

REWI

Renewable Energy Wildlife Institute

Seeking a Common Operating Picture for Solar, Wildlife, and Ecosystems

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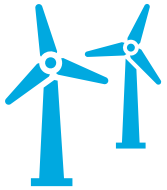
Josh Ennen, Senior Scientist & Solar Program Lead

National States Geographic Information Council, Western Caucus Roundtable 8 April 2025

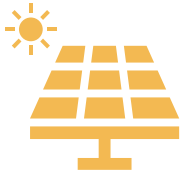
WWW.REWI.ORG

How We Work

Trusted Science



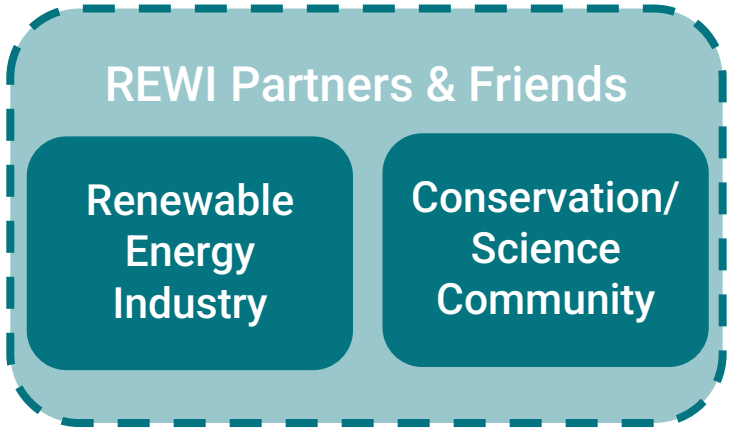
15+ years advancing results for **wind energy and wildlife**



Reframing approach to **solar-wildlife** research

Synthesizing and disseminating **research results**

Essential Collaboration



Real World Impact

Science Dissemination

Outreach to Impact

Informing Responsible Renewable Development

2025 REWI Partners & Friends

Essential Collaboration

Embracing a variety of perspectives to ensure a comprehensive approach

- **40+ Partners and Friends** representing conservation/science organizations, renewable companies, and public agencies, including associations
- **Science advisors** providing technical input on specific projects and products to ensure rigorous review and scientific accuracy.
- **Liaison relationships** with federal agencies and national labs
- **Joint research** with universities/ academics and consultants
- **Engagement** with state and local regulatory groups

Essential Collaboration

Shaping the Future of Renewable Energy

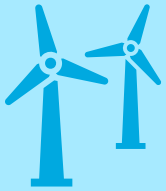
- Our culture of collaboration is shaping the future of renewable energy.
  - **Sector Caucuses**
  - **Cross-sector events and forums**

- Bringing together leading voices in **industry, science, conservation, and regulation** to develop the pivotal questions that need to be addressed
  - **Creative problem-solving**
  - **Expanding REWI-supported programs to external joint projects**

Trusted Science

Documenting state of the science and key questions to produce resources and solutions

REWI Programs



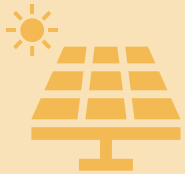
Wind Energy & Wildlife

Addressing risk across key issue areas

- Risk Assessment/ Documentation
- Solutions Assessment
- Compensatory Mitigation

Impact Summaries

Annual Research Meetings



Solar Energy, Wildlife, & Ecosystems

Viewing solar facilities as novel ecosystems

- Holistic approach
- Investigating: Ecological benefits of solar facilities; Regional strategies
- Open to additional topics

Research Plans

Webinars

Information Science

Collecting, synthesizing, and sharing renewable and biodiversity data

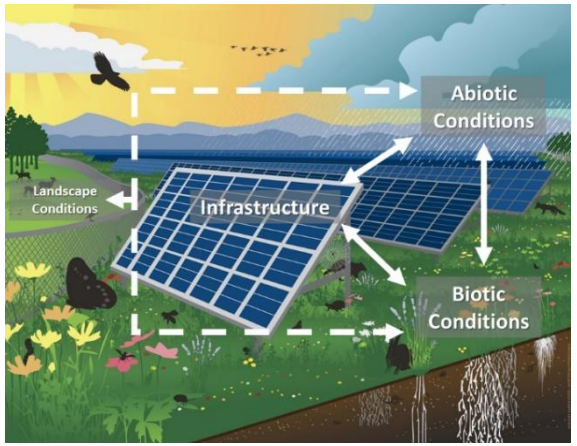
- Research Hub
- Technology Catalog

Data-sharing Platforms

Workshops

Solar Energy, Wildlife, & Ecosystems

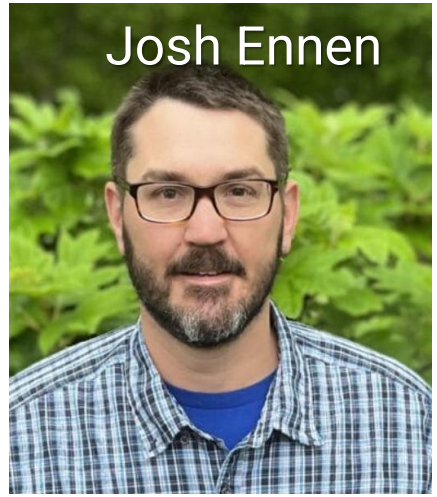
Reframing the approach to solar-wildlife research



Focus: Viewing solar facilities as novel ecosystems

- **Holistic approach**
- **Investigating:** Ecological benefits of solar facilities; Regional strategies
- Open to **additional topics**

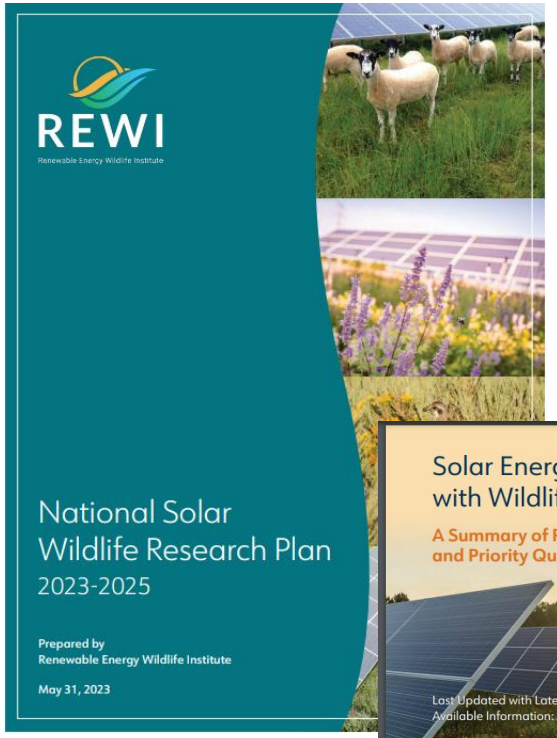
Solar-Wildlife Issues, Research, & Data

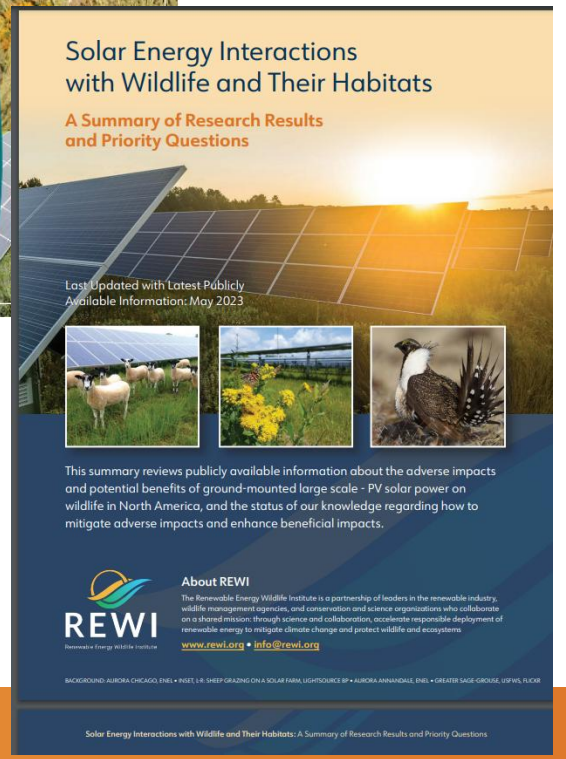


REWI's Program

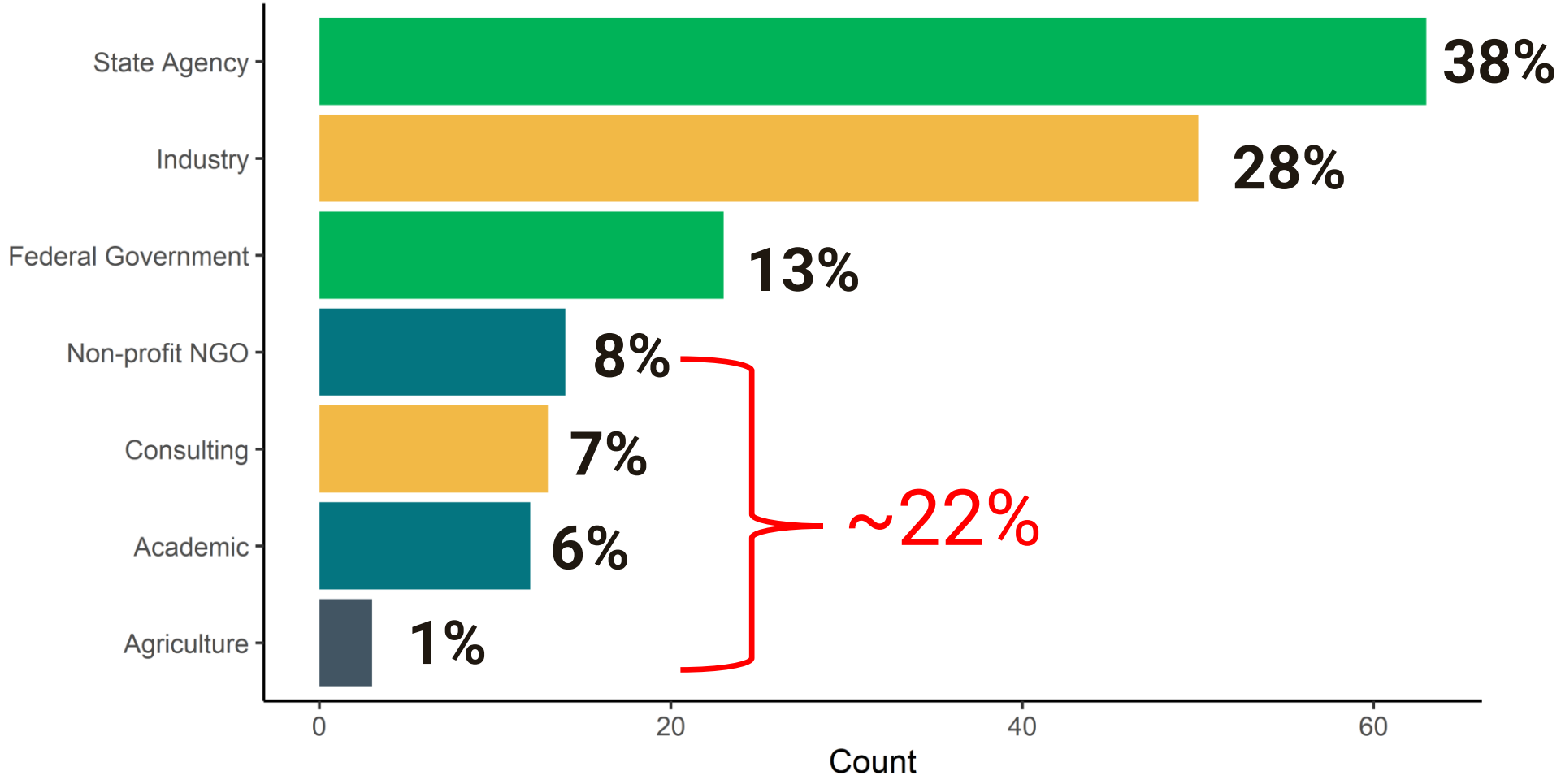
- **National Solar Wildlife Research Plan - 2023**
- **Solar Energy Interactions with Wildlife and Their Habitats - 2023**
- **Solar Symposia – 2021 & 2023**
- **SE Solar Workshop - 2024**
- **SolSource Database (DE-EE0010381)**

- Process
  - **Exhaustive Literature Review**
    - State of the Science
    - Identify research gaps
  - **Assessment Phases**
    - Surveys & Interviews
    - ~ 200 Respondents

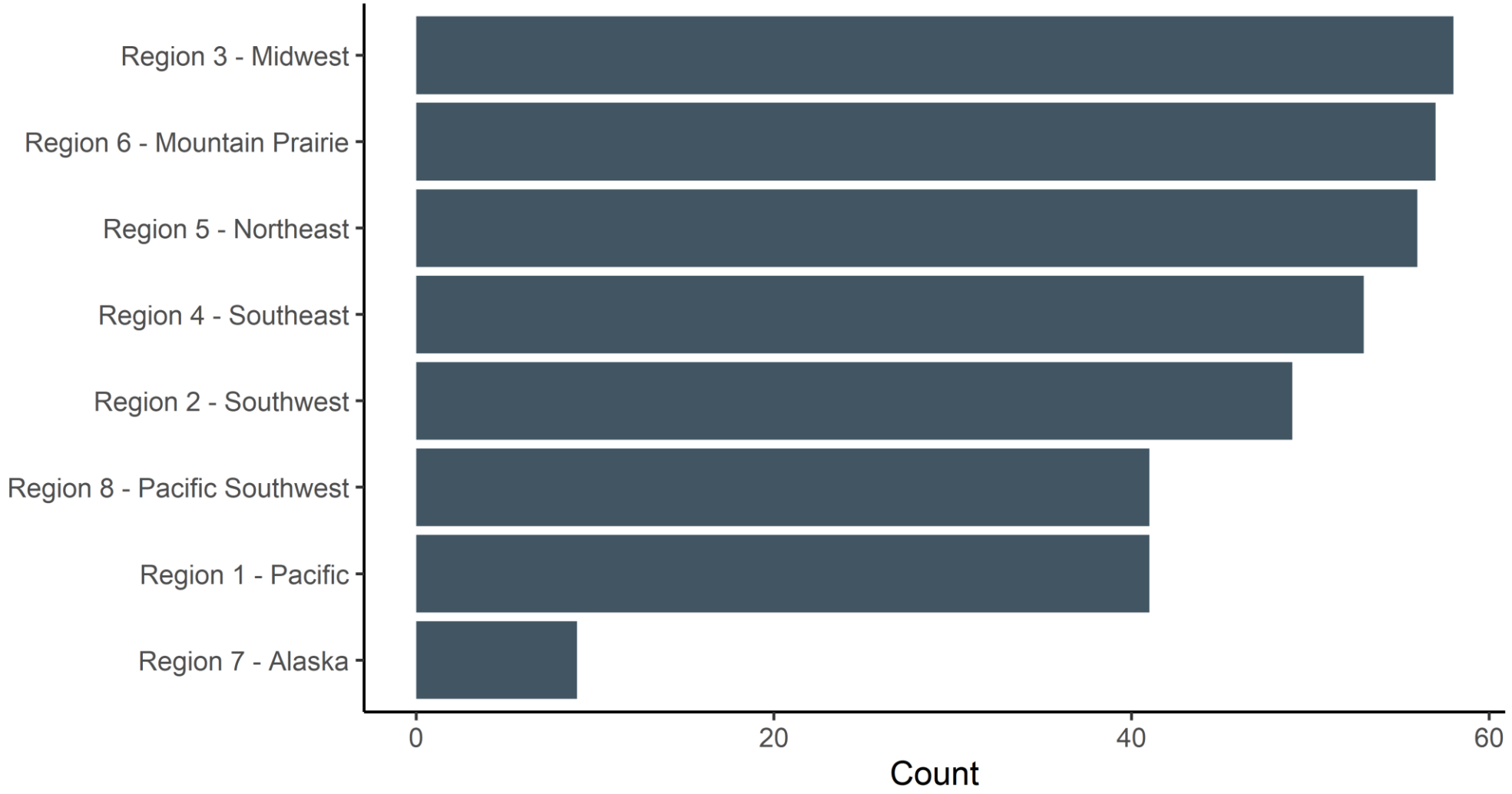




Assessment Phases – Stakeholder Representation

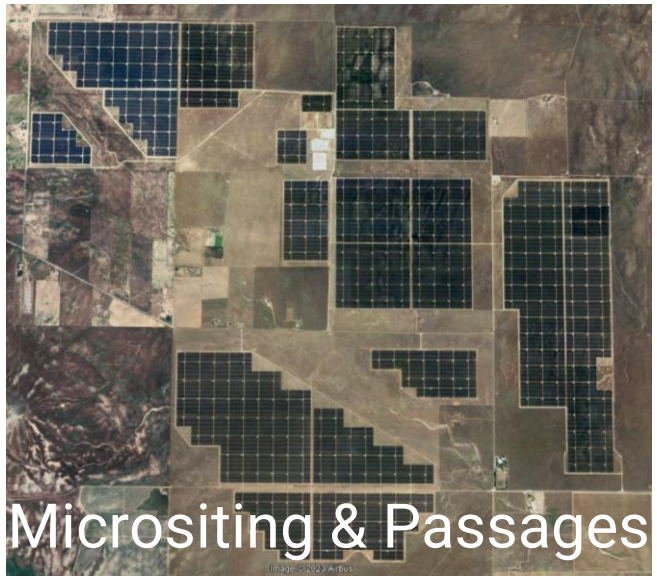


Assessment Phases – Regional Representation



Assessment Phases - What We Heard

- Species Risks/Challenges
  - **What are the species and species groups?**
    - E.g., birds, endangered and threatened species, big game, reptiles/amphibians, bats, etc
  - **What are the risks to wildlife?**
    - E.g., avoidance, habitat loss and fragmentation, displacement, barriers to movement, panel collision



Assessment Phase - What We Heard

- Wildlife & Other Natural Resources
  - **What are the onsite risks?**
    - E.g., Site preparation, vegetation removal, noxious weeds/invasive species, soil health, stormwater management (erosion & aquatic impacts), and microclimate effects
  - **What are the benefits/opportunities?**
    - E.g., Greenhouse gas emission reduction, biodiversity enhancement, vegetation management, dual-use/agrivoltaics, and ecosystem function and services
  - **What do we know about mitigation?**
    - Minimize - Wildlife-friendly fencing, onsite micrositing & deterrence; Avoidance - Siting strategies and planning; Compensatory – offsite actions

Article

https://doi.org/10.1038/s41893-023-01106-8

Dual use of solar power plants as biocrust nurseries for large-scale arid soil restoration

Received: 15 November 2022

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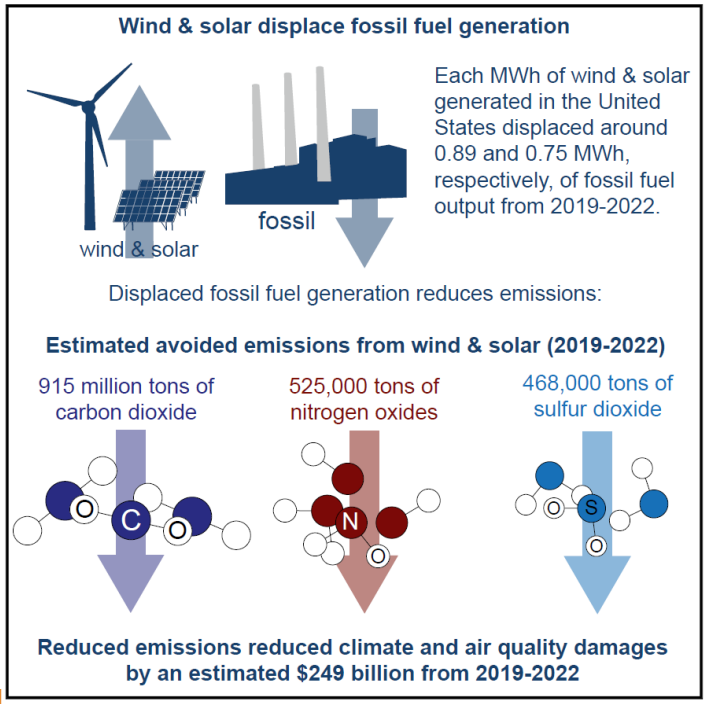
Ana Mercedes Heredia-Velásquez[1,5], Ana Giraldo-Silva[1,2,5], Corey Nelson[1,3], Julie Bethany[1,4], Patrick Kut[1], Luis González-de-Salceda[1] & Ferran Garcia-Pichel[1]

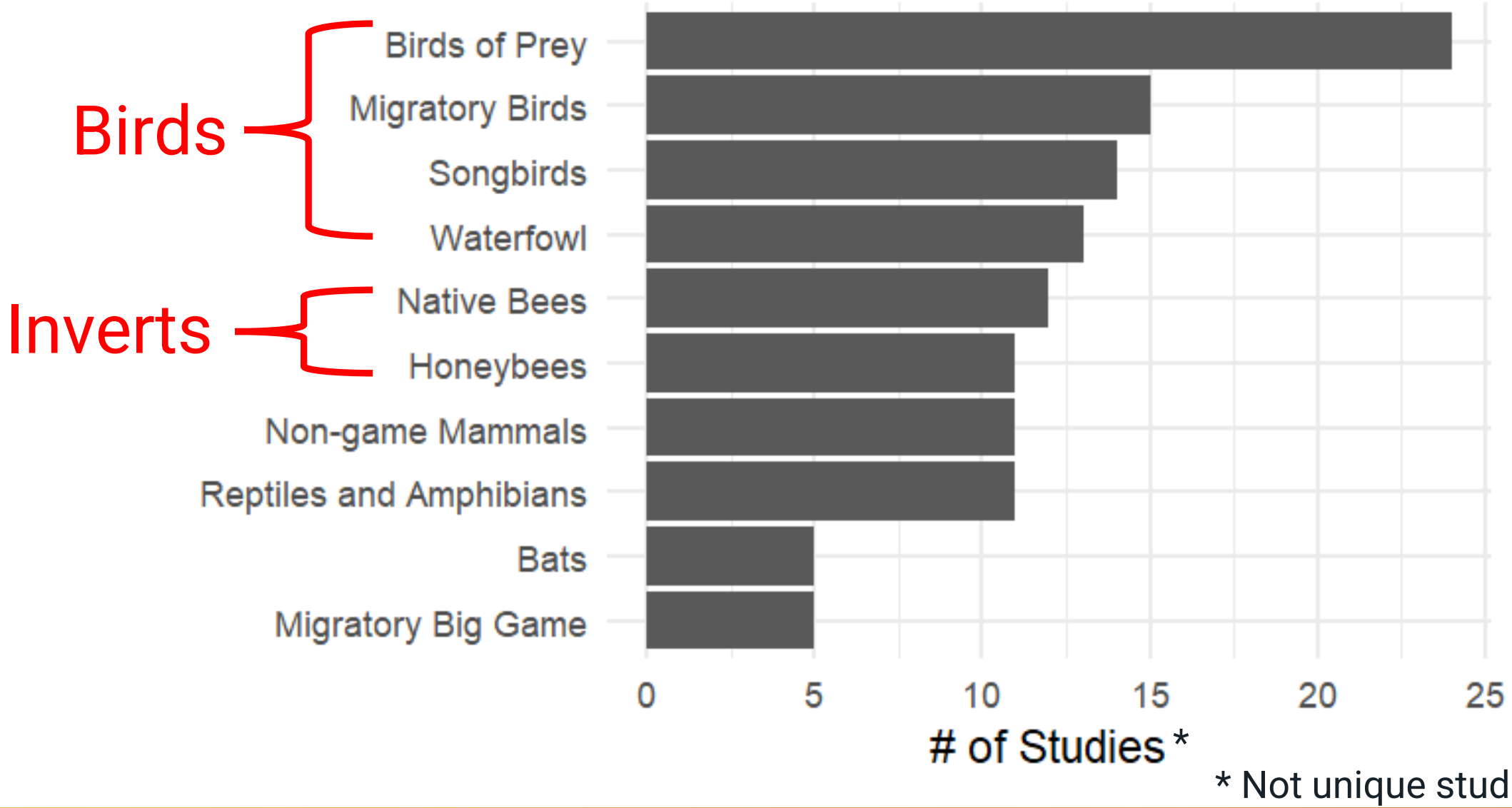
Millstein et al. 2024



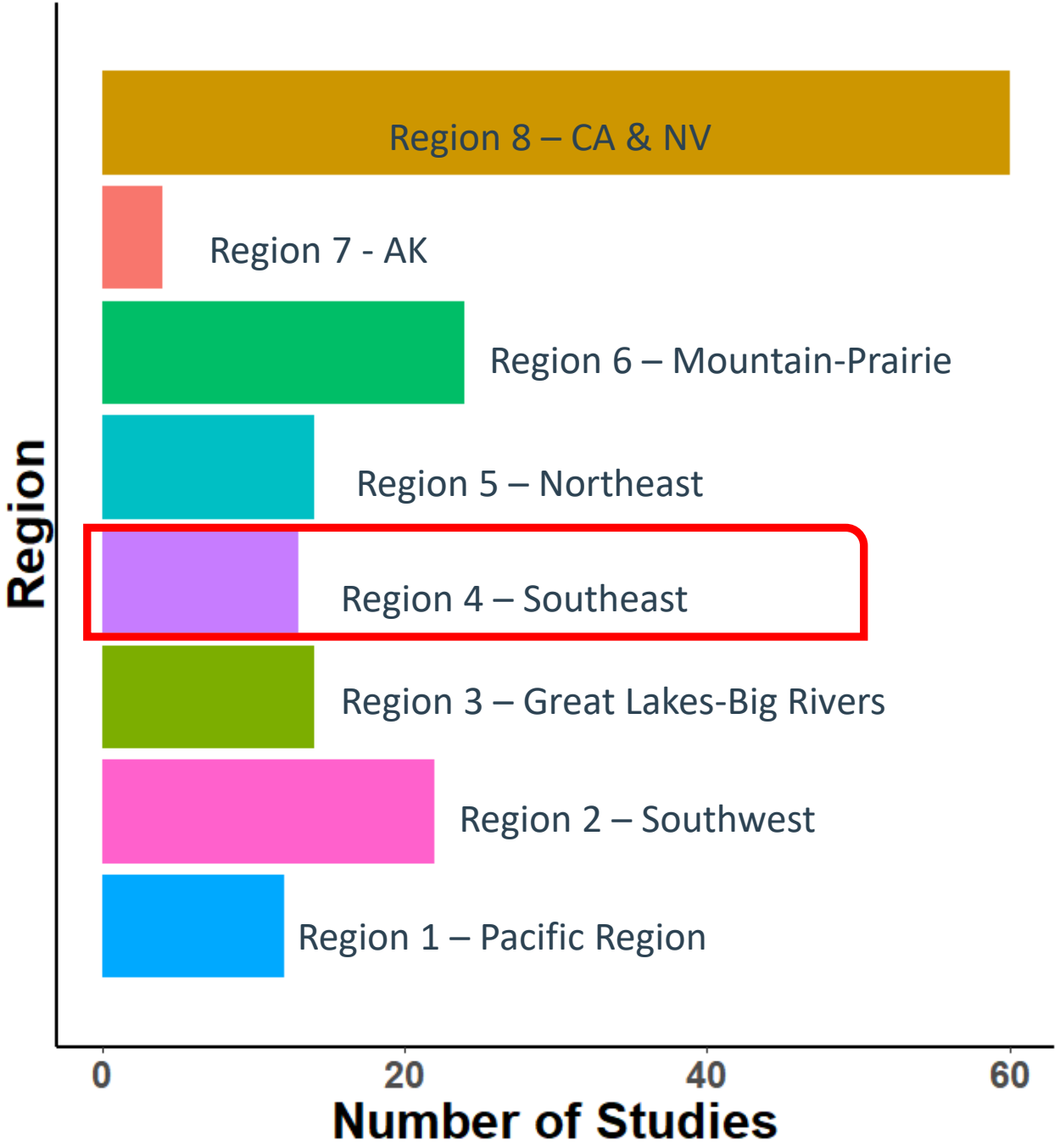
Assessment Phases - Results

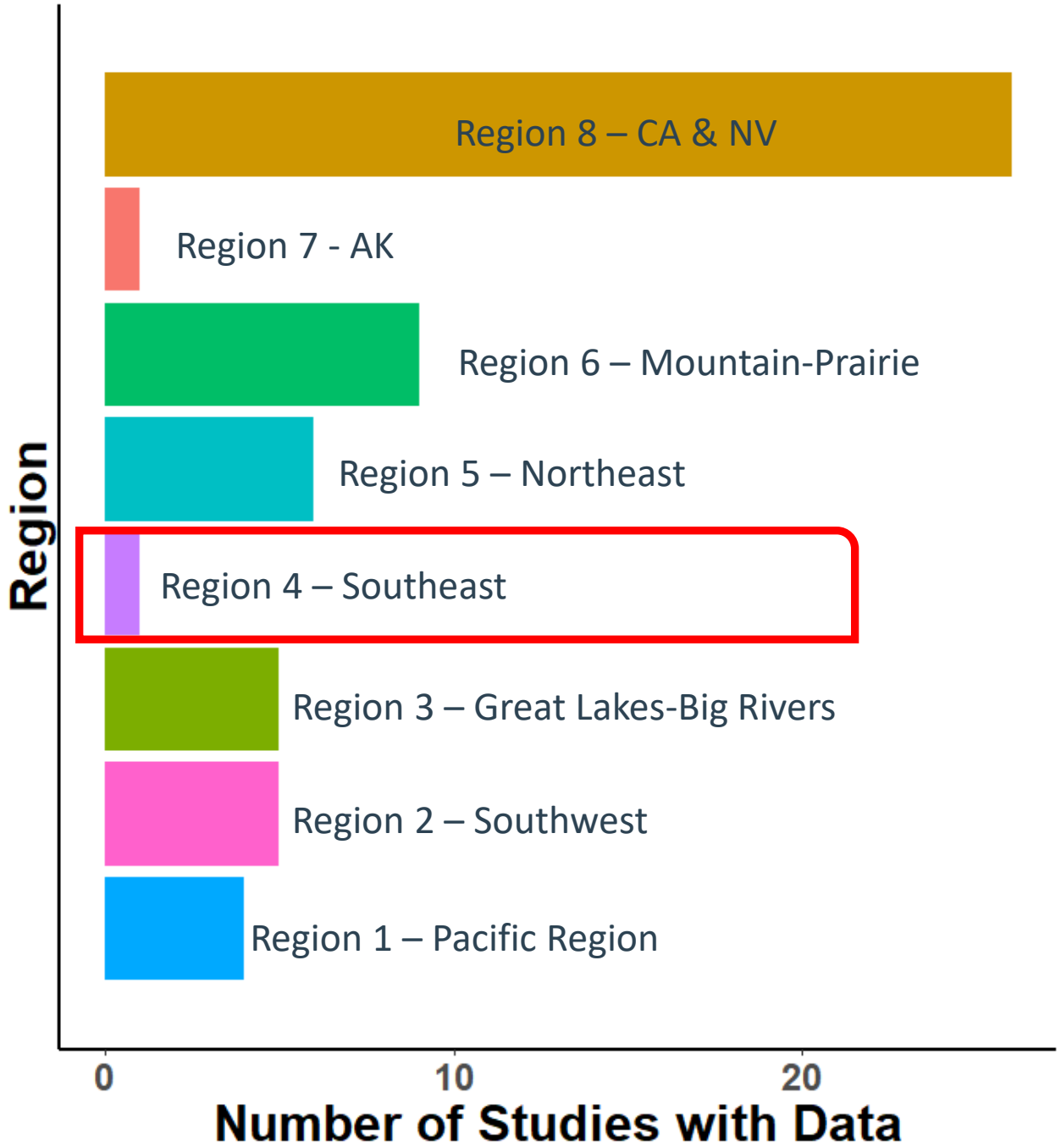
- Topics
  1. **Onsite Cohabitation**
  2. **Vegetation Management**
  3. **Ecosystem Services**
  4. **Wildlife-Friendly Fencing**
  5. **Movement & Connectivity**
  6. **Community Studies**
- Species Groups
  1. **Butterflies**
  2. **Native Bees**
  3. **Migratory Birds**
  4. **Reptiles/Amphibians**
  5. **Migratory Big Game**

State of the Science/Research – Species Groups



* Not unique studies


Region 8 – CA & NV
Region 7 - AK
Region 6 – Mountain-Prairie
Region 5 – Northeast
Region 4 – Southeast
Region 3 – Great Lakes-Big Rivers
Region 2 – Southwest
Region 1 – Pacific Region
Region
0
20
40
60
Number of Studies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Region
0
10
20
Number of Studies with Data

Regional Research Strategies

Exploring a Regional Framework for Solar Development

Engaging regional stakeholders in the Southeast and Southwest to identify priority problems to guide regional research objectives

- Successful Southeast Solar Workshop (June 2024) Highlighted:
  - **Major need for research but lack of clear priorities**
  - **Need for information sharing with state and federal agencies**

2024 Southeast Solar Workshop – Atlanta GA

- June 12-13
- Georgia Power HQ
- >180 attendees (54 virtual)
- Presentations by:
  - **Industry Representatives**
  - **State and Federal Agency staff**
  - **University Scientists**
  - **Consultants**
  - **Conservation NGOs**

2024 Southeast Solar Workshop – Breakout Groups

Siting Constraints

Source-Sink

Listed species (esp. gopher tortoises)

Cohabitation

Pre-data/baseline

Incidental take

Movement interference

Habitat value vs. loss

Seed mixes

Erosion & water quality

Long-term effects

Decommissioning

Vegetation management

Cumulative landscape-level impacts

Tree removal

Regional Research Strategies

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  - **Major need for research but lack of clear priorities**
  - **Need for information sharing with state and federal agencies**

- 1st SDM workshop targeting Spring 2025
  - **Participants representing all stakeholder groups**
  - **Condense list of candidate topics**
  - **Prioritize on the basis of value of information:**
    - Effect on decision making
    - “Reducibility of uncertainty” (feasibility of acquiring info)

PV Solar as an Ecosystem

Active Projects

RENEWABLE ENERGY WILDLIFE RESEARCH FUND

UNIVERSITY OF ARKANSAS

TETRA TECH

Understanding Solar-Wildlife Cohabitation

- Modelling climate change & PV solar effects on desert tortoise populations.
  - **Addresses sensitive species, thermal ecology, microclimates, and climate change concerns**

Ecological Value of PV Solar

- Project Partner on REWRF-funded research
- Investigating biodiversity responses in NW, SE, NE, and Texas
  - **Including camera trapping & acoustic monitoring**

SolSource Database

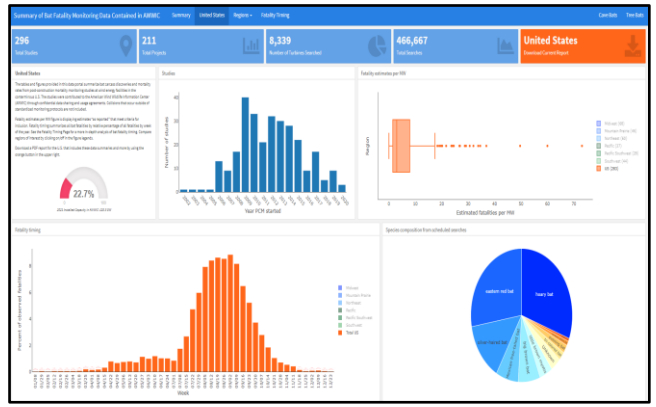
Pooling & Synthesizing Solar Research Results

Objective

Construct a DSI that will adapt to the emerging needs of solar energy and wildlife stakeholders

Project Goals

- Community resource for solar-biodiversity research products and tools
- Platform for sharing and aggregating data to provide regional insights
- Track status and results of solar-biodiversity research efforts



REWI is designing and constructing the SolSource Database with funding awarded through the U.S. Department of Energy Solar Energy Technologies Office (DE-EE0010381). For more information, please contact Dr. Josh Ennen (jennen@rewi.org) or Ryan Butryn (rbutryn@rewi.org)

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Solar Wildlife & Ecosystems Research Meeting

Bringing Trusted Science to Key Decisionmakers

3rd Solar Wildlife & Ecosystems Research Meeting (SWERM) taking place November 17-20, 2025

Convening stakeholders to review the state of the science and identify research gaps and priority questions

Gain knowledge on the impacts & benefits of solar on wildlife, ecosystems, and natural resources