

**A LESSON FROM ICARUS: HOW THE MANDATE FOR
RAPID SOLAR DEVELOPMENT HAS SINGED A FEW
FEATHERS**

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INTRODUCTION

On February 13, 2014, the Ivanpah Solar Electric Generating System (ISEGS) began to produce energy as the world’s largest solar thermal power plant.¹ It was built on over 3,500 acres of federal public land in the Mojave Desert near Ivanpah Dry Lake, California.² BrightSource Energy, Inc. developed the ISEGS with significant third-party investments and approval from the Bureau of Land Management (BLM) and the U.S. Department of Energy.³ The project was expected to (1) create jobs, (2) reduce carbon emissions, and most importantly, (3) generate enough green energy to power almost 140,000 homes.⁴ The project appears to have accomplished some of these goals, such as creating jobs and providing renewable energy to

1. *World’s Largest Solar Thermal Power Project at Ivanpah Achieves Commercial Operation*, BRIGHTSOURCE (Feb. 13, 2014), <http://www.brightsourceenergy.com/press-releases/> (scroll down to find article, organized by date) [hereinafter *World’s Largest*].

2. *California Clean Energy Tour: Ivanpah Solar Electric Generating System*, CAL. ENERGY COMM’N, <http://www.energy.ca.gov/tour/ivanpah/> (last visited Oct. 31, 2015).

3. *Id.*

4. *Id.*

California,⁵ with additional plants proposed in other parts of the desert.⁶ However, despite these benefits and years of research and environmental planning, scientists have discovered that fast-tracking the national mandate for clean energy comes with an unexpected cost: the death of thousands of birds.⁷

In the summer of 2014, just a few months after the plant started production, local observers noticed “smoke plume[s]” in the air when birds flew through the concentrated sun rays reflected off of the mirrors.⁸ The workers called these birds “streamers” for the image they created as the animals spontaneously ignited in midair and hurtled to the ground in a smoking, smoldering ball.⁹ These deaths are not an isolated incident where only a few stray birds might accidentally fly through the area—reports estimate that over 3,500 birds have experienced a similar fate during the plant’s first year, although the exact number is a subject of debate.¹⁰

The ISEGS uses more than 300,000 mirrors on almost 4,000 acres to direct solar radiation to the collection towers,¹¹ which can heat the surrounding atmosphere to temperatures between 800° and 1000° Fahrenheit.¹² The BLM is the federal agency responsible for evaluating the project’s environmental impact because the solar plant is on public land.¹³ The BLM complied with its statutory obligation under the National Environmental Policy Act (NEPA) and performed an Environmental Impact Statement (EIS) prior to approving the project.¹⁴ In the Final EIS, the agency

5. *Id.*

6. Carolyn Lochhead, *California Solar Projects Plan Undergoing Major Overhaul*, SFGATE (Sept. 11, 2014, 2:00 PM), <http://www.sfgate.com/science/article/California-solar-projects-plan-undergoing-major-5739105.php>.

7. Ellen Knickmeyer & John Locher, ‘Alarming’ Rate of Bird Deaths as New Solar Plants Scorch Animals in Mid-Air, HUFFINGTON POST (Aug. 18, 2014, 5:59 AM), http://www.huffingtonpost.com/2014/08/18/bird-deaths-solar_n_5686700.html.

8. *Id.*

9. *Id.*

10. James Meier, *Report: Ivanpah Solar Project Kills 3,500 Birds*, DESERT SUN (Apr. 23, 2015, 5:30 PM), <http://www.desertsun.com/story/tech/science/greenenergy/2015/04/23/ivanpah-solar-plant-bird-deaths/26273353/>.

11. *Id.*; *California Clean Energy Tour: Ivanpah Solar Electric Generating System*, *supra* note 2; Garrett Hering, *4 Reasons the Ivanpah Plant Is Not the Future of Solar*, GREENBIZ (Feb. 19, 2014, 5:30 AM), <http://www.greenbiz.com/blog/2014/02/19/largest-solar-thermal-plant-completed-ivanpah>.

12. Jack Dini, *Ivanpah Solar Plant Unintended Consequences*, CANADAFREEPRESS.COM (Sept. 3, 2014), <http://canadafreepress.com/index.php/article/ivanpah-solar-plant-unintended-consequences>.

13. BUREAU OF LAND MGMT., U.S. DEP’T. OF INTERIOR, FEIS-10-31, FINAL ENVIRONMENTAL IMPACT STATEMENT FOR IVANPAH SOLAR ELECTRIC GENERATING SYSTEM1-1 (2010), http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/needles/lands_solar.Par.19048.File.dat/1-CDCA-Ivanpah-Final-EIS.pdf [hereinafter FINAL ENVIRONMENTAL IMPACT STATEMENT].

14. *Id.*

considered 25 alternatives, including different project sites and other solar technologies.¹⁵ BLM dismissed all but three of the alternatives as unviable.¹⁶ While the agency followed NEPA guidelines, some environmental groups contend that the BLM rushed the EIS process, fast-tracked development, and failed to consider all of the appropriate alternatives.¹⁷

The Final EIS lacks a sufficient evaluation of the potential biological impact on migratory or in-flight birds. The Ivanpah solar reactor is the biggest of its kind, therefore few comparable solar plants exist that can provide insight into the likely environmental impacts.¹⁸ One of the proposed alternatives, suggested via public comment, was to build the project in phases so that the operational impacts could be studied before the full mirror field was completed and activated.¹⁹ The BLM rejected this alternative and failed to fully consider that the mirrors might have a detrimental effect on the environment.²⁰ In the Final EIS, the only alternatives explored were slight variations of the proposed plan, and none of these alternatives included the possible impact the mirrors and the reflected sun rays might have on birds.²¹

This Note analyzes the policy decisions, their implications, and the biological impact of the Ivanpah solar plant on the Mojave Desert region in light of the recent bird deaths. Part I discusses the initial push to build the facility, as well as the initial impacts to some species that the Final EIS analyzed. Part II analyzes the Final EIS and the BLM's NEPA compliance by examining the alternatives addressed, the conclusions reached, and where the EIS was lacking. This Note focuses solely on those areas of environmental impact that pertain to wildlife. Part III discusses the other federal statutes implicated by the solar plant including: the Endangered Species Act (ESA); the Migratory Bird Treaty Act (MBTA); the Bald and Golden Eagle Protection Act (BGEPA); and the Federal Land Policy Management Act (FLPMA). Part IV addresses national environmental policy in the context of clean energy development versus wildlife protection, and whether a mandate to rapidly develop energy sources must override wildlife protection. Specifically, it looks at the green policy conflict through the lens of the development and operation of the Ivanpah solar project. Finally, Part V looks towards the future of clean energy in the Mojave. With three solar

15. *Id.* at 1-11 to -14.

16. *Id.*

17. Scott Streater, *Fast-Tracked Solar Project Could Speed Mojave Desert's Demise*, N.Y. TIMES, (Nov. 12, 2009), <http://www.nytimes.com/gwire/2009/11/12/12greenwire-fast-tracked-solar-project-could-speed-mojave-95100.html?pagewanted=all>.

18. FINAL ENVIRONMENTAL IMPACT STATEMENT, *supra* note 13, at 3-107.

19. *Id.* at 3-107 to -108.

20. *Id.* 3-308.

21. *See id.* at 3-26 to -45 (discussing the most viable project alternatives).

projects planned, and using Ivanpah as a model, Part V discusses the biological resource implications in those areas and proposes that both clean energy development and wildlife protection may not necessarily be mutually exclusive.

I. BACKGROUND ON THE IVANPAH FACILITY AND ITS INITIAL IMPACTS

A. *The ISEGS: From Proposal to Operation*

BrightSource Energy, Inc. (BrightSource) first proposed the Ivanpah Solar Electric Generating System (ISEGS) on September 6, 2007 when BrightSource announced that it had filed an application for construction with the California Energy Commission (CEC) to build a 400 megawatt (MW) solar plant.²² Around the same time, the company applied for a right-of-way (ROW) grant with the BLM to use public land.²³ BrightSource next contracted to provide renewable energy through solar thermal electric generation, with the first project to be located in Ivanpah, California.²⁴ BrightSource formed a series of agreements to provide solar power to California homes to meet “the increasing demand for solar thermal energy.”²⁵ The California Public Utilities Commission approved BrightSource’s agreements on August 28 and November 24, 2009, which, once constructed, could supply up to 1,310 MW of power to California.²⁶

On November 10, 2009, the BLM published a Draft EIS (DEIS) for public review and comment,²⁷ and a Supplemental EIS (SEIS) on April 16, 2010 to address project alternatives.²⁸ The U.S. Department of Energy committed \$1.37 billion to BrightSource in loans to support the financing of

22. *BrightSource Energy Files First Solar AFC in California Since 1989*, BRIGHTSOURCE (Sept. 6, 2007), <http://www.brightsourceenergy.com/press-releases/> (articles organized by date).

23. *Id.*

24. *PG&E Signs Contracts with BrightSource Energy for up to 900 Megawatts of Solar Thermal Power*, BRIGHTSOURCE (April 1, 2008), <http://www.brightsourceenergy.com/press-releases/> (articles organized by date).

25. *Southern California Edison and BrightSource Energy Sign World’s Largest Solar Deal*, BRIGHTSOURCE (Feb. 11, 2009), <http://www.brightsourceenergy.com/press-releases/> (articles organized by date).

26. *California Public Utilities Commission Approves First Two BrightSource Energy Contracts with PG&E*, BRIGHTSOURCE (Aug. 28, 2009), <http://www.brightsourceenergy.com/press-releases/> (articles organized by date); *California Public Utilities Commission Approves BrightSource Energy Contracts with PG&E*, BRIGHTSOURCE (Nov. 24, 2009), <http://www.brightsourceenergy.com/press-releases/> (articles organized by date).

27. FINAL ENVIRONMENTAL IMPACT STATEMENT, *supra* note 13, at 1-2

28. *Id.*

the ISEGS.²⁹ Next, the BLM issued the Final Environmental Impact Statement (FEIS) on August 6, 2010,³⁰ and the CEC approved construction on September 22, 2010.³¹ Finally, the BLM approved the project to be built and operated on public lands on October 7, 2010,³² and BrightSource broke ground in the desert near Ivanpah Dry Lake on October 27, 2010.³³ The ISEGS began to generate power on February 13, 2014.³⁴

The ISEGS is located in San Bernadino County, California, 4.5 miles southwest of Primm, Nevada.³⁵ The facility contains three separate solar thermal collection towers with adjacent mirror fields built from 2010 to 2013.³⁶ Combined, the facility uses over 300,000 heliostat mirrors to track the sun and reflect sunlight to boilers atop three 459-foot tall collection towers (one for each mirror field).³⁷ The equipment is activated each morning and is run until the evening.³⁸ Electricity is generated by concentrated sunlight hitting the boiler pipes and superheating the water inside to create steam.³⁹ That steam is pumped to spin the turbines, which creates up to 400 MW of electricity.⁴⁰ Electricity is delivered via three supply lines to a substation that is owned and operated by Southern California Edison (SCE).⁴¹

29. *BrightSource Energy Offered Nearly \$1.4 Billion in Loan Guarantees from the U.S. Department of Energy*, BRIGHTSOURCE (Feb. 22, 2010), <http://www.brightsourceenergy.com/press-releases/> (articles organized by date).

30. U.S. Bureau of Land Management Issues Final Environmental Impact Statement for BrightSource Energy's Ivanpah Solar Electric Generating System, BRIGHTSOURCE (Aug. 6, 2010), <http://www.brightsourceenergy.com/press-releases/> (articles organized by date).

31. *California Energy Commission Licenses BrightSource Energy's Ivanpah Solar Electric Generating System*, BRIGHTSOURCE (Sept. 22, 2010), <http://www.brightsourceenergy.com/press-releases/> (articles organized by date).

32. *U.S. Bureau of Land Management Approves BrightSource Energy's Ivanpah Solar Electric Generating System*, BRIGHTSOURCE (Oct. 7, 2010), <http://www.brightsourceenergy.com/press-releases/> (articles organized by date).

33. *BrightSource Energy Breaks Ground on Ivanpah Solar Electric Generating System*, BRIGHTSOURCE (Oct. 27, 2010), <http://www.brightsourceenergy.com/press-releases/> (articles organized by date).

34. *World's Largest*, *supra* note 1.

35. *Ivanpah Solar Electric Generating System (CACA-48668)*, BUREAU OF LAND MGMT., U.S. DEP'T OF INTERIOR, <http://www.blm.gov/ca/st/en/prog/energy/pendingapps/ivanpahsolar.html> (last updated Mar. 12, 2013).

36. *Ivanpah Project Facts*, BRIGHTSOURCE, http://www.brightsourceenergy.com/stuff/contentmgr/files/0/8a69e55a233e0b7edfe14b9f77f5eb8d/folder/ivanpah_fact_sheet_3_26_14.pdf (last visited Oct. 31, 2015).

37. *Id.*

38. FINAL ENVIRONMENTAL IMPACT STATEMENT, *supra* note 13, at 1-2 to -3.

39. *Id.*

40. *Id.* at 1-3.

41. *Ivanpah Solar Electric Generating System (CACA-48668)*, *supra* note 35.

The stored energy then provides power to over 140,000 homes in Southern California.⁴²

Several federal and state agencies have been involved in the approval, planning, construction, and operation of the solar power facility.⁴³ For instance, the California Energy Commission (CEC) and the U.S. Fish and Wildlife Service (USFWS) both played crucial roles in approving the project.⁴⁴ The USFWS's contributions were of particular importance in consulting with developers about the biological impact to species in the area, with special focus on the desert tortoise population.⁴⁵ In addition to these agencies, the BLM was significantly involved in the initial process because the power plant was to be built on federal public land managed by the agency.⁴⁶ It was therefore the BLM's responsibility to evaluate the overall environmental impact, consider the alternatives, and release a Final EIS before the project could be approved.⁴⁷

The BLM prepared the EIS according to NEPA requirements in cooperation with other state and federal agencies. The Final EIS addresses multiple areas of potential impact including: effects to air, soil, and water; biological resources; cultural resources; public health and safety; socioeconomics; visual resources; and recreation.⁴⁸ The Final EIS concluded that the proposed project would have both beneficial and adverse impacts on different areas. The project would have the maximum benefit to the socioeconomic, greenhouse gas, and air pollutant impacts.⁴⁹ In contrast, the plan would have the greatest adverse impact on biological resources, soil and water resources, and visual resources, all of which could not be completely mitigated.⁵⁰ This Note focuses on the biological resources that are adversely impacted, as well as those that were barely even considered.

B. Stuck on the Ground: Impact to the Desert Tortoise

Of the many biological resources in Ivanpah, the Final EIS mainly focused on the effects that the ISEGS would have on the local desert tortoise

42. *Ivanpah Project Facts*, *supra* note 36.

43. FINAL ENVIRONMENTAL IMPACT STATEMENT, *supra* note 13, at 1-15 to -17.

44. *Id.* at 1-15 to -16.

45. *Id.* at 1-16.

46. *Id.* at 2-1.

47. *Id.*

48. *See id.* at 1-21 to -39 (providing a summary of the different resource impacts).

49. *Id.* at 1-39.

50. *Id.*

population.⁵¹ The Mojave Desert Tortoise (*Gopherus agassizii*) has been present in the Mojave region for millions of years.⁵² Less than 100 years ago, desert tortoises were common to the region, but now they are rarely seen, and in some places, they have completely disappeared.⁵³ Because of their decreasing numbers, they were listed as a threatened species in 1980.⁵⁴

The USFWS looks at five factors to determine whether to list a species as endangered or threatened: (1) destruction or modification of the habitat; (2) overutilization; (3) disease or predation; (4) inadequacy of regulatory mechanisms; and (5) other natural or manmade factors.⁵⁵ The desert tortoise is on the threatened species list because it is affected by all of the above factors.⁵⁶ Of particular relevance, the desert tortoise habitat can be adversely impacted during construction, ongoing operation, and maintenance of energy facilities.⁵⁷ While federal and state regulations protect this species, these laws often conflict with the multiple-use mandates of the regulating agencies, and agencies frequently do not have the funds to enforce protective measures.⁵⁸

In the Final EIS, the BLM concluded that the ISEGS's biggest threat to the desert tortoise would be the direct loss of almost 4,000 acres of habitat.⁵⁹ The EIS found that the project could fragment and degrade adjacent habitats, promote the growth of invasive plant species to compete with the tortoise's food sources, and could allow for the spread of predators.⁶⁰ Further, given how much time the desert tortoise lives underground, construction of the ISEGS could do more than destroy the tortoise's habitat—it could kill individuals of the species and the unborn offspring within their dens.⁶¹

Wildlife protection and environmental advocacy groups protested the ISEGS proposal and construction because of the potential adverse impacts on the desert tortoise.⁶² Some groups sued the federal government and

51. *Id.* at 1-23.

52. *Mojave Desert Tortoise*, U.S. FISH & WILDLIFE SERV., http://www.fws.gov/nevada/desert_tortoise/dt/dt_life.html (last updated April 16, 2014).

53. *Id.*

54. U.S. Fish & Wildlife Serv., *Desert Tortoise (Gopherus agassizii)*, ENVTL. CONSERVATION ONLINE SYS., <http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spscode=C04L> (last visited Oct. 31, 2015).

55. *Threats to Desert Tortoises*, NEV. FISH & WILDLIFE OFF., http://www.fws.gov/nevada/desert_tortoise/dt/dt_threats.html (last updated Apr. 16, 2014).

56. *Id.*

57. *Id.*

58. *Id.*

59. FINAL ENVIRONMENTAL IMPACT STATEMENT, *supra* note 13, at 6-1.

60. *Id.* at 1-23.

61. *Id.* at 4.3-39.

62. *W. Watersheds Project v. Salazar*, 993 F. Supp. 2d 1126, 1131 (C.D. Cal. 2012).

BrightSource, or negotiated settlements to mitigate the adverse impacts.⁶³ For instance, the Center for Biological Diversity agreed to halt litigation against BrightSource in exchange for the developer agreeing to acquire and/or enhance thousands of additional acres of land to make a suitable tortoise habitat.⁶⁴ In addition to the settlement, the federal and state governments required BrightSource to relocate the tortoises to a nearby habitat outside of the project area.⁶⁵ Despite these mitigating steps, there remained a concern that eggs and smaller tortoises would not be found before construction began and those individuals would be killed.⁶⁶

The majority of the Final EIS focused on desert tortoise mitigation measures. Specifically, the document proposed measures to deter tortoises from entering the project area.⁶⁷ Additionally, the EIS proposed a relocation plan to move the tortoises out of the project area.⁶⁸ Finally, the EIS proposed that the developer minimize road and traffic impacts; limit the amount of disturbed land; minimize the impact of transmission lines and pipelines; and avoid using toxic substances.⁶⁹ Currently, these mitigation measures are progressing with the hope of minimizing, although not fully eliminating, the adverse impacts to the tortoise population.⁷⁰ However, while the BLM took great care to address impacts to biological resources on the ground, they failed to look up and evaluate how the facility would affect birds in the air.

C. A Look to the Sky: The Bird Impact

After the ISEGS began producing energy on February 13, 2014, workers quickly noticed “smoke plume[s]” caused by birds igniting in midair when they flew over the solar mirrors.⁷¹ These “streamers,” as the workers called them, drew national attention starting in August 2014,⁷² but the deaths were

63. *Questions and Answers Related to the Settlement Agreement Between the Center for Biological Diversity and BrightSource Energy, Inc. Regarding the Ivanpah Solar Electric Generating System Project in the Mojave Desert*, CTR. FOR BIOLOGICAL DIVERSITY (Aug. 8, 2011) http://www.biologicaldiversity.org/species/reptiles/desert_tortoise/pdfs/CBD_Ivanpah_Factsheet_8-8-2011.pdf.

64. *Id.*

65. *Id.*

66. *Id.*

67. FINAL ENVIRONMENTAL IMPACT STATEMENT, *supra* note 13, at 4.3-95.

68. *Id.* at 4.3-97 to -98.

69. *Id.* at 4.3-101 to -02.

70. Kristin Hunter, *Translocating Desert Tortoise at the Ivanpah Project*, BRIGHTSOURCE (Apr. 26, 2012, 10:00 AM), <http://www.brightsourceenergy.com/translocating-desert-tortoise-at-the-ivanpah-project#.Vd9VRSVvHw>.

71. Knickmeyer & Locher, *supra* note 7.

72. *Id.*

first noticed early in the project's operation.⁷³ In April of 2014, the U.S. Fish and Wildlife's Office of Law Enforcement (OLE) sent scientists from their Forensics Laboratory to investigate 233 bird deaths (71 different species) related to solar facilities, and published a report on their findings.⁷⁴ The study investigated all incidents of avian mortality at three different sites, including the ISEGS.⁷⁵ Each project used a different form of solar technology (photovoltaic, trough, and solar power tower systems), and bird deaths were documented at all three sites.⁷⁶ The study concluded that there were three main causes of death: "impact trauma, predation and solar flux," where birds at all three sites were killed by impact trauma and predation, and only birds at the ISEGS were killed by solar flux.⁷⁷

While trauma was the leading cause of death at all three sites, trauma and solar flux were the two major causes of death in Ivanpah.⁷⁸ Solar flux is "intense radiant energy focused by the mirror array on the power-generating tower" creating extreme heat, which the birds fly through.⁷⁹ In the solar flux deaths, the investigators found:

Exposure to solar flux caused singeing of feathers, which resulted in mortality in several ways. Severe singeing of flight feathers caused catastrophic loss of flying ability, leading to death by impact with the ground or other objects. Less severe singeing led to impairment of flight capability, reducing ability to forage and evade predators, leading to starvation or predation.⁸⁰

The investigators discovered that the solar sites killed 71 different species.⁸¹ The species covered an ecologically diverse range of characteristics including: size variance (from hummingbirds to pelicans); raptors; aerial, aquatic, and ground feeders; nocturnal and diurnal species; and resident and non-resident (migratory) species.⁸² The results indicated that

73. Todd Woody, *How to Stop Solar-Power Plants from Incinerating Birds*, ATLANTIC (Apr. 28, 2014, 1:34 PM), <http://www.theatlantic.com/technology/archive/2014/04/how-to-stop-solar-power-plants-from-incinerating-birds/361318/>.

74. REBECCA A. KAGAN ET AL., AVIAN MORTALITY AT SOLAR ENERGY FACILITIES IN SOUTHERN CALIFORNIA: A PRELIMINARY ANALYSIS 5–6 (2014), <http://www.ourenergypolicy.org/wp-content/uploads/2014/04/avian-mortality.pdf>.

75. *Id.* at 1.

76. *Id.*

77. *Id.* at 24.

78. *Id.* at 1.

79. *Id.* at 12.

80. *Id.* at 1.

81. *Id.*

82. *Id.* at 1–2

47 deaths, of the 141 carcasses collected, were from solar flux exposure.⁸³ Additionally, investigators found a significant number of dead insects that led to the theory that the intense light from the mirror field acts as a “mega-trap”⁸⁴ by “attracting insects which in turn attract insect-eating birds, which are incapacitated by solar flux injury, thus attracting predators and creating an entire food chain vulnerable to injury and death.”⁸⁵

Unable to obtain technical data on the solar flux temperature at Ivanpah, investigators gathered data from other solar power tower style plants.⁸⁶ In these other projects, when the mirrors directed concentrated solar light to the power tower, the beams could “multiply the strength of sunlight by 5000 times” and generate “temperatures in excess of 3600 degrees Fahrenheit.”⁸⁷ Usually only a fraction of the mirrors are directed at the power tower at any given time, which creates an optimal functioning temperature of 900° F around the tower.⁸⁸ The Fish and Wildlife investigators observed that most of the “streamer” events occurred near the tower in the field where the solar flux temperatures would be the highest.⁸⁹ The investigators then conducted studies to determine that feathers can burn or singe at an air temperature of 752° F, which they concluded must have at least been the minimum temperature in the solar flux when the birds would have flown through.⁹⁰ During their time in Ivanpah, the investigators observed an average of one “streamer” every two minutes.⁹¹

The Fish and Wildlife study recommends several ways to mitigate the bird deaths caused by solar flux. But the agency’s main suggestion is to monitor the situation and conduct daily observations to study the full impact on avian wildlife for a two-year period.⁹² Some mitigation measures include: clearing area around the towers to decrease the habitat attractiveness; suspending “power tower operation during peak migration” periods; placing “perch deterrent devices . . . on tower railings near the flux field”; and employing other exclusionary measures.⁹³ The investigators emphasize a

83. *Id.* at 12.

84. The study defines “mega-traps” as an ecological trap where an artificial feature creates a “situation that results in an animal selecting a habitat that reduces its fitness relative to other available habitats.” *Id.* at 20.

85. *Id.* at 2.

86. *Id.* at 21.

87. *Id.* at 22.

88. *Id.*

89. *Id.* at 23.

90. *Id.* at 23–24.

91. *Id.* at 23.

92. *Id.* at 2–3.

93. *Id.* at 3.

lack of knowledge regarding the scope of avian mortality at these facilities, and limited data exists about how solar flux fully affects birds and insects.⁹⁴ But they do admit that “[t]he numbers of dead birds are likely underrepresented, perhaps vastly so.”⁹⁵

However, not all interested parties agree with the findings of the USFWS investigators. BrightSource’s own investigators estimate that the number of bird deaths from solar flux is more in the range of 1,000 birds per year.⁹⁶ A recent report estimates the number of deaths to be above 3,500, but even that number is fiercely debated.⁹⁷ One expert with the Center for Biological Diversity estimates the number closer to 28,000 birds killed per year.⁹⁸ Both BrightSource and the Center have opposed interests and the radical difference in estimates reflects each group’s priorities: BrightSource wants to diminish the ecological impact, but also stay on pace to build future projects;⁹⁹ the Center for Biological Diversity wants to decrease the adverse impact to wildlife.¹⁰⁰ While BrightSource admitted that they want to reduce avian impacts and use technology to detect, monitor, and deter bird movement around the solar facilities; they also reiterated their larger mission to provide renewable energy and fight climate change, and that such goals often come with necessary trade-offs to succeed.¹⁰¹

BrightSource is taking steps to try to solve the problem before it impedes future solar project development.¹⁰² The company is offering compensation for anticipated bird deaths, and they continue to investigate other technologies to deter the birds and/or insects including: sonic and smell deterrence; mirror repositioning; changing to LED lights; and turning lights off at night.¹⁰³ Furthermore, proponents of the facility cite the pros and cons

94. *Id.*

95. *Id.* at 25.

96. Knickmeyer & Locher, *supra* note 7.

97. Meier, *supra* note 10.

98. Knickmeyer & Locher, *supra* note 7.

99. Joe Desmond, *Setting the Record Straight: Solar Flux and Impact to Avian Species*, BRIGHTSOURCE (Aug. 19, 2014, 3:00 PM), <http://www.brightsourceenergy.com/setting-the-record-straight-solar-flux-and-impact-to-avian-species#.Vd9RxyVVhHw>.

100. K. Kaufman, *Palen Solar Project Gets Rare Scrutiny*, DESERT SUN, (Oct. 20, 2013), http://www.biologicaldiversity.org/news/media-archive/a2013/Solar_DesertSun_10-20-13.pdf.

101. Desmond, *supra* note 99.

102. Knickmeyer & Locher, *supra* note 7.

103. *Birds Bursting into Flames Above Solar Farm Stirs Calls to Slow Expansion*, CBS SAN FRANCISCO (Aug. 18, 2014, 11:25 AM), <http://sanfrancisco.cbslocal.com/2014/08/18/birds-bursting-into-flames-above-solar-farm-stirs-calls-to-slow-expansion-streamer-solar-field-central-valley-heat-streamer-fire-burn/>; Meier, *supra* note 10.

of other types of energy production, particularly those run on fossil fuels, in their efforts to encourage further development of solar power facilities.¹⁰⁴

The next proposed facility will be built near Joshua Tree National Park in California.¹⁰⁵ The biggest concern with this facility, particularly given the bird deaths in Ivanpah, is that the proposed plant is in an area that is “richer in avian life than the Ivanpah plant” “with protected golden eagles and peregrine falcons, and more than 100 other species of birds.”¹⁰⁶ USFWS officials have further warned that “the power-tower style of solar technology holds ‘the highest lethality potential’ of the many solar projects burgeoning in the deserts of California.”¹⁰⁷

II. NEPA COMPLIANCE AND THE FINAL EIS

In 1969, Congress passed the National Environmental Policy Act (NEPA) to force federal agencies to consider the environmental impacts of proposed actions as well as the alternatives.¹⁰⁸ The purpose of NEPA is to create:

[A] national policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation.¹⁰⁹

While NEPA does not necessarily ensure environmental protection, it does require consideration of all the factors that could be impacted, including both the potential harms to the environment and the economic benefits.¹¹⁰ Sometimes the environmental costs outweigh the economic benefits, and sometimes they do not, but in all instances, NEPA requires a “finely tuned

104. Jake Richardson, *Bird Deaths from Solar Plant Exaggerated by Some Media Sources*, CLEAN TECHNICA (Aug. 22, 2014), <http://cleantechnica.com/2014/08/22/bird-deaths-solar-plant-exaggerated-media-sources/>.

105. Dini, *supra* note 12.

106. *Id.*

107. Knickmeyer & Locher, *supra* note 7.

108. JAMES RASBAND ET AL., NATURAL RESOURCES LAW AND POLICY 258 (Robert C. Clark et al. eds., 2d ed. 2009).

109. National Environmental Policy Act of 1969, 42 U.S.C. § 4321 (2012).

110. RASBAND ET AL., *supra* note 108, at 258.

and ‘systematic’ balancing analysis.”¹¹¹ In this regard, NEPA contains both substantive and procedural provisions.¹¹² The general substantive policy is flexible and gives discretion to the acting agency where the only result required is for the agency to “‘use all practicable means and measures’ to protect environmental values.”¹¹³ However, the procedural measures are not as flexible and ensure that every federal agency complies with the substantive mandate to make environmental protection part of its planning process.¹¹⁴ Ultimately, an agency must consider the detailed environmental statement “at every important stage in the decision making process.”¹¹⁵

NEPA requires the agency to conduct an Environmental Impact Statement for every proposal involving “major Federal actions significantly affecting the quality of the human environment.”¹¹⁶ The purpose is to aid in the agency’s decision-making process and to advise others about the “environmental consequences of planned federal action.”¹¹⁷ The EIS must address: “the environmental impact of the proposed action; . . . any adverse environmental effects which cannot be avoided; . . . alternatives to the proposed action; . . . the relationship between local short-term uses of [the] environment and . . . long-term productivity; and . . . any irreversible and irretrievable commitment of resources involved in the proposed action.”¹¹⁸ Discussing alternatives ensures that the agency considers all of the possible approaches that “would alter the environmental impact and the cost-benefit balance.”¹¹⁹ However, an agency is not always required to choose the environmentally preferable option if it has complied with NEPA and fully considered the EIS.¹²⁰

The courts have held that NEPA does not give discretionary decision-making authority to the agency on procedural requirements, and environmental consideration must be addressed “to the fullest extent

111. *Calvert Cliffs’ Coordinating Comm., Inc. v. U.S. Atomic Energy Comm’n*, 449 F.2d 1109, 1113 (D.C. Cir. 1971).

112. *Id.* at 1111–12.

113. *Id.* at 1112 (quoting 42 U.S.C. § 4331(a)).

114. *Id.*

115. *Id.* at 1118.

116. 42 U.S.C. § 4332(2)(C).

117. *Calvert Cliffs*, 449 F.2d at 1114.

118. 42 U.S.C. § 4332(2)(C).

119. *Calvert Cliffs*, 449 F.2d at 1114; 42 U.S.C. § 4332(2)(C).

120. *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350–51 (1989) (“If the adverse environmental effects of the proposed action are adequately identified and evaluated, the agency is not constrained by NEPA from deciding that other values outweigh the environmental costs NEPA merely prohibits uninformed—rather than unwise—agency action.”).

possible.”¹²¹ In fact, the agency’s procedural duties are generally held to be inflexible “unless there is a clear conflict of statutory authority.”¹²² Section 104 of NEPA does not eliminate any duties already imposed on the agency by other “statutory obligations.”¹²³ Only in the situations where an agency’s other statutory obligations conflict with NEPA does that agency have a right to “dilute their compliance with the full letter and spirit of the Act.”¹²⁴ However, unless the obligations are mutually exclusive to both NEPA and the other law, NEPA’s mandate remains in force and may not be precluded.¹²⁵

One important part of NEPA’s language that broadens its scope is the trigger “major Federal actions.”¹²⁶ The Council of Environmental Quality (CEQ), which oversees and regulates NEPA’s procedural implementation,¹²⁷ promulgated regulations that clarify what constitutes a “major Federal action.”¹²⁸ One such regulation defines “federal actions” to include private actions that require a permit, or some other federal approval or assistance.¹²⁹ Because BrightSource leased federal public land from the BLM and also received a grant from the Department of Energy, the ISEGS constitutes a major federal action and is bound by all of the procedural and substantive provisions that NEPA demands, including an EIS.¹³⁰

One significant part of an EIS is the “discussion of steps that can be taken to mitigate adverse environmental consequences.”¹³¹ In *Robertson v. Methow Valley Citizens Council*, the Supreme Court found that an EIS requires a discussion of the “adverse environmental effects which cannot be avoided”¹³² and an implicit demand that the EIS also address how those adverse effects could be avoided.¹³³ To ensure that an agency thoroughly addresses the environmental consequences of a proposed federal action, an EIS requires the agency to discuss alternatives to the proposed action,¹³⁴

121. *Calvert Cliffs*, 449 F.2d at 1114 (quoting 42 U.S.C. § 4332).

122. *Id.* at 1115.

123. 42 U.S.C. § 4334.

124. *Calvert Cliffs*, 449 F.2d at 1115 n.12.

125. *Id.* at 1125.

126. 42 U.S.C. § 4332(2)(C).

127. *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 354 (1989).

128. 40 C.F.R. § 1508.18 (2014).

129. 40 C.F.R. § 1508.17.

130. *See Silva v. Romney*, 473 F.2d 287, 292 (1st Cir. 1973) (holding that a developer who has voluntarily submitted to federal regulation and aid is not purely private in nature, but is subject to NEPA compliance because the developer could not proceed absent the public’s assistance).

131. *Robertson*, 490 U.S. at 351.

132. 42 U.S.C. § 4332(C)(ii) (2012).

133. *Robertson*, 490 U.S. at 351–52.

134. 40 C.F.R. § 1502.14(f).

address consequences of the action,¹³⁵ and explain its ultimate decision.¹³⁶ The Supreme Court interpreted this procedural provision to mean that omitting a discussion of mitigation measures would “undermine the ‘action-forcing’ function of NEPA.”¹³⁷

However, when information concerning a reasonably foreseeable environmental impact is unavailable, the agency must address the environmental consequences of a proposed action, and the possible mitigation measures, through the prism of the generally held scientific understanding.¹³⁸ This particular regulation is critical in analyzing the Final EIS’s insufficiencies in addressing the foreseeable adverse impact of bird deaths, and in providing possible mitigation measures to counteract such possible consequences.

A. The Proposed Mitigation Measures

The BLM composed an Environmental Impact Statement that evaluated the ISEGS’s potential impacts to the environment.¹³⁹ After a public comment period, the Agency released a Final EIS draft. The draft considered 25 alternatives and evaluated three in detail.¹⁴⁰ The Final EIS contains over 600 pages addressing the potential environmental effects and the most feasible alternatives identified by the BLM.¹⁴¹ The detailed statement addresses different areas of impact including: biological resources, greenhouse gas emissions, cultural resources, public health and safety, soil and water quality, recreation, et cetera.¹⁴² In addition, the EIS offers mitigation measures for each consequence that was deemed reasonably foreseeable to occur in construction, operation, and eventual deactivation of the facility.¹⁴³ These cumulative impacts are the “incremental impact[s] of the proposed project when considered with other past, present, and reasonably foreseeable future actions.”¹⁴⁴

The environmental impact section of the EIS is particularly pertinent to this Note because within it, the BLM addressed the possible adverse impacts

135. 40 C.F.R. § 1502.16(h).

136. 40 C.F.R. § 1505.2(c).

137. *Robertson*, 490 U.S. at 352.

138. 40 C.F.R. § 1502.22(b) (requiring “reasonably foreseeable” impacts to include “catastrophic consequences, even if their probability of occurrence is low”).

139. FINAL ENVIRONMENTAL IMPACT STATEMENT, *supra* note 13, at 1-1.

140. *Id.* at 1-1, 1-11.

141. *Id.* at 4.0-1 to 4.20-6.

142. *Id.* at 4.0-4 to -9.

143. *Id.* at 4.0-1.

144. *Id.* at 5-1.

of the ISEGS, and its alternatives, on bird species in the area.¹⁴⁵ The project area provides “forage, cover, roosting, and nesting habitat” for a variety of birds including “migratory songbirds and raptors, many of which are protected by the MBTA” and are on the USFWS Birds of Conservation Concern list.¹⁴⁶ Some special status species have also been reported in the area, such as the Western Burrowing Owl and the Golden Eagle.¹⁴⁷ The EIS addresses many possible adverse effects to birds due to construction,¹⁴⁸ as well as several impacts from the project’s operation.¹⁴⁹ The EIS also notes that birds could suffer injury and death by colliding with tall structures such as communication towers, transmission lines, and the central power tower.¹⁵⁰

Most of the EIS discussion on the project’s effect on wildlife, and the proposed mitigation measures, focus on the above impacts. However, the EIS also briefly mentions the possibility of bird death caused by solar flux.¹⁵¹ The BLM acknowledged that such occurrences have been reported at other solar plants with the same technology as the ISEGS, calling them “heat-related injuries,” but the agency discounted these reports.¹⁵² It also concluded that because the ISEGS project does not have evaporation ponds, “heat-related injuries may not be substantial.”¹⁵³ Further, it determined that there was insufficient data to make a conclusion about the potential magnitude of these bird deaths at the ISEGS.¹⁵⁴ Of particular concern, and possibly neglect by the agency, is that the BLM recognized that the other solar plant is much smaller than the proposed ISEGS—almost 50 times smaller—and yet it

145. *Id.* at 4.3-15

146. *Id.* The USFWS BCC list identifies “species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act (ESA) of 1973.” *Birds of Conservation Concern*, U.S. FISH & WILDLIFE SERV., <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Management/BCC.html> (last updated Apr. 11, 2012).

147. FINAL ENVIRONMENTAL IMPACT STATEMENT, *supra* note 13, at 4.3-19 to -20.

148. *Id.* at 4.3-40 (discussing loss of habitat, movement corridor impairment, mortality from vehicle collisions, and “indirect impacts from construction and increased human activity levels.”).

149. *Id.* at 4.3-41 (listing declining forage, fewer native plants and a proliferation of noxious weeds; increased road traffic and vehicle/bird collisions; noise and human activity that increases stress on wildlife; habitat fragmentation; and displacement from existing habitats).

150. *Id.* at 4.3-41 to -42.

151. *Id.*

152. *Id.* at 4.3-42 (“[H]eat-induced injuries that have been reported at solar facilities, may be associated or exacerbated by large evaporation ponds at the solar plant that attracted the birds to the area.”).

153. *Id.*

154. *Id.*

discounted this information without much analysis of the potential correlating, and magnified, impact in Ivanpah.¹⁵⁵

The BLM demonstrated such little concern for the possibility of solar flux mortality that it proposed a wait-and-see mitigation strategy. The proposed measure would require BrightSource to conduct

[V]isual biweekly surveys for bird and bat mortalities throughout the project site. Data would document the species affected and any overt signs of injury resulting in death (e.g., scorched feathers). This information would be compiled and provided to the BLM on quarterly intervals for the first three years, then annually thereafter.¹⁵⁶

The hope is that sufficient data might be gathered to develop a mitigation plan in the future that may be effective in reducing these mortalities.¹⁵⁷ Taken one step further, the EIS states that there is a similar possibility of this adverse impact occurring for each of the project's main alternatives (not including the no action alternative) because they all use the same technology.¹⁵⁸ Essentially, the mitigation plan to manage birds burning to death is for BrightSource to monitor the situation and keep track of how many birds (and bats) are killed because of the plant's operation.¹⁵⁹ The BLM adopted this strategy based on data taken from a much smaller solar plant, but as the agency itself pointed out, the ISEGS is 50 times bigger, and has a higher potential to magnify the adverse impacts that the model plant experienced.¹⁶⁰ The "wait-and-see" approach would compile data over three years, which is particularly alarming if the Center for Biological Diversity's report of 28,000 birds killed per year proves to be accurate.¹⁶¹

The BLM's dismissal of the potential adverse impacts to wildlife caused by the solar flux is particularly concerning given the understanding of biological "mega traps," which are considered at least partially responsible for the "streamer" events. First, the agency attributes an attraction to evaporation ponds as the reason birds were found dead at the model plant, ponds that the ISEGS does not have, so it dismissed the likelihood of a similar

155. *Id.* ("[The] proposed ISEGS project is approximately 50 times the size of the McCrary study site with more numerous and taller towers.").

156. *Id.*

157. *Id.* at 4.3-128.

158. *Id.* at 4.3-62, 4.3-77 to -78.

159. *Id.* at 4.3-42.

160. *Id.*

161. Knickmeyer & Locher, *supra* note 7.

cause of mortality.¹⁶² However, the USFWS Forensics Laboratory study found birds can be attracted into the mirror field to prey upon their food sources, which flock to the mirror field's reflected light.¹⁶³ The study indicates that perhaps the BLM was too quick in dismissing this possible adverse impact, and that relying on only one study, and not considering other possible scientific explanations, does not fulfill the agency's NEPA duty.

NEPA requires that the agency discuss all impacts with potentially catastrophic consequences, even if the possibility of the consequences occurring is low.¹⁶⁴ The agency must therefore provide a "summary of existing credible scientific evidence which is relevant to evaluating the reasonably foreseeable significant adverse impacts."¹⁶⁵ In the Final EIS, the BLM cited only one study on solar flux bird mortality and did not provide a "summary of existing credible scientific evidence" that could have indicated that such an adverse impact might have a higher likelihood of occurring. This outcome is more likely given the size of the ISEGS compared to the sample plant the agency used.

Second, the mitigation method proposed met neither NEPA standards nor the Supreme Court's interpretation of the agency's duties. A mitigation plan is important to the adequacy of an EIS because it allows the decision maker to make an informed judgement about the environmental impact.¹⁶⁶ While not required to adopt a mitigation plan fully, the agency still must ensure that the "environmental consequences have been fairly evaluated . . ."¹⁶⁷ Furthermore, addressing the environmental consequences ensures that "important effects will not be overlooked or underestimated only to be discovered after resources have been committed . . ."¹⁶⁸

The BLM's "wait-and-see" attitude of monitoring bird mortality is directly opposed to the mitigation plan's purpose: the agency overlooked and underestimated important effects and did not discover these effects until after the resources had already been committed. The ISEGS was fully built and operational, and resources had been committed, and by the time the full impact of the bird mortality was observed, it was too late and many birds had already been killed. Additionally, the agency is conducting the mitigation plan while it monitors the situation and the ISEGS continues to operate, killing more birds daily.¹⁶⁹ These "streamer" events are the very definition of

162. FINAL ENVIRONMENTAL IMPACT STATEMENT, *supra* note 13, at 4.3-42.

163. KAGAN ET AL., *supra* note 74, at 20.

164. 40 C.F.R. § 1502.22(b) (2014).

165. *Id.*

166. *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 347-48 (1989).

167. *Id.* at 352.

168. *Id.* at 349.

169. Knickmeyer & Locher, *supra* note 7.

overlooked and underestimated, and the agency had no other mitigation plan in place other than to monitor the situation.

Third, the EIS discussion on the possibility of solar flux mortality does not meet the dual NEPA procedural requirements: the agency must carefully consider detailed information about significant environmental impacts in making a decision, and relevant information must be available to interested parties so that they may play a role in the decision-making process and its implementation.¹⁷⁰ The BLM merely provided a cursory mention of the possibility of solar flux mortality prior to dismissing the likelihood entirely.¹⁷¹ The agency did not go into sufficient detail that would lend itself to careful decision-making. If the BLM had addressed the possibility of solar flux mortality more thoroughly, the agency may have been more careful in how it proceeded prior to approving the ISEGS, and may have chosen a different alternative. Also, the quick dismissal of the possible impact restricts public involvement in the decision-making process. Through a careful evaluation of these impacts, interested parties could have had a more active role in the decision-making and implementation of the ISEGS. Perhaps they could have had enough influence to urge a different alternative or a more impactful mitigation measure.

B. Three out of Twenty Five: The ISEGS Alternatives

In addition to mitigation measures and possible environmental impacts, the EIS also evaluates and compares the proposed project to three primary alternatives which include: the Mitigated Ivanpah 3 Alternative, the Modified I-15 Alternative, and the No Action Alternative.¹⁷² The EIS states that only these alternatives “were found to have a potential to avoid or minimize adverse effects on the human environment.”¹⁷³ The No Action Alternative must be included in the EIS in order to “sharply defin[e] the issues and provid[e] a clear basis for choice among options by the decisionmaker and the public.”¹⁷⁴ In addition to a No Action Alternative, the agency must “[r]igorously explore and objectively evaluate all reasonable alternatives,” briefly discuss the rejected alternatives and the reasons for eliminating them, provide a substantial analysis comparing the proposed project with the alternatives, include alternatives that are not within the agency’s jurisdiction,

170. *Robertson*, 490 U.S. at 349.

171. FINAL ENVIRONMENTAL IMPACT STATEMENT, *supra* note 13, at 4.3-42.

172. FINAL ENVIRONMENTAL IMPACT STATEMENT, *supra* note 13, at 3-5 to -6.

173. *Id.* at 1-11.

174. 40 C.F.R. § 1502.14 (2014).

identify the agency's preferred alternative, and "[i]nclude appropriate mitigation measures."¹⁷⁵

Aside from the No Action Alternative, the essential differences between the two other alternatives and the project proposal were the site location, size, and mirror arrangement of the final solar plant.¹⁷⁶ The Mitigated Ivanpah 3 Alternative uses the same technology as the proposed project, but uses less land, and would accomplish all of the ISEGS objectives: energy generating goals, and other beneficial impacts like job creation.¹⁷⁷ The Modified I-15 Alternative would use the same technology and configuration as the Mitigated Ivanpah 3 Alternative but would be located on a different site.¹⁷⁸ It too would meet all of the objectives and most of the beneficial impacts.¹⁷⁹ Both alternatives have the potential for the same adverse impact to birds and the same mitigation measures as the proposed project.¹⁸⁰

The agency determined that the No Action Alternative would, of course, have no adverse impacts on any resources, biological or otherwise.¹⁸¹ Essentially, the No Action Alternative establishes a baseline of what conditions would be like if the project were not built.¹⁸² The alternative is useful because it allows the decision makers and the public to compare the effects and alternatives of the proposed project to the natural state of the environment.¹⁸³ Under this alternative, any impact that occurs within the area is not related to the ISEGS. However, in the EIS, the BLM mentioned that the land could still be used in the future by other development which would likely not meet the green energy objectives of the current project and may result in the same, or worse, adverse impacts that would be avoided by taking the no action approach.¹⁸⁴ The agency therefore rejected the No Action Alternative because of "the importance of solar technology as a tool in reducing greenhouse gases," and the agency's desire to approve some version of the ISEGS.¹⁸⁵

The EIS evaluated these alternatives and compared them to the impacts of the proposed facility and determined that the proposed project would

175. *Id.*

176. See FINAL ENVIRONMENTAL IMPACT STATEMENT, *supra* note 13, at 1-12 to -14 (providing a summary of the main project proposals discussed in greater detail in the EIS).

177. *Id.* at 1-12 to -13.

178. *Id.* at 1-13 to -14.

179. *Id.*

180. *Id.* at 4.3-62; *Id.* at 4.3-77 to -78.

181. *Id.* at 3-45.

182. *Id.* at 3-45 to -46.

183. *Id.* at 3-45.

184. *Id.* at 3-46.

185. *Id.*

achieve all objectives (the maximum amount of beneficial socioeconomic, greenhouse gas, and air pollutant impacts), but “it would also result in the greatest number and magnitude of adverse impacts.”¹⁸⁶ For the above reasons, the BLM preferred the Mitigated Ivanpah 3 Alternative.¹⁸⁷

The other alternatives that the BLM considered, but ultimately dismissed, included alternative site locations, different types of solar and renewable energy technologies, different methods of power generation, and a different method of project implementation—a phased development process.¹⁸⁸ The BLM clarified that an alternative site would have to be “clearly superior” to the proposed project in order to be approved.¹⁸⁹ The EIS goes on to dismiss the other sites for various reasons: little significant change in impacts; requiring too much private land acquisition; a larger adverse impact on the desert tortoise; not meeting project objectives; and simply not being a feasible location.¹⁹⁰

The EIS also addresses alternative solar generating technologies. These alternatives would replace the heliostat mirror and power tower style of the ISEGS with other methods of solar power generation.¹⁹¹ These methods include: parabolic trough technology,¹⁹² Stirling dish technology,¹⁹³ linear Fresnel technology,¹⁹⁴ and photovoltaic technology.¹⁹⁵ The EIS admits that most of these alternatives would achieve the same power generating objectives as the proposed project.¹⁹⁶ However, the agency dismissed these alternatives because it claimed that it is not within its authority “to direct a project applicant to the specific type of technology or system of energy development on the public lands.”¹⁹⁷

186. *Id.* at 1-39.

187. *Id.* at 8-4.

188. *Id.* at 3-47.

189. *Id.* at 3-48.

190. *See id.* at 3-47 to -82 (discussing the reasons for rejecting alternative sites).

191. *Id.* at 3-82.

192. “A parabolic trough system converts solar radiation to electricity by using sunlight to heat a fluid, such as oil, which is then used to generate steam.” *Id.* at 3-83.

193. “Stirling dish technology converts thermal energy to electricity by using a mirror array to concentrate and focus sunlight on the receiver end of a Stirling engine.” *Id.* at 3-85.

194. A Fresnel power plant converts solar radiation to electricity by using moving mirrors to follow the path of the sun and reflect its heat on fixed pipe receivers to produce steam, which is used to turn steam turbine generators and produce electricity. *Id.* at 3-87.

195. “A solar photovoltaic (PV) power generation facility would consist of PV panels that would absorb solar radiation and convert it directly to electricity.” *Id.* at 3-88.

196. *See id.* at 8-84 to 3-94 (noting that each alternative is capable of generating the same power—400 MW—as the proposed project).

197. *Id.* at 3-82.

The BLM addressed these alternatives purely because NEPA requires it to do so, but dismissed them primarily because they are “not within the area of expertise of the applicant.”¹⁹⁸ The EIS states that the impacts from these alternative technologies would largely be the same as the proposed project, except that the Fresnel and photovoltaic technology would require less land use, and the parabolic trough method would leave a smaller footprint.¹⁹⁹ Furthermore, the brief environmental impact analysis focuses on the impacts to other resources like recreation or soil and water resources, while its assessment of biological resources focuses on the desert tortoise.²⁰⁰ But the agency neither fully contemplated the likelihood of solar flux mortality, nor considered the possibility when discussing the benefits of alternative technology. The parabolic trough technology and photovoltaic technology, because of their lack of mirrors focusing the sun’s rays, would appear to eliminate the possibility of solar flux while still meeting the power generating objectives of the original project.²⁰¹

The EIS also considers alternative forms of renewable energy such as: wind, geothermal, biomass, tidal, and wave energy.²⁰² Again, the EIS briefly discusses these other forms of energy but dismisses them because tidal and wave energy are not on BLM land, and wouldn’t meet the energy objectives; geothermal sources are not found in the targeted area; there is insufficient fuel in the desert for biomass energy; and wind energy carries its own share of adverse impacts (bird collisions with wind turbines)—plus, the applicants did not apply for these types of energy grants.²⁰³ While the EIS acknowledges that some of these renewable energy methods are a “reasonable and feasible renewable technology,” it ultimately dismisses them for the reasons mentioned above.²⁰⁴

The wind energy alternative is particularly noteworthy because the Ivanpah area could be conducive to wind turbines, it could meet the energy objectives, and it is within the BLM’s authority to approve and lease the land for wind development.²⁰⁵ However, the BLM rejected this alternative

198. *Id.* at 3-84, 3-86, 3-87, 3-89.

199. *See id.* at 3-82 to -94 (analyzing the pros and cons and the reasons for rejecting alternative technologies).

200. *Id.* 3-82 to -94, 4.3-95 to -98.

201. *See id.* 3-83 to 3-94 (discussing the likely environmental impact of the alternative forms of solar generation technology, as well as each type of technology’s ability to meet the energy production goals of the proposed project).

202. *Id.* at 3-94 to -95.

203. *Id.* at 3-95.

204. *Id.* at 3-96.

205. *Id.* at 3-95 to 3-96.

because wind energy carries many of the same environmental risks as the ISEGS: birds can collide with the wind turbines, and the construction and operation of the turbines can fragment wildlife habitat.²⁰⁶ Additionally, wind turbines could use more land than the proposed project in order to reach the same energy output as the ISEGS, which would result in greater habitat disruption.²⁰⁷ The EIS concludes that “wind energy that would be viable at some locations in the Mojave Desert could create significant impacts to biological, visual, cultural, and water and soils resources.”²⁰⁸

In order to fully comply with NEPA, the BLM also considered nonrenewable energy sources such as: natural gas, coal, nuclear energy, and conservation and demand-side management.²⁰⁹ These alternatives are briefly discussed and quickly dismissed because nonrenewable energy does not meet the project’s key objectives of constructing and operating a “400-megawatt, renewable power generating facility” to meet the “needs of California utilities.”²¹⁰

Finally, the EIS addresses an alternative that was proposed by environmental interest groups during the comment period after the Draft EIS.²¹¹ The comments suggested a Phased Approval Alternative because the ISEGS is the largest solar power facility to use the power tower method of generating electricity, and the possible adverse impacts of construction and operation could be unpredictable.²¹² The EIS acknowledges that “the proposed project was the first of this scale and technology proposed on federal lands, and that uncertainties regarding potential impacts existed.”²¹³ As discussed above, the mitigation measure proposed for these uncertainties is to monitor impacts and then respond accordingly should any adverse consequences occur.²¹⁴

The ISEGS consists of three separate solar power plants and mirror fields built from 2010 to 2013.²¹⁵ Under the Phased Approval Alternative, the three mirror fields and towers would be built separately, in phases, and after the first plant was built and operational, the BLM would monitor for

206. *Id.* at 3-96.

207. *Id.*

208. *Id.* at 3-95.

209. *Id.* at 3-103.

210. *Id.*

211. *Id.* at 3-107.

212. *Id.*; *World’s Largest*, *supra* note 1.

213. FINAL ENVIRONMENTAL IMPACT STATEMENT, *supra* note 13, at 3-107.

214. *Id.*

215. *Ivanpah Project Facts*, *supra* note 36.

any adverse impacts prior to approving construction on the next phase.²¹⁶ After a sufficient amount of time to monitor consequences of the first phase, the BLM would consider the impacts and decide either to approve the next phase as proposed, recommend approval with modifications, or recommend halting continued development.²¹⁷ If the BLM decided to modify the subsequent phases, then the agency could incorporate portions of the other reasonable alternatives, including “alternative sites, alternative technologies, alternative construction or operation procedures, and modified mitigation measures.”²¹⁸

The BLM ultimately dismissed phased development, contending that it would be too slow economically for the project applicant BrightSource. The agency concluded that “the Phased Approval alternative is likely to be economically infeasible for the applicant because they would not qualify for the DOE federal loan guarantee program under the EPAct of 2005.”²¹⁹ Furthermore, the BLM decided that the proposed mitigation measure of monitoring the impacts was sufficient to address the concerns of those who suggested the Phased Development Alternative.²²⁰ The EIS states that the proposed mitigation plan would “provide the flexibility necessary to respond to newly identified impacts and conditions, and phased approval would not likely reduce those impacts further.”²²¹ The BLM promoted this mitigation measure despite the uncertainty inherent in building and operating the largest solar plant of its kind.

By dismissing the Phased Development Alternative, the BLM underestimated the potential adverse impact on biological resources because no solar plant of this type had ever been built. The agency should have recognized the inherent unpredictability of possible impacts that might arise from the largest heliostat mirror field ever constructed and proceeded cautiously. Because of this unpredictability, the BLM should have rolled out the project in a phased process in order to have a better understanding of the possible adverse impacts. This level of caution would have allowed the agency to modify, or even cancel, future phases if needed. Instead, the agency dismissed the phased approach and approved the project in its entirety, only to monitor impacts later. This method lets the proverbial genie out of the bottle, making it more difficult to address significant adverse impacts after operation than it would have been if the ISEGS had been built in phases.

216. FINAL ENVIRONMENTAL IMPACT STATEMENT, *supra* note 13, at 3-108.

217. *Id.*

218. *Id.*

219. *Id.*

220. *Id.*

221. *Id.*

With phases, the BLM would have observed the solar flux incidents and could have modified the future phases with alternative sites, renewable technology, different operation methods, or modified mitigation measures. Instead, the agency chose to fast-track energy development ahead of a cautious phased development. The agency's primary reason for doing so was that the developer might miss out on financing, or "Federal and State incentives for renewable energy development[] to proceed with the project."²²²

C. What Does NEPA Require Now?

A frequent question that comes up in relation to an agency's NEPA obligations is: when must an agency prepare a Supplemental EIS?²²³ This question applies when there is new information that changes the understanding of the impacts in the original EIS.²²⁴ An agency is required to supplement the EIS when: (1) "[t]he agency makes substantial changes in the proposed action that are relevant to environmental concerns;" or (2) "[t]here are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts."²²⁵ The Supreme Court has ruled that while an agency is not required to prepare a Supplemental EIS every time new information or adverse impacts develop, it is required to "take a 'hard look' at the environmental effects of their planned action, even after a proposal has received initial approval."²²⁶ An agency that puts on "blinders to adverse environmental effects," because its role in the approval phase is over, is neglecting duties that go to the very heart of NEPA: to make informed decisions in considering environmental protection.²²⁷ An agency must look at the new information, determine whether it is significant to the decision-making process, and decide whether "the remaining governmental action would be environmentally significant."²²⁸ Ultimately, "NEPA ensures that the agency will not act on incomplete information, only to regret its decision after it is too late to correct."²²⁹

222. *Id.*

223. RASBAND ET AL., *supra* note 108, at 288.

224. *Id.*

225. 40 C.F.R. § 1502.9(c)(1) (2014).

226. *Marsh v. Or. Nat. Res. Council*, 490 U.S. 360, 373–74 (1989).

227. *Id.* at 371.

228. *Id.* at 372.

229. *Id.* at 371.

The BLM now has a legal responsibility to prepare a Supplemental EIS for the ISEGS. The incidents of solar flux bird mortality developed after the ISEGS started generating power.²³⁰ This new environmental concern fits precisely within the second requirement for a supplemental EIS: a significant new circumstance relevant to environmental concerns has occurred, and continues to occur, which bears on the impact of the agency's action.²³¹ The Court has said that the agency is required to take a hard look at the environmental effects of its action, even after that action has been implemented, but currently, the agency wants to monitor the situation for another year. Meanwhile, birds continue to be killed as the plant remains operational. While the agency might argue that taking a year to monitor the situation helps it make an informed decision, as NEPA requires, one could argue that the BLM's continued wait-and-see approach further demonstrates the agency putting on blinders to this adverse impact, as it did in the Final EIS and the proposed mitigation measures.

The agency should have put greater consideration into the possibility of solar flux mortality in the original EIS and not simply dismissed it as an unlikely occurrence. Now that this adverse impact is a reality, the BLM's NEPA duties demand that the agency prepare a Supplemental EIS—especially given the USFWS Forensics Laboratory findings—and properly address this significant impact on wildlife, after it failed to do so prior to approving the ISEGS. A Supplemental EIS allows the agency a do-over on its underestimation of the possibility of solar flux mortality. Preparing a Supplemental EIS would, at the very least, allow the BLM to propose different project operating methods, and to apply more effective mitigation measures (such as those suggested by USFWS) to decrease harm to the birds.²³² If the high-end projection of 28,000 bird mortalities is accurate, the wait-and-see approach needs to quickly be replaced with a more aggressive method. The agency cannot afford to just sit and monitor the situation: the adverse impact to wildlife will mount while the BLM waits a year for more data. As the Court has said, the agency does not want to fail to address this significant new environmental consequence and end up regretting its decision after it is too late to correct.²³³

230. Knickmeyer & Locher, *supra* note 7.

231. 40 C.F.R. § 1502.9(c)(1)(ii) (2014).

232. Mitigation measures suggested by FWS include: clearing the area around the towers to decrease the habitat attractiveness; suspending power tower operation during peak migration periods; placing perch deterrent devices on tower railings near the flux field; and employing other exclusionary measures. KAGAN ET AL., *supra* note 74, at 3.

233. *Marsh*, 490 U.S. at 371 (1989).

III. THE OTHER FEDERAL STATUTES

While NEPA perhaps plays the most critical role in evaluating the Final EIS, other federal statutes play an important role in addressing the BLM's consideration and dismissal of solar flux mortality, and its response when those impacts became a reality. As discussed in Part I, § 104 of NEPA does not eliminate any other statutory duties already imposed on the agency.²³⁴ Only when the agency's duties under the other statute are in conflict with NEPA duties may the agency use its discretion to choose its level of compliance.²³⁵ Otherwise, NEPA's mandate and the requirements of the other statute both apply to the agency's actions.²³⁶ Because of § 104, the BLM is also subject to the Endangered Species Act (ESA),²³⁷ the Migratory Bird Treaty Act (MBTA),²³⁸ the Bald and Golden Eagle Protection Act (BGEPA),²³⁹ and the Federal Land Policy and Management Act (FLPMA)²⁴⁰ in all of its actions regarding the approval of the ISEGS and its management of the federal land in Ivanpah.

A. Implications of the Endangered Species Act

The Endangered Species Act is regarded as the “most powerful federal wildlife law.”²⁴¹ The declarative purpose of the Act is to provide a means to conserve “the ecosystems upon which endangered species and threatened species depend” and to provide a program to conserve such endangered and threatened species.²⁴² The ESA reflects a “commitment to protect wildlife by mandating the dedication of resources and the tempering of development,”²⁴³ and an intent to afford a high priority to endangered species.²⁴⁴ Other environmental protection laws, such as NEPA, balance environmental concerns between social and economic costs, but the ESA's purpose is to protect animal species at any cost.²⁴⁵ For this reason, the ESA often interacts

234. 42 U.S.C. § 4334 (2012).

235. *Calvert Cliffs' Coordinating Comm., Inc. v. U. S. Atomic Energy Comm'n*, 449 F.2d 1109, 1115 n.12 (D.C. Cir. 1971).

236. *Id.*

237. Endangered Species Act of 1973, 16 U.S.C. §§ 1531–1544 (2012).

238. Migratory Bird Treaty Act of 1918, 16 U.S.C. §§ 703–712 (2012).

239. Bald and Golden Eagle Protection Act, 16 U.S.C. §§ 668–668ee (2012).

240. Federal Land Policy and Management Act of 1976, 43 U.S.C. § 1701 (2012).

241. RASBAND ET AL., *supra* note 108, at 348.

242. 16 U.S.C. § 1531(b).

243. RASBAND ET AL., *supra* note 108, at 348.

244. *Tenn. Valley Auth. v. Hill*, 437 U.S. 153, 174 (1978).

245. RASBAND ET AL., *supra* note 108, at 348.

with other statutes, and often trumps those laws if protection of a species is at issue.²⁴⁶ Congress passed the ESA expressing an “overriding need to devote whatever effort and resources were necessary to avoid further diminution of national and worldwide wildlife resources.”²⁴⁷ Both senators and representatives “uniformly deplored the irreplaceable loss to aesthetics, science, ecology, and the national heritage should more species disappear.”²⁴⁸ The clear intent was “to halt and reverse the trend toward species extinction, whatever the cost.”²⁴⁹

There are two key components for ESA implementation. First, it provides a mechanism to identify and list endangered and threatened species to be protected.²⁵⁰ Second, and critical to bird mortality in Ivanpah, once a species is listed, all federal agencies have a duty to conserve listed species and ensure their recovery.²⁵¹ The language of the statute is clear: all federal agencies are to “insure that any action authorized, funded, or carried out by such agency . . . is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species”²⁵² All federal agencies are therefore obligated not to “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct” towards the listed species protected by the Act.²⁵³ The Supreme Court has additionally concluded that Congress would have foreseen, and therefore must have intended, the ESA to “require agencies to alter ongoing projects in order to fulfill the goals of the Act.”²⁵⁴

In the Final EIS, several special status species were observed in Ivanpah. It should be noted that none of the bird species in the area have yet to be listed as protected under the ESA, but several are potential candidate species. Candidate species are “any species being considered . . . for listing as an endangered or . . . threatened species, but not yet the subject of a proposed rule.”²⁵⁵ Potential candidate bird species are on the Fish and Wildlife

246. *Id.*

247. *Tenn. Valley Auth.*, 437 U.S. at 177 (quoting George Cameron Coggins, *Conserving Wildlife Resources: An Overview of the Endangered Species Act of 1973*, 51 N.D. L. REV. 315, 321 (1975) (emphasis omitted)).

248. *Id.*

249. *Id.* at 184.

250. Endangered Species Act of 1973, 16 U.S.C. § 1533 (2012).

251. *Id.* § 1536.

252. *Id.* § 1536(a)(2).

253. *Id.* § 1532(19).

254. *Tenn. Valley Auth.*, 437 U.S. at 186 (basing this conclusion upon the legislative history of the Endangered Species Act).

255. 50 C.F.R. § 424.02(b) (2014).

Service's Birds of Conservation Concern list: animals that, without additional conservation efforts, are likely to become listed under the ESA.²⁵⁶ Because these birds are not yet listed, the BLM is not strictly required to protect these species (although the MBTA has different requirements). However, at the very least, the BLM should confer with the Secretary of the Department of the Interior (Secretary) "on any agency action which is likely to jeopardize the continued existence of any species proposed to be listed."²⁵⁷ Furthermore, there shall be "a system to monitor effectively the status of all [candidate] species . . . [and] to prevent a significant risk to the well being of any such species."²⁵⁸ Some of the special status species include the Western Burrowing Owl and the Golden Eagle, amongst others.²⁵⁹

There are numerous disparities between the protections given to ESA listed species versus those given to candidate species awaiting listing. The ESA does not protect candidate species, but "[p]roactive conservation efforts . . . can, in some cases, eliminate the need to list them"²⁶⁰ Suffice it to say, candidate species face "dire circumstances . . . [and] are afforded little protection."²⁶¹ Quite often, by the time a candidate species is finally listed "as threatened or endangered, the species likely has reached a situation requiring drastic, and possibly prohibitively expensive, recovery procedures."²⁶² Many such species "may already be extinct."²⁶³ Because of the potential costs—both to the agency and to the species—of not taking "proactive conservation efforts," it would behoove public agencies to consider the risks to candidate species with a little more urgency before approving an action.

The ESA mandates the BLM to protect and assist the recovery of protected species, and to conserve their habitat, but when it considered the ISEGS, the agency was not strictly bound by the law to take all measures to

256. *Birds of Conservation Concern*, *supra* note 146.

257. 16 U.S.C. § 1536(a)(4). Federal agencies are required to consult the Secretary on any action that threatens not only species already listed as endangered or threatened, but also species formally proposed for listing. *Wilson v. Block*, 708 F.2d 735, 750–51 (D.C. Cir. 1983). While BLM may have met its binding legal obligation before approving the ISEGS, the agency should have also been required to consider species of concern even if those species have not been formally proposed for listing.

258. 16 U.S.C. § 1533(b)(3)(C)(iii).

259. FINAL ENVIRONMENTAL IMPACT STATEMENT, *supra* note 13, at 4.3-19 to -22 (including the Loggerhead Shrike; the Crissal, Bendire's, and the Le Conte's Thrasher; the Vaux's Swift; the Brewer's Sparrow; and the Gray Vireo).

260. U.S. FISH & WILDLIFE SERV., CANDIDATE CONSERVATION AGREEMENTS 1 (2011), <http://www.fws.gov/endangered/esa-library/pdf/CCAs.pdf>.

261. Andrew A. Smith et. al., *The Endangered Species Act at Twenty: An Analytical Survey of Federal Endangered Species Protection*, 33 NAT. RESOURCES J. 1027, 1047 (1993).

262. *Id.*

263. *Id.*

ensure that special status birds were protected. However, because these birds have the potential for listing, there should be a heightened awareness towards their conservation, and the BLM should have at least considered any possible adverse impact with a little more scrutiny; the EIS even identifies them as special status. The ESA may not legally require protecting a non-listed candidate species, but the policies and purposes of the Act, as well as the language in § 1536(a)(4), indicate that agencies are encouraged to at least consider conservation methods if their actions puts an already at-risk species further at risk.²⁶⁴ The purpose and policy goals of the ESA are therefore implicated because these animals could easily become listed one day.²⁶⁵

Furthermore, two legal theories appear to require the BLM to have considered the risks caused by solar flux before approving the ISEGS. First, the agency needed to confer with the Secretary of the Interior if its actions jeopardized a candidate species, and the agency must have taken steps “to prevent . . . significant risk[s] to the well being” of “species proposed to be listed.”²⁶⁶ While it may have conferred with the Secretary, the BLM did not take steps to prevent risk to the well-being of candidate species when it dismissed the likelihood of solar flux mortality. Second, under NEPA, the agency also has a duty to consider and weigh the significance of these environmental risks before taking action and to consult with the Secretary if vulnerable species are at risk.²⁶⁷ When the BLM evaluated the possibility of solar flux mortality, it did not properly consider the environmental impact to these at-risk species, and it did not take the steps needed to help prevent these species from possibly becoming listed under the ESA in the future.

In sum, the Agency had both a NEPA duty to consider the adverse environmental impacts to candidate species, and an ESA duty to prevent risks to those species—both implied and after any DOI consultation process. Given the dire risks a candidate species faces from the lack of ESA protection, the BLM should have erred on the side of caution and considered proactive conservation efforts in a goal to eliminate the need to list the species in the future. The agency was aware of the potential for ESA listing—indicated by the inclusion of “special status species” in the EIS—so it should have placed greater weight on the possibility that solar flux mortality might jeopardize those species.

264. See 16 U.S.C. §§ 1533(b)(3)(C)(iii), 1536(a)(4) (2012) (requiring federal agencies to consult with the Secretary of the Interior on any action that may threaten species formally proposed for listing as well as those actually listed).

265. *Birds of Conservation Concern*, *supra* note 146.

266. 16 U.S.C. § 1536(a)(4).

267. 42 U.S.C. § 4332(2)(C).

B. Two Treaties to Protect Avian Wildlife

The Migratory Bird Treaty Act is one of the oldest federal wildlife laws, and its reach in protecting migratory birds can sometimes extend to species beyond the protection of the ESA.²⁶⁸ The Act is the ratified version of a 1918 international treaty between the United States, Great Britain (on behalf of Canada), Mexico, Japan, and Russia that protects certain species of migratory wildlife.²⁶⁹ Similar to the ESA, it is unlawful to “take” a species listed under the MBTA without a permit.²⁷⁰ “Take means to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to” do any of these actions towards a protected bird species.²⁷¹ A violation of any of the MBTA’s provisions without a permit carries the possibility of arrest and criminal penalties.²⁷²

The permitting process allows the taking of a listed migratory bird after approval by the USFWS.²⁷³ Special permits may be issued if the applicant shows a “benefit to the migratory bird resource, important research reasons, reasons of human concern for individual birds, or other compelling justification.”²⁷⁴ Land management agencies like the BLM may be exempt from the permit process, but only if in the agency’s official business, they “collect, possess, transport, and dispose of sick or dead migratory birds.”²⁷⁵ However, the BLM is not allowed to take uninjured or healthy birds, or when a bird’s “death, injury, or disability was caused by factors other than infectious disease and/or natural toxins.”²⁷⁶

Similar to the MBTA, the Bald and Golden Eagle Protection Act (BGEPA), passed in 1940, criminalizes the taking of any bald or golden eagle “alive or dead.”²⁷⁷ “Take” in this context includes acts of pursuing, shooting, poisoning, killing, capturing, molesting, or disturbing eagles.²⁷⁸ In the USFWS regulations, a “person” is either a private entity or a public agent, meaning both the BLM and BrightSource are bound by the BGEPA

268. RASBAND ET AL., *supra* note 108, at 347.

269. *Id.*

270. Migratory Bird Treaty Act of 1918, 16 U.S.C. § 703(a) (2012) (making it unlawful to “pursue, hunt, take, capture,” attempt to take, possess, buy, sell, import, or export or commit these acts to “any part, nest, or egg of any such bird” on the MBTA list).

271. 50 C.F.R. § 10.12 (2014).

272. 16 U.S.C. § 706.

273. 50 C.F.R. § 13.11(b)(5).

274. 50 C.F.R. § 21.27.

275. 50 C.F.R. § 21.12(b)(2).

276. *Id.*

277. 16 U.S.C. § 668a (prohibiting taking, possession, sale, purchase, transport, export, or import, of any bald or golden eagle, “alive or dead, or any part, nest, or egg . . .”).

278. *Id.* § 668c; RASBAND ET AL., *supra* note 108, at 347.

requirements.²⁷⁹ Just like the MBTA, the Secretary of the Interior may issue permits that authorize a person to take an eagle, but only for scientific, exhibition, or religious purposes, or for the protection of wildlife or agriculture, such as to stop predation by an eagle.²⁸⁰

Even incidental takes, such as those at the ISEGS, require a permit if “the take cannot practicably be avoided.”²⁸¹ The USFWS considers numerous criteria before approving an applicant’s incidental take permit.²⁸² The Fish and Wildlife Service must be satisfied that the take is not the purpose of the applicant’s activity and that the take is unavoidable despite efforts by the applicant to follow “advanced conservation measures” and minimize impacts to eagles.²⁸³ Once approved, the permit holder must follow “avoidance, minimization, or other mitigation measures . . . to compensate for the detrimental effects, including indirect effects.”²⁸⁴ The holder must monitor use of the area and submit an annual report to USFWS when eagles could be affected by the permit holder’s activities.²⁸⁵ Even then, the activity must match the description in the permit application, and any changes in activity or unanticipated takes must be immediately reported.²⁸⁶ The USFWS may “amend, suspend, or revoke” a permit “to safeguard local or regional eagle populations,” and the permit holder is responsible for monitoring and mitigating impacts at all times.²⁸⁷ The BGEPA does not contain any exemption for federal agencies, so any permits issued, both public and private, must comply with the justifications given above, as well as the more intricate USFWS regulations.²⁸⁸

Many of the bird species observed within the Ivanpah Valley are listed either under the MBTA or the BGEPA, including those mentioned in Part II-A, such as the Golden Eagle.²⁸⁹ While the BLM and BrightSource were not strictly bound by the ESA to protect these species, they were bound to protect

279. 50 C.F.R. § 22.3.

280. 16 U.S.C. § 668a.

281. 50 C.F.R. § 22.26(a)(1).

282. *Id.* § 22.26(e)-(g) (determining whether to issue an incidental take permit requires an evaluation of many factors including: whether it is likely that a take will occur; if the take is compatible with the preservation of eagle species; if the take is “[n]ecessary to protect a legitimate interest in a particular locality;” and if the applicant has “proposed avoidance and minimization measures to reduce the take to the maximum degree practicable;” among others).

283. *Id.* § 22.26(f)(5).

284. *Id.* § 22.26(c)(1).

285. *Id.* § 22.26(c)(2).

286. *Id.* § 22.26(c)(5)-(6).

287. *Id.* § 22.26(c)(7).

288. *Id.* § 22.21-.28.

289. FINAL ENVIRONMENTAL IMPACT STATEMENT, *supra* note 13, at 4.3-15, -20.

them—or at least not “take” them—under the MBTA and BGEPA. The BLM did not consider that these migratory, and protected, birds would be at a considerable risk—although in hindsight, there was evidence of a greater potential for solar flux mortality than the Agency would accept.²⁹⁰ As discussed, had the Agency considered the risks appropriately, it would have realized that operating the ISEGS could cause an incidental take of a protected species. An eagle may not be taken without a “permit[] to do so,”²⁹¹ and both the BLM and BrightSource are a “person,” according to the regulations.²⁹² They were not just required to monitor the area, but instead, BLM and BrightSource were required to obtain a permit and follow appropriate “avoidance, minimization, [and] other mitigation measures” once the ISEGS was approved, became operational, and posed the risk of an incidental take.²⁹³

Neither the BLM nor BrightSource had a permit to take any of these species, although by approving and operating the ISEGS, a taking of a protected species is exactly what could happen. Even with a permit, the bird deaths do not serve “important research reasons” or as a “benefit to the migratory bird resource.”²⁹⁴ The MBTA exemption does not apply because the migratory birds that have been killed were not sick or dead prior to their solar flux encounter; they were uninjured or healthy birds whose deaths were not caused by “infectious disease and/or natural toxins.”²⁹⁵ Furthermore, while solar flux has yet to cause a Golden Eagle death, the possibility still exists. If that should happen, such a taking would not be for scientific, exhibition, or religious purposes, or for the protection of wildlife or agriculture.

The BLM and BrightSource were both obligated under the MBTA and the BGEPA to take action to protect these migratory and eagle species, or at the very least, not violate the statutes by taking any of these birds. BrightSource in particular needed to apply for an incidental take permit with the USFWS before operating the ISEGS, and demonstrate that if a take did occur, it would be unavoidable and would only happen despite the company’s efforts to minimize and mitigate the risks. By overlooking the possibility of solar flux mortality, developing insufficient mitigation measures, approving a solar plant that has caused the death of some of these protected species, and

290. See KAGAN ET AL., *supra* note 74, at 20.

291. 16 U.S.C. § 668 (2012).

292. 50 C.F.R. § 22.3.

293. 50 C.F.R. § 22.26(c)(1).

294. 50 C.F.R. § 21.27.

295. 50 C.F.R. § 21.12(b)(2).

not applying for, or complying with, an incidental take permit, the BLM's approval of the ISEGS violated both wildlife protection statutes.

C. Clarifying FLPMA's Role

The Federal Land Policy and Management Act, known as the BLM's Organic Act,²⁹⁶ requires the agency to manage the public land for "multiple use and sustained yield."²⁹⁷ Historically, FLPMA's purpose was to show that public lands were not solely for grazing, mining, or other extractive purposes, but rather for a multiple use of resources.²⁹⁸ Under FLPMA's multiple use mandate, the BLM must manage the public land and its resources in a way that will "best meet the present and future needs of the American people."²⁹⁹ The agency is to consider "balanced and diverse resource uses [and] take into account the long-term needs of future generations for renewable and nonrenewable resources"³⁰⁰ Such resource management includes both wildlife and scientific values.³⁰¹ In applying this balancing approach, the agency must not permanently impair the "productivity of the land and the quality of the environment," and it must consider "the relative values of the resources," not just the "uses that will give the greatest economic return."³⁰² The sustained yield mandate requires the agency to achieve and maintain a high-level output of the renewable resources of the public lands.³⁰³

The multiple use and sustained yield mandate, while allowing some agency discretion, does not give the BLM a blank check to use the public land resources as it pleases; it is still accountable to the statutory mandate to preserve both renewable and nonrenewable resources for future generations.³⁰⁴ In planning land use, the Secretary of the Interior must prioritize the "designation and protection of areas of critical environmental concern,"³⁰⁵ and "prevent unnecessary or undue degradation of the lands."³⁰⁶ These "areas of critical environmental concern" are lands that require special

296. The original Park Service Organic Act's mission was "to conserve the scenery and the natural and historic objects and the wild life therein" 16 U.S.C. §§ 1-18f (2012).

297. 43 U.S.C. § 1732(a).

298. RASBAND ET AL., *supra* note 108, at 953.

299. 43 U.S.C. § 1702(c).

300. *Id.*

301. *Id.*

302. *Id.*

303. *Id.* § 1702(h).

304. *Id.* § 1702(c).

305. *Id.* § 1712(c)(3).

306. *Id.* § 1732(b).

attention “to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources”³⁰⁷

The Supreme Court granted a “great deal of discretion” to the BLM in achieving its objectives.³⁰⁸ But even with such deference, the agency must still not act in a way that is “arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law.”³⁰⁹ An agency’s decision is arbitrary and capricious if the agency fails to “consider an important aspect of the problem,” or gives an explanation counter to the available evidence.³¹⁰ An agency’s decision may be valid if it “considered the relevant factors and articulated a rational connection between the facts found and the choices made.”³¹¹

Even though it is given deference to implement FLPMA’s multiple use and sustained yield requirements,³¹² the BLM’s actions, as they pertain to considering, dismissing and responding to the solar flux mortality, could be argued to be an arbitrary and capricious decision that did not comply with FLPMA. First, by failing to address the possibility that the solar flux could kill birds in large numbers, the BLM did not prioritize “the designation and protection of areas of critical environmental concern.”³¹³ Second, by not developing more effective and timely mitigation measures, the agency failed in its FLPMA duty to “protect and prevent irreparable damage to important . . . wildlife resources.”³¹⁴ Third, by not thoroughly investigating and then quickly dismissing the greater possibility of solar flux mortality, the BLM appeared to favor a resource management plan that “[would] give the greatest economic return,” rather than a balanced management that considers “the quality of the environment.”³¹⁵ Finally, the BLM both failed to consider an important aspect of the solar flux problem—that the ISEGS is 50 times bigger than the model plant—and offered an explanation that is counter to the evidence—that birds are attracted to the mirror field for reasons beyond an evaporation pond.

In preparing the Final EIS, the BLM did not properly follow its FLPMA mandate in determining how to manage the public land under its care. For

307. *Id.* § 1702(a).

308. *Norton v. S. Utah Wilderness All.*, 542 U.S. 55, 66 (2004).

309. Administrative Procedure Act, 5 U.S.C. § 706(2)(A) (2012). The Administrative Procedure Act is the main federal statute that guides how agencies must operate. RASBANDET AL., *supra* note 108, at 223.

310. *Gardner v. U.S. Bureau of Land Mgmt.*, 638 F.3d 1217, 1224 (9th Cir. 2011) (quoting *Lands Council v. McNair*, 537 F.3d 981, 987 (9th Cir. 2008)).

311. *Id.* (quoting *Arrington v. Daniels*, 516 F.3d 1106, 1112 (9th Cir. 2008)).

312. *Norton*, 542 U.S. at 66.

313. 43 U.S.C. § 1712(c)(3) (2012).

314. *Id.* § 1702(a).

315. *Id.* § 1702(c).

this reason, the agency's decision to dismiss the possibility of solar flux bird mortality, and not propose a suitable mitigation plan, was ultimately arbitrary and capricious.

IV. NATIONAL POLICIES: A CONFLICT OF ETHICS

Bird and wildlife mortality in the Ivanpah Valley has raised a number of political and ethical dilemmas. Chief amongst these concerns is the battle of green and renewable energy production versus the protection of wildlife. There are many obvious benefits to the increased development of green energy. One is to reduce our dependence on fossil fuel alternatives such as coal, oil, and gas, which can pollute the environment and are nonrenewable, meaning at some point these resources will be exhausted.³¹⁶ Other benefits from green energy production include: energy security, a reduced dependence on foreign oil, job growth, and economic opportunities.³¹⁷

The other side of the argument is that wildlife has long deserved, and received, our protection; just look at the purpose and requirements of the Endangered Species Act,³¹⁸ or the near century-old international obligations of the Migratory Bird Treaty Act.³¹⁹ The concern is that sometimes green energy development, while trying to help the environment, can also end up having a detrimental effect in other ways, such as the deaths of hundreds to thousands of birds from the Ivanpah solar power plant.³²⁰ The potential for such an adverse impact is particularly troublesome because in the Ivanpah situation, it appears that the importance of protecting wildlife is in some ways expendable—or at the very least a secondary concern—when confronted by the national mandate to advance green energy production as rapidly as possible.³²¹

316. Sarah Pizzo, *When Saving the Environment Hurts the Environment: Balancing Solar Energy Development with Land and Wildlife Conservation in A Warming Climate*, 22 COLO. J. INT'L ENVTL. L. & POL'Y 123, 126 (2011).

317. U.S. DEP'T. OF THE INTERIOR & U.S. DEP'T. OF AGRIC., NEW ENERGY FRONTIER: BALANCING ENERGY DEVELOPMENT ON FEDERAL LANDS 3 (2011), <http://www.doi.gov/sites/doi.gov/files/migrated/whatwedo/energy/upload/NewEnergyFrontier050511.pdf> [hereinafter NEW ENERGY FRONTIER].

318. 16 U.S.C. § 1531 (2012).

319. *Id.* § 703.

320. Knickmeyer & Locher, *supra* note 7.

321. Daniel Stone, *Obama Pledges U.S. Action on Climate, With or Without Congress*, NAT'L GEOGRAPHIC, (Feb. 12, 2013), <http://news.nationalgeographic.com/news/energy/2013/2/130212-obama-pledges-climate-change-action/>; Scott Streater, *Park Service Warns of Solar Projects' Impacts to Mojave Desert*, N.Y. TIMES, (Apr. 23, 2009), <http://www.nytimes.com/gwire/2009/04/23/23greenwire-park-service-warns-of-solar-projects-impacts-t-10660.html>.

President Obama declared that “we are ushering in a new era of green energy that will benefit our economic recovery, our security, and our long-term prosperity.”³²² The President encourages a national policy to pursue new technologies in production and to speed up the nation’s transition to renewable and sustainable energy.³²³ To implement this strategy, the Department of the Interior (DOI) and Department of Agriculture (DOA) filed a detailed report to Congress, which laid out a plan to develop both conventional and renewable energy sources on federal lands.³²⁴ The report sets the primary goals for this new development: (1) “the safe and responsible production of natural gas and oil” domestically, (2) “mak[ing] renewable energy a priority,” (3) “begin[ing] to move the Nation toward a clean energy economy,” (4) creat[ing] jobs, and (5) “reduc[ing the nation’s] dependence on foreign oil.”³²⁵ The report cites the Secretary of the Interior’s order to prioritize the “production, development, and delivery of renewable energy”³²⁶

Fortunately, the report also states a concurrent goal to apply the “best management practices to help ensure that energy development is conducted in an environmentally responsible manner” and to address “wildlife and habitat concerns by reducing impacts through proper project siting and mitigating impacts that cannot be avoided.”³²⁷ The report seems to understand the importance, and statutory obligation, of balancing resources and environmental concerns, but it also acknowledges that the President has “set ambitious goals for developing new, domestic clean energy.”³²⁸ At the time, those goals were to double the nation’s “renewable energy generating capacity” by 2011.³²⁹ With such an ambitious target, it wouldn’t be surprising for the DOI agencies, such as the BLM, to fast-track renewable energy projects, like the ISEGS, and possibly overlook wildlife and habitat concerns, such as the potential for solar flux mortality.

Solar energy is not the only green energy that can adversely impact wildlife and the environment. As mentioned, wind energy can similarly cause bird mortalities by habitat fragmentation or by birds flying into the rotating turbines.³³⁰ Wind and solar energy taken together are considered the

322. Proclamation No. 8431 of Oct. 2, 2009, 74 Fed. Reg. 51,735 (Oct. 8, 2009).

323. Stone, *supra* note 321.

324. NEW ENERGY FRONTIER, *supra* note 317, at 1.

325. *Id.*

326. *Id.* at 2.

327. *Id.* at 4.

328. *Id.* at 5.

329. *Id.* at 6.

330. FINAL ENVIRONMENTAL IMPACT STATEMENT, *supra* note 13, at 3-96.

“ultimate green project.”³³¹ But wind energy has been around long enough that the adverse impacts have been studied extensively; enough to partially mitigate the harms and to plan wind farm locations with possibly fewer environmental consequences—although these impacts are still never fully eliminated, only lessened.³³² For the ISEGS, the size of the facility and the relatively newer technology are mostly untested in how they might impact the local wildlife—although the science was available to consider bird mortalities more thoroughly than what the BLM accomplished in the EIS. Unfortunately, even while solar flux mortality is now a known problem and is being studied by biological experts—despite a one year wait for the agency to consider action—there are hopes that an effective mitigation plan will present itself. However, birds are still burning to death in Ivanpah, and that is not the only possible harm that green energy development can have on the environment.

Any type of green energy development can have a detrimental effect on wildlife from a permanent loss of habitat; fragmentation and degradation of habitat; loss of foraging grounds; death or injury of animals; vehicle collisions; harassment and stress caused by machinery and human activity; the list goes on and on, and most likely includes adverse impacts not yet considered.³³³ The ultimate question is: what should our priorities be as a nation as we consider the use of public lands, their development, and our relationship with the environment and wildlife going forward?

Currently there is a conflict between green energy development and wildlife protection, and the two appear to be mutually exclusive in some circumstances. The answer is first, for our regulatory agencies to actually implement some best management practices that ensure environmentally responsible energy development and commit to plans that properly site the projects, mitigate the impacts, and appropriately address wildlife and habitat concerns.³³⁴ Second, a reliance on strong scientific data; informed decision-making; robust, appropriate, and effective mitigation measures; and a national commitment not to fast-track one green policy at the expense of another. With these commitments, protecting wildlife and developing clean renewable energy need not be as mutually exclusive as they currently are.

331. John Copeland Nagle, *Green Harms of Green Projects*, 27 NOTRE DAME J.L. ETHICS & PUB. POL'Y 59, 61 (2013).

332. *Id.* at 73.

333. *Id.* at 68.

334. *Id.* at 89–90.

V. THE FUTURE OF SOLAR POWER IN THE MOJAVE

After nine months in operation, the ISEGS did not deliver on the energy output that was promised before construction.³³⁵ So far, the solar power plant is producing half of its anticipated annual output.³³⁶ Weather has been the biggest cause of the plant's inefficiency and it could take several more years for it to reach its peak target of production (likely by 2018).³³⁷ This statistic is concerning to BrightSource because the company does not qualify for a 30% investment tax credit if the ISEGS is not fully operating at its target output by 2016.³³⁸ The facility's lower-than-expected production numbers, combined with industry apprehension over the success of future thermal solar projects, has thus forced BrightSource to pull its participation from the proposed Palen project.³³⁹ Also, while not given as an official reason for the company's withdrawal, it is thought that the "hailstorm of abuse over reports of birds being fried" had a lot of influence on BrightSource's decision.³⁴⁰ In fact, prior to withdrawing from the Palen project, the company had reduced the number of planned power towers from two to one because of the impact to wildlife at the ISEGS.³⁴¹ However, while BrightSource is no longer part of the next proposed Mojave solar plant, the project remains a possibility as another firm, Abengoa Solar, announced that it will "buy[] out BrightSource's interest and will [move] forward with a redesigned version of the project."³⁴² Furthermore, the nation's mandate for clean energy is still ever-present and agencies like the BLM have a directive to encourage resource development on federal lands.³⁴³

Heading into the future, as several more solar thermal power projects are planned and developed, the question is how to properly mitigate green energy's adverse impacts, and what should industry and the government

335. Michael R. Blood, *Ivanpah Solar Plant Lags in Early Production*, HUFFINGTON POST (Nov. 17, 2014, 2:23 PM), http://www.huffingtonpost.com/2014/11/17/ivanpah-solar-plant-production_n_6173114.html.

336. *Id.*

337. *Id.*

338. Ken Broder, *Did Fried Birds Cook Proposed Desert Solar Project's Goose?*, ALLGOV (Oct. 9, 2014), <http://www.allgov.com/usa/ca/news/controversies/did-fried-birds-cook-proposed-desert-solar-projects-goose-141009?news=854477>.

339. *Id.*

340. *Id.*

341. *Id.*

342. Chris Clarke, *'Dead' Solar Plant May Rise from Grave*, KCET.ORG (Nov. 4, 2014, 3:05 PM), <http://www.kcet.org/news/define/rewire/solar/concentrating-solar/dead-solar-plant-apparently-rises-from-grave.html>. The Palen project is currently on hold until the future of the federal investment tax credit is determined, which is currently set to expire at the end of 2016. Meier, *supra* note 10.

343. NEW ENERGY FRONTIER, *supra* note 317, at 1.

learn from the ISEGS' lessons? Already, a power-tower-style solar plant nears completion in Tonopah, Nevada, where around 130 birds were ignited and killed when they flew through the solar flux created from a test run of the facility's 10,000 mirrors.³⁴⁴ Once informed of the "avian safety issues," SolarReserve, the Tonopah plant owner, acted immediately to halt testing and evaluate the situation to prevent further issues.³⁴⁵ But the question remains, how can solar development strategies improve, and what can be done in the future to prevent more wildlife mortality?

First, the green energy industry should strongly consider other forms of solar technology that have less potential to adversely impact wildlife and don't take up as much land as the massive mirror fields. One of the most promising technologies is photovoltaic systems—the EIS for Ivanpah even admitted that this technology could meet the objectives of solar thermal power plants.³⁴⁶ Photovoltaic "projects can now reliably be built for far less cost than solar thermal projects and there's enough data to reliably predict energy production from Day 1."³⁴⁷

Second, if the solar thermal plants are pushed through, the agency can be more thorough in evaluating the science of the potential adverse impacts. This is particularly true for those projects that are proposed in areas of higher migratory bird traffic than even the ISEGS location.³⁴⁸ The agency should not dismiss possible harmful consequences as quickly as it did with the ISEGS, and it should properly understand that facilities of a larger size can magnify environmental impacts. The agency should also have a more effective mitigation plan in place before approving new facilities. The plan should be more than a wait-and-see strategy and should have significant action-forcing remedies available in case the potential adverse impacts turn out to be a reality.

Finally, for those projects that will use multiple mirror fields and power towers, the agency should require development in a phased implementation plan. This alternative was proposed by environmental interest groups for the

344. Sarah Griffiths, *Solar Farm Sets 130 Birds on Fire: Extreme Glow of Power Plant Ignites Creatures Mid-Air During Tests*, DAILY MAIL (Feb. 23, 2015, 6:53 AM), <http://www.dailymail.co.uk/sciencetech/article-2965070/Solar-farm-sets-130-birds-FIRE-Extreme-glow-power-plant-ignites-creatures-mid-air-tests.html#ixzz3Wq6xfVtY>.

345. *Id.*

346. FINAL ENVIRONMENTAL IMPACT STATEMENT, *supra* note 13, at 3-89.

347. Travis Hoium, *Media Reports Another Solar Company Bailout, But They're Wrong*, MOTLEY FOOL (Nov. 23, 2014), <http://www.fool.com/investing/general/2014/11/23/media-reports-another-solar-company-bailout-but-th.aspx?source=isesitlnk0000001&mrr=1.00>.

348. Erik Zerkel, *New Solar Power Plants Are Incinerating Birds*, WEATHER CHANNEL (Aug. 18, 2014, 11:44 PM), <http://www.weather.com/science/news/solar-plants-birds-20140818>.

ISEGS, and was quickly rejected by the agency.³⁴⁹ A phased development would allow all interested parties to monitor the environmental impacts of each subsequent period of construction and operation, and allow those parties to modify, mitigate, or cancel future projects depending on what evidence presents itself. Such an approach would allow for informed decision-making that properly considers all of the important data, and could preclude the agency from having to look back in “regret [at] its decision after it is too late to correct,” as has happened in Ivanpah.³⁵⁰

CONCLUSION

The loss of wildlife at the ISEGS facility in Ivanpah Valley, California, is a significant environmental concern, and it serves as a microcosm of the national problem of green harm caused by green policy mandates. Developing renewable energy is a noble goal worth pursuing, but as demonstrated in Ivanpah, it does not always come free from adverse impacts and environmental harm. Federal agencies have a directive, both from the President and national sentiment, to rapidly develop clean energy and decrease the United States’ dependence on fossil fuels, both foreign and domestic. However, these agencies are also bound by federal laws that require consideration and protection of other valuable environmental resources: wildlife species and their associated habitats.

In approving the ISEGS, the Bureau of Land Management complied with its mandate to develop renewable energy on public lands, but in its haste, the agency also failed to meet its other statutory duties to protect the natural resources under its care. Because the agency quickly dismissed the likelihood of solar flux mortality, offered inappropriate mitigation measures, and did not properly consider the available science and possible impacts of a larger facility, birds continue to burn to death at a rapid rate. It is the government’s responsibility to make reasoned and informed decisions before taking action; this is the only way that the purposes behind the federal environmental protection laws can succeed. The situation in Ivanpah represents both a failure by the federal agency to do its job properly and a warning about building future energy generation technologies too quickly without fully considering the possible dire consequences. Ultimately, developing green energy and protecting other important environmental values, such as wildlife, need not be mutually exclusive so long as the agencies, developers, and

349. FINAL ENVIRONMENTAL IMPACT STATEMENT, *supra* note 13, at 3-108.

350. *Marsh v. Or. Nat. Res. Council*, 490 U.S. 360, 371 (1989).

public are more meticulous and thoughtful about planning the development of public lands.

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