Yeongyang International Dark Sky Park (Silver Tier)

Nomination Package

2015. 07

Prepared by Yeongyang Dark Skies Committee
Proposal to the International Dark-Sky Association

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1. Letter of Nomination

YEONG YANG
379-1 Seobu-ri, Yeongyang-eup, Yeongyang-gun, Gyeongsangbuk-do, Republic of Korea
Tel 054-680-6031 Fax 054-680-6059

July 10, 2015
IDA Board of Directors
3223 North First Avenue
Tucson, AZ 85719

Dear IDA Board Members,

Please accept this nomination packet of Yeongyang Eco Park for International Dark-Sky Park Designation.

The designation as a Dark Sky Park is great step towards recognizing and promoting the value of Dark Sky communities throughout Korea.

This nomination packet seeks to demonstrate that Yeongyang Eco Park is uniquely blessed with characteristics closely associated with "Silver Tier Designation".

Please feel free to call upon me as you carefully consider the acceptance of this nomination packet seeking the Dark Sky Park Designation of Yeongyang Eco Park.

Sincerely

Yeong Taek Kwon
Mayor of Yeongyang County
82-54-680-6004

37, Guncheong-gil, Yeongyang-eup, Yeongyang-gun, Gyeongsangbuk-do /
Tel(Rep). 82-54-682-2241 / Fax(Rep). 82-54-683-2246

2. Letters of Support

The following letters document both local and wide-ranging support for Yeongyang Eco park(Fireflies eco park & Ecological Landscape Preservation Area) being designated as an "International Dark Sky Park" :

Si-hong Kim, Chairman, Yeongyang County Councils

Wonkil Jeong, IDA Daegu GyeongBuk Korea Chapter

Yung-Tak Park, Director, Yeongyang Natural Eco Park Administration Office

Soo-jong Kim, Representative, Yeongyang Firefly Conservation Committee

Ju-Bong Jang, Resident Representative

Hyungbin Choi, Director, Korea Astronomy & Space Science Museum Association

YEONG YANG
379-1 Seobu-ri, Yeongyang-eup, Yeongyang-gun, Gyeongsangbuk-do, Republic of Korea
Tel 054-680-6031 Fax 054-680-6059

July 03, 2015

IDA Board of Directors

3223 North First Avenue

Tucson, AZ 85719

Dear IDA Board Members,

As the chairman of the County Council representing the residents in Yeongyang, I want to submit this nomination letter of support for Yeongyang as a designated "International Dark Sky Park" qualified park which will be the first in Korea and Asia.

Yeongyang has been the home of the Sun and the Moon for a long time and the most remote area with clean environment. Yeongyang, where the nature is alive, was the first in Korea to be designated as the Firefly Ecological Special Zone and the Conservation Area of Landscape and Natural Environment. Even though we worshipped the Sun and the Moon and the children developed their dreams staring at the clear dark sky since ancient times, the area of emotional stability and developing dreams for the children has been consistently decreasing. Yeongyang, where my family is, has the best environment to instill children in appreciating nature and enjoy all the rich surroundings by interacting with nature. If IDA, a front leader of the world for the preservation of the dark sky and the environment, designates Yeongyang as the International Dark Sky Park, I think we are all moving a step closer to our goals for the conservation of clean and beautiful dark sky.

For these reasons, I strongly support such a worthy cause on designation of Yeongyang International Dark Sky Park.

Sincerely yours,

Si-hong, Kim

Chairman, Yeongyang County Councils

Cellula Phone : 82-10-3547-1619

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June 15, 2015

IDA Board of Directors
3223 North First Avenue
Tucson, AZ 85719

Dear IDA Board Members,

As a professor at Daegu Haany University and a current leader of The Korean Chapter of the International Dark Sky Association as well as an amateur photographer, I realized the seriousness of light pollution whenever I visited the dark sky preserved area.
After I have gotten to know the International Dark Sky Association in 2013, I have desperately realized the importance of preserving the beautiful dark sky and therefore have set a goal to have Yeongyang Fireflies Ecological Preservation Zone to be the first dark sky in Asia to be designated for the Dark Sky Park.

In October of 2013, I visited the headquarters and met up with Scott Kadel and John Ballentine to learn more about the necessary arrangements and process for the preparation. While there, I visited the Natural Bridges, Sedona, Death Valley and Bryce Canyon parks. After observing the main facilities and programs, I became even more confident about the Yeongyang Fireflies Ecological Preservation Zone becoming the first Dark Sky Park in Asia. Henceforth, with the collaboration of the Yeongyang County governor and other officials, we have set up a committee to pursue this project.

During the preparation process, we were able to hold an International seminar with many professionals and citizens concerning the importance of the dark sky and were able to introduce a variety of the many programs of the Yeongyang Firefly Ecology Park to the media. I believe through these efforts, many local authorities were influenced concerning the prevention of light pollution.

I am very excited and pleased, both as an IDA Chapter Korea and a member of the Yeongyang Dark Sky Committee, to dedicate my support to Yeongyang Firefly Park as the first "International Dark Sky Park" in Korea and Asia.

Sincerely yours,

Wonkil Jeong
A professor at Daegu Haany University, IDA Daegu GyeongBuk Korea Chapter
Cellular Phone : 82-10-2520-2963

YEONG YANG
379-1 Seobu-ri, Yeongyang-eup, Yeongyang-gun, Gyeongsangbuk-do, Republic of Korea
Tel 054-680-6031 Fax 054-680-6059

June 30, 2015
IDA Board of Directors
3223 North First Avenue
Tucson, AZ 85719

Dear IDA Board Members,

I have worked towards the development and prosperity of Yeongyang for more than 30years, and now as the director of Yeongyang Natural Eco Park Administration Office, I am one of the people who is trying to maintain Yeongyang's purity.

The vicinity of the Yeongyang Natural Eco Park is a very remote village in Korea. Along with clean water and beautiful natural landscapes of Sooha valley, the training of the minds and practicing spaces are created so that our future generations could develop spiritually and fill their thoughts with hopes and dreams. It is outstandingly beautiful for reaching for the stars and space exploration, and tracing the cultural scent in the feast of fireflies in summer nights through the clean dark sky. We have done a lot of work to awaken the nature's importance to our growing generations and the city people who are suffering from industrialization, urbanization and artificial illumination in cities. I believe these efforts are parallel to what International Dark Sky Association is trying to seek.

In order to maintain the park forever, where the smell of nature, beautiful dark sky and the area for city people to come and enjoy to the nature, I strongly recommend that Yeongyang Firefly Eco Park is an excellent candidate for the designation of International Dark Sky Park.

Thank you for your careful consideration.

Sincerely yours,

Yung-Tak Park
Director
Yeongyang Natural Eco Park Administration Office
Office Phone : 82-54-680-5300

Hot yeong yang

July 02, 2015

IDA Board of Directors

3223 North First Avenue

Tucson, AZ 85719

Dear IDA Board Members.

The Yeongyang Firefly Conservation Committee, aiming to preserve and restore the natural environment where fireflies could inhabit, was founded in March of 2004 and is a leading environmental organization representing this area with the pride of the environment keepers. And to further its aims, the committee has arranged various exemplary programs and events such as flying the firefly event, releasing larvae event and habitat protection programs for the fireflies through the nature purification activities.

Firefly is an insect that could exist only in a very clean environment. To encourage firefly growth and foster wildlife habitat, artificial lighting should be minimized and the surrounding environment should be kept in its natural looks.

Yeongyang Firefly Ecological special Zone is a well-maintained environment. To protect the wildlife refuge and act as an environmental educational center, the committee is consistently engaging in handing its clean environment down to posterity.

The purpose of designation for Yeongyang International Dark Sky Park is protecting the night sky from light pollution caused by the excessive artificial lights and preserving beautiful and clean dark sky for the best ecological environment. I believe Dark Night Skies is a natural resource worth protecting, therefore I fully support this effort to be designated "International Dark Sky Park". If there is anything else I can offer in the way of support or assistance, it would be my pleasure.

Sincerely yours.

Soo-jong Kim

Representative

Yeongyang Firefly Conservation Committee

Hot yeong yang

June 30, 2015
IDA Board of Directors
3223 North First Avenue
Tucson, AZ 85719

Dear IDA Board Members,

As the representative of the village living in the Yeongyang International Dark Sky Park to be designated, it is my honor to completely support my hometown to be designated as International Dark Sky Park.

In today's society, the environmental pollution such as air pollution, water pollution, light pollution and other pollutions caused by urbanization and industrialization has created serious problems and issues.

My hometown is the area where fireflies live in the natural habitat and various animals and plants including goat, otter, endangered or rare wildlife species find homes. This ecological environment can boast on uniquely shaped stones, beautiful natural scenery where the water flows through the valley, and where many Geumgang pine trees stand. The Yeongyang Firefly Observatory was built since this area meets the best conditions in observing stars due to no light pollution and excellent brightness at night. And many astronomical observation clubs from the nation are coming to study beautiful dark sky. By minimizing the light pollution through the efficient use of artificial lightings, we could contribute to the restoration of the environment and conserve wild-life animals and plants from the light pollution. I greatly hope that we could preserve the beautiful ecological landscape and the night sky. With respect of the establishment purpose and activities of IDA, my thoughts are with the people who are working toward the Yeongyang International Dark Sky Park.
Thank you for your consideration.

Sincerely yours,

Ju-Bong Jang
Resident representative

KASMA
(사)한국천문우주과학관협회

July 6, 2015

IDA Board of Directors
3223 North First Avenue
Tucson, AZ 85719

Dear IDA Board of Directors,

I'm the director of the Daejeon Citizens' Observatory and the Korea Astronomy & Space Science Museum Association.
Being the first citizens' observatory in Korea, the Daejeon Citizens' Observatory has been sponsoring events of Astronomy & Space Science and Art and Culture(A Starlight Concert, and Poetry Reading under the starlight).
The Korea Astronomy & Space Science Museum Association works with the National Science Museum, the Korea Astronomy and Space Science Institute, the Local Citizens' Observatories, the Astronomical Space Theme Science Museum, 17 Education and Science Research Institutes, and Youth Training Facilities to promote advancement of the astronomy & space science and to expand public awareness.
Due to light pollution, places to observe stars at night has been decreasing in Korea. On behalf of the astronomers in Korea, I would like to express my support in designating the Yeongyang Fireflies Eco Park as an "International Dark Sky Park."
Yeongyang is one of the very few remote villages in Korea where the skies still remain very dark. These days where people seem to overlook the issue, I believe the preservation of dark skies is of vital importance.
Along with the support for designating the Yeongyang Fireflies Eco Park as an International Dark Sky Park, the Korea Astronomy & Space Science Museum Association has been measuring the night sky brightness, in order to protect and preserve the night skies in Korea, by deploying the networks of the national observatories. With the designation of the "International Dark Sky Park", we hope that this will lead to raising awareness of the importance of preserving our dark skies and a broader conservation.
As one of the astronomers in Korea, I write this letter to support the Yeongyang Fire Flies Eco Park's application to become the first International Dark Sky Park in Korea and Asia.

Sincerely

Hyung Bin Choi, Director
Korea Astronomy & Space Science Museum Association
Office Phone: 82-42-861-1108

3. Yeongyang County History and Information

3.1 General Information of Yeongyang County

Yeongyang, a county blessed by heaven with a wonderful natural environment and an abundance of mountains and forest resources, is renowned for its beautiful dark sky. The county is a treasure-house of brilliant culture with numerous cultural treasures handed down from ancestors. It is also the birthplace of many patriots and scholars. Thus, the county is a comfortable and affluent place for living an eco-friendly life due to the pure and pollution-free agricultural products.

Yeongyang is a typical rural community with an area of 815.09㎢ and a population of 20,000, with 65% of the population engaging in a primary industry, 12% in a secondary industry and 23% in a tertiary industry. Being the highest mountain town in Gyeongbuk province, there are high mountains located in the northern area with lower hilly terrain, which often shows frost, located in the southern area.

The yearly average temperature range of 22.3℃ indicates the typical mountain climate of this village. Yeongyang, an inland county located in the northern part of the middle east in Korea, has a great reputation for live ecological preservation, based on a purely natural environment.

<Figure 3.1 Yeongyang County Site>

3.2 Security of various regional programs for treasure-house and preservation of live eco

For the first time in Korea, a Special Ecological Zone for fireflies was designated and a National Endangered Species Restoration Center was established in Yeongyang. And because of the second largest wind power plant in Korea, which helps maintain the clean environment, an eco-friendly energy system was built. This environmental system for harmonized living between nature and humans was also built in the designated conservation area of the Wangpi river basin.

Also, a top-quality local specialty food from this region is Yeongyang' s red pepper, grown under its fine sunlight. Because of the special features of Yeongyang's continental climate in which temperature differences between hot and cold are extreme, conditions are perfect to grow the red peppers. Therefore, the taste and spicy scents of the red peppers are vastly superior to others. A fine chili powder is made from these peppers. This chili powder has a fine and clear color, floats on the water, and ha a rich taste that can be made with only a small amount. Being the best quality chili powder in the world; it is produced by Yeongyang Red Pepper Trade Company using an up-to-date continuous dry system which has certifications of HACCP for sanitary facilities, ISO22000 for the globalization of quality management, and Traditional Food Quality for product superiority.

Umsikdimibang, which was written 340 years ago based on local specialty products, is the cookbook written by a scholar, Jang Gae Hang (1598~1680) from a gentry family in Yeongyang, Gyeongbuk province. This cookbook, which was made for her descendants while in her 70' s, introduces the recipe, methods of storage for fermented food, and means of food storage for the food originally made in the families that lived in Gyeongbuk area during the middle and the end of the Chosun dynasty. This is the first food encyclopedia in Korea and the best existing cookbook written in Korean(Hanguel).

It also introduces the foods inherited from the past or developed by scholar Janggaehang herself and introduces recipes of special foods for the noble families. It is a very important reference book for studying and understanding the Korean' s dietary life in the middle of 17th century.

		
Yeongyang firefly observatory	Yeongyang' s red pepper	Umsikdimibang
		
Yeongyang firefly Eco Park	National Endangered Species Restoration Center	Yeongyang' s wind power plant

3.3 The sun, The moon and the home of Mount Ilwol, Yeongyang

An abundance of stories related to the sun and the moon has been in existence in this area for a long time. Many children' s folk-tales were written with the topic of the sun, the moon and the forest and the name Mount Ilwol, a mountain located in the center of Yeongyang, bears a root meaning of these three words.

The character "Sun" grew up imagining creative dreams by eating wild herbs and clean vegetables and became Haennim (meaning bright sun in Korean), brightening the whole world, the "Moon" became Dalnim (meaning bright moon in Korean), brightening the dark nights in order for children to sleep peacefully and dream at the place where the sun had passed by. The mountains and the forest represents a mother' s warm and loving heart which embraces nature. This is how Mount Ilwol's name was derived.

<Figure 3.2 Summer of Mount Ilwol>

This mountain is also considered a Spiritual Site similar to Sedona National Park in Arizona

Like Sedona, which many believe has the strongest spiritual energy in the world, Mount Ilwol is also a place where people have been looking to receive the energy, which according to folk belief, has been forming for a long period of time.

Furthermore, Mount Ilwol is known as a female mountain having yin energy. The last day of every month, all shamans from the nation come to the mountain for an invocatory rite of a would-be (spiritualistic) medium. The mountain is also worshiped as a sacred mountain by the shaman. When the most well-known ritual takes place, Mount Ilwol is the first mountain spirit to be called.

<Figure 3.3 Exorcism Performance>

Many shamans pray for the peace and wellness of families living throughout the mountain which is considered a home of the folk culture.

3.4 Yeongyang, home of the literature.

Yeongyang, an area having the moon and the sun for a long period of time, has produced many writers who have written many stories. It is home for more than 13 writers representing Korea including writer Lee Moon-Yeul, a modern lyric poet; Oh Ildo; and Chung-lok group poet, Cho Ji-Hoon.

"Our Twisted Hero", "Age of Hero" and "Portrait of youth", all written by Lee Moon-Yeul were successfully adapted to film and are still loved by the Koreans.

		
Cho Ji-Hoon(poet)	Oh Il-do(poet)	Lee Moon-Yeul(writer)

3.5 Hub of the National Endangered Specifies Preservation

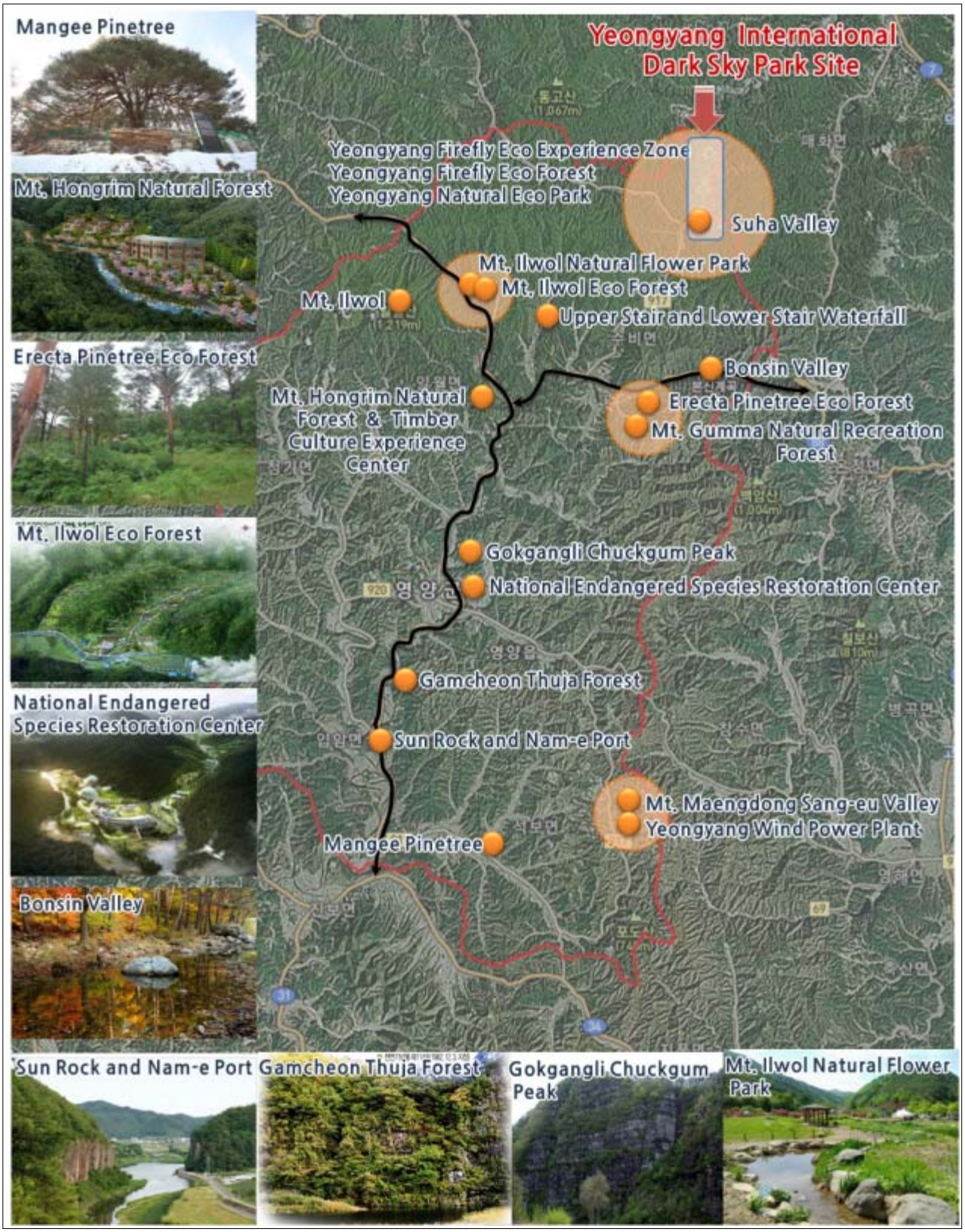
The National Endangered Species Preservation Center is a comprehensive restoration center. It is a center for education and systematic research as well as a place to preserve and research endangered species unique to Korea. If the center is to be built in the clean Daecheon area of 2,584㎢, it is expected to play a big role in restoring and preserving unique Korean biological resources and boost Yeongyang eco-tourism.

<Figure 3.4 National Endangered Species Preservation Center>

3.6 Yeongyang wind power plant

Since carbon emission, due to the excessive use of fossil fuel, is depleting the ozone layer causing many environmental problems, Yeongyang built a wind power plant in the area in 2007 and has been supplying eco-friendly wind power energy. This wind power plant is the second largest in Korea and is contributing in building eco-friendly energy system by reducing air pollution occurring from the combustion of fossil fuels. The total of 41 generators are producing 154.9MV(1.5~3.3MW x 41 generators) eco-friendly power and this is the capacity for 100,000 households to use yearly. These wind power facilities preserve the air and space environment of Yeongyang, which in turn help in sustaining the clean dark sky.

<Figure 3.5 Yeongyang wind power plant>



<Figure 3.6 Eco Resources of Yeongyang County>

4. Yeongyang International Dark Sky Park Site History and Information

4.1 Firefly Eco park and Observatory, Youth training center, Wangpi river and Ecological landscape protected area.

- Ecological environmental education and experience of astronomical observation

The intended area with 390ha of Yeongyang International Dark Sky Park includes a Yeongyang firefly special zone and an ecological landscape protected area. Suhari which is 30km away from Yeongyang is still preserved in its natural state and has Jangsoo creek and Wangpi river creek flowing freely. Yeongyang Firefly Observatory, Firefly Ecology School, Eco Park and Eco Experience Village are located in this area. The Observatory, Eco School, and Youth Training Center operated by the Nature Eco Park Management Office is becoming the Mecca of a nature Eco experience.

Yeongyang firefly observatory is a citizen-oriented observatory which was opened in September, 2005. This observatory, located in the special firefly zone of Eco experience village, is the one and only place in the country for the astronomical observation of the stars of the night in summer together with fireflies living in the nature. During the day, you can observe sunspots and red flames using a helioscope and at night you can observe the plant, nebulas, star clusters, galaxies and the moon. Due to the astronomical telescope and astronomical projection chamber, the stars can always be observed in a room without the restrictions of weather and time. People can enjoy the displays of the universe on the 1st and 2nd floors of the observatory and the telescopes installed on the 3rd floor show the stars in the night sky.

The main 16 inch catadioptric telescope from the MEAD installed at the prime observing capsule is helping visitors to observe nebulas, star clusters and other phenomenon. At the assisted observing capsule installed with 4 refracting telescopes and 4 reflecting telescopes, visitors can view the constellations in the night sky and observe planets such as Saturn and Jupiter along with the Moon, nebulas and star clusters.

Even though Yeongyang firefly observatory is small in size, this is the place where you can see lots of stars in the dark sky and can always see the galaxy on fine summer evenings.

The place where Yeongyang firefly Eco school and observatory was built was previously a branch of an elementary school. The Eco school is a compact place of living organisms growing naturally in Yeongyang. Visitors can see various plants, animals and insects such as the Yeongyang deer longicorn living in Yeongyang and can also experience programs such as making wooden necklaces and making insect specimens.

Firefly Eco school also operates the greenhouse and Eco park. The greenhouse offers visitors the educational experience of actually observing and feeling wildflowers growing in Yeongyang, native fishes living in JangSooPo Creek, and by raising and releasing fireflies, butterflies, insects and so on. Because of a pollution-free Yeongyang, Firefly Eco Park is the largest habitat for fireflies in Korea. Its space showcases the beauty of natural landscapes and the importance of clean environments by providing various nature-related experiences which are not possible in the city. Since Eco Park created a natural habitat for the fireflies to exist, many tourists are visiting here every year for the numerous flying firefly events.

Firefly observatory, Eco school and Eco Park in 1,938.529m2 was designated as a Special Zone of Yeongyang Firefly Eco Experience Village. Firefly Eco village and its access road were built as a landscape farming zone in order to protect the firefly habitat. Environmentally-friendly agriculture (organic rice) in this area helps it's resident income and boosts tourism. The festivals which use fireflies and other insects invite many tourists, promote Eco village, and sell the environmentally-friendly agricultural products produced in the Special Zone.

The site scheduled to be designated as YeongYang Dark Sky Park includes the very important Wangpi River ecological and landscape preservation area designated by the National Environmental Office.

<Figure 4.1 Agricultural Zone around the Firefly Live Eco Park>

The land of the Yeongyang International Dark Sky Park is composed of 68.2% state land and 31.8% is privately owned. In accordance with the law or ordinance of the Natural Environment Conservation Zone and the Firefly Conservation Zone, all constructions and lighting installations should be approved by the Yeongyang Coun

<Table 4.1Status of land ownership inside the Yeongyang International Dark Sky Park>

	public land	private land	total
area(ha)	266	124	390
percentage(%)	68.2	31.8	100

<Figure 4.2 Yeongyang International Dark Sky Park Site>

4.2 The Status of Each Area

4.2.1 Yeongyang Firefly Special Zone

This special zone was designated for the purpose of research and education on natural environments, ecotourism, and for selling eco-friendly agricultural products through the Firefly Live Eco Experience Village. Yeongyang youth training center, Firefly Eco School, Firefly Observatory, Firefly Eco forest and family resort are also built in this area.

Firefly special zone was designated and opened on 2005 and is operated by Yeongyang Nature Eco Park Management Office for systematic operation.

Firefly Eco School

Firefly Eco School, which is operated by Yeongyang-gun and which opened on 2005 is a public science museum consisting of Firefly Observatory, Firefly School and Firefly Eco Park.(http://np.yyg.go.kr)

Through the planetarium projection and observatory room, the main facilities of The Firefly Observatory, and the exhibit room for the growth and raising of fireflies, visitors can experience and learn of celestial bodies and fireflies. The visitors consist of families or other groups.

The Main education programs of Firefly Observatory include watching the animation in the planetarium projection room, observing dark night skies, making horoscopes, observation of total eclipse, learning about timing by sundial, making a model of telescope, public observation meetings, astronomical picture exhibitions and also other various programs.

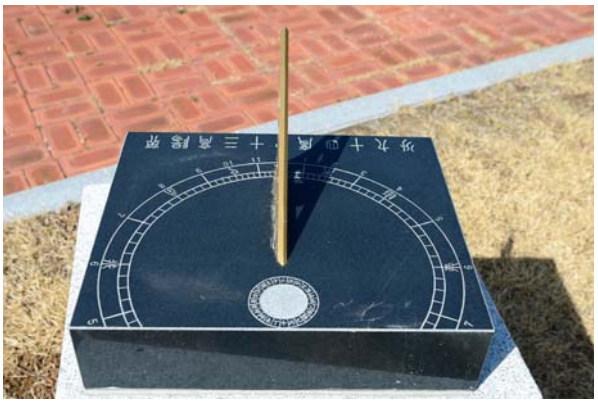
A model of Chumsung Dae of a representative observatory in Korea which was built 1,400 years ago has been installed in front of the Firefly Observatory. Chumsung Dae teaches us a long observation history of the stars and has important meaning.

<Table 4.2 The status of Yeongyang Firefly Observatory facilities>

1. Planetarium projection dome ① 4D image experience room, 8M dome, 43 seats 2. Main observation room ② 406.4mm Schmidt Cassegrain' s telescope, 7M dome 3. Assistant observation room ① 7m X 8m Sliding Dome ② 150mm refracting telescope 3 levels ③ Helioscope 1 level ④ 250mm reflecting telescope 1 level ⑤ 200mm reflecting telescope 1 level. 4. Observation objects : Sun, Moon, Planets, Nebulas, Star clusters

<Figure 4.3 The panorama of Yeongyang Firefly Eco School>

<Figure 4.4 The facade of Yeongyang Firefly Observatory>



<Figure 4.5 Sundial>

<Figure 4.6 Sub Observation Room>

<Figure 4.7 Main Observation Room>

<Figure 4.8 Inside Firefly Observatory>

<Figure 4.9 A Model of Chumsung Dae in Firefly Observatory>

The Firefly Eco School consists of a firefly breeding facility, as well as an exhibition of various insects, and endangered species. Through these facilities, the Eco School shows visitors breeding sites of fireflies, native fish habitat environment and offer direct experience of insect observation.

In order to reinforce these activities, the Eco School has been hosting The Firefly festival every June which emphasizes the importance of environmental preservation.

<Figure 4.10 Yeongyang Firefly Live Eco Exhibition>

<Figure 4.11 Firefly Live Greenhouse>

<Figure 4.12 Yeongyang Firefly Exhibition, Inside>

<Figure 4.13 Yeongyang Firefly Greenhouse>

<Figure 4.14 Yeongyang Firefly Exhibition, Inside>

<Figure 4.15 Yeongyang Fireflies Breeding Farm>

To preserve the delicate environment of the fireflies, an eco park has been created with an observation trail where natural monitoring can take place; and here in this eco park the Release of Fireflies event is held annually

<Figure 4.16 Yeongyang Firefly Eco Park>

<Figure 4.17 Yeongyang Firefly Eco Park>

<Figure 4.18 Yeongyang Firefly Eco Park Observation Trail>

<Figure 4.19 Yeongyang Firefly Eco Park Observation Trail>

<Figure 4.206 Yeongyang Firefly Festival>

<Figure 4.21 Yeongyang Firefly Larvae Release>

Eco-friendly lodging facilities were also built so that visitors to the Breeding Farm could enjoy the surrounding nature. In this family-friendly lodge, cooking is possible and it is also suited for group visitations. Visitors are welcome to simply come and enjoy the beautiful dark skies, fireflies, and nightlife without special equipment or preparation.

<Figure 4.22 Yeongyang Firefly Resort>

Firefly Eco Forest

Along with Firefly Eco School, Firefly Eco Forest provides a therapeutic walking path where people can relax their minds and bodies while preserving the original forest vegetation. SuHaLee is especially noted for having the best eco environment in Korea and plays a role in visitors regaining energy through a diverse experience of nature.

The Firefly Eco Forest, which was officially opened to the public in 2011, covers a total area of 62ha and it includes a public restroom and an information center. Within the Eco Forest, there are a variety of recreational facilities.

<Figure 4.23 Firefly Eco Forest Guide Map>

<Figure 4.24 Firefly Eco Forest Visitor Center>

<Figure 4.25 Firefly Eco Forest>

<Figure 4.26 Firefly Eco Forest Pine-wind Square>

<Figure 4.27 Firefly Eco Forest Pine-wind Square Panorama>

Yeongyang Youth Training Center

The Youth Training Center is located by the bank of Suha Valley where the water is clear in a beautiful landscape. It is in the center of the area which is proposed to be the International Dark Sky Park. This facility was built to give hopes and dreams to youths, who represent our future. At this center, they can develop a great peaceful spirit through nature by training and experience.

In order to provide a better educational experience through nature, this youth training center also administers programs such as "reminiscing through summer firefly festival", "searching for a cultural scent by cultural exploration", and "a survival game in the virgin forest". These programs are being fully utilized in group retreats, school field trips, and family trips.

Yeongyang Youth Training Center opened in year 2000 and has about 10,000 visitors per year. It includes the following facilities.

<Table 4.3 Yeongyang Youth Training Center & Resort status>

① Youth center : lodging facility, auditorium, conference room, seminar room
② Outdoor theater, family lodging(3)
③ Survival game ground, grass playing field, campground

<Figure 4.28 Youth Center Auditorium>

<Figure 4.29 Youth Center Campground>

<Figure 4.30 Youth Center Panorama>

4.2.2 Wangpi River Basin Ecological Landscape Protected Zone

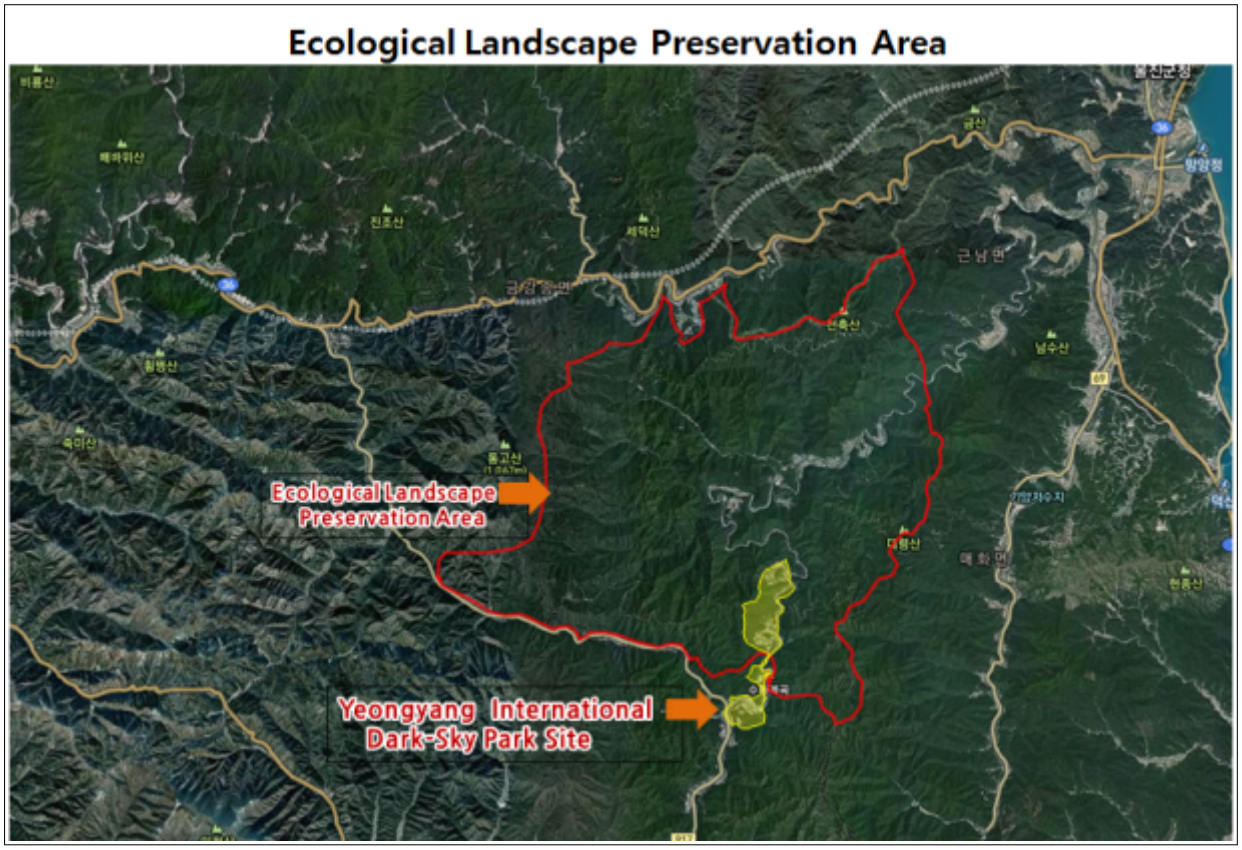
Wangpi River Basin Ecological Landscape Protected Zone consists of an outstanding natural ecosystem where natural wildlife and rare and endangered species such as otters, mountain goats, falcons, wild cats, and martens cohabitate.

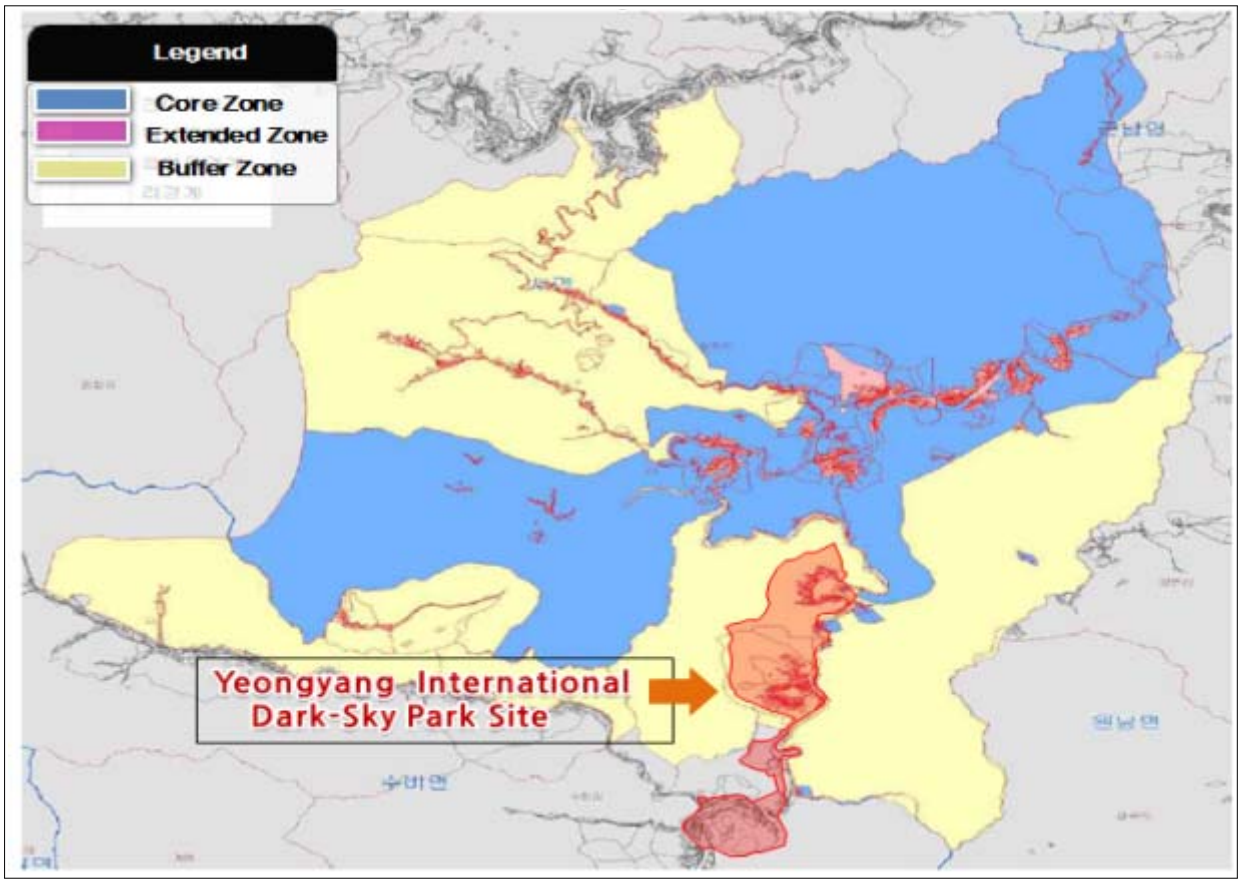
In October 14, 2005, The Ministry of Environment designated this area as a natural ecosystem conservation zone to protect the natural wildlife of this area.

The Ecological Landscape Protected Zone' s gross area is 10,284ha and Yeongyang occupies 1,258ha, which accounts for 12.24% of the total area. The proposed zone of 197ha will be designated for the International Dark Sky Park. This zone is well known for its outstanding aquatic and forest environment which provides a habitat for the endangered species. Wangpi River Basin, with ecological varieties, is a biological repository and has a high landscape value. While limiting development and emphasizing preservation, the forest trail, Eco trail and other eco-friendly areas have formed a biological balance for humans to coexist with nature.

<Figure 4.31 Wangpi River Basin Ecological Landscape Protected Zone>

<Figure 4.32 Wangpi River Basin Ecological Landscape Protected Zone Information Center>





<Figure 4.33 Wangpi River Basin Ecological Landscape Preservation Area>

<Mountain Goat>

<Hawk>

<Otter>

<Yellow Serpent>

<Pinus Densiflora Forest>

<Swertia Wilfordi Kerner>

<Pogonia Japonica Rchb>

<Filipendula Glaberrima NAKAI>

<Figure 4.44 Environment n Wangpi River Basin Ecological Landscape Preservation Area>

4.2.3 SongBang Village and O-Mu Village

Located at the bending of Su-bi valley, SongBang Village and O-Mu Village are typical mountain villages.

Most of the natives in this area gather wild vegetables and grow red peppers and apples which are the regional specialties. Some families engage in private room rentals for the visitors of Wangpi River Live Eco Landscape Preservation Area and Firefly Eco School.

The name SongBang, which means "many pine trees," is a very small village where about 20 families are residing.

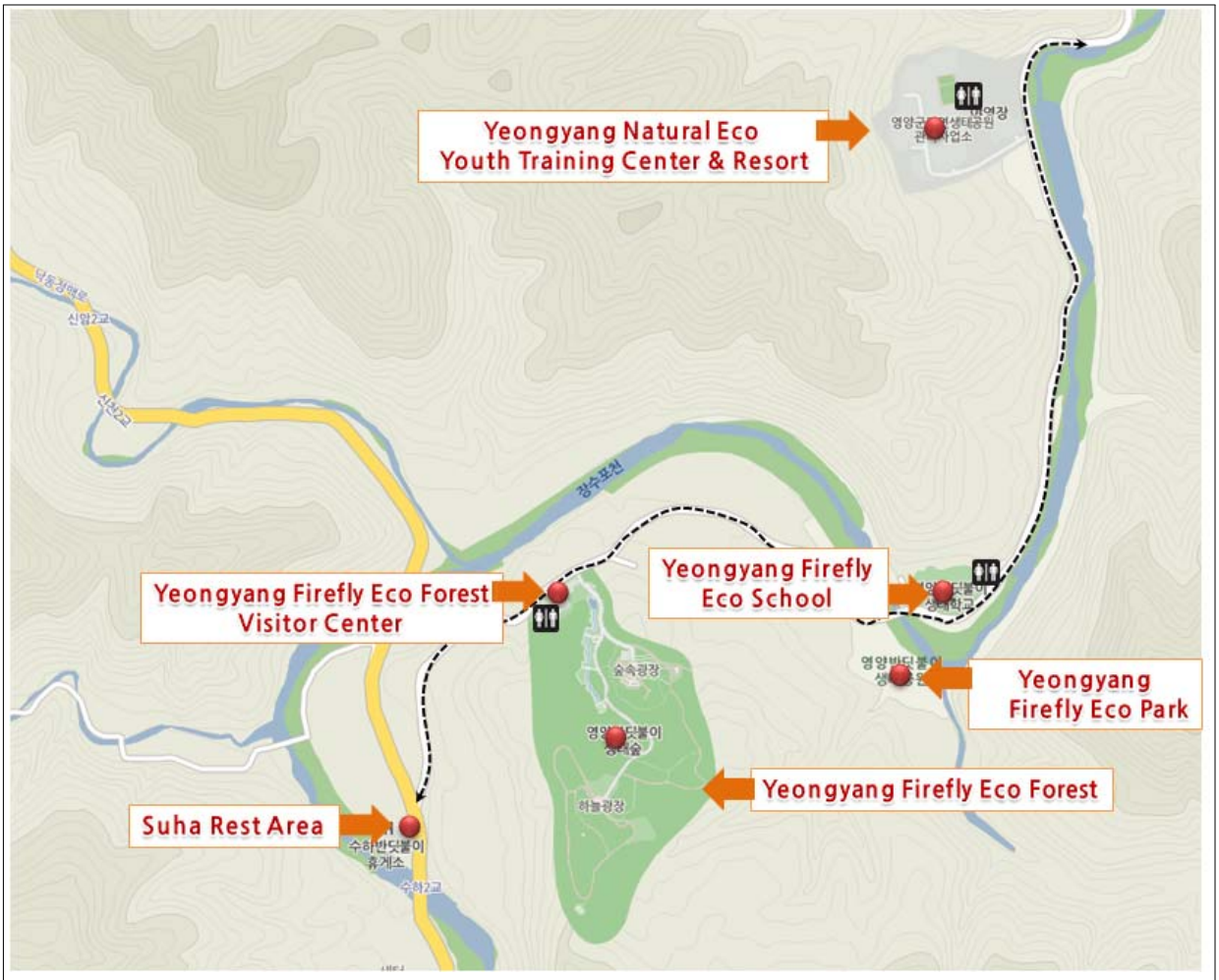
O-Mu village, located at the downstream of Jangsoopo River is a warm village where the Paulownia trees are prevalent around the village and the mountains are very beautiful. It is still called O-Mu since a lot of fish are living due to a clean stream and a deep valley.

<Figure 4.45 O-Mu Village>

<Figure 4.46 O-Mu Village>

<Figure 4.47 SongBang Village>

5. Yeongyang International Dark-Sky Park Site Locations



<Figure 5.1 Site Map 1>

<Figure 5.2 Yeongyang Natural Eco Youth Training Center & Resort>

<Figure 5.3 Yeongyang Natural Eco Youth Training Center & Resort aerial photograph>

<Figure 5.4 Firefly Eco School & Firefly Eco Forest panorama>

<Figure 5.5 Firefly Eco School & Observatory Aerial Photograph>

<Figure 5.6 Firefly Eco Forest Aerial Photograph>

O-Mu Village

SongBang Village

<Figure 5.7 Site Map 2>

<Figure 5.8 Site Map 2 Entrance road>

<Figure 5.9 Sub Site Entrance road>

<Figure 5.10 Su-ha Valley Panorama>

<Figure 5.1110 Su-ha Valley Panorama>

6. Yeongyang International Dark Sky Site Night Sky Quality

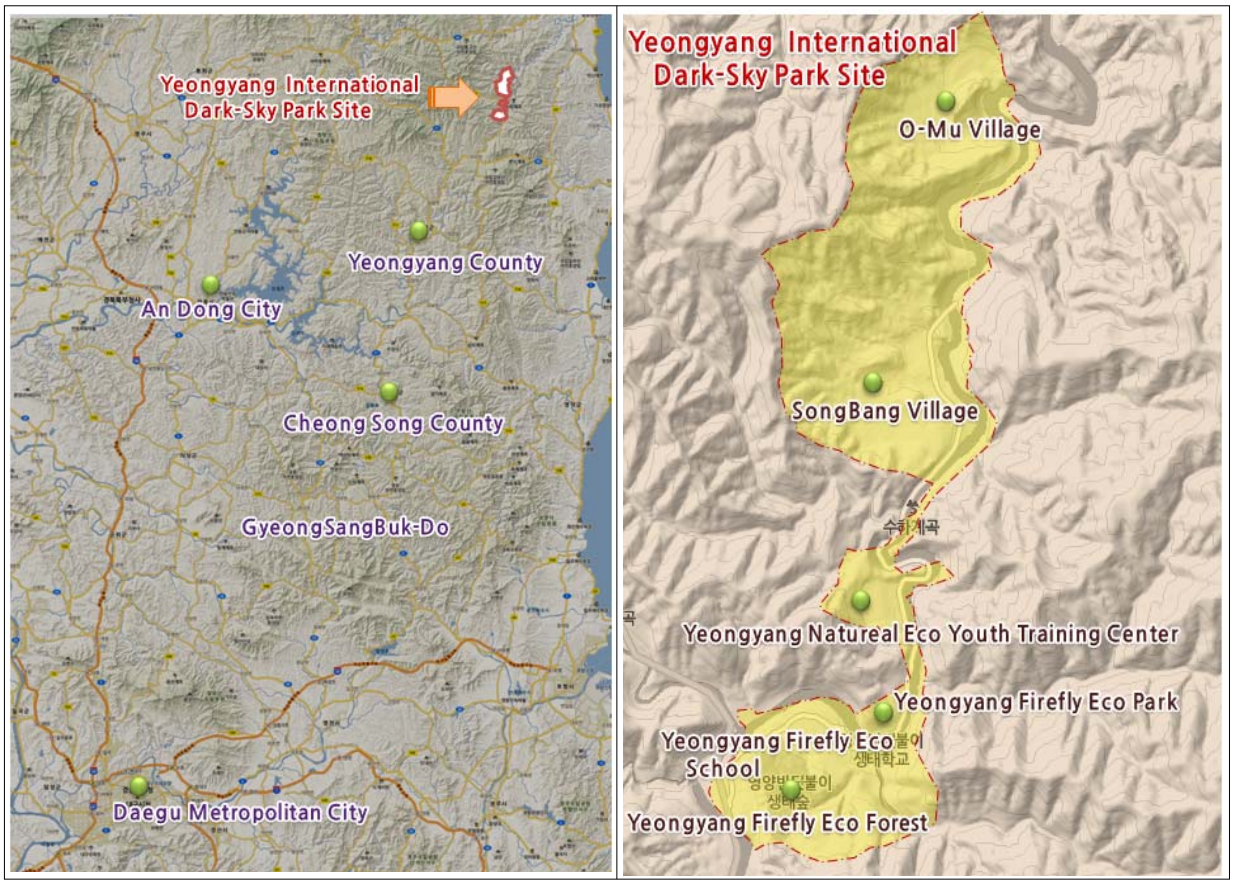
6.1 Contour Maps

Since the contour map of Korea shows too wide a range, an aerial photograph map has been suggested for use.

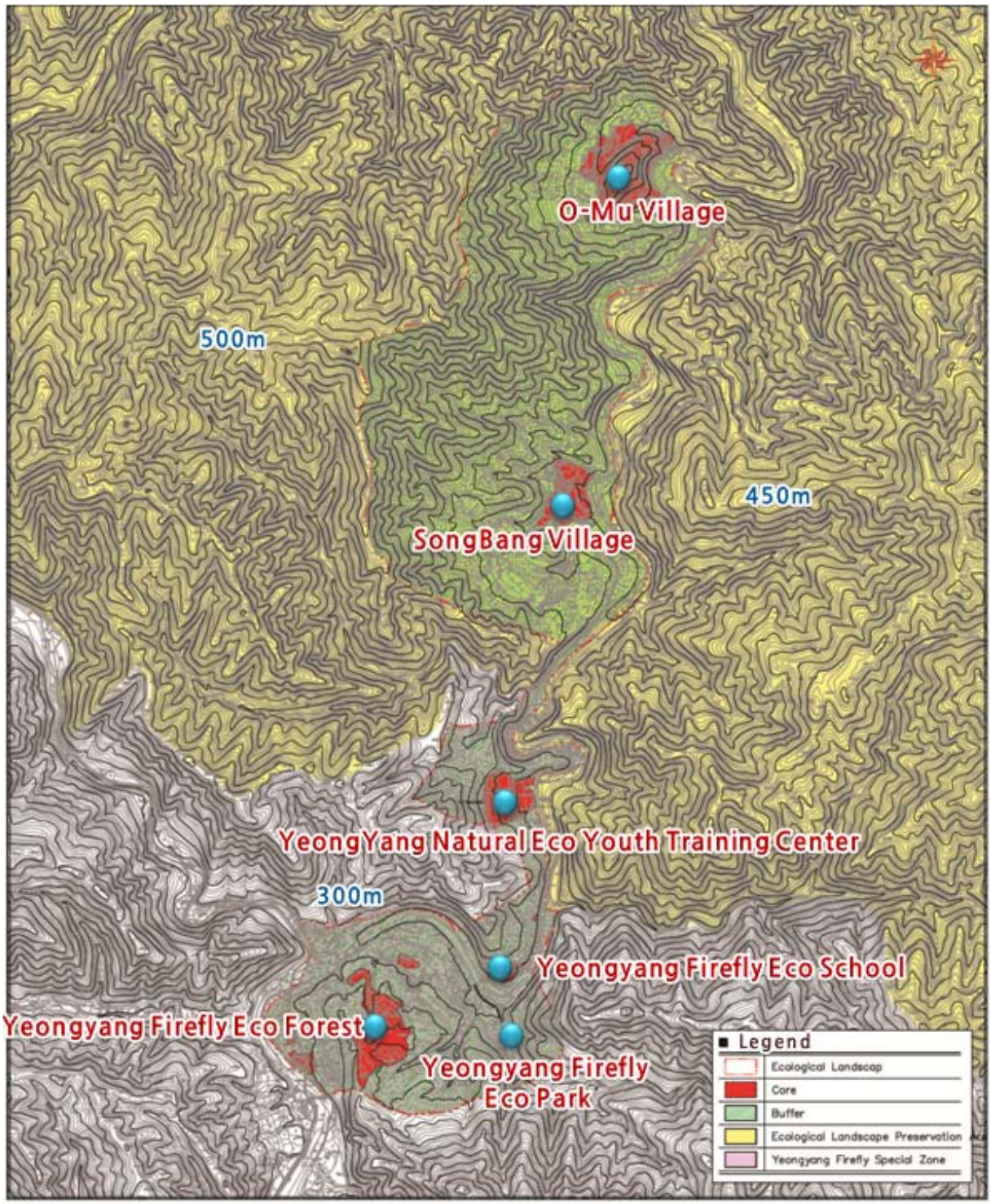
The Mt. Gumjang, located in the vicinity of scheduled proposed area to be designated Yeongyang International Dark Sky Park, is 861m(2,824ft) in altitude and the whole area of Sooha Valley, which is the main selected site is located at an altitude of between 300m to 600m.

Most of the designated park area has an altitude of about 300m(984ft) to 350m(1,148ft)

Big cities near the Site are Andong, Uljin-gun, Cheongsong-gun, Bongwha-gun, and Daegu Metropolitan City.



<Figure 6.1 Area Contour Maps>



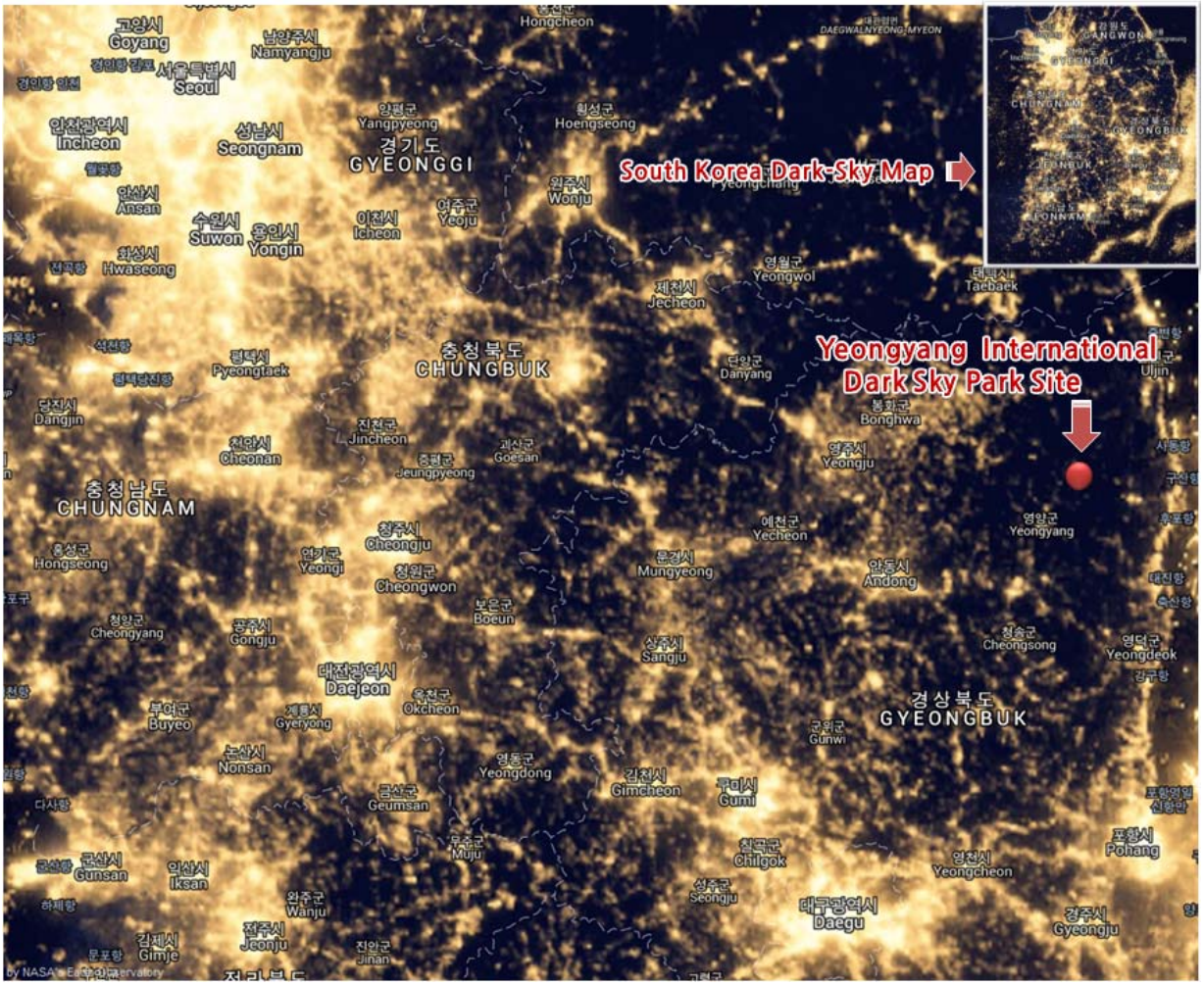
<Figure 6.2 Yeongyang International Dark Sky Park Site Contour Map>

6.2 Satellite Images

The satellite image shows most of The night skies of Korea to be very bright, especially in the capital area of Seoul and other metropolitan cities.

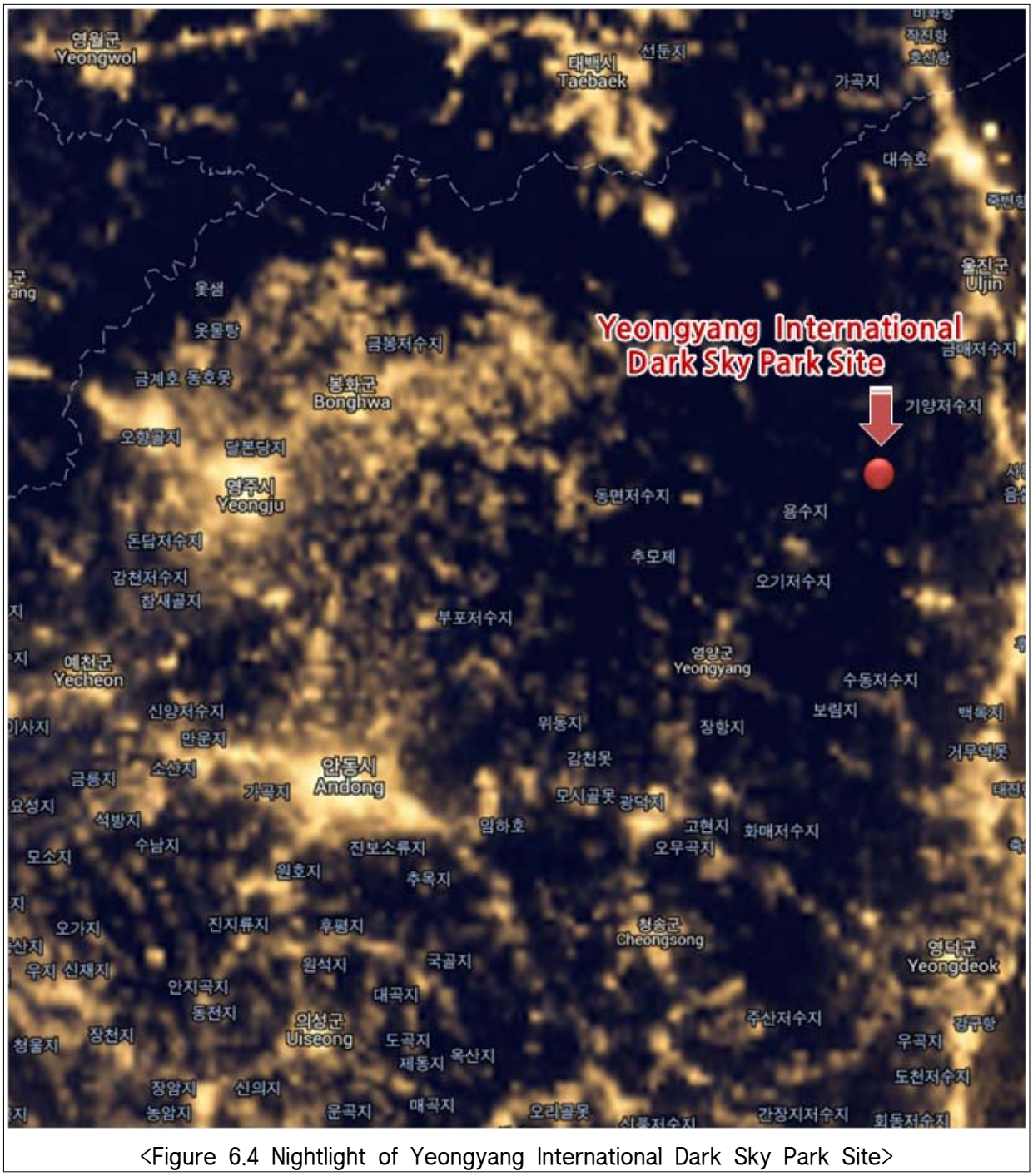
(source : http://blue-marble.de/nightlights/2012)

According to this source, the Seoul area, which is relatively a flatland and has urbanized rapidly, along with the Gyeonggi area, including In-Chon Metropolitan and Chungcheong Province, as well as Daejeon Metropolitan, all look like a single hot-wire and show a very bright night sky. The eastern part of Korea, including Gyeongbuk province which has relatively high mountains, appears to be less bright.



<Figure 6.3 Satellite Image of South Korea>

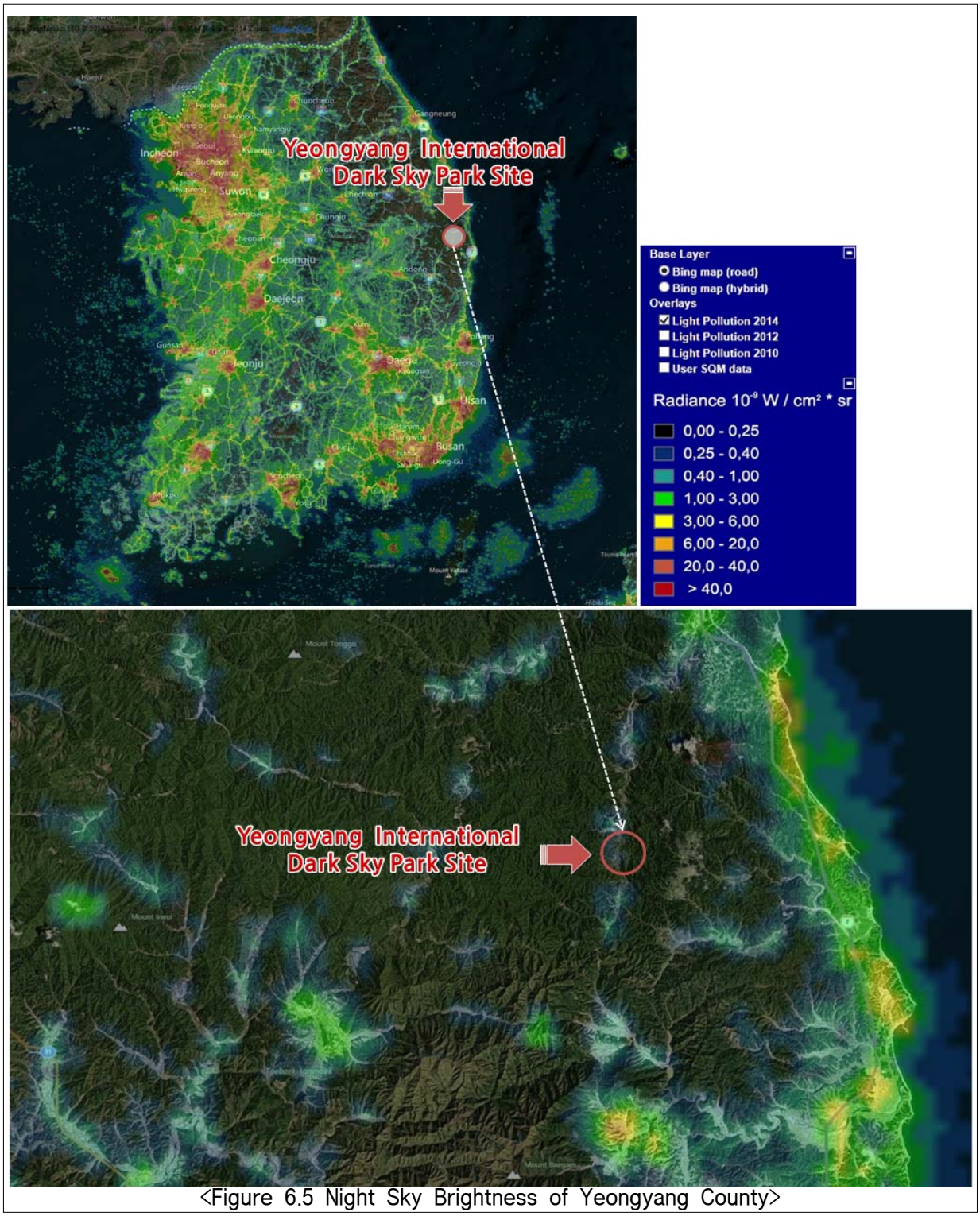
An enlarged images show bright lights in the night sky of Yeongju, Andong, and other cities while Yeongyang County shows in generally a less lighted night sky. The brightness of night sky in the Subi area, scheduled to be the Yeongyang International Dark Sky Park, also shows darkness.



<Figure 6.4 Nightlight of Yeongyang International Dark Sky Park Site>

6.3 Yeongyang County Dark Sky Map

The brightness data of Yeongyang night sky is based on the reference received from www.lightpollutionmap.info.

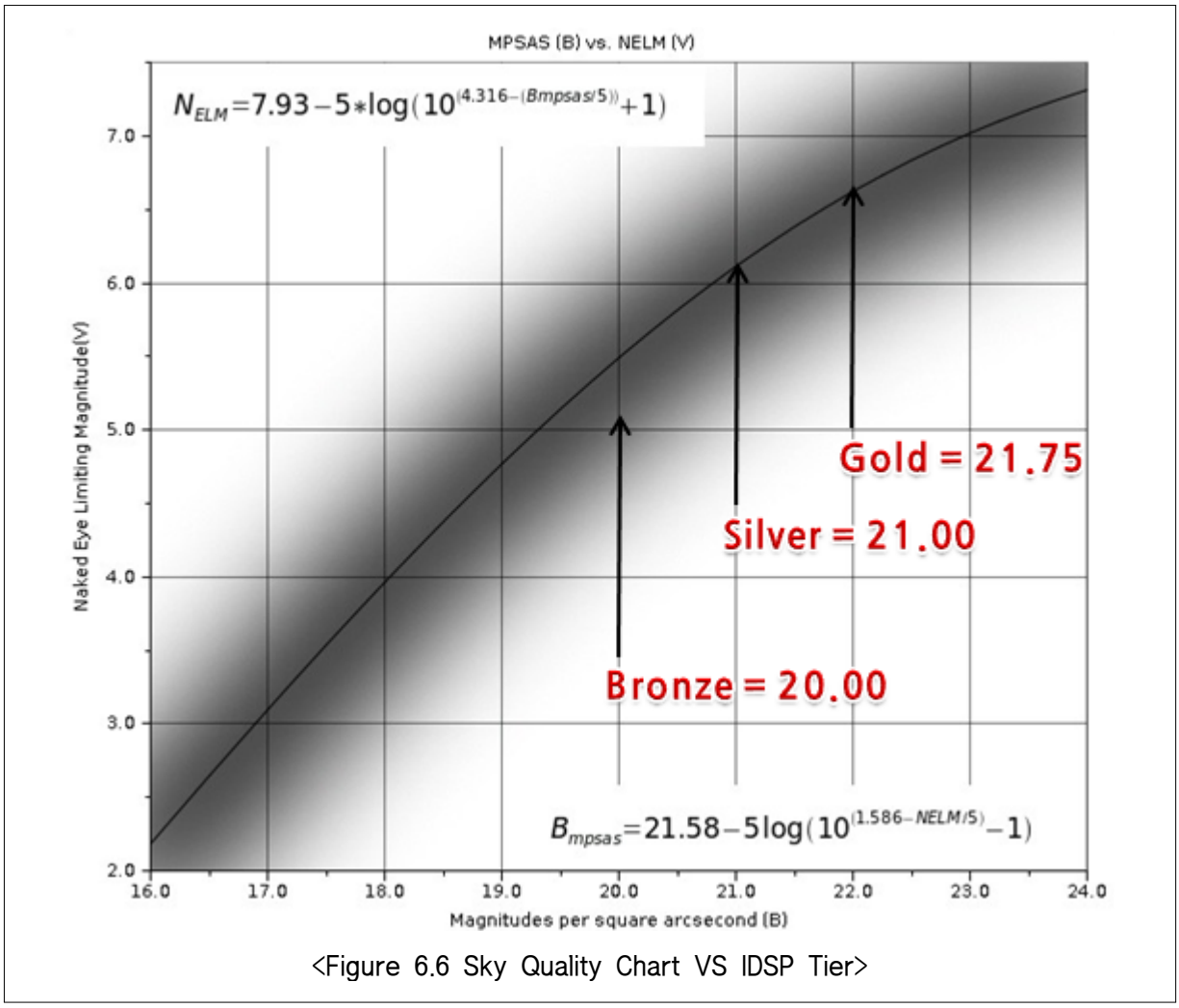


<Figure 6.5 Night Sky Brightness of Yeongyang County>

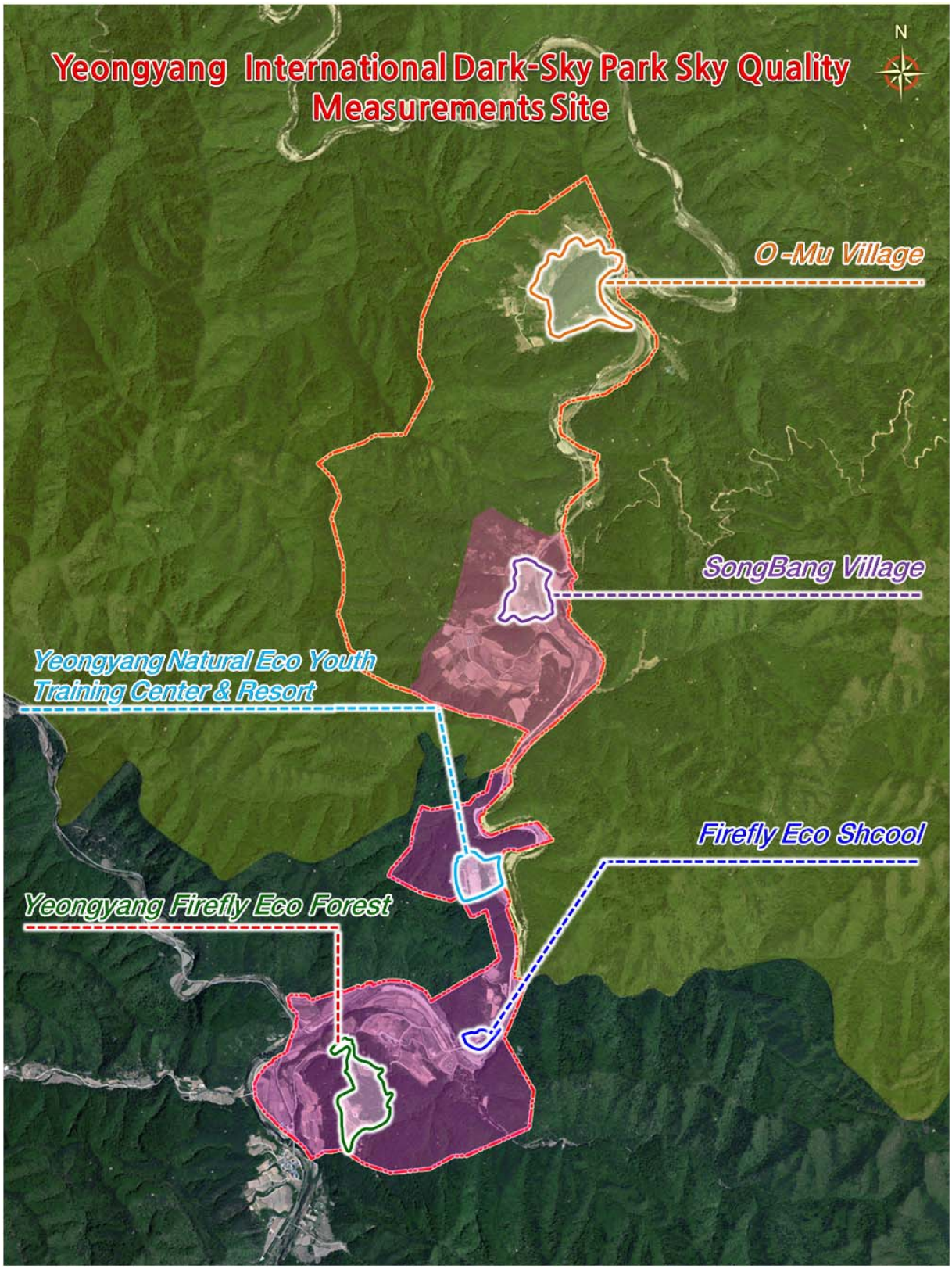
6.4 Sky Quality Measurements

Sky quality measurements were taken 13 times on different nights at four different locations of Yeongyang International Dark Sky Park. From March of 2015, sky quality was measured based on the values measured by the fixed device installed in the observatory.

(http://www.unihedron.com/projects/sqm-l)



<Figure 6.6 Sky Quality Chart VS IDSP Tier>



<Figure 6.7 Yeongyang International Dark-Sky Park Sky Quality Measurements Site>

<Table 6.1 Yeongyang International Dark Sky Park Site Sky Quality Measurements>

Site / Date/Time	Firefly Eco School &(astro-nomical)observatory		Firefly Eco Forest		Natural Eco Youth Training Center		SongBang Village		O-MU Village		Conditions
Lat/Long	N36° 49′ 48.3″ E129° 16′ 10.6″		N36° 49′ 50.0″ E129° 15′ 45.2″		N36° 50′ 15.0″ E129° 16′ 17.1″		N36° 50′ 56.7″ E129° 16′ 26.8″		N36° 51′ 45.4″ E129° 16′ 42.7″		
10/22/2014 (23:00)	20.87	21.08	20.93	21.03	21.01	21.06	20.66	21.01	20.86	20.88	Clouds
	21.13	21.31	21.04	21.04	21.2	21.08	20.68	21.02	21.04	21.01	
	21.29	21.3	21.04	21.06	21.2	21.05	20.89	21.01	20.99	21.01	
	21.16		**21.02**		**21.10**		**20.88**		**20.97**		
12/18/2014 (23:20-00:30)	21.33	21.07	20.79	20.98	21.02	21.06	20.97	20.98	20.87	20.94	some thin clouds
	20.99	20.94	21.07	21.25	21.23	21	20.96	20.97	21.05	20.99	
	21.03	21.13	20.98	20.94	21.29	21.03	21.1	21	20.95	20.97	
	21.09	21	20.91	20.96	21.04	21.02	21	20.9	20.99	21.03	
	-	-	20.97	20.99	21	21.32	-	-	21.08	20.87	
	21.07		**20.98**		**21.10**		**20.99**		**20.97**		
01/23/2015 (23:30-00:10)	21.28	21.33	21.21	21.37	21.32	21.27	21.27	21.23	21.28	21.31	No Clouds
	21.24	21.26	21.36	21.21	21.36	21.29	21.3	21.31	21.25	21.27	
	21.27	21.4	21.35	21.23	21.41	21.28	21.28	21.31	21.27	21.29	
	21.33	21.3	21.38	21.33	21.31	21.34	21.37	21.33	21.3	21.26	
	21.26	21.28	21.44	21.26	21.3	21.33	21.35	21.32	21.33	21.28	
	21.30		**21.31**		**21.32**		**21.31**		**21.28**		
02/19/2015 (23:30-00:00)	21.42	21.49	21.32	21.32	21.35	21.42	21.36	21.32	21.36	21.37	Clear
	21.46	21.49	21.34	21.34	21.36	21.37	21.34	21.31	21.36	21.35	
	21.52	21.51	21.32	21.35	21.38	21.36	21.34	21.33	21.34	21.34	
	21.48	21.52	21.34	21.3	21.34	21.41	21.35	21.34	21.35	21.36	
	21.48	21.54	21.31	21.36	21.39	21.43	21.31	21.37	21.34	21.37	
	21.49		**21.33**		**21.38**		**21.34**		**21.35**		
03/20/2015 (23:30-00:00)	21.4	21.49	21.31	21.32	21.32	21.4	21.33	21.3	21.33	21.33	Clear
	21.42	21.49	21.33	21.3	21.33	21.36	21.32	21.3	21.34	21.35	
	21.44	21.5	21.3	21.3	21.33	21.35	21.32	21.33	21.31	21.36	
	21.45	21.51	21.31	21.33	21.34	21.4	21.33	21.33	21.33	21.36	
	21.45	21.52	21.3	21.35	21.35	21.41	21.3	21.35	21.33	21.37	
	21.47		**21.32**		**21.36**		**21.32**		**21.34**		
04/02/2015 (23:30-00:00)	19.27	19.21	19.3	19.2	19.88	19.67	19.22	19.33	19.38	19.9	Clouds
	19.24		**19.25**		**19.78**		**19.28**		**19.64**		
04/09/2015 (23:30-00:00)	21.59	21.61	21.6	21.63	21.58	21.53	21.33	20.99	21.32	21.58	Clear
	21.60		**21.62**		**21.56**		**21.16**		**21.45**		
04/11/2015 (23:30-00:00)	21.92	21.93	21.88	21.69	21.1	21.11	21.58	21.86	21.6	21.62	Clear
	21.93		**21.79**		**21.11**		**21.72**		**21.61**		
04/12/2015 (23:30-00:00)	21.95	21.92	21.9	21.71	21.13	21.21	21.6	21.88	21.62	21.64	Clear
	21.94		**21.81**		**21.17**		**21.74**		**21.63**		
04/14/2015 (23:30-00:00)	22.87	22.85	22.84	22.6	21.05	21.07	22.06	22.12	22.1	22.11	Clear
	22.86		**22.72**		**21.06**		**22.09**		**22.11**		
04/19/2015 (23:30-00:00)	22.03	22.01	21.95	21.88	21.33	21.15	22.08	22.1	22.11	22.13	Clear
	22.02		**21.92**		**21.24**		**22.09**		**22.12**		
04/20/2015 (23:30-00:00)	22.43	22.23	22.1	22.01	21.35	21.17	22.1	22.12	22.13	22.15	Clear
	22.33		**22.06**		**21.26**		**22.11**		**22.14**		
04/26/2015 (23:30-00:00)	21.85	21.83	21.44	21.2	21.08	21.11	21.65	21.67	21.66	21.68	Clear
	21.84		**21.32**		**21.10**		**21.66**		**21.67**		
AVERAGE	**21.56**		**21.42**		**21.12**		**21.36**		**21.41**		

To recognize the importance of protecting the night sky from light pollution inside the Yeongyang International Dark Sky Park, Yeongyang has legislated an ordinance for the operation and management of Firefly Eco School so that Eco-friendly environment could be maintained. This ordinance contains various managing activities, such as researching, protecting and educating of Dark Sky, Clean Water, Clean Air and others, which are closely correlated with Fireflies and the Observatory.

Operation and Management Ordinance of Yeongyang Firefly Eco School

Article 1.(purpose) The ordinance aims to regulate the detailed issues in operating of the Yeongyang Firefly Eco School in order to conserve or restore the natural environment for the firefly in Yeongyang, and also aims to attract more tourists for ecological experience through firefly which is an environmental index indicating pollution free environment.

Article 4(task) Eco school conducts the following tasks (revision 2015.03.13)

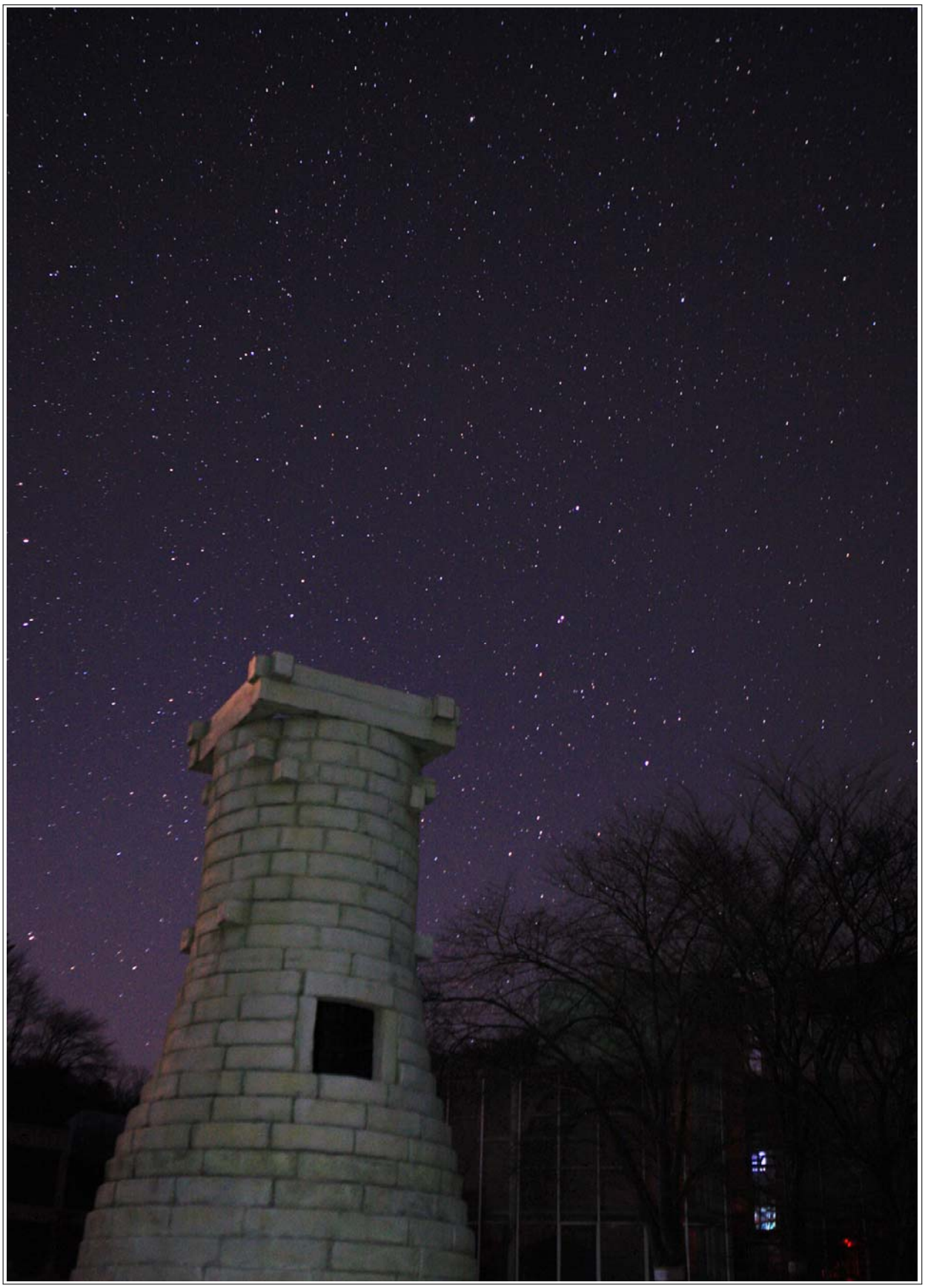
1. Establishing the master operation plan of Eco School (revision 2015.03.13)
2. Operation and Management of Eco School (revision 2015.03.13)
3. Researching, studying, farming and conservation management of firefly ecosystem
4. Operation and management of the Firefly Eco Park
5. Creating the Firefly Eco Experience Village (revision 2015.03.13)
6. Creating the Jangnoesam(ginseng) Theme Park
7. Publishing newsletters and promotional materials of firefly.
8. Activities of restoring the firefly.
9. Operating the Firefly Observatory.
10. Hosting events of firefly eco experience.
11. Other issues of firefly (revision 2015.03.13)

6.5 Night Sky Photographs

<Figure 6.8 A View of Yeongyang Firefly Observatory North>

<Figure 6.9 A View of Yeongyang Firefly Observatory North>

<Figure 6.10 A View of Yeongyang Firefly Observatory North>



<Figure 6.11 A View of Yeongyang Firefly Observatory Front>

7. Yeongyang International Dark Sky Site Lighting Inventory

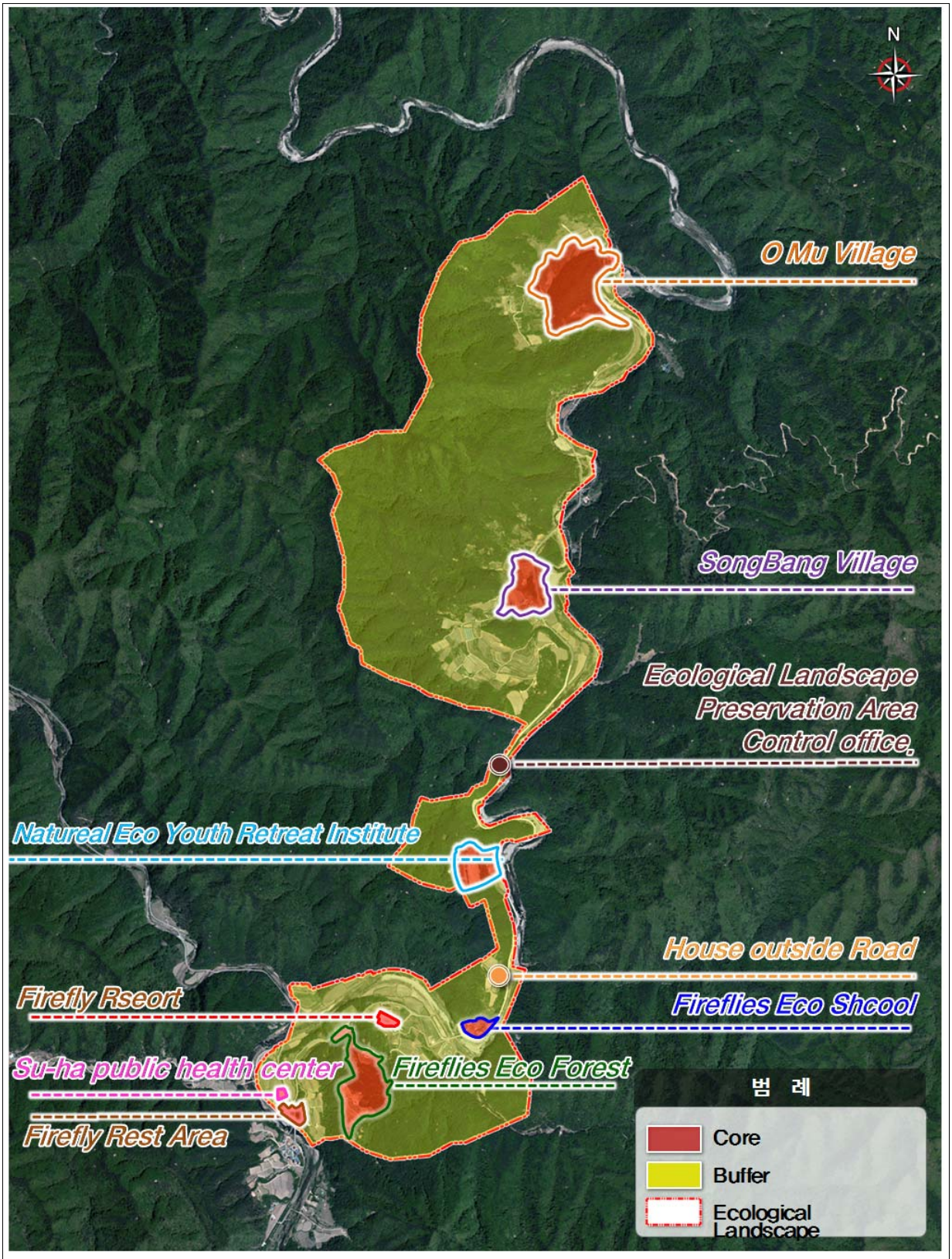
After dividing Yeongyang International Dark Sky Park designation into the core zone and the buffer zone, a full investigation was conducted on the facilities installed in the core Zone

The core zone: Firefly Rest Area, Suha Health Clinic, Firefly Eco Forest, Firefly Eco School, Firefly Resort, Roadside Housing, Natural Eco Youth Training Center & Resort, Songbang Village, O-mu village

The complete investigation was made on the daytime lighting, and on the lighting at night, it focused on the panoramic view and the lights that were lit.

The lighting facilities inside the core zone show total of 303 places and they are as follows: 7 places in Firefly rest area, 4 places in Suha health clinic, 83 places in Firefly Eco Forest, 21 places in Firefly Resort, 61 places in Firefly Eco school, 4 places in roadside housing, 95 places in Natural Eco Park Administration office, 17places in Songbang village and 11places in O-Mu village.

The lighting facilities in various types account to 94.4% of the total including 34 street lamps, 85 down lights, 42 wall lamps, 56 security lights, 5 ceiling fixtures and 64 lawn lamps. Besides that, special lightings, such as 11 fountain lights, 2 signboard lamps, 1 electronic board and 3 floodlights, are installed.



<Figure 7.1 Yeongyang International Dark Sky Site Lighting Inventory>

Site : The Firefly Rest Area

▶ Location Map of the Firefly Rest Area

▶ A View of the Firefly Rest Area

No.	location	Lightings details	fully shielded	lamp type	Lumens	control	Dark Time	compli-ance
1	yard	Roadway fixture	None	CDM	20,000	Y(Timer)	19:30~20:30	No
2	entrance	wall lamp	None	CFL	1,400	Y(on/off)	-	No
3	entrance	wall lamp	None	CFL	1,400	Y(on/off)	-	No
4	entrance	wall lamp	None	CFL	1,400	Y(on/off)	-	No
5	rest area	security light fixture	None	MH	4,160	Y(timer)	19:30~20:30	No
6	rest area	security light fixture	None	MH	4,160	Y(timer)	19:30~20:30	No
7	restaurant	fluorescent light (ceiling fixture)	None	FPL	2,900	N	-	No

▶ 1. yard

▶ 2~4. entrance

▶ 5~6. rest area

▶ 7.restaurant

Site : Su-ha Health Clinic

▶ Location Map of Su-ha Health Clinic

▶ A View of Su-ha Health Clinic

No.	location	lighting details	fully shielded	lamp type	lumens	control	Dark Time	compli-ance
1	parking lot	security lighting fixture	None	ML	3,800	Y (timer)	19:30 ~ 20:30	No
2	entrance	downlight (sensor)	N/A*	LED	960	Y (sensor)		N/A
3	entrance	downlight (encased)	None	CFL	1,120	N		No
4	entrance	downlight (encased)	None	CFL	1,120	N		No

* N/A : Not Applicable

▶ 1. parking lot

▶ 2. entrance

▶ 3~4. entrance

Site : The Firefly Eco Forest

▶ Location Map of the Firefly Eco Forest

▶ Location Map of the Firefly Eco Forest Sect. 1

▶ A View of the Firefly Eco Forest Sect. 1

No.	location	lighting details	fully shielded	lamp type	lumens	control	Dark Time	compli-ance
1	Admin. office parking lot	security lighting fixture	None	LED	450	Y(timer)	19:30~20:30	Yes
2	Ad. office parking lot	security lighting fixture	None	LED	450	Y(timer)	19:30~20:30	Yes
3	Ad. office parking lot	security lighting fixture	None	LED	450	Y(timer)	19:30~20:30	Yes
4	Ad. office parking lot	security lighting fixture	None	LED	450	Y(timer)	19:30~20:30	Yes
5	parking lot	elect. signboard	None	LED	450	Y(timer)	19:30~20:30	Yes
6	rest room	downlight(encased)	FCO**	LED	380	Y(on/off)	-	Yes
7	rest room	downlight(encased)	FCO	LED	380	Y(on/off)	-	Yes
8	rest room	downlight(encased)	FCO	LED	380	Y(on/off)	-	Yes
9	rest room	downlight(encased)	FCO	LED	380	Y(on/off)	-	Yes
10	rest room	downlight(encased)	FCO	LED	380	Y(on/off)	-	Yes
11	rest room	downlight(encased)	FCO**	LED	380	Y(on/off)	-	Yes
12	rest room	downlight(encased)	FCO	LED	380	Y(on/off)	-	Yes
13	rest room	downlight(encased)	FCO	LED	380	Y(on/off)	-	Yes
14	rest room	downlight(encased)	FCO	LED	380	Y(on/off)	-	Yes
15	rest room	downlight(encased)	FCO	LED	380	Y(on/off)	-	Yes
16	rest room	downlight(encased)	FCO	LED	380	Y(on/off)	-	Yes
17	rest room	downlight(encased)	FCO	LED	380	Y(on/off)	-	Yes
18	rest room	downlight(encased)	FCO	LED	380	Y(on/off)	-	Yes
19	rest room	downlight(encased)	FCO	LED	380	Y(on/off)	-	Yes
20	rest room	downlight(encased)	FCO	LED	380	Y(on/off)	-	Yes
21	rest room	downlight(encased)	FCO	LED	380	Y(on/off)	-	Yes
22	rest room	downlight(encased)	FCO	LED	380	Y(on/off)	-	Yes
23	rest room	downlight(encased)	FCO	LED	380	Y(on/off)	-	Yes
24	rest room	downlight(encased)	FCO	LED	380	Y(on/off)	-	Yes
25	trail	security lighting fixture	None	LED	450	Y(timer)	19:30~20:30	Yes

** FCO : Full - Cut - Off

▶ 1~4. 25 Administration office parking lot

▶ 5. parking lot

▶ 6~17. rest room

▶ Location Map of the Firefly Eco Forest Sect. 2

▶ A View of the Firefly Eco Forest Sect. 2

No.	location	lighting details	fully shielded	lamp type	Lumens	control	Dark Time	compli-ance
26	trail	security lighting fixture	None	LED	450	Y(timer)	19:30~20:30	Yes
27	trail	security lighting fixture	None	LED	450	Y(timer)	19:30~20:30	Yes
28	parking lot	security lighting fixture	None	LED	450	Y(timer)	19:30~20:30	Yes
29	forest square	security lighting fixture	None	LED	450	Y(timer)	19:30~20:30	Yes
30	forest square	security lighting fixture	None	LED	450	Y(timer)	19:30~20:30	Yes
31	birch classroom	security lighting fixture	None	LED	450	Y(timer)	19:30~20:30	Yes
32	birch classroom	security lighting fixture	None	LED	450	Y(timer)	19:30~20:30	Yes
33	forest square	security lighting fixture	None	LED	450	Y(timer)	19:30~20:30	Yes
34	forest square	bollard(lawn lamp)	FCO	LED	880	Y(timer)	19:30~20:30	Yes
35	forest square	bollard(lawn lamp)	FCO	LED	880	Y(timer)	19:30~20:30	Yes
36	forest square	bollard(lawn lamp)	FCO	LED	880	Y(timer)	19:30~20:30	Yes
37	shade botanical garden	bollard(lawn lamp)	FCO	LED	880	Y(timer)	19:30~20:30	Yes
38	shade botanical garden	bollard(lawn lamp)	FCO	LED	880	Y(timer)	19:30~20:30	Yes
39	shade botanical garden	bollard(lawn lamp)	FCO	LED	880	Y(timer)	19:30~20:30	Yes
40	shade botanical garden	bollard(lawn lamp)	FCO	LED	880	Y(timer)	19:30~20:30	Yes
41	shade botanical garden	bollard(lawn lamp)	FCO	LED	880	Y(timer)	19:30~20:30	Yes
42	shade botanical garden	bollard(lawn lamp)	FCO	LED	880	Y(timer)	19:30~20:30	Yes
43	shade botanical garden	bollard(lawn lamp)	FCO	LED	880	Y(timer)	19:30~20:30	Yes
44	shade botanical garden	bollard(lawn lamp)	FCO	LED	880	Y(timer)	19:30~20:30	Yes
45	shade botanical garden	bollard(lawn lamp)	FCO	LED	880	Y(timer)	19:30~20:30	Yes
46	shade botanical garden	bollard(lawn lamp)	FCO	LED	880	Y(timer)	19:30~20:30	Yes
47	sky square entrance	bollard(lawn lamp)	FCO	LED	880	Y(timer)	19:30~20:30	Yes
48	shade botanical garden	bollard(lawn lamp)	FCO	LED	880	Y(timer)	19:30~20:30	Yes
49	shade botanical garden	bollard(lawn lamp)	FCO	LED	880	Y(timer)	19:30~20:30	Yes
50	shade botanical garden	bollard(lawn lamp)	FCO	LED	880	Y(timer)	19:30~20:30	Yes
51	shade botanical garden	bollard(lawn lamp)	FCO	LED	880	Y(timer)	19:30~20:30	Yes
52	aquatic plants observatory	bollard(lawn lamp)	FCO	LED	880	Y(timer)	19:30~20:30	Yes
53	aquatic plants observatory	bollard(lawn lamp)	FCO	LED	880	Y(timer)	19:30~20:30	Yes
54	aquatic plants observatory	bollard(lawn lamp)	FCO	LED	880	Y(timer)	19:30~20:30	Yes
55	aquatic plants observatory	bollard(lawn lamp)	FCO	LED	880	Y(timer)	19:30~20:30	Yes
56	aquatic plants observatory	bollard(lawn lamp)	FCO	LED	880	Y(timer)	19:30~20:30	Yes

〈To be Continue〉

No.	location	lighting details	fully shielded	lamp type	Lumens	control	Dark Time	compli-ance
57	shade botanical garden	security lighting fixture	None	LED	450	Y(timer)	19:30~20:30	Yes
58	shade botanical garden	security lighting fixture	None	LED	450	Y(timer)	19:30~20:30	Yes
59	shade botanical garden	security lighting fixture	None	LED	450	Y(timer)	19:30~20:30	Yes
60	shade botanical garden	security lighting fixture	None	LED	450	Y(timer)	19:30~20:30	Yes
61	shade botanical garden	security lighting fixture	None	LED	450	Y(timer)	19:30~20:30	Yes
62	shade botanical garden	security lighting fixture	None	LED	450	Y(timer)	19:30~20:30	Yes

▶ 26~27. trail

▶ 28. parking lot

▶ 37~38. Shade botanical center

▶ 39~46, 48~51. Shade botanical center

▶ 47. Sky square entrance

▶ 52~56. Aquatic plants observatory

▶ 57. Shade botanical garden

▶ 58~62.Shade botanical garden

▶ Location Map of the Firefly Eco Forest Sect. 3

▶ A View of the Firefly Eco Forest Sect. 3

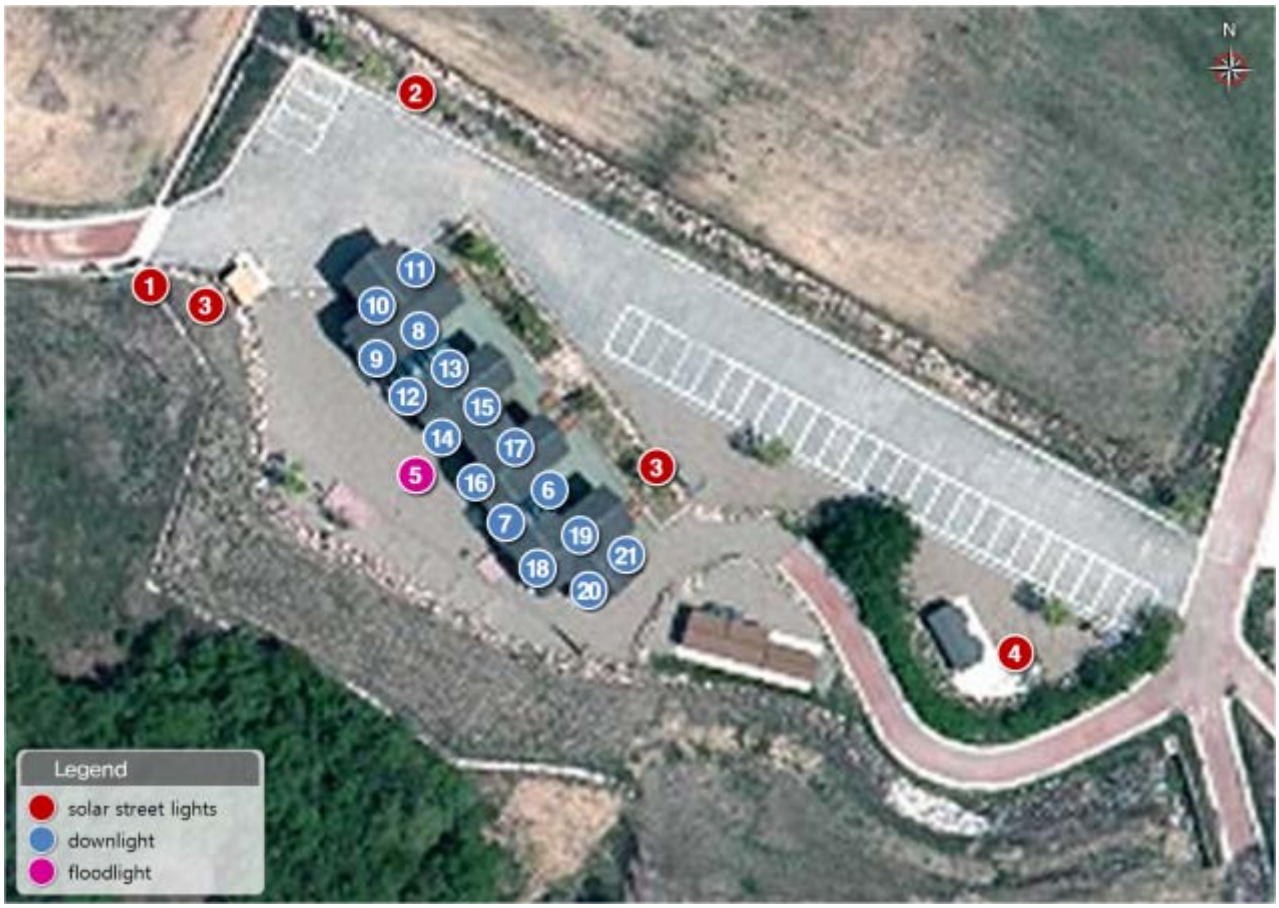
No.	location	lighting details	fully shielded	lamp type	Lumens	control	Dark Time	compli-ance
63	sky square	security lighting fixture	None	LED	450	Y(timer)	19:30~20:30	Yes
64	sky square	security lighting fixture	None	LED	450	Y(timer)	19:30~20:30	Yes
65	sky square	bollard(lawn lamp)	FCO	LED	880	Y(timer)	19:30~20:30	Yes
66	sky square	bollard(lawn lamp)	FCO	LED	880	Y(timer)	19:30~20:30	Yes
67	sky square	bollard(lawn lamp)	FCO	LED	880	Y(timer)	19:30~20:30	Yes
68	sky square	bollard(lawn lamp)	FCO	LED	880	Y(timer)	19:30~20:30	Yes
69	sky square	bollard(lawn lamp)	FCO	LED	880	Y(timer)	19:30~20:30	Yes
70	sky square	bollard(lawn lamp)	FCO	LED	880	Y(timer)	19:30~20:30	Yes
71	sky square	bollard(lawn lamp)	FCO	LED	880	Y(timer)	19:30~20:30	Yes
72	sky square	bollard(lawn lamp)	FCO	LED	880	Y(timer)	19:30~20:30	Yes
73	sky square	bollard(lawn lamp)	FCO	LED	880	Y(timer)	19:30~20:30	Yes
74	sky square	bollard(lawn lamp)	FCO	LED	880	Y(timer)	19:30~20:30	Yes
75	sky square	bollard(lawn lamp)	FCO	LED	880	Y(timer)	19:30~20:30	Yes
76	sky square	bollard(lawn lamp)	FCO	LED	880	Y(timer)	19:30~20:30	Yes
77	sky square	bollard(lawn lamp)	FCO	LED	880	Y(timer)	19:30~20:30	Yes
78	sky square	bollard(lawn lamp)	FCO	LED	880	Y(timer)	19:30~20:30	Yes
79	sky square	bollard(lawn lamp)	FCO	LED	880	Y(timer)	19:30~20:30	Yes
80	sky square	security lighting fixture	None	LED	450	Y(timer)	19:30~20:30	Yes
81	sky square	security lighting fixture	None	LED	450	Y(timer)	19:30~20:30	Yes
82	sky square	bollard(lawn lamp)	FCO	LED	880	Y(timer)	19:30~20:30	Yes
83	sky square	bollard(lawn lamp)	FCO	LED	880	Y(timer)	19:30~20:30	Yes

▶ 63~64. 81 The sky square

▶ 65~79. 82~83 The sky square

▶ 80. The sky square

Site : Firefly Resort



▶ Location Map of the Firefly Resort

▶ A View of the Firefly Resort

No.	location	lighting details	fully shielded	lamp type	Lumens	control	Dark Time	compli-ance
1	entrance	solar street lights	FCO	LED	1,350	Y(timer)	19:30~20:30	Yes
2	front parking lot	solar street lights	FCO	LED	1,350	Y(timer)	19:30~20:30	Yes
3	front parking lot	solar street lights	FCO	LED	1,350	Y(timer)	19:30~20:30	Yes
4	front parking lot	solar street lights	FCO	LED	1,350	Y(timer)	19:30~20:30	Yes
5	backside	floodlight(round type)	FCO	ML	6,300	Y(timer)	19:30~20:30	Yes
6	Resort	downlight(sensor)	N/A	LED	760	Y(on/off)	-	N/A
7	Resort	downlight(sensor)	N/A	LED	760	Y(on/off)	-	N/A
8	Resort	downlight(sensor)	N/A	LED	760	Y(on/off)	-	N/A
9	Resort	downlight(sensor)	N/A	LED	760	Y(on/off)	-	N/A
10	Resort(2nd floor)	downlight	FCO	LED	760	Y(on/off)	-	Yes
11	Resort(1st floor)	downlight	FCO	LED	760	Y(on/off)	-	Yes
12	Resort(2nd floor)	downlight	FCO	LED	760	Y(on/off)	-	Yes
13	Resort(2nd floor)	downlight	FCO	LED	760	Y(on/off)	-	Yes
14	Resort(2nd floor)	downlight	FCO	LED	760	Y(on/off)	-	Yes
15	Resort(1st floor)	downlight	FCO	LED	760	Y(on/off)	-	Yes
16	Resort(2nd floor)	downlight	FCO	LED	760	Y(on/off)	-	Yes
17	Resort(1st floor)	downlight	FCO	LED	760	Y(on/off)	-	Yes
18	Resort(2nd floor)	downlight	FCO	LED	760	Y(on/off)	-	Yes
19	Resort(1st floor)	downlight	FCO	LED	760	Y(on/off)	-	Yes
20	Resort(2nd floor)	downlight	FCO	LED	760	Y(on/off)	-	Yes
21	Resort(1st floor)	downlight	FCO	LED	760	Y(on/off)	-	Yes

▶ 1. entrance

▶ 2~4. front parking lot

▶ 5. backside

▶ 6~9. Resort

▶ 10~13. Resort

▶ 12~13. Resort

▶ 14~19. Resort

▶ 20. Resort (2nd floor)

Site) : Firefly Eco School

▶ Location Map of the Firefly Eco School

▶ A View of the Firefly Eco School

No.	location	lighting details	fully shielded	lamp type	Lumens	control	Dark Time	compli-ance
1	access road	bollard (lawn lamp)	None	LED	450	Y(timer)	19:30~21:30	Yes
2	access road	bollard (lawn lamp)	None	LED	450	Y(timer)	19:30~21:30	Yes
3	access road	bollard (lawn lamp)	None	LED	450	Y(timer)	19:30~21:30	Yes
4	access road	bollard (lawn lamp)	None	LED	450	Y(timer)	19:30~21:30	Yes
5	access road	bollard (lawn lamp)	None	LED	450	Y(timer)	19:30~21:30	Yes
6	access road	bollard (lawn lamp)	None	LED	450	Y(timer)	19:30~21:30	Yes
7	access road	bollard (lawn lamp)	None	LED	450	Y(timer)	19:30~21:30	Yes
8	access road	bollard (lawn lamp)	None	LED	450	Y(timer)	19:30~21:30	Yes
9	access road	bollard (lawn lamp)	None	LED	450	Y(timer)	19:30~21:30	Yes
10	access road	bollard (lawn lamp)	None	LED	450	Y(timer)	19:30~21:30	Yes
11	access road	bollard (lawn lamp)	None	LED	450	Y(timer)	19:30~21:30	Yes
12	access road	bollard (lawn lamp)	None	LED	450	Y(timer)	19:30~21:30	Yes
13	access road	bollard (lawn lamp)	None	LED	450	Y(timer)	19:30~21:30	Yes
14	access road	bollard (lawn lamp)	None	LED	450	Y(timer)	19:30~21:30	Yes
15	access road	bollard (lawn lamp)	None	LED	450	Y(timer)	19:30~21:30	Yes
16	access road	bollard (lawn lamp)	None	LED	450	Y(timer)	19:30~21:30	Yes
17	access road	bollard (lawn lamp)	None	LED	450	Y(timer)	19:30~21:30	Yes
18	access road	bollard (lawn lamp)	None	LED	450	Y(timer)	19:30~21:30	Yes
19	square	security lighting fixture	None	ML	1,440	Y(timer)	19:30~21:30	No
20	square	security lighting fixture	None	ML	1,440	Y(timer)	19:30~21:30	No
21	entrance door of greenhouse	downlight (encased)	FCO	CFL	1,400	Y(on/off)	-	Yes
22	entrance of greenhouse backside	downlight (encased)	None	LED	450	Y(on/off)	-	Yes
23	entrance to rest room	downlight (encased)	None	LED	450	Y(on/off)	-	Yes
24	backside of restroom	downlight (encased)	None	LED	450	Y(on/off)	-	Yes

〈To be Continue〉

No.	location	lighting details	fully shielded	lamp type	lumen	control	Dark Time	compli-ance
25	entrance of annex to Eco school	downlight (encased)	FCO	LED	720	Y(on/off)	-	Yes
26	entrance of annex to Eco school	downlight (encased)	FCO	LED	720	Y(on/off)	-	No
27	annex to Eco school(2nd floor)	downlight (encased)	FCO	CFL	1,400	Y(on/off)	-	No
28	annex to Eco school(2nd floor)	downlight (encased)	FCO	CFL	1,400	Y(on/off)	-	No
29	annex to Eco school(2nd floor)	downlight (encased)	FCO	CFL	1,400	Y(on/off)	-	No
30	annex to Eco school(2nd floor)	downlight (encased)	FCO	CFL	1,400	Y(on/off)	-	No
31	observatory	wall lights (wall ramp)	None	LED	450	Y(on/off)	-	Yes
32	observatory	wall lights (wall ramp)	None	LED	450	Y(on/off)	-	Yes
33	observatory	wall lights (wall ramp)	None	LED	450	Y(on/off)	-	Yes
34	observatory	wall lights (wall ramp)	None	LED	450	Y(on/off)	-	Yes
35	observatory	wall lights (wall ramp)	None	LED	450	Y(on/off)	-	Yes
36	observatory	wall lights (wall ramp)	None	LED	450	Y(on/off)	-	Yes
37	observatory	wall lights (wall ramp)	None	LED	450	Y(on/off)	-	Yes
38	observatory	wall lights (wall ramp)	None	LED	450	Y(on/off)	-	Yes
39	observatory	wall lights (wall ramp)	None	LED	450	Y(on/off)	-	Yes
40	observatory	wall lights (wall ramp)	None	LED	450	Y(on/off)	-	Yes
41	observatory	downlight (encased)	FCO	LED	720	Y(on/off)	-	Yes
42	observatory	downlight (encased)	FCO	LED	720	Y(on/off)	-	Yes
43	observatory	downlight (encased)	FCO	LED	720	Y(on/off)	-	Yes
44	observatory	downlight (encased)	FCO	LED	720	Y(on/off)	-	Yes
45	observatory	downlight (encased)	FCO	LED	720	Y(on/off)	-	Yes
46	observatory	downlight (encased)	FCO	LED	720	Y(on/off)	-	Yes
47	observatory	downlight (encased)	FCO	LED	720	Y(on/off)	-	Yes
48	observatory	downlight (sensor)	N/A	LED	960	Y(sensor)	-	N/A
49	observatory signboard	signboard lamp	None	LED	64,800	Y(timer)	19:30~20:30	No
50	observatory signboard	signboard lamp	None	LED	32,000	Y(timer)	19:30~20:30	No


▶ 1~18. access road


▶21. entrance door of greenhouse

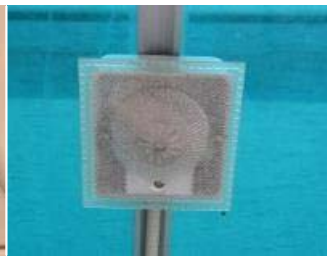

▶22. entrance of greenhouse backside


▶23-24. entrance and backside of restroom


▶25-30. entrance of annex to eco school


▶ 31~40. The observatory


▶ 41~47. The observatory


▶ 48. The observatory

▶ 49.The observatory signboard

▶ 50. The observatory signboard

Site : Roadside Housing

▶ Location Map of Roadside Housing

▶ A View of Roadside Housing

No.	location	lighting details	fully shielded	lamp type	lumen	control	Dark Time	compli-ance
1	access road	security lighting fixture	None	CDM	14,500	Y(timer)	19:30~20:00	No
2	porch	wall lights (wall lamp)	None	CFL	1,120	Y(on/off)	-	No
3	roof	downlight	None	CFL	1,120	Y(on/off)	-	No
4	wall	wall lights (wall lamp)	None	CFL	1,120	Y(on/off)	-	No

▶ 1. access road

▶ 2, 4. porch,wall

▶ 3. roof

Site : Natural Eco Youth Training Center & Resort

▶ Location Map of the Natural Eco Youth Training Center & Resort

▶ Location Map of Natural Eco Youth Training Resort Sect. 1

▶ Location Map of Natural Eco Youth Training Resort Sect.1

No.	location	lighting details	fully shielded	lamp type	Lumen	control	Dark Time	compli-ance
1	Resort 1	wall lights(wall lamp)	None	LED	450	Y(on/off)	-	Yes
2	Resort 1	wall lights(wall lamp)	None	LED	450	Y(on/off)	-	Yes
3	Resort 1	downlight(ceiling lamp)	None	LED	450	Y(on/off)	-	Yes
4	Resort 1	downlight(ceiling lamp)	None	LED	450	Y(on/off)	-	Yes
5	Resort 1	downlight(ceiling lamp)	None	LED	450	Y(on/off)	-	Yes
6	Resort 1	wall lights(wall lamp)	None	LED	450	Y(on/off)	-	Yes
7	Resort 1	wall lights(wall lamp)	None	LED	450	Y(on/off)	-	Yes
8	Resort 1	wall lights(wall lamp)	None	LED	450	Y(on/off)	-	Yes
9	Resort 1	downlight(ceiling lamp)	None	LED	450	Y(on/off)	-	Yes
10	Resort 1	downlight(ceiling lamp)	None	LED	450	Y(on/off)	-	Yes
11	Resort 1	downlight(ceiling lamp)	None	LED	450	Y(on/off)	-	Yes
12	Resort 1	downlight(ceiling lamp)	None	LED	450	Y(on/off)	-	Yes
13	Resort 1	downlight(ceiling lamp)	None	LED	450	Y(on/off)	-	Yes
14	Resort 1	wall lights(ceiling lamp)	None	LED	450	Y(on/off)	-	Yes
15	Resort 1	security lighting fixture	None	LED	450	Y(timer)	19:30~20:30	Yes
16	Resort 1	security lighting fixture	None	LED	450	Y(timer)	19:30~20:30	Yes
17	tennis court	floodlight(round)	FCO	MH	42,000 (for 1unit)	Y(on/off)	-	Yes
18	Resort 2	security lighting fixture	None	LED	450	Y(timer)	19:30~20:30	Yes
19	Resort 2	security lighting fixture	None	LED	450	Y(timer)	19:30~20:30	Yes
20	Resort 2	floodlight(round)	FCO	MH	20,000 (for 1unit)	Y(on/off)	-	Yes
21	Resort 2	security lighting fixture	None	LED	450	Y(timer)	19:30~20:30	Yes
22	Resort 2	downlight(ceiling lamp)	None	LED	450	Y(on/off)	-	Yes
23	Resort 2	downlight(ceiling lamp)	None	LED	450	Y(on/off)	-	Yes
24	Resort 2	downlight(ceiling lamp)	None	LED	450	Y(on/off)	-	Yes
25	Resort 2	downlight(ceiling lamp)	None	LED	450	Y(on/off)	-	Yes
26	Resort 2	downlight(ceiling lamp)	None	LED	450	Y(on/off)	-	Yes
27	Resort 2	downlight(ceiling lamp)	None	LED	450	Y(on/off)	-	Yes
28	Resort 2	downlight(ceiling lamp)	None	LED	450	Y(on/off)	-	Yes
29	Resort 2	downlight(ceiling lamp)	None	LED	450	Y(on/off)	-	Yes

〈To be Continue〉

No.	location	lighting details	fully shielded	lamp type	Lumens	control	Dark Time	compli-ance
30	Resort 2	downlight (ceiling lamp)	None	LED	450	Y(on/off)	-	Yes
31	Resort 2	wall lights (ceiling lamp)	None	LED	450	Y(on/off)	-	Yes
32	Resort 2	wall lights (ceiling lamp)	None	LED	450	Y(on/off)	-	Yes
33	Resort 2	downlight (ceiling lamp)	None	LED	450	Y(on/off)	-	Yes
34	Resort 2	security lighting fixture	None	MH	10,400 (for 2 lamps)	Y(timer)	19:30~20:30	No
35	Resort 2	security lighting fixture	None	MH	10,400 (for 2 lamps)	Y(timer)	19:30~20:30	No
36	Resort 2	security lighting fixture	None	MH	8,300 (for 2 lamps)	Y(timer)	19:30~20:30	No
37	barbecue area	fluorescent lamp (ceiling lamp)	None	FPL	2,900(unit)	Y(on/off)	-	No
38	barbecue area	fluorescent lamp (ceiling lamp)	None	FPL	2,900(unit)	Y(on/off)	-	No
39	barbecue area	fluorescent lamp (ceiling lamp)	None	FPL	2,900(unit)	Y(on/off)	-	No
40	barbecue area	fluorescent lamp (ceiling lamp)	None	FPL	2,900(unit)	Y(on/off)	-	No

▶ 1~2, 6~8, 14. Resort 1

▶ 3~5, 9~13. Resort 1

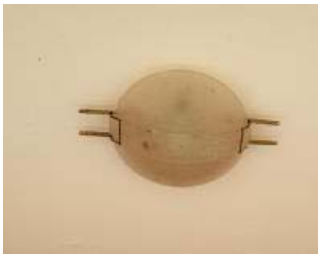
▶ 15. Resort 1

▶ 16. Resort 1

▶ 17. tennis court

▶ 18~19, 21. Resort 2

▶ 20. Resort 2



▶ 22~29. Resort 2

▶ 31~32. Resort 2

▶ 30, 33. Resort 2

▶ 34~36. Resort 2

▶ 37~39. BBQ area

▶ Location Map of Natural Eco Youth Training Center & Resort Sect.2

▶ Location Map of Natural Eco Youth Training Center & Resort Sect. 2

No.	location	lighting details	fully shielded	lamp type	Lumens	control	Dark Time	compli-ance
41	main building	wall lamp	None	LED	450	Y(on/off)	-	Yes
42	main building	wall lamp	None	LED	450	Y(on/off)	-	Yes
43	main building	wall lamp	None	LED	450	Y(on/off)	-	Yes
44	main building	wall lamp	None	LED	450	Y(on/off)	-	Yes
45	main building	wall lamp	None	LED	450	Y(on/off)	-	Yes
46	main building	(wall lights)wall lamp	None	LED	450	Y(on/off)	-	Yes
47	main building	(wall lights)wall lamp	None	LED	450	Y(on/off)	-	Yes
48	main building	(wall lights)wall lamp	None	LED	450	Y(on/off)	-	Yes
49	main building	(wall lights)wall lamp	None	LED	450	Y(on/off)	-	Yes
50	main building	(wall lights)wall lamp	None	LED	450	Y(on/off)	-	Yes
51	main building	(wall lights)wall lamp	None	LED	450	Y(on/off)	-	Yes
52	main building	(wall lights)wall lamp	None	LED	450	Y(on/off)	-	Yes
53	main building	bollard(lawn lamp)	None	LED	450	Y(timer)	19:30~20:30	Yes
54	main building	bollard(lawn lamp)	None	LED	450	Y(timer)	19:30~20:30	Yes
55	main building	bollard(lawn lamp)	None	LED	450	Y(timer)	19:30~20:30	Yes
56	main building	bollard(lawn lamp)	None	LED	450	Y(timer)	19:30~20:30	Yes
57	main building	bollard(lawn lamp)	None	LED	450	Y(timer)	19:30~20:30	Yes
58	main building	bollard(lawn lamp)	None	LED	450	Y(timer)	19:30~20:30	Yes
59	main building	street lighting fixture	FCO	CDM	14,500	Y(timer)	19:30~20:30	Yes
60	main building	street lighting fixture	FCO	CDM	14,500	Y(timer)	19:30~20:30	Yes
61	main building	street lighting fixture	FCO	CDM	14,500	Y(timer)	19:30~20:30	Yes
62	main building	security lighting fixture	None	MH	10,400 (for 2 lamps)	Y(timer)	19:30~20:30	No
63	playfield	security lighting fixture	None	LED	450	Y(timer)	19:30~20:30	Yes
64	playfield	security lighting fixture	None	LED	450	Y(timer)	19:30~20:30	Yes
65	playfield	security lighting fixture	None	LED	450	Y(timer)	19:30~20:30	Yes
66	outdoor theater	security lighting fixture	None	MH	4,160	Y(on/off)	-	No
67	outdoor theater	security lighting fixture	None	MH	4,160	Y(on/off)	-	No
68	outdoor theater	security lighting fixture	None	MH	4,160	Y(on/off)	-	No
69	outdoor theater	security lighting fixture	None	MH	4,160	Y(on/off)	-	No
70	outdoor theater	security lighting fixture	None	MH	4,160	Y(on/off)	-	No
71	outdoor theater	security lighting fixture	None	MH	4,160	Y(on/off)	-	No
72	outdoor theater	security lighting fixture	None	MH	4,160	Y(on/off)	-	No
73	entrance road	street lighting fixture	None	MH	20,000	Y(timer)	19:30~20:30	No

▶ 41~45. main building

▶ 46~52. main building

▶ 53~28. main building

▶ 59~61. main building

▶ 62. main building

▶ 63~65. playing field

▶ 66~70. outdoor theater

▶ 71~72. outdoor theater

▶ Location Map of Natural Eco Youth Training Center & Resort Sect. 3

▶ A view of Natural Eco Youth Training Center & Resort Sect. 3

No.	location	lighting details	fully shielded	lamp type	Lumens	control	Dark Time	compli-ance
74	entrance road	street lighting fixture	None	MH	20,000	Y(timer)	19:30~20:30	No
75	entrance road	street lighting fixture	None	MH	20,000	Y(timer)	19:30~20:30	No
76	entrance road	street lighting fixture	None	MH	20,000	Y(timer)	19:30~20:30	No
77	entrance road	street lighting fixture	None	MH	20,000	Y(timer)	19:30~20:30	No
78	entrance road	street lighting fixture	None	MH	20,000	Y(timer)	19:30~20:30	No
79	entrance road	street lighting fixture	None	MH	20,000	Y(timer)	19:30~20:30	No
80	entrance road	street lighting fixture	None	MH	20,000	Y(timer)	19:30~20:30	No
81	campground	security lighting fixture	None	MH	8,300 (for 2 lamps)	Y(timer)	19:30~20:30	No
82	campground	security lighting fixture	None	MH	8,300 (for 2 lamps)	Y(timer)	19:30~20:30	No
83	campground	security lighting fixture	None	MH	8,300 (for 2 lamps)	Y(timer)	19:30~20:30	No
84	campground	security lighting fixture	None	MH	8,300 (for 2 lamps)	Y(timer)	19:30~20:30	No
85	campground	security lighting fixture	None	MH	8,300 (for 2 lamps)	Y(timer)	19:30~20:30	No
86	campground	security lighting fixture	None	MH	8,300 (for 2 lamps)	Y(timer)	19:30~20:30	No
87	campground	security lighting fixture	None	MH	8,300 (for 2 lamps)	Y(timer)	19:30~20:30	No

〈To be Continue〉

No.	location	lighting details	fully shielded	lamp type	Lumens	control	Dark Time	compli-ance
88	shower room	downlight (sensor)	N/A	CFL	1,120	Y(sensor)		N/A
89	shower room	downlight (sensor)	N/A	CFL	1,120	Y(sensor)	-	N/A
90	Adm. office	wall lights (wall lamp)	None	LED	450	Y(on/off)	-	Yes
91	Adm. office	downlight	None	LED	450	Y(on/off)	-	Yes
92	Adm. office	downlight	None	LED	450	Y(on/off)	-	Yes
93	Adm. office	wall lights (wall lamp)	None	LED	450	Y(on/off)	-	Yes
94	Adm. office	security lighting fixture	None	CFL	4,800	Y(timer)	19:30~20:30	No

▶ 74~80. entrance road

▶ 74~80. entrance road

▶ 81~87. campground

▶ 88~89. shower room

▶ 90. Adm. office

▶ 91~92. Adm. office

▶ 93. Adm. office

▶ 94. Adm. office

▶ Location Map of Natural Eco Youth Training Center & Resort Sect. 4

No.	location	lighting details	fully shielded	lamp type	Lumens	control	Dark Time	compli-ance
95	road in front of the guard post	street lighting fixture	None	CDM	25,800	Y (timer)	19:30~20:30	No

▶ 95. road in front of the guard post

Site : SongBang Village

▶ Location Map of SongBang Village

▶ SongBang Village Panorama

No.	location	lighting details	fully shielded	lamp type	Lumens	control	Dark Time	compli-ance
1	village road	street lighting fixture	None	CDM	25,800	Y (timer)	19:30~20:30	No
2	village road	street lighting fixture	None	CDM	25,800	Y (timer)	19:30~20:30	No
3	village road	street lighting fixture	None	CDM	25,800	Y (timer)	19:30~20:30	No
4	village road	street lighting fixture	None	CDM	25,800	Y (timer)	19:30~20:30	No
5	village road	street lighting fixture	None	CDM	25,800	Y (timer)	19:30~20:30	No
6	community center	downlight	None	CFL	1,120	Y (on/off)	-	No
7	community center	downlight	None	CFL	1,120	Y (on/off)	-	No
8	community center	downlight	None	CFL	1,120	Y (on/off)	-	No
9	community center	downlight (sensor)	N/A	CFL	1,120	Y (on/off)	-	N/A
10	community center	downlight	None	CFL	1,120	Y (on/off)	-	No
11	community center	downlight	None	CFL	1,120	Y (on/off)	-	No
12	village road	street lighting fixture	None	CDM	25,800	Y (timer)	19:30~20:30	No
13	village road	street lighting fixture	None	CDM	25,800	Y (timer)	19:30~20:30	No
14	village road	street lighting fixture	None	CDM	25,800	Y (timer)	19:30~20:30	No
15	village road	street lighting fixture	None	CDM	25,800	Y (timer)	19:30~20:30	No
16	village road	street lighting fixture	None	CDM	25,800	Y (timer)	19:30~20:30	No
17	visitor's rest area	street lighting fixture	None	CDM	25,800	Y (timer)	19:30~20:30	No

▶ 1~5, 12~17 village road

▶ 6~8, 10~11. community center

▶ 9. community center

Site : O-Mu Village

▶ Location Map of O-Mu Village

▶ A view of O-Mu Village

No.	location	lighting details	fully shielded	lamp type	Lumens	control	Dark Time	compli-ance
1	village road	street lighting fixture	None	CDM	25,800	Y (timer)	19:30~20:30	No
2	village road	street lighting fixture	None	CDM	25,800	Y (timer)	19:30~20:30	No
3	village road	street lighting fixture	None	CDM	25,800	Y (timer)	19:30~20:30	No
4	village road	street lighting fixture	None	CDM	25,800	Y (timer)	19:30~20:30	No
5	village road	street lighting fixture	None	CDM	25,800	Y (timer)	19:30~20:30	No
6	entrance to the village	street lighting fixture	None	CDM	25,800	Y (on/off)	-	No
7	information center	wall lights (wall lamp)	None	CFL	1,120	Y (on/off)	-	No
8	information center	wall lights (wall lamp)	None	CFL	1,120	Y (on/off)	-	No
9	housing	wall lights (wall lamp)	None	CFL	1,400	Y (on/off)	-	No
10	housing	wall lights (wall lamp)	None	CFL	1,400	Y (on/off)	-	No
11	housing	wall lights (wall lamp)	None	CFL	1,400	Y (on/off)	-	No

▶ 1~6. village road

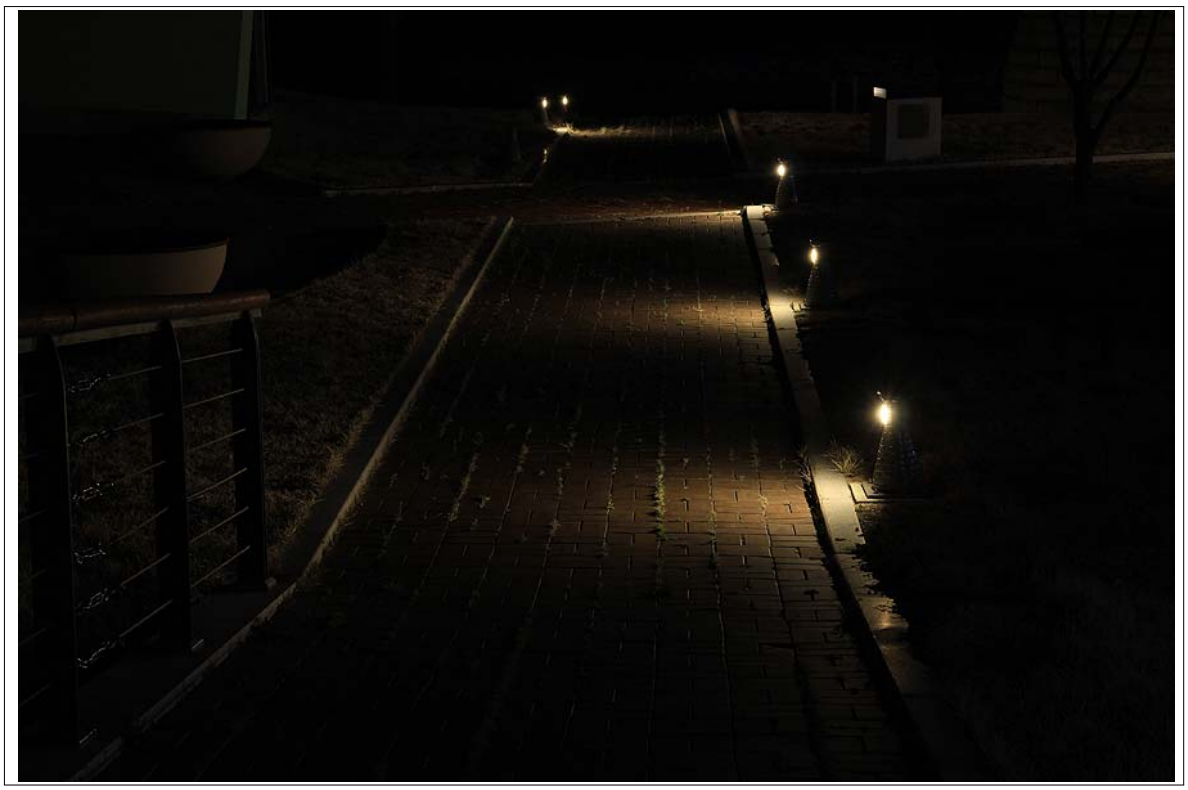
▶ 7~8. information center

▶ 9~11. housing

location	lighting / details	fully shielded FCO	lumen (〈500 lumen)	application	compli-ance
Firefly Rest Area (7)	1 street lighting 10m, 20,000 Lumen CDM	None	No	yard	No
	3 wall lamp, 1,400 Lumen CFL	None	No	entrance	No
	2 security lighting 5m, 4,160 Lumen MH	None	No	rest area	No
	1 ceiling lamp, 2,900 Lumen FPL	None	No	restaurant	No
Su-ha Health Clinic (4)	1 security lighting, 3,800 Lumen ML	None	No	parking lot	No
	1 downlight, 960 Lumen LED	N/A	No	entrance	N/A
	2 downlight, 1,120 Lumen CFL	None	No	entrance	No
Firefly Eco Forest (83)	23 security lighting 5m, 450 Lumen LED	None	Yes	parking lot trail forest square birch classroom shade botanical garden sky square	Yes
	19 downlight, 380 Lumen LED	FCO	Yes	rest room	Yes
	40 lawn lamp, 880 Lumen LED	FCO	No	forest square shade botanical garden sky square aquatic plants observatory	Yes
	1 electric board, 450 Lumen LED	None	Yes	parking lot	Yes
Firefly Resort (21)	4 street lighting 10m, 4,750 Lumen LED	FCO	No	parking lot	Yes
	4 downlight, 760 Lumen LED	N/A	No	Resort	No
	12 downlight, 760 Lumen LED	FCO	No	Resort	Yes
	1 floodlight, 6,300 Lumen ML	FCO	No	backside pension	Yes
Firefly Eco School (50)	1 signboard lamp, 64,800 Lumen LED 1 signboard lamp, 32,000 Lumen LED	None	No	observatory signboard	No
	9 downlight, 720 Lumen LED	FCO	NO	annex / observatory	Yes
	1 downlight, 960 Lumen LED	N/A	No	observatory	N/A
	3 downlight, 450L Lumen LED	None	Yes	greenhouse / rest room	Yes
	5 downlight, 1,400 Lumen CFL	FCO	No	greenhouse / annex	Yes
	10 wall lamp, 450 Lumen LED	None	Yes	observatory	Yes
	2 security lighting 5m, 1,440 Lumen ML	None	No	square	No
	18 lawn lamp, 640 Lumen LED	FCO	No	access road	Yes
Roadside Housing (4)	1 security lighting 5m, 14,500 Lumen CDM	None	No	access road	No
	1 downlight, 1,120 Lumen CFL	None	No	roof	No
	2 wall lamp, 1,120 Lumen CFL	None	No	entrance / wall	No

〈to be continued〉

location	lighting / details	fully shielded FCO	lumen (〈500 lumen)	application	compli-ance
Natural Eco Youth Training Center & Resort (95)	3 street lighting 10m, 14,500 Lumen CDM	FCO	No	main building	Yes
	8 street lighting 10m, 20,000 Lumen MH 1 street lighting 10m, 25,800 Lumen CDM	None	No	entrance road road in front of guard post	No
	2 downlight, 1,120 Lumen CFL	N/A	No	shower room	N/A
	20 downlight, 450 Lumen LED	None	Yes	Resort 1 Resort 2 admin. office	Yes
	22 wall lamp, 450 Lumen LED	None	Yes	Resort 1 Resort 2 admin. office main building	Yes
	8 security lighting 5m, 450 Lumen LED	None	Yes	Resort 1 Resort 2 playfield	Yes
	1 security lighting 5m, 4,800 Lumen CFL 7 security lighting 5m, 4,160 Lumen MH 8 security lighting 5m, 8,300 Lumen MH 3 security lighting 5m, 10,400Lumen MH	None	No	Resort 2 main building outdoor theater campground admin. office	No
	6 lawn lamp, 450 Lumen LED	None	Yes	main building	Yes
	4 ceiling lamp, 2,900 Lumen FPL	None	No	barbecue area	No
	1 floodlight, 42,000 Lumen MH	FCO	No	tennis court	Yes
	1 floodlight 20,000 Lumen MH	None	No	Resort 2	No
SongBang Village (17)	11 street lighting 10m, 25,800 Lumen CDM	None	No	village road visitors' rest area	No
	5 downlight, 1,120 Lumen CFL	None	No	community center	No
	1 downlight, 1,120 Lumen CFL	N/A	No	community center	N/A
O-Mu Village (11)	6 street lighting 10m, 25,800 Lumen CDM	None	No	village road village entrance	No
	2 wall lamp, 1,120 Lumen CFL 3 wall lamp, 1,400 Lumen CFL	None	No	information center housing	No



<Figure 7.2 Firefly Eco School, Before>

<Figure 7.3 Firefly Eco School, After>

<Figure 7.4 Firefly Eco School wall Lamp, Before>

<Figure 7.5 Firefly Eco School wall Lamp, After>

<Figure 7.6 Firefly Eco Forest, Before>

<Figure 7.7 Firefly Eco Forest, After>

<Figure 7.8 Firefly Eco Forest, Before>

<Figure 7.9 Firefly Eco Forest, After>

<Figure 7.10 Natural Eco Youth Training Resort, Before>

<Figure 7.11 Natural Eco Youth Training Resort, After>

8. Star Parties and Other Related Events

The programs operated by the Firefly Observatory and the Eco School located in the Yeongyang International Dark Sky Park consist of more than 30 various astronomical annual activities, firefly observation and preservation, Eco experience and other events. The main activities based on the observatory are astronomical observation, viewing videos pertaining to the space and space science camp for the family which takes place on the ground. The program also offers many opportunities to witness the night sky as nature intended by operating the mobile observatory for the various festivals and also the elementary, middle and high schools in Yeongyang.

<Table 8.1 Yeongyang International Dark Sky Park Site Education Program>

No.	division	program	time	content
1	operating program	touring the observatory	year-round	· Tue~Sun, 13:00~22:00
2	〃	visiting Eco school	daytime	· Tue~Sun, 10:00~18:00
3	〃	planetarium room	year-round	· Tue~Sun, 10:00~22:00 · explaining constellation & watching videos
4	〃	solar observation	daytime	· Tue~Sun, 10:00~16:00 · sunspot, solar protuberance and flares
5	〃	night space observation	night	· Tue~Sun, 19:30~22:00 · explaining constellation & space observation
6	〃	making planishere	night	· experiencing constellation by simple setting of date and time
7	〃	making wooden insects	daytime	· making insects & necklace with using wood
8	〃	making insect specimen	daytime	· using real insects
9	〃	making Jangseung	daytime	· Korean traditional totem pole
10	〃	pine cone experience	event	· creative experience with the materials from the nature
11	〃	making model telescope	daytime	· models of Mt. Bohyun's 1.8m telescope, radio telescope and space shuttle by using woodlark.
12	special program	group learning experience	day & night	· for the group visitors

<Table 3.10 YeongYang International Dark Sky Park Site Education Program-continue>

No.	sortation	program	time	content
13	operating program	measuring sundial time	daytime	· finding out present time with a sundial
14	special program	children's day / space learning experience	May 5	· Astronomy field trip for the children
15	〃	month of science in April	in April	· operating experiment program for a month
16	〃	mobile observatory	year-round	· offering astronomy observation and science experience to the surrounding area or each group
17	local gov't event	Yeongyang wild green festival mobile planetarium	in May	· mobile planetarium and promotional booth of observatory during the festival
18	education office event	Yeongyang science festival	in June	· operating booth for astronomy experience during Yeongyang science festival
19	special program	astronomy family camp	winter	· one night two days astronomy family camp
20	〃	firefly family camp	in June	· one night two days firefly family camp
21	〃	firefly exploring activities	in June & August	· exploring and observing fireflies
22	〃	flying firefly event	in June	· observing firefly and releasing activities on the last Saturday of June
23	local gov't event	H.O.T festival	Septemb er	· H.O.T festival. promotional booth for observatory. field trip
24	special program	solar eclipse viewing	event	· observing the Sun being blocked by the Moon and hold events
25	〃	lunar eclipse viewing	event	· observing the Moon is blocked by the Sun and hold events
26	〃	public observation	autumn	· science field trip, science lecture and space observation for the residents in Yeongyang
27	〃	viewing the first moon event	Februar y	· viewing the first moon and observing the full moon on the Korean Thanksgiving day
28	〃	astrophotograph exhibition	event	· astrophotograph exhibit on special event
29	〃	special exhibition	event	· travelling exhibition of space & ecology
30	〃	projects supported by Korea Foundation for the Advancement of Science & Creativity	event	· operating experience class on each observatory as part of supporting projects by KOFAC

With the operation of this mobile observatory, about 18,000 visitors, mainly of school groups, families and experience program visitors, are coming for the beautiful Yeongyang dark sky and firefly observation.

<Table 8.2 the status of visitors in Yeongyang firefly special zone and the observatory, and youth training center>

(unit : Person)

science museum \ number of visitors	total	2011	2012	2013	2014	2015 (~5/4)
Yeongyang firefly special zone (yeongyang firefly observatory)	25,784	7,145	7,344	6,115	4,859	321
Yeongyang youth training center (training center, pension)	49,000	11,000	12,000	13,000	11,000	2,000
Total	**74,784**	**18,145**	**19,344**	**19,115**	**15,859**	**2,321**

The Yeongyang Firefly Observatory, designated for the first time as a professional science museum by Gyeongbuk province in 2007, is engaging in astronomy activities in the province as well as various activities related with Korea Astronomy and Science Museum Association.

<Figure 8.1 Activities of Korea Astronomy and Science Museum Association>

[Registration of the Science Museum Issued by the Governor]

과 학 관 등 록 증

1. 등 록 번 호 : 제 공-1 호
2. 과학관의 명칭 : 영양반딧불이천문대
3. 과학관의 구분 : 전문과학관
4. 소 재 지 : 경북 영양군 수비면 수하리 255-1
5. 설 립 자
   - ○ 성 명 : 영양군수
     (개인,법인또는단체명)
   - ○ 주민등록번호 : 508-83-02335
     (법인등록번호)
   - ○ 주 소 : 경북 영양군 영양읍 서부리 379-1
6. 대 표 자
   - ○ 성 명 : 영양군수
   - ○ 주민등록번호 :
   - ○ 주 소 : 경북 영양군 영양읍 서부리 379-1
7. 등록연월일 : 2007 년 4 월 18 일

과학관육성법 제6조제1항 및 동법시행령 제7조제2항의 규정에 의하여 위와 같이 등록하였습니다.

2007 년 4 월 18 일

경 상 북 도 지 사

The county of Yeongyang, together with the Yeongyang Firefly Preservation Society and Korea Firefly Research Society, is operating educational and experience programs to promote the Yeongyang International Dark Sky Park. The events include such as releasing fireflies and firefly family camps. The Yeongyang County is also consistently operating symposiums for the space observation, reduction of light pollution and protection of the night sky with Korea Astronomy and Space Science Museum.

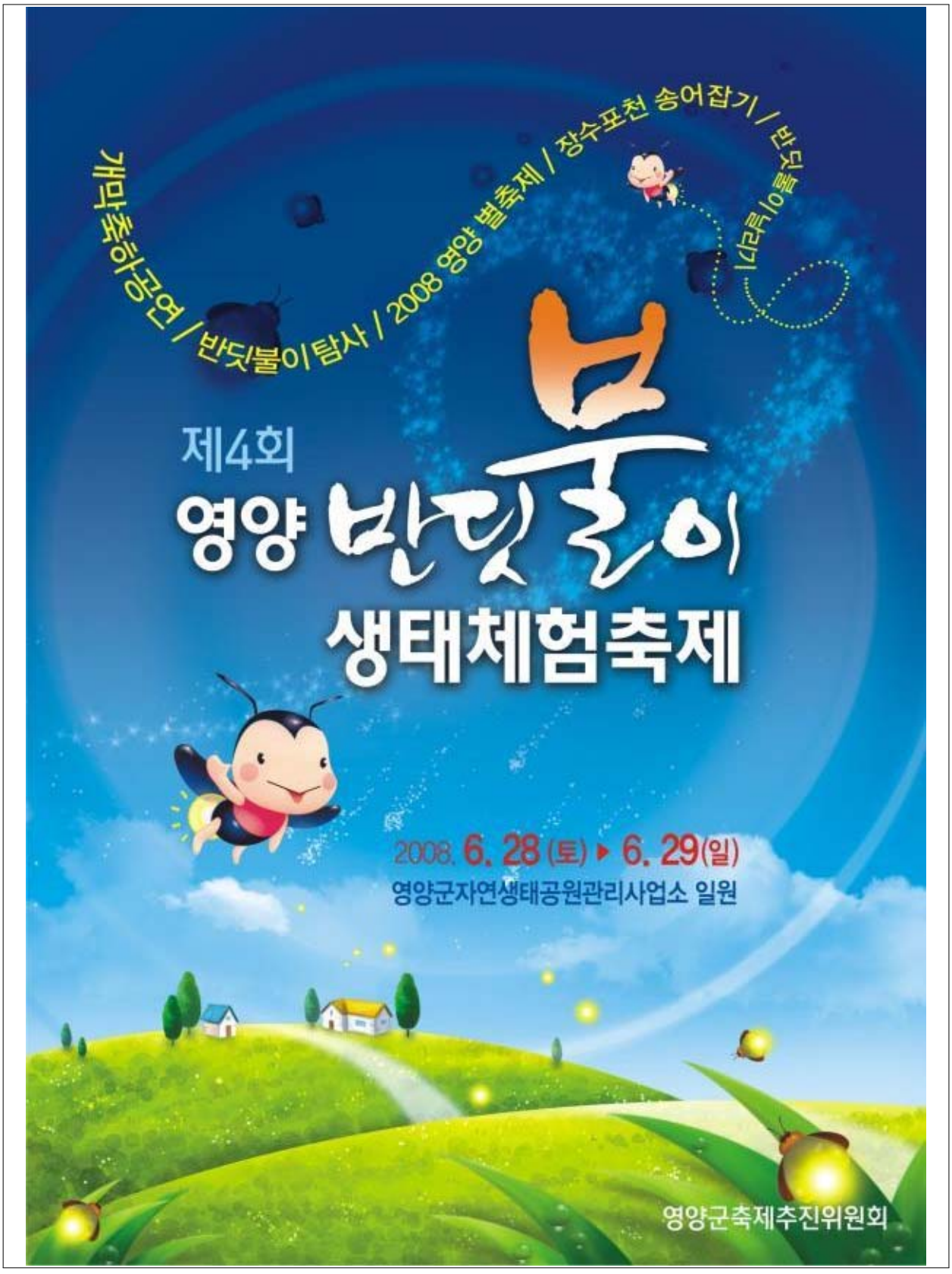
〈Leadership Activities and Cooperation for the Night Sky〉

Programs	External Partner	Contents	Public Education
Astronomy Family Camp of Yeongyang Firefly Obsevatory Program	· Korea Astronomy and Space Science Museum	· Space Observation · Watching Dark Sky · Protection of Night Sky	Yes
Firefly Family Exploration Camp Program	· Yeongyang Firefly Preservation Society · Korea Firfly Research Society	· Releasing Firefly · Stargazing · Protection of Night Sky	Yes
Science Experience	· Korea Astronomy and Space Science Museum	· Planetarium Experience · Watching Dark Sky · Protection of Night Sky	Yes
Observing total Eclipse of the Moon	· Korea Astronomy and Space Science Museum	· Observing the Moon · Protection of Night Sky · Making Compressed Air Rockets	Yes

[2nd Annual Yeongyang Firefly Eco Experience Festival, 2006]

[3rd Annual Yeongyang Firefly Eco Experience Festival, 2007]

[4th Annual Yeongyang Firefly Eco Experience Festival,2008]



[Annual Yeongyang Star Festival, 2008]

[Yeongyang Firefly Exploration, 2009]

[Yeongyang Firefly Exploration, 2010]

[Astronomy Family Camp of Yeongyang Firefly Observatory Program]

영양반딧불이천문대 가족천문캠프

○ 영양반딧불이천문대 가족천문캠프는 가족 단위로 천문학을 가까이 할 수 있는 다양한 체험행사로 매년 개최

○ 영양의 아름다움 밤하늘과 반딧불이를 통해 자연과 하늘의 별에 아름다움을 느낄 수 있도록 하고, 동심의 세계로 체험하며, 아이들이 자연 및 천체 교육과 가족의 화합을 느낄 수 있는 소중한 시간을 제공

○ 영양반딧불이 공원과 천문대에 대한 홍보

□ **교육내용**

○ 행 사 명 : "반딧불이 가족천문캠프"

○ 기　　간 : 매년 10월 - 12월까지(2,4째주 토요일, 총5회)

○ 장　　소 : 영양반딧불이천문대

○ 내　　용 : 천체관측, 별자리 이야기, 망원경 조작 실습, 별자리판 만들기, 천문체험만들기 등

〈1일차〉

시간	일정	내용	장소	흐린날(우천시)
~15:00	등록 및 접수		천문대 1층	
15:30~17:00	오리엔테이션 및 전시관 관람	- 전시관 자유관람 - 체험만들기	천문대/ 생태학교	
17:00~19:30	식사 및 자유시간	가족별 개별 식사		
19:30~20:30	망원경 조작 실습	망원경 원리 이해 및 체험	천문대 1층	
	플라네타리움	별자리 및 입체영상 관람	천체 투영실	
20:30~21:00	별자리판 만들기	별자리판을 이용한 별자리 교육	천문대 3층	
21:00~22:00	천체관측	- 주망원경을 통한 관측 - 체험용 망원경을 통한 가족별 자유 관측	천문대	특정사물을 망원경으로 관찰
22:00~	프로그램 종료	취침		

〈2일차〉

시간	일정	내용	장소	흐린날(우천시)
~10:00	기상 및 아침식사	가족별 개별 식사		
10:00~11:30	주간관측/ 체험만들기	- 태양관측(흑점 및 홍염) - 기념품 만들기	천문대3층 /생태학교	
11:30~	해산	기념사진 촬영		
※ 별자리판, 태양관측필터, 교육책자 제공 ※ 당일 사정에 따라 일정이 변동될 수 있습니다.				

□ 관측 프로그램 세부 계획

활동 명	천체관측 및 주간관측
목표	망원경을 통한 천체관측
운영 계획	
장소	시간
천문대 3층 천체관측실	첫날) 21:00 ~ 22:00 이튿날) 10:00 ~ 11:00

내 용
◉ 관측 기기 1. 400mm 슈미트카세그레인식 반사망원경 1대 2. 150mm 굴절망원경 2대, 250mm 반사망원경 2대 3. 105mm 경위대식 굴절망원경 6대, 쌍안경 6대 ◉ 망원경 관측 1. (1-3회차) 플레이아데스성단, 이중성, 페르세우스이중성단 등 2. (4-5회차) 플레이아데스성단, 이중성, 오리온대성운, 목성 등 ※ 달은 11월9일과 12월14일만 관측할 수 있음. ◉ 육안관측 - 가을철 별자리, 겨울철 다이아몬드, 북극성, 카시오페이아, 목성, 달 ◉ 주간관측 - 태양 광구면의 흑점, 태양 채층면의 홍염과 플레이 ※ 우천 시 대체프로그램 진행

□ 체험 프로그램 계획

○ 별자리판, 열쇠고리 및 버튼 만들기, 천문관련 만들기 등.

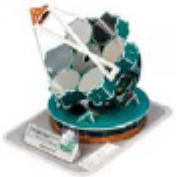
천문대 체험·교육프로그램(상시)

▫ 과학체험교실
- ○ 시　　간 : 상시운영(13:00~22:00)
- ○ 장　　소 : 반딧불이생태학교 별관 2층
- ○ 운영방법 : 매주 다른 과학체험 만들기 진행
- ○ 내　　용

기간	날 짜	체험 내용	장 소
1차	4. 8(화) ~ 13(일)	우주왕복선 만들기	천문대 및 반딧불이생태학교 별관 2층
2차	4. 15(화) ~ 20(일)	보현산 망원경 만들기	
3차	4. 22(화) ~ 27(일)	GMT망원경 만들기	

우주왕복선 모형

1.8M 망원경 모형



거대마젤란망원경 모형

▫ 천체투영실 4D영상물 상영
- ○ 시　　간 : 10:00 ~ 22:00
- ○ 장　　소 : 반딧불이천문대 1층 천체투영실
- ○ 내　　용 : 외계행성을 찾아서 (15분), 용의 비밀 (12분, 주간), 봄철 별자리 이야기 (15분, 야간)
- ○ 운영방법 : 1회당 2편 상영, 30명 관람

▫ 전시관 관람
- ○ 시　　간 : 10:00 ~ 18:00
- ○ 장　　소 : 반딧불이천문대 및 생태학교
- ○ 내　　용 : 반딧불이천문대 전시관 및 생태학교 전시관에서 망원경의 원리 이해, 우주의 신비를 알아보고 곤충과 어류의 모습과 특징을 관찰
- ○ 소요시간 : 약 30분

▫ 주야간 천체관측
- ○ 시　　간 : 13:00 ~ 22:00
- ○ 장　　소 : 반딧불이천문대 3층 관측실
- ○ 관측기기 : 400mm 슈미트카세그레인식 반사망원경 1대
  150mm 굴절망원경 2대, 250mm 반사망원경 2대
- ○ 관측대상 : 태양의 흑점 및 홍염, 플레어 (주간)
  달(4.8~17), 목성, 프레세페성단 (야간)
  봄철별자리(사자, 목동, 처녀) 등 (육안)
- ○ 내　　용 : 주간에는 태양을 관측하여 흑점 및 플레어를 관찰하고, 야간에는 봄철별자리, 북두칠성 등의 별자리를 육안관측 및 달, 목성, 성운, 성단 등의 천체관측을 진행

[Astronomy Family Camp of Yeongyang Firefly Observatory, 2012]

Astronomy Family Camp

Astronomy Family Camp

Astronomy Family Camp

[Astronomy Family Camp of Yeongyang Firefly Observatory, 2013]

[Firefly Family Exploration Camp Program]

반딧불이 가족 탐사 캠프

가을밤 가족과 함께 떠나는 반딧불이 탐사 여행을 통하여 가족 화합의 장 마련과 청정지역에서 만끽하는 각종 자연 체험 학습을 즐기는 이색 체험캠프를 통해 청정 지역의 중요성에 대한 교육 진행

□ 행사개요

○ 일　　시 : 매년 9월 중

○ 장　　소 : 반딧불이생태학교 및 공원

○ 주요행사 : 반딧불이 가족 탐사

○ 체험행사 : 곤충표본 만들기 체험, 천체관측 및 4D천체영상물 관람,
가족 소망풍등 날리기 등 각종체험 프로그램 진행

○ 일　　정

비고	시　　간	체 험 행 사	장　　소
1일차	14:00 ~ 15:00	등록 및 숙소 배정	반딧불이천문대
	15:30 ~ 18:00	전시관 관람 및 곤충표본 만들기 체험	반딧불이생태학교
	18:00 ~ 19:30	식　사	
	19:30 ~ 20:30	반딧불이 관찰 및 탐사	반딧불이생태공원
	20:30 ~ 21:00	가족 소망풍등 날리기	반딧불이 생태공원
	21:00 ~ 22:00	가을철 별자리 탐사	반딧불이생태공원
	22:00 ~	가족별 자유시간 및 취침	
2일차	10:00 ~ 11:30	태양관측 및 가족 기념품 만들기	반딧불이생태학교
	11:30 ~	가족 기념촬영	

[Firefly Family Exploration Camp, 2014]

[Astronomy Family Camp, 2014]

Astronomy Observation	Night and Day Astronomy Observation

[Public Observation, 2014]

Observing Lunar Eclipse

Photo of the Lunar Eclipse Education


반딧불이
천문대
이동천체관측


반딧불이 천문대 홍보관
12
반딧불이 천문대
이동천체관측


반딧불이천문대와
함께하는
망원경으로
실내 액자
관측하기,
별자리
탁본
체험하기
반딧불이천문대

9. Yeongyang International Dark Sky Park Site Outdoor Lighting Policy

9.1 Yeongyang International Dark Sky Park Site Lighting Master Plan 2015

For the designation of International Dark Sky Park, Yeongyang established a master plan according to the lighting management guideline required by the IDA.

This master plan suggests maintenance plan for the Yeongyang International Dark Sky Park for the designation and established design guidelines for the best environment of the night sky by distinguishing the park area into a core area and a residential living area. The plan also states maintenance proposal for a consistent dark sky protection over the next 5 years.

9.2 Yeongyang International Dark Sky Park Policy

The following letter, received from the Director of Yeongyang Eco Park Adminstration Office, who is in charge of administering the total area of Yeongyang Dark Sky Park, suggests the future plans of night sky protection of Yeongyang Dark Sky Park and ecological landscape according to the lighting plan guidelines and the ordinance on the regulation of outdoor lighting.

YEONG YANG
379-1 Seobu-ri, Yeongyang-eup, Yeongyang-gun, Gyeongsangbuk-do, Republic of Korea
Tel 054-680-6031 Fax 054-680-6059

Juiy 01, 2015

As a Director of Yeongyang Natural Eco Park Administration Office, currently managing Firefly Eco Special Zone and the Natural Environment and Ecological Conservation Zone of Soobi-myeun, Yeongyang, and Songbang village and Omu village, We will do our best efforts to meet the requirements of the IDA's outdoor lighting guidelines and criteria. The new outdoor lightings will be installed based on the Yeongyang outdoor lighting guidelines and the master plan. We will also try to protect the light pollution of outdoor lightings by applying new methods such as Dark-Time on roadway lighting, signboard lamp and security lighting which are installed inside the village for security reasons.

This letter is to certify that as a candidate for the International Dark Sky Park, Yeongyang, a responsible member of the international community for the future, will put forth its utmost efforts to fulfill various education on light pollution protection and to preserve beautiful night sky at the Firefly observatory.

The Yellow/amber/red lighting systems installed in the future should not exceed 4,000K and we will comply with the following lighting plan process.

- The lighting plan process for the Yongyang International Dark Sky Park

Period	present(year 2015)	after 5yrs(year 2019)	after 10yrs(year 2024)
aim(%)	71.6	90	100

Sincerely

Yung Tak Park

Director

Yeongyang Natural Eco Park Administration Office

9.3 Yeongyang County ordinance for the lighting landscape management in the Yeongyang International Dark Sky Park

Article 1.(Purpose and Objective of Ordinance)

This ordinance is intended to protect the ecological landscape and night sky of the Yeongyang International Dark Sky Park (called "The Park" from now on) through the proper management of the artificial lighting.

Article 2.(Location)

The Park includes the special zone of the Yeongyang Firefly Eco Experience Village including the ecological landscape conservation zone of Wangpi River basin located in the Suha valley of Yeongyang.

Article 3.(Definition) The meaning of terms in this ordinance is as follow.

1. "Light pollution" is the pollution level of th sky affected by the light and the light which interrupts the observation of the night sky by the misty sheet of dust in the air caused by the artificial lighting.
2. "Artificial light" is the illumination produced by the artificial light source.
3. "Shield" is the fixture that blocks the transmission of the light traveling upward or illuminating in other directions than intended.
4. "IDA" is the International Dark Sky Association.
5. "Light landscape guidelines" is the issues on the installation and management of the lighting fixtures in The Park.

Article 4.(Scope of Ordinance)

This ordinance is limited to the area designated for The Park. However, the application range could be extended if the artificial lighting in the vicinity area affects The Park.

Article 5.(The responsibilities for the County and the Residents)

1. The Mayor of Yeongyang(called ""the Mayor"" from now on) must provide informations on the guideline of proper artificial lighting for the residents living in The Park(called "the residents"" from now on).

2. The residents must actively cooperate in preventing the light pollution by installing and managing the lighting according to the management plans of the lighting landscape.

Article 6.(Establishment of lighting management plan, and others)

(1)The Mayor must establish the management plan of the lighting landscape including the issues of the following situations in order to protect ecological landscape and night sky from the light pollution.

1. The issues on the effective management of the artificial lighting.

2. The issues on the usage range of the proper lighting fixtures.

3. The issues on the protection of animals and plants by minimizing the ecological effect of the artificial lighting.

4. The issues on the management and operation including the annual management plans of lighting landscape inside The Park being offered by the IDA.

Article 7(Guidelines for lighting installation)

1. The guideline encourages the use of orange lamp for the lighting fixtures and the brightness less than 500 lumens.

2. It is a mandatory that the lighting over 500 lumens must have a shield.

3. If the lighting is necessary for the playground and signboards, the brightness should be minimized and the light should be controlled by a sensor or a timer.

4. The details of the lighting installation shall be compliant with the lighting landscape guideline.

Article 8(Guidelines to Lighting Regulations)

1. The optimum level of lighting should be used in necessary time and in necessary place.
2. All the lights inside The Park should be lit after 30 minutes of sunset and should be off before 30 minutes of sunrise.
3. The light coming outside from the interior lighting should be cut off(blocked) before 30 minutes of the sunset.
4. The brightness of light, the effects of light and the lighting time should be minimized.

Article 9(Strengthening International Cooperation)

The Mayor should actively participate in protecting the night sky from the artificial lighting through the international cooperation with the IDA and the (designated) International Dark Sky Park (Site).

Article 10(Reward)

In accordance with the Reward Act of the Yeongyang County, the Mayor can reward the institutions, organizations and individuals who contributes significant achievements in preventing light pollution.

Supplementary provisions.

1. (Enforcement date) The ordinance comes into force from the day of promulgation.
2. (Actions on a previous installation) The lighting facilities already installed and operating at the time of the enforcement ordinance are regarded as installed according to this ordinance.

1. Yeongyang International Dark Sky Park Guidelines for Outdoor Lighting

Scope

This document, for the designation of Yeongyang International Dark-sky Park, presents guidelines for outdoor lighting (GOL) on the basis of Royal Astronomical Society of Canada(RASC) Dark-sky Preserves and International Dark-Sky Association(IDA).

The purpose of this guideline is to promote the reduction in light pollution, demonstrate good night-time lighting practices, improve the nocturnal environment of wildlife, protect and expand dark observing sites for astronomy, and provide accessible locations for the general public to experience the naturally dark night sky.

Definitions

Dark Time

A period after which scheduled outdoor activity has ended and visitors are expected to minimize their activity to permit other visitors to sleep.

Two hours after the sunset.

DSP BUFFER

Region within DSP surrounding the Core area under control of the park manager.

DSP CORE

Region within DSP surrounded by a Buffer area under control of the park manager.

Types of Lamp

CDM : Ceramic Discharge Metal-Haide, invented by Phillips by using new ceramic material to make the Arc Tube

CFL : Compact Fluorescent Lamps

FPL : Fluorescent P type Lamp meaning "U" shaped lamp.

The letter "P" stands for "pie" in Greco-Roman letter and the capital letters represent "U" shape.

LED : Light Emitting Diodes

MH : Metal Halide lamps("white" colored lamps)

ML : Mercury Lamp

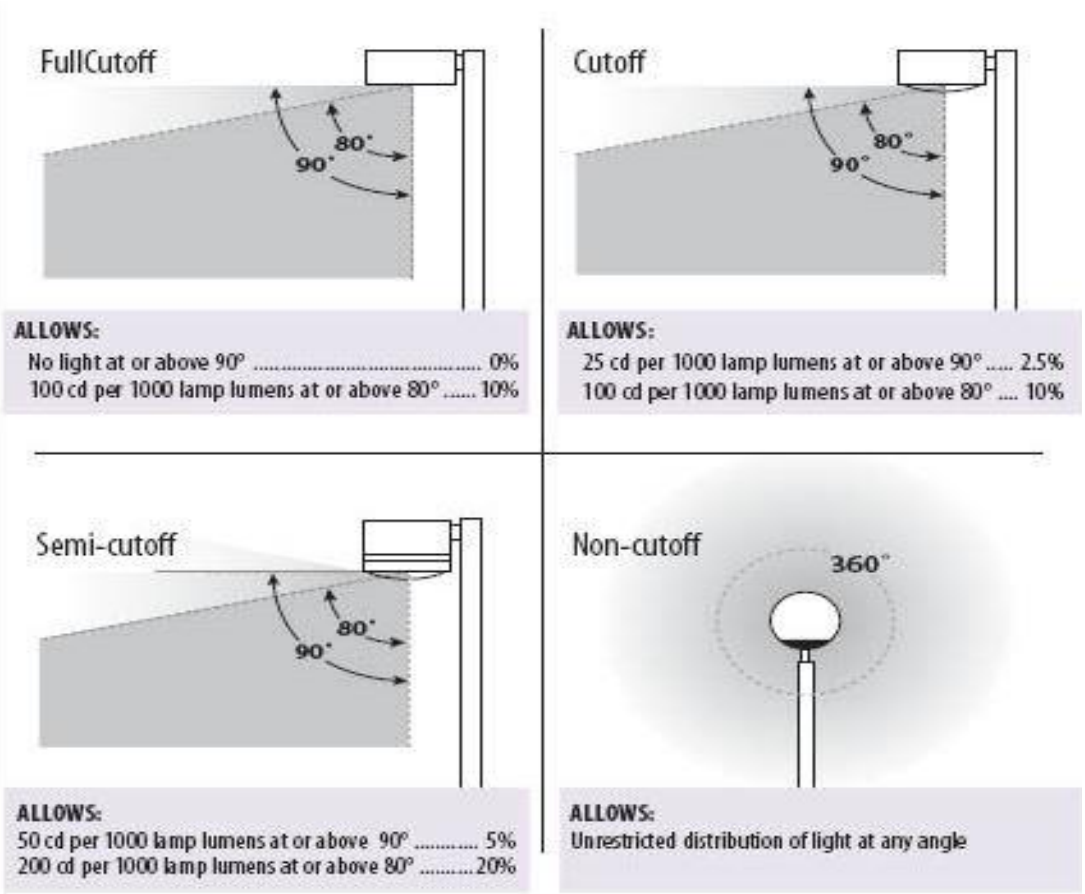
Illumination Engineering Society of North America(IESNA) Standard cut-off Classification

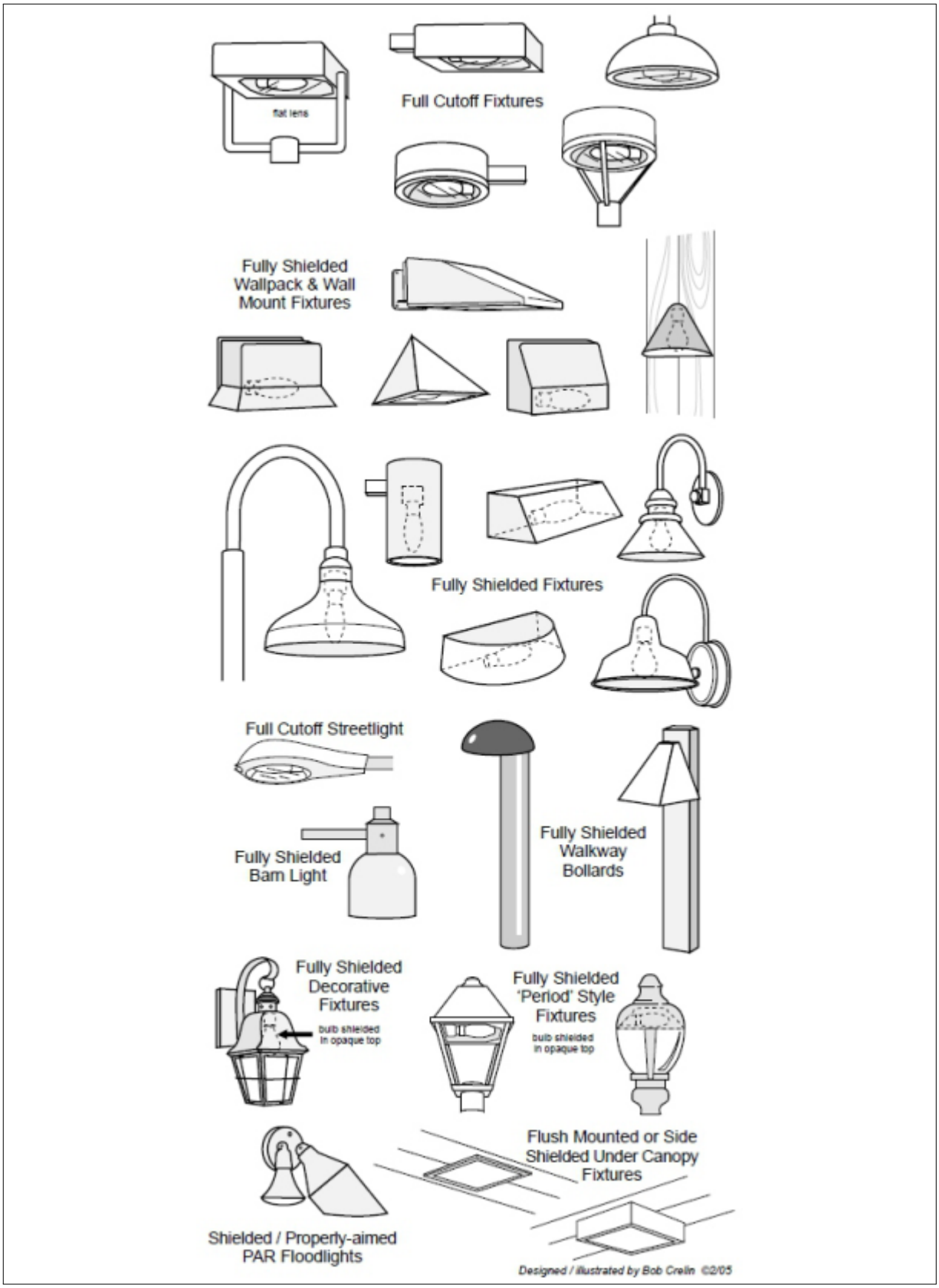
FCO : Full Cut Off (0% up-light or Fully Shielded)

CO : Cut-off Luminaries(〉0% and 〈2% up-light)

SCO : Semi Cut-Off (〈2% and 〈5% up-light)

NC : Non Cut-off (Light is not blocked)




flat lens
Full Cutoff Fixtures
Fully Shielded
Wallpack & Wall
Mount Fixtures
Fully Shielded Fixtures
Full Cutoff Streetlight
Fully Shielded
Barn Light
Fully Shielded
Walkway
Bollards
Fully Shielded
Decorative
Fixtures
bulb shielded
in opaque top
Fully Shielded
'Period' Style
Fixtures
bulb shielded
in opaque top
Flush Mounted or Side
Shielded Under Canopy
Fixtures
Shielded / Properly-aimed
PAR Floodlights
Designed / illustrated by Bob Crelin ©2/05

2. Guidelines for Outdoor Lighting

Precondition

Before determining what type of lighting should be installed or retrofitted, it is important to ask the basic question "Is the lighting necessary?" . If no valid reason for lighting can be found, it is better to remove the current lighting than replacing it with better technology.

Where necessary for basic safety and navigation, following standard should be followed to minimize light pollution:

① Illumination should be to the minimum practical level.

② The affected area of illumination should be as small as practical.

③ The duration of the illumination should be as short as practical.

④ Minimize the amount of short wavelength spectral content including UV and blue light

⑤ HID lamps are very efficient but they emit more light than is recommended. So, relatively inefficient, incandescent lights may be used for short periods of time or more advanced Light Emitting Diode(LED) lamps may be installed.

⑥ The lighting systems installed in the future should not exceed CCT of 4,000K and 2,500K is recommended.

General Principles

1. Buildings require illumination only when open or available to people. After the office is closed to the public, all lighting visible from the outside should be turned off or covered.
2. To save energy and minimize the duration and extent of light pollution, lighted pathways should be illuminated only when pedestrians are in transit. All reasonable effort should be made to turn off lighting when pedestrian traffic is low or is no longer expected.
3. To minimize the impact of artificial lighting on the ecosystem, the areas covered by this specification should only provide a safe transition between lighted structures and the surrounding unlighted area and to assist in navigation.

4. To minimize the extent of light pollution, the area of illumination should be strictly limited.

5. To limit the duration of light exposure on the ecosystem and to save energy, light activated timing circuits should turn off outdoor lighting. The time delay should begin at sunset and should extend to an appropriate time into the evening to permit scheduled activity to end.

6. Where vehicle and pedestrian traffic is at a low speed or infrequent, retro-reflective signage should be used instead of installed lighting fixtures.

1) Buildings

Six types of structures that may require illumination within a park. In all cases, full cut-off (FCO) luminaries should be used and illumination should be controlled to prevent light scattering beyond the immediate area of the light fixture. The color of this light should have minimal UV and blue (short wavelength) content and dark time lighting curfews should apply.

Five classifications for buildings:

Administration Buildings - Public Buildings - Retail Stores - Vending Machines - Toilet Facilities

Building Illumination Guidelines (Maximum Values)

Area	Type	Lamp	Illuminatio n Level lux	Lamp Color	Dark Time
Administrative Bldgs.	FCO	Incandescent, Yellow CFL or Amber LED	〈 500	Yellow Amber Red	Yes
Public Bldgs.	FCO	Incandescent, Yellow CFL or Amber LED	〈 500	Yellow Amber Red	Yes
Retail Stores	FCO	Incandescent, Yellow CFL or Amber LED	〈 500	Yellow Amber Red	Yes
Vending Machine	FCO	Incandescent, Yellow CFL or Amber LED	〈 500	Yellow Amber Red	Yes
Toilet Facilities	User (FCO)	Incandescent, Yellow CFL or Amber LED	〈 500	Yellow Amber Red	NO

※ Dark Time : In the case of Youth Center, 4 hours of application is possible depending on the situation.

(1) Administration Buildings

After sunset, all interior lighting should be turned off, or window and door blinds should be used to prevent interior light from shining outside.

Light activated timing circuits should turn off all outdoor lighting within 30 minutes of the office being closed.

Manual reset switches may be used to extend this period for late-working staff.

(2) Public Buildings

After sunset, all interior lighting should be turned off or window and door blinds should be used to prevent interior light from shining outside.

Light activated timing circuits should turn off all outdoor lighting with 30 minutes of the office being closed.

The outside lighting will be limited to the main doorway and steps.

The lights should turn off after a period of time specified by Park manager.

Motion detectors or manual reset switches may be used to adjust time.

(3) Retail Stores

It is assumed that retail stores remain open longer hours for business and will have higher pedestrian traffic.

Window coverings should be used after 30 minutes of sunset in order to block out interior lighting from shining outside.

Exterior light is permitted, and restricted to, the area around the door using Full Cut-off(FCO) fixtures.

All Exterior lighting should be turned off within 30 minutes after business hours.

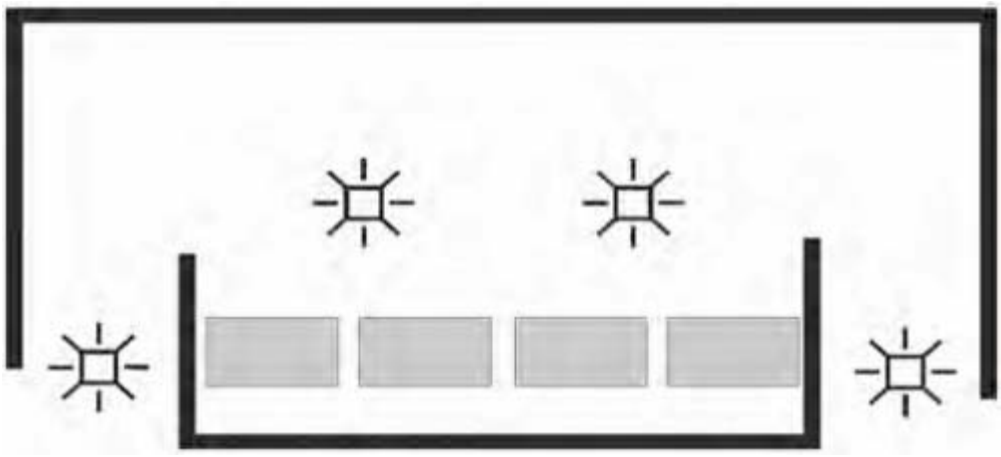
(4) Vending Machines

Vending machines should be located in an enclosed space and their lights should not shine directly outside through windows.

Practically, vending machines should be enclosed in public buildings.

Like the drawing below, FCO fixtures should be used to light the area outside the entrances and the extent of the light is restricted to less than 5 meters from the entrance.

Doorway lighting should be turned off within two hours after sunset and interior lighting may remain on at the decision of the owner.



Vending Machines

(5) Toilet Facilities

To light the entrance and nearby area, Full Cut-off(FCO) fixtures should be used.

If considered necessary by Park managers, a non-cut-off marker light with the lowest practical wattage should be used.(Ex. a1 w red or amber LED)

Excessive interior lighting levels can produce serious glare that impairs exterior visibility therefore interior lighting should use bug light or yellow color whenever possible and lighting levels as measured horizontally at the floor should not exceed 10 lux(1fc).

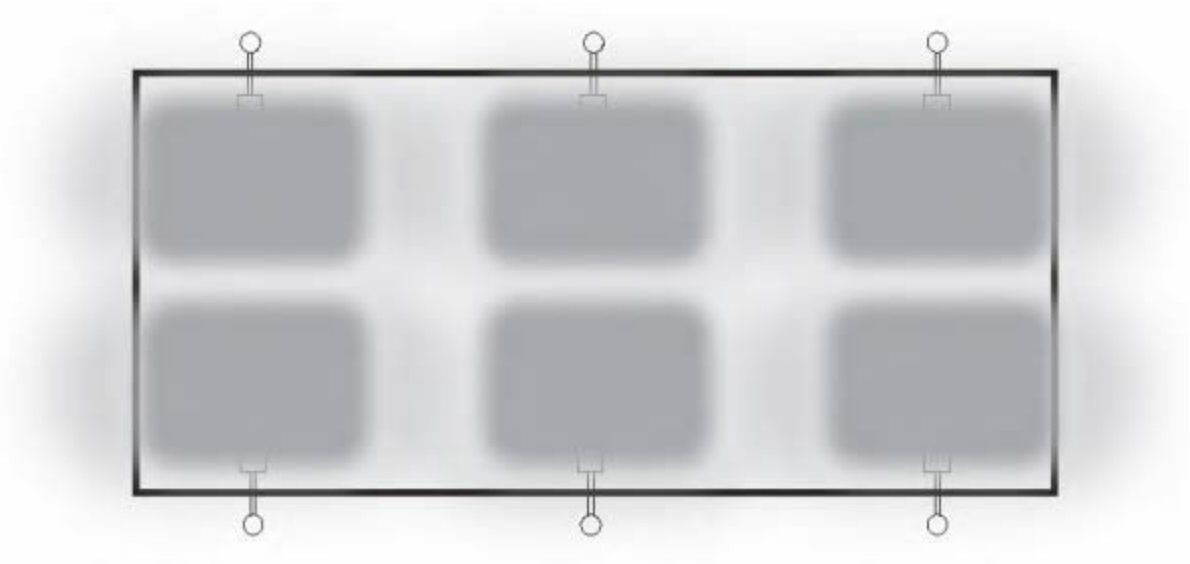
2) Parking lots.

Where needed, Full Cut-off luminaires should be placed at the corners of the parking lots.

Pole spacing of no less than 4-times the luminaire height.

Their light distribution pattern should be "full forward" and aimed into the lot.

With the lighting poles, retro reflective markers should be extending from the ground level up to approximately one meter.



Parking lot illumination

(1) Administration Parking Lots

Lightings should be turned off within 30 minutes of the office closure and for employees working late, timing circuit should be controlled with a manual reset.

(2) Visitor Parking Lots (Small)

As a general rule, parking lots with less than 10 cars should not be illuminated.

(3) Visitor Parking Lots (Large)

Large parking lots with spaces for more than 10 care may be illuminated at the decision of the Park manager. However, illumination levels should not exceed the limits listed as below.

Parking Lot Illumination Guidelines (Maximum Values)

Parking Area	Type	Lamp	Illuminatio n Level	Color	Dark Time
Admin. Lot	FCO	LPS, HPS or Amber LED	〈 500	Yellow Amber Red	Yes
Visitor Lot(small)	N/A*	None	N/A	Yellow Amber Red	N/A
Visitor Lot(large)	FCO	LPS, HPS or Amber LED	〈 500	Yellow Amber Red	Yes

* N/A - Not Applicable

3) Roadways

Intersections being one of the most dangerous area for drivers, drivers of high-speed vehicles require sufficient time to react when they approach an intersection. Thus, major intersections should be marked with signage or luminaires and illumination of adjacent area should be minimized.

(1) Class 1(High Traffic) ~ Class 3(Medium Traffic)

Class 1 ~ Class 3 are high traffic roads, therefore marker lighting is needed to alert an intersection.

To reduce the impact of luminaires, the luminaire should be mounted no longer than 6 meters and the fixture should use LPS or Amber LED to minimize the exposure of UV and blue light.

Roads between all intersections should use retro-reflective signage and illuminated signage should not be permitted.

(2) Class 4(Low Traffic) ~ Class 6(Occasional Traffic)

Roadways and Intersections: Recognizing the infrequent use of these roads and the potential impact they may have on remote areas, they should not be illuminated.

Roadway Illumination Guidelines (Maximum Values)

Roadways	Type	Lamp	Illumination (Lumens)	Color	Dark Time
Class 1-3 Roadways	None	N/A	N/A	Yellow Amber Red	N/A
Class 1-3 Roads&Intersections	FCO Marker	LPS, HPS or Amber LED	〈 500	Yellow Amber Red	No
Class 4-6 Roads&Intersections	Signage only	N/A	N/A	Yellow Amber Red	N/A

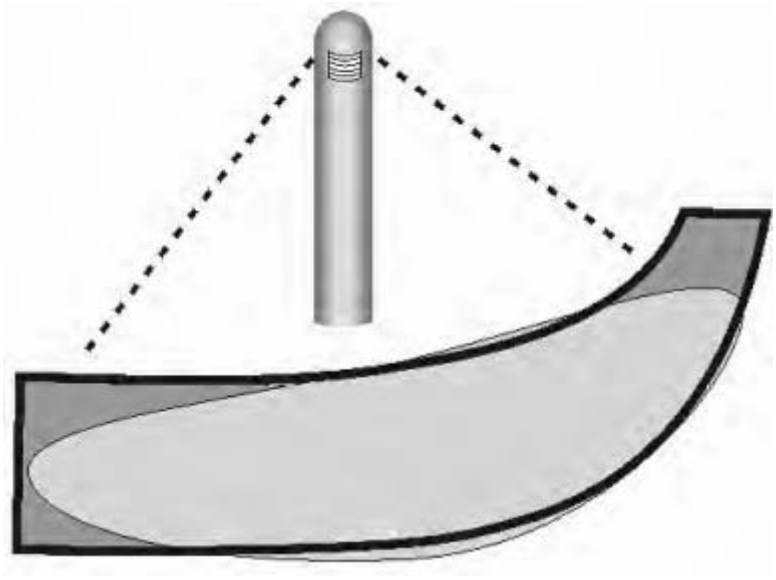
(3) Pathways

Pathways need illumination for visibility but excessive illumination can disturb the navigation

of the pathways.

Pathways can be approached by wildlife so lighting should be restricted to only near buildings, parking lots and campgrounds, and only those paths that the Park Manager considers appropriate should be illuminated.

Low wattage lighting should be used and bollard luminaire should be installed to light the width of the pathways.



Bollard Lighting

Pathways should use white limestone and asphalt is not recommended. Retro-reflective or passive fluorescent markers may be used to mark the direction and these can be mounted on bollards or in the pathway surface.

Switches with timing circuits may be used to automatically turn them off when not in use.

Luminaires close to the ground need very low light intensity, therefore low wattage incandescent lamps or LEDs should be used.

If possible, pathways in the park should not be illuminated but when necessary, it may be illuminated with fluorescent markers.

Pathway illuminations should be FCO bollard lighting.

After the Dark Time lighting curfew, all the pathways lighting should be turned off. Retro-reflective markers on the bollards can assist pedestrians after Dark Time.

Main pathways leading to night facilities may be illuminated throughout the night at the decision of the Park Manager.

Pathway Illumination Guidelines (Maximum Values)

Pathways	Type	Lamp	Illumination (Lumens)	Color	Dark Time
Pathways	None	None	N/A	Yellow Amber Red	Yes
Illuminated Pathways	FCO	Incandescent, Yellow CFL or Amber LED	〈 500	Yellow Amber Red	Yes
Main Pathways	FCO	Incandescent, Yellow CFL or Amber LED	〈 500	Yellow Amber Red	Yes

4) Signage

Signs within a Park are essential to the navigation of the site.

Types of Signs :

Names for sites or buildings(usually mounted in proximity to buildings or other structures)

Directions for roadways or pathways

Informations for roadways or pathways

Illuminated signs are prohibited in a DSP(internally illuminated signs, signs illuminated from below and above the sign, and in front of the sign)

Signs should be made from the materials that could be easily read with flashlights or existing lighting.

Retro-reflective signage is recommended.

Retro-reflective signage should be installed lower than one meter so they may be easily found by pedestrians with flashlights.

All bollards should be marked with retro-reflective material so they may be visible after dark.

Signage Illumination Guidelines(Maximum Values)

Signage	Type	Lamp	Illumination (Lumens)	Color	Dark Time
Building	Retro-reflective	Amber or Red LED	N/A	Amber Red	N/A
Navigation	Retro-reflective	Amber or Red	N/A	Amber Red	N/A
Information	Retro-reflective	Amber or Red	N/A	Amber Red	N/A

5) Developed Properties within Park Facilities

These properties include privately owned and rental properties and towns within Park boundaries.

Owners of the private properties withing the Park should be informed of the impact of artificial lighting on wildlife.

They should be encouraged to decrease the use of over night lights, replace yard lights with FCO and replace MH lamps(white) with HPS(yellow), LPS or amber LED.

They should be encouraged to minimize the use of exterior lights while indoors.

All municipal lighting should be FCO and illumination should follow IESNA guidelines.

The outdoor lighting under the control of the Park managers should use FCO fixtures.

Yard lights and over night lights should not be permitted nor should MH or mercury vapour lamps be permitted.

Use of outdoor lighting on private properties within Parks should be discouraged 2-hours after sunset.

Lights should be turned off when people are indoors.

No outdoor lights should be on throughout the night.

Other Properties Illumination Guidelines (Maximum Values)

Other Properties	Type	Lamp	Illumination (Lumens)	Color	Dark Time
Door Lights	FCO	Incandescent, Yellow CFL or Amber LED	〈 500	Yellow Amber Red	Yes
Yard Lights	FCO	LPS, HPS, Yellow CFL or Amber LED	〈 500	Yellow Amber Red	Yes
Roadway Lights	FCO	LPS, HPS, Yellow CFL or Amber LED	≤ minimum IESNA	Yellow Amber Red	Yes

6) Wilderness Areas

Wilderness areas are all "undeveloped" property, therefore red or amber flashlights should be encouraged but high power flashlights with over 300 lumens is not permitted.

The permanent lighting, as with flashlights, amber and red lights will reduce glare and help maintain dark adaptation.

The use white flashlights should be discouraged or used sparingly.

Lamp Color Guidelines

Six lamp types that convey color from amber to bright white.

The last LED color can be customized by the user.

Color	Type	Characteristics	Applicability
White ↕ Amber	MH : Metal Halide (Mercury Lamp)	• due to wide spectrum emission allows good color recognition • excessive UV emission	DSP prohibited
	Incandescent	• warm white and very low energy efficient • good reasons for use ① easy turn off through a sensor ② when Amber LED or Yellow CFL Lamp can't be used due to insects	possible if under stated reasons
	HPS : High Pressure Sodium (Yellow Lamp)	• Bright Yellow and is allowed in a small light-emitting region • type of HID	Allowed
	Yellow CFL – Compact Fluorescent Lamps	• wider spectrum than LED • to avoid insect attraction, darker yellow or orange lamp is possible • do not perform well in cold temps. • warm-up needed in sub-zero temps.	Allowed
	LPS – Low Pressure Sodium Monochromatic	• poor color recognition • energy efficient • even low wattages produce too mich light for use in DSPs • light-emitting region is larger than HID making shielding more difficult	Prohibited
	LEDs – Light Emitting Diodes	• Amber and Red LED has low impact on the environment • most desirable for DSP applications	AMBER LED RED LED

10. IDA International Dark Sky Park Program

10.1 Program Criteria Compliance Checklist

The IDA Dark Sky Park Program Criteria(May 2013 version

;http://www.darksky.org/idsp/Guidelines/IDSP%20Guildelines%20Final-‐-‐.May13-‐-‐.BP.pdf)was used in the preparation of this Nomination Package.

The following checklist shows the Yeongyang International Dark-Sky Park compliance status with reference to the appropriate sections of this Nomination Package.

〈Table 10.1 IDSP Program Criteria Compliance〉

IDSP Program Criteria	Compliance Status	Section Discussed
ELIGIBILITY(ALL MUST BE MET)		
A)All protected public lands, whether managed by national, state, provincial, or local agencies, are eligible.	∨	3 4
B)The park must provide the opportunity for public nighttime access, with or without supervision. Regular visitation by the public is essential to meet the goals of the IDSP program. A portion of designated land may meet this requirement, or access must be available for a portion the night.	∨	4.1 4.2 7
C)The park must provide an exceptional dark sky resource, relative to the communities and cities that surround it. Core night sky quality must fit in one of the three tier qualifications Gold, Silver, or Bronze.	∨	6
MINIMUM REQUIREMENTS[see Program Criteria for sub-‐-‐.requirements]		
A)A quality comprehensive Lightscape Management Plan (LMP)	∨	9
B)The park’ s commitment to dark skies and lightscape management)	∨	9
C)The park’ s commitment to public education	∨	3 4 8 11

10.2 Program Criteria Tier Compliance

The following table shows the three "International Dark Sky Park" designation tiers(Gold, Silver, and Bronze) and what tier YeongYang International Dark-Sky Park meets for each indicator.

GOLD, SILVER, AND BRONZE TIER DESIGNATION

Indicator	Gold	Silver	Bronze
Philosophy	Nighttime environments that have negligible to minor impacts from light pollution and other artificial light disturbance, yet still display outstanding quality night skies and have superior nighttime lightscapes.	Nighttime environments that have minor impacts from light pollution and other artificial light disturbance, yet still display good quality night skies and have exemplary nighttime lightscapes.	Areas not meeting the requirements of *Silver*, yet still offering people, plants, and animals a respite from a degraded nocturnal environment and suitable for communicating the issue of light pollution and connecting people with the many aspects of the night sky.
Artificial Light and Skyglow	Typical observer is not distracted by glary light sources. Light domes are only dim and restricted to sky close to horizon.	Point light sources and glary lights do not dominate nighttime scene. Light domes present around horizon but do not stretch to zenith.	Areas with greater artificial light and skyglow than *Silver*, but where aspects of the natural sky are still visible.
Observable Sky Phenomena	The full array of visible sky phenomena can be viewed—e.g. aurora, airglow, Milky Way, zodiacal light, and faint meteors.	Brighter sky phenomena can be regularly viewed, with fainter ones sometimes visible. Milky Way is visible in summer and winter.	Many sky phenomena cannot be seen. Milky Way is seen when pointed out to the average person, as is the Andromeda Galaxy.
Nocturnal Environment	Area is devoid of obvious lights that can cause wildlife disorientation. Artificial light levels are thought to be below the threshold for plant and animal impact. Ecological processes related to nocturnality are unaltered. No lighting atop towers or buildings within park boundary.	Areas that have minor to moderate ground illumination from artificial skyglow. Lights that may cause disorientation to wildlife are distant. Disruption of ecological processes is minor with no impairment to plants or wildlife.	Areas with greater nocturnal impact than *Silver*, but where ecosystems are still functional.
Visual Limiting Magnitude	Equal or greater than 6.8 under clear skies and good seeing conditions	6.0 to 6.7 under clear skies and good conditions	5.0 to 5.9 under clear skies and good seeing conditions
Bortle Sky Class	1-3	3-5	5-6
Unihedron Sky Quality Meter	> 21.75	21.74-21.00	20.99-20.00

11. Media Coverage

Ever since the Yeongyang County in Korea took interest in the night sky protection program of IDA, we, for the first time in Asia, visited the IDA headquarters in Tucson to further obtain varied information and understand the programs and the aims of the IDA. At that time, we met up with Scott Kardel, the Director, and John Barentine, the Program Manager and had a discussion which allowed us to get the information of International Dark Sky Park designation.

<Figure 11.1 Visit to IDA>

<Figure 11.2 IDA Office Photo>

<Figure 11.3 Consultation with IDA office>

<Figure 11.4 Visit to IDA>

We invited the IDA officials to Yeongyang for more detailed discussion and explained the current situation and out look of Yeongyang for the International Dark Sky designation. Yeongyang also held seminars with Kyeongbuk Province to seek various measures for the Yeongyang Dark Sky Park designation.

2014 International Seminar – "Yeongyang International Dark-Sky Park Designation and Tourism Promotion Strategy" International Seminar

<Presentation of IDA Activities>

<IDA consultation with Yeongyang officials>

<IDA discussion in the seminar for the designation>

<Photo of main participants>

<Interview with Korean media>

<Presentation for the IDA designation and strategy for the tourism industry>

Articles on the IDA visitation and seminar were introduced on each media in the area and also the news briefing.

Let's turn Yeongyang Firefly Eco Park into the International Dark Sky Park

안전하고 아름다운 자전거길

경북매일

북부권
영양

영양 반딧불이 생태체험마을 특구 국제 밤하늘 보호 공원으로 만들자

국제심포지엄 개최 실무작업 준비

장유수기자 | jang7775@kbmaeil.com

승인 2014.11.04

▲ 국제밤하늘보호협회원인 IDA의 스콧 카텔씨가 밤하늘보호공원 지정 의미와 IDA의 역할에 관해 주제발표를 하고 있다.

【영양】 영양군이 수비면 수하리 반딧불이생태체험마을특구 일대를 국내에서 처음으로 인공조명 공해가 없는`국제밤하늘보호공원`지정을 추진하고 있는 가운데 이와 관련한 국제 심포지엄이 열려 관심을 모았다.

영양군은 국제밤하늘보호협회(IDA: International Dark-SKY Association)에 수비면 수하리 반딧불이생태체험마을 일대를`국제밤하늘보호공원`으로 지정해달라는 신청서를 내년 6월 안으로 접수한다는 계획에 따라 현재 실무적인 준비작업을 하고 있다.

국제밤하늘보호공원은 미국 애리조나주 투산시에 본부를 둔 국제밤하늘협회가 지정하고 있으며 현재 미국 유타주에 있는 내추럴브리지국립공원과 영국 갤로웨이포레스트공원 등 세계적으로 12곳이 지정돼 있지만 우리나라를 비롯한 아시아권에는 아직 지정된 곳이 없다.

국제밤하늘보호협회는`옥외전등으로부터 생태와 밤의 문화유산을 지켜내자`는 취지로 설립됐으며 과도한 밝은 조명으로 생태계 교란은 물론 사람의 생체리듬을 해치는`빛공해`의 심각성을 알리고 적절한 조명을 사용, 생태계를 복원하고 사람들의 건강을 지키기 위한 다양한 운동을 펴고 있다.

국내 최초 국제밤하늘보호공원 지정과 지역관광 발전방향을 주제로 한`2014년도 경북관광포럼 정책심포지엄`은 지난달 31일 영양군문화원에서 개최됐다.

/장유수기자 jang7775@kbmaeil.com

프리미엄 심포지엄 상상플랜

<kbmaeil newspaper, www.kbmaeil.com>

Yeongyang County, Holding a Symposium for International Dark Sky Park Designation

꿈과 희망이 있는 명품도시
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기자수첩 · 특별기고 · 독자 칼럼 · 오솔길

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영양군,밤하늘보호공원 지정을 위한 심포지엄 개최

-2014년도 경북관광포럼 정책심포지엄, 밤하늘보호공원 지정 활성화 논의-

조승욱 기자 / jsw532@naver.com | 입력 : 2014년 11월 06일(월) 09:47 | 경로복사

공유 :

ⓒ CBN 뉴스

[CBN뉴스 조승욱 기자]= 국내 최초 국제밤하늘보호공원 지정과 지역관광 발전방향을 주제로 2014년도 경북관광포럼 정책심포지엄이 영양군에서 개최 하였다.

지난 10월 31일 영양군에서 개최하는 심포지엄은 경북관광포럼 위원, 경상북도, 영양군, 대구한의대, IDA(International Dark-SKY Association) 관계자 등 100여명이 참석한 가운데 영양 국제밤하늘보호공원 지정과 지역관광 발전방향에 대해서 논의하였다.

특히 국제밤하늘보호협회인 IDA의 관계자도 참석하여 밤하늘보호공원 지정 의미와 IDA의 역할에 관해 주제발표를 하며, 이어 John Barentine IDA Program Manager, 김남일 경상북도 문화관광체육국장, 박영선 ㈜마을디자인 대표, 이용규 전 영양군 기획감사실장, 전영권 대구가톨릭대학교 교수는 지역관광 발전방향에 대하여 토론하였다.

최근 '빛 공해'가 새로운 환경오염의 한 종류로 부각되고 있는데 이번 심포지엄으로 영양군의 "국제밤하늘보호공원"을 지정과 국가산채식품클러스터, 국립멸종위기종복원센터, 반딧불이 생태체험특구 등을 연계한 새로운 관광모델을 제시하고, 영양군의 청정한 이미지를 국제적으로 알리고 생태계 복원 등 긍정적인 영향을 기대해본다.

<www.cnbnews.com>

Yeongyang County, Driving for the First IDSP Designation in Suha-ri Firefly Eco Park

영양군, 수하리 반딧불이생태체험마을특구 일대 국내 첫 '국제밤하늘보호공원' 지정 추진

경향신문 원문 | 입력 2014.10.31 15:56

댓글 0 글자크기 + −

경북 영양군은 수비면 수하리 반딧불이생태체험마을특구 일대를 국내에서 처음으로 인공조명 공해가 없는 '국제밤하늘보호공원' 지정을 추진한다고 31일 밝혔다.

국제밤하늘보호공원은 미국 애리조나주 투산시에 본부를 둔 국제밤하늘협회가 지정하고 있으며 현재 미국 유타주에 있는 내추럴브리지국립공원과 영국 갤로웨이포레스트공원 등 세계적으로 19곳이 지정되어 있지만 우리나라를 비롯한 아시아권에는 아직 지정된 곳이 없다.

이 협회는 '옥외전등으로부터 생태와 밤의 문화유산을 지켜내자'는 취지로 설립됐으며 과도한 밝은 조명으로 생태계 교란은 물론 사람의 생체리듬을 해치는 '빛공해'의 심각성을 알리고 적절한 조명을 사용, 생태계를 복원하고 사람들의 건강을 지키기 위한 다양한 운동을 펴고 있다.

영양군이 '국제밤하늘보호공원' 지정을 추진하는 수비면 수하리 반딧불이생태체험마을특구 일대 /영양군 제공

영양군은 수비면 수하리 일대의 광해도(빛 공해 정도)가 이 협회의 기준에 근접한 것으로 판단, 광해도를 협회가 제시하는 기준에 맞게 유지 관리하기 위한 조명 관리계획을 세워 내년 7월쯤 협회에 '국제밤하늘보호공원' 지정을 신청할 계획이다.

영양군과 함께 이 계획을 추진하고 있는 대구한의대 정원길 교수(의료경영학과)는 "국제밤하늘보호공원이 된다는 것은 인공조명으로 인해 생체리듬이 교란되지 않고 숙면에 방해받지 않는, 편하게 쉴 수 있는 공간이자 별을 보며 자연상태의 밤문화유산을 향유할 수 있는 공간으로 세계적으로 인정받는다는 의미"라고 말했다.

김영범 영양군 자연생태공원관리사업소장은 "수하리 일대가 밤하늘보호공원으로 지정되면 '별이 빛나는 밤'을 주제로 한 체류보장형 생태관광을 주도할 수 있다"며 "기존 반딧불이 생태공원과 생태학교, 천문대 등과 연계한 다양한 프로그램을 운영, 이 일대를 생태 및 치유관광의 메카로 만들 것"이라고 말했다.

<최슬기 기자 skchoi@kyunghyang.com>

<www.kyunghyang.com>

Yeongyang County, Pushing for the International Dark Sky Park Designation

영양군 '국제 밤하늘 보호공원' 지정 추진

뉴시스 원문 | 입력 2014.10.30 15:57

댓글 0 글자크기 + −

【영양=뉴시스】 김진호 기자 = '국제 밤하늘 보호공원' 지정을 위한 2014 경북관광포럼 정책 심포지엄이 31일 경북 영양군에서 열린다.

영양군에 따르면 이번 심포지엄은 IDA(International Dark-SKY Association·국제밤하늘보호협회) 관계자를 비롯해 경북관광포럼 위원 등 1000여명이 참석한다.

IDA 관계자는 이날 밤하늘 보호공원 지정의 의미 및 IDA의 역할에 대해 주제 발표를 한다.

이어 존 바렌틴 IDA 기획자, 김남일 경북도 문화관광체육국장, 박영선 ㈜마을디자인 대표, 전영권 대구가톨릭대학교 교수가 지역관광 발전방향에 대해 토론한다.

영양군 관계자는 "최근 '빛 공해'가 새로운 환경오염의 한 종류로 부각되고 있다"며 "이번 심포지엄을 통해 영양군의 청정한 이미지를 국제적으로 알리겠다"고 말했다.

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<www.newsis.com>

Have you heard of the Dark Sky Preservation Park?

밤하늘 보호공원을 아십니까?

한겨레 원문 | 입력 2014.10.31 15:18

댓글 0 글자크기 + −

[한겨레] 경북 영양군, 국내 첫 '국제 밤하늘 보호공원' 지정 추진

경북 영양군이 우리나라에서는 처음으로 '국제 밤하늘 보호공원' 지정을 추진중인 것으로 알려져 관심을 끌고 있다.

영양군은 31일 '국제 밤하늘 협회' (IDA: International Dark-SKY Association)에 수비면 수하리 반딧불이 생태체험 마을 일대를 '국제 밤하늘 보호공원'으로 지정해달라는 신청서를 곧 접수할 예정이라고 밝혔다. 영양군 쪽은 "신청서를 내년 초~6월중으로 접수한다는 계획에 따라 현재 실무적인 준비작업을 하고 있다"고 말했다. '국제 밤하늘협회'는 미국 애리조나주 투산시에 본부를 두고 있으며, 옥외전등으로부터 인간의 생태와 밤의 문화유산을 지켜내자는 취지로 1988년 설립됐다.

'국제 밤하늘 협회'는 "적절한 장소에서 적절한 조명을 사용해야 한다"며 생태계를 복원하고 사람들의 건강을 지켜내기 위한 다양한 실천방안을 제시하고 있다.

현재 미국 유타주에 있는 내추럴브리지 국립공원과 영국 갤로웨이 포레스트 공원 등 전세계 12곳은 '밤하늘 보호공원', 9곳은 '밤하늘 보호지역'으로 지정돼 있다. 밤하늘 보호공원과 지역은 미국과 유럽에 밀집돼 있으며, 우리나라를 비롯한 아시아권에는 지정된 곳이 아직 없다. 국제밤하늘협회가 선정한 '밤하늘을 볼 수 있는 최고의 장소'는 남반구의 별자리를 가장 자세히 볼 수 있는 뉴질랜드의 '아오라키 맥켄지', 야생동물을 보호하기 위해 인공조명을 통제하는 아프리카 나미비아의 '나미브랜드 자연보호구역', 밤이 되면 하늘과 땅의 경계가 사라질 정도로 암흑으로 변하는 미국 펜실베니아의 '체리 스프링스 스테이크 파크' 등이다.

박제훈 영양군 자연생태공원관리사업소 주무관은 "수비면 수하리 반딧불이 생태체험마을이 만약 밤하늘 보호공원으로 지정된다면 빛은 필요한 만큼 사용해야 한다는 경각심과 에너지 절감 의식 등이 확산될 것으로 믿는다"고 말했다. 그는 또 "밤하늘 보호공원이 워낙 희귀하기 때문에 영양군으로서는 생태관광 자원으로 활용할 수도 있을 것"으로 내다봤다.

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<www.hani.com>

In the following year, Yeongyang County officials and Prof. Jeong, wonkil, Korea chapter, visited the IDA headquarters in Tucson for the further discussion of Yeongyang International Dark Sky Park designation. They also visited the Oracle State Park and explored abroad cases to be in a better position to manage and operate more efficiently after the designation of Yeongyang International Dark Sky Park.

Yeongyang County, Pushing for the International Dark Sky Park Designation

영양군, 국제밤하늘보호공원 지정 추진

아시아투데이 원문 | 입력 2015.01.12 10:16 | 수정 2015.01.12 10:25

댓글 0 글자크기 + −

· 미국 애리조나주 투산시 국제밤하늘협회(IDA) 방문

영양군 수비면에 위치한 반딧불이천문대야경/제공=영양군청

영양/아시아투데이 김정섭 기자 = 경북 영양군은 국제밤하늘보호공원 지정을 위해 미국 애리조나주 투산시에 소재하는 국제밤하늘협회(IDA)본부와 국제밤하늘보호공원(IDSPark) 지정지를 9일부터 4박 6일 일정으로 방문한다고 12일 밝혔다.

권영택 영양군수와 김시홍 영양군의회의장외 실무팀 6명이 IDA(International Dark-Sky Association) 본부를 방문하고 밤하늘 보호지구 지정지 답사를 통해 IDSPark 지정에 대한 긴밀한 업무협의를 진행할 예정이다.

또한 군은 지정지 현황 등에 관한 자료를 수집해 올해 영양을 국제밤하늘보호공원으로 지정받겠다는 계획도 세우고 있다.

박영탁 군 자연생태공원관리사업소장은 "천혜의 자연경관을 자랑하는 반딧불이생태체험마을 특구지 일대를 아시아 최초로 IDSPark으로 지정 받아 지역의 청정이미지를 국제적으로 알리고 반딧불이천문대, 국립멸종위기종복원센터, 왕피천생태경관보전지구 등 생태관광자원과 연계해 힐링생태관광의 메카로 만들어 갈 계획"이라고 설명했다.

<www.asiatoday.com>

San Manuel Miner

Korean delegation, International Dark Skies Association pay visit to Oracle State Park

By **John Hernandez** | **Posted** January 13th, 2015 |

Yeong Yang County, South Korea, Governor Kwon Yeong Taek is welcomed by Arizona State Parks Director Bryan Martyn. John Hernandez | Miner

In a small cultural exchange, Governor Kwon Yeong Taek tries Jim Walsh's hat on. John Hernandez | Miner

A high level delegation from Yeongyang County, South Korea led by County Governor Kwon Yeong Taek visited Oracle State Park along with members of the International Dark-Skies Association (IDA) last weekend. John Barentine, IDA Program Manager arranged the visit through Oracle State Park which has been designated as an International Dark-Sky Park. IDA had visited the Governor in Korea and spoken with him about creating a Dark Sky Park in Yeongyang and had mentioned the Oracle Dark-Sky Park to him. When he heard that the Korean delegation would be in the area, he thought a visit to Oracle State Park would be beneficial in helping Governor Taek decide about a park in Yeongyang.

The delegation was greeted at the park by the Executive Director of Arizona State Parks Bryan Martyn, President of the Friends of Oracle State Park Jim Walsh, Michael Weasner of the Oracle Dark Skies Committee and Arizona State Park Rangers. Director Martyn spoke to the delegation through translator Won-Kil Jeong welcoming them. The delegation got excited when Bryan told them that he had been stationed in South Korea with the military and flew the Apache helicopter. Bryan had been stationed at Camp Page in Chun Chon, South Korea.

The delegation was then given a tour of the Kannally Ranch house by Oracle State Park Ranger Jennifer Rinio. Jennifer told them about the history of the Kannally paintings, the ranch and the surrounding area. Following the tour, Governor Paek said that the delegation really appreciated what the park has done for them. Governor Paek then presented Director Martyn with a handmade fan which will remain at the Oracle State Park and be displayed in the Kannally Ranch House.

Director Martyn then presented Governor Paek with a "challenge coin" which is a military tradition. It is usually given in recognition of a special achievement. He wished the Korean delegation success in getting their Dark-Sky Park and bid them safe travel.

"You are our people," Martyn said. "You are our friend."

The Governor and Director then embraced while those in attendance applauded.

A light supper provided by the Friends of Oracle State Park and catered by David Raneri and the Patio Café was served. The meal included local jojoba fed beef sliders provided by local rancher Gregg Vinson's Jojoba Beef Company.

Following the meal, Jim Walsh, President of the Friends of Oracle State Park spoke. Ranger Steve Haas then made a few remarks and then introduced Michael Weasner. Michael spoke to the delegation about how the Oracle Dark-Sky Park was started and able to get its accreditation. He talked about the economic benefits a Dark-Sky Park can bring to an area.

"We both have beautiful skies," Governor Paek said in closing. "We hope that both parks can work together and maybe become world famous parks."

Posted January 13th, 2015

Article By John Hernandez, Copper Area News Publishers, www.copperarea.com/

These articles were also introduced in NIGHTSCAPE ISSUE #94, issued by IDA. During the visit, Scott Kardel, IDA Director and John Barentine, Proram Manager to Korea, toured Yeongyang area with Prof. Jeong, Wongil, Korea Chapter, and Yeongyang officials.

After the tour, Yeongyang had an opportunity to gather their opinions and to recognize needed modifications and improvements for Yeongyang IDSP(International Dark Sky Park) designation.

IDA NIGHTSCAPE ISSUE #94

Good News from South Korea

IDA staff meets with Korean officials about plans for Asia's first International Dark Sky Park.

There's a lot of excitement brewing in South Korea about dark skies. So much in fact that IDA staff members John Barentine and Scott Kardel were flown to the country to discuss creating Asia's first International Dark Sky Place.

The champion of this effort is Dr. Won-kil Jeong, a professor at Daegu Haany University and leader of the IDA Daegu and GyeongBuk chapter in Korea. While in the country, the IDA team toured the aspiring Dark Sky Park, met with local officials, and took part in a public tourism forum devoted to bringing the IDA designation to the region. Over 100 people attended the event. The IDA team was graciously welcomed throughout their trip and treated like foreign dignitaries.

The aspiring Dark Sky Park is a nature preserve in Yeongyang with special protections for fireflies and has some of the darkest skies in South Korea. Public outreach is already at the forefront. The preserve boasts an astronomical observatory and planetarium, and three interpretive centers devoted to fireflies and wildlife conservation.

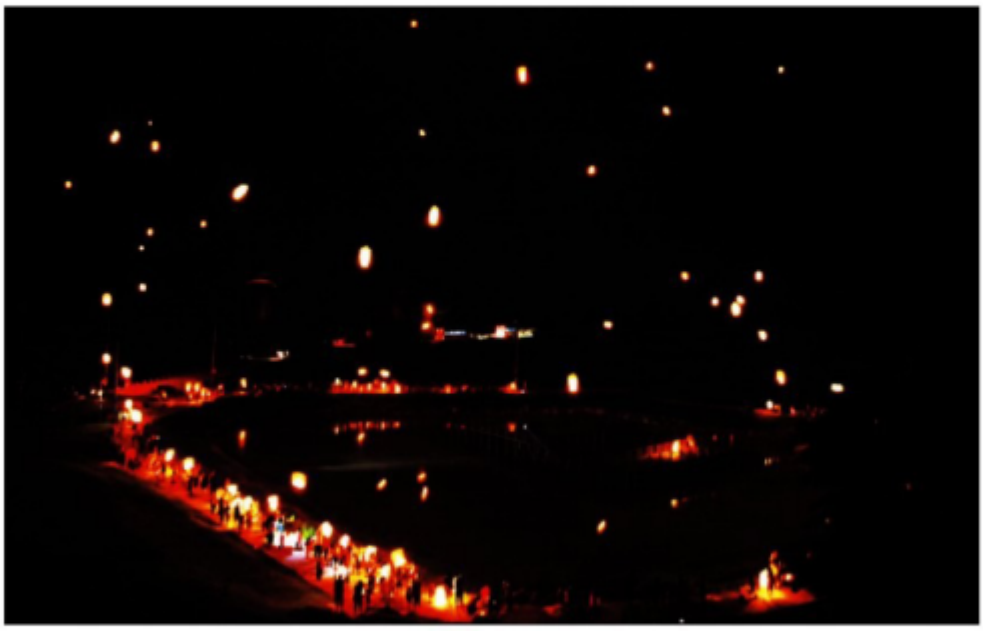
In a follow up to the October meetings, a delegation that included government officials, land managers, IDA chapter leader Won-kil Jeong, and Yeongyang Governor Kwon-Yeong Taek, traveled to Tucson in January to visit IDA headquarters and tour IDA's newest Dark Sky Park in Oracle, Ariz. The visit gave the Korean delegation a first-hand look at one of our International Dark Sky Parks and the opportunity to discuss the designation process with IDA staff and the Oracle Dark Skies Committee.

IDA staff advises members of the dark sky team working to create the first Dark Sky Park in Asia. From left to right: Oh-Seung Kwon, Scott Kardel, Won-Kil Jeong and John Barentine.

Yeongyang County, Pushing for the International Dark Sky Park Designation Part 1

☆별 헤는 영양 수하 밤하늘 〈상〉 아시아 첫 밤하늘 보호구역 도전

별 헤는 밤하늘은 우리에게 숱한 추억으로 남아있다. 한여름 밤 은하수 별 무리 속에는 견우와 직녀의 애잔함이 흐른다. 산과 들녘, 강과 바다, 우리나라 어느 곳을 가더라도 캄캄해진 밤하늘을 올려다보면 금방이라도 쏟아질 듯한 별 무리의 반짝임을 볼 수 있었다. 은하수에 대한 기대는 언제나 가슴을 설레게 했었다. 은하수를 보면서 상상의 나래를 펴기도 하고, 이성에 대한 이유 없는 설렘을 갖기도 했다. 하지만 언제부턴가 은하수 별 무리는 사람들을 떠나 버렸다. 은하수뿐 아니라 쏟아질 듯 반짝거렸던 별조차도 희미해졌다. 인공 빛 때문이다. 한밤중에도 대낮처럼 불을 밝히는 인공조명과 차량의 불빛 등 인공 빛이 밤하늘의 추억을 앗아가 버렸다. 이 때문에 지구촌 곳곳에서 사라진 밤하늘을 자연 그대로 살리는 운동이 활발하다. 영양군도 전국 최고의 청정 이미지를 앞세워 반딧불이가 날아다니는 수비면 수하리 계곡 밤하늘을 인공 빛으로부터 지켜내 되살리는 '국제밤하늘 보호구역' 지정을 추진하고 있다. 머지않아 별 헤는 수하 밤하늘을 볼 수 있을 것으로 기대된다. 세 차례에 걸쳐 '별 헤는 수하 밤하늘'을 소개한다.



영양군 수비면 수하 계곡 밤하늘이 아시아 첫 '국제밤하늘 보호구역' 지정이 추진된다. 이 지역은 청정지역에서만 서식하는 반딧불이를 볼 수 있는 곳으로 인공 빛 공해로부터 차단된 곳. 밤하늘이 가장 잘 보존된 지역이다. 영양군 제공

인공 빛 없는 청정지역 밤
은하수의 전설 '반짝반짝'

◆아시아 첫 밤하늘 보호구역 지정 추진한다

영양군 수비면 수하 계곡의 밤하늘이 아시아 국가에서는 처음으로 국제밤하늘 보호구역으로 지정이 추진된다. 이 지역은 인공 빛 공해가 없는 청정지역에서만 사는 반딧불이를 관찰할 수 있는 '영양 반딧불이생태공원'이 있는 곳이다.

'밤하늘 보호구역(공원)'은 국제 민간비영리단체인 '국제밤하늘 보호협회'(IDA·International Dark-sky Association)가 지구촌에서 아름다운 밤하늘을 볼 수 있는 곳을 청정 생태관광지로 지정하는 곳이다. 지난 2001년부터 세계적으로 19곳만 지정됐고, 아시아에는 한 곳도 없다.

국제밤하늘협회 카델 회장은 수하 지역의 밤하늘 투명도가 세계적으로 뛰어난 수준이고 반딧불이 생태공원 등 지역 내 생태계 보존 노력 등이 진행되고 있다는 점을 높이 평가해 아시아의 첫 밤하늘 보호구역 지정 가능

반딧불이 날아드는 영양 수하계곡
밤하늘 투명도 세계 수준 '청정지역'

산채클러스터·위기종복원센터 연계
생태·힐링오지 관광 중심지로 부상

성이 높은 것으로 내다보고 있다.

지난해 영양지역을 찾았던 카델 회장은 이달 10일 협회를 방문한 권영택 영양군수 등 일행에게 "수하 밤하늘의 투명도가 평균 20~22mag/arcsec²(특정면적당 밝기 단위)로 지정 기준을 넘어섰다. 구역 지정 후 대기환경 및 생태계 보존에 대한 영양군 차원의 다양한 계획과 사업들이 좋은 결과를 가져올 것으로 기대한다"고 했다. 이에 권영택 영양군수는 "수하 계곡은 국내에서 몇 곳 남지 않은 천연 그대로의 자연자원 지역으로 유명하다. 협회 차원의 밤하늘 보호공원으로 지정될 경우, 협회가 추구하는 인간과 자연의 조화로운 관계를 통한 삶의 질 향상에 상당한 역할을 할 것으로 기대한다"고 화답했다.

◆체류형 생태 관광지, 세계적 명성 얻는다

국제밤하늘 보호협회 한국본부 챕터인 정

영양군은 이달 10일 수하 밤하늘 보호구역 지정과 관련해 미국 애리조나 투산시 국제밤하늘 보호협회를 방문, 지역출신 화가 금동효 씨의 수하 계곡 그림을 전달했다. 엄재진 기자

원길 대구한의대 교수도 "한국의 밤하늘은 상당히 밝은 편이지만 인공조명의 영향을 받지 않는 영양군은 아시아 최초의 밤하늘 보호구역으로 지정될 가능성이 높다. 아시아 최초로 밤하늘 보호구역으로 지정되면 체류형 생태관광지로 자리 잡을 수 있다. 청정지역으로 세계적 명성을 얻게 된다. 이를 통해 전 세계 관광객들이 찾을 것"이라고 했다.

국제 민간기구인 IDA의 수하 밤하늘 보호구역 지정은 국제적 청정 지역 이미지를 확보하는 결정적 효과가 기대된다. IDA는 그동안 청정하고 맑은 밤하늘을 가진 지역을 보호구역과 보호공원 등으로 지정해 국제적 청정지역으로 자리매김시키고 있다.

특히 청정 영양 관광의 국제화와 반딧불이 특구로서의 위상을 높이는 계기가 될 것으로 보인다. 또 국가산채클러스터와 국립멸종위기종복원센터 등과 연계한 생태관광, 힐링 오지 관광의 메카이자 밤하늘 보호공원으로 국제적 입지를 확보할 수 있을 것으로 기대된다. 게다가 영양군이 가지고 있는 '산나물' '음식디미방' '반딧불이' 등 청정 이미지와 웰빙 이미지를 극대화할 수 있는 계기가 될 것으로 보인다.

이 밖에 국제밤하늘 보호공원으로 지정된 국제 도시 간 네트워크 확보와 교류 행사를 추진해 국제적 생태도시, 청정도시로 구축할 것으로 전망된다. 수하 지역에서 생산된 농·특산물 브랜드도 청정 이미지를 앞세워 큰 홍보 효과를 얻게 된다.

권영택 영양군수는 "국제밤하늘 보호구역 지정으로 청정·웰빙 영양 이미지를 국제 관광지화할 수 있을 것으로 기대된다. 또 온갖 빛 공해에 시달려 지치고 병든 현대인들이 수하계곡에서 새로운 활력을 되찾고, 잊어진 별 헤던 추억들을 곱씹어갈 수 있다. 국제적 명소로 발전시킬 것"이라고 각오를 밝혔다.

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Yeongyang County, Pushing for the International Dark Sky Park Designation Part 2

별 헤는 영양 수하 밤하늘 〈중〉한국 최고 생태·힐링관광 메카로

곳곳에 사막이 있는 미국 애리조나주에는 아름다운 밤하늘의 별을 볼 수 있는 대표적인 공원들이 많다. 투산시에 위치한 '오라클공원'과 명상의 도시 '세도나' '플래그스태프' '그랜드캐니언' 국립공원 등이다. 오라클공원은 지난해 밤하늘보호공원으로 지정된 곳으로 밤하늘의 별을 사랑하는 사람들이 민간조직을 구성해 다양한 보호활동과 별 관찰을 즐기는 곳으로 유명하다. 특히 명상과 휴양의 도시 세도나와 플래그스태프 등 밤하늘보호지역으로 지정된 곳도 지역민들 스스로 바닥에 낮게 붙은 가로등을 설치하는 등 인공 빛으로부터 밤하늘을 보호하려는 노력을 기울이고 있다. 이런 노력 덕분에 관광객들이 급증하면서 세계적 인지도를 높여가는 효과를 보이고 있다. 이들 공원의 관리 시스템과 밤하늘 보호를 위한 민간 조직들의 활동을 통해 수하계곡 밤하늘 보호와 보호구역 지정 이후의 관리 문제에 대한 해답을 찾아야 한다.

미국 애리조나주 투산시 오라클공원은 '오라클공원 친구들'이라는 순수 민간 자원봉사·후원모임이 관리하는 대표적 밤하늘보호공원이다. 권영택 영양군수 등이 오라클공원을 찾아 민간모임 관계자들과 밤하늘 보호·관리에 대해 대화를 나누고 있다. 엄재진 기자

'하늘 아래 첫 동네' 상품화 '밤 테마' 머무는 관광 선도

◆자원봉사·후원모임 '오라클공원 친구들'의 역할=지난해 11월 국제밤하늘보호협회(IDA)로부터 '밤하늘보호공원'으로 지정된 투산시 '오라클파크'는 '오라클공원 친구들'이라는 민간조직이 자원봉사·후원모임을 관리하고 있다. 이들은 밤하늘 별빛 관찰과 밤문화 음악회 등 다양한 이벤트를 열어 관광객들을 끌어모은다.

'오라클공원 친구들'의 마이클 위즈즈 회장은 "우리 모임은 밤하늘보호공원 지정 이전부터 오라클공원과 함께해 온 사람들이다. 오로지 오라클공원의 아름다운 경치와 환상적인 밤하늘의 별무리들을 관리하고 많은 사람들이 즐길 수 있도록 노력하고 있다"고 했다.

이들은 지난해 초부터 밤하늘보호공원 지정을 위해 IDA 관계자들을 만나 협의하고 지역사회 도움을 요청했다. 우선 공원 내 모든 조명을 붉은색으로 바꾸고, 하늘로 향했던 불빛들도 가로등 덮개 등을 이용해 바닥으로 향하도록 했다. 밤하늘보호공원에 대해 지역주민과 사업가, 관공서 등을 찾아다니면서 중요성을 설명하고 협조를 끌어냈다.

지난해 6월 별 관찰 동호인과 주민 600여 명이 참여한 가운데 '밤문화 음악회'를 열었고, 지역 주민들의 보호공원 선정 지지 서한을 한데 모아 제출하기도 했다.

오라클공원 해설사 제니퍼 리니오 씨는 "밤하늘보호공원 지정 이후 방문객이 하루 평균 60여 명에서 360여 명으로 늘었다. 공원 지정에 민간 모임이 가장 중요한 역할을 했다"고 말했다.

◆수하계곡 밤하늘보호공원 지정도 민·관이 함께해야=권영택 영양군수는 '오라클공원 친구들'과의 만남에서 "민간기구와 지역주민 조직은 보호공원 지정에 가장 중요한 부분이라는 생각이 든다. 수하계곡 주변 지역민들에게 이 사업의 중요성을 설명하고 함께 참여할 수 있도록 할 것"이라고 했다.

인공빛 공해로부터 최대한 밤하늘을 보호하려는 오라클공원 조영등.

영양군, 반딧불이·천문대 묶어
생태·치유 관광산업 집중 개발

미 오라클·세도나·그랜드캐니언
별 관찰·음악회 등 이벤트 다양

수하계곡 밤하늘의 보호공원 지정은 '밤을 주제로 한 체류형 관광산업'을 이끌 것으로 기대된다. 단순히 시각적 체험과 야외 체험 등 '낮'을 중심으로 한 관광에서 '밤' 관광산업화로 체류가 필수적으로 동반되는 효과를 가져온다. 게다가 현대 여가의 중심축인 가족 단위, 동호회 등 캠핑족과 연계하면 관광 시너지 효과를 극대화할 수 있을 것으로 기대된다.

기존 반딧불이특구와 멸종위기종복원센터, 천문대 등을 통한 야생동·식물 보호와 교육 프로그램을 통해 계곡 활용을 극대화하고, 국가산채클러스터와 자연생태보호구역 등 청정 관광자원을 국제화해 대한민국 최고의 생태관광, 힐링관광 메카로 자리 잡을 것으로 보인다. 일몰과 일출을 주제로 한 사진전, 청정 밤하늘과 달·별을 주제로 한 밤하늘 체험 프로그램 도입, 국제밤하늘 및 빛 공해 저감의 대한민국 대표지역으로 다양한 심포지엄과 국제세미나 유치도 가능하다.

게다가 밤하늘 특성을 반영한 '캠핑 문화'도 조성할 수 있다. 많은 인공 빛을 사용하는 오토캠핑장과 달리 밤하늘을 보호하고, 하늘과 가장 가까운 곳을 선정해 차별화된 개념의 캠핑장을 도입, 오지의 독특한 캠핑 개념을 도입하면 새로운 캠핑문화도 이끌 수 있다.

국제밤하늘보호협회 한국본부장 정원길 대구한의대 교수는 "세계적 청정 밤하늘의 이미지를 1차 농·임·축산물에 도입하고 농특산물 브랜드화를 통해 세계적으로 안전한 곳에서 생산된 상품임을 홍보할 경우 지역경제 활성화에도 한몫할 것"이라고 했다.

영양 엄재진 기자 2000jin@msnet.co.kr

Yeongyang County, Pushing for the International Dark Sky Park Designation Part 3

☆별 헤는 영양 수하 밤하늘 〈하〉 9월 '밤하늘보호구역' 지정

빛의 발견은 인류 문명의 상징이다. 인공 빛 덕분에 밤에도 대낮처럼 일할 수 있게 됐다. 하지만 현대사회에는 인공 불빛이 과도해 '빛 공해'로 되돌아오고 있다. 촛불 하나 정도의 밝기가 1칸델라(cd)라고 한다. 우리 주변에서 쉽게 접할 수 있는 스마트폰, TV, 네온사인 등은 수백~수만cd를 내뿜고 있다. 그만큼 우리는 인공 빛에 밤낮없이 노출돼 생체리듬에 악영향을 받고 있다.

빛 공해는 밤하늘의 별빛을 빼앗아버렸다. 영국 왕립천문학회 보고서에 따르면 세계에 퍼진 인공 불빛의 수는 1970년대에 비해 3배가량 늘어났다. 2008년 월스트리트저널은 '세계 인구의 3분의 2가 밤하늘의 별을 제대로 볼 수 없다'고 보도하기도 했다.

별은 인간을 꿈꾸게 한다. 불을 끄면 별이 켜진다. 오는 9월, 늦반딧불이가 밤하늘을 수놓을 때쯤 영양군 수비면 수하리 생태지역의 밤하늘이 국제기구로부터 밤하늘보호구역으로 지정된다. 반딧불이로 유명한 수하계곡이 '별빛 명소'로 국제적 명성을 떨칠 것으로 기대된다.

국제밤하늘보호구역으로 지정된 미국 세도나의 밤하늘. 가운데 희뿌연 부분이 은하수다.

국제밤하늘보호협회 제공

아시아 '별빛 명소' 첫 지정 새로운 꿈 키워나가는 영양

"中·몽골·日 잇는 생태 교두보"

◆스콧 카델 회장=국제밤하늘보호협회 스콧 카델 회장은 "영양 수하계곡 밤하늘이 우리 협회로부터 '밤하늘보호구역'으로 지정되면 아시아 첫 지정을 뛰어넘어 중국과 몽골, 일본 등 밤하늘보호구역에 관심을 보이는 국가와 지역에 영향을 미치는 교두보가 될 것"이라고 했다.

그는 수하지역 밤하늘의 투명도가 평균 20~22mag/arcsec²(특정면적당 밝기 단위)로 세계적으로 뛰어난 수준이고, 반딧불이 생태공원 등 지역 생태계 보전 노력 등이 진행되는 점을 높이 평가, 아시아의 첫 밤하늘 보호구역 지정 가능성이 높은 것으로 내다보고 있다.

카델 회장은 "지구촌 곳곳에서 밤하늘보호구역으로 지정된 뒤 지역민들이 함께 인공 빛을 규제하고, 밤하늘과 별빛의 아름다움을 보호하기 위해 꾸준히 노력하고 있다"고 했다.

국제밤하늘보호협회(IDA)는 수하 밤하늘이 보호구역으로 지정될 경우 협회 웹사이트, 캘린더, 협회보 및 다양한 미디어 등을 통해 새로운 공원 지정을 국제사회에 알린다.

'반딧불이 특구' 등 묶으면 시너지

◆권영택 영양군수=지난 2005년 수비면 수하2리 심천마을과 송방마을 일대 193만8천529㎡가 '반딧불이생태체험마을 특구'로 지정받았다. 이 지역은 청정 환경의 상징인 반딧불이가 서식하는 곳으로 알려지면서 다양한 학술연구와 생태보전 메카로 활용되고 있다. 이제 바로 이 지역이 '국제밤하늘보호구역' 지정을 통해 아시아 최고의 청정 환경 지역으로 인정받게 된다.

권영택 영양군수는 "영양지역은 반딧불이 생태체험마을 특구를 비롯해 세계적 생태습지로 가꾸는 '삼지연꽃테마공원', 국립멸종위기종복원센터, 국가산채식품클러스터 등 국내 최고의 청정지역으로 자리 잡고 있다"며 "이런 환경 속에서 수하 밤하늘이 국제밤하늘보호공원으로 지정되면 영양은 새로운 꿈과 희망을 키워나가는 지역으로 거듭나게 될 것"이라고 했다.

권 군수는 "앞으로 5월까지 영양군의 청정 이미지를 담고 조명 관리 계획, 보전 계획, 지역주민 참여를 위한 조직 구성 등 열정을 담아 신청서를 작성, 제출할 계획"이라고 했다.

'밤 테마' 관광 등 활용 범위 다양

◆한국챕터 정원길 교수=아시아 태평양에서 아홉 번째, 한국에서는 서울챕터와 함께 최초의 국제밤하늘보호협회(IDA) 한국챕터(Chapter)인 정원길 대구한의대 교수는 "지난 2001년 이후 IDA가 주도해 13곳의 밤하늘보호공원, 5곳의 밤하늘보호구역, 4개의 지역사회 커뮤니티 등 9개국 22곳을 지정, 관리하고 있다. 그러나 아직까지 아시아 국가는 한 곳도 없다"고 했다.

그는 "IDA는 '옥외 전등으로부터 인간의 생태와 밤의 문화유산을 지켜내자'라는 기본 취지로 적절한 장소에서 적절한 조명을 사용해 생태계를 복원하고, 사람들의 건강을 회복하기 위한 다양한 분야의 노력을 기울이고 있다"며 "수하 밤하늘이 보호구역으로 지정되면 체류형 야간 관광명소, 의료관광, 청정 환경을 인정받은 지역 농산물 브랜드화, 반딧불이생태체험마을과 함께 지역의 새로운 관광 패턴을 이끌어가는 효자로 가꿀 수 있다"고 했다.

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By lim jae-jin, maeil News, www.imaeil.com (27 January 2015 - 17 February 2015)

12. Yeongyang Dark Skies Committee

Young Taek Kwon : Mayor of Yeongyang

Wonkil Jeong : IDA Korea Daegu Gyeongbuk Chapter, Professor at Daegu Haany University

Yung Tak Park : Director, Yeongyang Nature Eco Park Administration Office

Young Chang Kwon : Park Manager, Yeongyang Firefly Eco Park

Je Hoon Park : Manager, Yeongyang Firefly Observatory

Kyong Ho Kim : Park Manager, Yeongyang Firefly Eco Park

Soo Jong Kim : Representative, Yeongyang Firefly Conservation Committee

Oh Seong Kwon : Researcher at Daegu Haany University community Center, IDA member

I-Ruk Kim : SunJae DNC chief director, Lighting Landscape director

13. Document Revisions

Schedule	Contents
October 13, 2013	Discussion of Korea members's visitation to the IDA headquarters in the USA
November 10, 2013	Collecting previous data with Yeongyang-gun for the IDP designation
December 20, 2013	Consultation on the candidate area for the IDSP designation, focusing on the Firefly Special Zone
Jan. 02, 201-Sep.30, 2014	Reviewing the applications of designated IDSPs around the world and prepare standards.
September 10, 2014	purchasing measuring device for night sky brightness and begin to measure
Oct. 28, 2014-Nov., 2014	Officials of IDA headquarter visit to Yeongyang, discussion, host a seminar
February 05, 2015	Confirmation of area for Yeongyang IDSP designation
March 20, 2015	Establishing management guidelines for local outdoor lighting
April 30, 2015	Drafting for IDA IDSP designation
May 20, 2015	Establishing the ordinance for Yeongyang outdoor lighting
May 30, 2015	replacement and implementation of local illumination
May 30, 2015	Data modification and supplementation for IDA IDSP designation
June 1st, 2015	Additional data and modification of the data
June 12, 2015	Data Update
June 15, 2015	Complete application
June 18, 2015	Register recommendation letters
June 22, 2015	Reviewing of final report
June 30, 2015	Final report preparation