August 20, 2020

Via Electronic and Certified Mail

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RE: Sixty-Day Notice of Violations of the Endangered Species Act Regarding "Not Warranted" Listing Decision for San Joaquin Valley Giant Flower-loving Fly

Dear Secretary Bernhardt and Director Skipwith:

Pursuant to 16 U.S.C. § 1540(g), this letter serves as the Center for Biological Diversity's ("Center") sixty-day notice of intent to sue David Bernhardt, the Secretary of the Interior ("Secretary"), in his official capacity, and the U.S. Fish and Wildlife Service ("FWS") for violations of the Endangered Species Act[1] ("ESA") in connection with the FWS's decision that the San Joaquin Valley Giant Flower-loving Fly (*Rhaphiomidas trochilus*) ("Flower-loving Fly") does not warrant listing as an endangered or threatened species ("not-warranted finding").[2] The FWS's decision unlawfully deprives the Flower-loving Fly of the ESA's protections, leaving its only extant population vulnerable to imminent extinction.

The Flower-loving Fly was believed to be extinct from 1979 through 1997 when Gregory Ballmer, an entomologist, discovered two new populations—one at Sand Ridge, a stable sand dune in Kern County, California, and another at a site ten miles south of Bakersfield, California. The latter population was extirpated in 2006 when land was cleared for agricultural purposes. Today, only the Sand Ridge population remains.

With just 5 to 110 breeding individuals in a given year, the Flower-loving Fly clings to survival. Despite its protestations to the contrary, the FWS's own analysis and the myriad and significant threats to the Flower-loving Fly clearly demonstrate listing is warranted. Thus, the FWS's not-warranted finding is contrary to the best-available science and violates the ESA. With the ESA,

[1] 16 U.S.C. §§ 1531 *et seq*.
[2] 83 Fed. Reg. 65,127, 65,132 (Dec. 19, 2018).

Congress adopted a policy of "institutionalized caution" and intended to "afford[] endangered species the highest of priorities.[3] This policy demands that the FWS extend the ESA's protections to the Flower-loving Fly.

I. Background

The Flower-loving Fly is one of the largest flies in North America, with a body length of over an inch.[4] The Flower-loving Fly color is gray brown with pale yellow bands on its abdominal segment. It has transparent wings and a protruding slender proboscis approximately 0.35 inches in length that extends from its head. Unlike other similar species, the Flower-loving Fly does not appear to use its proboscis for nectar feeding.[5] Mature Flower-loving Flies are capable of fast and extended flight, covering up to 100 meters in less than six seconds, and can hover like hummingbirds.[6]

The Flower-loving Fly inhabits the arid or semi-arid regions of California's San Joaquin Valley and thrives in sand dunes with relatively sparse native vegetation.[7] Flower-loving Fly larvae live in moist sandy soil, approximately six to ten feet below the surface.[8] Larvae are opportunistic predators of soft-bodied insects and also feed on the roots of native woody or partially woody perennial shrubs.[9] Depending on food availability, Flower-loving Fly larvae can molt, growing when nutrients are abundant and losing weight and size when nutrients are scarce. Some larvae repeat this growth-and-shrinkage cycle multiple times throughout their lifetime. The larvae's ability to molt contributes to an extended larval phase of approximately one to two years.[10] Just before pupation, Flower-loving Fly larvae migrate to the soil's surface.[11]

The lifespan of an adult Flower-loving Fly is estimated at no more than three days.[12] The adult Flower-loving Fly does not feed and subsists on energy reserved during the larval stage.[13] In general, most adults emerge during the summer months, with a seven-week flight season spanning from mid-August to early October.[14] Annual variations in the flight season's timing and duration and the number of adult Flies that emerge are common and depend on broader environmental conditions.[15] During flight season, males search for female mates, which often

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[3] *Tenn. Valley Auth. v. Hill*, 437 U.S. 153, 194 (1978).
[4] FWS, Sacramento Fish and Wildlife Office, Species Status Assessment Report for the San Joaquin Valley Giant Flower-Loving Fly at 3 (June 8, 2017) [hereinafter 2017 SSA].
[5] *Id.* at 3-4.
[6] Gregory Ballmer & Kendall Osborne, A Petition to the United States Dep't of the Interior, Fish and Wildlife Serv. to List the San Joaquin Valley Giant Flower-loving Fly (*Rhaphiomidas trochilus*) at 4-5 (June 24, 2016) [hereinafter Fly Petition].
[7] 2017 SSA, *supra* note 4, at 2.
[8] *Id.* at 7.
[9] *Id.*
[10] *Id.*
[11] *Id.* at 8.
[12] *Id.* at 4.
[13] Fly Petition, *supra* note 6, at 4.
[14] 2017 SSA, *supra* note 4, at 5.
[15] Fly Petition, *supra* note 6, at 4.

perch or rest on shrubs, by cruising at low altitudes. Because the male Flower-loving Fly locates females by sight, areas of sparse vegetation make its job easier. After mating, the female Flower-loving Fly deposits approximately five to thirty-eight eggs in or on the soil's surface and the eggs hatch after approximately ten days.[16]

Historically, researchers observed the Flower-loving Fly on at least seven sites with riparian sandy habitat throughout the San Joaquin Valley as far north as the Antioch Dunes of Contra Costa County, California. Much of the Flower-loving Fly's historical habitat has been destroyed or degraded by agricultural conversions and sand mining.[17] The Sand Ridge population, the sole remaining population of Flower-loving Fly, is roughly estimated at 100 to 1,000 individuals just before flight season (*i.e.*, when all individuals are larvae or pupae), which translates into an effective population size of approximately 5 to 110 breeding individuals.[18]

II. The Petition to List the Flower-loving Fly

On June 26, 2014, Gregory Ballmer and Kendall Osborne, entomologists and members of the Center, formally petitioned the FWS to emergency list the Flower-loving Fly as an endangered species under the ESA because the best-available science shows that current and proposed sand-mining activities at Sand Ridge likely will destroy the Flower-loving Fly's remaining suitable habitat and result in the imminent extinction of the Flower-loving Fly's only extant population ("Petition").[19] The Petition cited habitat loss and degradation as the primary threat to the Flower-loving Fly's continued existence.[20]

The Petition also emphasized sand-mining impacts on historical Flower-loving Fly populations and habitat. Nearly all of the Flower-loving Fly's former habitat, including at Antioch Dunes, was destroyed by sand mining and other habitat-degrading activities, including agricultural conversions.[21] The entomologists urged the FWS to issue an immediate moratorium on sand mining at Sand Ridge. Their ask was and is especially pressing because Caliente Sand and Mineral Company ("Caliente"), the private owner of the larger of two sand mines at Sand Ridge, filed in 2013 an application with Kern County to expand its mining operations. If granted, the proposed expansion would permanently destroy an additional 16.95 acres of existing Flower-loving Fly habitat (out of 131.3 acres of remaining unprotected and undeveloped habitat).[22] Caliente's application is still pending due to concerns raised about the county's draft environmental impact report.[23]

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[16] 2017 SSA, *supra* note 4, at 5.
[17] *Id.* at ii, 2-3.
[18] *Id.* at ii-iii.
[19] Fly Petition, *supra* note 6.
[20] *Id.* at 1.
[21] *Id.* at 1, 7.
[22] 2017 SSA, *supra* note 4, at 35.
[23] FWS, Species Assessment and Listing Priority Form at 20 (Oct. 2018) [hereinafter 2018 Species Assessment]; *see also* Letter from Jeffrey R. Single, Ph.D., Regional Manager, California Dep't of Fish and Wildlife, to Jacquelyn R. Kitchen, Kern Cnty. Planning and Cmty. Dev. Dep't (Dec. 19, 2013) (FOIA Response 20180420.090504.2 Re_FW_FW_SJ Fly att2.pdf)

Finally, the Petition recommended that the FWS explore whether the land in a Center-of-Natural-Lands-Management ("CNLM")-owned preserve could be managed to remove nonnative vegetation and reseed native woody perennial shrubs.[24] Provided sand-mining activities cease, the entomologists anticipate that the affected portions of Sand Ridge can be naturally restored to their former vegetative condition over a period of years, which could lead to recolonization by the Flower-loving Fly and other species dependent on the ecosystem.[25]

III. The FWS's Regulatory Actions

In 1991, the FWS published its Candidate Review for Listing identifying the Flower-loving Fly as a "Category 3A species," *i.e.*, "taxa for which the Service has persuasive evidence of extinction and if rediscovered, such taxa might acquire high priority for listing."[26] The Flower-loving Fly's Category 3A designation remained unchanged in the FWS's 1994 Candidate Review for Listing.[27] In 1996, the FWS discontinued the Category 3 designation, such that the Flower-loving Fly was no longer considered a candidate, but "retained all Category 3 information in case future reviews are conducted on these taxa."[28] The Flower-loving Fly was believed to be extinct until 1997 when Ballmer discovered two populations, including the Sand Ridge population.[29]

A. The 90-Day Finding and the Species Status Review

In response to Ballmer and Osborne's Petition to emergency list the Flower-loving Fly as endangered, the FWS issued a September 12, 2014 letter stating its position that the Flower-loving Fly did not warrant emergency listing. On April 10, 2015, the FWS published in the Federal Register a 90-day finding under section 4(b)(3)(A)[30] of the ESA, which concluded that "the petition present[ed] substantial scientific or commercial information indicating that the petitioned action may be warranted for the [Flower-loving Fly] based on Factors A and E" of

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(noting that proposed expansion has potential to impact "endangered, rare, or threatened species" and to restrict their range, among other concerns about the DEIS); Letter from Deborah L. Rogers, Ph.D., Dir. of Conservation Science and Stewardship, Ctr. for Natural Lands Mgmt. *et al.*, to Jacquelyn Kitchen, Supervising Planner, Kern Cnty. Planning and Cmty. Dev. Dep't (Dec. 16, 2013) (FOIA Response 20170614.1145.1 Email_Hull-Rogers_Habitat restoration on Sand Ridge preserve att1.pdf) (noting that one of the DEIS's proposed alternative locations is on property that CNLM owns and encouraging County to consider ways to mitigate dispersal of invasive-plant seeds).

[24] Fly Petition, *supra* note 6, at 7.

[25] *Id.*

[26] Endangered and Threatened Wildlife and Plants; Animal Candidate Review for Listing as Endangered or Threatened Species, 56 Fed. Reg. 58,804, 58,805, 58,836 (Nov. 21, 1991).

[27] Endangered and Threatened Wildlife and Plants; Animal Candidate Review for Listing as a Threatened or Endangered Species, 59 Fed. Reg. 58,982, 59,028 (Nov. 15, 1994).

[28] Endangered and Threatened Wildlife and Plants; Review of Plant and Animal Taxa That Are Candidates for Listing as Endangered or Threatened Species, 61 Fed. Reg. 7596, 7597 (Feb. 28, 1996).

[29] Fly Petition, *supra* note 6, at 2.

[30] 16 U.S.C. § 1533(b)(3)(A).

section 4(a)(1).[31] Upon finding that a petitioned action (*i.e.*, listing the Flower-loving Fly as endangered) may be warranted, the FWS must "commence a review of the status of the species concerned" and issue a 12-month finding that the petitioned action is not warranted, warranted, or warranted but precluded by higher listing priorities.[32]

According to a Listing Evaluation Project Plan, the FWS began its status review of the Flower-loving Fly in 2016—well after the June 26, 2015 statutory deadline for the 12-month finding.[33] The FWS's early efforts focused on studying the Flower-loving Fly's biology, estimating the size of the Sand Ridge population, mapping the Flower-loving Fly's current and historical range, identifying threats to the Flower-loving Fly's continued existence, and exploring various pre-listing conservation measures to protect the Fly. The FWS finalized its Species Status Assessment Report on or about June 8, 2017 ("2017 SSA").[34]

The 2017 SSA provides that the Sand Ridge population presently and over the next 50 years faces threats from urban and agricultural development, sand mining, vegetation overgrowth, off-highway vehicles ("OHV"), small population size, pesticide drift, and climate change.[35] Taking into account these threats, the FWS evaluated the Flower-loving Fly's resiliency, redundancy, and representation to determine its continued viability.

Resiliency is a species' ability "to withstand stochastic disturbance events."[36] The Sand Ridge population's size is, and will continue to be, restricted by the available local habitat.[37] The FWS anticipates that "[a]gricultural development and sand mining are likely to increase in the future."[38] If Kern Country approves Caliente's application to expand mining operations or if such operations otherwise expand unlawfully, a portion of the "highest quality remaining habitat" will be destroyed.[39] Also, the Flower-loving Fly's small effective-population size makes it susceptible to inbreeding depression and stochastic events.[40] Based on evidence that habitat degradation resulted in the extirpation of other known Flower-loving Fly populations and because the habitat impacts at Sand Ridge are "likely to continue or increase in the future," the FWS concluded that "low population numbers are unlikely to significantly improve, and the population will likely remain potentially subject to extirpation from stochastic events or inbreeding depression."[41]

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[31] Endangered and Threatened Wildlife and Plants; 90-Day Findings on 10 Petitions, 80 Fed. Reg. 19,259, 19,262 (Apr. 10, 2015).
[32] 16 U.S.C. § 1533(b)(3)(A)-(B).
[33] FWS, San Joaquin Valley Giant Flower Loving Fly 2016-2017 Listing Evaluation Project Plan (FOIA Response 20161026.0849.1 EM-Turner).
[34] 2017 SSA, *supra* note 4.
[35] *Id.* at ii-iv.
[36] FWS, Species Status Assessment Framework, Version 3.4 at 6 (Aug. 2016); 2018 Species Assessment, *supra* note 23, at 9.
[37] 2017 SSA, *supra* note 4, at 31-32.
[38] *Id.* at 31.
[39] *Id.* at 30-31.
[40] *Id.* at 31-32.
[41] *Id.* at v, 31-32.

Redundancy is a species' ability "to withstand catastrophic events."[42] Because the Sand Ridge population is the only known extant population, the Flower-loving Fly has no redundancy. Indeed, "[l]oss of the Sand Ridge population would thus very likely mean loss of the species."[43] In the process of exploring pre-listing conservation efforts for the Flower-loving Fly, a FWS biologist stated in a memorandum that "[t]o avoid listing, the [Flower-loving Fly] should have at least two relatively large, stable populations."[44]

Representation is a species' ability "to adapt to changing environmental conditions."[45] The Flower-loving Fly's habitat representation is "currently very low."[46] While the Flower-loving Fly's historical populations may have been adapted to variations in temperature and precipitation, disease resistance, and larval prey species, that "historical range of differences is no longer supported by the single remaining population."[47]

The FWS considered the 2017 SSA's findings during a June 8, 2017 Recommendation Team Meeting where each member of the Core Team tasked with preparing the SSA and the broader Recommendation Team provided preliminary recommendations.[48] Two of the four Core-Team members, including the SSA's primary drafter, recommended listing the Flower-loving Fly as endangered because, among other reasons, the threats identified in the SSA, together with the Flower-loving Fly's low resiliency, redundancy, and representation, demonstrate that the Sand Ridge population "could not withstand any catastrophic impact" and was "liable to go extinct in [the] near future."[49] Several Recommendation-Team members speculated that the Sand Ridge population is resilient because it has persisted since its discovery in 1997 and because many of the stressors identified in the 2017 SSA appeared constant and "[didn't] seem to be increasing."[50]

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[42] FWS, Species Status Assessment Framework, Version 3.4 at 6 (Aug. 2016); 2018 Species Assessment, *supra* note 23, at 9.
[43] 2017 SSA, *supra* note 4, at 32.
[44] Memorandum from Glen Tarr, SFWO Biologist, to Mike Long, Region 8 Division Chief: Endangered Species (Mar. 15, 2017) (FOIA Response 20170315 EM-Tarr (SJF Pre-listing Conservation Opportunities Analysis)).
[45] FWS, Species Status Assessment Framework, Version 3.4 at 6 (Aug. 2016); 2018 Species Status Assessment, *supra* note 23, at 9.
[46] 2017 SSA, *supra* note 4, at vi.
[47] *Id.* at 32.
[48] In 2016, the FWS established Unified Listing Team (ULT)—a new approach for making listing determinations. ULT prescribes a "large, collaborative, nationwide team with listing expertise to address problems associated with an unevenly distributed workload." ULT's goal is to achieve "a more efficient and timely [listing] process by implementing the same methodology for all listing decisions." The core team typically includes field-office biologists and experts assigned to develop the SSA, a regional solicitor, and other region staff as applicable. The recommendation team is broader; it typically includes the ULT liaison, lead-field supervisors for SFWO, listing biologists and supervisors, Region 8 liaison, listing and recovery chief, and ecological services. FWS, San Joaquin Valley Giant Flower Loving Fly 2016-2017 Listing Evaluation Project Plan at 2 n.1 (FOIA Response 20161026.0849.1 EM-Turner).
[49] FWS, Recommendation Team Meeting Notes (June 8, 2017) (FOIA Response 20170609.0615 EM-Giglio (SJVGFLF RTM notes are attached)).
[50] *Id.*

At the conclusion of the meeting, the Recommendation Team recommend listing the Flower-loving Fly as a threatened species based on population size and the historic loss of its other populations, and to seek funding for conservation and management.[51]

After the meeting, the FWS prepared a Briefing Paper for Departmental Clearance of Federal Register Documents to list the Flower-loving Fly as a threatened species "due to habitat loss from sand mining, agricultural and urban development and off-highway vehicles (Factor[] A); and vegetation overgrowth, small population size, and climate change (Factor E) and by those threats in concert" ("2017 Briefing Paper").[52] The 2017 Briefing Paper provides that the threats are "ongoing, rangewide, and are *expected to increase in the future*, and are *significant* because they further restrict limited available habitat and decrease the resiliency of the [Flower-loving Fly] within those habitats."[53] The scientific basis for the FWS's recommendation to list the Flower-loving Fly is provided in the 2017 SSA.

B. Conservation Measures

Alongside preparation of the listing documents, the FWS explored potential conservation measures for the Flower-loving Fly. The FWS contacted CNLM, which owns and manages the Sand Ridge Preserve, approximately 130.5 acres of which is Flower-loving Fly habitat, to inquire about the possibility of restoring habitat on the Preserve for the benefit of both the endangered Bakersfield Cactus and the Flower-loving Fly.[54] These discussions led to the development of a project titled Habitat Restoration for Bakersfield Cactus and the San Joaquin Valley Giant Flower Loving Fly at the Sand Ridge Preserve ("Habitat Restoration Project").[55]

In July 2017, the FWS and CNLM completed a statement of work and the Bureau of Reclamation provided to CNLM $249,757.02 to implement the Habitat Restoration Project.[56] Pursuant to the statement of work, CNLM agreed to "conduct a project to restore habitats for federally listed CVP [Central Valley Project]-impacted species, primarily for Bakersfield cactus, but also for the [Flower-loving Fly] which may be listed in the near future."[57] To assist the Flower-loving Fly, CNLM agreed to reduce or remove invasive vegetation on approximately 18 acres of the Sand Ridge Preserve utilizing weed-whipping, herbicide, and harrowing, and to conduct annual surveys on the preserve "twice a week for a minimum of four weeks during July-

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[51] *Id.*
[52] FWS, Briefing Paper for Departmental Clearance of Federal Register Documents, at 1 (FOIA Response 20170714.0842 Email_Giglio-Drake_SJGFLF briefing papers with interested parties discussions) [hereinafter 2017 Briefing Paper].
[53] *Id.* (emphasis added).
[54] 2017 SSA, *supra* note 4, at 2.
[55] Habitat Restoration for Bakersfield Cactus and the San Joaquin Valley Giant Flower Loving Fly at the Sand Ridge Preserve, Statement of Work (FOIA Response 20171019.1403.1 Email_Drake-Hull_CNLM Project Plan for Sand Ridge) [hereinafter CNLM Habitat Restoration Project SOW].
[56] *Id.*; *see also* FOIA Response 20180726.0854 Email_Giglio-Hull&Drake_SJV fly need info on CVPIA funding to CNLM ASAP today.
[57] CNLM Habitat Restoration Project SOW, *supra* note 55, at ¶ 4.

September when peak emergence is expected" throughout the Project's duration.[58] The Habitat Restoration Project is expected to conclude on August 30, 2022.[59]

On October 30, 2018, CNLM issued to the Bureau of Reclamation a performance report on the Habitat Restoration Project, which stated that 2018's annual Flower-loving Fly survey had been completed.[60] The performance report provided that the main activity during the April 1, 2018 through September 30, 2018 reporting period was a "comprehensive survey for the [Flower-loving Fly] on the Sand Ridge study area" in August and September of 2018.[61] However, it is unclear whether the survey was ever completed and provided to the FWS or whether any additional surveys contemplated in the statement of work were performed.

Ultimately, the FWS did not list the Flower-loving Fly as a threatened species in the summer of 2017 or take any other action on the Petition for listing. Because the FWS failed to timely issue the 12-month finding mandated by the ESA, in May 2018, the Center filed suit in the United States District Court for the District of Columbia to compel the Service to comply with its statutory duty.[62] Soon thereafter, the FWS filed an Unopposed Motion to Stay Proceedings, in which it stated that it expected to issue the 12-month finding by October 31, 2018.[63]

C. The 12-Month Finding

On December 19, 2018, the FWS issued a 12-month finding on the Flower-loving Fly, which concluded that listing the Flower-loving Fly as an endangered or threatened species was not warranted for the following reasons:[64]

> Despite the fly being dependent on rare areas of inland dune sand and having lost seven of eight historically known populations, we found that the remaining population provides sufficient resiliency, redundancy, and representation now and in the future. Further, we found that the stressors we assessed are not of significant imminence, intensity, or magnitude, either singly or in combination, to indicate that

[58] *Id.* at ¶ 8 (Objectives 1, 3).
[59] The Bureau of Reclamation completed National-Environmental-Policy-Act analysis on the Habitat Restoration Project in June 2018. After preparing an environmental assessment, the Bureau issued a finding of no significant impact. Whether the project remains ongoing is unclear.
[60] The text of the report suggests that it is the second performance report on the project. The FWS did not provide any other reports in response to the Center's 2019 FOIA request.
[61] Letter from Deborah L. Rogers, Director of Conservation Science and Stewardship, CNLM, to Larry Glover-Meade, Grants Officer, Bureau of Reclamation at 1 (Oct. 30, 2018) (FOIA 20181031.1430 Emaile_Hull-Drake_Sand Ridge Semi-annual report).
[62] Complaint, *Ctr. for Biological Diversity v. Zinke*, No. 1:18-cv-01127 (D.D.C. May 11, 2018).
[63] Def.'s Unopposed Mot. to Stay Proceedings at 2, *Ctr. for Biological Diversity v. Zinke*, No. 1:18-cv-01127 (D.D.C. July 23, 2018).
[64] Endangered and Threatened Wildlife and Plants; 12-Month Findings on Petitions to List 13 Species as Endangered or Threatened Species, 83 Fed. Reg. 65,127, 65,132 (Dec. 19, 2018).

> the fly is in danger of extinction throughout all or a significant portion of its range now or in the foreseeable future.[65]

The not-warranted finding is based on an October 2018 Species Assessment and Listing Priority Form ("2018 Species Assessment") developed after the Recommendation Team recommended listing the Flower-loving Fly as a threatened species.[66]

Based on substantially the same scientific evidence described in the 2017 SSA, the FWS arrived at a decidedly different conclusion about the Flower-loving Fly's continued viability in the 2018 Species Assessment. The 2018 Species Assessment provides that the combined effects of the identified potential threats on the Flower-loving Fly and its habitat are likely to have a "relatively minor impact on the species overall."[67] Contrary to the resiliency analysis in the 2017 SSA, the FWS concluded in the 2018 Species Assessment that the Sand Ridge population is resilient because of the "combination of having over half of this location under permanent protection from future development, and no evidence of current or future threats that will negatively act on the species or its habitat."[68] Further, "[w]hile the species may have limited redundancy and representation, we also recognize that the lack of surveys on suitable habitats at other sites throughout the San Joaquin Valley, including private holdings, prevents us from definitively concluding at this time that there are no other extant populations in existence."[69]

Although the 2018 Species Assessment includes a summary of conservation measures, which focus on the Habitat Restoration Project at CNLM's Sand Ridge Preserve, the FWS apparently did not evaluate the project under the criteria established in its Policy for Evaluation of Conservation Efforts When Making Listing Decisions ("PECE Policy")[70] or otherwise rely on the project to justify its not-warranted finding. In the preamble to the PECE Policy, the FWS stated that to avoid listing, the FWS must determine at the time of listing "that the conservation effort is sufficiently certain to be implemented and effective so as to have contributed to the elimination or adequate reduction of one or more threats to the species identified through the section 4(a)(1) analysis."[71] The FWS never stated or implied that the Habitat Restoration Project satisfied that standard, and it is unclear whether the Project is still proceeding.

IV. Statutory Framework

The Supreme Court has described the ESA as "the most comprehensive legislation for the preservation of endangered species ever enacted by any nation."[72] The ESA's purpose is to

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[65] *Id.*
[66] 2018 Species Assessment, *supra* note 23.
[67] *Id.* at 23, 25. Note that the remaining undeveloped land refers to the 127.7-acre Sand Ridge preserve that CNLM owns and manages and a 5-acre preserve that the California Department of Fish and Wildlife owns. *Id.* at 10.
[68] *Id.* at 25.
[69] *Id.*
[70] 68 Fed. Reg. 15,100 (Mar. 28, 2003).
[71] *Id.* at 15,115.
[72] *Tenn. Valley Auth. v. Hill*, 437 U.S. 153, 180 (1978).

conserve endangered and threatened species of fish, wildlife, and plants and their ecosystems.[73] With the ESA, Congress intended to "halt and reverse the trend toward species extinction, whatever the cost."[74]

The ESA requires the Secretary, through the FWS, to list by regulation any species that the Secretary determines is endangered or threatened.[75] A species is "endangered" if it "is in danger of extinction throughout all or a significant portion of its range."[76] Similarly, a species is "threatened" if it "is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range."[77] The definition of "species" includes "subspecies" and "distinct population segments of any species of vertebrate fish or wildlife which interbreeds when mature."[78]

Section 4 of the ESA provides detailed procedures governing listing determinations through notice-and-comment rulemaking.[79] Specifically, the FWS must list a species if it determines that the species is an "endangered species" or a "threatened species" because of any of the following five factors:

> (A) the present or threatened destruction, modification, or curtailment of its habitat or range;
> (B) overutilization for commercial, recreational, scientific, or educational purposes;
> (C) disease or predation;
> (D) the inadequacy of existing regulatory mechanisms; or
> (E) other natural or manmade factors affecting its continued existence.[80]

The FWS must make listing determinations "solely on the basis of the best scientific and commercial data available" after performing a status review of the species.[81] To comply with this statutory mandate, the FWS "cannot ignore available biological information" even if the FWS disagrees or otherwise discredits the information in the administrative record.[82] Courts also have held that the best-available-science standard "does not require that the FWS act only when it can justify its decision with absolute confidence."[83] Rather, even if the available data is inconclusive,

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[73] 16 U.S.C. § 1531(b).
[74] *Tenn. Valley Auth.*, 437 U.S. at 184.
[75] 16 U.S.C. § 1533(a).
[76] *Id.* at § 1532(6).
[77] *Id.* at § 1532(20).
[78] *Id.* at § 1532(16).
[79] *Id.* at § 1533.
[80] *Id.* at § 1533(a)(1); 50 C.F.R. § 424.11(c); *see also Fed'n of Fly Fishers v. Daley*, 131 F. Supp. 2d 1158, 1164 (N.D. Cal. 2000) (noting that the section 4 factors "are listed in the disjunctive; any one or a combination can be sufficient for a finding that a particular species is endangered or threatened").
[81] 16 U.S.C. § 1533(b)(1)(A).
[82] *Conner v. Burford*, 848 F.2d 1441, 1454 (9th Cir. 1988).
[83] *Ariz. Cattle Growers' Ass'n v. Salazar*, 606 F.3d 1160, 1164 (9th Cir. 2010), *cert denied*, 131 S. Ct. 1471 (2011).

the FWS "may—indeed must—still rely on it."[84] Reliance upon the best-available science, as opposed to scientific certainty, "is in keeping with congressional intent" that the FWS "take preventive measures *before* a species is 'conclusively' headed for extinction."[85]

Nor can the FWS consider economics or politics in its listing determination. As courts have explained, "the ESA clearly bars economic considerations from having a seat at the table when the listing determination is being made."[86] Similarly, the FWS "does not have the legal authority to weigh the political importance" of a species in making listing decisions.[87] In fact, "the word 'solely' is intended to remove from the process of the listing or delisting of any species *any factor* not related to the biological status of the species."[88]

V. The FWS's 12-Month Finding Violates the ESA

As explained above, the ESA mandates that the FWS make listing determinations on the basis of the "best scientific and commercial data available."[89] In its not-warranted finding, the FWS dismissed or ignored the best-available science about threats to the Flower-loving Fly from small population size, sand mining, OHVs, urban and agricultural development, and climate change because it "found no evidence to indicate they were reasonably likely to occur" or "would have effects of sufficient imminence, intensity, or magnitude, either singly or in combination" to warrant listing.[90] But the FWS relied on that same data to recommend listing the Flower-loving Fly as a threatened species in the 2017 Briefing Paper. Citing uncertainty, and without further explanation, the FWS arbitrarily changed its position in the not-warranted finding.

The Ninth Circuit, however, has held that it is "not enough for the [FWS] to simply invoke 'scientific uncertainty' to justify its action."[91] In fact, because the listing calculus involves an inquiry into the species' future condition, scientific certainty seldom is available, and the FWS must extrapolate from the available data when it does not have perfect clarity.[92] "Although the FWS cannot act on pure speculation or contrary to the evidence, the ESA accepts agency

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[84] *Sw. Ctr. for Biological Diversity v. Babbitt*, 215 F.3d 58, 60 (D.C. Cir. 2000).
[85] *Defenders of Wildlife v. Babbitt*, 958 F. Supp. 670, 679-80 (D.D.C. 1997) (emphasis in original).
[86] *N.M. Cattle Growers Ass'n v. U.S. Fish & Wildlife Serv.*, 248 F.3d 1277, 1285 (10th Cir. 2001).
[87] H.R. Rep. No. 95-1625 (1978), *reprinted in* 1978 U.S.C.C.A.N. 9453, 9463.
[88] *N.M. Cattle Growers Ass'n*, 248 F.3d at 1284-85 (citing H.R. Rept. No. 97-567, pt. 1, at 29 (1982) (emphasis added)).
[89] 16 U.S.C. § 1533(b)(1)(A).
[90] 2018 Species Assessment, *supra* note 23, at 24.
[91] *Greater Yellowstone Coal. v. Servheen*, 665 F.3d 1015, 1028 (9th Cir. 2011); *see also Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 52 (1983) ("Recognizing that policymaking in a complex society must account for uncertainty . . . does not imply that it is sufficient for an agency to merely recite the terms 'substantial uncertainty' as a justification for its actions.").
[92] *Greenpeace Action v. Franklin*, 982 F.2d 1342, 1354-44 (9th Cir. 1992).

decisions in the face of uncertainty."[93] Still, the FWS must explain why the uncertainty justifies its finding. Otherwise, the court "might as well be deferring to a coin flip."[94]

Conclusory reliance on uncertainty, without more, does not justify the FWS's decision not to list the Flower-loving Fly. The FWS's not-warranted finding violates the ESA because it is contrary to the facts and evidence provided in the Petition and in the peer-review process, and contrary to the FWS's conclusions in the 2017 SSA and the 2017 Briefing Paper about the gravity of the threats.

A. The Best-Available Science Shows That the Flower-loving Fly Is Susceptible to Inbreeding Depression and Negative Stochastic Events Due to Small Population Size

The Petition and various studies that the FWS considered when it prepared the 2017 SSA establish that the Flower-loving Fly's small population size threatens its survival. Informal population estimates suggest that the Sand Ridge population's size is 100 to 1,000 pupae and larvae just before flight season (*i.e.*, when no adults or eggs are present).[95] But because not all larvae eclose into adults during any given seven-week flight season, the effective population size is estimated at approximately 5 to 110 breeding individuals.[96] Further, because adults only live approximately three days, the Sand Ridge population is not large enough for all adult Flies to find mates, to avoid inbreeding depression, or to recover from negative stochastic events.[97] Indeed, the FWS acknowledges that "[i]f *any* of these impacts were to occur and cause significant population-level effects, it could become difficult for the population to recover."[98]

Nevertheless, the FWS concluded in the 2018 Species Assessment that the negative effects of small population size are not acting on the Sand Ridge population currently or in the foreseeable future because no studies have been conducted to investigate the small-population-size effects on the Flower-loving Fly.[99] The absence of perfectly tailored studies does not give the FWS license to ignore data that addresses the effects of small population size on species generally.[100] The ESA's best-available science standard does not require perfection. "[T]he 'best scientific . . . data *available*' does not mean 'the best scientific data *possible*.'"[101]

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[93] *Ariz. Cattle Growers' Ass'n v. Salazar*, 606 F.3d 1160, 1164 (9th Cir. 2010), *cert denied*, 131 S. Ct. 1471 (2011).
[94] *Greater Yellowstone Coal.*, 665 F.3d at 1028.
[95] 2018 Species Assessment, *supra* note 23, at 16 (citing Ballmer and Osborne 2016a, at 2); 2017 SSA, *supra* note 4, at ii-iii.
[96] 2017 SSA, *supra* note 4, at ii-iii.
[97] 2018 Species Assessment, *supra* note 23 at 16 (citing Ballmer and Osborne 2016a, at 2).
[98] *Id.* (Emphasis added.)
[99] *Id.*
[100] *See Ctr. for Biological Diversity v. Zinke*, 900 F.3d 1053, 1068 (9th Cir. 2018) (citing *Conner v. Burford*, 848 F.2d 1441, 1454 (9th Cir. 1988)).
[101] *San Luis & Delta-Mendota Water Auth. v. Jewell*, 747 F.3d 581, 602 (9th Cir. 2014) (citing *Bldg. Indus. Ass'n v. Norton*, 247 F.3d 1241, 1246 (D.C. Cir. 2001) (emphasis added)).

In the 2018 Species Assessment, the FWS disregarded longstanding conservation-biology principles that establish the "fundamental fact" that small populations lead to depressed genetic variation, which, in turn, "influences the long-term survival of a population because genetic variation is requisite for evolutionary adaptation to a changing environment."[102] Biologists have concluded that effective population sizes "of at least *several hundreds* of individuals" are necessary to provide species' with adequate representation.[103] Biologists also have concluded that effective population sizes "of less than 50 dispose[] a population to inbreeding depression."[104]

Courts defer to an agency's interpretation of scientific data only when "the agency provides a reasonable explanation for adopting its approach and discloses the limitations of that approach."[105] Against this backdrop, the FWS is required to explain its conclusion that the Flower-loving Fly's last-remaining population has sufficient representation to avoid inbreeding depression and other population-level impacts that could lead to extinction. No such explanation appears in the not-warranted finding or elsewhere. The FWS didn't even acknowledge or cite to these fundamental principles in the 2018 Species Assessment.

In addition, in the 2017 SSA, the FWS projected that within the next 50 years the Sand Ridge population size will fall to levels that will subject it to risk from stochasticity because "population sizes tend to fluctuate over time, and because of likely continuing or increasing impacts" from other threats.[106] The available scientific data supports this projection. Analysis of stochasticity effects on species distinguishes between demographic stochasticity (*i.e.*, random fluctuations in population size given that each member's birth and death are independent events) and environmental stochasticity (*i.e.*, environmental conditions acting on the population as a whole, such as storms, drought, or wildfires).[107] Either of these forces alone can subject a small population to extirpation; together, "populations in the size range of 50 to 100 would have difficulty surviving the joint action of these forces for more than a century."[108]

Yet the FWS discounted its projection because it is based on unproven and uncertain assumptions pertaining to informal population estimates, including larval lifespan, ecolsure rate and distribution, and adult lifespan.[109] However informal the estimates are, "they are the best

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[102] Russell Lande & George F. Barrowclough, *Effective Population Size, Genetic Variation, and Their Use in Population Management*, Viable Populations for Conservation 87 (Michael Soulé ed., 1987); *see also* D.A. Briscoe *et al.*, *Rapid Loss of Genetic Variation in Large Captive Populations of Drosophila Flies: Implications for the Genetic Management of Captive Populations*, 6 Conservation Biology 417 (1992).
[103] Lande & Barrowclough at 88, 119 (emphasis added).
[104] Michael E. Gilpin, *Spatial Structure and Population Vulnerability*, Viable Populations for Conservation 132 (Michael Soulé ed., 1987) (citing Soulé, 1980, Franklin, 1980).
[105] *Alaska Oil & Gas Ass'n v. Pritzker*, 840 F.3d 671, 679 (9th Cir. 2016) (citing *Nw. Ecosys. Alliance v. U.S. Fish & Wildlife Serv.*, 475 F.3d 1136, 1150 (9th Cir. 2007)).
[106] 2017 SSA, *supra* note 4, at 30.
[107] Gilpin, *supra* note 104, at 133-34; 2017 SSA, *supra* note 4, at 10.
[108] *Id.* at 134.
[109] 2018 Species Assessment, *supra* note 23, at 17.

available data, and [the FWS] ha[s] no information to suggest they should be higher."[110] In any event, a conclusory statement that the threat of small population size is based on informal assumptions does not satisfy the FWS's obligation to provide a reasoned explanation.[111] The Ninth Circuit has held that where the "science on population size and trends is underdeveloped and unclear, the Secretary cannot reasonably infer that the absence of evidence of population decline equates to evidence of persistence."[112] The FWS is required to explain why the uncertainty favors not listing the Flower-loving Fly as opposed to taking another course of action.[113]

Rather than concede the very real threat that small population size poses, the FWS hides behind its unsupported belief that the Flower-loving Fly has always existed in very sparse numbers and that the Sand Ridge population is not "facing conditions relative to adult breeding opportunities, and therefore relative to any population demographic effects, any different from their historical condition."[114] The pertinent question, however, is not how many individual Flies existed historically. Instead, the deciding factor is the present-day population size and stability.[115] The Sand Ridge population is neither large nor stable. Just one stochastic event could lead to the extirpation of the Flower-loving Fly's only extant population. The Flower-loving Fly warrants listing on the basis of this factor alone.

B. The Best-Available Science Shows that Continued Sand Mining Could Lead to the Flower-loving Fly's Extirpation

The data provided to the FWS in the Petition and through the peer-review process illustrates that sand mining is a significant and ongoing threat to the Flower-loving Fly's Sand Ridge Population. Indeed, sand mining caused the extirpation of other populations.[116] Today, the Sand Ridge habitat is bifurcated by two sand mines.[117] Operation of the mines destroys suitable Flower-loving Fly habitat because it permanently removes woody or partially woody perennial shrubs that adults and larvae and their prey rely upon and disturbs the deeper layers of moist soil utilized by larvae and pupae. The removal and transport of sand also directly kills Flower-loving Flies.[118]

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[110] 2017 SSA, *supra* note 4, at v.
[111] *See Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983); *Greater Yellowstone Coal. v. Servheen*, 665 F.3d 1015, 1028 (9th Cir. 2011).
[112] *Tucson Herpetological Soc'y v. Salazar*, 566 F.3d 870, 879 (9th Cir. 2009).
[113] *Ctr. for Biological Diversity v. Zinke*, 900 F.3d 1053, 1073 (9th Cir. 2018).
[114] 2018 Species Assessment, *supra* note 23, at 17.
[115] *See* 16 U.S.C. § 1532(6) (defining "endangered species" as a species "in danger of extinction throughout all or a significant portion of its range").
[116] Fly Petition, *supra* note 6, at 7.
[117] The larger mine is privately owned by Caliente. Presently, Caliente's mine occupies approximately 20.3 acres and its conditional-use permit authorizes the company to remove up to 200,000 tons of material per year. Kern County owns the smaller mine, which occupies approximately nine acres in the middle portion of the ridge. 2018 Species Assessment, *supra* note 23, at 11.
[118] *Id.*

In 2013, Caliente, the larger mine's owner, applied to Kern County to expand its mine. To date, the county has not approved the still-pending application. In the past, however, Caliente expanded operations without approval, demonstrating that further expansion is possible even if the county does not approve its application. The FWS projects that maximum expansion of the Caliente mine would result in the loss of approximately 6% of the remaining Flower-loving Fly habitat.[119] Other potential effects of an expansion include the removal of individual Flower-loving Fly larvae or pupae in the expanded area, an increase in the separation between suitable habitat to the north and south of the mine, such that adult Flies may have to travel greater distances to find mates during flight season, the diversion of water from moist soil in nearby unmined areas to newly mined areas depriving larvae of optimal conditions for growth and feeding, and the loss of any eggs laid in the actively mined area.[120]

Except for the increase in habitat separation north and south of the mine, which the FWS readily discounted because the Flower-loving Fly is capable of extended flight, the FWS claims it has "no information to suggest that these other potential effects from a mine expansion are likely."[121] The FWS, however, ignored both the information about sand-mining effects that Ballmer and Osborne provided in the Petition and the comments of the FWS's own peer reviewer.

Among other things, the Petition explained that sand mining caused the extirpation of the Flower-loving Fly's Antioch Dunes population and, since the Sand Ridge population's discovery in 1997, "has resulted in continuous and progressive denaturing of habitat for [the Flower-loving Fly] and other endemic species."[122] Sand mining "represents an acute and immediate threat to the [Flower-loving Fly's] continued existence."[123] The Petition also provided photographs illustrating the alarming scale of habitat loss for the Flower-loving Fly and other endemic species dependent on the Sand Ridge ecosystem.

In addition, Matthew Van Dam, the entomologist who peer reviewed the 2017 SSA, explained in his comments that the potential mining expansion into additional Flower-loving Fly habitat is "underestimated as to its impact" on the Flower-loving Fly.[124] Specifically, Van Dam explained that the projected 6% loss of remaining Flower-loving Fly habitat at Sand Ridge is "an underestimation given the rest of the habitat supports few flies due to invasive vegetation overgrowth. From the aerial photographs this area looks to be closer to ~50% of the current viable habitat."[125] Van Dam further stated that the "proposed continuation of sand mining operations will result in a much larger impact for the [Flower-loving Fly] than currently

[119] 2017 SSA, *supra* note 4, at 27; 2018 Species Assessment, *supra* note 23, at 12.
[120] 2018 Species Assessment, *supra* note 23, at 12-13.
[121] *Id.* at 13.
[122] Fly Petition, *supra* note 6, at 7.
[123] *Id.*
[124] Matthew Van Dam, Review of Draft Species Status Assessment (2017) (FOIA Response 20170504.094204.2 Fwd_Request for Peer Review).
[125] *Id.*

considered."[126] In his view, of all the threats considered in the SSA, sand mining is the "greatest threat" to the Flower-loving Fly.[127]

The data shows that sand mining presents a real and ongoing threat to the Flower-loving Fly. The FWS's conclusion is contrary to the best available science and arbitrary because the FWS did not "articulate any rational connection between the facts found and the choice made."[128] Indeed, the FWS's conclusion appears to be untethered from any facts or analysis in the Petition or the 2017 SSA. Courts "need not defer to the agency when the agency's decision is without substantial basis in fact."[129] Nor does the FWS's expertise save its unsupported conclusion; unchecked agency expertise "can become a monster which rules with no practical limits on its discretion."[130]

C. The FWS Conclusion that Increased OHV Use Will Have a "Beneficial Effect" on the Flower-loving Fly Is Contrary to the Best-Available Science and Evidence Provided by Its Peer Reviewer

Contrary to the best-available science, the FWS concluded that increased OHV use could have a beneficial effect on the Flower-loving Fly by removing invasive vegetation. OHV use removes woody or partially woody perennial shrubs that larval prey species need for nutrients.[131] OHVs also are likely to directly injure or kill pupae, which are positioned just below the soil's surface in areas of open sand, including dirt roads, as well as eggs and newly eclosed adults.[132] Illegal OHV use occurs on the CNLM Sand Ridge Preserve because CNLM lacks funding to erect a fence or police violations. An area in Sand Ridge's southern portion, northeast of Caliente's sand mine, is also subject to OHV impacts.[133]

Without any supporting data, the FWS suggests in the 2018 Species Assessment that any expansion in OHV use will have "relatively small" impacts and that there may be a "countervailing small beneficial effect" due to the prevention of overgrowth of invasive vegetation, which would open up bare-sand areas for the Flies' use during egg laying and larval and pupal development.[134] Van Dam, however, explained in his comments to the 2017 SSA that there are "no published reports that support the claim that [OHV use] would be beneficial for" the Flower-loving Fly.[135] While OHVs do remove vegetation, removal is "done haphazardly

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[126] *Id.*
[127] *Id.*
[128] *Burlington Truck Lines, Inc. v. United States*, 371 U.S. 156, 168 (1962); *see also Friends of Endangered Species, Inc. v. Jantzen*, 760 F.2d 976, 982 (9th Cir. 1985).
[129] *Ctr. for Biological Diversity v. Zinke*, 900 F.3d 1053, 1067 (9th Cir. 2018).
[130] *Burlington Truck Lines*, 371 U.S. at 167 (quoting *New York v. United States*, 342 U.S. 882, 884 (1951) (dissenting opinion)).
[131] 2018 Species Assessment, *supra* note 23, at 14.
[132] *Id.* at 14-15.
[133] *Id.*
[134] *Id.* at 15-16.
[135] Matthew Van Dam, Review of Draft Species Status Assessment (2017) (FOIA Response 20170504.094204.2 Fwd_Request for Peer Review).

potentially removing vegetation needed" for the Flower-loving Fly's survival.[136] Further, "as pupa rest below the surface of the soil potentially for prolonged periods (years), OHV activity will destroy many [Flies] in addition to potential food sources for the flies."[137] Van Dam "could see no long term benefit of OHV activity" for the Flower-loving Fly.[138]

In the 2018 Species Assessment, the FWS also ignored Van Dam's research about the modern expansion of OHV use in the California desert. Van Dam observed that from 1983 through 2000, registration in California of OHVs, including dune buggies and sand-rail vehicles, increased by ninety percent. "This demonstrates the emerging popularity with [OHV] use. Such great numbers of [OHV] enthusiasts may have a substantial impact on the desert ecosystem."[139] Van Dam's study, which quantified the impact of OHV use on endemic beetles in the Algodones Dunes, located 858 beetles in protected areas, but only 54 in unprotected areas where OHV use occurred.[140] While comparative, this data suggests that even if the FWS is right that any increased use likely will occur in "already established unauthorized areas" rather than "expand the footprint," that use will further degrade the Flower-loving Fly's already comprised habitat.

The FWS's suggestion that OHV use will result in any positive outcome for the Flower-loving Fly is thus directly contrary to the best-available science and violates the ESA.

D. The FWS Ignored Data Showing That Agricultural Development Contributed to the Extirpation of Historical Flower-loving Fly Populations and Will Lead to Additional Habitat Loss in the Future

The Petition and other data that the FWS considered while preparing the 2017 SSA establishes that urban and agricultural development, including urban growth, conversion of land to agricultural uses, infrastructure construction, and sand mining, contributed to the extirpation of the Flower-loving Fly's Antioch Dunes population and was a major cause of the extirpation of populations at two other sites in the vicinity.[141] As explained above, Ballmer discovered one of the extirpated populations in 1997; it disappeared just nine years after its discovery when land was cleared for agricultural uses. The FWS, however, ignored this data when it concluded that the Flower-loving Fly did not warrant listing.

In the Petition, Ballmer and Osborne noted that most of the Flower-loving Fly's former habitat was "destroyed by sand mining activities . . . or due to agricultural conversions during the 19th and 20th Centuries."[142] Other historical data suggests that between 2009 and 2012, 19 acres south of Highway 58 was converted to citrus, and an additional 40 acres north of Highway 58

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[136] *Id.*
[137] *Id.*
[138] *Id.*
[139] Alex R. Van Dam & Matthew H. Van Dam, *Impact of Off-Road Vehicle Use on Dune Endemic Coleoptera*, 101 Annals of the Entomological Soc'y of Am. 411 (2008).
[140] *Id.* at 415.
[141] 2017 SSA, *supra* note 4, at 11. The two other sites are described as "10 mi S of Bakersfield" and "2 mi E of Antioch." *Id.*; *see also* Fly Petition, *supra* note 6, at 2-3, 5.
[142] Fly Petition, *supra* note 6, at 1.

was converted before 2005.[143] The Petition also provided that "[g]iven the current trends and economic pressures for conversion of natural open spaces to agricultural uses in the area inhabited by [the Flower-loving Fly], it is highly unlikely that private land owners will voluntarily act to preserve habitat for the species."[144]

The FWS utilized this data to project possible conversions of the remaining undeveloped 120.3 acres of habitat privately owned and zoned for agriculture. The FWS concluded in the 2017 SSA that loss of additional habitat to agricultural conversion is "likely in the next 50 years."[145] The "more likely" scenario forecasts loss of an additional 12-percent of total remaining habitat over that time period.[146]

In an about-face, the 2018 Species Assessment provides that the checkerboard configuration of the remaining undeveloped land at Sand Ridge makes it "unlikely" that privately owned habitat will be converted to agriculture within the foreseeable future.[147] The FWS relied on the fact that slightly over half of the undeveloped habitat (*i.e.*, the CNLM Sand Ridge Preserve and the CDFW preserve) is protected from future development. The other half, while zoned for agriculture, consists of four segments along the ridge, which are separated by other segments, including certain of the protected lands.

The 2018 Species Assessment references the 2017 SSA's forecasted scenario but states that the FWS "found no information to indicate any additional conversions were likely to occur."[148] This conclusion, however, is contrary to the Petition, which highlighted the prevailing economic pressures to convert open land to more lucrative agricultural uses. The FWS also did not explain why it disregarded this data and its prior projections about the effect of future urban and agricultural development on the Flower-loving Fly's habitat.[149] Accordingly, the FWS's not-warranted finding is arbitrary and capricious because it disregarded the best-available science.

E. The FWS Did Not Provide a Reasoned Explanation for Its Conclusion That the Sand Ridge Population is Adapted to Climate Change

Even though the best-available climate data shows that rising temperatures, drought, and wildfires will have significant impacts on California's San Joaquin Valley, the FWS concluded without explanation that such impacts will be negligible on the Flower-loving Fly and its habitat. Since the beginning of the 20th century, California's annual average temperatures have increased by approximately 1.5 degrees Fahrenheit.[150] Over the next 50 years, carbon dioxide concentrations of approximately 550 parts per million in the San Joaquin Valley are expected to result in average temperature increases of approximately 2.0 degrees Fahrenheit.[151] Higher

[143] 2017 SSA, *supra* note 4, at 27.
[144] Fly Petition, *supra* note 6, at 7.
[145] 2017 SSA, *supra* note 4, at 30.
[146] *Id.* at 11.
[147] 2018 Species Assessment, *supra* note 23, at 11.
[148] *Id.*
[149] *Ctr. for Biological Diversity v. Zinke*, 900 F.3d 1053, 1073-74 (9th Cir. 2018).
[150] 2017 SSA, *supra* note 4, at 25-26.
[151] *Id.*

temperatures will be coupled with decreases in average annual precipitation, which could lead to drought.[152]

During the five-year period between February 2012 and February 2017, Sand Ridge experienced a drought; for three of those five years, from January 2014 through January 2017, the drought was designated as "exceptional" (*i.e.*, the highest designation).[153] Droughts, particularly those that persist for extended periods, diminish the moisture content of the soil where Flower-loving Fly larvae live, as well as the larval insects upon which the Flower-loving Fly feeds. Although the impacts of drought severity on the Flower-loving Fly have not been directly studied, the best-available science suggests that droughts likely will depress the Flower-loving Fly larval population commensurate with their severity and duration.[154] In addition, increased temperatures and drought due to climate change increase the likelihood and severity of wildfires.[155] A fire during the summer flight season could directly kill Flower-loving Fly adults or eggs, and at other times could reduce the woody and partially woody perennial shrubs and thereby negatively impact Flower-loving Fly larvae and their prey.[156]

The climate models that the FWS relies upon predict an annual decrease in precipitation at Sand Ridge of approximately 5.9 inches. On that basis, the FWS projected in the 2017 SSA that because total numbers of deep-rooted native shrubs are likely to decrease, with extirpation of some plant species altogether, "maximum population levels for subterranean prey species may be lowered, thereby also lowering maximum population levels of [Flower-loving Fly] larvae."[157] Based on the same data that led to that projection, in the 2018 Species Assessment, the FWS concludes that it is "equally likely that there would be no change at all in plant numbers, health, or density resulting from this potential decrease in precipitation."[158]

Without any evidence, the FWS concludes that because the San Joaquin Valley likely has experienced extended droughts historically, it is "reasonably likely that the Sand Ridge ecosystem, including its flora, fauna, and hydrology, has evolved to withstand periodic decadal drought conditions" and that any decadal drought that manifests in the foreseeable future is "reasonably likely to have only negligible effects" on the Flower-loving Fly.[159] Historical conditions are a poor analog, particularly because the best-available climate-science models reliably project the present and future impacts of increased temperatures and drought. The FWS's conclusion that these impacts will be "negligible" is directly contrary to its earlier conclusion that although the Flower-loving Fly likely has weathered and survived droughts in its evolutionary past, "they almost certainly would have entered those droughts with multiple populations occupying larger dune systems that were unaffected by nonnative introduced

[152] *Id.* at 22.
[153] *Id.* at 21.
[154] *Id.* at 22.
[155] *Id.*
[156] 2017 SSA, *supra* note 4, at 22.
[157] *Id.* at 26.
[158] 2018 Species Assessment, *supra* note 23, at 19.
[159] *Id.*

vegetation."[160] Again, the FWS did not provide any explanation, much less a reasoned one, for its contrary conclusion.

VI. The FWS Failed to Explain Its Change in Position from the 2017 Briefing Paper Where It Proposed to List the Flower-loving Fly as Threatened

The FWS did not adequately explain how, within one year and based on the same science, it changed its position from recommending listing the Flower-loving Fly as a threatened species to concluding that listing was not warranted. When the FWS makes a listing determination, it must "consider[] the relevant factors and articulate[] a rational connection between the facts found and the choice made."[161] Under well-settled administrative-law principles, when the FWS changes position, it must "supply a reasoned analysis for the change."[162] In particular, when its determination "rests upon factual findings that contradict those" underlying its earlier determination, the FWS must "provide a more detailed justification" to explain why it disregarded facts and circumstances upon which it previously relied.[163]

In the not-warranted finding, the FWS did not explain, or even acknowledge, its change in position from its earlier determination that the Flower-loving Fly warranted listing as a threatened species. The FWS's proposal to list the Flower-loving Fly in the 2017 Briefing Paper is supported by its evaluation of the threats acting on the Flower-loving Fly in the 2017 SSA. In the FWS's own words:

> [The] threats [facing the Flower-loving Fly] are ongoing, rangewide, and are expected to increase in the future, and are significant because they further restrict limited available habitat and decrease the resiliency of the [Flower-loving Fly] within those habitats.[164]
>
> [L]ow population numbers are unlikely to significantly improve, and the population will likely remain potentially subject to extirpation from stochastic events or inbreeding depression.[165]
>
> As only the Sand Ridge population remains, the range habitat representation in the species is currently very low.[166]
>
> Loss of the Sand Ridge population would [] very likely mean loss of the species.[167]

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[160] 2017 SSA, *supra* note 4, at 26.
[161] *Friends of Endangered Species, Inc. v. Jantzen*, 760 F.2d 976, 982 (9th Cir. 1985) (quoting *Balt. Gas & Elec. Co. v. Natural Res. Def. Council, Inc.*, 462 U.S. 87, 105 (1983)).
[162] *State Farm*, 463 U.S. at 42.
[163] *FCC v. Fox Television Stations, Inc.*, 556 U.S. 502, 515 (2009).
[164] 2017 Briefing Paper, *supra* note 52, at 1.
[165] 2017 SSA, *supra* note 4, at v, 31-32.
[166] *Id.* at vi.
[167] *Id.* at 32.

Just one year after the FWS finalized the 2017 SSA, and without developing any additional facts or evidence, the FWS reevaluated the very same data and reached the opposite conclusion, *i.e.*, that the Flower-loving Fly did not warrant listing.

> Despite . . . having lost seven of eight historically known populations, we found that the remaining population provides sufficient resiliency, redundancy, and representation now and in the future. Further, . . . the stressors we assessed are not of significant imminence, intensity, or magnitude . . . to indicate that the fly is in danger of extinction throughout all or a significant portion of its range now or in the foreseeable future.[168]

This is the essence of arbitrary decision-making and suggests that other factors beyond those which Congress mandated that the FWS consider in making listing determinations likely influenced the not-warranted finding.[169] Congress made it "abundantly clear that the balance has been struck in favor of affording endangered species the highest of priorities."[170] The FWS "may not use equity's scales to strike a different balance."[171]

VII. Conclusion

The FWS's determination that listing the Flower-loving Fly is not warranted is arbitrary, capricious, and violates the ESA. If the FWS does not act within sixty days to correct the violations detailed in this letter, the Center may pursue litigation in federal court to resolve the matter.

Sincerely,

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[168] Endangered and Threatened Wildlife and Plants; 12-Month Findings on Petitions to List 13 Species as Endangered or Threatened Species, 83 Fed. Reg. 65,127, 65,132 (Dec. 19, 2018).
[169] *Cf. Nat'l Treasury Emp. Union v. FLRA*, 404 F.3d 454, 457-58 (D.C. Cir. 2005) (quoting *Am. Fed'n of Gov's Emps., Local 2761 v. FLRA*, 866 F.2d 1443, 1446 (D.C. Cir. 1989) (noting that "'unexplained departure from prior agency determinations' is inherently arbitrary and capricious in violation of APA § 706(2)(A)")).
[170] *Tenn. Valley Auth. v. Hill*, 437 U.S. 153, 194 (1978).
[171] *Sierra Club v. Marsh*, 816 F.2d 1376, 1383 (9th Cir. 1987), *abrogated on other grounds, Cottonwood v. Envtl. Law Ctr. v. U.S. Forest Serv.*, 789 F.3d 1075, 1088-91 (9th Cir. 2015).