

Avian-Solar Science Plan DRAFT Outline

Executive Summary

This section will provide a summary of the elements of the proposed avian-solar science plan. It will be sufficiently detailed to convey the full scope of the plan and how it will be implemented.

1 Introduction

This section will provide background information on an avian-solar science plan, including the increase and prospects of new solar energy development in the U.S.; observed avian-solar interactions; the goal and objectives of a science plan; elements of a successful plan; and desired outcomes. The section will also describe the multiagency Avian-Solar Collaborative Working Group (CWG), participating agencies (reference CWG Charter – Appendix A), CWG purpose and objectives, and CWG relationship to other programs and activities. The CWG agency-specific management questions will also be summarized in this section.

2 Conceptual Framework of Avian-Solar Interactions

This section will present and discuss a working conceptual framework of avian interactions with components of solar facilities and technologies based on current knowledge. Technology-specific flow diagrams will be used to identify (1) direct and indirect impacting factors; (2) exogenous factors contributing to risk; (3) direct, indirect, and cumulative effects on specific groups of birds (taxonomic groups and functional guilds); and (4) outcomes of these interactions as related to local and regional populations. Discussion in this section will provide support for the identification of information gaps and research priorities. The conceptual model will be used to structure discussions in the rest of the science plan.

3 Summary of Existing Information

This section will provide a relatively high-level summary of what is currently known about avian-solar interactions. The primary source of this summary will be the 2015 DOE avian-solar rapid report, which will be supplemented by more recent technical reports (e.g., monitoring reports), and new information resulting from CWG discussions. The section will identify elements of the conceptual model that are well-understood and those that are poorly understood. This section will be updated in future versions of the Science Plan.

4 Information Gaps Related to Avian-Solar Interactions

Based on the information presented in Section 3, this section will identify and discuss the information gaps that impede the development of effective means to avoid, minimize, and mitigate adverse avian-solar interactions. Discussion of the relative importance of addressing these information gaps to understanding avian risks will be provided. Discussion may include (but will not be limited to) the following:

- *Technology-specific factors that contribute to risk (e.g., collision, flux effects)*
- *Project and site design including retention of habitat within facility boundaries*
- *Impacts of ancillary facilities*
- *Construction and operational practices that contribute to risk (e.g., seasonal timing, implementation of best management practices [BMPs])*
- *Effectiveness of deterrents*

- *Exogenous factors that contribute to risk including local and regional habitat conditions; time of day and year; functional guild; taxonomy; life cycle; residency; and transience*
- *Indirect, direct, and cumulative impacts*
- *Population-level consequences of avian-solar interactions*
- *Contribution of climate change to cumulative impacts*
- *Understanding and identifying cause of death*
- *Existing data quality and resulting uncertainty*

5 Identifying and Prioritizing Research and Monitoring Needs

Based on the agency-specific management questions identified in Section 1 and information gaps identified in Section 4, this section will focus on identifying specific research and monitoring needs and the activities that could be implemented or are being implemented to improve understanding of the nature and magnitude of avian-solar interactions. This section will identify and discuss ways these interactions could be avoided, minimized, or mitigated. Priorities (high, medium, or low) will be assigned to research and monitoring activities based on the relative risk to birds of each impacting and contributing factor in the conceptual model and agency-specific management questions.

6 Program Implementation

This section will identify and discuss a plan that guides the direction and oversight of future activities, outline how future activities should tier from the plan, and inform how research results will be used to update the plan. A flow diagram will illustrate the implementation process.

Topics discussed will include (but not be limited to) the following:

- *Agency roles in implementing the plan*
- *Collaboration with ASWG and other stakeholders to ensure consistency and complementary actions*
- *Updating information and the role of adaptive management in implementing science activities*
- *Tiering from the plan*
- *Approximate cost of research and monitoring activities and sources of funding*
- *Future CWG activities*

7 References

APPENDIX A: CWG CHARTER