

# **DARK SKY PROJECT**

**CAPRICE PHILLIPS  
SLEEPING BEAR DUNES NATIONAL LAKESHORE  
NIGHT SKIES ASSISTANT  
SUMMER 2016**



# MOSAICS IN SCIENCE

- Internship Program that provides youth that are under-presented in natural resources science career fields with on-the-ground, science based work experience with the National Park Service
- Funded through the National Park Service and partners with the Greening Youth Foundation



**Greening Youth**  
FOUNDATION

# INTERNATIONAL DARK SKY ASSOCIATION

- “To preserve and protect the nighttime environment and our heritage of dark skies through environmentally responsible outdoor lighting”



[www.darksky.org](http://www.darksky.org)

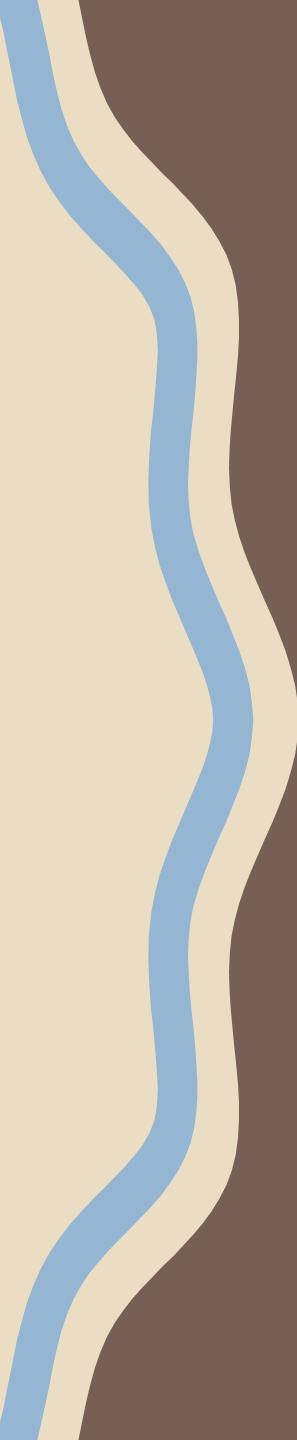


# SLEEPING BEAR DUNES NATIONAL LAKESHORE



# HOME SWEET, LYME DISEASE?



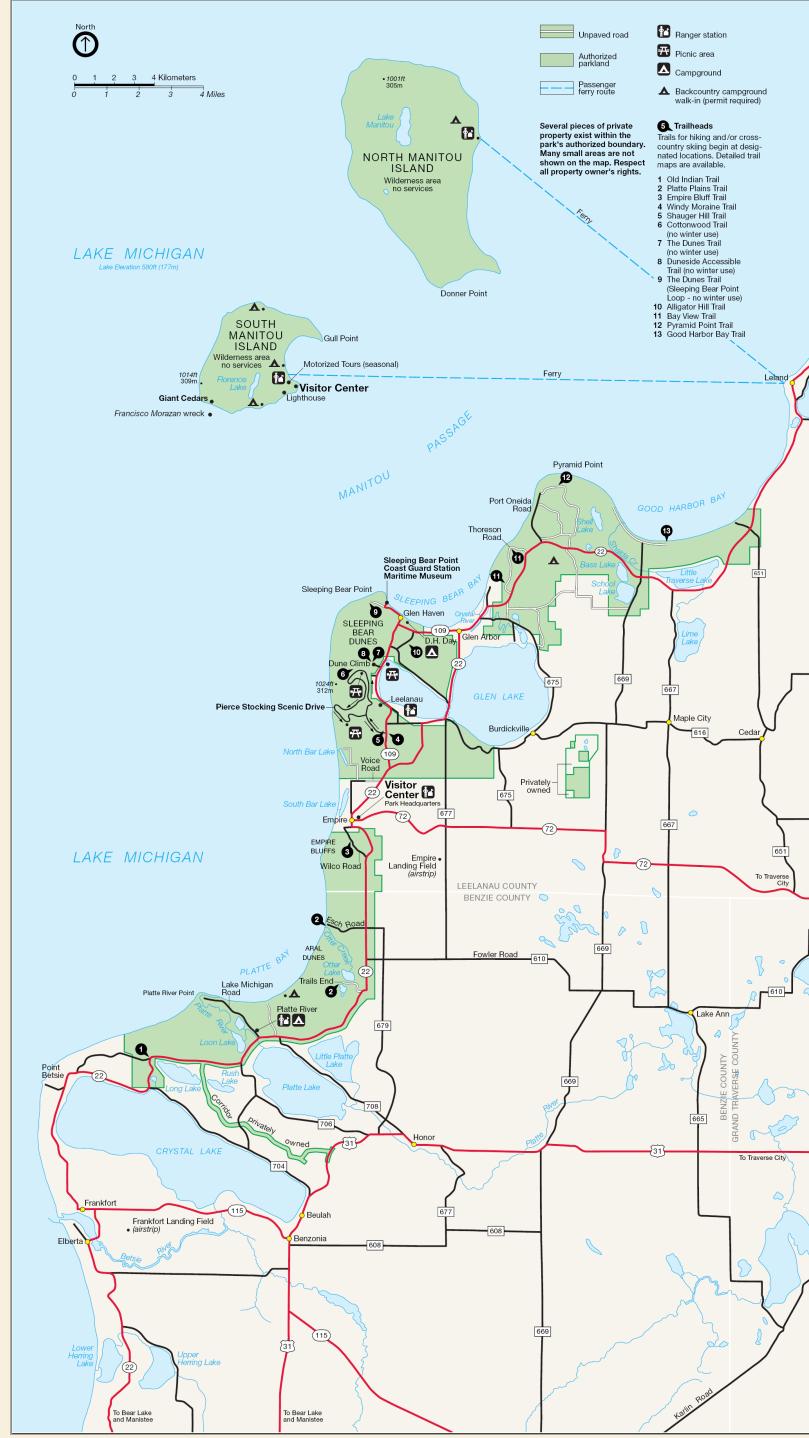


# PROCESS OF LIGHTING INVENTORY

# LIGHTING INVENTORY

- Photo documented exterior lights on buildings that Sleeping Bear Dunes National Lakeshore owns.
- Collected data on light fixtures (wattage, type, etc.)





# PLATTE RIVER DISTRICT



# LEELANAU DISTRICT



# NORTH AND SOUTH MANITOU ISLANDS





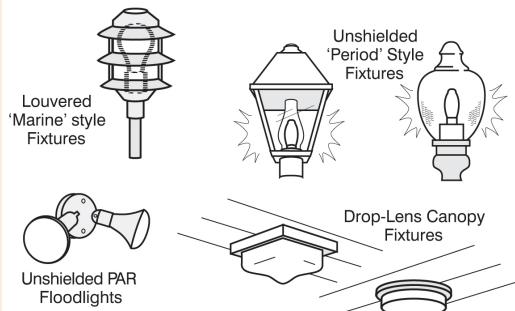
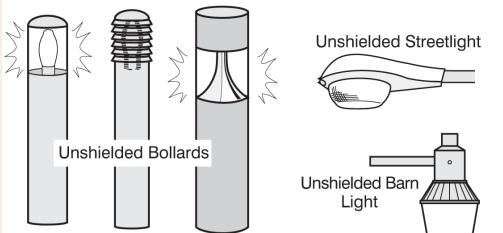
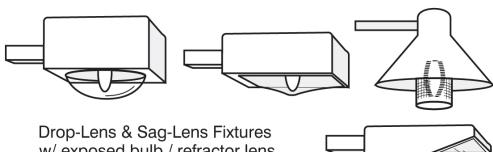
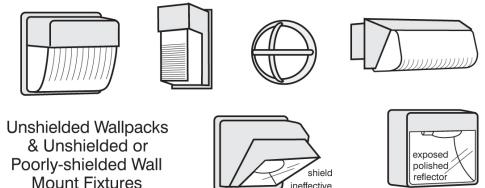
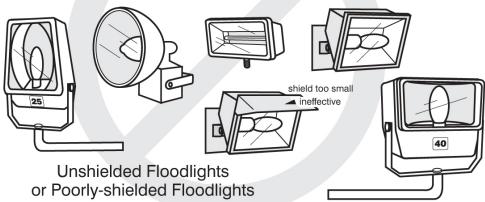
# THE GOOD, THE BAD, AND THE UGLY



# Examples of Acceptable / Unacceptable Lighting Fixtures

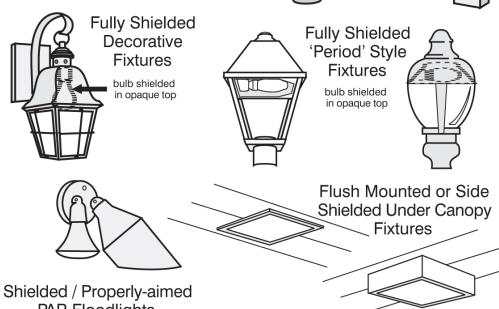
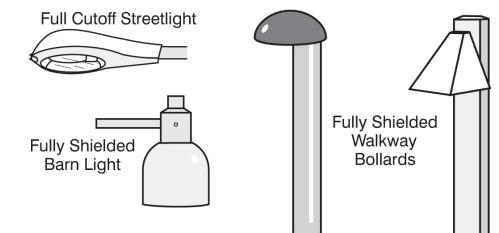
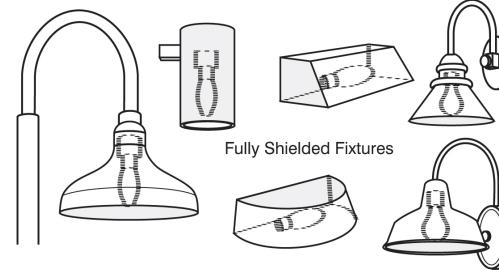
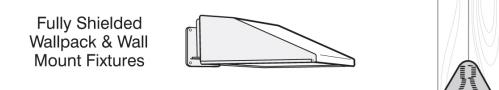
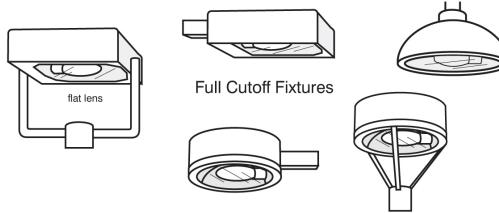
## Unacceptable / Discouraged

Fixtures that produce glare and light trespass



## Acceptable

Fixtures that shield the light source to minimize glare and light trespass and to facilitate better vision at night



## Platte River District Lighting Inventory



Location	Fixture	Fully-Shielded	Photo	<500 lumens	Application	Conformity with Proposed Lighting Zone
Platte River Campground Maintenance Office	3 fixtures 13W Fluorescent Photocell Yellow	Partial (roof eave)		NO	Building egress	NO (recessed canopy)
Platte River Campground Amphitheater	35 fixtures 9W Flush Compact Wall Lights Photocell Yellow	NO		NO	Pathway illumination	NO (install grate that points light downward)
Platte River Campground Amphitheater	29 fixtures Bollards 13W Photocell Fluorescent Yellow	NO		NO	Pathway illumination	NO (replace with fully-shielded fixture)
Platte River Campground Amphitheater	2 fixtures 9W Photocell Fluorescent Yellow	Partial (roof eave)		NO	Under projection booth door	NO (recessed canopy)

# TOTAL RESULTS

- Sleeping Bear Dunes National Lakeshore
  - Total: 341 lights
    - 64 lights Fully-Shielded (18.8%)
    - 277 lights not Fully-Shielded (81.2 %)





# LIGHTING ZONES

<b>Lighting Zone</b>	<b>Purpose</b>	<b>Continuity of Illumination</b>	<b>Allowances</b>
<b>NDZ</b>	A Naturally Dark Zone (NDZ) where <b>no permanent lighting is allowed</b> , providing the best possible protection of natural lightscapes. Temporary artificial light limited to only where needed for human travel or work.	<b>None.</b>	Only small portable lighting allowed for human travel through this zone- flashlights, headlights, etc. <b>This is the default lighting zone for undeveloped areas in parks.</b>
<b>LZ00</b>	To provide an <b>absolute minimal level of lighting</b> for human safety, minimal disruption of natural character. Lighting is installed for discrete tasks only.	<b>No continuity of lighting.</b> Permanent lighting is utilized only at critical safety areas, and unlit areas predominate.	Lighting restricted to specific applications (i.e. egress lighting, steps). Preference for non-white light with good glare control and minimal brightness.
<b>LZ0</b>	To provide a <b>reasonably low level of lighting for basic human safety and basic park operations</b> , with minimal disruption of natural character.	<b>Lighting is largely discontinuous</b> , and within the zone there are substantial unlit areas. Some high use corridors may have continuous lighting.	Lighting is used for a variety of safety and operational needs. <b>This is the default lighting zone for developed areas in parks.</b>
<b>LZ1</b>	To provide a <b>modest level of lighting to meet visitor expectations, safety concerns, and park operational needs</b> in busy park environments.	<b>Lighting is largely continuous</b> along corridors and somewhat uniform.	Most lighting applications permitted, but at illumination levels below typical suburban or residential practices.
<b>LZ2</b>	<b>For parks in urban areas</b> and with a high ambient illumination level, but are also not adjacent to sensitive natural areas.	<b>Lighting is generally continuous and uniform</b> and designed to blend with surrounding urban or suburban environment.	Best lighting practices are used throughout and lighting is exemplary of night-sky friendly principles. This zone is only warranted within and adjacent to urban / suburban environments.

# TOTAL RESULTS FOR LIGHTING ZONES

- Platte River District [Southern Part of Park]
  - ~LZ0
- Leelanau District [Northern Park of Park]
  - ~LZ00
- North and South Manitou Island
  - ~NDZ

# INTERPRETATION ACTIVITIES

- Star Party
- Astronomy Fest





# **LIGHT POLLUTION**

# LIGHT POLLUTION

Wildlife and ecosystems



# LIGHT POLLUTION

Energy Waste  
& Human  
Health



# LIGHT POLLUTION

Energy Waste  
& Human  
Health

- Melatonin
  - Circadian rhythm (body's natural clock)
  - Produced at night



# NIGHT SKY HERITAGE





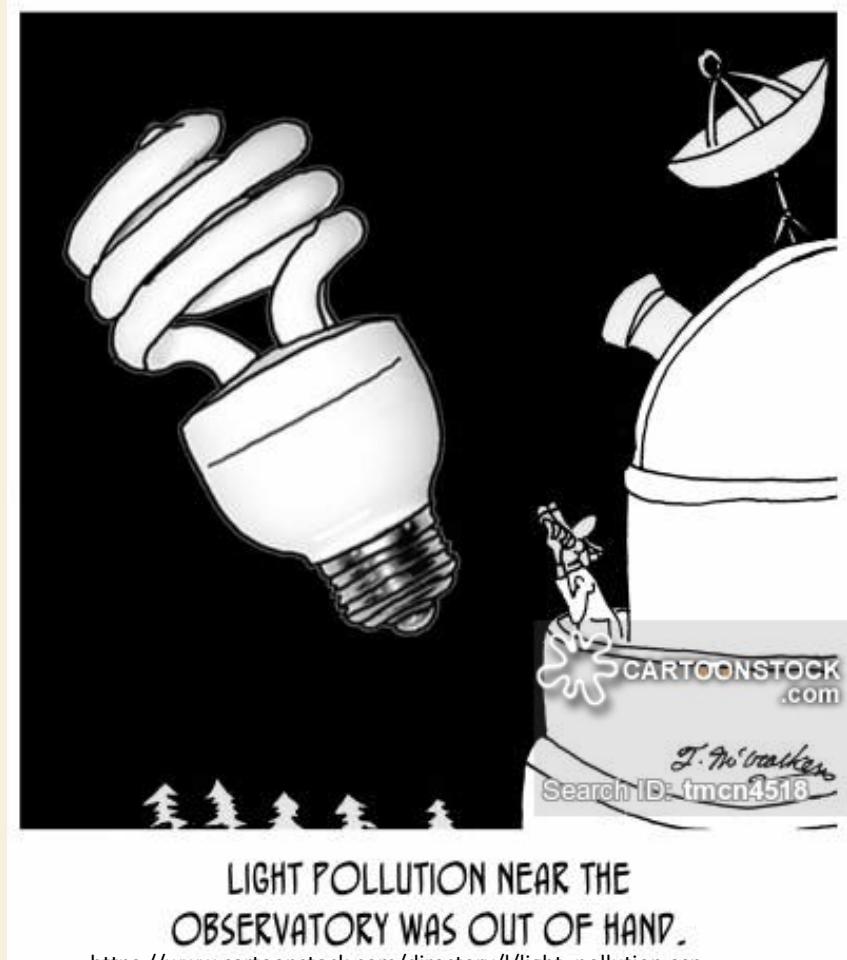
Photo: Milky Way Galaxy over NMI

Image Credit: <https://www.nps.gov/slbe/planyourvisit/exploring-dark-skies.htm>

# ASTRONOMY & LIGHT POLLUTION

MCDONALD  
OBSERVATORY

- Dark Skies Initiative



# WHY IT ALL MATTERS

## NPS

- NPS recognizes the night sky as a natural resource worth preserving and protecting
- National Park refuges for darkness

## SLBE

- Reducing the impact SLBE has on light pollution
- Designation of Sleeping Bear Dunes National Lakeshore Dark-Sky Park

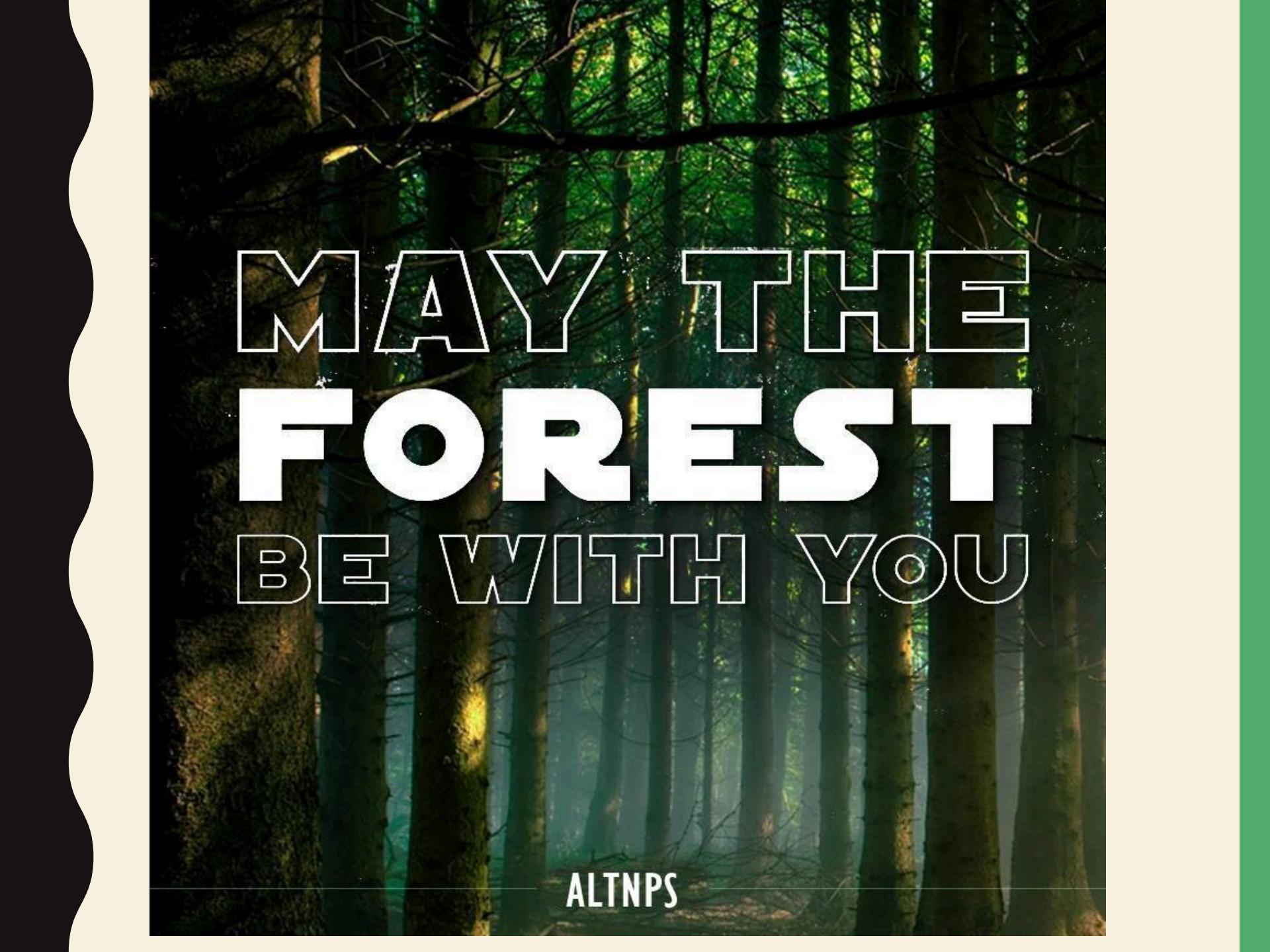
## YOU

- Involves aspects of your life

# ACKNOWLEDGEMENTS

- Mosaics in Science Internship
- Greening Youth Foundation
- National Park Service
- Staff of Sleeping Bear Dunes National Lakeshore
  - Grand Traverse Astronomical Society
  - International Dark Sky Association
    - Kevin Skerl
    - Marie Scott
    - Lisa Griebel
    - Tim Lempke
    - Dr. Jerry Dobek



A photograph of a dense forest. Sunlight filters through the canopy of tall, thin trees, creating bright highlights on the trunks and dappled light on the ground. The overall atmosphere is mysterious and serene.

MAY THE  
**FOREST**  
BE WITH YOU

ALTNPS