# Oracle State Park
# Center for
# Environmental Education

## International Dark Sky Park
## (Silver Tier)
## Nomination Package

**Prepared by the Oracle Dark Skies Committee (ODSC)**

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# 1. Letter of Nomination



June 16, 2014

IDA Board of Directors
International Dark-Sky Association
3225 North First Avenue
Tucson, Arizona 85719-2103

Dear IDA Board of Directors,

Please accept this nomination packet of Oracle State Park Center for Environmental Education 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 Arizona.

This nomination packet seeks to demonstrate that Oracle State Park is uniquely blessed with characteristics closely associated with "Gold Tier Designation".

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

Sincerely,

Bryan Martyn
Executive Director
BMartyn@AZStateParks.gov
(602) 542-7107

## 2. Letters of Support

The following letters document both local and wide-ranging support for Oracle State Park being designated as an "International Dark Sky Park":

Friends of Oracle State Park

Copper Corridor Economic Development Coalition

Cascabel Conservation Association

Pinal County Board of Supervisors

The Nature Conservancy

MMT Observatory

Arizona Trail Association

Oracle Historical Society

Hair Country (local business)

Cherry Valley Ranch (local business)

Lower San Pedro Watershed Alliance

Oracle School District #2 Superintendent

Keith Krueger (IDA member)

Catalina/Oracle State Park Manager

Oracle State Park Ranger

Mary Huebner (local resident)

Oracle State Park Ranger

Mike Weasner (IDA member)

Friends of
Oracle State Park

PO Box 8405, Tucson, AZ 85738 friendsoraclestatepark@gmail.com friendsoraclestatepark.org

July 10 2014

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

Dear Directors:

This letter is in support of the Oracle Dark Skies Committee and Michael Weasner in their application to obtain "International Dark Sky Park" status for Oracle State Park in Oracle, AZ.

The Friends of Oracle State Park (FOSP) have a long relationship with Oracle State Park (OSP) which predates the opening of the Park in the late 90s. FOSP was founded to support OSP and to further its programs. We have done this by providing monetary donations, encouraging volunteers, and promoting OSP by news articles and outreach to other community groups, particularly in Southern Arizona. Our support was instrumental in OSP reopening and also in the restoration of its year-round availability. We routinely provide financial support for maintenance and restoration work on the historic Kannally Ranch House at OSP, which is listed on the National Registry of Historic Places.

FOSP has provided financial support for both the environmental education and cultural programs offered at OSP. In 2012 and 2013 FOSP obtained significant RICO grants from the Pinal County Attorney's Office for the environmental programs offered to schoolchildren at OSP. FOSP regularly budgets funds to assist the Park in presenting cultural events such as lectures, wild life and native plant demonstrations, and events such as the recent June 21 concert which preceded a Dark Sky program.

Many FOSP members are active volunteers at OSP. They help with gardening, maintenance, and operations, for example helping at the gate and the gift shop. FOSP helps to pay for the annual volunteer awards and recognition.

Earlier this year FOSP learned of the possible designation of OSP as an International Dark Sky Park. Michael Weasner presented a wonderful description of what that status would mean at one of our regular bimonthly meetings. FOSP is excited about this prospect. Immediately several of our members joined the new Oracle Dark Skies Committee to work with Michael on the application process and programs to make the public aware of OSP's potential for night sky observation.

FOSP voting members have unanimously supported the designation of OSP as an International Dark Sky Park. We have been able to offer some modest financial support to achieve this designation. The Vice President and I have personally advocated this designation with the Arizona State Parks Director, Bryan Martyn. I have spoken to outside groups about how important it would be to be designated as an International Dark Sky Park.

In short, FOSP strongly encourages you to consider the application favorably and to designate Oracle State Park as an International Dark Sky Park.

Sincerely yours,

MaryAnn Pogany for James P. Walsh

James P. Walsh
President, Friends of Oracle State Park

**Copper Corridor Economic Development Coalition**
**P.O. Box 5115**
**Oracle, AZ 85623**


July, 9, 2014

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

Dear IDA Board of Directors:

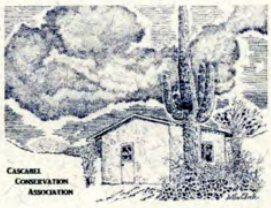
This letter is to express our support in designating the Oracle state Park as an "International Dark Sky Park" we received a wonderful presentation by Mike Weasner the Chair of the Oracle Dark Skies Committee a few months ago and learned how this designation meets several of the goals of the IDSP program.

Our organization is committed to promoting economic development in the Copper Corridor and we are privileged that the Oracle State Park designation as an IDSP would help promote ecotourism in our area as well as several other benefits regarding encouraging sensible lighting ordinances and potential health benefits.

Thank you for the opportunity to support such a wonderful endeavor.

Sincerely,

Elizabeth Magallanez
Board President



# CASCABEL CONSERVATION ASSOCIATION

**SUPPORTING CONSERVATION, COMMUNITY AND CONTEMPLATION IN THE MIDDLE SAN PEDRO RIVER VALLEY**

6146 N. Canyon Road, Cascabel, AZ 85602
(520) 212-4628 / www.cascabelconservation.org

July 5, 2014

Board of Directors
International Dark Sky Association
3223 N. First Avenue
Tucson, Arizona 85719

Dear IDA Board of Directors:

The Board of Directors of the Cascabel Conservation Association (CCA) enthusiastically supports the nomination of Oracle State Park as an International Dark Sky Park. The CCA is a non-profit organization dedicated to supporting conservation, community, and contemplation in the Middle San Pedro River Valley. Dark Sky programs at the park serve to support education, appreciation and conservation in this region. We are grateful to all those who have worked so thoughtfully to bring this nomination to fruition.

Thank you for this consideration.

Sincerely,

Norm "Mick" Meader

Norm (Mick) Meader
Chairperson, Conservation Committee, and Board Member

Daniel Baker

Daniel Baker
Secretary, Cascabel Conservation Association

PINAL • COUNTY
*wide open opportunity*



Wednesday, July 2, 2014

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

Dear IDA Board of Directors,

Oracle State Park, located in Pinal County, Arizona, is being submitted to become the first IDA "International Dark Sky Park" in the Arizona State Parks system. The Pinal County Board of Supervisors fully agrees with and supports this nomination.

The area of Oracle State Park has a history spanning many decades although the Park itself opened in 2001. During its short existence the Park has excelled at being a "Center for Environmental Education", providing wonderful and inspiring cultural, ecological, environmental, and scientific public outreach opportunities to local schools and the general public. Star parties have occurred at Oracle State Park in the past to take advantage of its night sky quality, and more will be held in the future.

The "International Dark Sky Park" designation will result in an increase in the number of visitors to Oracle State Park, not only from surrounding communities, but from locations further away. This will provide the Park with an ever expanding reach of public education on the impacts of light pollution. That is a role in which Oracle State Park has much to offer.

Increased visitorship to Oracle State Park will also bring increased economic benefits to Pinal County and businesses within the County. Increasing public awareness of the detrimental effects of light pollution on human health, the environment, and energy costs will benefit every County resident and improve the quality of life in Pinal County.

The Pinal County Code 2.195 Outdoor Lighting, updated in 2010 to provide Dark Sky compliance requirements, demonstrates the County's commitment to the goals of the International Dark-Sky Association.

**BOARD OF SUPERVISORS**

135 North Pinal Street, Building A, PO Box 827 Florence, AZ 85132 T 520-866-6220 FREE 888-431-1311 F 520-866-6355
www.pinalcountyaz.gov

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We acknowledge the Oracle Dark Skies Committee, a group of individuals from the Oracle area. The Committee has generated a great deal of positive public support for this nomination. Without their dedication and drive this nomination would not have been prepared as quickly and as thoroughly as it has.

Oracle State Park will celebrate its lucky 13th anniversary on October 1, 2014, and it would be a great honor for Pinal County and the State of Arizona to have its first "International Dark Sky Park" become a reality by that date.

Sincerely,

Pinal County Board of Supervisors

Chairman Anthony Smith, District 4

Vice-Chairman Todd House, District 5

Supervisor Pete Rios, District 1

Supervisor Cheryl Chase, District 2

Supervisor Stephen Q. Miller, District 3

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

25 June 2014

Dear IDA Board of Directors,

It is with great excitement that I share my support for the nomination of the Oracle State Park as an International Dark Skies Park. I am honored to know many of the people who are so dedicated to the Park and this designation, specifically Mike Weasner and the park rangers. Mike has been working quite diligently on this project, enthusiastically raising support, yet sharing his knowledge in a calm and unpretentious manner. I have learned so much from him during this process. He attends our Copper Corridor Economic Development meetings (of which I am a board member) to spread the word. His energy is contagious.

Oracle State Park is situated somewhat northeast of the Santa Catalina Mountains, northwest of my town of San Manuel. I know intimately how wonderfully dark our nights are, with San Manuel at the north end of a dirt road that runs between the Santa Catalina and Galiuro Mountains. Our nights are richly dark but for the planets and stars that make their appearance that we are fortunate to see because of the lack of light pollution in this part of the state. My husband and I are amateur night sky viewers and know the importance of having these International Dark Sky Parks available so that everyone can share in the joy and wonder of viewing a sky that is unmarred by light pollution.

I am grateful that you will consider Oracle State Park as our International Dark Sky Park.

Sincerely,

Celeste Andresen

**Celeste Andresen**
*~~Ranch~~ Manager & Outreach Liaison*
*Lower San Pedro River Program*
candresen@tnc.org
(520) 609-3420 (Cell)

**The Nature Conservancy**
1510 East Fort Lowell Road
Tucson, AZ 85719

The Nature Conservancy
Protecting nature. Preserving life.™

**nature.org**

Smithsonian Astrophysical Observatory & Steward Observatory, The University of Arizona

MMT Observatory
Smithsonian Institution &
The University of Arizona

June 16, 2014

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

Dear IDA Board of Directors:

This letter is to express our support for designating Oracle State Park as an "International Dark Sky Park." Arizona has a long history of astronomical research and hosts several world-class astronomical observatories. The preservation of dark skies is of paramount importance for optical astronomical research.

The Oracle Dark Skies Committee's initiative for designation as an International Dark Sky Park is beneficial in many ways; by encouraging sensible lighting ordinances in Pinal County, by raising local awareness of the importance of preserving our dark skies, and by drawing together diverse groups with the common interest of protecting and preserving the unique Southern Arizona environment.

We commend this initiative and hope that it will lead to a broader conservation of the region for all to enjoy.

Sincerely,

George G. Williams, Ph.D.
Director
MMT Observatory

MMT Observatory • The University of Arizona • Tucson, Arizona 85721 • PHONE: 520.621.1558 • FAX: 520.621.4144

June 15, 2014

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

To Whom It May Concern,

It is with honor that I write this letter of support of Oracle State Park's application to become an International Dark Sky Park. As the Executive Director of the Arizona Trail Association, the organization responsible for building, maintaining, promoting, protecting and sustaining the Arizona National Scenic Trail as a unique encounter with the land, among my main objectives are promoting and preserving the natural resources through which the Arizona Trail passes, including Oracle State Park.

The area surrounding Oracle State Park is very unique, and among the natural features that many Arizona Trail users comment on is the vast expanse of desert between Oracle and the Gila River that feels like the most remote places in the Southwest. During the winter months, the Arizona Trail will receive light traffic from hikers, mountain bikers and equestrians. During the rest of the year, many use this passage of the Arizona Trail at night. The lack of tree cover and virtually no light pollution make the night sky near here a mesmerizing experience. A common theme among trail journals found online and mailed to our office is the thick blanket of stars that can be enjoyed here at night. In fact, the photo we selected to represent this passage of the Arizona trail within our recently published guidebook (*Your Complete Guide to the Arizona National Scenic Trail*, Wilderness Press) is a nighttime image.

Since the completion of the Arizona Trail in 2011 it has become an international destination. Each year we see increasing numbers of visitors from abroad who hike, bike or ride along this National Scenic Trail through the wild heart of Arizona. For many, it's their first experience seeing Arizona's night sky. There is no better way to demonstrate the importance of preserving dark skies until an individual who has only ever seen a few stars gets to experience myriad galaxies and constellations while coyotes howl in the distance. It's a life-changing experience, and one that will only be recognized and preserved with the designation that Oracle State Park now seeks.

As more of Arizona's deserts, forests, canyons, state parks and other natural areas of the state are recognized, celebrated and protected, the more likely future generations are to be able to experience that which we often take for granted. No place in the world has a night sky like southern Arizona, and as an International Dary Sky Park, I am confident that Oracle State Park will take seriously its role in promoting and protecting this honorable designation.

Thank you for your considering of their request, and for accepting this letter of support on behalf of the Arizona Trail Association, its Board of Directors, members, volunteers and trail users.

Sincerely,

Matthew J. Nelson
Executive Director

cc: Michael Weasner

Arizona Trail ASSOCIATION

P.O. Box 36736 Phoenix, Arizona 85067 (602) 252-4794 www.aztrail.org ata@aztrail.org

Oracle Historical Society
& Acadia Ranch Museum

825 Mt. Lemmon Rd. • P.O. Box 10 • Oracle, Arizona 85623 | (520) 896-9609 | www.OracleHistoricalSociety.org

June 11, 2014

International Dark Skies Association
Board of Directors
3223 N. First Avenue
Tucson, AZ 85719

Dear IDA Board of Directors:

At its regular monthly meeting on June 8, 2014, the Oracle Historical Society (OHS) Board of Directors unanimously approved a motion to support the nomination and designation of Oracle State Park (OSP) as a Dark Skies Park.

An important part of OHS' mission is to provide education about this area's rich history. OHS focuses on restoring and preserving historic buildings and artifacts, developing a library of historic documents, maps and photographs, and assembling a significant archival collection. All of this allows us to provide information to the general public and maintain a "living" history of this community. Minimizing light pollution generally and designating OSP as a Dark Skies Park goes hand in hand with the mission of OHS, and provides other opportunities for showing how Oracle may have looked in earlier times.

Thank you for your consideration. Please feel free to contact OHS if you have any questions or require further information.

Sincerely,

Susan Schiek, Administrator
Oracle Historical Society, Inc.

SBS:cs

MaryHelen Vasquez
520-896-2380
Hair Country
Mt. View Plaza
399 American Ave
Oracle, AZ 85623

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

Dear Board of Directors

As a resident and business owner, I want to submit this nomination letter of support for Oracle State Park as a designated "International Dark Sky Park" qualified park.

I am on the Dark Skies Committee and have observed Mike Weasner work so passionately to achieve step by step this wonderful endeavor of preserving the dark sky for our area. Oracle is a special place I have called home all my life. The Kannally family came and settled here as ranchers and are part of my growing up. We are grateful for their foresight in preserving the Kannally Ranch with all its wonderful resources for all of us to enjoy.

The ODSC has taken Oracle State Park a step further documenting and publicizing the dark sky that surrounds the Oracle Community. The Committee has already made a wonderful accepted impact and difference in Oracle and surrounding communities in a short time. I know this area will get darker as more residents and businesses become aware of the impact they add towards this effort.

I want to share that my family has been here a long time. We knew the Kannallys. As a little girl, I recall the Kannally family, two brothers and two sisters. They would walk into Church every Sunday and occupy one pew. My family homesteaded in Klondyke on the east side of Aravaipa Canyon along Aravaipa Creek when Arizona was a territory. My dad and his two sisters were born there, my dad in 1912. We still go there for family reunions under the big cottonwood trees along the creek. I am thankful that it is preserved for posterity.

Our family later moved to Oracle and I have lived here all my life. I am thankful that they instilled in me to appreciate nature and all the richness that surrounds me here, especially the dark sky we have always enjoyed. I remember my family sitting out in the courtyard, in the evenings, enjoying family conversations and seeing bright stars under a very dark sky. That will always stay with me.

I am thankful to be part of this effort to preserve our dark sky knowing how it will benefit our children, grandchildren and future generations. My five-year-old granddaughter enjoys viewing through my telescope and has many questions already.

It brings to mind how it was not so easy living here growing up, mainly because there was no water pumped up to Oracle. I remember my grandparent's well being dug by hand. Their well provided wonderful drinking water but we had to haul water for household use. I know I sound like the Walton's, but the point I am making is that even though life was hard, they valued Oracle as a beautiful place and worth the effort. I know my parents and grandparents would be smiling knowing the effort that is being put forth today to preserve this quality of life, which they enjoyed and valued.

In closing, as a small business owner, Hair Country Beauty Salon, and amateur astronomer, I look forward to meeting new customers, sharing my enthusiasm, as well as my art when they visit Oracle to take in the wonders only seen in our special night sky.

Sincerely,
MaryHelen Vasquez


June 11, 2014

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

*Cherry Valley Ranch B&B, LLC*
*2505 Mt. Lemmon Road*
*Oracle, AZ 85623*
*800-731-6760*
*520-896-9639*

Dear IDA Board of Directors,

This letter is to give my nomination and support to the Oracle State Park (OSP) as a designated "International Dark Sky Park" qualified park. I live across the road from OSP at Cherry Valley Ranch, a 100-acre ranch, and have been here with my family since 1956. My family has always enjoyed the dark skies and star/sky watching at night. We have seen the encroachment of lights over the years but Arizona has protected the viewing of the skies with "dark sky" rules for developers with fully shielded lighting devices. For the past 20 years, I have managed Cherry Valley Ranch Bed & Breakfast. Dark skies are part of the experience and indeed, one of the joys of staying here at CVR B&B! For many people, it is serendipitous to see the stars as never before and they are in awe. People have visited here just for that reason. My family was friends of the Kannally family who were settlers and ranchers in the area, and we knew that their wishes were to preserve and protect the property and educate the public about the wonders of nature while preserving the wildlife.

The Park is exemplary in its public outreach efforts. The Park is exceptional in carrying out its mission to protect the designated wildlife refuge and act as an environmental educational center. Educationally focused trails and knowledgeable guides interact with walkers and hikers to educate them about the habitats of flora and fauna and their interrelationships with people. An important focus of the park is to help people realize themselves as part of nature and to clarify options for environmentally sensitive lifestyle. OSP works to enhance cultural awareness of its past by offering archeological educational sessions, demonstrations from Native Americans who harvested in the area, and music of all kinds. It is a well-maintained environment by Friends of OSP and Park staff. Now it is a perfect place to offer Dark Night Sky viewing, special programs, and the message of Dark Sky preservation because of its management, environment, and community involvement. Dark Night Skies is a natural resource worth protecting and worth increasing its awareness by people.

I appreciate the efforts of the community to have this designation and fully support this effort to be awarded "International Dark Sky Park" designation.

Please feel free to call me any time at 520-896-9639 or my cell phone: 520-576-8548.

Sincerely yours,

Susan Woodruff

Susan Woodruff, Manager of Cherry Valley Ranch B&B


June 10, 2014

Board of Directors
International Dark-Sky Association
3223 N. First Ave.
Tucson, AZ 85719

Dear IDA Board of Directors:

The 11-member board of directors of the Lower San Pedro Watershed Alliance (LSPWA) strongly supports the nomination of Oracle State Park as an International Dark Sky Park. This designation would support the mission of the LSPWA, which is to unite conservation-minded individuals, groups, and agencies to protect the natural ecosystems of the lower San Pedro watershed. We currently have 143 members, of whom 91 are landowners within this rural watershed. Oracle State Park is one of the most important conservation jewels in this region.

We have been impressed and inspired by the enthusiasm and dedication of the Oracle Dark Skies Committee. We know they will do a superb job of supporting the goals and objectives of the IDA.

Sincerely,

Peter Else, Chairperson

Anna Lands, Director and LSPWA coordinator for dark sky initiatives

Lower San Pedro Watershed Alliance
P.O. Box 576
Mammoth, AZ 85618

LowerSanPedro.org
phone 520-487-1903

Oracle School District #2
725 N. Carpenter Dr., Oracle, Arizona 85623 Phone: 520.896.3070 Fax: 520.896.3088

ORACLE RIDGE CAMPUS
Pre-School and Kindergarten
520-896.3070

MOUNTAIN VISTA CAMPUS
Grades First-Eighth
520-896.3000/520.896.3001

The Oracle State Park sits in the northern foothills of the Santa Catalina Mountain range and also happens to be in the Oracle Elementary School District. Our small school district has enjoyed an outstanding relationship with the Oracle State Park for many years. The Park has always enjoyed excellent support from volunteers from the surrounding communities of SaddleBrooke, SaddleBrooke Ranch and the town of Oracle.

I have lived near the Park for over twenty five years and have always enjoyed the areas feeling of remoteness while being right around the corner from Tucson. The towering Catalina Mountains, reaching almost 10,000 feet in elevation shield the Park from the Tucson Glow. The combination of this, very little air pollution, low humidity and a small local population have helped keep the Oracle skies dark and stunningly beautiful. In fact, on a recent field trip to the Kit Peak Observatory one of our fourth grade students commented that you could see "all of the stars, just like Oracle". Without fail, when our family visits us from the Eastern United States one of the highlights of their visits is always the dark, clear desert skies of the Oracle Area.

I am very happy that Mr. Mike Weasner is working with the Oracle State Park to preserve our beautiful night skies. I have already pledged that the District will do anything it can to support such a worthy cause and would like to offer my personal support for this project. If there is anything else I can offer in the way of support or assistance it would be my pleasure.

Respectfully,

Dennis Blauser
Superintendent Oracle Elementary School District
Office Phone: (520) 896-3074
email: dblauser@osd2.org

Keith J. Krueger
Pinal County Chapter Leader
11181 E. Peralta Canyon Dr.
Gold Canyon AZ, 85118

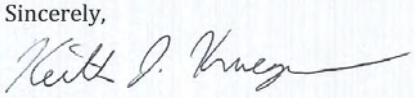
June 1, 2014

Board of Directors
International Dark-Sky Association
3223 North First Avenue
Tucson, AZ 85719-2103

To the International Dark-Sky Association (IDA) Board of Directors:

Involving the Arizona State Parks system in the IDA dark sky places program to establish dark sky anchors all around Arizona could be instrumental in keeping skies darker throughout the state. With an SQM reading that exceeds 21, Oracle State Park is a great place to start. Thank you for considering the outstanding work that the Oracle Dark Skies Committee has done to help make this a reality. It is hoped that once Oracle State Park is accepted into the IDA dark sky places program other state parks will follow. It is understood that there is support for this move by the Arizona State Park system at the highest levels of the organization. Thanks again for your consideration.

Sincerely,



Keith J. Krueger

IDA Board of Directors
International Dark-Sky Association
3225 North First Avenue
Tucson, Arizona 85719-2103

Date: 5/29/2014

Dear IDA Board of Directors,

As Park Manager for both Catalina and Oracle State Park Center for Environmental Education, I strongly support this nomination for Dark-Sky Park designation for Oracle State Park. Oracle State Park is approximately 30 miles from Tucson (one million plus population in greater Tucson) and yet the quality of the night sky at Oracle State Park is impressive and one reason many visitors come to enjoy the park during night viewing opportunities.

One major goal of Oracle State Park, besides being a wildlife refuge, is to be a center for environmental education. Since the park opened in 2001, the park has been dedicated to the mission of environmental education and the night sky has been an integral component of the environmental education. The dark sky educational emphasize can be seen through the numerous Star Parties, moonlight walks, lunar eclipse viewing, Astronomy night, and Dark Sky viewing events that have been held at the park since it opened. The Oracle State Park staff and volunteers are very proud that we can facilitate dark sky experiences to our park visitors as well as opportunities for solitude and reflection and to provide a refuge for wildlife.

Oracle State Park is a day use park only except for special events. Consequently, there is almost zero light pollution generated by the park because we do not have the many amenities (i.e. light pollution) that are needed to have camping. Hence, the vast majority of our special events held after hours focus on the beauty of the pristine dark sky.

Oracle State Park is considered a wildlife refuge, and the park fully understands and appreciates the value and impacts of dark skies and/or light pollution for wildlife and plant species in regards to migration, habitat changes, reproduction, and overall health. The importance of dark skies is a common thread that runs through our bird walks, bug nights, and night wildlife environmental education outreach.

The mission statement for Arizona State Parks is managing and conserving Arizona's natural, cultural and recreational resources for the benefit of the people, both in our parks and through our partners. I strongly feel this International Dark Sky nomination process and hopeful designation has brought many different groups together (Partners) and satisfies the core being of our overall mission statement. For example, the dark sky designation process has involved Arizona State Park rangers, volunteers, Friends of Oracle State Park members, local Oracle and Oro Valley residents,

Arizona State Parks • 1300 W. Washington Street • Phoenix, AZ 85007
Phone/TTY: (602) 542-4174 • Fax: (602) 542-4188

educators, amateur astronomers, local business, and many other interested individuals that all have the same goal of protecting the night sky in Oracle, Arizona. It has been a real honor and privilege to work with the many different stakeholders involved in this very exciting and important dark sky designation for Oracle State Park.

I feel Oracle State Park is an excellent candidate for your Dark Sky designation and I ask that you give this nomination careful consideration. Thank you.

Sincerely,

Steven C. Haas
Park Manager
Catalina/Oracle State Park
11570 N. Oracle Rd
Tucson, AZ 85737
(520) 628-5798
shaas@azstateparks.gov

Mary L. Huebner
PO Box 646
Oracle, AZ 85623
marylhuebner@gmail.com

May 29, 2014

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

Dear Directors:

My husband and I are full-time residents of Oracle, Arizona, and our property adjoins Oracle State Park. We are also members of the Friends of Oracle State Park, and I am a park volunteer. As an architect, I fully support the Dark Sky initiatives, and when planning our new home, we consciously selected exterior light fixtures that would limit light pollution far beyond the requirements of County ordinance.

We enthusiastically support the nomination of the Oracle State Park to obtain the Dark Sky Park designation. To further our support, we have offered to donate to the Friends of Oracle State Park our eight-inch Celestron telescope in the hopes that the telescope would be a valuable asset for future astronomy nights or other educational activities at the Park.

Thank you for the good work you do, and I hope you will find the Oracle State Park's application worthy of the Dark Sky Park designation.

Best regards,

Mary L. Huebner
261 Scat Ridge Rd.
Oracle, Arizona

May 28, 2014

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

Dear IDA Board of Directors,

As an Oracle State Park Environmental Education Ranger for the past 15 years, I strongly support this nomination to designate Oracle State Park as a qualified International Dark Sky Park.

I was hired as a Park Ranger in 1999, when Oracle State Park was not yet open to the public, but operated as an environmental education center by reservation for visiting school groups who participated in hands-on interactive programs along trails in our 4,000 acre wildlife refuge. Those programs on habitat needs and interconnections continue today, along with expanded educational programming extended to all ages now that the state park is open to the public.

I recall the first park Astronomy Event held in October 2001, when Oracle State Park first officially opened to the public, and we celebrated with a two-day weekend special event. That first open Saturday night, Starizona of Tucson brought up telescopes and their specialists interpreted the night sky for a large crowd. I remember how thrilling it was to see Saturn and it's rings again, amazed how it looked so exactly like a glow-in-the-dark sticker in a child's room up there, and I'm sure I was among many that night who couldn't help but take a minute to ponder the universe. I remember emailing several long distance friends and family about it, and I was particularly impacted by a response I received from a friend who works at a law firm in San Francisco when he wrote back with remorse, "There is no Saturn in the city". I still think of that at times, when defending the environmental education mission as more necessary than just a luxury, the importance to connect nature to kids, our future land stewards, and to create opportunities for those city visitors who travel to our park to find a meaningful nature connection of their own.

As the Oracle Dark Sky committee has met to assist the nomination package, it's been a great learning experience and reinforces what a good fit the dark sky message is with respect to the mission of the park as a wildlife refuge and environmental education center. The park is special in so many ways, for its quietness, for all the large raptor nesting that this oak-grassland habitat supports, and for its focus on providing educational opportunities toward

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preserving and protecting cultural and natural resources. It's been interesting to begin thinking about more creative programming to shed light on the dark sky resource, and to learn about research suggesting ways that wildlife and people are affected by light pollution.

We are inspired to offer more star parties in combination with future night-time events, such as Bat Night or Bug Night, evening guided nature walks and more live music events. We look forward to planning daytime presentations in the historic Kannally Ranch House living room to support the Dark Sky message. And there is continued potential for programming that incorporates citizen scientist projects and research to enhance Oracle State Park's environmental education mission.

The nomination process as well has reminded us of all the wonderful volunteer energy and community assets that lend support to programming and public outreach at Oracle State Park, Center for Environmental Education. From the first committee meeting, I shared my confidence that this was a good fit, because of what I had witnessed at a more recent star party held here. I smiled with satisfaction a year ago overhearing Tucson Amateur Astronomer volunteers arguing amongst themselves to accurately locate familiar reference stars in the sky, and they were finding it difficult to get oriented, because they were confused by the 'extra' stars not 'normally' seen from Tucson. It's all those extra stars up there we can see from Oracle's vantage point, as well as the spectacular landscape and history that surrounds them from below, that make this special place worthy of international recognition for the dark sky resource visitors appreciate at this park.

Thank you for your consideration of Oracle State Park, Center for Environmental Education, as Arizona's first International Dark Sky Park.

Sincerely,

Jennifer Rinio

Jennifer Rinio
Oracle State Park Ranger

Oracle State Park
Center for Environmental Education
P.O. Box 700
Oracle, AZ 85623
(520) 896-2425


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

13 May 2014

Dear IDA Board of Directors,

I and my wife purchased our retirement land in Oracle, Arizona, in 2004. We chose this area for its natural environment, cultural activities, and the very dark skies. From 2005 to 2009, about once a month I would drive from southern California to come to our land in Oracle with a tent and a telescope to take advantage of the dark skies here. After retirement from the aerospace industry in southern California in 2007, we built our house and observatory in 2008-9, and moved to Oracle in June 2009. I became an amateur astronomer at the age of six and I received a B.S. in Astrophysics, Indiana University, in 1970. Now that I am retired with my own observatory I get to frequently enjoy the dark skies in Oracle.

Based on my sky quality observations from my observatory in Oracle beginning in 2005, in February 2014, I began contemplating the idea of Oracle State Park being designated as an IDA "International Dark Sky Park" (IDSP). Initial discussions in March 2014 with the "Friends of Oracle State Park", Dr. John Barentine at IDA, and Rangers Steve Haas and Jennifer Rinio at Oracle State Park demonstrated that there was broad support for the idea. In April 2014, the "Oracle Dark Skies Committee" was formed to pursue the IDSP designation.

The Oracle Dark Skies Committee, with the outstanding assistance and support of Oracle State Park, Arizona State Parks management, the Friends of Oracle State Park, and local business owners, residents, and elected officials, made great progress on the IDSP Nomination Package in a very short period of time. It has already had positive impacts on local light pollution through public outreach and education.

I am very excited and pleased, both as an IDA member and the Chair of the Oracle Dark Skies Committee, to lend my support to Oracle State Park as the first "International Dark Sky Park" in the Arizona State Parks system.

Sincerely yours,

Mike Weasner
IDA Member
Chair, Oracle Dark Skies Committee

# 3. Oracle State Park History and Information

## 3.1 History of Oracle State Park - Center for Environmental Education

The Kannally Ranch was donated to The Defenders of Wildlife (DOW), a non-profit organization, in 1976. The will of Lucille Kannally gave the 4000-acre ranch to DOW with the stipulation that the property be perpetually used as a wildlife reserve. The DOW held this property (called the Oracle Wildlife Refuge) for ten years. For most of the time, the Oracle Education Project, under the leadership of Bob Hernbrode, utilized the Kannally Ranch House as its base of operation for a variety of environmental education programs.

Figure 3.1 Kannally Ranch Home in 1985

In 1985, through the encouragement and efforts of Bill Roe, of the Arizona Outdoor Recreation Coordinating Commission, the DOW decided to offer the property to the State for a State Park. The Arizona Parklands Foundation (APF), a non-profit organization created by Governor Babbitt, worked with DOW and State Parks to facilitate the transfer of the property to APF for eventual transfer to the State Parks Board. In October of 1985, APF sponsored a dedication event to honor the future State Park. Governor Babbitt and the Parks Board members were in attendance. Graphic design panels, showing the name of the Park as Herberger State Park, and presenting concepts for intensive development of the property that would be a primary destination for public recreation, were exhibited at the dedication. Intended to generate enthusiasm and support for the new Park, the proposed name and developments actually generated strong opposition from the local residents.

The Parks Board held a meeting in December 1985 in Oracle to provide the people of the community an opportunity to air their concerns and to provide input and

ideas for the proposed new State Park. A large number attended this meeting from the area and several volunteered to serve on a planning committee. The Parks Board accepted the offer of assistance and appointed a Planning Committee to serve as a liaison between the community and Board and to develop an acceptable park master plan.

The Arizona Parklands Foundation held the deed to the property from November 1985 until it transferred the property to the State Parks Board in March 19, 1986. The deed restrictions that came with the property prohibit hunting, trapping, off-road vehicle use, and limited development of the property to no more than 10 percent of the acreage. Mike Mayer was selected as the first Park Manager.

The Planning Committee worked throughout 1986 and invested a great deal of time and effort in their charge. The large group, divided into five subcommittees, sought technical input and held numerous open meetings and site visits. Many of the development ideas presented at the dedication were eliminated from further consideration during this process.

Figure 3.2 Planning Committee in 1986

Concurrent with the activities of the Planning Committee, Arizona Department of Transportation (ADOT) contracted on January 16, 1986, for design improvements of the Mt. Lemmon Road and the Kannally Ranch House Road. In January 1987, the Ad Hoc Planning Committee presented its recommendations to the Arizona State Parks Board. The Board agreed with the recommendations in principle, including the recommendation that the Park have a dual purpose of serving as both a wildlife refuge and as a learning center for environmental education. In March, after reviewing the Committee's recommendations in full, the Board formally approved the report.

In November 1987, a complete site resource inventory was initiated. This research integrated studies of the Park vegetation, wildlife species, wildlife resources, geology, soils, watersheds, hydrology, topography and several other aspects of the site and surrounding vicinity (but it did not include the dark sky).

In early 1988, the development of a Park master plan was initiated. State Parks informed the planning consultant that certain basic issues related to the development of the Park had already been established. First and foremost was that Oracle State Park would be developed and managed as both an environmental education center and wildlife preserve. Also, the Ad Hoc Planning Committee had already determined the required facilities.

A Technical Advisory Committee was organized to assist the consultant and State Parks in the master planning process. This group included members of the previous Ad Hoc Planning Committee, community representatives, resource professionals and environmental educators. During the planning process, there were numerous additional opportunities for public input through the Committee members and through open public meetings.

Throughout the master planning process, public input significantly affected plans for the Park. A walk-in entrance was added to the plan so that visitors could leave vehicles on the periphery of the site and hike in. It was decided that signage would direct visitors to the main entrance but that the public would be encouraged to use the pedestrian access as much as possible. At the request of local citizens, the name of the Park was changed to Oracle State Park - Center for Environmental Education.

The State Parks Board approved the Oracle State Park Master Plan in February 1990. The Plan outlined general description and design criteria for a new visitor center and limited picnic sites, a residential environmental education facility with bunkhouses and dining hall, a group use area, a maintenance area and staff residence area. When all facilities, roads and areas impacted by construction were combined, less than one percent of the total Park acreage was to be altered by development. The Master Plan also called for construction of wildlife watering sites to enhance the wildlife habitat. As shown on the Plan, the entrance road and most of the new facilities are sited near the edge of the oak zone, just before the elevation drops in the mesquite scrub. The majority of the oak grassland habitat in the Park would remain undisturbed.

In February of 1993, ADOT entered into a contract with another engineering consultant to complete the design for the roads and parking areas as described in the Park Master Plan. In May 1993, a public meeting was held to provide the public with the opportunity to review and comment on the proposed road improvements.

In February 1994, a final Draft Environmental Assessment was made available to Oracle area residents. On May 23, 1994, The Environmental Assessment was accepted by ADOT. The road design and the project specifications were finalized. Construction was completed in 1996.

The Park was continually available for environmental education programs on a reservation basis. Oracle State Park was officially dedicated and opened to the public October 1, 2001.

This history is from the book *Arizona State Parks: The Beginning* edited by Charles R. Eatherly, and used with permission. Copyright Arizona State Parks.

## 3.2 Park Information

The park is open Saturdays and Sundays. Hours are 8 am - 5 pm. Environmental Education Field Trip Programs for school groups are scheduled weekdays by reservation. Special nighttime events are held throughout the year. Night access for observing programs available by reservation.

### Restrooms

The park has modern, handicap accessible restrooms at the Group Use Area. There are four composting toilets, each with sink and running water.

At the Kannally Ranch House, old plumbing is a limitation so the public is asked to use the two handicap accessible port-o-toilets, with foot-pump hand-washing station.

There is one handicap accessible port-o-toilet available at the Oak-Woodland parking area, with no sink facility.

All Park restrooms will be upgraded during the summer of 2014 with new facilities, plumbing, and accessibility.

### Gift Shop

The Gift Shop is housed in the office/visitor contact station located in the upper solarium of the historic Kannally Ranch House. Items for sale include a variety of books, magnets, notecards, postcards, T-shirts, stuffed animals and educational games.

### Exhibits

The historic Kannally Ranch House is a museum with historic photos, original artwork and unique design features including Mediterranean and Moorish architecture. Constructed between 1929-33, the house is four levels built up the hillside and is listed on the National Register of Historic Places.

A 45-minute guided tour of the ranch house is offered to the public on Saturdays, Sundays and holidays at 10 am and again at 2 pm. Guided tours during midweek may be scheduled by reservation. Other exhibits include an extensive plant herbarium, with laminated specimens available for viewing in the park office/gift-shop.

**Group: Day Use Areas**

Two ramada shades with picnic tables (10 tables), four restrooms and one charcoal grill. The ranch house and patios may also be reserved for group gatherings.

**Picnic Areas/Shelters**

Kannally Ranch House patios (3) with limited seating and four patio tables for picnic use.

Oak Woodland Area with eight picnic tables under shade trees, one handicap accessible port-o-toilet; no running water.

Five picnic tables under shade trees along Main Road across from Oak-Woodland Area.

**Hiking Trails**

Oracle State Park: Center for Environmental Education offers more than 15 miles of hiking trails. The Arizona Trail also offers the opportunity to extend treks into the Catalina Mountains to the south and rolling desert hills to the north.

Granite Overlook Trail: This trail is accessed from the Oak Woodland parking area, which is the first parking lot when entering the park. It is a 1.6 mile loop. This trail goes through oaks and boulder piles. At the top are nice stands of banana yucca. From the top there are great views of the surrounding mountains and valleys.

Bellota Trail: This trail is accessed from the Group Use Area parking area. It is used on the Park's environmental education school programs during the week. It is a 0.8 mile loop. The trail goes through parts of the sandy Kannally Wash with large oaks and open grassy areas with great views.

Windy Ridge Trail: This trail is across from the Group Use Area and also can be easily accessed from the Kannally Ranch House parking area. This is another environmental education/school program trail. It is a 0.9 mile loop. The hike ventures along a sandy wash with great boulder piles up to the top of a ridge formed by a geologic formation called a dike.

Nature Trail: This trail is accessed at the end of the park road at the Kannally Ranch House parking area. It is a 1.2 mile loop. This is the only short loop trail that dogs are allowed on. The best springtime flowers start along this trail. There are great views of the areas' history including; The Kannally Ranch House on the park, and parts of the San Manuel mining area which covered large sections of the valley in the distance.

Manzanita/Arizona/Wildlife Corridor: This combination of trails allows for about a 6 mile loop hike. It is accessed from the Kannally Ranch House parking area. The hike goes through a rolling terrain of oaks and open grasslands. Soaptree Yucca and

desert scrub augment springtime desert flowers on the Arizona Trail section of this loop (the Arizona Trail starts near Mexico and extends to Utah, as seen below).


Figure 3.3 Map by the Arizona Trail Association (used with permission)

**Equestrian Trails**

Equestrians can access the Arizona Trail and other designated multi-use paths from the American Avenue parking lot in Oracle. Multi-use trails include the Arizona Trail,

Cherry Valley Wash, Windmill Trail Loop, Gasline Road, Kannally Wash, and Cottonwood Wash. The Firebreak Road Trail connects the Kannally Wash and Cottonwood Wash near the ranch house to divert equestrians away from the park's inner trail system used for educational programming. Park staff are working on developing limited equestrian facilities at this trailhead parking lot off American Avenue.

**Biking**

From the Kannally Ranch House, access the Wildlife Corridor Trail via the Nature Trail, and head out to the Arizona Trail. Return on the Mariposa Trail from the American Avenue parking lot. Bicyclists can also use designated multi-use paths including the Cherry Valley Wash, Kannally Wash, Firebreak Road and Cottonwood Wash.

**Wildlife Viewing**

The diversity of vegetation, slope and elevation provide habitat for a variety of mammals, birds, reptiles, insects and more. The most commonly sighted mammals include the white-tailed deer, coyote, bobcat, javelina, gray fox, skunks (hognose, hooded and white striped) and cottontail rabbit but many many other smaller mammals could be named. Mountain lions are occasionally seen in the park; more often they leave a sign of their presence such as a deer carcass.

Common bird sightings include the scrub jay, gambel's quail, cardinal, great horned owl, cooper's hawk, northern harrier, red tailed hawk, turkey vulture, gila woodpecker, rednaped sapsucker, curve billed and crissal thrashers, say's phoebe, scott's and hooded oriole, canyon towhee, green tailed towhee, spotted towhee, bridled titmouse, phainopepla, pyrrhuloxia, and many others depending on the time of year, including warblers, hummingbirds, sparrows and more.

Reptiles include the common western diamondback rattlesnake, bullsnake, ringneck snake, kingsnake, western fence lizard, earless lizard, Clark's spiny lizard, ornate tree lizard and giant spotted lizards among others.

## 3.3. Oracle State Park Environmental/Cultural Education Events

Oracle State Park frequently conducts events of an environmental and/or cultural nature. One such event in April 2014 was a local grade school visitation:


Photographs by Chip Parfet, ODSC member. Used with permission.

A typical schedule (from April 2014) includes events like these:

**Saturday April 12: Boulder Scramble:** Meet at the ranch house at 8:30am and join Naturalist volunteer, Rick Gagnon, for short hikes to explore up close some of the boulder piles along park trails. No reservation needed. Free with park admission.
**Also, Saturday, April 12: Wildlife Painting at Oracle State Park from 10am-Noon:** Meet on the upper patio of the Kannally Ranch House and join the fun! – bring your own art materials or use what is provided to explore your creativity and make your own painting. The session is open to all ages, and facilitated by Keefer Gagnon, 8th grade National Junior Honor Society student at Mountain Vista School in Oracle. Reservation preferred.
**Also, Saturday April 12: Bi-national Landscape Restoration in the Sky Islands**, presentation at **NOON** in the living room of the Kannally Ranch House. Sky Island Alliance (SIA) is a conservation organization dedicated to the protection and restoration of the rich natural heritage of native species and habitats in the Sky Island region of the southwestern United States and northwestern Mexico. A cornerstone of SIA's conservation successes lie in the on-the-ground work of the RESTORE Program, which works cooperatively with government agencies, private landowners, and a corps of capable volunteers on both sides of the US-MX international border to increase ecosystem resilience to the stresses of land management and climate change. Join Carianne Campbell, the RESTORE Program Manager, for a virtual tour of where they have been working and upcoming projects. Free with park admission. Please call for a reservation.
**Sunday, April 13: Southwest Landscape Drawing Workshop with Sedona artist, Joella Jean Mahoney, 11am-1pm.** No drawing experience necessary. *"Mahoney is a lifelong painter and has her home and studio in Sedona. Her vivid, powerful, large-scale paintings are exhibited nationally and internationally and are in many public and private collections. Mahoney's paintings are all inspired by places she has hiked or backpacked. In 1985, the State of Arizona and the Arizona Parks Foundation invited her to produce a painting that would commemorate the dedication of Oracle State Park and establish the visual identity of the park."* A print of the Oracle State Park painting, part of her Monsoon Sky Series, is currently on display at the Kannally Ranch House. Reservation required. Free with park admission.
**Saturday, April 19: Guided Hike and Geology,** led by Gaston Meloche and guest Geologist. Meet at 8:30am at the ranch house parking lot for a 5-6 mile hike. A reservation is required. Please call Gaston to register by 4pm the previous day, at (520) 638-5404. Free with park entrance fee.
**Also, Saturday, April 19: Reptile Walk with Herpetologist, Ed Moll.** Begins with a presentation at 11am at the Kannally Ranch House followed by a walk to find and identify lizards and other reptiles at the park. Reservation required. Free with park admission.

**Also, Saturday, April 19: Wilderness Talk:** Join Rod Mondt of the Sky Island Alliance, at **3pm** in the living room of the ranch house for a presentation about wilderness and protected areas on this year's 50th Anniversary of the Wilderness Act. Reservation suggested, free with park admission.

**Sunday, April 20: Guided Plant Walk,** with Chuck LeFevre. Meet at the Ranch House office at **11am**. Free with park admission. No reservation needed.

**Saturday, April 26: Ask Your Master Gardener, 11am to 1pm** at the Kannally Ranch House. The Saddlebrooke Master Gardeners will be on hand to answer gardening questions. If you have a plant you want identified, or bug or pest issues, bring a picture or a sample. Otherwise, just stop by to see their display and pick up useful garden tips. Master Gardeners are dedicated volunteers who assist the Cooperative Extension Service by providing home horticulture information that is endorsed by the University of Arizona.

**Also, Saturday, April 26: Garden Talk: The Native Mesquites. 11:30am** at the Kannally Ranch House, with presenter, Kathie Griffin, a Saddle brooke Master Gardener. The presentation will familiarize participants with these amazing desert legumes found in the park. **Part 1 – The Tree of Life:** Identification of the velvet and honey mesquites, growing patterns, and natural enemies. **Part 2 – The Value of the Mesquite:** Its importance to animals, plants, the soil, and to humans. Please call for a reservation. Free with park entrance fee.

# 4. Oracle State Park Dark Sky Event Locations

## 4.1 Oracle State Park Maps

The following maps of Oracle State Park show the main roads, trails, and facilities. The first map shows the main Park area; the second shows an overview of the entire Park.

Three locations at Oracle State Park have been selected where events that showcase the Park's dark sky can be held. These are: the Kannally Ranch House patio and adjacent parking lot, the Group Use Area (with adjacent parking lot), and the Arizona Trail Walk-In parking lot. Telescopes can be set up in all three locations, with electrical power available at the Ranch House patio and Group Use Area. In addition, displays and presentations can be done at both the Ranch House and in the large shelters at the Group Use Area. The following Park maps have been annotated to show these locations.

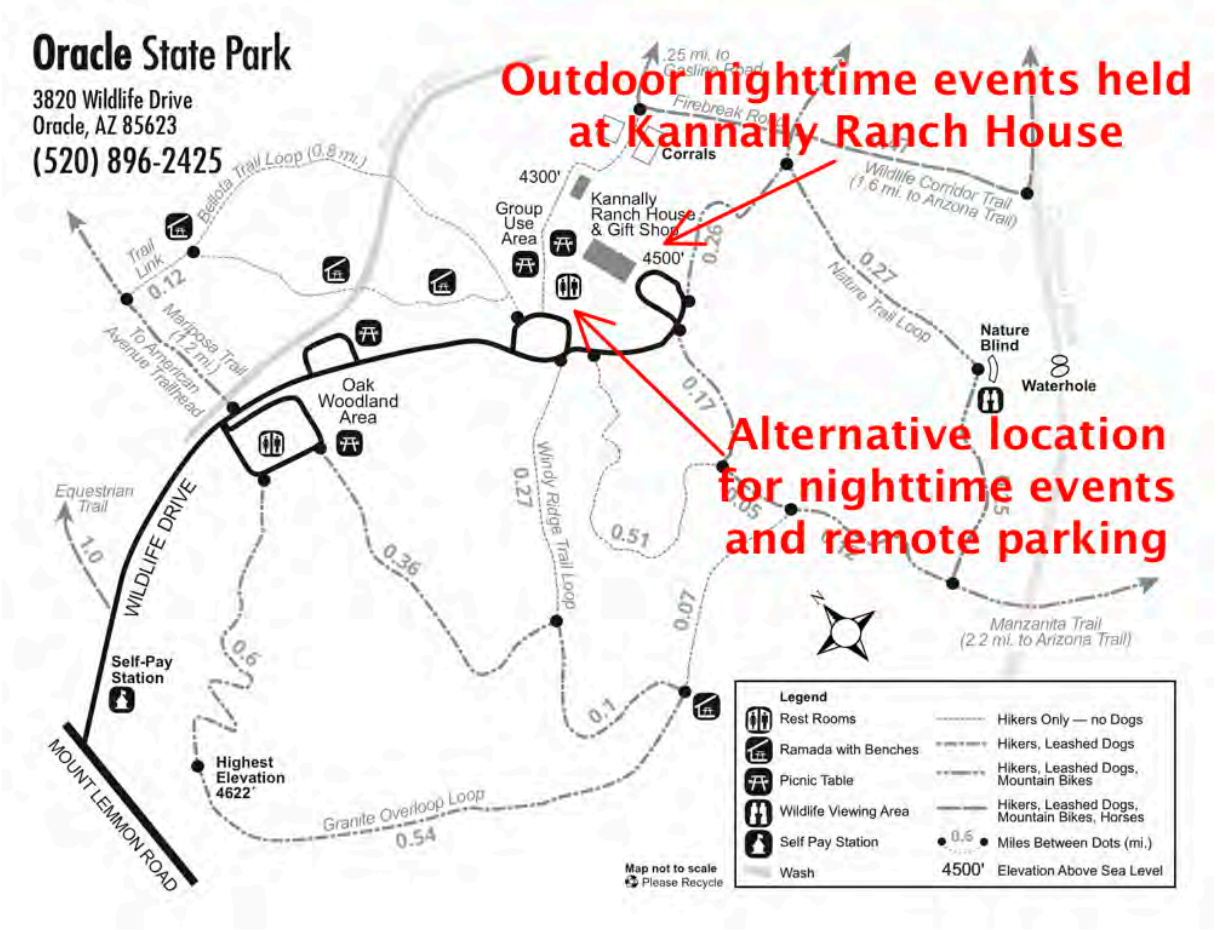



Figure 4.1 Main Park Map

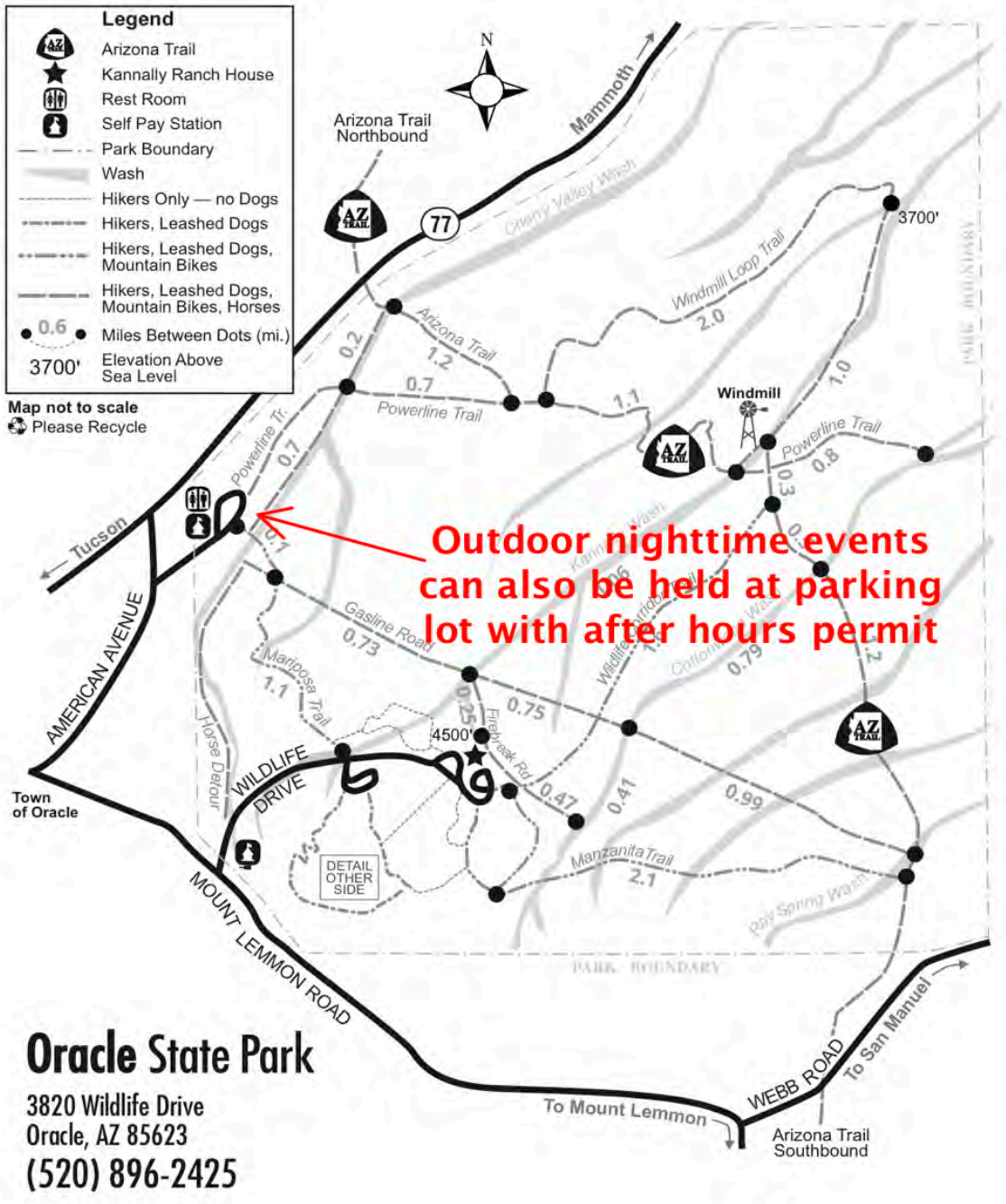



Figure 4.2 Arizona Trail Walk-In

The two satellite images (from the Apple Maps application) on the next page show these locations at approximately the same scale.

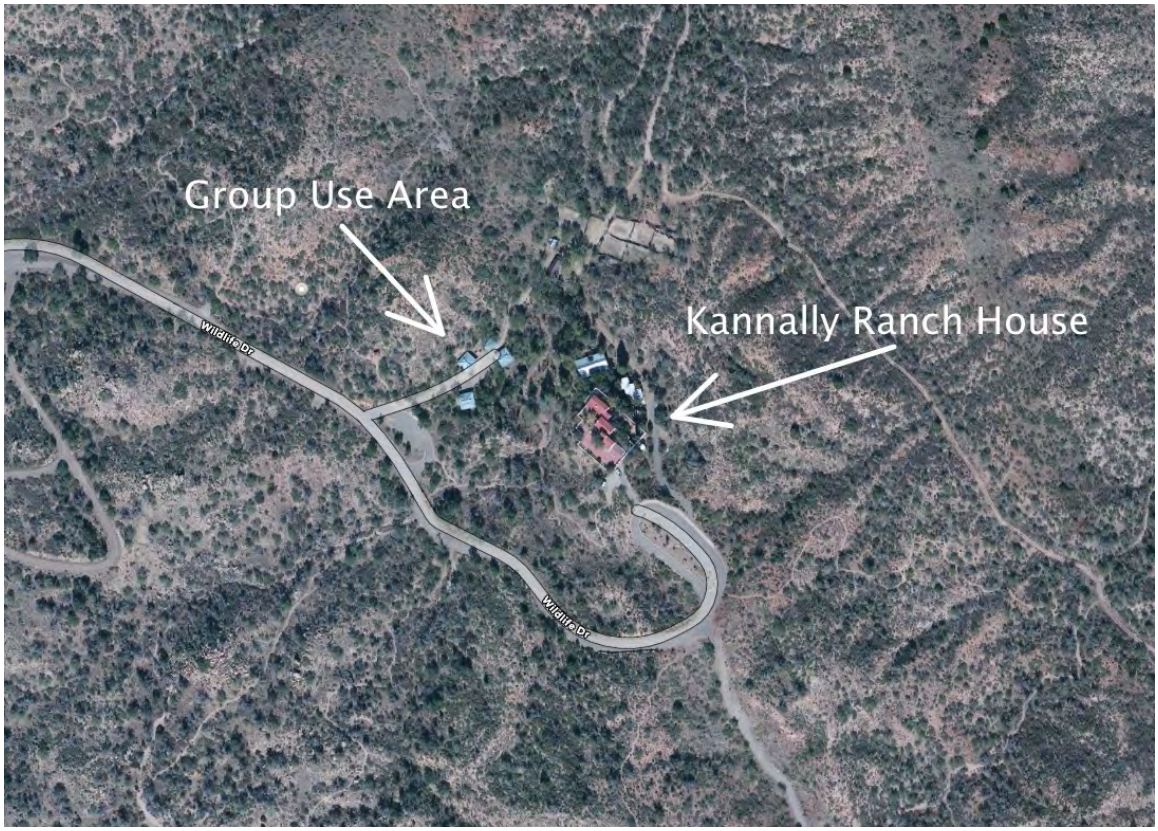


Figure 4.3 Satellite Day Image Main Park Area

Figure 4.4 Satellite Day Image Arizona Trail parking lot

As can be seen in Figures 4.3 and 4.4, there are no structures nearby that would be sources of light pollution.

### 4.2 Day Sky Panorama Photographs

Two of the three locations described above have excellent 360° views nearly to the horizon. The Kannally Ranch House parking lot has the best view of the sky, as seen in these panoramas (taken by Mike Weasner, ODSC):

Figure 4.5 Kannally Ranch House parking lot panorama: West (left), North (center), East (right)

Figure 4.6 Kannally Ranch House parking lot panorama: East (left), South (center), West (right)

The Arizona Trail Walk-In parking lot is in a slight depression, but still provides excellent sky views:

Figure 4.7 Arizona Trail Walk-In parking lot panorama: West (left), North (center), East (right)

Figure 4.8 Arizona Trail Walk-In parking lot panorama: East (left), South (center), West (right)

The Group Use Area is in a slight depression and is surrounded by trees, but provides a good view of much of the sky and is protected from any wind that might be blowing:

Figure 4.9 Group Use Area panorama: West (left), North (center), East (right)

Figure 4.10 Group Use Area panorama: East (left), South (center), West (right)

Of the three locations, the Kannally Ranch House has been the location where past star parties have occurred and is the primary location for future star parties. The Arizona Trail Walk-In parking lot is available with an after hours permit for unescorted nighttime access at any time by individuals or groups who want to set up telescopes.

# 5. Oracle State Park Night Sky Quality

## 5.1 Contour Maps

The US Geological Survey map (Figure 5.1) shows the location of Oracle State Park (outlined in red), approximate elevation of 4390 feet above sea level, situated north of the Santa Catalina Mountains. The mountain range (elevation 9157 feet above sea level) obscures much of the light dome from Tucson (nearest large city, lower left corner on the map) as seen from Oracle State Park.

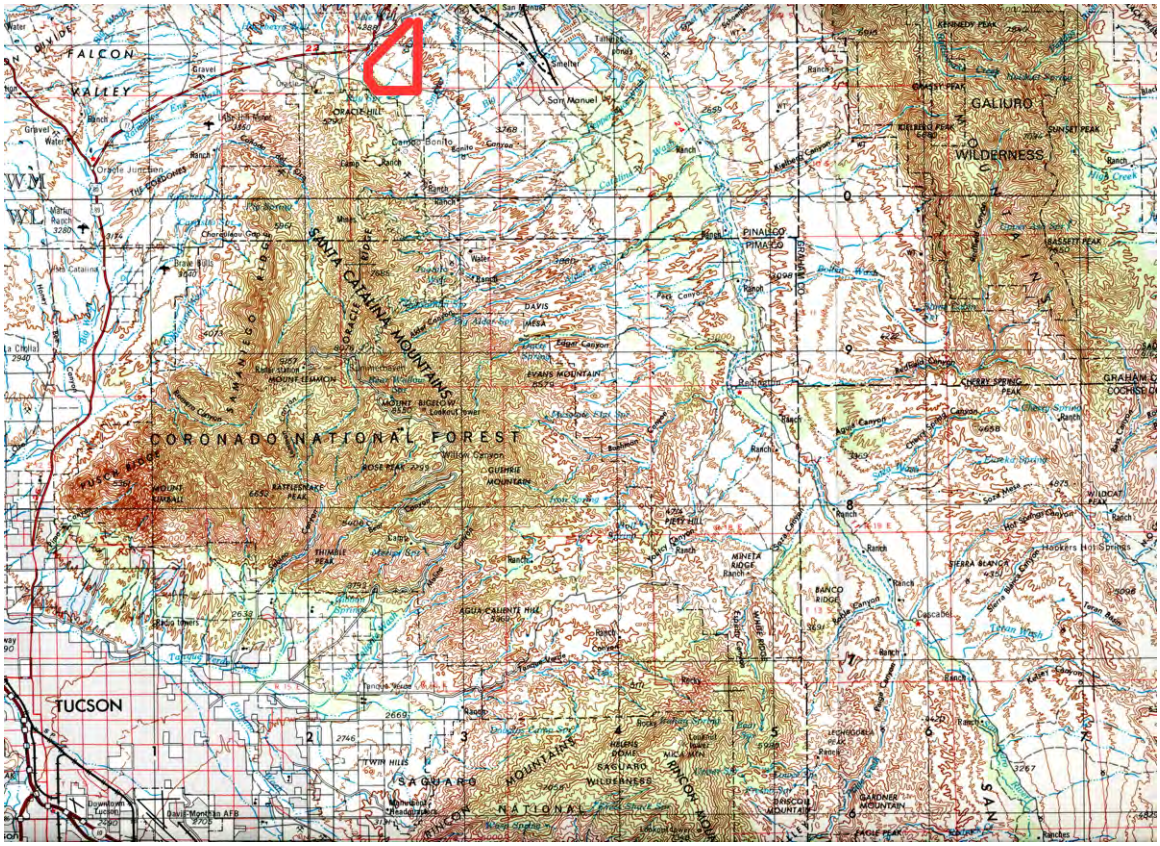



Figure 5.1 Area Contour Map

Figure 5.2 shows the small, unincorporated, community of Oracle, population 3686, just west (left) of Oracle State Park (outlined in red).

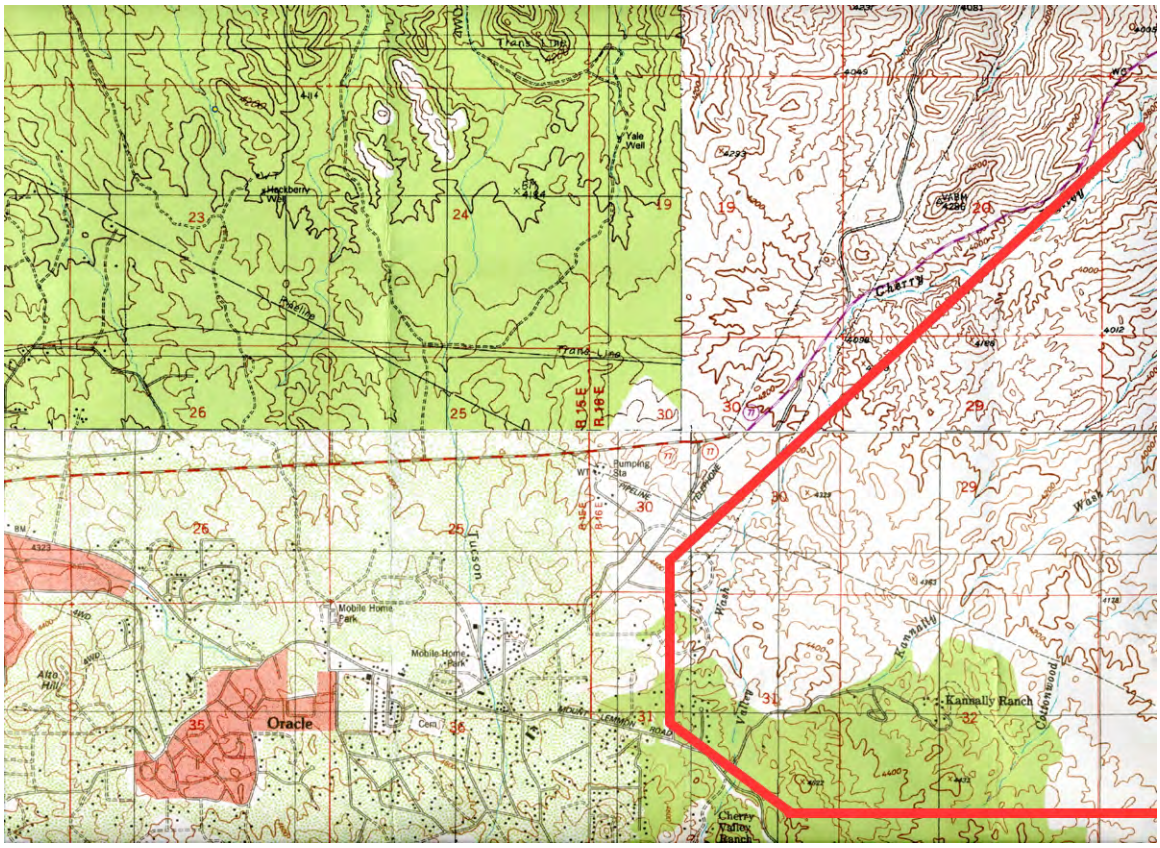


Figure 5.2 Oracle Area Contour Map

The rural nature of Oracle and the surrounding area reduces the opportunities for nearby outdoor lighting to infringe upon Oracle State Park. Pinal County and Pima County (south of Pinal) have excellent outdoor lighting codes. Maricopa County is less pro-dark sky than either Pinal or Pima counties. Consequently, the main threats to the dark sky at Oracle State Park come from outside Pinal County. Going forward during the upcoming years, as other Arizona State Parks pursue "International Dark Sky Park" status, it is likely that state-wide education will result in improvements in dark sky quality throughout Arizona.

## 5.2 Satellite Images

Satellite images effectively show the sparseness of the general area and the distances from any major sources of light pollution. The nighttime satellite image of the state of Arizona (from http://www.blue-marble.de/nightlights/2012) clearly shows that Oracle is located far from the major source of light pollution in the state (Phoenix):


Figure 5.3 Satellite Night Image of Arizona

A close-up image showing Tucson and Oracle reveals that the Santa Catalina Mountain Range shields Oracle State Park from the bulk of light pollution from Tucson:

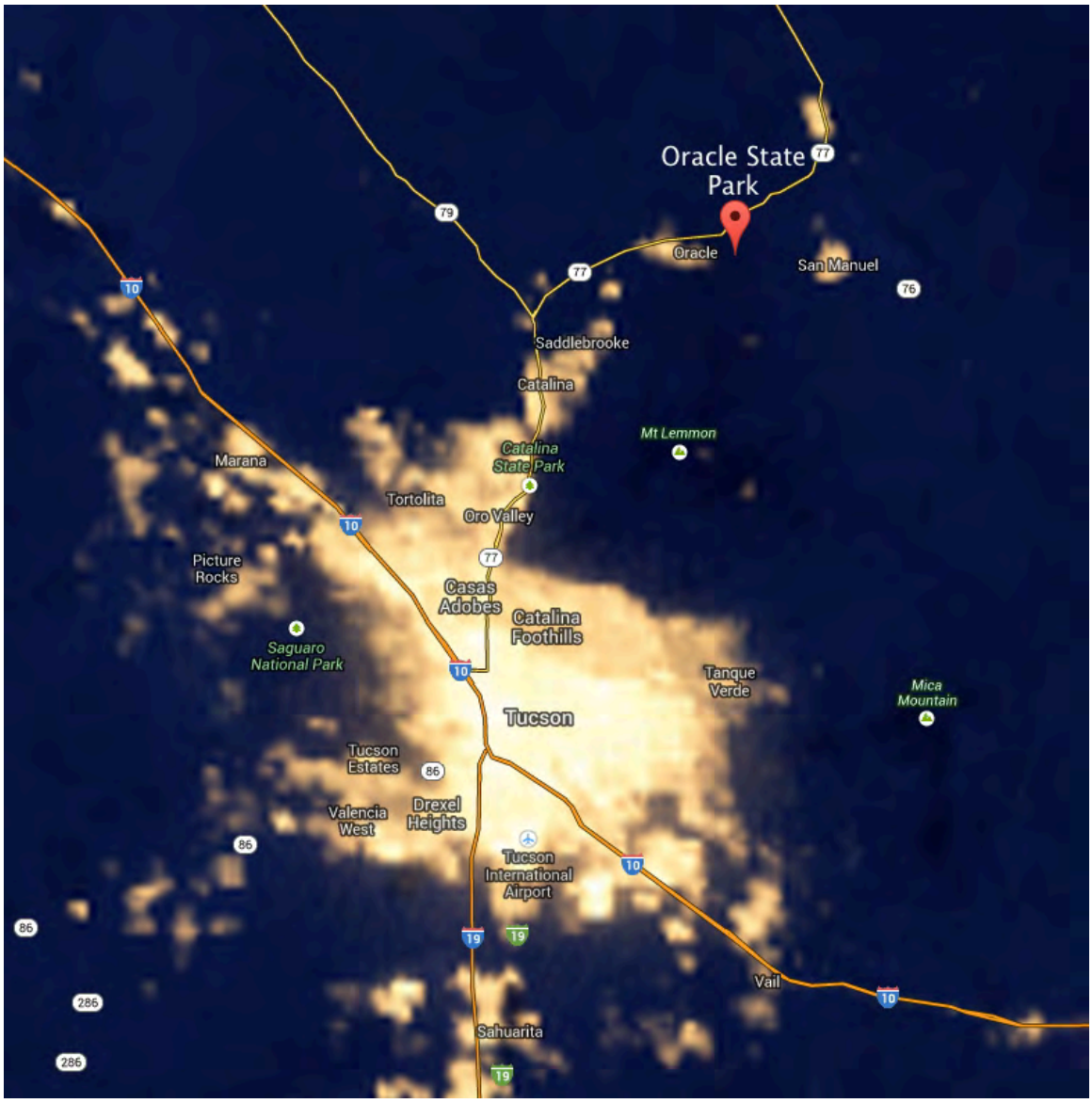



Figure 5.4 Satellite Night Image Tucson to Oracle

Figure 5.5 shows a daytime satellite image (from the Mac OS X Maps application) with a somewhat similar view to the contour map seen in Figure 5.2, with the community of Oracle at the left and Oracle State Park covering most of the center and right side.

Figure 5.5 Satellite Day Image Oracle

Other than the small community of Oracle itself, the area surrounding the Park is very sparsely populated. Consequently, very little light pollution seen from Oracle State Park actually comes from the community of Oracle.

## 5.3 Arizona Dark Sky Map

A portion of the "World Atlas of the Artificial Night Sky Brightness" (by David Lorenz, 2006 data, which is the most recent available) provides an indication of the sky brightness as seen in southern Arizona (Figure 5.6; North at the top). The location of Oracle State Park shown is an approximation based on the nighttime satellite images above.

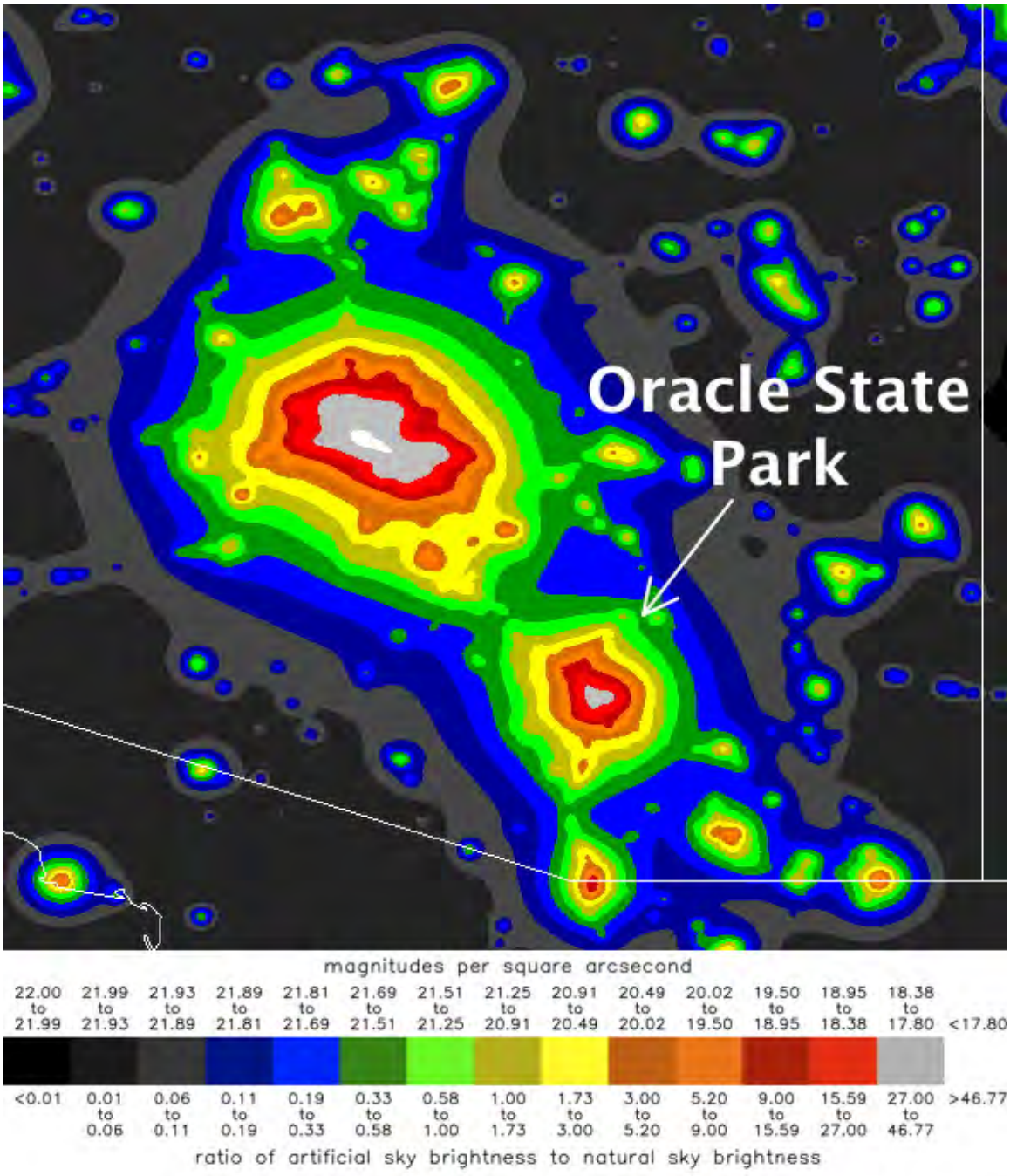



Figure 5.6 Night Sky Brightness Arizona

The next section documents actual sky quality measurements at Oracle State Park.

## 5.4 Sky Quality Measurements

Sky Quality Measurements were taken at all three Park locations (described in Section 4) on different nights, at various times, and under varying sky conditions (but always clear). Measurements were made using a Unihedron Sky Quality Meter with Lens (SQM-L), serial number 6254, on loan from the National Optical Astronomy Observation in Tucson, Arizona. The meter measures the sky brightness (or darkness, in the case of Oracle State Park) in units of "magnitudes per square arc second". Since most astronomers and the knowledgeable public think in terms of "what's the faintest star visible?" the following chart developed by K. Fisher (http://www.unihedron.com/projects/darksky/images/MPSASvsNELM.jpg) provides a conversion to visual magnitudes.

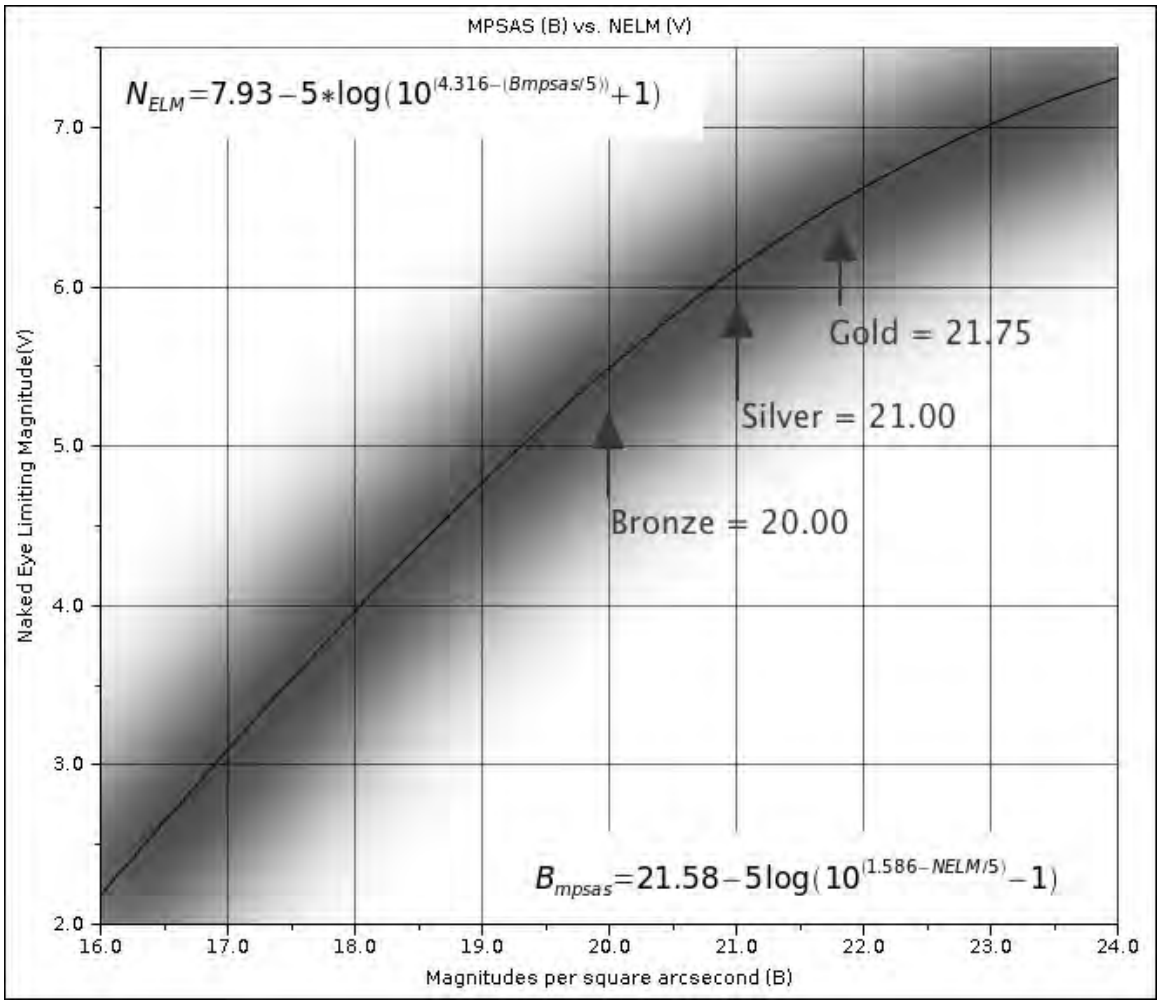



Figure 5.7 Sky Quality Chart vs IDSP Tiers

The "International Dark Sky Park" levels of Gold, Silver, and Bronze have been added to the chart.

Table 5.1 shows the night sky quality measurements taken at the Park. No parking lot lighting was illuminated at the time of the measurements.

| Site | Date/Time | Lat/Long | Elevation | Conditions | SQM |
|---|---|---|---|---|---|
| AZ Trail Walk-In parking lot | 04/28/14 2039 MST | N 32° 37' 17.2" W 110° 44' 47.7" | 4290 ft | Astronomical Twilight End 2032 MST. No clouds. Zodiacal Light visible. | 21.24 |
| Group Use Area | 04/28/14 2138 MST | N 32° 36' 36.0" W 110° 44' 04.3" | 4303 ft | No clouds. | 21.25 |
| Kannally Ranch House parking lot | 04/28/14 2230 MST | N 32° 36' 32.4" W 110° 43' 58.9" | 4384 ft | No clouds, breezy. | 21.34 |
| Kannally Ranch House parking lot | 04/29/14 0003 MST | N 32° 36' 32.4" W 110° 43' 58.9" | 4384 ft | No clouds, breezy. | 21.40 |
| Group Use Area | 04/29/14 0011 MST | N 32° 36' 36.0" W 110° 44' 04.3" | 4303 ft | No clouds, breezy. | 21.36 |
| AZ Trail Walk-In parking lot | 04/29/14 0027 MST | N 32° 37' 17.2" W 110° 44' 47.7" | 4290 ft | No clouds, breezy. | 21.34 |
| AZ Trail Walk-In parking lot | 05/02/14 2223 MST | N 32° 37' 17.2" W 110° 44' 47.7" | 4290 ft | Moonset 2218 MST. Clear but some dust in air from recent strong winds. | 21.37 |
| Group Use Area | 05/02/14 2242 MST | N 32° 36' 36.0" W 110° 44' 04.3" | 4303 ft | Moonset 2218 MST. Clear but some dust in air from recent strong winds. | 21.39 |
| Kannally Ranch House parking lot | 05/02/14 2251 MST | N 32° 36' 32.4" W 110° 43' 58.9" | 4384 ft | Moonset 2218 MST. Clear but some dust in air from recent strong winds. | 21.41 |
| Kannally Ranch House parking lot | 05/03/14 0100 MST | N 32° 36' 32.4" W 110° 43' 58.9" | 4385 ft | Clear but some dust in air from recent strong winds. | 21.42 |
| AZ Trail Walk-In parking lot | 05/21/14 2234 MST | N 32° 37' 17.2" W 110° 44' 47.7" | 4290 ft | Some thin clouds, maybe some airborne dust | 21.44 |
| Group Use Area | 05/21/14 2253 MST | N 32° 36' 36.0" W 110° 44' 04.3" | 4303 ft | Some thin clouds, maybe some airborne dust | 21.40 |
| Kannally Ranch House parking lot | 05/21/14 2301 MST | N 32° 36' 32.4" W 110° 43' 58.9" | 4384 ft | Some thin clouds, maybe some airborne dust | 21.39 |
| Kannally Ranch House parking lot | 05/27/14 0105 MST | N 32° 36' 32.4" W 110° 43' 58.9" | 4384 ft | Clear but clouds along eastern horizon, Milky Way near zenith | 21.36 |
| Group Use Area | 05/27/14 0115 MST | N 32° 36' 36.0" W 110° 44' 04.3" | 4303 ft | Clear but clouds along eastern horizon, Milky Way near zenith | 21.32 |
| AZ Trail Walk-In parking lot | 05/27/14 0130 MST | N 32° 37' 17.2" W 110° 44' 47.7" | 4290 ft | Clear but clouds along eastern horizon, Milky Way near zenith | 21.31 |
| Kannally Ranch House patio | 06/21/14 2146 MST | N 32.61° W 110.73° | 4384 ft | Clear. Reading taken at a Star Party at the Park | 21.46 |
| Kannally Ranch House patio | 06/21/14 2320 MST | N 32.61° W 110.73° | 4384 ft | Clear, but windy. Reading taken after Star Party was over. | 21.43 |
| Kannally Ranch House parking lot | 06/24/14 2119 MST | N 32.61° W 110.73° | 4384 ft | Clear. Large wildfire 25 miles east. End Astronomical Twilight. | 21.36 |
| Kannally Ranch House parking lot | 06/24/14 2336 MST | N 32.61° W 110.73° | 4384 ft | Clear. Large wildfire 25 miles east. | 21.38 |

Table 5.1 Oracle State Park Sky Quality Measurements

During the time frame of SQM readings (28 April 2014 to 26 June 2014), the overall average SQM at Oracle State Park (all three locations combined) is 21.37, with the Kannally Ranch House location exhibiting the darkest sky at 21.46. This sky quality puts Oracle State Park in the middle of the Silver tier.

It is worth noting that M33 (Triangulum Galaxy) has been seen using the naked eye from the west side of the community of Oracle by Mike Weasner, Chair of the Oracle Dark Skies Committee, from his Cassiopeia Observatory location. The observation was made in October 2013 and is another indication of the sky quality in Oracle, Arizona.

## 5.5 Night Sky Photographs

Photographs of the night sky were taken by Mike Weasner, Chair, Oracle Dark Skies Committee, local amateur astronomer, and IDA member, using a Nikon D7000 DSLR with a Rokinon 8mm f/3.5 180° Fisheye Lens. Exposure settings were f/5, 60 seconds, ISO 1600, for the following non-tracking images. These photos provide an approximation of what the human eye would see. A typical faint star in these zenith pointed photos is SAO 82254 (near the zenith) in the constellation of Coma Berenices, Magnitude +7.0.

Figure 5.8 Arizona Trail Walk-In parking lot: All Sky (North at top, West at right)

Figure 5.9 Group Use Area: All Sky (North at top, West at right)

Figure 5.10 Kannally Ranch House parking lot: All Sky (North at top, West at right)

The following six photos were taken with the 180° fisheye lens aimed at the horizon to better capture "light domes" from distant cities. The major cities seen are Phoenix (to the Northwest) and Tucson (to the South).

Figure 5.11 Arizona Trail Walk-In parking lot night panorama: View to Northwest

Figure 5.12 Arizona Trail Walk-In parking lot night panorama: Southern Sky

Figure 5.13 Group Use Area night panorama: View to Northwest

Figure 5.14 Group Use Area night panorama: Southern Sky

Figure 5.15 Kannally Ranch House parking lot night panorama: View to Northwest

Figure 5.16 Kannally Ranch House parking lot night panorama: View to South

As is evident from the photos, the distant city light domes extend only a few degrees above the local horizon and have a minimal impact on the night sky at Oracle State Park.

To showcase the beauty of the night sky as seen from Oracle State Park, Figure 5.17 is a photograph of the rising Milky Way on 3 May 2014, 0038 MST. The photograph was taken using a Nikon D7000 DSLR with a Rokinon 8mm f/3.5 180° Fisheye Lens mounted on a tracking Meade LXD55 GEM tripod. The exposure setting was f/8, 5 minutes, ISO 2500.

Figure 5.17 Rising Milky Way at Oracle State Park

The night sky at Oracle State Park is dark enough to view and photograph the Zodiacal Light. Although May is not ideal for the evening Zodiacal Light, it can be seen faintly above the rock formation at the Park in the photograph below taken on 26 May 2014, 2105 MST (18mm lens, f/4, 30 seconds, ISO 4000).

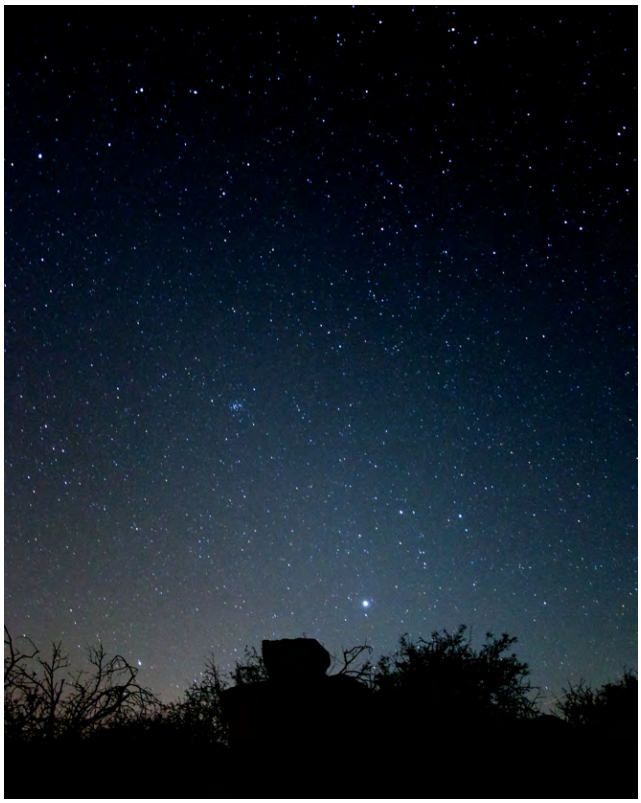


Figure 5.18 Evening Zodiacal Light at Oracle State Park

The artistic quality of the night sky at Oracle State Park is seen in Figure 5.19 showing star trails over Kannally Ranch House, 26-27 May 2014, two-hour period (8mm fisheye):

Figure 5.19 Star Trails over Kannally Ranch House

Milky Way, 27 May 2014, 0042 MST, 8mm fisheye lens, f/5, 30 seconds, ISO 6400:

Figure 5.20 Milky Way from Kannally Ranch House parking lot

## 6. Oracle State Park Lighting Inventory

An inventory of outdoor lighting fixtures at Oracle State Park was done on 22 April 2014 by Stan Bembenek, Oracle Dark Skies Committee member, Friends of Oracle State Park member, and Park volunteer, and Mike Weasner, Chair, Oracle Dark Skies Committee, local amateur astronomer, and IDA member. All fixtures were documented, including ones of historical value and fixtures that are not in use at the Park. Many of the fixtures that were not in use had no light bulbs or had no electrical connections. Photographs were taken of all the fixtures. The table below documents the outdoor lighting at the Kannally Ranch House area and the Group Use Area. There are no light fixtures at the Arizona Trail Walk-In area. The table includes some possible retrofit notes that were considered at the time of the inventory.

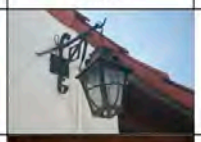
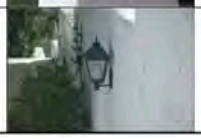
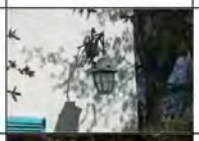
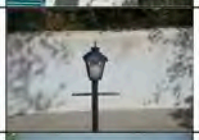
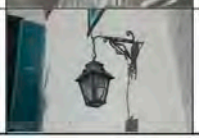
| Site | Location | Light Ref. # | Photo | Fixture(s) | Use | Fully-Shielded | Compliant | Retrofit |
|---|---|---|---|---|---|---|---|---|
| Kannally Ranch House | West Side | 1 |  | Historical | Not Used | No | No | N/A |
| Kannally Ranch House | West Side - Patio | 2 |  | CFL | Not Used | No | No | N/A |
| Kannally Ranch House | Main Entrance | 3 |  | Historical | Security | No | No | Yes - Red Bulb? |
| Kannally Ranch House | Gate | 4 |  | Historical | Security | No | No | Yes - Red Bulb? |
| Kannally Ranch House | Steps | 5 |  | Historical | Safety | No | No | Yes - Red Bulb? |

Table 6.1 Oracle State Park Lighting Inventory

| Site | Location | Light Ref. # | Photo | Fixture(s) | Use | Fully-Shielded | Compliant | Retrofit |
|---|---|---|---|---|---|---|---|---|
| Kannally Ranch House | Mid Patio | 6 |  | Historical | Security | No | No | Yes - Red Bulb? |
| Kannally Ranch House | Mid Steps | 7 |  | Historical | Safety | No | No | Yes - Red Bulb? |
| Kannally Ranch House | Lower Patio | 8 |  | Historical | Security | No | No | Yes - Red Bulb? |
| Kannally Ranch House | Lower Patio | 9a |  | Reflector | Security | Yes | Yes | N/A |
| Kannally Ranch House | Lower Patio | 9b |  | Historical | Security | No | No | Yes - Red Bulb? |

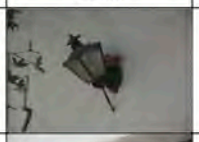
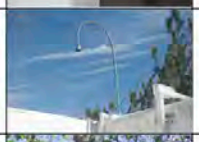
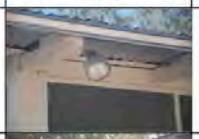
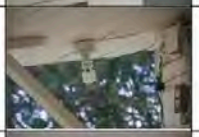
| Site | Location | Light Ref. # | Photo | Fixture(s) | Use | Fully-Shielded | Compliant | Retrofit |
|---|---|---|---|---|---|---|---|---|
| Kannally Ranch House | Lower Patio | 10 |  | Historical | Security | No | No | Yes - Red Bulb? |
| Kannally Ranch House | Lower Patio Door | 11 |  | Glass | Security | No | No | Yes - Red Bulb? |
| Kannally Ranch House | Lower Patio | 12 |  | Open | Not Used | No | No | N/A |
| North Residence | Steps | 13 |  | Shielded | Not Used | Yes | Yes | N/A |
| North Residence | Patio | 14 |  | Shielded | Not Used | Yes | Yes | N/A |

Table 6.1 Oracle State Park Lighting Inventory (continued)

| Site | Location | Light Ref. # | Photo | Fixture(s) | Use | Fully-Shielded | Compliant | Retrofit |
|---|---|---|---|---|---|---|---|---|
| North Residence | Patio | 15 |  | Shielded | Not Used | Yes | Yes | N/A |
| North Residence | Patio | 16 |  | Shielded | Not Used | Yes | Yes | N/A |
| North Residence | Patio Door | 17 |  | Historical | Not Used | No | No | N/A |
| Residence 3 | Front Door | 18 |  | CFL | Security | No | No | Yes - Red Bulb? |
| Residence 2 | Front Door | 19 |  | CFL | Security | No | No | Yes - Red Bulb? |

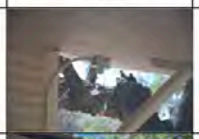
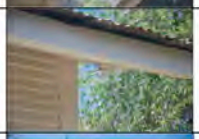
| Site | Location | Light Ref. # | Photo | Fixture(s) | Use | Fully-Shielded | Compliant | Retrofit |
|---|---|---|---|---|---|---|---|---|
| Residence 1 | Front Door | 20 |  | N/A | Security | No | No | Yes - Red Bulb? |
| Residence 1 | Back | 21 |  | N/A | Security | No | No | Yes - Red Bulb? |
| Tool Shed | Door | 22 |  | Bulb | Security | No | No | Yes - Red Bulb? |
| Kannally Ranch House | South Wall | 23 |  | N/A | Security | Yes | Yes | Yes - Red Bulb? |
| Kannally Ranch House | Parking Lot | 24 |  | Lamp Post (qty 12) | Safety | No | No | Yes |

Table 6.1 Oracle State Park Lighting Inventory (continued)

**Oracle State Park - Lighting Inventory**
**22 April 2014**

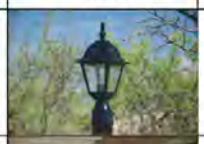
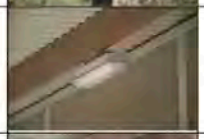
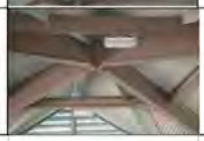
| Site | Location | Light Ref. # | Photo | Fixture(s) | Use | Fully-Shielded | Compliant | Retrofit |
|---|---|---|---|---|---|---|---|---|
| Group Use Area | Parking Lot | 25 |  | Lamp Post (qty 5) | Safety | No | No | Yes |
| Group Use Area | Restroom | 26 |  | Enclosed (qty 2) | Not Used | No | Yes | N/A |
| Group Use Area | Shelter #1 | 27 |  | Enclosed (qty 2) | Not Used | No | Yes | N/A |
| Group Use Area | Shelter #2 | 28 |  | Enclosed (qty 2) | Safety | No | Yes | N/A |

Table 6.1 Oracle State Park Lighting Inventory (continued)

As indicated in the Arizona State Parks Policy on Outdoor Lighting (Section 8), outdoor lighting is used only when necessary and is turned off when there are no nighttime activities at the Park requiring use for safety.

The outdoor restrooms at the Kannally Ranch House location are scheduled for replacement in the fall of 2014. The two "Port-a-Potties" will be replaced with a small permanent structure. Lighting for the new restroom structure will be minimal, solar powered, with a on/off switch, and will meet Dark Sky lighting standards.

Parking lot lighting at the Kannally Ranch House was retrofitted in June 2014 to be "dark sky" compliant. The Group Use Area parking lot lighting will be upgraded before the first nighttime use, otherwise the lighting will remain off. The following "before" and "after" retrofit nighttime photographs of some Kannally Ranch House parking lot lamps show the change from white incandescent bulbs to red CFL bulbs. The "after" photographs were taken about 45 minutes before the end of astronomical twilight, with a Full Moon rising in the east, using the same exposure settings as the "before" photographs.

Figure 6.1 Kannally Ranch House parking lot lighting “before”

Figure 6.2 Kannally Ranch House parking lot lighting “after”

Figure 6.3 Parking lot light fixture “before”

Figure 6.4 Parking lot light fixture “after”

Many of the light fixtures at the Kannally Ranch House are considered “historic”, as documented on the Lighting Inventory, and no retrofits were planned. However, all of the outdoor fixtures at the Ranch House did have their bulbs swapped for red CFLs, which provide sufficient illumination for safety and security. This photograph shows the Ranch House (faintly visible due to a rising Full Moon) with the red illumination at the entrance (Table 6.1, Light Ref #1):

Figure 6.5 Kannally Ranch House with dark sky lighting

The following photographs of Group Use Area shelter #2 show the minimal lighting used inside the shelter. The location of the interior lights and the roof overhang reduces the footprint of the illuminated area.

Figure 6.6 Group Use Area shelter illumination

Figure 6.7 Group Use Area shelter lights

These lights are generally not used and would be turned off during star parties at the Group Use Area.

## 7. Oracle State Park Star Parties and Other Related Events

Since its opening in 2001, Oracle State Park has frequently held events that take advantage of the dark night sky as seen from the Park, as well as events to educate and entertain the public on science, environmental, and cultural topics related to the Park. Section 7.1 provides a selection of these events that have occurred over recent years. Section 7.2 discusses how future events will be planned.

### 7.1 Selected Past Events

**2007:**

**Friday, September 28: Moonlight Walk**, 7-9pm. Join volunteer astronomer Paul Weiss for an evening stroll in the park. We'll watch the moonrise then return to the parking lot for star and planet gazing through telescopes. Casey and Tim Egan, local insect and reptile specialists, will also be on hand to talk about any nightlife we may encounter. Meet at the Kannally Ranch House. Reservations suggested.

**2008:**

**Thursday, February 21: LUNAR ECLIPSE Viewing** at Oracle State Park. Meet at the Group Use Area at 7:45pm. Take a short walk to a vista atop the rocks. Astronomy buff Paul Weiss will share his telescope for star-viewing. Family-friendly event. Ends by 9pm. Reservation required. Call 896-2425.

**The Oracle Odyssey**
**An environmental education program for grades 4-6**

The Odyssey sparks curiosity, challenges students to think about the environment in new ways, and encourages students to consider simple positive actions that contribute to a healthy environment. The Oracle Odyssey focuses on habitat and interrelationships and includes the study of humans as an integral part of the natural community. Teachers receive a packet with complete pre-visit and post-visit lesson plans. The materials contain specific key concepts, teacher background information, and student activity sheets. During their field studies, students are guided by park rangers in a series of activities along the trail in the 4,000-acre park. This 2.5 hour program of hands-on activities brings ecological concepts learned in the classroom into a real world context.

**Friday, May 9: ASTRONOMY NIGHT with Starizona of Tucson. 7:00pm-9:30pm** at the ranch house upper patio. Starizona will provide telescopes and interpret the night sky for visitors. See planets Saturn and Mars, and the craters of the moon. Find constellations, galaxies, star clusters and more. No reservation needed. All ages; Family friendly. Free event, thanks to Friends of Oracle State Park.

**2009:**

## Earth Day: Arizona State Parks Celebrates the Southwest Legacy of Aldo Leopold
## At Oracle State Park, Center for Environmental Education
## Sunday, April 19, 2009

**SCHEDULE OF EVENTS**
**Reservation preferred for all trail programs, (520) 896-2425**

| | |
|---|---|
| 7am: | Park opens |
| 7:15am: | **Birding 101 for kids and families**, with Audubon naturalist, Doug Jenness, until 8:30am |
| 8am: | **Guided Bike Ride** with Gary Faulkenberry , until 10am |
| 9am: | **Windmill Hike** (4 miles roundtrip) with John Rendall, Arizona Trail Association, until 11am |
| 10am: | **"Scavenger Hunt"** Interactive Trail Program for kids and families, until 11am |
| 11am: | **Ranch House activities begin, including interactive educational booths, live music and kids activities, until 3pm** |
| 12pm: | **Chautaqua Speaker, Kim Stone, as Aldo Leopold**, in the Kannally Ranch House living room, until 1pm |
| 1pm: | **Live Music** by Phil Maffetone and Coralee Thompson, until 1:30pm |
| 1:30pm: | **Guest Speaker, Dr. Bob Casavant, "Aldo Leopold and Science in Parks"** in the Kannally Ranch House living room, until 2:30pm |
| 2:30pm: | **Live music** by Phil Maffetone and Coralee Thompson, until 3pm |
| 3pm: | Music, Food, Kids Activities end at ranch house |
| | **Guided Walk: "Wild Foods and Wildflowers"** with Ranger Rick Gagnon, until 4pm |
| | **Guided Hike: Arizona Trail Loop Hike** (5.5 miles) with Ranger Jennifer Rinio, with podcast recording of Aldo Leopold readings, until 5:30p/6p |
| 6pm: | Park closes |

**11am-3pm Booths by…**
Evaline Auerbach, books by and about Aldo Leopold
AZ Trail Association, membership booth
GO Green Oracle display
Oracle Land Trust: food, kids activity
Kid's Activity: "Wildlife CSI – Critters Scene Investigation, What Happened Here?"
Friends of Oracle State Park, Music in the Park ticket sales & seed packets
Possible Oracle farmer's market vendors

**2013:**

# SKY SUNDAY

*Free programs*

## APRIL 14TH

## Oracle State Park

**Center for Environmental Education**

**"SOUTHWESTERN ROCK CALENDARS & ANCIENT TIME PIECES" with Alan Dart, archaeologist…**

**An Arizona Humanities Council Presentation**
about historically known sky-watching practices of various South-Western Native Americans and discussion of how their ancestors' observations of the heavens may be commemorated in ancient architecture and rock symbols.
**BEGINS AT NOON in the Kannally ranch house living room.**
RESERVATIONS REQUIRED
At (520) 896-2425

**"STAR PARTY" with ASTRONOMERS & TELESCOPES…**

…for night sky viewing and star discovery guided by Tucson Amateur Astronomy Assn
**BEGINS AT 7PM on the patio.**
RESERVATIONS REQUIRED
At (520) 896-2425

## Saturday, April 27th

**FINAL OPEN WEEKEND FOR ORACLE STATE PARK UNTIL OCTOBER !!!**
**EXTENDED PARK OPEN HOURS, 8AM-10PM**

## 7pm

## *LIVE MUSIC*

**&**

## *STAR GAZING*

**begins at the Kannally Ranch House upper patio**

**Bring a picnic dinner, enjoy music, and explore Jupiter and its moons, Saturn's rings, star clusters and double stars**

**Evening Sky Viewing by *ARIZONA STAR TOURS* and live music by *CLASSIC ROCK BAND "ONE WITHOUT"***
**Event is free with park admission**

**2014:**

# Oracle State Park
## Center for Environmental Education
# Saturday, June 21
# Live Music and Star Party

**Live Music begins at 6pm**
**Stargazing with Telescopes begins at 8pm**

Celebrate the Summer Solstice at Oracle State Park! Bring your own Picnic
**and enjoy live music by Undercover Band from 6pm-8pm.**
*(thanks to the Friends of Oracle State Park!)*

***Undercover** is a variety dance band from Tucson known for a great sound, playing an eclectic blend of songs and styles from the 60's through today. They cover everything from the Beatles to Van Morrison to the Stones with a little jazz and country thrown in.*

*Visitors will have a chance to view Mars and Saturn, the asteroids Ceres and Vesta, plus star clusters, nebulae and galaxies. During the evening, the Milky Way will rise over the eastern horizon.*

***Oracle Dark Skies Committee** is working to have Oracle State Park designated a **Dark Sky Park** by the **International Dark Sky Association.** Part of the mission is to promote awareness of dark sky-friendly alternatives to outdoor lighting of homes and businesses.*

*Oracle State Park May 2014,*
*Photo by Mike Weasner, Oracle Dark Sky Committee Leader*

**Oracle State Park open hours are extended from 8am-10pm on Saturday, June 21.**

**Park Entrance Fees apply: $7 per vehicle includes 4 adults**

Seating is available, but visitors are encouraged to bring a comfortable outdoor chair!
**Call for more information: (520) 896-2425**

www.AZStateParks.com/Parks/ORAC

The Oracle Fire Station displayed this on their marquee message display in the days leading up the 21st:


This night event was well attended. Past typical evening/night events at Oracle State Park would draw about 50-60 visitors. This event had about 350 visitors, an incredible turnout, with some visitors coming from as far away as east of Tucson and from Phoenix. Members of the Tucson Amateur Astronomy Association, the Oracle Dark Skies Committee, and local residents set up several telescopes for viewing. The following photographs show the support at this event.

IDA, ODSC, and Friends of Oracle State Park tables:



Some of the telescopes:

A panorama photograph showing the size of the crowd at Oracle State Park for the "Live Music and Star Party":

Photographs by Mike Weasner & MaryHelen Vasquez, members of the ODSC. Used with permission.

## 7.2 Future Events

As with past events at Oracle State Park, nighttime events (star parties, meteor shower watching, moon observing, etc.) and daytime science events (astronomy), environmental, and cultural events will be scheduled and conducted in accordance with Park procedures. Nighttime events may be combined with live music events and/or "bug nights", "night wildlife", or other appropriate night education events. The Oracle Dark Skies Committee will do public outreach on controlling and eliminating light pollution at these events.

Groups or individuals who want to utilize the Park's dark sky for astronomy purposes at a protected location can also reserve nighttime use of the Park.

As with any event at the Park, there are fees associated with the use of the Park for stargazing. These fees are $7/day/vehicle for day use and night use until 10 PM, and $12/night/vehicle for 10 PM to sunrise. Frequent Park visitors are encouraged to purchase an annual pass ($75/year) or become an Arizona State Parks Volunteer and receive free access to the Park.

Publicity about upcoming events at the Park is via:

Arizona State Parks web site (http://azstateparks.com)
Oracle State Park web site (http://azstateparks.com/Parks/ORAC/)
Oracle Dark Skies Committee web site (http://www.weasner.com/ODSC)
Oracle Fire Station outdoor marquee message display
Oracletown web site (http://oracletown.com)
Cassiopeia Observatory web site (http://www.weasner.com/co)
news releases
local media
local email lists
word-of-mouth
locally distributed flyers

# 8. Oracle State Park Outdoor Lighting Policy

## 8.1 Oracle State Park Lighting Master Plan 2000

The following page from the Oracle State Park Master Plan (2000) describes the past and current design guidelines for site lighting:

### DESIGN GUIDELINES FOR SITE LIGHTING

**DESIGN OBJECTIVES**

- To provide lighting only where necessary for the health and safety of the Park user or where necessary for the security of Park buildings.
- To minimize atmospheric light pollution resulting from site lighting within the Park.
- To minimize use of commercial electrical energy for site lighting.

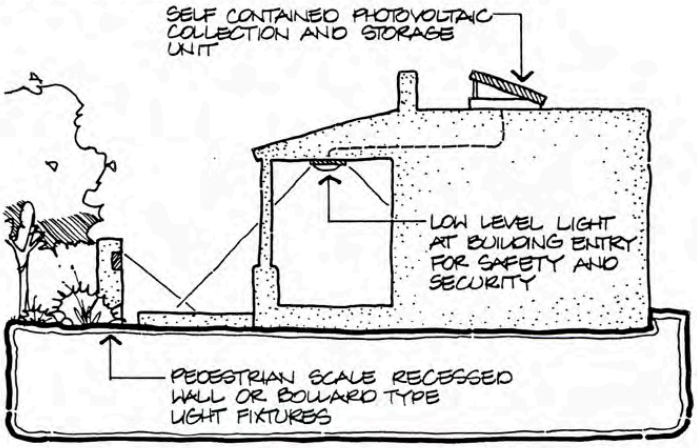
**DESIGN REQUIREMENTS**

- Self contained photovoltaic systems shall be utilized to provide for low level safety lighting in and around restrooms, ramadas, and other facilities that will be used by the public at night.
- Shielded, walkway type fixtures shall be utilized in critical areas such as around the dining hall or visitor center.
- All outdoor light fixtures shall be equipped with photocells or timers for automatic shut off when not needed.

**RESTRICTED DEVELOPMENT**

- The night lighting of non-essential areas shall be prohibited.

**FIGURE I-19**




**TYPICAL SITE LIGHTING APPROACHES**

*Design Guidelines for Site Lighting* *I-23*

MASTER PLAN
ORACLE STATE PARK
2000

## 8.2 Oracle State Park Policy

This letter from Steve Haas, Park Manager, Catalina and Oracle State Park, documents the current standard operating procedures for lighting at Oracle State Park:



May 21, 2014

The following is a summary of the standard operating procedures for lighting at Oracle State Park:

Oracle State Park is a day use only park, and in general, no night lighting is used other than interior lights in the ranger residence (ranger lives on premises year round in state provided housing).

Oracle State Park does however have the ability to use lighting in selected areas for specific special events. Examples include indoor lighting and porch lights for the Kannally ranch house, roadside lanterns at the Kannally ranch house parking lot and group use road, low voltage solar powered lighting under the ramada at the group use area, and solar powered port-o-john lighting.

There is no electricity or alternative lighting at the remote parking area.

In regard to astronomy events, no parking lighting would be used, and/or red bulbs could be replaced in bathrooms for safety.

Sincerely,

Steven C. Haas
Park Manager
Catalina and Oracle State Park

Arizona State Parks • 1300 W. Washington Street • Phoenix, AZ 85007
Phone/TTY: (602) 542-4174 • Fax: (602) 542-4188

## 9. Pinal County Code 2.195 Outdoor Lighting

The Pinal County Outdoor Lighting Code 2.195 was updated in 2010 to provide detailed requirements for new and existing residential and business outdoor lighting. While existing installations are grandfathered under the previous Code, all new installations or upgrades must comply with the new Code. The Oracle Dark Skies Committee is doing public outreach to make residents and businesses aware of the revised Code and encouraging owners to be compliant even if grandfathered under the old Code.

The Pinal County Code 2.195 Outdoor Lighting is included here in its entirety.

## Chapter 2.195
## OUTDOOR LIGHTING

Sections:



**2.195.010 Administration.**

A. Purpose. The purpose of this chapter is to establish comprehensive provisions for outdoor lighting within Pinal County. This document intends to achieve a balance between safety and aesthetics, to encourage designs that provide for the proper quality and quantity of nighttime illumination, while managing energy consumption, and minimizing light trespass and negative impacts on the surrounding areas and our night sky. Proper exterior lighting design creates lighting systems that are sensitive to the surrounding areas by confining the illumination as much as possible within the boundaries of the project site. It also provides appropriate quantities and uniformity of both horizontal and vertical illumination on the site while minimizing energy usage. This will involve the use of not only the appropriate fixtures and light sources, but also proper placement and operating schedules.

Pinal County recognizes the intent of the International Dark-Sky Association, the Recommended Practices and Design Guidelines put forth by the Illuminating Engineering Society of North America (IESNA), and the requirements and limitations of the International Energy Conservation Code (IECC), and has used these as guiding principles in the development of this chapter. More information can be acquired by obtaining copies of the most recent IESNA and IECC publications.

B. Applicability. This chapter applies to all new and replacement lighting to be installed at all residential and nonresidential facilities/sites, or the existing lighting at a facility/site that is undergoing a change in use. In the event that a lighting renovation affects more than 50 percent of the facility/site lighting, then the entire facility/site shall be brought into compliance with this chapter. Single-family residences, attached and detached, are subject to PCDSC 2.195.040(L) through 2.195.090 only. In the event an attached or detached single-family dwelling family is on the same parcel as a multifamily commercial or industrial use, the requirements for the multifamily commercial or industrial use shall apply.

C. Conformance with Applicable Law. All outdoor illuminating devices shall be installed in conformance with the provisions of this chapter, Pinal County subdivision regulations, and any building, zoning or energy codes now in effect or which may hereafter be enacted, as applicable. Where any provisions of any of the Arizona Revised Statutes, federal law, or other Pinal County ordinances or regulations conflict with the requirements of this chapter, the most restrictive shall govern.

D. Approved Material and Methods of Installation. The provisions of this chapter are not intended to prevent the use of any material or method of installation not specifically prescribed by this chapter, provided any such alternate has been approved. The planning director may approve any such alternate, provided he or she finds that the proposed design, material or method:

1. Provides approximate equivalence to those specific requirements of this chapter; or

2. Is otherwise satisfactory and complies with the intent of this chapter.

E. As new lighting technology develops which is useful in reducing energy consumption, light pollution, and light trespass, consideration shall be given to use of state of the art technology in keeping with the intent of this chapter.

F. In certain sections of this chapter a lumen requirement is followed by incandescent equivalent in parenthesis. This is for an example only. The lumen requirement shall apply. [Ord. PZ-C-003-09 § 1].

**2.195.020 Definitions.**
The following words, terms and phrases when used in this chapter shall have the meanings ascribed to them below, except when the context clearly indicates a different meaning:

"**Abandonment**" is the discontinuation of use for a period of one year or more.

"**Areas, equestrian/roping**" is an improved area, generally fenced, of at least 30 feet in width or length within which equestrian activities involving horse riding or driving occurs that are noncommercial in nature and do not include seating.

"**Arenas, equestrian/roping**" is commercially utilized structure or area, sometimes with tiers of seating rising around an improved area, of at least 30 feet in width or length within which equestrian activities involving horse riding or driving occurs.

"**Bollard, louvered**" is a ground-mounted luminaire that is usually 36 inches to 48 inches in height, is generally used for the lighting of paths and building entries, and possesses a stacked set of external angled visors/louvers that minimize direct view of the light source. In order to qualify as a louvered bollard under this chapter, the stacked visors must be positioned/angled in such a fashion as to prevent any direct view of the light source from viewing angles of 90 degrees and above.

"**Fascia**" is the vertical element found around the perimeter of a canopy structure.

"**Footcandle (FC or VFC)**" is a unit of the illumination being produced on a surface, and defined as one lumen per square foot of area illuminated. Footcandle or FC is a general term for all types of illumination, while vertical footcandles (VFC) refers only to illumination being produced on a vertical surface (facade of a building) or passing over a property line (spill light/light trespass).

"**General illumination**" is outdoor lighting used for, but not limited to, illumination for walkways, roadways, equipment yards, parking lots, and outdoor security where safety or security of the grounds is the primary concern.

"**Glare**" is the sensation produced by a bright light source within the visual field that is sufficiently brighter than the level to which the eyes are adjusted, causing discomfort and/or loss in visual performance or visibility.

"**House-side shield (HSS)**" is a visor or louver that is internal or external to a luminaire, that physically blocks and thereby reduces the amount of illuminance being produced to the rear of the luminaire (usually toward residential properties).

"**Illuminance**" is the amount of light falling onto a surface area, measured in footcandles (lumens per square foot) or lux (lumens per square meter). For conversion purposes, one footcandle (FC) is equal to 10.76 lux (lx).

"**Illuminating Engineering Society of North America (IESNA)**" is the nonprofit society established in 1906 whose goal is to improve the lighted environment by bringing together those with lighting knowledge and by translating that knowledge into actions that benefit the public. The IESNA is the primary source of lighting "recommended practices" in North America.

"**Individual**" shall mean any private individual, tenant, lessee, owner or any commercial entity including but not limited to companies, partnerships, joint ventures or corporations.

"**Installed**" means the attaching or assembling in place of any luminaire.

"**Kelvin**" is the temperature scale utilized in illumination science to describe the hue/color of the light. A lower value such as 2,700 Kelvin is associated with a "warm" colored light source such as incandescent, while a higher value such as 4,000 Kelvin is associated with a "cool" colored light source such as metal halide.

"**Lamp, coated**" is the correct term for a light source, such as incandescent or metal halide lamps. "Coated" lamps have an outer coating that minimizes direct view of the arc tube.

"**Lighting power density (LPD)**" is defined as the watts of exterior lighting per square foot of area (watts/$ft^2$) for the different sections of the project site (parking lot, walkways, building entries, etc.). This is the metric established by the International Energy Conservation Code (IECC), and will therefore be utilized as one of the factors for determining conformance with the IECC and this chapter.

"**Light trespass/spill light**" is unwanted light that falls outside of the area intended to be lighted. This chapter places limits on the amount of illumination, in footcandles, that shall be allowed to cross a residential property line.

"**Lumen**" is the unit used to measure the total amount of light that is produced by a light source/lamp. All light sources reduce in lumen output the longer that they are operated. "Initial lumens" is a term defined as the amount of light output from a lamp when it is new. "Mean lumens" is a term defined as the average lumen output of a lamp over its life, and is the lumen value utilized in the proper design of lighting systems. A lumen is a unit of standard measurement used to describe how much light is contained in a certain area. One lumen is defined as the luminous flux of light produced by a light source that emits one candela of luminous intensity over a solid angle of one steradian.

"**Lumen density (LD)**" shall be defined as the initial lumens of the lamps/light sources utilized by the exterior lighting per square foot of area (lumens/ft$^2$) for the project site. This metric is another factor that will be utilized for determining compliance with this chapter.

"**Luminaire**" is a complete lighting unit/fixture, including the lamp, ballast, wiring, housing, reflector, lens, and any shielding.

"**Luminaire cutoff**" is a term established by the IESNA that is associated with four different general classifications of luminaires, each with a different amount of allowed high-angle and upward light: non-cutoff, semi-cutoff, cutoff and full-cutoff. Full-cutoff luminaires, which minimize high-angle light and allow no light above the horizontal, shall be required for most uses. Semi-cutoff and cutoff luminaires, which allow for up to five percent and 2.5 percent uplight respectively, shall be allowed for low-wattage decorative/accent lighting for some uses in lighting zones 2 and 3.

Examples of **full-cutoff** pole-mounted and building-mounted luminaires. The lamp is completely recessed into the luminaire, and the lens is flat. No light is produced above the horizontal.

Examples of **cutoff** pole-mounted and building-mounted luminaires. The lamp is completely recessed into the luminaire, but the lens sags/curves downward. Up to 2.5% of the light is produced above the horizontal.

Examples of **semi-cutoff** pole-mounted and building-mounted luminaires. The lamp visibly protrudes downward into a

sag/curved lens. Up to 5.0% of the light is produced above the horizontal.

Examples of **non-cutoff** pole-mounted and building-mounted luminaires (which are not allowed under this chapter). The lamp is substantially exposed. Little or no attempt is made to control the light produced above the horizontal.

"**Luminaire, fully shielded**" is a fully shielded fixture that is shielded in such a manner that light rays emitted by the fixture, either directly from the lamp or indirectly from the fixture, are projected below a horizontal plane running through the lowest point on the fixture where light is emitted.

"**Luminaire, partially shielded**" is a partially shielded fixture that is shielded in such a manner that the bottom edge of the shield is below the plane of the center line of the lamp reducing light above the horizontal.

"**Outdoor lighting**" is any lighting not within a completely enclosed building.

"**Outdoor luminaires/light fixtures**" are outdoor electric illuminating devices, fixtures, lamps and other devices, searchlights, spotlights or floodlights, permanently installed or portable, used for illumination, emergency, security or commercial purposes. Such devices shall include, but are not limited to, lights for:

A. Parking lots;

B. Roadways;

C. Driveways;

D. Buildings and structures;

E. Recreational areas and facilities;

F. Landscaping decorative effects;

G. Billboards and signs (advertising and other);

H. Product display areas;

I. Gas station lighting; and

J. Automotive dealership lighting.

"**Outdoor recreational facility**" is an area designed for active recreation, whether publicly or privately owned, including but not limited to: parks, sports fields, sport courts, golf courses, and roping/equestrian arenas.

"**Residential lighting**" refers to outdoor lighting for single or multiple household dwellings.

"**Security lighting**" refers to luminaires that operate dusk-to-dawn in order to provide for protection of property and safety for individuals. They shall conform to all sections of this chapter, and shall generate less than 50 percent of the lighting power density or lumen density utilized by the facility/site during normal business hours.

"**Skyglow**" is the brightening of the sky caused by outdoor lighting, atmospheric factors, and celestial factors. Excessive skyglow interferes with astronomical observations and the enjoyment of the night sky, and this chapter includes several requirements and limitations that help to minimize skyglow.

"**Uplighting**" is any light source that does not have an opaque covering on top.

"**Use, nonresidential**" is the use of land for a purpose other than single-family dwelling units or multiple household dwellings. This definition includes parks with residential zoning.

"**Watt**" is the unit used to measure the electrical power consumption (not the light output) of a light source/lamp. [Ord. PZ-C-003-09 § 1].

**2.195.030 General requirements.**
A. Lighting Zones. In order to be more responsive to the special needs of different portions of the county, a system of three different "lighting zones" has been established based upon the current and/or planned uses and ambient brightness of the area. Each "lighting zone" will have different development requirements and lighting restrictions.

Lighting Zone 1: Low ambient light areas, found in zoning districts: CAR, CR-1, CR-1A, CR-2, CR-3, GR, GR-5, GR-10, SH, SR, MH, RU-10, RU-5, RU-3.3, RU-2, RU-1.25, RU-C, R-43, R-35, R-20, R-12, R-9, R-7 and MH-8. Outdoor lighting in this lighting zone shall not exceed 50 percent of the maximum lighting power density (LPD) limits established in the currently adopted version of the International Energy Conservation Code (IECC), or a lumen density (LD) of nine lumens per square foot, whichever is less.

Lighting Zone 2: Medium ambient light areas, found in zoning districts CB-1, CR-4, CR-5, MHP, PM/RVP, RV, TR, MD, MR, O-1, O-2, C-1, MH-435, PM/RV-435. Outdoor lighting in this lighting zone shall not exceed 75 percent of the maximum lighting power density (LPD) limits established in the currently adopted version of the International Energy Conservation

Code (IECC), or a lumen density (LD) of 14 lumens per square foot, whichever is less.

Lighting Zone 3: High ambient light areas, found in zoning districts: CB-2, CI-1, CI-2, CI-B, AC-1, AC-2, AC-3, C-2, C-3, I-1, I-2, I-3. Outdoor lighting in this lighting zone shall not exceed 100 percent of the maximum lighting power density (LPD) limits established in the currently adopted version of the International Energy Conservation Code (IECC), or a lumen density (LD) of 19 lumens per square foot, whichever is less.

Note: In the event that a new lighting zone 3 site, or an existing lighting zone 3 site that is undergoing a renovation (as per PCDSC 2.195.010(B)), is to be located within 150 feet of an existing lighting zone 1 site, then the lighting zone 3 site shall be considered a lighting zone 2 site for the purpose of conformance to this chapter.

B. Operating Hours. Every project in all lighting zones shall be encouraged to reduce as much as possible the amount of outdoor lighting that operates after 10:00 p.m., except as permitted in PCDSC 2.195.040. All nonsecurity lighting (except for the illumination of roadways and state and federal flags) shall be turned off by 10:00 p.m. or within one hour after close-of-business, whichever is later. A nighttime reduction of at least 50 percent in overall LD or LPD is required. All non-full cutoff luminaires in lighting zones 1 and 2 shall be included in the fixtures being turned off.

Non-full-cutoff and nonfully shielded incandescent luminaires of greater than 150 watts, and all other luminaire types of greater than 70 watts, that were installed prior to the adoption of the chapter are considered to be nonconforming, and shall possess an automatic control device that turns the luminaires off between midnight and sunrise.

In addition to turning off these nonconforming luminaires, multifamily housing is only required to reduce the lighting located at common areas such as clubhouses, pool areas and playgrounds.

C. Light Sources and Fixture Shielding. New mercury vapor light sources shall not be allowed. Existing installations must be removed or replaced with a conforming light source and luminaire by no later than January 1, 2011.

Searchlights and strobe/flashing lights are not allowed in any lighting zone without a separate permit as required in PCDSC 2.195.090, and the duration of the allowed use may be limited by planning staff.

Lasers, exposed neon, and other intense linear light sources are not allowed in lighting zone 1, but are allowed in lighting zones 2 and 3 and subject to approval and stipulations by planning staff during the review process. Lasers must be aimed at-or-below the horizontal plane and terminated on an opaque surface within the site.

All site perimeter luminaires located within 50 feet of a single-family residential property line, excluding bollards or other luminaires of less than six feet in height, shall possess house-side shielding (HSS) to the satisfaction of planning staff. All such luminaires that will also be operating after 10:00 p.m. shall possess external house-side shielding.

The total amount of outdoor lighting that is not full-cutoff, including uplighting, shall not

exceed five percent of the outdoor lighting LPD or LD, whichever is less. Uplighting that is covered by solid roof or solid building overhang will not be subject to this chapter if it is:

1. Permanently set at 90 degrees; and

2. Is pulled back from any edge of the solid roof or solid building overhang by a distance equal to the distance between the top of the uplight (X) and the distance between the outside edge of the uplight and the outside edge of the solid roof or solid building overhang (Y).

Lighting Zone 1: Pole- or wall-mounted luminaires shall be full-cutoff luminaires only. Bollards shall be full-cutoff, or louvered with coated lamps (see PCDSC 2.195.020, "Bollard, louvered"). All light sources shall have a maintained color temperature of less than or equal to 3,000 Kelvin.

Wall-mounted luminaires of greater than 800 initial lumens shall possess a bottom-diffusing lens or an internal house-side shield (HSS), to the satisfaction of planning staff, in order to minimize the illuminance "hot spot" on the wall. Uplighting luminaires shall not exceed 800 initial lumens each.

Lighting Zone 2: Pole- or wall-mounted luminaires of less than or equal to 1,800 initial lumens may be semi-cutoff, cutoff, or full-cutoff. All other pole or wall-mounted luminaires shall be full-cutoff. Bollards shall be full-cutoff, or louvered with coated lamps, or of a type where the lamp is recessed and not directly visible.

Wall-mounted full-cutoff luminaires of greater than 3,500 initial lumens shall possess a bottom-diffusing lens or an internal house-side shield to the satisfaction of planning staff. Uplighting luminaires shall not exceed 1,200 initial lumens each.

Lighting Zone 3: Pole- or wall-mounted luminaires of less than or equal to 3,500 initial lumens may be semi-cutoff, cutoff, or full-cutoff. All other pole or wall-mounted luminaires shall be full-cutoff. Bollards shall be full-cutoff, or louvered with coated lamps, or of a type where the lamp is shielded and not directly visible.

Wall-mounted fixtures of greater than 6,500 initial lumens shall possess a bottom-diffusing lens or an internal house-side shield to the satisfaction of planning staff. Uplighting fixtures shall not exceed 1,200 initial lumens each.

D. Luminaire Mounting Height and Equipment Finish. The mounting height of a luminaire is to be measured from finished grade to the fixture lens or luminous opening. The exposed portion of concrete pole bases shall be finished in a fashion other than exposed concrete (brushed finish, painted, etc.). No portion of any luminaire that is attached to a wall that is common with another property shall be allowed to protrude above the top of the wall. In lighting zones 1 and 2, bollards shall not be more than 48 inches in height.

Lighting Zone 1: Luminaires located at or within 30 feet of a residential property line shall not exceed eight feet in height. All others shall not exceed 15 feet in height, and the pole color shall be dark and nonreflective (such as dark bronze or black).

Lighting Zone 2: Luminaires located at or within 30 feet of a residential property line shall not exceed eight feet in height. Luminaires located greater than 30 feet and less than or equal to

150 feet from a residential property line, and not blocked from direct view by a structure, shall not exceed 15 feet in height. All others shall not exceed 25 feet. Pole color shall be dark and nonreflective (such as dark bronze or black).

Lighting Zone 3: Luminaires located at or within 30 feet of a residential property line shall not exceed eight feet in height. Luminaires located greater than 30 feet and less than or equal to 150 feet from a residential property line, and not blocked from direct view by a structure, shall not exceed 15 feet in height. All others shall not exceed 30 feet in height. Pole color shall be approved by planning staff.

E. Perimeter (Spill Light) Illuminance Levels. This chapter establishes limits for the amount of light trespass/spill light that is allowed to cross a project site's property line(s) when there is a residential property line located within 150 feet of any of the project site's property line(s). These limits are based upon initial maximum vertical illuminance values along the appropriate property lines, calculated at no more than 10-foot horizontal increments, and at an elevation of six feet above finished grade. The calculated "observation point" shall be oriented perpendicular into the project site, and angled at 90 degrees above nadir (perfectly horizontal). The light loss factor (LLF) utilized for the calculations shall be 1.00. The following limits shall not be applied to the permanently exempted uses, or the specific uses in this chapter where alternate spill light limits are expressly defined.

Lighting Zone 1: The maximum initial vertical illuminance at any calculation point shall not exceed 0.30 footcandles during normal business evening hours, and 0.10 footcandles after the facility enters security lighting-only operating mode (in compliance with subsection B of this section).

Lighting Zone 2: The maximum initial vertical illuminance at any calculation point shall not exceed 0.80 footcandles during normal business evening hours, and 0.30 footcandles after the facility enters security-lighting-only operating mode.

Lighting Zone 3: The maximum initial vertical illuminance at any calculation point shall not exceed 1.50 footcandles during normal business evening hours, and 0.80 footcandles after the facility enters security-lighting-only operating mode.

F. Lighting Chapter Matrix (Commercial Uses Only).

| **Lighting zone** | Operating Hours, LPD Limit and LD Limit | Light Sources and Fixture Shielding | Mounting Height and Pole Color | Perimeter Illuminance Levels | Uplighting |
|---|---|---|---|---|---|
| **1 Low Ambient Light** | Security lighting only after 10:00 p.m. or 1 hour after close of business LPD = 50% of | Light sources L.T.E. 3,000K color temperature Full-cutoff fixtures only HSS on perimeter | 8' height when L.T.E. 30' from residential property line 15' height when G.T. 30' | 0.30 VFC maximum normal business and 0.10 VFC security | L.T.E. 800 initial lumens Turn off at 10:00 p.m. or 1 hour |

| | | | | | |
|---|---|---|---|---|---|
| **Areas** | IECC limit LD = 9 lumens/ft$^2$ | fixtures adjacent to residential | Dark and nonreflective colors | only, at a residential property line | after close of business |
| **2 Medium Ambient Light Areas** | Security lighting only after 10:00 p.m. or 1 hour after close of business LPD = 75% of IECC limit LD = 14 lumens/ft$^2$ | All light sources Semi-cutoff and cutoff fixtures when L.T.E. 1,800 initial lumens Full-cutoff when G.T. 1,800 initial lumens HSS on perimeter fixtures adjacent to residential | 8' height when L.T.E. 30' from residential property line 15' ht. when G.T. 30' and when L.T.E. 150' 25' ht. when G.T. 150' Dark and nonreflective colors | 0.80 VFC maximum normal business and 0.30 VFC security only, at a residential property line | L.T.E. 1,200 initial lumens Turn off at 10:00 p.m. or 1 hour after close of business |
| **3 High Ambient Light Areas** | Security lighting only after 10:00 p.m. or 1 hour after close of business LPD = 100% of IECC limit LD = 19 lumens/ft$^2$ | All light sources Semi-cutoff and cutoff fixtures when L.T.E. 3,500 initial lumens Full-cutoff when G.T. 3,500 initial lumens HSS on perimeter fixtures adjacent to residential External HSS adjacent to residential after 10:00 p.m. | 15' height when L.T.E. 150' from residential property line 30' ht. when G.T. 150' Dark and nonreflective colors | 1.50 VFC maximum normal business and 0.80 VFC security only, at a residential property line | L.T.E. 1,200 initial lumens Turn off at 10:00 p.m. or 1 hour after close of business |

**Explanation of Terms Used in the Lighting Chapter Matrix**

| | |
|---|---|
| *** | To be determined by planning staff. |
| 1,800, 3,500 and 6,500 Lumens | 1,800 lumens is equivalent to the initial lumen output of a 100-watt incandescent, or a 26-watt compact fluorescent lamp. 3,500 lumens is equivalent to the initial lumen output of a 42-watt compact fluorescent, or a 50-watt metal halide lamp. 6,500 lumens is equivalent to the initial lumen output of a 70-watt high pressure sodium lamp. |
| G.T. | Greater than. |
| L.T.E. | Less than or equal to. |
| L.T.E. 1,800 | A light source that produces less than or equal to 1,800 lumens of light |

| | |
|---|---|
| | when the lamp is new. |
| Kelvin (K) | The Kelvin temperature scale is utilized to describe the color/hue of a light source. |
| L.T.E. 3,000K | A light source with a color temperature of less than or equal to 3,000 degrees Kelvin (“warm” color/hue light). |
| Light Source | A type of lamp, such as an incandescent or metal halide lamp. |
| H.S.S. | House-side shields reduce the amount of rearward illumination produced by a luminaire. Shields on pole-mounted luminaires reduce the amount of spill light/light trespass from the site, while shields on wall-mounted fixtures reduce the intense illumination “hot spots” that can be produced underneath the luminaire. |
| Height (Ht.) | The mounting height of a luminaire, as measured from the fixture lens to the finished grade of the parking lot. 15' HT. L.T.E. 150' means that luminaires located less than or equal to 150 feet from a residential property line cannot exceed 15 feet in mounting height. |
| Dark Color | The required color/finish of a light pole. |
| Perimeter Illuminance Levels | The highest allowed initial vertical illuminance at any point around the perimeter of a site. |

[Ord. 011812-ZO-PZ-C-007-10 § 22; Ord. PZ-C-003-09 § 1].

**2.195.040 Specific uses.**

A. Parking Canopies. All light fixtures shall be full-cutoff, or the fixtures shall be located and all sides of the canopy fascia extended so that no portion of the lamp or lens is visible from beyond any of the property lines. Light fixtures in multifamily housing shall be located at no less than every other parking space, and shall utilize polycarbonate lenses and tamper-proof hardware. This illumination and associated wattage shall be included in the outdoor lighting submittal, and shall not exceed an LPD of 1.08 watts/$ft^2$.

B. Multilevel Parking Structures.

Lighting Zones 1 and 2: Interior fixtures and rooftop fixtures shall be full-cutoff. The interior fixtures shall be attached to the ceiling or mounted no lower than the bottom of the support beams. Rooftop fixtures shall be set back a minimum of 25 feet from the perimeter, and shall not exceed 14 feet in height.

Lighting Zone 3: Interior fixtures visible from any residential property shall be full-cutoff. All others may be semi-cutoff or cutoff, but shall possess diffusing lenses or shielding so the lamp is not directly visible from off site. Roof fixtures shall be full-cutoff, set back a minimum of 25 feet from the edge, and shall not exceed 16 feet in height.

C. Gas Stations/Convenience Stores. Fuel canopy luminaires shall be recessed into the canopy ceiling, with a lens that is flat and flush to the ceiling (the fixture access door can protrude below the ceiling). Metal halide canopy lighting is allowed in all lighting zones. In the event that the canopy is located within 150 feet of a property line that is zoned as

residential, the canopy fascia shall be extended to a minimum depth of 12 inches below the canopy ceiling. Exposed light sources (such as neon or fluorescent) on the canopy are not allowed. Areas of fascia that are internally illuminated are not allowed in lighting zones 1 and 2. This does not include any internally or back-lighted signage, which shall continue to be regulated by the county's sign ordinance. The amount of spill light shall not exceed two times the limits in PCDSC 2.195.030(E).

D. Drive-Throughs. All fixtures are to be full-cutoff and either recessed into the canopy ceiling, or mounted so that the lowest portion of the fixture is higher than the bottom edge of the canopy fascia. All nonsecurity lighting is to be turned off by 10:00 p.m. or within one hour after close of business, whichever is later.

E. Banks/ATMs. All fixtures for the ATM or teller areas shall be full-cutoff. The fixtures at drive-up canopies shall either be recessed into the canopy ceiling, or mounted so that the lowest portion of the fixture is higher than the bottom edge of the canopy fascia.

F. Religious Facilities. Metal halide and other light sources with color temperatures cooler than 3,000 Kelvin are not allowed in lighting zones 1 and 2, and for all facilities in lighting zone 3 that are at or within 300 feet of a residential property line. All nonsecurity lighting shall be turned off within two hours after the completion of the last service/event. Any fixtures located within 30 feet of a residential property line shall be included in those being turned off. In the event that the parking lot is sized for peak usage (holidays, etc.), control of the lighting is to be divided into "tiers," so that the parking lot lighting in the peak-usage areas only operates during those peak times of the year. Uplighting for the illumination of steeples or other towers for religious facilities are not subject to the provisions of this chapter.

G. Automotive Dealerships. A minimum of 50 percent of the outdoor illumination shall be turned off within one hour after the close of business. All non-full-cutoff fixtures shall be automatically turned off at this time. All perimeter fixtures shall possess house-side shields. Under-canopy lighting shall be full-cutoff, or the canopy fascia shall be extended on all sides so that is lower than any portion of the fixture lens. This use is subject to all other applicable sections in this chapter except for the vertical footcandle (VFC) limits in PCDSC 2.195.030(E).

H. Equestrian Arenas. All new luminaires mounted at a height of 40 feet or less shall be full-cutoff, and others mounted higher than 40 feet may be sports-style floodlights with exceptional internal and external shielding, to the satisfaction of planning staff. All luminaires are to be located, aimed, and/or externally shielded so that none of the light sources are directly visible at any of the property lines. All arena lighting shall be turned off when not in use, and all non-arena lighting shall be reduced at nighttime as per PCDSC 2.195.030(B) when not in use.

Lighting Zone 1: If the arena is located within 150 feet of a residential property line, then the calculated spill light at the property line facing the residential property shall not exceed 0.80 initial vertical footcandles at any point, or 2.00 initial vertical footcandles at any point along the other property lines.

Lighting Zone 2: If the arena is located within 150 feet of a residential property line, the calculated spill light shall not exceed 1.00 initial vertical footcandles (VFC) at any point, or 2.50 initial VFC at any point along the other property lines.

Lighting Zone 3: If the arena is located within 150 feet of a residential property line, the calculated spill light shall not exceed 1.50 initial vertical footcandles (VFC) at any point, or 3.00 initial VFC at any point along the other property lines.

I. Flagpole Lighting. Flagpole uplighting is restricted to state and federal flags, and shall be shielded so that the light source is not directly visible from any of the property lines. Uplighting in all lighting zones shall not exceed the equivalent of two fixtures of 3,500 initial lumens each per flagpole. Flagpole lighting may operate all night, but is to be turned off at dusk if the flag is lowered.

J. Park and Sportslighting for All Private and Public Nonresidential Facilities. All sports, path, parking lot, and playground lighting are to be illuminated in conformance with this chapter, and the most current recommended practices issued by the IESNA. All sports field luminaires shall utilize superior shielding and aiming angles to the satisfaction of planning staff. All sports field luminaires shall possess a gray painted finish, and all poles shall have a painted or "dull" galvanized finish. Sports field poles are to be set back a minimum of 50 feet from any residential property line or right-of-way.

All sport courts shall be lighted with full-cutoff luminaires, and are to utilize "on" and "off" user-accessible push-buttons so that the lighting does not operate unless the courts are in actual use. Automatic time-clocks or other programmable controllers are to be used, and shall turn off all nonsecurity lighting at a time in accordance with the applicable lighting zone, except for sports field lighting, which may stay on to as late as 11:00 p.m. when a formal game is in progress, except as permitted under PCDSC 2.195.090.

All park luminaires, such as those located in ramadas, shall be shielded and/or located so that the light source is not directly visible from beyond any of the property lines. Initial vertical illuminance (spill light) shall be calculated in conformance with PCDSC 2.195.030(E), except that the spacing distance between the calculation points may match the spacing used for the sports lighting calculations.

Lighting Zone 1: Sports field lighting shall not exceed 80 feet in height. Path, and parking lot lighting shall not exceed 16 feet in height. Playground lighting shall not exceed 20 feet in height. Sport court lighting shall not exceed 25 feet in height, and all fixtures shall possess four-sided shielding/skirting. Sports lighting shall not operate after 10:30 p.m. Perimeter spill light shall not exceed 0.80 footcandles at any point along an adjacent residential property line, or 1.60 footcandles at any point along any property line not adjacent to a residential property.

Lighting Zone 2: Sports field lighting shall not exceed 80 feet in height. Path, parking lot, and playground lighting shall not exceed 25 feet in height. Sport court lighting shall not exceed 30 feet in height. Sports lighting shall not operate after 10:30 p.m. Perimeter spill light shall not exceed 1.20 footcandles at any point along an adjacent residential property line, or 2.40 footcandles at any point along any property line not adjacent to a residential property.

Lighting Zone 3: Sports field lighting shall not exceed 90 feet in height. Path, parking lot, and playground lighting shall not exceed 30 feet in height. Sport court lighting shall not exceed 50 feet in height. Sports lighting shall not operate after 11:00 p.m. Perimeter spill light shall not exceed 1.50 footcandles at any point along an adjacent residential property line, or 3.00 footcandles at any point along any property line not adjacent to a residential property.

K. Signage Lighting. This chapter shall apply to externally illuminated signs only. All such lighting shall comply with the lumen and LPD limits and shielding requirements established in PCDSC 2.195.030(C).

L. Single-Family Residences, Attached and Detached.

1. Lighting Zone 1. All fixtures, except fixtures of 1,800 lumens (100 watts incandescent) or less, shall be shielded and/or located so that the light source is not directly visible from beyond any of the property lines. The mounting height of any building-mounted fixture shall not exceed 15 feet from finished grade to the center of the fixture. Spill light from adjacent properties shall not exceed 0.30 footcandles within eight feet of any single-family residence between the hours of 10:00 p.m. and 6:00 a.m.

2. Lighting Zones 2 and 3. All fixtures of greater than 1,800 lumens shall be shielded and/or located so that the light source is not directly visible from any of the property lines. The mounting height of any building-mounted fixture shall not exceed 20 feet from finished grade to the center of the fixture. Spill light at any point on any of the property lines shall not exceed 0.80 footcandles between the hours of 10:00 p.m. and 6:00 a.m. All nonconforming fixtures shall be turned off between the hours of 10:00 p.m. and 6:00 a.m.

3. Motion-sensor-controlled fixtures that are located at least 50 feet apart (measured along the roof lines) and are less than 100 watts (1,800 lumens) per lamp are exempt from subsections (L)(1) and (2) of this section.

4. Residential Sport Courts and Equestrian Areas in All Lighting Zones.

a. Existing facilities that were built prior to the adoption of this chapter are exempt from all sections of this chapter, except in the event that any of the existing luminaires needed to be replaced, then they shall be specified, installed, and controlled in compliance with all sections of this chapter. This does not include the normal maintenance of lamps or ballasts. All new luminaires must be full-cutoff, fully shielded, or partially shielded, to the satisfaction of planning staff.

b. All equestrian areas and sport court luminaires must be turned off when not in use.

c. New facilities shall not exceed a mounting height of 40 feet. New facilities that utilize full-cutoff or fully shielded luminaires shall not exceed a lighting power density of 1.50 watts per square foot. New facilities that utilize cutoff, semi-cutoff, or partially shielded luminaires shall not exceed a lighting power density of 1.00 watt per square foot.

d. All applicants shall include in their submittal a completed worksheet, which may be obtained from planning staff, and which will document compliance with this section.

5. Mercury vapor light sources are not allowed, and any existing installations must be removed prior to January 1, 2011. [Ord. 011812-ZO-PZ-C-007-10 § 22; Ord. PZ-C-003-09 § 1].

**2.195.050 Equipment substitutions or alterations.**
The outdoor lighting equipment installed at a project site (fixtures, lamps, poles, finishes, controls, etc.) and the locations thereof shall not be substituted or altered in any way from the approved plans (except for the use of alternate manufacturers already listed in the fixture schedule of the approved plans) without first submitting the changes to planning staff and receiving written approval. Failure to comply with this chapter can result in penalty action from the county, including a decline to issue the final certificate of occupancy or final certificate of completion until the project is brought into conformance with the approved plans, to the satisfaction of planning staff. [Ord. PZ-C-003-09 § 1].

**2.195.060 Verification.**
All outdoor lighting installations are subject to inspection/verification of the lighting equipment, LPD, LD, and illumination levels (adjusted for light loss factors) by county staff or their designee, prior to the issuance of the final certificate of occupancy or final certificate of completion. Installations that are determined by planning staff to not be in compliance with the approved plans shall be corrected and brought into compliance with the approved plans prior to the issuance of the final certificate of occupancy or final certificate of completion. A complete set of the approved planning submittal shall be kept at the site for the duration of the project, and the planning department shall be contacted for an on-site inspection of the outdoor lighting equipment prior to the installation of any luminaire that is to be mounted at a height of more than six feet. [Ord. PZ-C-003-09 § 1].

**2.195.070 Permanent exemptions.**
A. Nonconforming Fixtures. All outdoor fixtures existing and fully installed prior to the effective date of this chapter, except for luminaires with a mercury vapor light source, may remain “nonconforming” indefinitely; provided, however, there shall be no change in use, replacement, structural alteration, or restoration of outdoor light fixtures after not being used for a period of 12 consecutive months unless it thereafter conforms to the provisions of this chapter. This does not include the standard maintenance replacement of lamps and/or ballasts.

B. Federal and State Facilities. Those facilities and lands owned and/or operated as protected by the U.S. federal government or the state of Arizona is exempted by law from all requirements of this chapter. In addition, all federal and state detention facilities and other places for lawful confinement shall have the same exemption. Voluntary compliance with the intent of this chapter at those facilities is encouraged.

C. Public and Private Detention Facilities. All detention facilities and other places for lawful confinement, whether they are public or private, shall have the same exemptions as in subsection B of this section. Voluntary compliance with the intent of this chapter at those facilities is encouraged.

D. Projects That Require Unusually High Illuminance Levels or Luminaire Mounting Height. Projects that require unusually high illuminance levels and/or mounting height shall be exempt from this chapter. These projects will be reviewed by county staff on an individual basis, and subsequently submitted to the board of supervisors for final approval. These types of projects include, but are not limited to: professional sports stadiums, other public or private sports facilities, and high schools.

E. Motion-Sensor-Controlled Lighting. Motion-sensor controlled fixtures being utilized for security or safety purposes, with a wattage of less than or equal to 100 watts (1,800 lumens) per lamp, are exempt from these provisions.

F. Electric Utility Leased Lighting. Planning staff, at its discretion, may allow the use of electric utility leased lighting that does not exceed a mounting height of 21 feet in lighting zone 1, and 28 feet in lighting zone 2. The light sources utilized in lighting zone 1 shall not exceed a color temperature of 3,500 degrees Kelvin. “Half-night” photocells may be utilized instead of the required 10:00 p.m. timed shutdown. The lighting must meet any of the relevant shielding requirements established in this chapter. [Ord. PZ-C-003-09 § 1].

**2.195.080 Procedures for chapter compliance.**

A. Applications.

1. Any individual applying for a compliance review number or building permit under this chapter intending to install outdoor lighting shall, as part of said application, submit evidence that the proposed work will comply with this section.

2. All other individuals intending to install outdoor lighting fixtures shall submit an application to the planning director providing evidence that the proposed work will comply with this section.

B. Contents of Application or Submission.

1. The applicant may obtain from planning staff a document that lists all of the items that comprise a proper and complete outdoor lighting submittal. The submittal shall contain, but shall not necessarily be limited to, the following:

2. Plans indicating the location on the premises, and the type of illuminating devices, fixtures, lamps, supports, other devices, etc.

3. Description of the illuminating devices, fixtures, lamps, supports and other devices, etc. This description may include but is not limited to manufacturers, catalog cuts, drawings and photometrics (including sections where required).

4. The above required plans and descriptions shall be sufficiently complete to enable the planning director to readily determine whether compliance with the requirements of this chapter will be secured. If such plans and descriptions cannot enable this ready determination, by reason of the nature or configuration of the devices, fixtures or lamps proposed, the applicant shall submit evidence of compliance by certified test reports as performed by a recognized lab.

C. Issuance of Permit. Upon compliance with the requirements of this chapter, the planning director shall issue a permit for installation of the outdoor lighting fixtures, to be installed as approved. In the event the application is part of the building application under the zoning regulations, the issuance of the building permit will be made if the applicant is in compliance with this chapter as well as the other requirements for issuance under the zoning regulations.

D. Amendment to Permit. Should the applicant desire to substitute outdoor light fixtures or lamps after a permit has been issued, the applicant must submit all changes to the planning

director for approval with adequate information to assure compliance with this chapter. [Ord. PZ-C-003-09 § 1].

**2.195.090 Temporary exemptions.**

A. Request for Temporary Exemptions.

1. Any individual as defined in this chapter may submit a written request on a form prepared by the planning department for a "temporary exemption" to the requirements of this chapter. Approval for a temporary exemption is at the discretion of the planning director and shall be valid for 30 calendar days or less, as determined by the planning director. Any renewal is also at the discretion of the planning director. The request for temporary exemption shall contain minimally the following listed information:

a. Specific exemptions involved;

b. Previous temporary exemptions, if any;

c. Duration of time requested exemption;

d. Type and use of exterior light involved;

e. Type, wattage and initial lumens of proposed lamps;

f. A plan with proposed luminaire locations; and

g. Manufacturer cutsheets for proposed luminaires.

2. In addition to the above data, the planning director may request any additional information which would enable him or her to make a reasonable evaluation of the request for temporary exemption. [Ord. PZ-C-003-09 § 1].

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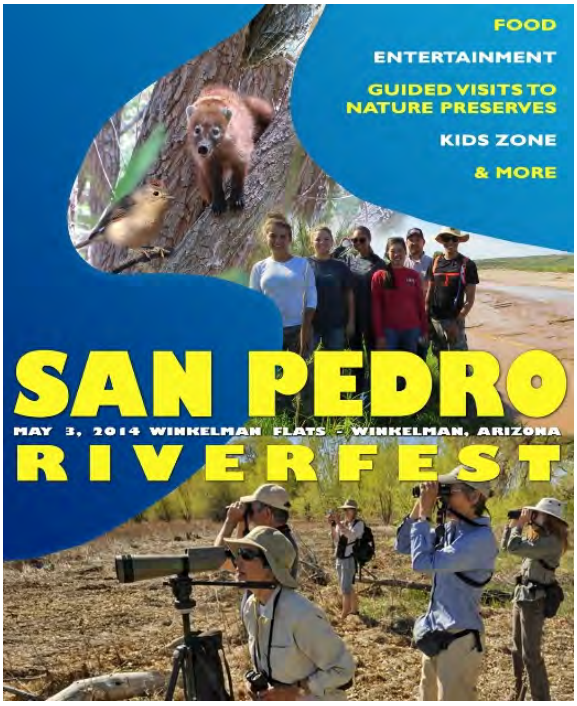
# 10. Light Pollution Control/Restoration Community Projects

## 10.1 Public Outreach and Education

The Oracle Dark Skies Committee began doing public outreach in coordination with Oracle State Park within three weeks of being formed in April 2014. A "Music in the Park" event was held on Sunday, 27 April 2014:


This is Mike Weasner, Chair of the Oracle Dark Skies Committee, at the “Music in the Park” event:

Oracle State Park and the Oracle Dark Skies Committee were represented at the "San Pedro Riverfest", held in Winkelman, Arizona, on Saturday, 3 May 2014:




Riverfest was well attended by Pinal County residents, business owners, and elected officials. Oracle State Park Ranger Dale Redies (right) and Committee Chair Mike Weasner (left) discussed what the Park has to offer and how everyone benefits from preserving our dark sky resource:

Oracle Public Library and the Pinal County Library District sponsored an "Astronomy for Everyone: Size and Scale of the Universe" presentation on 27 May 2014. The Oracle Dark Skies Committee was on hand at the Oracle Public Library to answer any questions about light pollution and to discuss its work with Oracle State Park. This is the Committee's display at this event:


The event was the first use of the new Oracle Dark Skies Committee banner.

The Oracle Dark Skies Committee has been invited to give a presentation on its work to residents of the nearby Saddlebrooke Ranch community in August 2014.

Also in August 2014, Mike Weasner, Chair of the Committee, will be attending the "Blinded by the Light" summit in Flagstaff, AZ. The attendance is sponsored by Arizona State Parks and further demonstrates the support of the State of Arizona to the long-term goals of the IDA.

The Oracle Dark Skies Committee web site (http://www.weasner.com/ODSC) went live in June 2014. An article asking for the community's help to Oracle State Park "Go for the Gold" is available on the Committee web site, along with other information.


Figure 10.1 Oracle Dark Skies Committee web site

The Oracle Fire Station also asks for the community's help:


The Committee is in the initial planning stages for an "Oracle Community Lighting" meeting to be held in late 2014 or early 2015. The Committee hopes to have participants from the Pinal County Sheriff's Department, the Pinal County Planning and Development Department, the Pinal County Board of Supervisors, the local electric utility (SCIP, part of the Bureau of Indian Affairs) local hardware stores (with discounts for Dark Sky Compliant fixtures), and IDA.

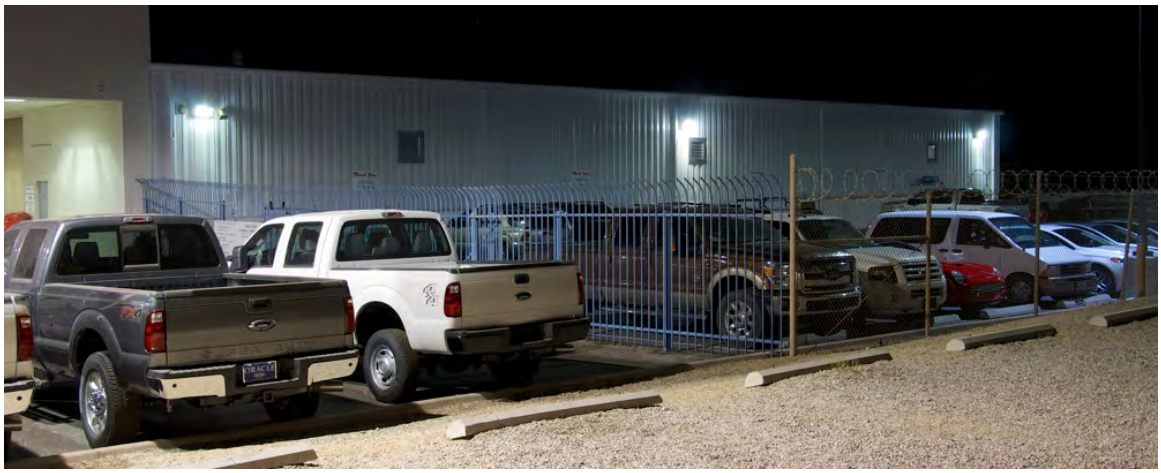
The Committee has been contacting local businesses and residents whose outdoor lighting presents a source of light pollution in Oracle. These projects are reported in the next sections. While these projects have just begun and final resolutions are still in progress in some cases, they are included here to demonstrate the commitment of the Oracle Dark Skies to improving sky quality in southern Arizona. They also demonstrate the community awareness and strong support for the Oracle Dark Skies Committee that has developed after only a few months of existence.

## 10.2 Ford Dealership

Members of the Oracle Dark Skies Committee met with the manager of the local "Oracle Ford" car dealership that is west of the community of Oracle. Its parking lot lighting is Dark Sky Compliant but security lighting on two sides of its main building shine horizontally and are brightly visible. Two lights are seen on this nighttime photo taken from about a mile away (a third is masked by the Jones Outdoor Advertising billboard, discussed in Section 10.6):


The current fixtures are all like this:

The manager was very supportive of the work of the Committee and agreed to replace the lights with Dark Sky compliant fixtures. Upon further reflection he decided to turn off the six lights and leave them off, as the other existing (compliant) lighting is sufficient. The following two photos show the "before" lighting:



The next three photos show the “after” look:

Several local residents immediately mentioned to the Committee that they noticed the improvement.

### 10.3 Circle K Convenience Store

The manager of the two Circle K Convenience Stores in Oracle was contacted by the Committee regarding lighting at one of the locations. The lighting of concern illuminates the pump area and, while compliant with the Pinal County Outdoor Lighting Code (Section 9) under the "grandfathered" clause, it is not compliant to the revised code and not Dark Sky compliant as there are unshielded lights that extend below the ceiling, as seen in this photo:


The manager was agreeable with replacing the lighting or properly shielding the fixtures, but said he would "have to check with Corporate".

The manager was contacted three weeks after the initial meeting and he reported that a work order had been placed to redo the lighting to be compliant. Due to a lengthy Corporate bidding process, the work may not be completed until late in 2014.

## 10.4 Southern Arizona Equestrian Center

The Southern Arizona Equestrian Center, west of Oracle, has several unshielded bright tall pole mounted lights that are illuminated during the hours when the Center is in use at night.

This photo, taken from about a mile away, shows the overwhelming nature of the lights as they illuminate the surrounding area well outside of the Center property:

Contact was made with an owner of the Center. He agreed to look into the lighting to determine if there was anything he could do to prevent the spillage. He mentioned that the lighting was only on a few times a week and then usually for only a couple of hours. The Committee plans to do further follow-up with the Center.

## 10.5 Former Liberty Park

The land formerly known as “Liberty Park” in Oracle is unused, yet has lighting which its neighbors consider a nuisance. This photo shows the lighting that is illuminated all night long:

A local Oracle historian and Committee member prepared a history of the Park for inclusion in this Nomination Package (next page).

# History of *Liberty Park* aka *Wood Field*

*compiled by Evaline Auerbach*

'Wood Field" became a park for the use of schoolchildren when Elizabeth Lambert Wood, a benefactor to Oracle, gave it to the children of Oracle on Armistice Day (Nov. 11), in 1928. She bought the lot for that purpose because it was close to the school—across Mt. Lemmon Road from Oracle Ridge, the original Oracle school building. But because Oracle was unincorporated, the title went to the school.

Mrs. Wood died in 1962. By 1973, neighbors became concerned that the park was being used as a school bus yard. The Oracle School District Superintendent reportedly said that the change came because the park hadn't been maintained and had become a hazard.

When the new Mt. Vista School was built across town, on the west side, OSD traded the "bus yard" (Wood Field) for county property closer to the new school. The buses left in 1996.

The empty lot, owned by Pinal County, remained unused until 2000 when a group of Oracle residents interested in regaining "Wood Field" wrote to the County Supervisor requesting that the park be restored for use by children. The supervisor replied that if a local non-profit organization would take responsibility, the county would "initiate a transfer of ownership."

The Oracle Historical Society (OHS), agreed to take on the project. The group had maintained its nonprofit, 501(c)(3) status in the community for 25 years and was already caretaker of two area historic sites. The Board of Supervisors approved the lease in December, 2000, and published its Legal Notice of Intent to Enter into a Lease. The Board seemed set to approve the lease agreement at its regular meeting January 16, 2002.

But the item was pulled from the agenda—by the Supervisor, who said that he thought the OHS had lost interest, so decided to turn it over to the new "Citizens for Positive Growth and Development (CPGD)—incorporated on July 3, 2001 and headed up by a local citizen.

This group had been funded by two developers that wanted to build large housing projects in the area. They had promised that if the residents of Oracle would support their side in a zoning dispute, they would provide "$5.5 million to Oracle and Pinal County kids." The money was to be used for "recreational amenities for area kids. The fund can facilitate construction of community parks, pools, ball fields and other after-school resources…a community pool and ball field in Oracle right away, if there is no referendum on the zoning."

A few weeks after founding CPGD, the head of that group became the only Oracle resident who joined the developers as a plaintiff in a their lawsuit against Pinal County for allowing a referendum (vote) on the zoning.

The *Arizona Daily Star* reported on July 6, 2001, that CPGD "received slightly less than $7,000 from the two developers. Another $7,000 in office equipment was donated.

Six months later in January of 2002, when the Supervisor for the Oracle district pulled the agenda item to grant a lease to the Oracle Historical Society and instead grant it to CPGD, the County Attorney was reportedly "shocked. He said he'd only been informed of the switch the day before." he said to a reporter.

So, the Wood Field property was turned over to the CPGD and renamed "Liberty Park." The community group did try to make a park at the spot, but presumably with no more help from the developers once the court ruled in their favor.

The site remained a draw for vandals and a potential liability, unknown to Pinal County (the Supervisor had retired). Then in 2012, the new Pinal County Open Space and Trails Advisory Commission began doing an inventory of existing Pinal County parks. They found the existing lease with Citizens for Positive Growth and Development (CPGD) and attempted to

contact the group to find out if they had insurance, as required. At that time, the group no longer existed officially. Records showed that the group had tried to hand over the lease to another group which also no longer existed.

In the Fall of 2012, the county staff reported the site's status to the Board of Supervisors, which repealed the lease. After that, the County took over "all operations and maintenance."

According Ken Taylor, head of the group: "[Open Space and Trails] in an attempt to wrap its arms around issues with deferred maintenance," found that the existing skate ramps were not installed according to any known guidelines for safety.

They were removed.

From then on the site has been on a weekly checklist, along with other parks under county management. Maintenance has had to repaint the restrooms 3-4 times due to graffiti. The lights in place were not operational, so the county removed those lights and put in new security lights in the Spring of 2014. They are on dawn to dusk for security. Mr. Taylor is going to be meeting with Steve Abraham of Planning and Zoning at the site in Oracle soon to evaluate the lighting according to the Pinal County Code

The "Oracle Park" which has been consistently run for the community by the County is also under consideration for security lighting.

The ultimate nature, management and ownership of both parks, along with several others in the county is currently under review. Before any final decision is made, community input will be requested.

History of Liberty Park aka Wood Field p. 2 of 2

The Oracle Dark Skies Committee is working with the Pinal County Department of Planning and Development to determine the Park's status and resolve the lighting issue.

## 10.6 Jones Outdoor Advertising Billboard

A billboard on Arizona Highway 77, just west of Oracle, has two extremely bright lights that illuminate signs on both sides of the billboard.


The lights are inadequately shielded, as seen here:

Consequently, the illumination from both lights is not limited to just the dimensions of the billboard, but shines well outside the boundaries of the sign:


As such, these lights are not only wasteful of electricity and a source of light pollution, they are also a driving hazard due to the blinding bright light that shines into drivers' eyes when approaching the billboard from either direction on Highway 77.

The Committee contacted the Tucson office of Jones Outdoor Advertising several times to discuss the lights. A company email address was provided and the Committee Chair sent an email to dtjones@jonesoutdoor.com (the owner) with background on the Committee, its work with Oracle State Park, a description of the problem lighting, and a photo (seen above). A request was made to discuss what resolutions might be possible to reduce or eliminate the spillage. Eventually the owner responded but declined to support the Park and community or address the light spillage concern. The Committee is continuing to pursue a resolution. It should be noted that the lights are currently turned off about midnight each night.

### 10.7 Triangle L Ranch

The owner of Triangle L Ranch in Oracle initiated contact with the Oracle Dark Skies Committee to discuss nighttime lighting for several events planned for the fall of 2014. The Triangle L Ranch web site (http://www.trianglelranch.com) describes the Ranch as:

> "The Triangle L Guest Ranch is a magical property nestled among giant oaks and boulders in the high desert foothills of the Catalina Mountains. Set on fifty secluded acres, with lovely whitewashed adobe buildings dating from the 1880s, Triangle L Ranch offers comfortable accommodations, privacy, easygoing hospitality, and the charm of a rustic, historic ranch setting enhanced by a commitment to the arts. Our abundant birds and wildlife, our cloudless, temperate days and star-filled night skies, make the Triangle L a carefree environment to relax, slow down, watch birds, hike, or simply enjoy a peaceful, technology-free retreat for individuals, couples, families, and friends."

The owner requested that the Committee survey existing lighting at Triangle L Ranch and make recommendations to ensure Dark Sky compliance. The survey was done in July 2014. Most of the outdoor lighting at the Ranch is low wattage solar powered "decorative" or "art" displays. No problem lights were found. The Committee will do public outreach at four GLOW night events in September and October 2014 at Triangle L Ranch.

### 10.8 Triangle Y Ranch

The owner of Triangle Y Ranch in Oracle also initiated contact with the Oracle Dark Skies Committee to request support for their three telescopes that are used for night programs. The Triangle Y Ranch (http://www.tucsonymca.org/triangle/) is a local summer camp and retreat center used by the YMCA of Southern Arizona. Mike Weasner, Chair of the Committee and local amateur astronomer, will visit the Ranch during the summer of 2014 to check out the telescopes and design an appropriate usage programs for the Ranch. Public outreach on light pollution will be included in these programs.

### 10.9 Local Residents

A local resident was contacted about two unshielded, horizontally aimed, bright floodlights, as seen in this "before" photo:

The homeowner agreed to replace the fixtures, seen here:

Information on replacements was provided to the resident and the work should be done in the summer 2014.

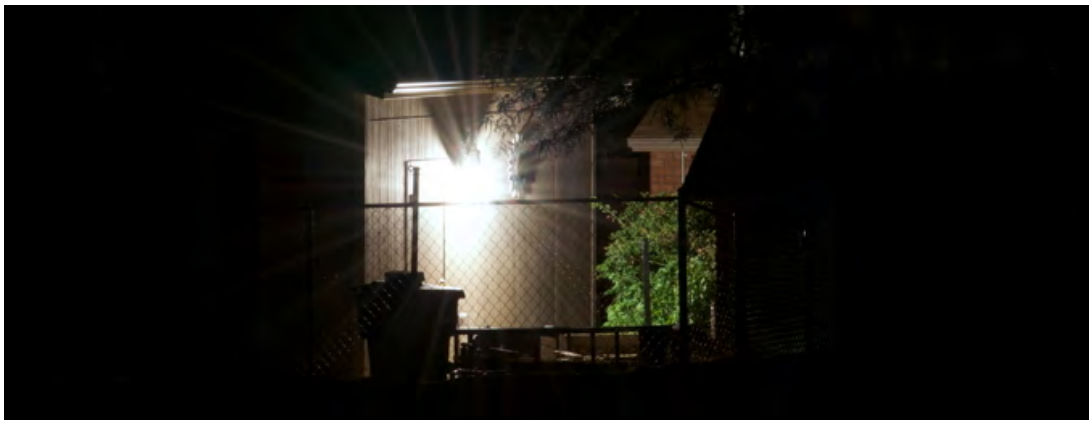
The Committee approached another homeowner regarding driveway lighting that illuminates the roadway and another homeowner's property:

The homeowner agreed to discuss what could be done to mitigate the concern of the unshielded lighting fixtures:

Resolution is expected summer 2014.

Another homeowner that the Committee met with was able to immediately rectify his problem light during the meeting. A light on his recently constructed garage extended below the fixture shield, as seen in these "before" photos:

The exposed bulb, which was on all night, created a lot of glare:



The homeowner removed the two extension pieces and now the bulb no longer extends below the fixture:

In addition, the homeowner stated he would only turn the light on when needed, rather than having it on all night. This is an "after" photograph:

The Oracle Dark Skies Committee will continue to do public outreach, and more residential and business projects will be undertaken and documented. These efforts will continue after this Nomination Package is submitted and after the IDA "International Dark Sky Park" designation for Oracle State Park is received.

# 11. IDA International Dark Sky Park Program

## 11.1 Program Criteria Compliance Checklist

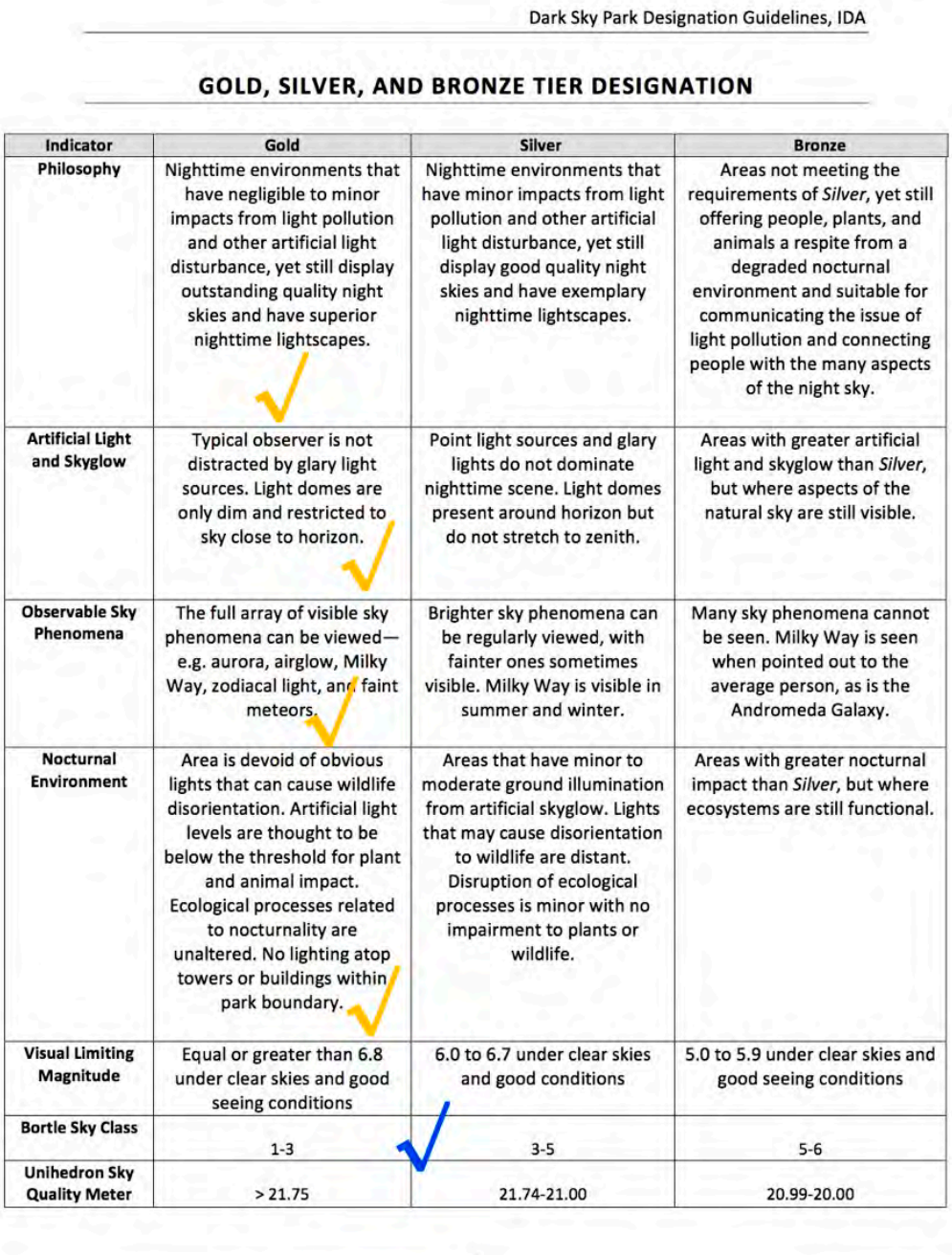
The IDA Dark Sky Park Program Criteria (May 2013 version; http://www.darksky.org/idsp/Guidelines/IDSP%20Guildelines%20Final-May13-BP.pdf) was used in the preparation of this Nomination Package. The following checklist shows the Oracle State Park compliance status with reference to the appropriate sections of this Nomination Package.

| 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 |
| 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. | √ | 3.2<br>4.2<br>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. | √ | 5 |
| **MINIMUM REQUIREMENTS** [see Program Criteria for sub-requirements] | | |
| A) A quality comprehensive Lightscape Management Plan (LMP) | √ | 8 |
| B) The park's commitment to dark skies and lightscape management) | √ | 8 |
| C) The park's commitment to public education | √ | 3 |

Table 11.1 IDSP Program Criteria compliance

## 11.2 Program Criteria Tier Compliance

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



Dark Sky Park Designation Guidelines, IDA

**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 |

6

Table 11.2 IDSP Program Tier Designation

# 12. Miscellaneous Materials

## 12.1 History of Oracle's Steward Family Support to Astronomy

Oracle has a long history of support to astronomy, as documented here.

**Dark Skies Spark Oracle Resident's Appreciation**
**Result: Steward Observatory**

Though people living in the clear, dark skies far from city lights have enjoyed their view of the sky in the Oracle area for many centuries, from the Native Americans to the Biosphere 2, one citizen, Mrs. Lavinia Steward, has left a lasting legacy with a donation to fund the first Observatory at the University of Arizona with a "very large" 36-inch telescope.

That donation, just under one hundred years ago, fulfilled the wishes of Director Andrew Ellicott Douglass at the U of A. Since coming to the University in 1906, he had made do with small or borrowed telescopes in less-than-perfect quarters on campus.

**Douglass and the University Program**

A borrowed 8-inch refractor telescope had given "long and convincing evidence of the advantages of this Southern Arizona location for astronomical work." Not only had it shown the division in the nucleus of Halley's Comet in 1910, but In one of the observing seasons, seventy-two nights out of seventy-five were found to be available for work. In the winter of 1913 , a series of forty nights in succession showed thirty-six workable and twenty-six of extremely fine character. With all these successes, in September of 1914, Douglass advanced a request for the "large telescope."

The new University of Arizona president took the request to the Arizona legislature in early 1915 where, according to Douglass "[the legislature] failed to make the appropriation desired." So, Douglass and the University sought private funds

**The Stewards: Lavinia, Henry and Fred**

Meanwhile, Henry and Lavinia Steward with their adopted nephew Fred J. happened to be among those well-do-do people who had moved to Oracle for their health and stayed.


They first built a small two-story stucco adobe and used that as a home while building the Steward House by 1895. Both are still standing and are registered as historic places.

*View from Linda Vista road about 1900—postcard sold at Terry and Lawson's store,* —property of Evaline Auerbach and used by her permission

Oracle's Steward Gift Observatory p. 1 of 4

Henry Steward, having sold out his oat mill in Joliet, Ohio, could afford this magnificent home —– still known in Oracle as the "Steward House" though most recently "Grace Manor." Lavinia lavished her artist skills on the house and garden, as well as continuing her painting (she had been part of an artists' group in Illinois). Fred throve and soon was off to Tucson to pursue a successful business in banking. However, Henry died in 1902 of heart problems.

Lavinia continued to live alone n the house described as "spacious and stately ... with orchard and garden and employee's quarters, ample grounds, and ivied dignity". The house contained notable works of art besides those she had painted herself, many on trips to Mexico.

Douglass declared at the dedication of the Observatory: Lavinia Steward was "a charming and lovely character, deeply interested in the arts and sciences. She had shown the wonders of the heavens to her grand-nephew and nieces. She had planned to do something for the University and felt a personal inclination towards providing some astronomical equipment. Thus all conditions were happily favorable for the beginning of the Steward Observatory."

That bequest —"the princely gift" of $60,000 to for building and outfitting the Steward Observatory—came in October, 1916. Unfortunately Mrs. Steward passed away in August 1917, Douglass noted "It is my deep regret that she did not live to look through this magnificent instrument."

***The value of Lavinia Steward's gift adjusted for inflation would be equivalent to $1,265,660 in 2013 dollars.***

*—Tom Fleming, Steward Observatory.*

At the dedication in 1923, Fred Steward presented the "three-inch telescope which had so long been in the home of his aunt" to Douglass. (This writer has not yet discovered what became of that memento. It is reportedly not in the possession of the Steward Observatory.)

The Observatory had been carefully sited on campus, "away from the lights at the main part of the university" on the site of a former ostrich farm, run by the College of Agriculture. Douglass thought, "The real advantage of the site" [where the Observatory still stands] was "the control of lights, a feature most essential to the success of the Observatory."

However problems with extraneous lights began to arise before the Observatory could be built. According to Douglass "If there had been no war [WWI], the Observatory would have been completed in 1918 or 1919. As it was, the glass for the telescope could not be manufactured in France as planned, so it had to be done in the United States - by Warner and Swazey Company of Cleveland, Ohio, who had contracted to do the casing.

As Douglass recounted in 1917, "the area chosen contained practically no houses nearby to the east or north, but ...[by 1923] this part of the city has grown rapidly. The City Council, however, has expressed the wish for most cordial cooperation with the Observatory in the matter of avoiding objectionable lights, of which the common arc light of the city street is the greatest offender." However, the university itself was to become an offender when the tennis courts, always near the observatory, were apparently given permission to add lights.

***Steward Observatory, 1928.*** *Note the tennis courts which became a problem when lights were added .*

*The original dome, a stately structure covered with cream colored tile, is a campus landmark and is listed on the National Register of Historic Places. Architect Roy Place also designed St. Helen's Church and El Rancho Robles in Oracle.!*

—Courtesy of University of Arizona Libraries, *Special Collection*

**The telescope**

Douglass had chosen a 26-inch reflecting telescope, a rather new technology, citing "extensive tests made with the great sixty-inch telescope on Mount Wilson." Warner & Swayze of Cleveland, Ohio, received the contract for making the telescope structure. However, the mirror was to be made in France, as was usual in 1916-17.

However, WWI delayed the making of the mirror—until The Spencer Lens Company of Buffalo, N. Y. developed the making of optical glass. For most of 1920, Spencer tried their regular glass furnaces without success. Finally, after installing new furnaces, the first all-American telescope became the Steward telescope.

Douglass and two former students had installed the telescope structure at the Steward Observatory building, and the completed glass was received and mounted in July 10, 1922

*Prof. A.E. Douglass with the 36-inch reflector. "The first view through the new telescope: "a beautiful crescent of the planet Venus in the afternoon of July 17, 1922."— Courtesy of University of Arizona Libraries,* Special Collections

**Lights Cause Removal to Kitt Peak**

By 1963, the Steward Observatory's once solitary, dark-sky setting had been encroached upon by an expanding Tucson and an expanding campus necessitating a move to Kitt Peak—now the site of most of University of Arizona astronomy, along with much international work. The Steward Observatory's original, "Steward" telescope was removed from that dome for relocation; a smaller telescope was installed for student use.

*The 'Steward Telescope,' removed to Kitt Peak in 1963, along with most of the astronomy program of the Steward Observatory, is now housed in this building. Since 1980, it has been used by the Spacewatch program.* —-Courtesy of Steward Observatory

Since 1982, the telescope has been used by the Space Watch Project: "Once at Kitt Peak, the telescope began its new uses. After 1980, the director of the Steward Observatory granted the Spacewatch Project—a group at the University of Arizona's Lunar and Planetary Laboratory—exclusive access to the telescope on the condition that Spacewatch take on all the tasks of refurbishing the telescope and performing all maintenance.

The primary goal of Spacewatch is to explore the various populations of small objects in the solar system, and study the statistics of asteroids and comets in order to investigate the dynamical evolution of the solar system. Spacewatch also finds potential targets for interplanetary spacecraft missions, provides followup astrometry of such targets, and finds objects that might present a hazard to the Earth.

Thus, the interest in dark skies begun by an artist and humanitarian in Oracle, became the catalyst for the University of Arizona's internationally renowned astronomical studies.

The End

***CREDITS:*** *Article by Evaline Auerbach, Oracle Historian, with information from the Steward Observatory website and other information at the Arizona Historical Society and the Oracle Historical Society.*

*Thanks to Thomas A. Fleming, Steward Observatory, for assistance with the photographs and for corrections to this history.*

## 12.2 Media Coverage

Media coverage of the work to have Oracle State Park designated as an IDSP has been extensive. This section has some selected articles.

The San Manuel Miner newspaper published this article on 15 April 2014 covering the initial Oracle Dark Skies Committee meeting:

# Dark skies over Oracle? Committee has inaugural meeting

*The Milky Way rises over Oracle on June 3, 2013. Mike Weasner | Submitted*

*A time lapse photo of the northern sky taken June 2. 2013. Mike Weasner | Submitted*

*Oracle resident and astronomer Mike Weasner (far left) addresses the Oracle Dark Sky Committee. John Hernandez | Miner*

San Manuel Miner

The Oracle Dark Skies Committee had its kick off meeting Thursday, April 10 at the Kannally Ranch House in Oracle State Park. The meeting was well attended and plans are being developed to have Oracle State Park become a designated International Dark Skies Park (IDSP). Once Oracle State Park is designated as an IDSP, it will become the model for additional parks within the Arizona Parks system to follow. The IDSP designation will be good for Arizona, Pinal County, the Copper Corridor, Oracle, and the environment.

The Oracle Dark Skies Committee is being led by Mike Weasner of Oracle. He is an amateur astronomer with a BS degree in Astrophysics. Mike is a former fighter pilot, pilot instructor, former manager in the US Air Force Shuttle Program and a retired senior manager for a large aerospace company. The committee will be gathering support letters from politicians, businesses, organizations, government agencies and others as well as looking for sponsors.

The International Dark Skies Association (IDSA) is an organization dedicated to preserving and protecting the night time environment and our heritage of dark skies through environmentally responsible outdoor lighting. They are considered the authority on light pollution and are consulted by government agencies in developing lighting ordinances. The IDSA is

the approving authority making Oracle State Park an International Dark Skies Park provided they meet the qualifications. It is believed that Oracle and the lower San Pedro Valley have some very good dark skies.

Achieving the International Dark Skies Park designation will bring recognition to Oracle State Park. The IDSA has thousands of members in 70 countries. They also have chapters and affiliates around the world. Other benefits the park would receive are:

• Increased educational opportunities for science projects for local schools.

• Oracle State Park and the community of Oracle would reap economic benefits from increased visitation to the area.

• County wide public relations and economic benefits from having an International Dark Sky Park in Pinal County. Visitors coming to the park would be exposed to the Copper Corridor area and Pinal County.

• Through the education of residents, light pollution will be reduced which will result in long term health, environmental, and economic benefits within Pinal County.

The Oracle Dark Skies Committee will be meeting every week on Thursday at 6:30 p.m. at the Kannally Ranch House in Oracle State Park. If interested in volunteering, sponsoring, or would like more information contact Mike Weasner at 520-289-3402 or email: mweasner@mac.com.

Article by John Hernandez, Copper Area News Publishers, www.copperarea.com.
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Arizona State Parks published this Press Release on 29 May 2014:

ARIZONA STATE PARKS: For Immediate Release
Managing and conserving Arizona's natural, cultural and recreational resources for the benefit of the people, both in our Parks and through our Partners. FOR MORE INFORMATION CONTACT: Ellen Bilbrey at (602) 542-1996 or (602) 228-8518 or Monica Enriquez at (602) 542-6997. Contact by Email: pio(at)azstateparks.gov

# Oracle State Park Going for International Dark Sky Park Designation

*(Phoenix, Arizona - May 29, 2014)* - Arizona State Parks, in collaboration with the Friends of Oracle State Park and the recently formed Oracle Dark Skies Committee, announces that it is pursuing an "International Dark Sky Park" (IDSP) designation at Oracle State Park in Oracle, Arizona.

The designation, when awarded by the International Dark-Sky Association (IDA), headquartered in Tucson, Arizona, will make Oracle State Park the first Arizona State Park to be so honored. The IDA defines IDSP sites as "a park or other public land possessing exceptional starry skies and natural nocturnal habitat where light pollution is mitigated and natural darkness is valuable as an important educational, cultural, scenic, and natural resources." The IDA IDSP Program has three tiers to designate the quality of night skies. Gold is the highest award representing the darkest skies, followed by the Silver and Bronze designations.

Light pollution comes from lighting that is aimed horizontally or upward, is unshielded, brighter than it needs to be, and/or shines beyond where and when it is needed. Light pollution not only impacts the science of astronomy (an important business in Arizona), but can cause documented negative impacts on wildlife, the environment and human health. Light pollution wastes over $2 billion a year in unnecessary energy costs in the United States.

As part of its work to have Oracle State Park nominated for the designation, the Oracle Dark Skies Committee is reaching out to local residents, business owners and government offices to reduce or eliminate local sources of light pollution. Everyone can help Oracle State Park "Go for the Gold."

Oracle State Park is located northeast of Tucson in the northern foothills of the Catalina Mountains. The Park is a 4,000-acre wildlife refuge, environmental education center and day-use recreation park. The Park features a diversity of animals, plant species and rock formations. There are also oak tree-shaded washes, mesquite scrub habitats and riparian woodlands with manzanita and beargrass.

On weekdays, the park has school programs by reservation by calling (520) 896-2425 and on weekends is open for hiking, offers tours of the Kannally Ranch House and holds events. Group facilities are also available for weddings and other group gatherings. The Park Entrance Fee is $7 per vehicle for up to four adults. For more information about Oracle State Park call (520) 896-2425 or visit AZStateParks.com/parks/ORAC.

For more information about the Dark Sky designation, contact Mike Weasner, Chair, Oracle Dark Skies Committee, mweasner(at)mac.com or call (520) 289-3402. Find out more about the IDA "International Dark Sky Park" Program.

For information about all 27 Arizona State Parks, the Trails and Off-Highway Vehicle Programs and State Historic Preservation Office call (602) 542-4174 (outside of the Phoenix metro area call toll-free (800) 285-3703). Campsite or cave tour reservations can be made online at AZStateParks.com or by calling the Reservation Call Center at (520) 586-2283. Open 7 days a week, from 8 a.m. to 5 p.m. MST. Follow AZStateParks on Twitter and Facebook.

-end-

Find out more about Oracle State Park

link to this page:
http://azstateparks.com/press/2014/PR_05-29-14.html

Arizona Daily Star published this story about Oracle State Park on 30 May 2014:

Arizona Daily Star
www.azstarnet.com

Apps Android iPhone iPad Kindle Fire E-edition/iPad Wildcat Extra/Android Wildcat Extra/iPhone

# Oracle State Park seeks dark skies designation

\nBirders gathered early at Kannally Ranch

Ron Medvescek / Arizona Daily Star Birders gathered early at Kannally Ranch House for a bird walk at Oracle State Park in 2012.

Buy Now

15 hours ago • By Douglas Kreutz

Oracle State Park might soon be known for its dark nights and starry skies as well as its sunny days and scenic landscapes.

The park near Oracle is pursuing designation as an "International Dark Sky Park."

The designation would come from the International Dark-Sky Association, which chooses sites that have "exceptional starry skies and natural nocturnal habitat where light pollution is mitigated and natural darkness is valuable as an important educational, cultural, scenic and natural resource."

"Oracle State Park is 'behind' the mountain from the city of Tucson, so it can provide a look at the night skies without a


**Oracle State Park**

• What's there: The 4,000-acre park is known for its oak grassland landscapes, hiking trails and the historic Kannally Ranch House.

• When it's open: 8 a.m. to 5 p.m. Saturdays and Sundays year-round.

lot of light pollution — and that's a really wonderful thing," said **Ellen Bilbrey**, spokeswoman for Arizona State Parks. "It's also exciting because this would be the first Arizona state park to get dark-skies designation."

## GROUP EFFORT

Arizona State Parks, the Friends of Oracle State Park, and the recently formed Oracle Dark Skies Committee are collaborating to produce a proposal for the Tucson-based Dark-Sky Association.

It will be open for a "star party" June 21 with music beginning at 6 p.m. and star viewing at 8 p.m.

• Get there: Drive north on Oracle Road, which becomes Arizona 77, and follow Arizona 77 past Oracle Junction to the town of Oracle. In Oracle, follow American Avenue to a turnoff for Mount Lemmon and the park. Then continue just over a mile to the park entrance.

• Admission: $7 per vehicle.

Among 16 parks that have been awarded Dark-Sky status by the association are Big Bend National Park in Texas, Chaco Culture National Historical Park in New Mexico, Galloway Forest Park in Scotland and Eifel National Park in Germany.

The Oracle Dark Skies Committee is working with area residents, business owners and government offices to reduce or eliminate light pollution in the Oracle Park area — the key factor in winning the association's highest, or "gold," designation.

"There are several things that have to happen for the designation," said committee chairman **Mike Weasner**. "It involves documenting the type of park, the history, and also the sky quality of the park — how dark it is at night, how many lights are visible and things like that."

Weasner said the committee has done lighting inventories and is now doing sky-quality measurements using a specially designed light meter to measure the degree of darkness.

"We've gone out to businesses and residences with lighting that is unshielded, and we're talking with these folks about limiting light," he said. "The more lights we can get turned off at night or aimed downward, the more it will help us get to that gold level" of designation.

Plans call for presenting the proposal to the Dark-Sky Association by the end of July, Weasner said.

## STAR PARTIES PLANNED

Special nighttime events at the park such as "star parties" and telescope viewing events will allow the public is to take advantage of dark skies there.

Such events will be necessary because the 4,000-acre park is normally closed at night. It's open to the public only from 8 a.m. to 5 p.m. on Saturdays and Sundays year-round.

The park was closed by budget cuts in 2009, but state parks revenue and volunteer work by the Friends group brought about a limited reopening, said **Bryan Martyn**, State Parks executive director. At first it was open only on Saturdays some months of the year, with hours gradually increasing to the current status of full weekends year-round. It's closed to the public on weekdays.

The first of the star parties is scheduled for June 21 with extended park hours. A music program begins at 6 p.m. followed by an 8 p.m. star party with telescope viewing. Normal park admission fees of $7 per vehicle will be in effect.

Contact reporter Doug Kreutz at dkreutz@azstarnet.com or at 573-4192. On Twitter: @DouglasKreutz



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Arizona Public Media published this story about Oracle State Park on 3 June 2014:

ARIZONA PUBLIC MEDIA®

HOME NEWS TV RADIO ON DEMAND ORIGINALS EDUCATION

Arizona Politics Business Health Science+Nature Arts+Culture Education

News - Front Page - AZPM Local News - Oracle State Park Hopes for Dark Skies ...

AZPM Local News

## Oracle State Park Hopes for Dark Skies Recognition

**Story by Zachary Ziegler**

*June 3, 2014*

Oracle State Park in the town of Oracle could get recognition for preserving "dark skies."

Members of the Oracle Dark Skies Committee said they believe the park meets the requirements to be named a dark sky park by the International Dark Skies Association.

The park would be the first in Arizona to receive the recognition.

According to the committee, the amount of light in the Oracle area is low enough to receive a silver rating, but with a little help from nearby residents and businesses that can be improved.

"We are asking the residents and businesses in this area to help us go for the gold," said Oracle Dark Skies Committee Chair Mike Weasner. "We're reaching out and asking if you have unshielded night-time lighting, if you have lighting that's too bright, if it's aimed upwards or horizontally, please shield those lights or turn them off when they're not needed."

Dark Sky Places Program Manager John Barentine said Oracle State Park would be unusually close to a major city for a dark sky park.

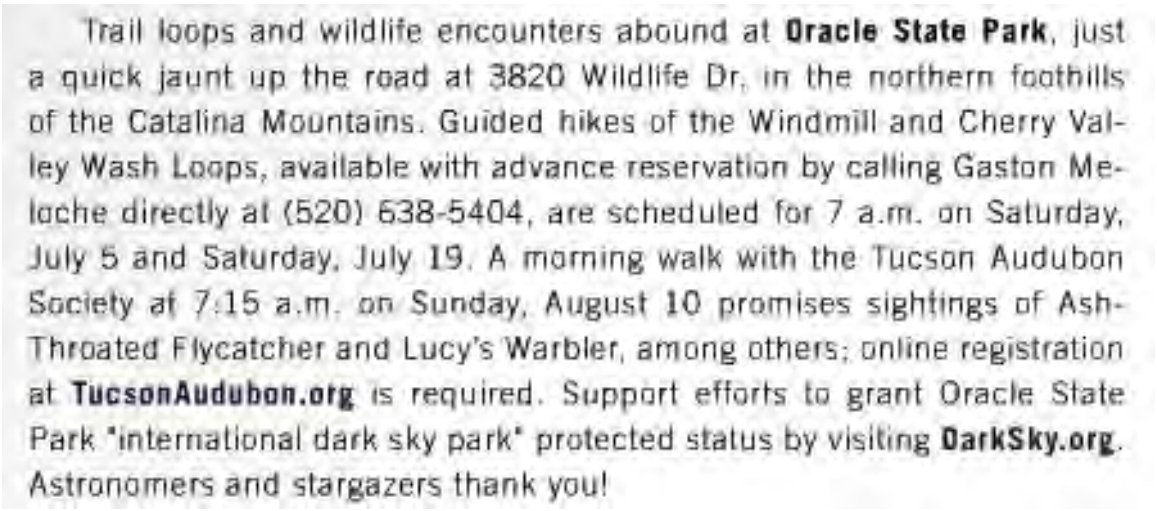
He attributed climate conditions, and the park's proximity to the Santa Catalina Mountains as a reason the area doesn't receive much light pollution from the Tucson area.



An audio file of the radio broadcast is available at:

http://media.azpm.org/master/audio/2014/6/2/mp3/oracle.mp3

Zócalo, the Tucson Arts and Culture Magazine, available free in Tucson, published this item about Oracle State Park in its July/August 2014 issue:



Trail loops and wildlife encounters abound at **Oracle State Park**, just a quick jaunt up the road at 3820 Wildlife Dr. in the northern foothills of the Catalina Mountains. Guided hikes of the Windmill and Cherry Valley Wash Loops, available with advance reservation by calling Gaston Meloche directly at (520) 638-5404, are scheduled for 7 a.m. on Saturday, July 5 and Saturday, July 19. A morning walk with the Tucson Audubon Society at 7:15 a.m. on Sunday, August 10 promises sightings of Ash-Throated Flycatcher and Lucy's Warbler, among others; online registration at **TucsonAudubon.org** is required. Support efforts to grant Oracle State Park "international dark sky park" protected status by visiting **DarkSky.org**. Astronomers and stargazers thank you!

## 13. Oracle Dark Skies Committee

Mike Weasner, Chair: Oracle resident, IDA member, amateur astronomer

Evaline Auerbach, Recorder: Oracle resident, local historian, former Central Arizona College professor

Laurie Bryant: Oracle resident

Stan Bembenek: Oracle resident, member Friends of Oracle State Park, Park volunteer

Dan Blanko: Oracle resident, staff member MMTO

Casey Egan: Oracle resident, retired elementary school teacher

Peter Else: Lower San Pedro Watershed Alliance

Bill John: Oro Valley resident, member Friends of Oracle State Park

Jean John: Oro Valley resident, member Friends of Oracle State Park

Anna Lands: Lower San Pedro Watershed Alliance

Wendy Ostrander: Oracle resident

Chip Parfet: Oracle resident, Vice-President Friends of Oracle State Park

Charlotte Poole: Oracle resident

Dale Redies: Oracle State Park Ranger

Jennifer Rinio: Oracle resident, Oracle State Park Ranger

MaryHelen Vasquez: Oracle resident, owner Hair Country Beauty Salon

Waldo Vasquez: Oracle resident

## 14. Document Revisions

| | | |
|---|---|---|
| 0.1 | 4 May 2014 | Initial Committee review draft |
| 0.2 | 13 May 2014 | Initial draft comments incorporated |
| 0.3 | 27 May 2014 | Additional material, combined two sections |
| 0.4 | 1 June 2014 | Additional material, some edits |
| 0.5 | 13 June 2014 | Updated Committee names, added material |
| 0.6 | 14 June 2014 | Final internal review revision |
| 0.7 | 17 June 2014 | Comments incorporated, Letter of Nomination added |
| 0.8 | 18 June 2014 | Released to “Letter of Support” writers |
| 0.9 | 11 July 2014 | Internal review version of final Nomination Package |
| 1.0 | 18 July 2014 | Final version |