains and *Erigeron annuus* (*Himejo'on*), which propagate rapidly and can be seen frequently around the campsites or lodges. Although efforts for their extermination have been carried out every year, these species have been repeatedly re-introduced.

In terms of the fauna of the area, certain types of dragonflies unusually increased when the heavy usage of agricultural chemicals was common in the areas around Oze. The number of these dragonflies are now said to have returned to the usual levels.

3.2. Impacts on the most important species

Lysichiton camtschatcense (Japanese Skunk Cabbage, *Mizubashou*) can be considered a representative of Oze's flora. Especially in terms of general public perceptions, *Mizubashou* is considered particularly special to the Japanese people because its beauty is described in the most well known phrase of the 1949 song of Oze.

Some believe that, due to the over-nourishment of the soils through human impacts, unusually enlarged *Mizubashou* can be seen in some areas in Oze. Because of its representative character, these incidences were treated sensationally in the late 1980s, and the enlarged *Mizubashou* have been called “Monster *Mizubashou*”. *Mizubashou* grows not only on marshland but also on wet soil in and around the forest. In actual fact, *Mizubashous* growing in the forest can be significantly larger than those in the marshland because of the nutritive abundance of the soil in the forest; such enlargement is, of course, not affected by human activities. It has been reported that at *Miharashi* district in *Ozegahara* marshland relatively larger *Mizubashous* — considered to be enlarged by over-nourishment — were observed. Today, such large *Mizubashous* are not found.

For other species, including the plants or animals named after “Oze” or “Shibutsu” (one of the mountains surrounding Oze and formed by serpentinite base-rocks), impacts which prove a threat to the existence of particular species have not been reported.

3.3. Impacts on ecosystem resilience

As indicated above, the marshland is quite vulnerable to trampling. As early as the 1950s, the damage caused by trampling has been taking place in the more popular areas, such as the cross-roads in the middle of *Ozegahara* and in “*Ayamedaira* (Field of Iris)”, another marshland located on the ridge of the south side of Oze. Because of its scenic beauty, *Ayamedaira* has been dubbed the “paradise up in the sky”. From 1966, efforts for the recovery of vegetation have been taking place by the Gunma prefecture. Although much of the areas trampled in the 1950s or 1960s have recovered, the recovery of the *Ayamedaira* vegetation has been slower. Domestic plants such as *Carex michauxiana* (*Mitakesuge*) have been planted; and their seeds have been sown. Because *Ayamedaira* is in a district with heavy snowfall in winter, the season for the plants to grow is particularly short compared with other areas. In addition, because *Ayamedaira* is on a slope, the surface soil can be washed away very easily. These characteristics of *Ayamedaira* make it very difficult for the vegetation to recover. The recovery of the vegetation along the road to Mount Shibutsu, as discussed in Section 2.1.3, shares the same difficulties as *Ayamedaira*: both are located at rather higher altitudes along the road to the top of the mountain, with tilted fields whose surface soil is easy to erode, the snow packs the earth for a rather long period, and the melted snow softens the earth so that the roots of the plants are unstable.

As was pointed out in Section 3.1.2, the water quality of *Ozenuma* has not been deteriorating as much in recent years. However, since 1981, the measured level of COD in *Ozenuma* has not passed the Environment Quality Standard (less than 1 mg per litre for the lakes that are classified as “nature conservation use”).¹⁵ The current situation of *Ozenuma* can be depicted as “breaking-even”; there is no deterioration, but neither has there been any fundamental improvements.

3.4. Damage to the resource base

As has been described above, the nature conservation movement started as early as the 1950s in Japan. As a result, there has been no species that has been driven to extinction or seriously endangered. Since the fauna and flora of Oze are not used as a resource base for industries other than tourism, the pressures of hunting and collecting on the species are not prevalent.¹⁶

¹⁵ The Environment Quality Standard for water pollution is the target level of water quality to be achieved and maintained in public waters, as prescribed in the Basic Environment Law. The level of the Standard is the “desired” one, and the Standard works not a regulative measure specifying the exact level to be obtained, but as a guideline to the national and local governments for planning their environment protection policy.

¹⁶ Of course, the potential pressure of illegal wildlife hunting does exist in Oze, especially for the flora such as *Hemerocallis middendorffii* (*Nikkokisuge*, a type of lily with a yellow flower, another representative flower of Oze). It remains only a potential though; the illegal picking of flowers is only exercised by private

4. IMPACTS ON ECONOMY AND WELFARE

4.1. Direct economic losses

The loss of the value of the nature of Oze would result in a tremendous impact on the domestic economy. The compositions of labour in Katashina Village and Hinoemata Village — the villages which contain the three main entrances to Oze — are as follows shown in Table 1.

Table 1. Labour Composition of Gateway Villages to Oze (1995)

	Primary Industry	Secondary Industry	Tertiary Industry	(Service)
Katashina Village	688 (20.6%)	830 (24.8%)	1 824 (54.5%)	1 143 (34.1%)
Gunma Prefecture	83 222 (7.9%)	401 218 (38.2%)	564 569 (53.7%)	232 687 (22.1%)
Hinoemata Village	15 (3.1%)	52 (10.6%)	424 (86.4%)	326 (66.4%)
Fukushima Prefecture	117 560 (10.8%)	392 816 (36.1%)	575 236 (52.9%)	241 419 (22.2%)

Source: Population Census of Japan, 1995.

As can be seen from this Table, for both villages the ratio of the labour population working in the service industry is large for the Prefecture they are situated in. Particularly in the Hinoemata Village, the percentage of the working population in the service industry is significantly higher than for the Fukushima Prefecture. Of course, these figures show only part of the economy in local villages, but the loss of biological value in Oze would affect the local economy tremendously, as the major tourist attraction for those two villages is Oze.¹⁷

The economic loss incurred by the tourism industry would be enormous as well. Eighteen tour operators in 1995, and 12 in 1997, attended the guidance meeting for tour operators who sponsor tours to Oze. The names and addresses of these operators show that both local and Tokyo-based national tour operators operate these tours. Although it is difficult to identify the exact frequency and number of tourists that visit, the volume and diversity of the tour operators is another indication of the economic value of the nature of Oze.

4.2. Economic valuation of damages to public goods

Because of the significant character of its nature, and its long history of nature conservation, Oze is the main symbol of nature conservation in Japan. It is not only the nature of Oze itself, but also the history — or legend — of the conservation that occurs there that is a public good. A lot of nation-wide movements for nature conservation have been spawned in Oze and later spread to other areas. The

tourists, most of whom do so for individual pleasure and the resulting effects are either unconscious or unintentional.

¹⁷

At Katashina Village, there are other tourist attractions such as ski ranges (8 areas), hot springs (traditional Japanese tourism attraction), and other natural areas such as Marunuma-Sugenuma ponds (famous for being mysterious ponds) and Hotaka High-land (famous for its flower-blossoming field).

environmental protection measures that have been tried in Oze are regarded as the measures in the forefront of the new era, and they are now used by other nature conservation areas or regions. This value of Oze as the leading edge in Japanese nature conservation is of course non-excludable, and the use of these experiences by others will not reduce its utility for any individual. Although it is difficult to quantify this value, it can be assumed to be “enormous”.

4.3. Effects of adverse incentives on budget, efficiency and employment

The plans for public construction which were abolished (i.e. for the power plants and the prefectural and national roads) might be seen as having the “effects of adverse incentives on budget, efficiency and employment”, since significant amounts from the government budget would have been spent on them. The monetary support from the general budget required for conservation efforts continues, and helps to fund the recovery of vegetation, the establishment of the wooden boardwalk, and the treatment of the waste waters. The positive effects on the budget that might arise from the cessation of activities aimed at environmental conservation have not been realised in terms of measures used in Oze.

The congestion of tourists and their over-use of the National Park reduces the utility of the Park for each tourist visiting Oze. On weekends during the most popular season, visitors form a continuous line along the wooden boardwalk so that it is difficult to stop at their favourite points to enjoy the sights, or to enjoy the calmness and cleanliness of the rural areas which are the characteristics tourists from urban areas most attracted to. As a result of this over-use, vegetation is destroyed, water quality deteriorates, etc. — all because of the devaluation in the utility visitors gain from visiting the Park. Finding the solution to the problem of over-use should include enhancing the efficient use of the Park by each tourist, that is, the utility gained in each visit should improve.

4.4. Beneficiaries of inaction and bearers of costs prior to implementation

In terms of the impacts caused by tourism, it is difficult to identify particular beneficiary of the effects, or a bearer of the costs. Benefits and burdens are the flip sides of the same coin, and anybody associated with Oze can be categorised as being affected by both. The private land owner of Oze might be able to use the land as they desire without regulating it, but they may gain a negative reputation if they do not appropriately conserve such precious nature as is found in Oze, and thus potentially reduce their brand value in the case of a for-profit company. The national government might benefit from not spending its budget on the rather expensive conservation measures needed (e.g. the water treatment systems), but at the same time they would be severely criticised for the degradation of the Park, and distrust and disobedience on the part of the public might occur as a result, which could rebound back on the Government when they enforce other political measures. The lodge owners can manage their property as they like, but at the same time they themselves bear the costs of conservation in order to preserve the value of Oze, which is the source of their revenue. The same situation applies for the tourism industry.

It is difficult to categorise the parties involved into “good-versus-bad” or “justice-versus-evil” in this discussion about nature conservation in Oze. The value that should be protected is a public good, which benefits all, but the cost for sustaining these benefits can be shared in many ways. Finding a compromise on how to share these costs can be difficult: while nobody disagrees about the conservation itself, views on how the conservation should be supported will vary according to the personal interests of each involved party.

5. IMPLEMENTATION OF INCENTIVE MEASURE(S) AND CONTEXT

5.1. Identification of actual or planned incentive measures

Two main bodies are responsible for introducing and implementing incentive measures in Oze: the public ones (in the form of the Environment Agency (its Visitor Center), the local authorities of prefectures or villages, and the local police authority), and the private ones (individual lodges or their association, volunteers, private land owners in Oze, nature conservation NGOs, etc.). Sometimes individually, and sometimes together with other bodies, these groups have been implementing a diverse range of incentive measures. In 1995, *Oze Hogo Zaidan* (Oze Conservation Foundation) was established as a “hybrid” fund of both public and private interests, and it includes most of the bodies concerned. The original, but co-ordinated, activities of the Foundation are expected to become yet another firm basis for the protection of Oze.

5.1.1. *Types of measures*

We can categorise the incentive measures into three types. First are the regulative methods which bind the behaviour of individuals by law, sometimes accompanied by penal provisions. The second and the third ones are promotional measures. The second are those promotional measures which do not affect the ordinary behaviour of each tourist, but limit the impacts of this behaviour on the environment, primarily through the introduction of facilities and equipment. The third type of measure aims to influence the tourism activities so that they become more environment-friendly by making the visitors more aware of their impact on the nature. In the next Section, several measures are introduced and classified according to these three categories, as indicated by a (*1), (*2), or (*3) next to each depending on which category the measure falls into.¹⁸

5.1.2. *Objective of each measure and the reasons for choosing it*

Measures against “trampling”

Trampling causes the most direct and visible impacts on the marshland. The marshland is the nursery of the beautiful flora that characterises Oze. Due to the vulnerability of the marshland and its importance, various measures against “trampling” have been used for a long time. The wooden boardwalk was established over the marshland and other areas where surface soil is easy to erode since the 1950s (*2). The construction of these boardwalks were financed by a subsidy from the national government to the local government (prefectural level), which is matched by their own funds or the by the private property owner, Oze Forest Management Co.. The costs of construction are about 50 000 to 100 000 yen¹⁹ per meter, and the duration period is about 7-10 year, not including corrosion-prevention treatment. The daily management of the roads is undertaken by the park rangers of the Environment Agency and the Oze Forest Management Co., with other concerned parties — such as the owner or the employees of the lodges — contributing on a voluntary basis.

At the same time, entrance restrictions to some marshland areas has been enforced by the Natural Parks Law (*1). The re-planting of native flora is a direct measure for vegetation recovery (*2). Of

¹⁸ General promotional activities such as those held at visitor centres are not mentioned here because they are a matter of course. See Section 5.4.3.2. for a fuller description of activities held at visitor centres.

¹⁹ 1\$ = 130 yen (December 1997).

course, brochures and travel guidebooks can be used to inform general visitors the environmental impact of trampling (*3).

Measures applying to wastewater

Domestic treatment systems for wastewater have been introduced in all public toilets and lodges (*2). Within Oze, there are eight public toilets provided by the Environment Agency, local prefectural government, and Oze Forest Management Co., primarily at popular areas such as crossroads, campsites or locations where the lodges and visitor centres are concentrated. Since 1990, wastewater treatment systems for all public toilets have been put in place. The financial source of those facilities depends on the ownership. The construction costs of these toilets is about four times more than similar toilets in cities, because of the costs of transporting the toilet systems by helicopter. The running costs of the treatment system are about several million yen per year each. Again, various bodies finance these costs. In addition, all the lodges in Oze (16 lodges) are equipped with the same wastewater treatment system as the public toilets. The lodge owners installed the systems on their own account, as specified in the voluntary agreement.²⁰

In addition to these treatment systems, pipelines have been constructed in Oze since 1991 to lead the dirty water to areas downstream of the lakes and rivers of Oze in those areas where public facilities are most concentrated. These are financed by the Environment Agency and the prefectural governments. At each public toilet, a voluntary donation of about 100 yen per use has been requested. The revenue from these donations is used to purchase consumptive materials such as papers²¹ and cleansers. The revenue falls far short of the costs of maintenance of the water treatment system, and of course the per-use charge is too small to provide an incentive for the tourists against the over-use of the toilets. Nevertheless, the promotion of such a donation is a contribution not only in financial terms, but also to the awareness of the general public to the pressures on nature conservation by making them aware of the impacts of their own activities. Other methods include the “voluntary regulations” specified in the agreement of the lodge owners. The capacity increase of all lodges together has been frozen since 1967 at 2 163 visitors, and in 1992 the lodges adopted a compulsory reservation policy under which it is necessary to make a reservation in advance for an overnight stay. Other policies include the voluntary restriction of the use of soap and shampoo in the lodges (since 1981), and the introduction of a “no-bathe day” (since 1991)(*1).²² At one lodge, water-washing type of lavatories have been introduced in order to reduce the burden on the treatment system by treating the toilet papers (*2).

²⁰ Some suggest that the existence of the lodges within the Ozegahara and Ozenuma area constitute the fundamental pressure on the environment, and several nature conservation NGOs have proposed the removal of the lodges from the valley. These proposals were strongly advocated in the late 1980s, after which the establishment of the wastewater treatment system progressed rapidly.

The proposals have not been accepted by all those concerned, because it is widely recognised that it has been the individual owners and the associations that devote their lives to Oze (their native area) that have contributed so much to the protection and conservation of the nature of Oze, long before the importance of nature conservation was widely accepted in Japan. For example, the native man who “saved” Oze and whose story is now in Japanese textbooks was the owner of a lodge at Ozenuma. It is also recognised that the lodges provide relief and pleasure to the people visiting Oze by providing information or space for informal discussion and exchange of views between visitors in a friendly atmosphere. These customs can be seen to be another, invisible, treasure of Oze. As a result, environmental protection measures should be enforced in co-operation with lodge owners, not conspiratorially but with mutual understanding and trust.

²¹ It is not common in Japan to equip toilets with paper for hand towels for wiping hands. Usually papers are provided only in each booth. (In Japan it is conventional to bring a handkerchief for wiping hands in the toilets.)

²² As these restrictions are voluntary, the consent and co-operation of the users of lodges are necessary. In this sense, these “voluntary regulations” can be categorised as group (*3).

Measures to counter the introduction of exotic species

During the peak visitor season, volunteers at the main entrances to Oze guide tourists in the removal of soil and seeds from their shoes (*3).

Measures regarding other human activities

Measures against waste and litter

The removal of public trash cans from the Park (*2), and the “trash-carry-home-movement” (*3) are the two most effective measures for reducing waste and litter in Oze.

Under the “trash-carry-home-movement”, various bodies — including both national and local government, private land owners (i.e. TEPCO and Oze Forest Management Co.), the association of lodge owners, and NGOs for environment protection — undertake various promotional activities for the removal of waste and litter. In addition, trash cans have been abolished in the area. These groups have, for example, appealed to the visitors for co-operation, distributed refuse bags at the entrance to Oze and the nearest railway stations, displayed an appealing banner at the gateways, and spoken with visitors and the surrounding communities. In addition to these promotional activities, many privately published books — such as travel guides and picture books about Oze — not only introduce the reader to the beauty of Oze, but also the attitudes to nature conservation that should be borne in mind when entering Oze.

A unique policy has been used in Oze to “de-establish” (or abolish) public trash cans from in and around the entire Oze area. This abolition has been in place since 1972 as one of the policies of “trash-carry-home-movement”. In conjunction with the promotional and educational initiatives, this abolition has contributed not only to enhancing the cleanliness of the environment, but also to motivating visitors’ attitudes to environmental protection. In addition, the movement also contributes to a reduction in the costs of treating the wastes. In this sense, it has succeeded in internalising the costs of waste treatment plus the costs of the negative externalities associated with waste disposal.

Measures applying to vehicle users

Traffic restrictions are enforced during the peak season, as mentioned in Section 1.3.1 (*1). Initially, the number of enforcement days was under 10 per year, and only on the weekends of the *Mizubashou* (*Lysichiton camtschaticense* — Japanese Skunk Cabbage) season. For the 1996 season, however, such restrictions were enforced on 66 days on the south side, and 71 days on the north side of Oze. During the season, the passage of all the cars other than the permitted buses and taxis are restricted.

Measures applying to the tourism industry and tourists

To reduce the concentration of usage on the weekends, there are various promotional measures for encouraging weekday visits to Oze carried out by many of the concerned bodies (*3). According to interviews conducted by the association of lodge owners of Oze in February 1997, and covering about 1 500 visitors, 73.9 per cent of the visitors knew that the concentration of tourists on the weekends has negative effects on the environment through the high use of toilets, unintended trampling of the marshland, and illegal parking. Nevertheless, only 60.8 per cent of those answered “yes” to the question of whether they would come to Oze on a weekday the next time. Due to the institutional failure of the Japanese holiday system, as mentioned above, it is difficult to successfully encourage weekday visits to Oze.

The guidance meeting for the promotion of weekday trips to Oze has also been organised to target tour bus operators (*3). The *Oze Hogo Zaidan* (Oze Conservation Foundation) held such a meeting in Tokyo; they are now thinking of holding one in Osaka as well (the second most populated city in Japan) for the next season. In addition, they distribute information leaflets to tour operators asking for a reduction in the over-use of the Park and requesting the instruction of general “conservation manners” to the tourists.

5.2. Process of implementation and distributional effects

5.2.1. Beneficiaries of incentive measures and the bearers of costs after implementation

As discussed in Section 4.4, it is difficult to identify the beneficiaries and the bearers of the costs. Anyone can fall into both categories. The general public has to pay taxes which help maintain the Park, so those who do not enjoy the nature of Oze might be labelled cost-bearers, but not beneficiaries. Nevertheless, even these general taxpayers benefit from the conservation of Oze because of the invaluable “brand quality” of Oze as a symbol of nature conservation, which has helped to promote general environmental protection policy. (In this sense the conservation of Oze can be said to be a “merit good”.)

One might say the bearers of the implementation costs — in purely monetary terms — are: (1) the government, both national and local, through subsidisation of the establishment of facilities such as water treatment systems and the wooden boardwalk; (2) similarly, the private land owner of Oze and the lodge owners for financing similar facilities; (3) the visitors to Oze who are supposed to provide a donation for the use of public toilets, or whose lodging fees might include the costs of conservation measures; and (4) the private volunteers who sacrifice their time (the opportunity cost of undertaking alternative activities) to nature conservation, which does not benefit them monetarily.

5.2.2. Participation and negotiation

Throughout the long history of the conservation of Oze, various bodies have been concerned with its protection. This history can be described as one of co-operation, opposition, and compromise among the relevant parties.

In 1986 the “round-table meeting for the protection of Oze” was established, and included seven nature conservation NGOs, biologists, politicians, journalists, private land owners, and representatives of the prefectural governments. In 1988 the meeting put forward 15 proposals, 11 of them were to be enforced immediately. Some measures, including the establishment of water treatment systems and the temporary closure of one road for the recovery of vegetation, were actually realised soon after the announcement of the proposals. Since then, meetings of the relevant government bodies, both national and local, have been held occasionally. More precise measures — such as what kind of water treatment systems should be installed in which facilities and when, or what type of promotional measures should be used to encourage the tourists to reduce their impact that result from overuse, etc. — were agreed between them in 1991, and have been enforced continuously since then.

One of the proposals agreed in 1988, and which was again proposed in the agreement of 1991, was the establishment of a trust fund for the management of Oze, and composed of various bodies concerned with its conservation. In 1993, at a meeting of three prefectural governors (the “Oze Summit”), the establishment of such fund was reconfirmed, and a more specific role for the fund defined. Primarily, it was agreed that the Fund would take on a promotional and advocational function, supporting the activities of the government and private bodies.

At last, in 1995, the “*Oze Hogo Zaidan*” (Oze Conservation Foundation) was established.²³ It currently undertakes various activities, including providing direction and guidance to the tourists, the publication of promotional brochures, the organisation of guidance meetings with the tourism industry, as well as entrusted activities on behalf of governmental bodies, such as the management of visitor centres and toilets, or the recovery of vegetation.

5.3. The role of information and uncertainty in the implementation process

The “brand” name of Oze has proliferated across Japan as a symbol of nature conservation, which has proven an advantage for implementing various incentive measures. For example, this has made it easier to obtain government support, such as subsidies, for conservation purposes. The value of Oze as a national “treasure”, not only for its scenic beauty but also for its conservation tradition, are broadly shared, making it possible to obtain the consent of interested parties for the implementation of sometimes progressive and strict measures.

To pass on the value of Oze to the next generation, as well as to reduce the burden on the Park imposed by school trips which usually include over a hundred, promotional measures directed towards children have been implemented by various bodies. For example, since 1994, a “Oze Children’s Summit” has been held on an annual basis. Sixty children at elementary or junior high school level gather at a lodge and exchange ideas about the value of Oze, as well as broader issues about nature conservation. These activities are expected to feed the minds of the younger generations for nature conservation at an early stage in their lives.

A number of books are published about Oze. A search of Japanese published books listed on the World Wide Web whose title includes the word “Oze” finds over 200 books. Most of these are travel guides, but a number are photo or painting books introducing the beauty of Oze, essays on the history of nature conservation in Oze, or books written by the lodge owners or others natives of Oze.

5.4. Framework and context of implementation

5.4.1. *Explicit legal framework, property rights and rights of access*

As explained in Section 1.3.1, Oze is designated as a Special Protection Zone in which the strictest regulations are enforced. The damage or planting of trees, pasturing, accumulation or storage of materials outdoor, burning of fires, picking of plants, capturing of mammals, or the entrance of automobiles are all regulated, in addition to the other regulations enforced in all Special Zones, and for which the permission of the Director General of the Environment Agency is required.

5.4.2. *Cultural, historical and social context*

The value of Oze as the origin of nature conservation in Japan came about as the result of several factors: the beauty of the nature itself; the academic value of the development of marshland, lakes and mountains; its biological uniqueness; the history of conservation in Oze and the traditions; and the publicity given to the area through various media, such as radio broadcasts of the Song of Oze. The existence, as well as the continuation and accumulation, of these values has developed Oze into a stable “symbol” for nature conservation.

²³ Currently, their base fund is about 1.4 billion yen. Half of this is funded by the public sector, prefectural and village governments. The rest is funded by private bodies such as the Tokyo Electric Power Company (TEPCO) and other local companies. More than 30 million yen comes from individual private donations.

Oze has been the focus of hot debate on nature conservation in Japan. It is widely recognised that the movement for the conservation of Oze is the origin from which nature conservation in Japan as we now know it started. Reflecting on the common value of Oze shared by those who are concerned about the protection of its environment, a range of statements have been made, ranging from the purely moral type of slogans to more concrete ones, some of which are shared by all and some of which are conflicting. Even though some of these are not shared by all, this advocacy still helps to educate the general public about the importance of the protection of Oze; as well as indicating to them the difficulties of reaching consensus among people from various sectors and addressing several issues, even if all of them are motivated toward the improvement and betterment of the protection and conservation of Oze.

5.4.3. *Institutions concerned*

Diversity of the concerned bodies

Because of its long history and nation-wide interest, the institutions concerned with the conservation of Oze are very diverse. Many of those with different backgrounds now meet to discuss issues about the conservation of Oze on a daily basis and in a rather frank manner, after years of severe negotiations and confrontation. Of course, sometimes their interests still conflict, but it is through a mutual consultation basis — rather than a more legally-oriented process such as administrative settlements or law suits — that a solution can be found. The Board of Directors and the Council of *Oze Hogo Zaidan* (Oze Conservation Foundation) are listed in Table 2. *Oze Hogo Zaidan* is only one forum for mutual negotiations, but the Table indicates just how diverse the institutions concerned are, as well as how those institutions are co-ordinated.

Role of visitor centres and park rangers

The two visitor centres are located in the two areas where facilities are most concentrated. A number of educational activities have been implemented at these centres, including on-site lectures about the nature of Oze and how to observe it, the showing of slides shows and movies at night, and the provision of information about nature and its conservation through displays and discussions. One centre, which is located at the lakeside of Ozenuma, was established by the Ministry of Health and Welfare²⁴ in 1964, and in 1985 it was totally remodelled by the Environment Agency. The other centre, located at Yamanohana (at the opposite end of Ozegahara to Ozenuma, and along the busiest road into Oze from the surrounding mountains), was established by the Agency for Cultural Affairs²⁵ in 1966, and in 1993 the Gunma prefecture rearranged and renamed it. Both centres are currently managed by the non-profit *Oze Hogo Zaidan* (Oze Conservation Foundation). Their management costs are subsidised by the Environment Agency (Ozenuma visitor centre) and the Gunma prefecture (Yamanohana centre). The various activities of the centres are not only undertaken by the park rangers who employed by the Environment Agency, but also by the employees of *Oze Hogo Zaidan* (Oze Conservation Foundation) and the volunteers organised by the Environment Agency or Oze Conservation Foundation.

²⁴ Until 1971 and the Environment Agency was founded, the Nature Conservation Bureau of the Environment Agency was a bureau under the Ministry of Health and Welfare.

²⁵ The Agency for Cultural Affairs is one of the subsidiary agencies of the Ministry of Education, Science, Sports and Culture. The Cultural Properties Protection Law is under its jurisdiction.

Table 2. Composition of the organisation of *Oze Hogo Zaidan* (Oze Conservation Foundation)

Board of Directors (21 Total)		Council (29 Total)	
<i>Chairman:</i>	<ul style="list-style-type: none"> • Governor of Gunma Prefecture 	<i>Fukushima Prefecture (8)</i> <i>(Composition of representatives of other two prefectures are almost the same):</i>	<ul style="list-style-type: none"> • Chief Administrators of the Prefecture (2)
<i>Vice-Chairman:</i>	<ul style="list-style-type: none"> • Governor of Fukushima Prefecture • Governor of Niigata Prefecture 		<ul style="list-style-type: none"> • Deputy mayor of the local village • President of local nature conservation association
<i>Managing Director:</i>	<ul style="list-style-type: none"> • President of TEPCO • Director of the Environment, Department of Gunma Prefecture 		<ul style="list-style-type: none"> • President of local tourism association • Committee of the research team of arts and sciences of Oze
<i>Directors:</i>	<ul style="list-style-type: none"> • Chairmen of the Environment Council of Prefectures(2) • Chief of local villages (3) • Representatives of public interest (Professor, NGO representatives(3), Essayist, Mountaineer)(6) 	<i>Others:</i>	<ul style="list-style-type: none"> • Directors of local newspapers (2) • Committee of the research team of arts and sciences of Oze • Representative of NGO • Representative of the association of lodge owners • President of Oze Forest Management Co. • President of railroad company
<i>Auditors:</i>	<ul style="list-style-type: none"> • Presidents of local bank association (3) • Chief cashiers of the Prefectures(2) 		

The park rangers employed by the Environment Agency, are stationed in the main areas of the National Park. In Oze, the Environment Agency has one ranger per station who is delegated authority by the Director General of the Environment Agency to evaluate and provide guidance for permission procedures on regulated activities, except for large-scale or critical issues. Since this ranger is domiciled at Ozenuma, he/she knows every nook and corner of Oze, not only the natural character but also the “human community” of Oze through negotiations and more casual daily conversations. Since the park rangers of the Environment Agency are, like other officials of national government, lifetime-employees, throughout their careers they work either at the Agency in Tokyo or are transferred to other regional stations. Through the senior-junior relationship of the rangers, the on-going activities in the Park are transferred smoothly, as are the relationships with the local people, which contributes significantly to a continuity in management style. At the same time, the rangers can bring the insights and expertise gained

throughout their careers to their work In Oze, as well as bringing what they learn in Oze to other nature conservation areas.

5.4.4. Internal evaluation and remedial process

The measures taken by various bodies are reviewed either regularly or on more temporary basis by those actually undertaking them or other bodies. An example of a regular review process is the so-called “Oze Summit”, which has been held annually for three years and is co-ordinated by *Oze Hogo Zaidan* (Oze Conservation Foundation). Most of the concerned bodies — including government organisations, NGOs, private owners, lodge owners, etc. — attend the Summit. Statistical reports and the results of incentive measures that have been implemented are presented in the meetings, and various issues about the betterment of conservation and the use of Oze are very eagerly discussed. This year, the “Council for the Improvement of the Usage of Oze”, which was established under the Fund, reported their analysis and the results of discussions about measures to counter various issues of current concern, such as the increase in visitors, and their overuse of resources and manners. Based on this report, heated debate has taken place. This kind of opportunity provides the concerned bodies a chance to express their opinions, which should enhance their individual motivation to be a part of such a loosely co-ordinated group for the protection of Oze. The opinions and information presented in the meetings are used in the implementation or improvement of actual measures.

6. POLICY RELEVANT CONCLUSIONS

The discussion so far has focused on the “third phase” of the conservation of Oze, which is “the era of appropriate usage and conservation”, and followed after the phases of “the era of national projects and nature conservation” and “the era of road construction and nature conservation”. First of all, the co-operative, co-ordinated and consultation-based framework for those concerned was able to be realised in this phase because the basis for establishing such a framework (consensus about the value of the nature of Oze and its conservation) has been engrained in the minds of all the relevant parties throughout the long history of conservation in Oze. With this particular characteristic of Oze conservation in mind, conclusions and lessons learned from this experience are presented below.

6.1. Lessons learned

Two significant lessons should be highlighted: the importance of the distribution of information about the meaning and value of conservation; and the importance of co-operation between concerned parties.

As mentioned above, the asymmetry of information which is usually as one of the main problems facing nature conservation, is not applicable in the case of Oze. Among the many means through which knowledge about Oze has proliferated, some of the most unique have been the distribution through textbooks (which has resulted in the efforts of local people for conservation being widely known nationwide) and drama (especially through the theme song which has widely spread an image of Oze as a beautiful “paradise” of clean nature, particularly given the timing of the broadcast — just four years after World War II when people were very eager for a peaceful and calm atmosphere). Of course, other promotional and educational activities undertaken eagerly by those concerned have also contributed significantly to the conservation efforts.

The co-operation of all the concerned parties as has occurred in Oze is especially important under the National Park system of zone designation, as is found in Japan. In a nation guaranteeing the

individual freedom over their own property, it is impossible to introduce regulative measures onto private lands without the consent of the private owner. In addition, it is impossible to actually enforce regulations continuously without the help of motivated local bodies. Although the opinions about the “desired” measures differ between interested parties, and sometimes even conflict with each other, the motivation for conservation itself is shared. Such a “bottom-up”, “endogenous”, or “based on the pride for homeland” type of motivation is long lasting as it starts at a fundamental stage.

6.2. Transferability of the experience

The two “lessons” highlighted above are also the advantages Oze holds compared with other national parks in Japan, as well as other nature conservation areas around the world. It is not always true that the spirit for conservation is shared among those who have interests in the areas, especially where there are commercial interests or potential development interests. In addition, although access to Oze has been significantly improved, its geographical characteristics — such as the very remote mountainous area that is more than an hour from the closest railway station — can be seen as another conservation “advantage” for Oze. Also the established “brand name” of Oze may have worked as a “trump card” for the enhancement of conservation measures in Oze through the attraction of funds from both government and non-government sources.

But such a co-operative framework between the concerned parties, as witnessed in the establishment of *Oze Hogo Zaidan* (Oze Conservation Foundation), should be transferable to other national and international nature conservation areas. By joining together those that share the same feeling for conservation, and trying to find a mutually agreeable meeting point, as well as the accumulation of rather long-term relationships between these people, especially between those who regulate and those who are regulated, such a co-operative framework can be established in the long run.

To establish such a framework, the following two points are important:

- a consensus in favour of conservation between those concerned, especially those who might gain monetary benefits by not conserving the nature; and
- the establishment of a “core” body for co-ordinating between the different bodies.

The first point will vary for different situations, as the natural, historical, and cultural context of each particular nature conservation area differs. There may not exist a single right way for realising such a consensus. A step-by-step approach of building the efforts of the concerned parties may be the only way to establish such a consensus, since favourable feelings towards conservation will be nourished within each person through mutual reliance and trust. As is the case in Oze, the historical experiences shared by the involved parties became the nursery in which such a consensus could grow. The cultivation takes a long time, but the longer it takes, the stronger the flowers it produces may be.

For the case of Oze, park rangers of the Environment Agency have established a “core” which co-ordinates and liaises with the conflicting bodies. It is expected that the *Oze Hogo Zaidan* (Oze Conservation Foundation) will share part of the co-ordination roles. In the case of non-governmental bodies, administrative and financial capacity as well as the capacity for communicating with other bodies, mainly local ones, are necessary for the formation of such a “core” body.

6.3. Possible policy advice for implementation

The description presented so far represents the advice itself. The presentation and exchange of case studies are valuable because one can interpret the experience of the others in the context of one’s own situation. If one piece of advice were to come from this, it would be the importance of mutual

understanding and co-operation between those with different interests. Throughout the process of writing and editing this report, we have reviewed many articles and accumulated experiences in Oze, and it is our common understanding that to implement and sustain a framework of nature conservation, to understand the background of the people with their different opinions, and to make every effort to find points of agreement, and sometimes compromise if necessary, is the most advisable policy. Zero-sum games do not work well, especially in nature conservation systems with zone designation, and which have been institutionalised and in a rather densely populated country, as is the case in Japan.

NOTE.: This report was compiled and translated into English by Mr. Taichi Ono, Deputy Director of Planning Division, Nature Conservation Bureau of the Environment Agency after his field visit to the Oze area in October 1997, and in consultation with following persons:

1. Ms. Y. Hirano, and Mr. S. Okamoto; Chozo-Lodge (*Chozogoya*) at Oze Lake (*Ozenuma*)
2. Mr. M. Usuki; Co-ordinator for Biological Diversity, Nature Conservation Bureau, Environment Agency (Ex-Park Ranger for Oze Area)
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4. Mr. K. Nakajima; Conservation Specialist, National Parks Management Division, Nature Conservation Bureau, Environment Agency (Ex-Park Ranger for Oze Area)

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