

3,500 birds died at Ivanpah 'power towers' in 1st year -- report

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An estimated 3,500 birds died at the Ivanpah solar energy plant in its first year of operation, according to a report sent this week to state and federal regulators.

The report by consultants H.T. Harvey and Associates sheds important light on how the 377-megawatt Ivanpah solar facility -- the first "power tower" facility of its kind in the United States -- is affecting birds and bats in the Mojave Desert south of Las Vegas.

Built by developer BrightSource Energy Inc. and operated by NRG Energy Inc., Ivanpah became a media sensation in 2014 after reports that sunlight concentrated by its 350,000 heliostat mirrors was scorching hundreds of birds in midair, a phenomenon known as "streamers."

Fish and Wildlife Service officials warned in a report a year ago that Ivanpah may act as a "mega-trap," where abundant insects attract small birds that are killed or incapacitated by the solar flux. Those birds in turn attract larger predators, "creating an entire food chain vulnerable to injury and death."

Mirrors at Ivanpah spread across an area four times the size of New York's Central Park focus sunlight onto receivers atop three 45-story power towers, boiling a liquid that turns turbines to create electricity.

The H.T. Harvey report summarizes the first year of avian and bat monitoring that began in October 2013, around the time the plant became operational. Monitoring was developed with FWS help and is required under the plant's permits with the Bureau of Land Management and the California Energy Commission.

Surveyors spent a collective 8,935 hours, including 281 hours with scent-sniffing dogs, scouring the 3,600-acre site for dead birds.

They found a total of 695 dead or dying birds and 32 dead bats. But because the surveyors only scanned a fraction of the site and since scavenger birds often remove dead birds before humans can find them, the consultants estimated there were about 3,500 bird deaths.

The facility was estimated to have killed 83 species of birds, with 64 species having fewer than 10 observed fatalities.

The most commonly killed birds were mourning doves, representing 14 percent of fatalities, followed by yellow-rumped warblers, tree swallows, black-throated sparrows and yellow warblers.

The report concluded that deaths to migratory birds -- which are protected under federal law -- "would be categorized as low." The Migratory Bird Treaty Act prohibits the unpermitted killing of more than 1,000 bird species, though top Fish and Wildlife officials have praised Ivanpah's efforts to minimize bird deaths. The service only seeks prosecution of companies that it feels have neglected ways to mitigate project impacts.

In addition, total fatalities for any species represent "a small proportion of local, regional or national populations," the report says.

For example, the estimated 412 mourning dove fatalities at the plant represent 0.00011 percent of the

species' population in North America. Hunters kill an estimated 14.5 million doves per year, the report said.

Of the 3,500 estimated bird fatalities, about 57 percent died of unknown causes that may or may not have been caused by the power plant itself, surveyors found.

Of the birds that died from known causes, about 47 percent died from being toasted by the heat of the solar flux, researchers estimated. Just over half of the known deaths were attributed to collisions.

David Knox, senior director of communications at NRG, said the plant appears to have had a minor impact on the region's birds.

"We monitor any and all environmental impacts at our site very closely throughout the year, and while we were pleased that the report said our impact is minimal, our focus is on reducing it further," Knox said.

"We are proud of the operations at Ivanpah and the ability of this plant to help reduce carbon emissions, which pose such a tremendous threat to our planet."

Efforts to protect birds

Ivanpah is testing ways to reduce bird deaths further, including with software to reposition the heliostats to reduce the level of elevated flux and minimize collisions; installation of light-emitting diodes that are not attractive to insects and help reduce the prey base for birds; anti-perching devices; and the use of avian deterrents like foul smells and the sounds of predators.

Last October, Ivanpah installed a "BirdBuffer" at the top of one of its towers. The moving box-size machine sprays a concentrated grape juice extract into the air at regular intervals. But it was installed during the last week of avian monitoring for this report, so its effectiveness is yet unknown.

While bird kills happen at all energy projects, Ivanpah has had an outsize amount of press attention -- possibly because it's the largest power tower project in the world and because it got a \$1.6 billion loan guarantee from the Department of Energy.

But deaths from solar plants are likely small compared with building collisions, which kill an estimated 365 million to 988 million birds annually in the United States, according to a 2014 study by federal scientists in the journal *The Condor: Ornithological Applications*. Stray and outdoor pet cats each year kill a median of 2.4 billion birds and 12.3 billion mammals, mostly native mammals like shrews, chipmunks and voles, according to a 2013 report from scientists from the Smithsonian Conservation Biology Institute and FWS.

This week's report will be informative as Spanish developer Abengoa SA pursues another power tower plant known as the Palen project in Southern California's Chuckwalla Valley along a major north-south flyway for migratory birds and within sight of Joshua Tree National Park.

The power tower technology, known as concentrated solar because it heats a liquid to generate electricity, has a potential leg up over traditional photovoltaics because it can be coupled with energy storage to eliminate the on-off nature of solar and wind energy.

SolarReserve's 110-MW Crescent Dunes Solar Energy Project in Tonopah, Nev., is set to become the

nation's first power tower plant with advanced molten salt energy storage when it comes online in the coming months.