

Stakeholder meeting, December 1 2023, New Mexico Tech

Motivation / Purpose

Early in 2023, DarkSky International contacted people in New Mexico to propose the formation of a state chapter. This was motivated by interest in establishing a regional effort on preserving and improving dark skies in the southwest US. DarkSky International received funding to support such an effort from the Carroll Petrie Foundation. In addition to supporting the formation of a state chapter, DarkSky also proposed to hold a stakeholder workshop on dark skies.

A New Mexico chapter was formed in March 2023. After spending a few months of meetings to discuss organizational structure and learn about each other and our interests, the initial ad hoc State Council agreed to partner with DarkSky International to hold a workshop. After some discussion, it was decided that the main goal of the workshop was to learn about the interests and efforts of groups around the state towards an effort to establish a broad consortium to effect change. This goal was motivated in part by past experience that when dark skies were perceived as a special interest (e.g., from those interested in astronomy), it was more challenging to make progress.

Different members of the group made contacts with various organizations and individuals around the state to invite people to a meeting. While some effort was made to try to contact a diversity of groups, contacts were largely made informally, and it is likely that there are interested parties that were not contacted. Most of the contacted groups responded and many committed to sending a representative to a meeting, but there were also some groups from which we did not get responses.

The stakeholder meeting was convened on December 1, 2023 in the Macy Center at New Mexico Tech, organized jointly by the New Mexico Chapter and DarkSky International. The agenda for the meeting included short presentations from representatives of groups describing their interest, a short breakout session to discuss broad goals and challenges, a set of four presentations focussed on the NM Night Sky Protection Act, local ordinances, basic principles of good lighting, and light standards of the Illuminating Engineering Society. The agenda is presented in Appendix A.

Reports from interested groups

Presentations were made by 14 different groups:

Cody Johnson spoke as representative from New Mexico True. In an effort to identify public interest in different aspects of New Mexico, they found that images that included dark skies registered high in public interest, motivating a dark sky component of NM True. Dark Sky content is included on their social media pages, and they would be interested in listing additional events. They continue to see the potential of dark skies to attract out-of-state visitors.

Grady Owens from New Mexico Skies spoke about their facility in Mayhill, which is one of several private domain astronomical facilities in the state that host telescopes for people around the world (both professional and amateur astronomers) that generally operate them remotely. Dark Sky New Mexico in Animas and Deep Sky West in Rowe are two other similar facilities. There are also a number of residential communities such as Astronomers Paradise in Rodeo that feature large numbers of residents interested in dark skies from the amateur astronomy perspective.

Eamon Brennan from the BLM spoke towards a presentation put together by McKinney Briske (who was unable to attend). BLM is responsible for more land in New Mexico than any other federal agency, so there is a lot of potential for dark sky presentation. Two established Dark Sky locations are on BLM land, and BLM is interested in getting more declared. BLM recognizes that dark skies are important for wildlife habitat. BLM recently developed an extensive document regarding best practices for light.

Peter Lipscomb spoke as a representative of NM State Parks and provided a summary of New Mexico State Park's actions during the Reach for the Stars program (2005-2010). Highlighted observatories at City of Rocks State Park and Clayton Lake State Park and Dinosaur Trackways. Clayton Lake was the first designated International Dark Sky Park in New Mexico (June 27th, 2010). Hybrid observatory project at Leaburg Dam State Park. A collaboration with Las Cruces Astronomical Society. Shared overview of New Mexico State Parks public engagement and interest in a dark night sky and the fact that night sky interpretation events are the most popular educational programs offered at parks locations. New Mexico State Parks is interested to restore the outdoor classroom program to continue and build on the legacy of Reach for the Stars.

John Winscott and Brian McLoughlin spoke from the State Lands Office, which manages lands throughout the state, with a goal of generating revenue for state use, e.g., in education. These include lands on which oil and gas leases are held, which generate significant revenue. It has been recognized that land leased for oil and gas development often has significant light pollution, with thousands of sites having 24-hour lighting. However, there has been some recent discussion about reducing light pollution, in particular with representatives from Carlsbad Caverns National Park. The State Lands Commissioner is committed to being a better steward of state land.

Zandra Fleming, a geologist working for Chevron, spoke about the recent discussions between the New Mexico Oil and Gas Association and Carlsbad Caverns to reduce light

pollution issues. They have discussed a “Dark for the Park Alliance”, and are collaborating with McDonald Observatory in west Texas, where there is a program that recognizes efforts to reduce light pollution by the oil and gas industry.

Brian Jensen spoke about dark skies interests of the Santa Fe Conservation Trust, which was founded in 1993 to protect culturally and environmentally significant landscapes. Their programming includes night sky events. They have recently established a program to put monitoring equipment around Sante Fe to track changes in night sky brightness.

Trish Cutler, a biologist at White Sands Missile Range (WSMR), talked about the impact of artificial light at night on birds and other animals. Artificial light impacts navigation/migration (much bird migration takes place at night), and there is also mortality associated with attraction to structures with bright lighting. WSMR views dark skies as a programmatic asset and has a lighting code that allows for artificial light, but limited in time, space, intensity and spectrum. She described some technical developments in lighting and noted that even fixtures advertised as DarkSky approved can have significant light pollution if not installed properly. WSMR has incorporated some custom shields.

Anna Walker from New Mexico Biopark Society and Kaitlin Haase from the Xerces Society spoke about biological/ecological impacts largely on invertebrates, insects, etc, where artificial light at night (ALAN) has significant adverse effects, leading to declines of insect population and diversity across the globe. They noted that insects are important for pollination as well as being at the base of the food web; moths, for example, are important nighttime pollinators. Anna noted the significant impact on fireflies, which includes 13 species in New Mexico (!), and suggested that, as a charismatic species, these could be a poster child for a dark sky campaign.

Catherine deMaria, the Director of Warehouse 110 in Magdalena, and Marisela La Grave (Dark Sky Land) spoke about the Dark Sky Land movement, a project to preserve a 100 mile corridor from Magdalena west to the Arizona border. They have established a Dark Sky Land exhibition series, which combines science and art; 500 people viewed their last installation.

John Briggs from the Astronomical Lyceum spoke about efforts in the Magdalena area related to dark skies. They have been organizing an annual Enchanted Skies Star Party. John noted that dark skies are an economic force, with many people moving to dark places in New Mexico to enjoy the night skies and astronomy; he noted that many real estate listings include a mention of dark skies. John also noted a recent speaker, Mario Motta, who highlighted the negative human health aspects of light pollution.

Antoine Ribaut from the Magdalena Astronomical Society also spoke of the value of dark skies in the Magdalena region. He is a dark sky activist and suggested that the concept of light trespass was important to convey to people and could be effective.

Eileen Ryan from New Mexico Tech and the Magdalena Ridge Observatory (MRO) discussed the value of dark skies to professional astronomy. MRO has a 2.4m telescope that has been operational since 2007 with fast slewing capability. It is a flagship facility for NASA and the Air Force for space domain studies and planetary defense (from asteroids). MRO also hosts an optical interferometer. Both the University of New Mexico and New Mexico State University (NMSU) also have active astronomy programs; NMSU operates the Apache Point Observatory which is funded by a consortium of universities around the country. These programs depend on dark skies. The facilities also serve to attract graduate students to these institutions. Preservation of dark skies protects research-dollar investments in observatories and universities. Eileen also talked about efforts to preserve dark skies in the Socorro area by positive conversations with city council members to limit lighting (e.g., LED billboards).

Robert Johnson from the Starfire Optical Range discussed their efforts on laser-beacon adaptive optics, which they use to observe artificial satellites. They operate two facilities, one outside of Albuquerque and another in Maui. He noted that from their range south of Albuquerque, it is mostly useless looking north; looking south much better but growth in Los Lunas may threaten that capability.

Presentations

Night Sky Protection Act

Peter Lipscomb gave an overview of the New Mexico Night Sky Protection Act (NSPA) . He provided some background on how it got started, noting that it was motivated in part by considering the night sky as a cultural and natural resource. Initial efforts to define it were supported by the New Mexico Heritage Preservation Alliance and the NSPA was passed in 1999. Peter described some of the history:

- 1999: Representative Pauline Gubbels (Republican, Bernalillo county) carried legislation HB 39 to pass the New Mexico Night Sky Protection Act. Passed and signed into law by Governor Gary Johnson. While the NSPA set a statewide minimum standard, no enforcement clause was in the original act.
- 2001: Pauline Gubbels returned with HB 613 to narrow scope of act to state buildings and to clarify that the state Construction Industries Division was the regulatory body. The rurther added an enforcement clause, but with permissive language: “a governing body of a political subdivision of the state may enforce the provisions of the Night Sky Protection Act.”
- 2007: John Arthur Smith carried SB 391 with language stating “each political subdivision of the state shall fully enforce the provisions of the Night Sky Protection Act”. It passed both Senate committees but was heard by only 1 of 2 house committee before the session expired.
- 2009: HB 362 Donna Irwin gave us a second chance at changing permissive language. Peter was involve and learned some good ways to compress the timeline through both legislative chambers, allowing successful passage.

- 2019: HB 620 was co-sponsored by Liz Stefanics and Nathan Small, and included revisions more relevant to developments in lighting technology. The bill was tabled by Joseph Cervantes, chair of the Senate Conservation Committee. Perceived lack of statewide coalition support caused the effort to fail.

Peter noted that the NSPA has been less effective than it should be and that there are several issues, including technical language that is no longer appropriate (specifies wattage rather than lumens or lux, BUG standards, color temperature, etc.) and that there are built-in exceptions that need to be tightened up and constrained. He noted that the NSPA defines a statewide minimum standard, and that local ordinances can be more stringent. He proposed that a broad coalition work to get a revision done in 2025, and that this will require broad support, meetings with our legislators, getting into interim committee meetings, and addressing new questions and concerns.

Local ordinances in New Mexico

Galen Gisler surveyed the lighting ordinances that presently exist in 33 jurisdictions around the state. Most of them are very rudimentary, mentioning shielding and adherence to New Mexico's Night Sky Protection Act, but lacking quantitative guidance on illuminance limits, light trespass, and colors. A few of these municipal ordinances, written in the 1990s, are badly in need of updating, but even some more recent ordinances are inadequate considering modern lighting technology. The Los Alamos County ordinance, initially drafted in 2021, modified during 2022, and passed by the County Council that December, is the most up-to-date and thorough, and is serving as a model for new ordinances in Albuquerque and Santa Fe. Lighting is a technical issue, much more so than other issues that are covered in municipal ordinances such as building heights and setbacks. Education is therefore required to bring policy makers and public safety officers up to speed on issues of illuminance, color temperature, and light trespass, all of which are relevant for preserving darkness to benefit wildlife, human health, and the cultural treasury of the night sky. Because enforcement of lighting ordinances is difficult (municipal staff rarely work at night), education and peer pressure are more effective than penalties.

Principles of Good Lighting

Brian Liebel discussed the development by DarkSky International and the Illuminating Engineering Society of the Five Principles of Responsible Outdoor Lighting, now two years old, based on the idea of being conscious about how light affects people, flora, fauna, and night sky and being responsible with light:

- useful: Use light only if it is needed
- targeted: Direct light so it falls only where it is needed
- low level: Light should be no brighter than necessary
- controlled: Light only when it is needed
- warm: use Warmer light (lower color temperature) when possible

He also described that DarkSky International is developing policy templates for state legislation and municipal ordinances, noting that language should be concise, accessible, consistent, and accurate.

Standards of the Illuminating Engineering Society

Billy Tubb from the Illuminating Engineering Society (IES) described some of the history and efforts of the IES. The IES believes that education on lighting is critical. Billy noted that the technological landscape for lighting has changed dramatically, with LEDs virtually replacing other types of lighting within the last 10 years; LEDs offer opportunities as more controllable and can be designed to be good for dark skies. Billy described some of the IES standards and notes that the IES intends to update their standards every two years. All of these are available (at a cost) through the IES lighting library.

Challenges and Opportunities

During a short morning breakout session, groups were asked to discuss large scale goals and challenges. Feedback included:

- Key way to promote dark skies is through promoting the economic benefits.
- Education is key: why does darkness matter and why is it important? Need to educate people and have them contact legislators, show up at city council meetings, etc. It takes individual actions to promote quality lighting. Shift perception from 'dark is a four-letter word'. Promote connection with biodiversity protection.
- How to show people that brighter is not better? Create a different message about lighting quality not relying on brightness. Ecotourism, eco-biodiversity, eco-star (saving the ecology around all the different things being affected by light pollution).
- Enforcement is a challenge, but important: educate code enforcement, educate Albuquerque, Santa Fe, etc.
- Need to promote shielded lighting.
- Needs to be a more direct approach to address light trespass
- Use imagery to show the impact of lighting issues: fireflies, insects attracted to lighting, etc.
- Broaden support : involve tribal organizations, involve angler (which rely on insects), other.
- Think of other things to advertise like bat populations.
- Have a ready-resource center available for people so everyone (citizens and city councils) can refer to the same information.
- How do you approach the "enemy"? The term 'recommended', and the term 'audit'. How do you address 'what's in it for me?'. Like comparing bulbs, what's better for the pocket book.

- Night sky protection act: Statewide that will affect all counties and cities. Long-term goal would be a set of rules that will change the way NM deals with LP. Requires a big coalition, need public support in order to get ordinances and legislation passed. Need to better organize, how to get politically organized to gain support and get these measures passed.
- Bringing these issues to our legislators. Takes an education effort. Requires more community engagement. Creating something that can move small communities to better ordinances. Hope to have further meetings like this, to maintain the momentum, really good turnout, and invite others like from the utilities/cities, etc.
- Win-win for citizens and advocates alike: recognition programs for companies, inspected by individuals to see certain facilities and see if they are compliant. Texas, McDonald Observatory provides this service.

Actions: Reports of Groups

During an extended afternoon breakout session, groups were formed around specific topics/interests: economic development, ecological issues, ordinances/enforcement, the NM Night Sky Protection Act, and preserving dark sky places (an education/outreach group did not achieve critical mass). Groups were asked to try to develop specific actions to take related to their topic.

Economic development

- Focus on astro tourism, attracting adults and children to witness pristine dark skies.
- Develop camping/glamping and tourism programs with DarkSky Approved Lodging (DarkSky Campers as well)
- DarkSky approved lodging can bring people to the state for economic development
- Implement an economic development recognition program for dark-sky friendly efforts

Ecological

- Develop map habitats for insects, moths, fireflies, and invertebrates that are affected by dark skies
- Write a series of op-ed letters for newspapers and engage in social media campaigns, topics could include: invertebrates, birds, human health, etc.
- Launch a "Lights Out" program to reduce artificial light at specific times.
- Educate on the effects of artificial light on animals, expanding to human health.
- Organize dark sky festivals to raise awareness.
- Consider how to take advantage of pollinators to raise awareness

Ordinances

- Establishment of ordinances - the roadblocks (jargon, technical details, crime)
- Address challenges in Los Alamos related to light pollution.

- Provide a toolbox for establishing lighting ordinances throughout the state and involve various stakeholders. Involve subject matter experts.
- Encourage each county to adopt a light ordinance within 3 to 5 years.
- Goal for this year: have one city in each county adopt an ordinance (32 counties)
- Certify processes with DarkSky International templates, and improve ordinances in specific areas.
- Roadblock sometimes is the police departments – concern over crime. Develop documentation about crime and lighting: educate on security lighting and promote LED usage.
- Direct connections important - involve city/county officials
- Involve the departments of transportation
- Having impact on city leaders; boots on the ground, how to make contact and get them to be advocates
- Address local ordinances and update language for clarity.
- Learn from successes in the Permian Basin regarding audits
- Better ordinance in Socorro and Magdalena
- Long term action items = better ordinances to get cities to adopt them

Night Sky Protection Act

- Tighten exceptions for mining, farming, and billboards.
- Collaborate with electric co-ops to ensure responsible lighting practices.
- Plan for better lighting by 2027, considering tourism, economic outcomes, and
- Include enforcement
- aim for 2025 session
- update to lumens, use BUG standards,
- Consider the conflicts that might turn up, e.g., oil & gas, billboards, agriculture, electric coops and utility companies
- Statewide statute, ordinances can be more stringent
 - Lower the angle to 80 degrees
 - Close up loopholes of gas & oil industries, mining and farming
 - Billboards, how to handle them
 - Electric co-ops; some of them are encouraging more lighting... trying to generate more consumption at night.
- Enforcement: who enforces state laws? How can we enforce more than just state-owned buildings?

Dark Sky Places

- Seek certification from DarkSky International for various locations. Establish IDSP mentorship and information repositories.
 - Emphasize advantages and bragging rights of certification.
 - Develop a centralized knowledge place for lighting management plans.
 - Work with private property owners, especially in dark sky corridors.

- El Malpais would like to apply
- Site of the Enchanted Skies Star Party and Magdalena Ridge Observatory site
- the process for application is difficult and takes time; need help from organizations that have already achieved Dark Sky status
- BLM working on getting certification, and they talked about the process
- Along Hwy 60, working on a similar project. Cost \$200 to start the process; several categories to work on, what about observatory sites become certified?
- What can be done to get the process done faster, getting more resources available to help applicants to understand the requirements
- Centralized knowledge base
- Regular meetings with chapter leaders, help chapters to get the information ready for the DS Place applicant.
- Short term: put more effort into those that are in progress to get them over the finish line.
- Need more in the state of NM, even though there's a lot more area that could be included as DS Place

Education/outreach

- Establish educational facilities or central libraries with guidelines on dark sky awareness.
- Address perception that more lighting increases security. Education to police departments.
- health concerns, wildlife
- Can we encourage people to turn in their bad lights? Source of funding? Tourism has a tax that helps such a program? This is longer term.
- Outreach to city councils and code enforcement needed about benefits of shielded lighting
- Unnecessary lighting proliferation; why are utilities subsidizing light bulbs?
- Education to discuss the benefits of dark skies, needs to better inform people about these.
- All comes down to education

Post meeting feedback on suggestions for actions

Post-meeting questionnaire include the question: Are there any key action items that you think should be undertaken with regard to dark skies? These can be items that struck you at the meeting, or things you thought of after the meeting. Responses included (after removing duplicates and duplicates of items noted above):

Outreach/education

- Outreach to the general public (the average New Mexican) on all of the ways that ALAN can negatively affect us, but how simple it is to control. Interaction with city councils and county commissioners to explain the issue and solutions. A standard lighting survey of municipal areas to convey the problem and show the solutions.

- Better communication with events and communities. Not just what you call outreach but also press releases for all events across the state to all the media outlets.
- Include legislators and/or their staff; they will ultimately be the power behind any change.
- Education, education, education. I did not realize how important dark skies are to defense, biology, as well as human comfort.
- Organize a social media campaign amongst parties across the state to bombard people with dark sky info at one time. April is astronomy month so this could be a good time to do it. Social media is an easy lift and very low cost (if any).
- Education needs to be strengthened. Ordinances should be worked on. NM DSPA needs to be worked on.
- Education- Series of op-eds to inform the public.

Ordinances/enforcement

- Working to get better state-wide regulation of lighting
- Improving the Night Sky Protection Act
- We definitely need to add some enforcement to the dark skies laws that are being passed. It was good to have people from so many different sectors at the table. I hope that this can be continued into the future. I think the solutions to Dark Skies issues in NM will require many groups at the table and a long-term view to make progress.
- 1) Updating NM dark sky legislation would provide a foundation for cities/towns/communities in NM to help with local outreach and partnerships on creating dark sky towns and destinations. 2) Help for how to get buy-in from local city councils that have other agendas and don't see the value of dark skies so don't want to participate in decreasing light pollution.
- working to enact ordinances in the larger cities, but also in the darkest counties in NM to preserve the darkest areas

Preservation of dark sky places

- If/when the dark skies certification program for lodging is available, we can encourage select lodging properties in the state to apply for that certification.
- Coming from the conservation world it felt that this meeting was overly focused on urban areas, lighting ordinances, and lighting technology, with little to no discussion about the value of conservation work in keeping undeveloped lands undeveloped, and therefore contributing to protection of dark skies (including outside of designated dark sky places).
- Feels like there is opportunity here to create a broader coalition or community of interest with an emphasis on wilderness, national monument, or other land designations that keep undeveloped/wildlands in that state...

Other

- Continue to expand the consortium of organizations affiliated with the NM Chapter.
- Identify key stakeholders in NM population centers to spearhead dark sky preservation

statutes.

- (1) Arrange for NM to offer Dark Skies license plates. (2) Explore the concept of light trespass. This may appeal to Gadsden-flag types in a way that other light-pollution concepts don't.
- The other ideas directed to government levels I heard were all good. An emphasis on merely feel-good actions like closing drapes at night to protect the sky are a harmful distraction from the collective & government actions that must be taken to deter light-pollution defectors, who are most of the problem.
- I would have liked to know who was in the room

Post-meeting feedback on groups to contact/include

Post-meeting questionnaire posed the question: If there are groups that you think we should contact to broaden our coalition to work on dark skies issues, note them here (with contact information if you have it). Responses included:

- Since the meeting, I have reached out to all of the Audubon chapters in the state about partnering on a lights-out during bird migration campaign. I have received positive feedback from Audubon Southwest and the Albuquerque chapter.
- From an economic development and tourism perspective, representatives from local chambers of commerce, MainStreet programs and destination management organizations should be invited to future workshops so they can learn more about the dark sky experience in their region and what they could do to lean into that as a strategy for destination promotion. Additionally, it might be nice to find ways to include representation from the Department of Transportation since I assume they manage a lot of the construction and maintenance of road lighting throughout the state.
- Space Festival and Spaceport America in Las Cruces. White Sands Missile Range. NASA in Las Cruces. All NM chambers of commerce and tribes (example, I am sure the Mescalero Apache homelands would participate).
- Groups with financial resources interested in making the world a safer and healthier place i.e. those who support PBS, NPR and other non profits. All PBS and NPR programs list the folks who support and finance each of their programs.....the lists of supporters are there, make use of them.
- New Mexico Medical Association, NM Fish & Wildlife Dept., Indigenous organizations (reps from Navajo Nation, Pueblos)
- Quivira Coalition (ranchers, government agencies, environmentalists). New Mexico Association of Counties and any equivalent mayors group.
- We should continue to reach out to the tribes. I believe that some will eventually contribute to the effort. We also should reach out again to potentially friendly folks who did not respond to the meeting invitations.
- Depends on action to expand the focus of this coalition to include federal public lands and possible state lands protection efforts. If this is incorporated into the priorities of this coalition I could recommend other groups.

- Possibly Citizen's Institute on Rural Design <https://www.rural-design.org/>

Appendix A. Agenda

- 9:30-10:00 : Introductions
 - Introduction / motivation /agenda : Jon Holtzman
 - Importance of Dark Skies and DarkSky International : Ruskin Hartley
- 10:00-11:30 : Building a broader coalition : perspective and ongoing efforts
 - 14 short presentations from various groups
 - Cody Johnson : NM True
 - Grady Owens : NM Skies
 - McKinney Briske/Eamon Brennan : BLM
 - Peter Lipscomb : NM State Parks
 - John Winscott / Brian McLoughlin (State lands office)
 - Zandra Fleming : NMOGA
 - Brian Jensen : Santa Fe Conservation Trust
 - Trish Cutler : WSMR/DoD/Audubon
 - Anna Walker : NM Biopark
 - Catherine DeMaria / Marisela LaGrave : Dark Sky Land
 - John Briggs : Astronomical Lyceum
 - Antoine Ribaut : Magdalena Astronomical Society
 - Eileen Ryan : New Mexico Tech
 - Robert Johnson : Starfire Optical Range
 - 11:30-12:00 : Short breakout sessions
 - Ideas for broadening coalition, working together, dreams, and challenges
- 12:00-1:00 : LUNCH
- 1:00-2:00 : Dark sky information and resources
 - NM Night Sky Protection Act : Peter Lipscomb (State Council/NM State Parks)
 - Local ordinances in NM : Galen Gisler (State Council)
 - Best practices and DarkSky International resources : Brian Liebel (DarkSky International)
 - IES Standards and technical tools : Billy Tubb (Illuminating Engineering Society)
- 2:00-3:30 : Breakout sessions on specific topics: developing actions
 - 40 minute group discussion
 - 40 minute group feedback
- 3:30-4:00 Closing comments / future plans

Appendix B. Attendees

This is a list of expected attendees, so there may be a few people listed who did not attend, and a few people who attended that are not listed, but should be mostly correct. A few people attended remotely.

Name	Affiliation
Michael Rymer	DarkSky Intl.
Brian Liebel	DarkSky Intl.
Ruskin Hartley	DarkSky Intl.
Jamey Eriksen	State Council / APO
Nick Knorr	State Council
Jon Holtzman	State Council / NMSU
Sheila Sullivan	State Council
Marisela La Grave	State Council / Dark Sky Land
Derek Wallentinsen	State Council / NM Mountain Club
Peter Lipscomb	State Council / New Mexico State Parks
John Briggs	State Council / Dark Sky Land / Magdalena Astronomical Society
Gary Starkweather	State Council
Michael Hensley	State Council / Dark Sky NM
Galen Gisler	State Council
Billy Tubb	Illuminating Engineering Society (IES)
Kaitlin Haase	Xerces Foundation
Anna Walker	NM BioPark
Trish Cutler	Mesilla Valley Audubon Society, NM Avian Conservation Partners, DoD Partners in Flight, DoD PIF Energy and Infrastructure Working Group
Luke Koenig	New Mexico Wilderness Alliance
Michael Casaus	Wilderness Society
Brian Jensen	Santa Fe Conservation Trust
Corrina Feldman	VLA
Michelle Creech Eakman	NM Tech/ MRO
Eileen Ryan	NM Tech/MRO
Van Romero	NM Tech
Jennifer Pedneau	Carroll Petrie Foundation
Mike Toomey	Asterion Foundation
McKinney Briske	BLM
Jennifer Merino	BLM
Geoff Goins	NPS
Priscilla Hare	Bandalier National Monument
Sarah Milligan	Bandalier National Monument
Sarah Puckette	NPS

Lisa Dittman	National Park Service, El Morro and El Malpais NMs
Jim Fordice	Director, GNT Observatory, Albuquerque Astro. Society
Steve Snider	TAAS President
Peter Eschman	TAAS
Jeff Cooper	San Simon Astronomical Society
Antoine Ribaut	President, Magdalena Astronomical Society
Darrel & Lorraine Moon	Magdalena Astronomical Society
Cody Johnson	New Mexico Tourism (New Mexico True)
Lynn Rice	New Mexico Skies Observatory
Grady Owens	NM Skies
Larry Wilson	Astronomers Paradise
Dan Champion	Astronomers Paradise
Judith Wilson	Astronomers Paradise
Diana Casas Hensley	Partner, Dark Sky NM
Catherine DeMaria	Warehouse 1-10 Gallery and Performance Space
Zandra Fleming	chair, Working Group, NMOGA
John Winscott	Deputy Director Oil, Gas and Minerals Division
Eamon Brennan	Assistant Field Manager, Rio Puerco Field Office, Bureau of Land Management
Brian McLoughlin	State Land Office; Oil, Gas and Minerals Division
Robin Martin	"The New Mexican" Newspaper
Elva Osterreich	Editor, Desert News
Jessica Carranza	Editor, El Defensor Chieftain
Gregory Spitz	MIT Lincoln Laboratory Experimental Test Site at White Sands
Mark Cornell	McDonald Obs, retired
Dr. Robert L. Johnson	USAF Starfire Optical Range
Chris Orwoll	Director, New Mexico Museum of Space History
Michael Shinabery	NM Museum of Space History
Tony Gondola	NM Museum of Space History
Jim Greenhouse	Space Science Director, New Mexico Museum of Natural History and Science
Geoff Skelton	Planetarium Technician, NMMNH&S
Eric Toops	Etronix
Jim Seargeant	DarkSky member
Debbie Conger	DarkSky member
Eric Dose	DarkSky member
Mark Goodman	DarkSky member
Misa Bloom	DarkSky member
Phillip Oltmann	
Didier Saumon	DarkSky member
Jeffrey Seres	architect
Joseph Karnes	land lawyer
Jim Price	

Appendix C. Expressions of interest in committees from post-meeting survey

Trish Cutler : My expertise is in wildlife, but I think to reach the general public we need to get out there and talk about all aspects of the problem.

Jim Price : Education of those who can enforce the codes. I have experienced code enforcement not understanding that a shielded fixture produces usable light and that the "light source" should not be visible from adjacent property.

Mark Goodman : ecology/biology/health, or education/outreach/community engagement

Robin Martin

Joseph Karnes

Robert Johnson : education/outreach/community engagement (however, I need to check with legal counsel to see if am allowed to serve on a committee)

Zandra Fleming : economic development (industry focus)