FOR PUBLICATION

UNITED STATES COURT OF APPEALS
FOR THE NINTH CIRCUIT

SAN LUIS & DELTA-MENDOTA WATER AUTHORITY; WESTLANDS WATER DISTRICT; STEWART & JASPER ORCHARDS; ARROYO FARMS, LLC; KING PISTACHIO GROVE; STATE WATER CONTRACTORS; METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA; COALITION FOR A SUSTAINABLE DELTA; KERN COUNTY WATER AGENCY; FAMILY FARM ALLIANCE, *Plaintiffs-Appellees*, CALIFORNIA DEPARTMENT OF WATER RESOURCES, *Intervenor-Plaintiff-Appellee*, v. SALLY JEWELL, as Secretary of the Department of the Interior; U.S. DEPARTMENT OF THE INTERIOR; U.S. FISH & WILDLIFE SERVICE; DANIEL M. ASHE, as Director of the U.S. Fish and Wildlife Service; REN LOHOEFENER, as Regional Director of the U.S. Fish and Wildlife Service, Pacific Southwest Region, U.S. Department of the Interior;	No. 11-15871 D.C. No. 1:09-cv-00407-OWW-DLB

UNITED STATES BUREAU OF RECLAMATION; MICHAEL L. CONNOR, as Commissioner of the U.S. Bureau of Reclamation, U.S. Department of the Interior; DAVID MURILLO, as Director of the U.S. Bureau of Reclamation, Mid-Pacific Region, U.S. Department of the Interior; MARK COWIN, Director, California Department of Water Resources; UNITED STATES DEPARTMENT OF JUSTICE; U.S. ENVIRONMENTAL PROTECTION AGENCY; GINA MCCARTHY, in her official capacity as Administrator of the Environmental Protection Agency; U.S. DEPARTMENT OF TRANSPORTATION; ANTHONY FOXX, in his official capacity as Secretary of Transportation; MARITIME ADMINISTRATION; PAUL N. JAENICHEN, SR., in his official capacity as Acting Maritime Administrator; U.S. DEPARTMENT OF HOMELAND SECURITY; JEH JOHNSON, in his official capacity as Secretary of Homeland Security; FEDERAL EMERGENCY MANAGEMENT AGENCY; WILLIAM CRAIG FUGATE, in his official capacity as Administrator of the Federal Emergency Management Agency; UNITED STATES ARMY

CORPS OF ENGINEERS; THOMAS P. BOSTICK, Commanding General and Chief of Engineers, United States Army Corps of Engineers,
Defendants,

and

NATURAL RESOURCES DEFENSE COUNCIL; THE BAY INSTITUTE,
Intervenor-Defendants-Appellants.

SAN LUIS & DELTA-MENDOTA WATER AUTHORITY; WESTLANDS WATER DISTRICT; STEWART & JASPER ORCHARDS; ARROYO FARMS, LLC; KING PISTACHIO GROVE; METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA; COALITION FOR A SUSTAINABLE DELTA; KERN COUNTY WATER AGENCY; FAMILY FARM ALLIANCE,
Plaintiffs,

CALIFORNIA DEPARTMENT OF WATER RESOURCES,
Intervenor-Plaintiff,

and

STATE WATER CONTRACTORS,
Plaintiff-Appellant,

No. 11-16617

D.C. No. 1:09-cv-00407-OWW-DLB

v.

SALLY JEWELL, as Secretary of the Department of the Interior; U.S. FISH & WILDLIFE SERVICE; DANIEL M. ASHE, as Director of the U.S. Fish and Wildlife Service; REN LOHOEFENER, as Regional Director of the U.S. Fish and Wildlife Service, Pacific Southwest Region, U.S. Department of the Interior; UNITED STATES BUREAU OF RECLAMATION; MICHAEL L. CONNOR, as Commissioner of the U.S. Bureau of Reclamation, U.S. Department of the Interior; DAVID MURILLO, as Director of the U.S. Bureau of Reclamation, Mid-Pacific Region, U.S. Department of the Interior; UNITED STATES DEPARTMENT OF JUSTICE; U.S. ENVIRONMENTAL PROTECTION AGENCY; GINA MCCARTHY, in her official capacity as Administrator of the Environmental Protection Agency; U.S. DEPARTMENT OF TRANSPORTATION; ANTHONY FOXX, in his official capacity as Secretary of Transportation; MARITIME ADMINISTRATION; PAUL N. JAENICHEN, SR., in his official capacity as Acting Deputy Maritime Administrator; U.S. DEPARTMENT OF

HOMELAND SECURITY; JEH JOHNSON, in his official capacity as Secretary of Homeland Security; FEDERAL EMERGENCY MANAGEMENT AGENCY; WILLIAM CRAIG FUGATE, in his official capacity as Administrator of the Federal Emergency Management Agency; UNITED STATES ARMY CORPS OF ENGINEERS; THOMAS P. BOSTICK, Commanding General and Chief of Engineers, United States Army Corps of Engineers; U.S. DEPARTMENT OF THE INTERIOR,
Defendants-Appellees,

NATURAL RESOURCES DEFENSE COUNCIL; THE BAY INSTITUTE,
Intervenor-Defendants-Appellees.

SAN LUIS & DELTA-MENDOTA WATER AUTHORITY; WESTLANDS WATER DISTRICT; STEWART & JASPER ORCHARDS; ARROYO FARMS, LLC; KING PISTACHIO GROVE; COALITION FOR A SUSTAINABLE DELTA; KERN COUNTY WATER AGENCY; FAMILY FARM ALLIANCE; STATE WATER CONTRACTORS,
Plaintiffs,

No. 11-16621

D.C. No. 1:09-cv-00407-OWW-DLB

CALIFORNIA DEPARTMENT OF WATER RESOURCES,
Intervenor-Plaintiff,

and

METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA,
Plaintiff-Appellant,

v.

SALLY JEWELL, as Secretary of the Department of the Interior; U.S. DEPARTMENT OF THE INTERIOR; U.S. FISH & WILDLIFE SERVICE; DANIEL M. ASHE, as Director of the U.S. Fish and Wildlife Service; REN LOHOEFENER, as Regional Director of the U.S. Fish and Wildlife Service, Pacific Southwest Region, U.S. Department of the Interior; UNITED STATES BUREAU OF RECLAMATION; MICHAEL L. CONNOR, as Commissioner of the U.S. Bureau of Reclamation, U.S. Department of the Interior; DAVID MURILLO, as Director of the U.S. Bureau of Reclamation, Mid-Pacific Region, U.S. Department of the Interior; UNITED STATES DEPARTMENT OF JUSTICE; U.S. ENVIRONMENTAL PROTECTION

AGENCY; GINA MCCARTHY, in her official capacity as Administrator of the Environmental Protection Agency; U.S. DEPARTMENT OF TRANSPORTATION; ANTHONY FOXX, in his official capacity as Secretary of Transportation; MARITIME ADMINISTRATION; PAUL N. JAENICHEN, SR., in his official capacity as Acting Deputy Maritime Administrator; U.S. DEPARTMENT OF HOMELAND SECURITY; JEH JOHNSON, in his official capacity as Secretary of Homeland Security; FEDERAL EMERGENCY MANAGEMENT AGENCY; WILLIAM CRAIG FUGATE, in his official capacity as Administrator of the Federal Emergency Management Agency; UNITED STATES ARMY CORPS OF ENGINEERS; THOMAS P. BOSTICK, Commanding General and Chief of Engineers, United States Army Corps of Engineers,

Defendants-Appellees,

NATURAL RESOURCES DEFENSE COUNCIL; THE BAY INSTITUTE,

Intervenor-Defendants-Appellees.

SAN LUIS & DELTA-MENDOTA WATER AUTHORITY; WESTLANDS WATER DISTRICT; STEWART & JASPER ORCHARDS; ARROYO FARMS, LLC; KING PISTACHIO GROVE; STATE WATER CONTRACTORS; METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA; COALITION FOR A SUSTAINABLE DELTA; KERN COUNTY WATER AGENCY; FAMILY FARM ALLIANCE,
Plaintiffs-Appellees,

CALIFORNIA DEPARTMENT OF WATER RESOURCES,
Intervenor-Plaintiff-Appellee,

v.

SALLY JEWELL, as Secretary of the Department of the Interior; U.S. DEPARTMENT OF THE INTERIOR; U.S. FISH & WILDLIFE SERVICE; DANIEL M. ASHE, as Director of the U.S. Fish and Wildlife Service; REN LOHOEFENER, as Regional Director of the U.S. Fish and Wildlife Service, Pacific Southwest Region, U.S. Department of the Interior; UNITED STATES BUREAU OF RECLAMATION; MICHAEL L. CONNOR, as Commissioner of the U.S. Bureau of Reclamation, U.S.

No. 11-16623

D.C. No. 1:09-cv-00407-OWW-DLB

Department of the Interior; DAVID MURILLO, as Director of the U.S. Bureau of Reclamation, Mid-Pacific Region, U.S. Department of the Interior; UNITED STATES DEPARTMENT OF JUSTICE; U.S. ENVIRONMENTAL PROTECTION AGENCY; GINA MCCARTHY, in her official capacity as Administrator of the Environmental Protection Agency; U.S. DEPARTMENT OF TRANSPORTATION; ANTHONY FOXX, in his official capacity as Secretary of Transportation; MARITIME ADMINISTRATION; PAUL N. JAENICHEN, SR., in his official capacity as Acting Deputy Maritime Administrator; U.S. DEPARTMENT OF HOMELAND SECURITY; JEH JOHNSON, in his official capacity as Secretary of Homeland Security; FEDERAL EMERGENCY MANAGEMENT AGENCY; WILLIAM CRAIG FUGATE, in his official capacity as Administrator of the Federal Emergency Management Agency; UNITED STATES ARMY CORPS OF ENGINEERS; THOMAS P. BOSTICK, Commanding General and Chief of Engineers, United States Army Corps of Engineers,

Defendants-Appellants,

and

NATURAL RESOURCES DEFENSE COUNCIL; THE BAY INSTITUTE,
Intervenor-Defendants.

SAN LUIS & DELTA-MENDOTA WATER AUTHORITY; WESTLANDS WATER DISTRICT,
Plaintiffs-Appellants,

and

STEWART & JASPER ORCHARDS; ARROYO FARMS, LLC; KING PISTACHIO GROVE; COALITION FOR A SUSTAINABLE DELTA; KERN COUNTY WATER AGENCY; FAMILY FARM ALLIANCE; STATE WATER CONTRACTORS; METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA,
Plaintiffs,

CALIFORNIA DEPARTMENT OF WATER RESOURCES,
Intervenor-Plaintiff,

v.

SALLY JEWELL, as Secretary of the Department of the Interior; U.S.

No. 11-16624

D.C. No. 1:09-cv-00407-OWW-DLB

DEPARTMENT OF THE INTERIOR; U.S. FISH & WILDLIFE SERVICE; DANIEL M. ASHE, as Director of the U.S. Fish and Wildlife Service; REN LOHOEFENER, as Regional Director of the U.S. Fish and Wildlife Service, Pacific Southwest Region, U.S. Department of the Interior; UNITED STATES BUREAU OF RECLAMATION; MICHAEL L. CONNOR, as Commissioner of the U.S. Bureau of Reclamation, U.S. Department of the Interior; DAVID MURILLO, as Director of the U.S. Bureau of Reclamation, Mid-Pacific Region, U.S. Department of the Interior; UNITED STATES DEPARTMENT OF JUSTICE; U.S. ENVIRONMENTAL PROTECTION AGENCY; GINA MCCARTHY, in her official capacity as Administrator of the Environmental Protection Agency; U.S. DEPARTMENT OF TRANSPORTATION; ANTHONY FOXX, in his official capacity as Secretary of Transportation; MARITIME ADMINISTRATION; PAUL N. JAENICHEN, SR., in his official capacity as Acting Deputy Maritime Administrator; U.S. DEPARTMENT OF HOMELAND SECURITY; JEH JOHNSON, in his official capacity as Secretary of Homeland Security;

FEDERAL EMERGENCY MANAGEMENT AGENCY; WILLIAM CRAIG FUGATE, in his official capacity as Administrator of the Federal Emergency Management Agency; UNITED STATES ARMY CORPS OF ENGINEERS; THOMAS P. BOSTICK, Commanding General and Chief of Engineers, United States Army Corps of Engineers,
Defendants-Appellees,

NATURAL RESOURCES DEFENSE COUNCIL; THE BAY INSTITUTE,
Intervenor-Defendants-Appellees.

STATE WATER CONTRACTORS,
Plaintiff-Appellant,

v.

SALLY JEWELL, as Secretary of the Department of the Interior; UNITED STATES DEPARTMENT OF JUSTICE; DANIEL M. ASHE, as Acting Director of the U.S. Fish and Wildlife Service; U.S. FISH & WILDLIFE SERVICE; MARK COWIN, Director, California Department of Water Resources; CALIFORNIA

No. 11-16660

D.C. No. 1:09-cv-00422-OWW-GSA

DEPARTMENT OF WATER RESOURCES,
Defendants-Appellees.

METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA,
Plaintiff-Appellant,

v.

U.S. FISH & WILDLIFE SERVICE; SALLY JEWELL, Secretary of the Department of the Interior; DANIEL M. ASHE, Acting Director of the U.S. Fish and Wildlife Service; UNITED STATES BUREAU OF RECLAMATION; J. WILLIAM MCDONALD; CALIFORNIA DEPARTMENT OF WATER RESOURCES; MARK COWIN, Director, California Department of Water Resources,
Defendants-Appellees.

No. 11-16662

D.C. No. 1:09-cv-00631-OWW-DLB

OPINION

Appeal from the United States District Court
for the Eastern District of California
Oliver W. Wanger, Senior District Judge, Presiding

Argued and Submitted
September 10, 2012—Las Vegas, Nevada

Filed March 13, 2014

Before: Morris S. Arnold,* Johnnie B. Rawlinson, and Jay S. Bybee, Circuit Judges.

Opinion by Judge Bybee;
Partial Concurrence and Partial Dissent by Judge Arnold;
Partial Concurrence and Partial Dissent by Judge Rawlinson

* The Honorable Morris S. Arnold, Senior Circuit Judge for the U.S. Court of Appeals for the Eighth Circuit, sitting by designation.

SUMMARY[**]

Environmental Law

The panel reversed in part and affirmed in part the district court's judgment invalidating a 2008 biological opinion by the U.S. Fish and Wildlife Service that concluded that the Central Valley and State Water Projects jeopardized the continued existence of the delta smelt and its habitat.

The Central Valley Project and the State Water Project, operated respectively by the U.S. Bureau of Reclamation and the State of California, supply water originating in northern California to agricultural and domestic consumers in central and southern California. The source of the water—the estuary at the confluence of the San Francisco Bay and the Sacramento-San Joaquin Delta—is the lone habitat for the delta smelt, a threatened species under the Endangered Species Act ("ESA"). After the Bureau of Reclamation requested a biological opinion ("BiOp"), the U.S. Fish and Wildlife Service ("FWS") concluded that the Central Valley operations would threaten the delta smelt and, as required by the ESA, proposed alternatives to ameliorate the effect on the smelt, including reducing the water exported to southern California. The plaintiffs-appellees—various water districts, water contractors, and agricultural consumers—brought suit under the Administrative Procedure Act against various federal defendants. The district court concluded that the 2008 BiOp was arbitrary and capricious.

[**] This summary constitutes no part of the opinion of the court. It has been prepared by court staff for the convenience of the reader.

Concerning the scope of the record, the panel held that the district court overstepped its bounds in admitting additional declarations from the parties' experts. The panel held that it would consider the BiOp and evidence submitted by the parties that the FWS considered in making its decision, and the testimony of the four experts the district court appointed pursuant to Federal Rule of Evidence 706.

Concerning the merits, the panel held that the 2008 BiOp's reliance on raw salvage figures to set the upper and lower Old and Middle Rivers flow limits was not arbitrary and capricious. The panel also held that the 2008 BiOp's determination of X2 (the point in the Bay-Delta at which the salinity is less than two parts per thousand) was not arbitrary and capricious. The panel further held that the BiOp's incidental take statement was not arbitrary and capricious because it included adequate explanation and support for its determinations. The panel also held the record supported the BiOp's conclusions regarding the indirect effects of project operations. The panel disagreed with the district court's determination that the FWS's own regulations and the Administrative Procedure Act required the FWS to explain that the reasonable and prudent alternatives satisfied 50 C.F.R. § 402.02's non-jeopardy factors. The panel held that the FWS's consideration of these factors could be reasonably discerned from the record to satisfy any explanation requirements.

Concerning the cross appeal, the panel held that the FWS did not violate the ESA by not separating the discretionary from nondiscretionary actions when it set the environmental baseline. The panel also held that the Bureau of Reclamation did not violate the ESA by accepting the 2008 BiOp. The panel affirmed the district court's judgment with respect to

the National Environmental Policy Act ("NEPA") claims, and held: NEPA does not require the FWS to prepare an Environmental Impact Statement in conjunction with the issuance of the BiOp; and the Bureau of Reclamation's provisional adoption and implementation of the BiOp triggered its obligation to comply with NEPA. The panel affirmed the district court's order remanding to the Bureau of Reclamation so that it can complete an Environmental Impact Statement evaluating the effects of its adoption and implementation of the BiOp.

Eighth Circuit Judge Arnold dissented from Parts III, IV.A., IV.B, IV.E, and V.B. of the majority opinion, and concurred in the rest. Judge Arnold would uphold the district court's limited admission of evidence outside the administrative record as relevant to the Old and Middle River flow limits and determination of X2, and agreed with the district court that the FWS's determination as to the flow prescription and X2 was arbitrary and capricious. Judge Arnold disagreed with the basis of the district court's conclusion that the non-jeopardy elements must be addressed in the BiOp or administrative record, but would affirm on the issue. Finally, Judge Arnold believes the district court should have found the Bureau of Reclamation independently liable under the ESA for relying on a legally flawed BiOp.

Judge Rawlinson concurred in the bulk of the majority opinion, but dissented from Part V.C.2. Judge Rawlinson disagreed only with the rationale and conclusion that the Bureau of Reclamation's adoption and implementation of the BiOp triggered its obligation to comply with NEPA by preparing an Environmental Impact Statement that is generally required under the ESA.

COUNSEL

Robert H. Oakley (argued), Ethan Carson Eddy, and Charles R. Scott, United States Department of Justice, Environment & Natural Resources Division, Washington, D.C.; Ignacia S. Moreno, United States Department of Justice, Assistant Attorney General, Washington, D.C.; Jim Monroe, Department of the Interior, Office of the Solicitor, Sacramento, California, for Federal Defendants-Appellants.

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Daniel J. O'Hanlon (argued), Hanspeter Walter, and Rebecca R. Akroyd, Kronick, Moskovitz, Tiedemann & Girard, Sacramento, California; Craig Manson, General Counsel, Westlands Water District, Fresno, California; Steven O. Sims, Michelle C. Kales, and Geoffrey M. Williamson, Brownstein Hyatt Farber Schreck LLP, Denver, Colorado, for Plaintiffs-Appellees-Cross-Appellants San Luis & Delta-Mendota Water Authority and Westlands Water District.

Gregory K. Wilkinson (argued), Steven M. Anderson, Melissa R. Cushman, and Steven G. Martin, Best Best & Krieger LLP, Riverside, California, for Plaintiffs-Appellees State Water Contractors.

Marcia L. Scully, Interim General Counsel; Linus Masouredis, Chief Deputy General Counsel, The Metropolitan Water District of Southern California, Sacramento, California; Christopher J. Carr, William N. Sloan, and Travis Brandon, Morrison & Foerster LLP, San

Francisco, California, for Plaintiff-Appellee-Cross-Appellant The Metropolitan Water District of Southern California.

Clifford T. Lee (argued), Deputy Attorney General; Kamala D. Harris, Attorney General of California; Kathleen A. Kenealy, Senior Assistant Attorney General; Robert W. Byrne, Supervising Deputy Attorney General; Cecilia L. Dennis, and Gary Alexander, Deputy Attorneys General, San Francisco, California, for Plaintiff-Intervenor-Appellee, California Department of Water Resources.

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OPINION

BYBEE, Circuit Judge, with whom ARNOLD, Circuit Judge, joins as to Parts I, II, IV.C, IV.D, V.A, and V.C, and with whom RAWLINSON, Circuit Judge, joins except as to Part V.C.2:

As the district court aptly put it, these cases arise from the "continuing war over protection of the delta smelt." *San Luis & Delta-Mendota Water Auth. v. Salazar*, 760 F. Supp. 2d 855, 863 (E.D. Cal. 2010). We are joined to the fray. The district court invalidated a biological opinion by the Fish and Wildlife Service that concluded that the Central Valley and State Water Projects jeopardize the continued existence of a three-inch fish and its habitat. We reverse in part and affirm in part.

The Central Valley Project and the State Water Project, operated respectively by the Bureau of Reclamation (Reclamation)[1] and the State of California, are perhaps the two largest and most important water projects in the United States. These combined projects supply water originating in northern California to more than 20,000,000 agricultural and domestic consumers in central and southern California. The source of this water, the estuary at the confluence of the San Francisco Bay and Sacramento-San Joaquin Delta (Bay-Delta), is also the lone habitat for the delta smelt, a threatened species under the Endangered Species Act. 16 U.S.C. § 1531 *et seq*.

[1] See the Glossary of Terms at the end of this opinion for a complete list of abbreviations and acronyms.

In 2008, Reclamation requested a biological opinion (BiOp) from the U.S. Fish and Wildlife Service (FWS), in accord with the Endangered Species Act (ESA), on whether its continued operations would jeopardize the smelt. In a more than 400-page opinion—described by the FWS as the most complex biological opinion ever prepared—the FWS concluded that the Central Valley operations would threaten the delta smelt and, as required by the Endangered Species Act, proposed "reasonable and prudent alternatives" that Reclamation should take to ameliorate the effect on the smelt. The alternatives recommended by the FWS would reduce the water exported from northern California to southern California through the Central Valley and State Water Projects. Reclamation has notified the FWS that it intends to operate the Projects in compliance with the biological opinion.

The plaintiffs-appellees—various water districts, water contractors, and agricultural consumers[2]—brought suit under the Administrative Procedure Act against various federal defendants, including Reclamation, the FWS, and the Secretary of the Interior, to prevent the federal defendants from implementing the biological opinion and its proposed alternatives. The district court, in a lengthy and comprehensive opinion, was deeply critical of the biological opinion and concluded that it was arbitrary and capricious. The court accused the FWS of repeatedly "ignoring [the] best science available" to reach a "results-driven choice." 760 F. Supp. 2d at 940, and "show[ing] no inclination to fully and

[2] The plaintiffs-appellees include the San Luis & Delta-Mendota Water Authority, the Westlands Water District, Stewart & Jasper Orchards, the California Department of Water Resources, and the Metropolitan Water District of Southern California.

honestly address water supply needs beyond the species," even as it "interdict[s] the water supply for domestic human consumption and agricultural use for over twenty million people who depend on the Projects for their water supply," *id.* at 956–57 (quoting the FWS).

We are acutely aware of the consequences of this proceeding. As a court, however, we are limited in our review of matters within the expertise of an agency. We may review the FWS's biological opinion and Reclamation's implementation for arbitrariness, caprice, or actions otherwise not in accordance with law. 5 U.S.C. § 706(2)(A). Although the FWS must employ "the best scientific and commercial data available," 16 U.S.C. § 1536(a)(2), it is "not required to support its finding that a significant risk exists with anything approaching scientific certainty," *Indus. Union Dep't v. Am. Petroleum Inst.*, 448 U.S. 607, 656 (1980) (plurality opinion). And, "[w]hen examining this kind of scientific determination . . . a reviewing court must generally be at its most deferential." *Baltimore Gas & Elec. Co. v. NRDC*, 462 U.S. 87, 103 (1983). For the reasons explained below, we conclude that the district court failed to observe these standards and we reverse its judgment.

We recognize the enormous practical implications of this decision. But the consequences were prescribed when Congress determined that "these species of fish, wildlife, and plants are of esthetic, ecological, educational, historical, recreational, and scientific value to the Nation and its people." 16 U.S.C. § 1531(a)(3). As the Supreme Court observed in *Tennessee Valley Authority v. Hill*: "It may seem curious to some that the survival of a relatively small number of three-inch fish . . . would require the permanent halting of a virtually completed dam," but "the explicit provisions of the

Endangered Species Act require precisely that result." 437 U.S. 153, 172–73 (1978). Such species have been "afforded the highest of priorities," by Congress, even if it means "the sacrifice of the anticipated benefits of the project and of many millions of dollars in public funds." *Id.* at 174 (footnote omitted). The law prohibits us from making "such fine utilitarian calculations" to balance the smelt's interests against the interests of the citizens of California. *Id.* at 187. Consequently, any other "[r]esolution of these fundamental policy questions" about the allocation of water resources in California "lies . . . with Congress and the agencies to which Congress has delegated authority, as well as with state legislatures and, ultimately, the populace as a whole." *Baltimore Gas & Elec.*, 462 U.S. at 97.

I. FACTS AND PROCEEDINGS BELOW

A. *Background*

1. The Sacramento-San Joaquin Delta

"The history of California water development and distribution is a story of supply and demand. California's critical water problem is not a lack of water but uneven distribution of water resources." *United States v. State Water Res. Control Bd.*, 182 Cal. App.3d 82, 98 (Cal. Ct. App. 1986). California's Central Valley comprises some of the most productive farmland in the world. Extending 450 miles from north to south, and averaging 100 miles wide east to west, the Central Valley includes two principal rivers: The Sacramento River begins in the northern part of the valley, runs south past Sacramento, and is fed by the Feather and American Rivers. The San Joaquin River begins in the Sierra Nevadas, northeast of Fresno, runs west and northwest into

the Central Valley, and is fed by smaller rivers, including the Calaveras, Chowchilla, Fresno, Kings, Merced, Mokelumne, Stanislaus, and Tuolumne Rivers. The two rivers converge in the Sacramento-San Joaquin Delta and form an estuary that joins Suisun Bay, San Francisco Bay, and the Pacific Ocean. Although over 70 percent of California's water originates north of Sacramento, more than 70 percent of the state's demand is in the south. The water from this region supplies irrigation for seven million acres of agriculture and more than twenty million people, nearly half of California's residents. *See Where Does California's Water Come From?*, Aquafornia, The California Water News Blog, Aug. 13, 2008, 9:29 a.m., http://www.aquafornia.com/index.php/where-does-californias-water-come-from/. *See generally Dugan v. Rank*, 372 U.S. 609, 612–13 (1963); *United States v. Gerlach Live Stock Co.*, 339 U.S. 725, 728–29 (1950); *San Luis & Delta-Mendota Water Auth. v. United States*, 672 F.3d 676, 681–83 (9th Cir. 2012); *Westlands Water Dist. v. United States*, 337 F.3d 1092, 1095–96 (9th Cir. 2003); *In re Bay-Delta Programmatic Envtl. Impact Report Coordinated Proceedings*, 184 P.3d 709, 715–17 (Cal. 2008); *State Water Res. Control Bd.*, 182 Cal. App.3d at 97–100.

In an effort to manage the increasing and conflicting demands placed on the water flowing through the Sacramento-San Joaquin Delta region, California and the United States have embarked on two massive projects. First, in 1933, California proposed the Central Valley Project (CVP), a plan to transfer water from the Sacramento River to water-deficient areas in the San Joaquin Valley and from the San Joaquin River to the southern regions of the Central Valley. *State Water Res. Control Bd.*, 182 Cal. App.3d at 98–100. Reclamation took over the project in 1935, and it is now "the largest federal water management project in the

United States." *Central Delta Water Agency v. United States*, 306 F.3d 938, 943 (9th Cir. 2002). The CVP consists of a series of dams, including Shasta, Folsom, and Nimbus Dams; 21 reservoirs; 11 hydropower plants; and 500 miles of canals and aqueducts. *In re Bay-Delta*, 184 P.3d at 716 n.1. In 1992, Congress adopted the Central Valley Project Improvement Act (CVPIA), Pub. L. No. 102-575, 106 Stat. 4706, which Congress described as designed "to achieve a reasonable balance among competing demands for use of Central Valley Project water, including the requirements of fish and wildlife, agricultural, municipal and industrial and power contractors." CVPIA, § 3402(f), 106 Stat. at 4706.

In 1951, California approved what is known as the State Water Project (SWP), the largest state-built water project in the United States. *San Luis & Delta-Mendota Water Auth.*, 672 F.3d at 683. Managed by the California Department of Water Resources (DWR), "[t]he SWP serves the domestic water needs of approximately two-thirds of all Californians," principally in Southern California. *In re Bay-Delta*, 184 P.3d at 716. SWP consists of "21 dams and reservoirs, . . . five power plants, 16 pumping plants, and 662 miles of aqueduct." *Id.* at 716 n.2. In 1994, eight state agencies and 10 federal agencies formed the CALFED Bay-Delta Program (CALFED) to address comprehensively the challenges of managing the Bay-Delta estuary. *Id.* at 717.

The CVP and SWP each operate a major station for pumping water from the Bay-Delta to canals and aqueducts that will carry the water to the south. Both plants are located near Tracy, California, and together they reverse the natural flow of the southern part of the Bay-Delta through two distributaries of the San Joaquin, Old, and Middle Rivers, referred to as "OMR." *San Luis & Delta-Mendota*, 760 F.

Supp. 2d at 863. The CVP operates the Jones Pumping Plant, capable of diverting 4,600 cubic feet per second (cfs). Nearby, the SWP operates the Harvey O. Banks Pumping Plant, with a capacity of 10,300 cfs, although it generally operates at or below 6,680 cfs. BiOp at 82, 108, 159–60. The plants have been constructed with louvers that allow water to pass through into the pumping plant, but will prevent most fish from entering the plants. The process of the fish entering the plants, known as entrainment, traps some 52 different species of fish. BiOp at 67. The salvaged fish are hauled in trucks injected with oxygen and released at sites on the Sacramento and San Joaquin Rivers. BiOp at 67, 145. Over a recent 15-year period, more than 110 million fish were salvaged from the Jones and Banks facility. BiOp at 160. This number, however, greatly underestimates the number of fish actually entrained at the facilities, because fish less than 30 mm (1.2 inches) are not efficiently collected at the louvers. BiOp at 160–61. Smaller fish, especially those in the juvenile or larval stage, are killed in the pumps. BiOp at 210. Those that are salvaged frequently do not survive the salvage process. BiOp at 338.

The Colorado River and the SWP have historically been the major supply of water for southern California. As the result of an interstate agreement signed in 2003, California will receive less water from the Colorado River. Quantification Settlement Agreement, San Diego Water Authority, http://www.sdcwa.org/quantification-settlement-agreement (last visited July 29, 2013). As a consequence, southern California has sought more water from SWP. BiOp at 89–90. Increased demand for water from SWP has had a predictable effect on the water flowing into the Bay-Delta. As more water is diverted from the rivers that feed the Delta into the southern Central Valley, the salinity of the Delta and

its estuaries increases along with the threat to the species that thrive there.

> The Delta generally describes a large lowland area with a labyrinth of natural channels in and around the confluence of the Sacramento and San Joaquin Rivers. . . .
>
> The major factor affecting water quality in the Delta is saltwater intrusion. Delta Lands, situated at or below sea level, are constantly subject to ocean tidal action. Salt water entering from San Francisco Bay extends well into the Delta, and intrusion of the saline tidal waters is checked only by the natural barrier formed by fresh water flowing out from the Delta.

State Water Resources Control Bd., 182 Cal. App.3d at 107. Since the 1970s, Reclamation and a raft of state agencies have worked to mitigate the effects of increased water salinity on Suisun Bay resulting from the upstream diversion of water that would otherwise naturally flow through Suisun. BiOp at 112–13. Salinity levels in Suisun Bay are highly sensitive to diversion from the Delta.

Two related standards are used to describe the salinity of the Bay-Delta. The first is the Low Salinity Zone or LSZ. BiOp at 147. The LSZ is the transition point between the freshwater of the inland rivers and brackish water flowing eastward from San Francisco Bay and the Pacific Ocean, and includes water ranging in salinity from 0.5 parts per thousand to six parts per thousand. BiOp at 191. The second is referred to as X2. X2 represents the point in the Bay-Delta at

which the salinity is less than two parts per thousand. *See Westlands Water Dist. v. Dep't of Interior*, 376 F.3d 853, 876 (9th Cir. 2004). The LSZ, which encompasses a larger region of the Bay-Delta, is generally centered around X2. Together, these regions are largely determined by Bay-Delta outflow, which is the difference between the inflow and the water exported. The agencies use X2 as a marker for the LSZ as well as a habitat indicator for fish and as a regulatory standard. BiOp at 149–50, 236; *San Luis & Delta Mendota*, 760 F. Supp. 2d at 864 & nn.4–5. They express the location of X2 as its distance in kilometers east of the Golden Gate Bridge, *Westlands Water Dist.*, 376 F.3d at 876.

2. The delta smelt

The delta smelt (*Hypomesus transpacificus*) is a small, two-to-three inch species of fish endemic to the San Francisco Bay/Sacramento-San Joaquin Delta Estuary. BiOp at 140–41. Once an abundant species in the Bay-Delta ecosystem, the delta smelt is now in imminent danger of extinction. In March 1993, the species was listed as threatened under the ESA, and the FWS designated the Bay-Delta system a critical habitat for the delta smelt in 1994.[3] 50 C.F.R. § 17.11; BiOp at 140. Yet, over the past decade, the delta smelt population has been decimated even relative to these depleted levels, with a measured decline since 2000

[3] In 1990, the National Marine Fisheries Service listed the Sacramento River winter-run chinook salmon as a threatened species under the Endangered Species Act. 50 C.F.R. § 227.4; *Orff v. United States*, 545 U.S. 596, 599 (2005); *O'Neill v. United States*, 50 F.3d 677, 681 (9th Cir. 1995). This case does not involve the salmon.

of up to three orders of magnitude below historic lows.[4] *San Luis & Delta-Mendota*, 760 F. Supp. 2d at 866. As a consequence, the FWS announced in 2010 that reclassifying the delta smelt from a threatened to an endangered species was warranted but precluded by higher priority listings.[5] *Id.*

The ESA provides "both substantive and procedural provisions designed to protect endangered species and their habitat." *Am. Rivers v. Nat'l Marine Fisheries Serv.*, 126 F.3d 1118, 1121 (9th Cir. 1997).[6] One such protection, § 7(a)(2) of the ESA, requires federal agencies 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." 16 U.S.C. § 1536(a)(2). Should the agency find that its proposed action *may* affect a listed species or critical habitat, it must formally or informally consult with the Secretary of the Interior, or his or her delegee. 16 U.S.C. § 1536(a)(4); 50 C.F.R. § 402.14(a); *see Am. Rivers*, 126 F.3d at 1122. If no effect is found, consultation is not required.

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[4] The 2008 delta smelt population was estimated at 1.5% of the 1980 level, 75 Fed. Reg. 17667 (April 7, 2010), and 2009 levels were estimated to be the lowest on record. *San Luis & Delta-Mendota*, 760 F. Supp. 2d at 866.

[5] The delta smelt was assigned a listing priority of 2 on a scale from 1 to 12, with 1 being the highest priority. *San Luis & Delta-Mendota*, 760 F. Supp. 2d at 866–67 n.6.

[6] Among other things, the CVPIA instructs the Secretary of the Interior to "operate the Central Valley Project to meet all obligations under State and Federal law, including but not limited to the Federal Endangered Species Act, 16 U.S.C. § 1531 et seq." CVPIA, § 3406(b), 106 Stat. at 4714.

50 C.F.R. § 402.14. Formal consultation is required when the acting agency or consulting agency determines that the proposed action is *likely* to adversely affect a listed species or critical habitat. 50 C.F.R. §§ 402.13, 402.14. Formal consultation requires the consulting agency, here the FWS, to issue a biological opinion stating whether the proposed action is likely to jeopardize such species or habitat. 16 U.S.C. § 1536(b); 50 C.F.R. § 402.14. Should the action jeopardize the species or habitat, the consulting agency must suggest any "reasonable and prudent alternatives" (RPA) that would allow the projects to continue operation without causing jeopardy to the species or adverse modification to its critical habitat. 16 U.S.C. § 1536(b)(3)(A). Once it receives the BiOp, the acting agency "shall determine whether and in what manner to proceed with the action in light of its section 7 obligations and the [FWS's] biological opinion." 50 C.F.R. § 402.15(a). If, after consultation, the agency determines that it cannot comply with § 7(a)(2), it may apply for an exemption, which can only be authorized by the Endangered Species Committee, an ad hoc panel composed of executive branch members and at least one appointee from the state in which the project is to occur. 16 U.S.C. § 1536(e); 50 C.F.R. §§ 402.15(c), 451.

B. *Proceedings Leading To The Present Controversy*

1. The FWS's 2008 Biological Opinion

Reclamation sought a biological opinion from the FWS as part of its continued long-term operation of the CVP and its coordinated operations with state agencies of the SWP. BiOp

at 1, 8.[7] Following § 7(a)(2) review and a subsequent formal consultation, the FWS issued a biological opinion in 2005 (2005 BiOp). The 2005 BiOp found that the proposed coordinated operations of the CVP and SWP would *not* have an adverse effect on the continued existence and recovery of the delta smelt and its critical habitat. *San Luis & Delta-Mendota*, 760 F. Supp. 2d at 863. The Natural Resources Defense Council—defendants-intervenors-appellants in the present case—challenged the FWS's conclusion in U.S. District Court for the Eastern District of California, and the court found the 2005 BiOp arbitrary and capricious. *Kempthorne*, 506 F. Supp. 2d at 387. After conducting an extensive evidentiary hearing, the district court issued an interim remedial order and findings of fact and conclusions of law, which covered, among other things, the effects on delta smelt of negative flows in OMR. *See San Luis & Delta-Mendota*, 760 F. Supp. 2d at 864. The district court ordered Reclamation and DWR to implement a winter "pulse flow" in OMR of no more negative than −2,000 cfs, and to "operate the CVP and SWP to achieve a daily average net upstream (reverse) flow in the OMR not to exceed −5,000 cfs on a seven-day running average during a defined period in the spring."[8] *Id.*; Int. Rem. Order at 5–7. The district court also

[7] The precipitating event for Reclamation seeking a biological opinion was a 2004 Operating Criteria and Plan (OCAP), reflecting changes in facilities, water delivery requirements, and regulatory restrictions and increasing coordination between federal and state agencies. *NRDC v. Kempthorne*, 506 F. Supp. 2d 322, 330 (E.D. Cal. 2007).

[8] When water is diverted from the Bay-Delta contrary to its natural course, the amount of water exported is usually expressed as a negative number because the pumping plants reverse OMR flow. For example, if the Banks facility is pumping 2,500 cubic feet per second to the California Aqueduct, it is noted as −2,500 cfs.

ordered the FWS to complete a new BiOp in just nine months, a deadline that it would ultimately extend to one year. *San Luis & Delta-Mendota*, 760 F. Supp. 2d at 865; Int. Rem. Order at 2.

The FWS issued a new delta smelt biological opinion on the deadline, December 15, 2008 (2008 BiOp or BiOp).[9] BiOp at 1–396. In stark contrast to the 2005 BiOp, the 2008 BiOp concluded that the "coordinated operations of the CVP and SWP, as proposed, are likely to jeopardize the continued existence of the delta smelt" and "adversely modify delta smelt critical habitat." BiOp at 276–78. With respect to the delta smelt, the FWS entered five findings of fact: (1) "Diversions of water from the Delta have increased since 1967 when the SWP began operation in conjunction with the CVP." BiOp at 276. The CVP/SWP operations have entrained smelt, including adults, larvae, and juveniles, at the Banks and Jones facilities; reduced smelt habitat; and reduced the Delta outflows, altering the location of the LSZ; (2) "The delta smelt is currently at its lowest level of abundance since monitoring began in 1967"; (3) "Under the proposed CVP/SWP operations, inflows to the Delta are likely to be further reduced, as water demands upstream of the Delta increase, most notably on the American River." BiOp at 276. This is likely to "cause increased relative entrainment of adult delta smelt in the winter and spring, and of larval and juvenile

[9] In preparing this BiOp, the FWS subjected it to an Internal Peer Review Team, consisting of experts in the development of complex biological opinions under the ESA from throughout the FWS, comments from a team of delta smelt experts from within the FWS and other related agencies, the review of PBS&J, an environmental consulting firm, as well as feedback from Reclamation and the DWR. *See* BiOp at i–vi. In response to the significant feedback it received, the FWS made substantial changes to the BiOp. *See* BiOp at ii.

delta smelt in the spring"; (4) "Other baseline stressors will continue to adversely affect the delta smelt, such as contaminants, microcystis, aquatic macrophytes, and invasive species"; (5) To recover, delta smelt will need a more abundant adult population, an increase in the quality and quantity of spawning, rearing, and migratory habitat, a reduction in contaminants and pollutants, a reduction in exposure to disease and toxic algal blooms, and a reduction in entrainment at water-diversion facilities in the Bay-Delta. BiOp at 276–77. With respect to delta smelt critical habitat, the FWS found that "past and present operations of the CVP/SWP have degraded these habitat elements" such that they are "insufficient to support successful delta smelt recruitment at levels that will provide for the species' conservation." BiOp at 278.

The FWS recommended five components and listed six separate actions as "reasonable and prudent alternatives" (RPA):

RPA Component 1 (Actions 1 and 2). Component 1 protects the adult delta smelt life stage by controlling OMR flows during the vulnerable December to March period. It has two proposed actions. Action 1 is "designed to protect upmigrating delta smelt" and describes the two periods when delta smelt are most vulnerable to entrainment: in December and when the first flush appears. BiOp at 280–81. Action 1 therefore proposes limiting the negative flows at OMR based on a "daily salvage index." *Id.* In effect, this means that when the "daily salvage index" reaches a critical point ("the risk threshhold"), the Projects have to reduce their diversion for 14 days. During that period, OMR flows can be "no more negative than –2,000 cfs" for a 14-day running average and "no more negative than -2,500 cfs" for a 5-day running

average. BiOp at 281, 329. Action 2 follows from Action 1 but covers the period from December through March, when pre-spawning adult delta smelt are vulnerable to entrainment. BiOp at 352. During that period, OMR flows can be no more negative than −5,000 cfs, although the FWS expected that flows would generally be in the range of −2,000 cfs to −3,500 cfs.

RPA Component 2 (Action 3). Component 2 protects larval and juvenile delta smelt by limiting OMR flows following the completion of Component 1 when the Bay-Delta water temperatures reach 12°C, or when a spent female smelt is detected in trawls at Jones or Banks or is found in the salvage facilities. Action 3 requires the CVP/SWP projects to maintain their average OMR flows between −1,250 and −5,000 cfs until June 30, or until the mean water temperature reaches a target level, whichever occurs earlier. BiOp at 290, 357–58.

RPA Component 3 (Action 4). Component 3 improves smelt habitat by increasing Bay-Delta outflow during the fall. Action 4 requires that in September and October, in years when the precipitation and runoff is defined as "wet or above normal," Reclamation and DWR must provide sufficient Delta outflow to maintain X2 no more eastward than 74 km from the Golden Gate in wet years and 81 km in above-normal years.[10] BiOp at 282–83, 369.

[10] In Action 4, the FWS noted that "there may be other ways to achieve the biological goals of this action," and that it would evaluate alternatives and modify Action 4 "consistent with the intention of this action." The FWS referred to this process as an "adaptive management process." BiOp at 283.

RPA Component 4 (Action 6[11]*)*. Component 4 restores habitat by establishing a program to create or restore intertidal and associated subtidal habitat to the Bay-Delta and Suisun Marsh. Action 6 requires DWR to create or restore at least 8,000 acres in the Delta and Suisun Marsh. BiOp at 283.

RPA Component 5. Component 5 monitors and reports on the implementation, success, and possible improvements of Components 1–4.[12]

Finally, the FWS issued an "incidental take statement" (ITS) in accord with 50 C.F.R. § 402.02. For purposes of the ITS, the FWS presumed that its reasonable and prudent alternatives would be implemented. Based on that premise, the FWS found that, as a result of CVP/SWP operations, there would be a take of the delta smelt, and that although the extent of the take would be difficult to estimate, smelt entrainment would be minimized when OMR flows were regulated according to the FWS's proposed RPA. BiOp at 285–86. As a consequence, the FWS concluded that "this level of anticipated take is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat when the RPA is implemented." BiOp at 293.

[11] For Action 5 see, *infra*, Note 12.

[12] Component 5 did not have a separate action item, and Action 5 was not formally associated with any of the RPA Components. Action 5 was specific to the installation of a physical barrier on the Old River that affected entrainment of larval and juvenile delta smelt. BiOp at 377–78.

2. The present case

The first of six complaints challenging the FWS's 2008 BiOp was filed in March 2009. *San Luis & Delta-Mendota*, 760 F. Supp. 2d at 865. "Plaintiffs moved for a preliminary injunction . . . to prevent Reclamation from implementing Component 2 of the RPA, alleging that FWS violated the National Environmental Policy Act ("NEPA") and the ESA." *Id.* The district court granted the motion in part, finding that plaintiffs-appellees were likely to succeed on the merits of their NEPA claim, and requiring the FWS to make specific written findings to justify weekly decisions regarding OMR flow restrictions. *Id.*

Plaintiffs-appellees sought a preliminary injunction against the implementation of RPA Component 3. *Id.* Following an evidentiary hearing,[13] the district court issued a preliminary injunction confirming that plaintiffs-appellees had succeeded on their NEPA claims and finding that

[13] At the evidentiary hearing, the district court appointed four experts pursuant to Federal Rule of Evidence 706, which permits the court to "appoint any expert that the parties agree on and any of its own choosing." Fed. R. Evid. 706(a). The court appointed two professors from the University of Washington, Dr. Andre Punt and Dr. Thomas Quinn, to advise the court on the complex technical and scientific matters. The court also appointed two additional experts: a Reclamation employee knowledgeable on the CVP, and a DWR employee knowledgeable in the SWP.

In addition to these court-appointed experts, the district court permitted substantial declarations from experts selected (but not agreed to) by the parties. In its written decision, the district court relied extensively on opinions and evidence submitted by its own experts and by the parties' experts.

plaintiffs-appellees were likely to succeed on the merits of their ESA claim. *Id.*

In December 2010, the district court entered final judgment on the primary claims in a 115-page opinion. *Id.* at 967–70. Although the FWS's 2008 BiOp reached antipodal conclusions to the 2005 BiOp—which reached a no-jeopardy conclusion and was found arbitrary and capricious—the district court once again found the 2008 BiOp to be arbitrary and capricious under the ESA and the APA and remanded the BiOp, its RPA, and Reclamation's provisional acceptance of the RPA to the agency. *San Luis & Delta-Mendota*, 760 F. Supp. 2d at 855, 970. The court's remand required the completion of yet a *third* BiOp analyzing the impact of CVP and SWP operations on the delta smelt. *San Luis & Delta-Mendota*, 760 F. Supp. 2d at 870. In March 2011, the district court entered final judgment on all remaining claims.

Although the district court accepted the BiOp's central conclusion that "Project operations are likely to jeopardize the continued existence and/or adversely modify the critical habitat of the delta smelt," *id.* at 969, the district court determined that there were a number of specific flaws with the BiOp, *id.* at 967–70. We will briefly set forth the district court's principal objections here—which are highly technical and somewhat obtuse out of context—and explain them in more detail in the discussion section.

First, the district court found the BiOp's reliance on analyses using raw salvage figures—e.g., those calculations that incorporated the absolute "raw" number of smelt entrained in pumping stations, as opposed to the smelt entrained as a percentage of the total population—to be arbitrary and capricious and not the result of the best

available science. *Id.* at 968. These calculations significantly influenced the upper and lower OMR flow limits in Actions 1, 2, and 3.

Second, the district court found that the BiOp's use of two different models, CALSIM II and DAYFLOW, that predict the location of X2, introduced bias requiring a corrective calibration or, at the very least, explanation. *Id.* The district court also found that the bias produced by the comparison of CALSIM II to DAYFLOW tainted the BiOp's justification for Action 4, which involves the management of X2. In addition, the district court found that the BiOp did not sufficiently explain why it is essential in Component 3 (Action 4) to maintain X2 at the specific locations of 74 km upstream from the Golden Gate Bridge following "wet years" and 81 km following "above-normal years." *Id.* at 969.

Third, the district court found that the BiOp did not sufficiently explain why different data sets were used to calculate the incidental take limit for juvenile and for adult smelt, and why these limits were calculated using an average of previous years' smelt salvage (which would be expected to be exceeded in 50% of all future years).

Fourth, the district court found the BiOp did not adequately support its conclusions that Project operations are reasonably certain to indirectly affect the delta smelt by limiting delta smelt food supply, by increasing harmful pollution and contaminants, and by increasing the detrimental impact of the "other stressors" of predation, macrophytes, and *microcystis* on delta smelt. *Id.*

Fifth, the district court held that the BiOp failed to analyze economic feasibility, consistency with the purpose of

the action, and consistency with the action agency's authority, as required by § 402.02. *See* 5 U.S.C. § 551 *et seq*; 50 C.F.R. § 402.02. *Id.* at 969–70.

Federal Defendants and the NRDC have timely appealed, urging reversal of the district court's remand. We address their claims in Part IV.

The San Luis & Delta-Mendota Water Authority and other appellees timely cross-appealed, arguing that the district court did not go far enough. They raise three claims: First, that the FWS violated the ESA by not separating out non-discretionary actions from discretionary actions in setting an environmental baseline; second, that Reclamation acted arbitrarily and capriciously in adopting the flawed BiOp; and, third, that the FWS failed to conduct the review required by NEPA.[14] We address their claims in Part V.

This tortured procedural history has extended over seven years, and has led to five fully consolidated suits and one partially consolidated suit brought by various groups who use water supplied by the CVP and SWP, as well as to the completion of two extensively researched BiOps—with a third currently in progress. All the while, the delta smelt has teetered on the brink of extinction.

We agree with Federal Defendants and the NRDC and reverse the district court's remand of the BiOp. We affirm the

[14] Federal Defendants and the NRDC also appeal the district court's determination that *Reclamation* failed to conduct review required by NEPA. We address this direct appeal together with appellees' cross appeal.

district court's judgment that Reclamation failed to comply with NEPA before implementing the FWS's BiOp.

II. STANDARDS OF REVIEW

We review the district court's ruling on summary judgment de novo. *McFarland v. Kempthorne*, 545 F.3d 1106, 1110 (9th Cir. 2008).

Neither the ESA nor NEPA supply a separate standard for our review, so we review claims under these Acts under the standards of the APA. *Bennett v. Spear*, 520 U.S. 154, 174 (1997); *Oregon Natural Desert Ass'n v. Bureau of Land Mgmt.*, 625 F.3d 1092, 1109 (9th Cir. 2010); *Pyramid Lake Paiute Tribe of Indians v. U.S. Dept. of Navy*, 898 F.2d 1410, 1414 (9th Cir. 1990). Section 706(2) of the APA provides that an agency action must be upheld on review unless it is "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law." 5 U.S.C. § 706(2)(A). As a reviewing court, we "must consider whether the decision was based on a consideration of the relevant factors and whether there has been a clear error of judgment." *Citizens to Preserve Overton Park, Inc. v. Volpe*, 401 U.S. 402, 416 (1971), *abrogated in part on other grounds as recognized in Califano v. Sanders*, 430 U.S. 99, 105 (1977). Although our inquiry must be thorough, the standard of review is highly deferential; the agency's decision is "entitled to a presumption of regularity," and we may not substitute our judgment for that of the agency. *Id.* at 415–16. Where the agency has relied on "relevant evidence [such that] a reasonable mind might accept as adequate to support a conclusion," its decision is supported by "substantial evidence." *Bear Lake Watch, Inc. v. FERC*, 324 F.3d 1071, 1076 (9th Cir. 2003). Even "[i]f the evidence is susceptible

of more than one rational interpretation, [the court] must uphold [the agency's] findings." *Id.*

Under the ESA, the agency must base its actions on evidence supported by "the best scientific and commercial data available." 50 C.F.R. § 402.14(g)(8); 16 U.S.C. § 1536(a)(2). The determination of what constitutes the "*best* scientific data available" belongs to the agency's "special expertise . . . . When examining this kind of scientific determination, as opposed to simple findings of fact, a reviewing court must generally be at its most deferential." *Baltimore Gas & Elec. Co.*, 462 U.S. at 103. "Absent superior data[,] occasional imperfections do not violate" the ESA best available standard. *Kern Cnty. Farm Bureau v. Allen*, 450 F.3d 1072, 1080–81 (9th Cir. 2006).

"The best *available* data requirement 'merely prohibits [an agency] from disregarding available scientific evidence that is in some way better than the evidence [it] relies on.'" *Kern Cnty. Farm Bureau*, 450 F.3d at 1080 (emphasis added) (quoting *Sw. Ctr. for Biological Diversity v. Babbitt*, 215 F.3d 58, 60 (D.C. Cir. 2000)). "Essentially, FWS 'cannot ignore available biological information.'" *Id.* at 1080–81 (quoting *Connor v. Burford*, 848 F.2d 1441, 1454 (9th Cir. 1988)). Thus, "insufficient . . . [or] incomplete information . . . does not excuse [an agency's] failure to comply with the statutory requirement of a comprehensive biological opinion using the best information available" where there was some additional superior information available. *Conner*, 848 F.2d at 1454–55. On the other hand, where the information is not readily available, we cannot insist on perfection: "[T]he 'best scientific . . . data available,'" does not mean "the best scientific data possible." *Building Indus. Ass'n v. Norton*, 247 F.3d 1241, 1246 (D.C. Cir. 2001).

III. THE SCOPE OF THE RECORD

Our review is limited to "the administrative record already in existence, not some new record made initially in the reviewing court." *Camp v. Pitts*, 411 U.S. 138, 142 (1973).

> If the record before the agency does not support the agency action, if the agency has not considered all relevant factors, or if the reviewing court simply cannot evaluate the challenged agency action on the basis of the record before it, the proper course, except in rare circumstances, is to remand to the agency for additional investigation or explanation. The reviewing court is not generally empowered to conduct a *de novo* inquiry into the matter being reviewed and to reach its own conclusions based on such an inquiry. . . .
>
> The factfinding capacity of the district court is thus typically unnecessary to judicial review of agency decisionmaking.

Florida Power & Light Co. v. Lorion, 470 U.S. 729, 744 (1985). *See also Citizens to Preserve Overton Park*, 401 U.S. at 419–20.

There is a danger when a reviewing court goes beyond the record before the agency. "When a reviewing court considers evidence that was not before the agency, it inevitably leads the reviewing court to substitute its judgment for that of the agency." *Asarco, Inc. v. EPA*, 616 F.2d 1153, 1160 (9th Cir. 1980). *See Sw. Ctr. for Biological Diversity v. U.S. Forest*

Serv., 100 F.3d 1443, 1450 (9th Cir. 1996) ("Judicial review of an agency decision typically focuses on the administrative record in existence at the time of the decision and does not encompass any part of the record that is made initially in the reviewing court."). Accordingly, we do not review "the evidence to determine the correctness or wisdom of the agency's decision . . . even if the court has also examined the administrative record." *Asarco*, 616 F.2d at 1160. If the reviewing court cannot find substantial evidence in the record, it should "not compensate for the agency's dereliction by undertaking its own inquiry into the merits," *id.*, but should remand to the agency for further proceedings, *see INS v. Ventura*, 537 U.S. 12, 16 (2002).

"We have, however, crafted narrow exceptions to this general rule." *Lands Council v. Powell*, 395 F.3d 1019, 1030 (9th Cir. 2005). As we have explained,

> [w]e allow expansion of the administrative record in four narrowly construed circumstances: (1) supplementation is necessary to determine if the agency has considered all factors and explained its decision; (2) the agency relied on documents not in the record; (3) supplementation is needed to explain technical terms or complex subjects; or (4) plaintiffs have shown bad faith on the part of the agency.

Fence Creek Cattle Co. v. U.S. Forest Serv., 602 F.3d 1125, 1131 (9th Cir. 2010). Keeping in mind the Supreme Court's concerns with reviewing court factfinding, we have approached these exceptions with caution, lest "the exception

. . . undermine the general rule." *Lands Council*, 395 F.3d at 1030.

We have serious concerns that the district court failed to observe these rules. First, the district court appointed four experts to aid it in understanding the technical and scientific aspects of the BiOp. These experts were appointed consistent with Federal Rule of Evidence 706. *See supra* Note 13. Having read the BiOp, we are sympathetic to the district court's need for a scientific interpreter. No party has objected on appeal to the district court's appointments, and we can see no reasonable objection to the use of experts to explain the highly technical material in the BiOp.

The district court, however, did not limit itself to the court-appointed experts. Over the vigorous objection of the appellants, the court admitted multiple declarations from multiple experts hired by the appellees, even though the party-appointed experts addressed many of the same issues being addressed by the court-appointed experts. By the government's count—which we have not sought to verify, although we have examined the declarations in the record—the district court admitted more than forty expert declarations from the appellees; once the court denied the appellant's motion to exclude the declarations, the appellants submitted their own experts' declarations. Yet, we cannot see what the parties' experts added that the court-appointed experts could not have reasonably provided to the district court. *See Animal Def. Council v. Hodel*, 840 F.2d 1432, 1437 (9th Cir. 1988) (plaintiff failed to show why the district court needed to go outside the administrative record). The effect of this was, predictably, to create a battle of the experts. Moreover, it gave the proceedings in the district court the appearance that the administrative record was open

and that the proceedings were a forum for debating the merits of the BiOp. *See Ariz. Cattle Growers' Ass'n v. U.S. Fish & Wildlife*, 273 F.3d 1229, 1245 (9th Cir. 2001) ("Considering evidence outside the record would render the extraordinarily complex consultation process . . . meaningless."). Just as we will not allow the agency to supply post-hoc rationalizations for its actions, so "post-decision information . . . may not be advanced as a new rationalization either for sustaining or attacking an agency's decision." *Sw. Ctr. for Biological Diversity*, 100 F.3d at 1450. As the Court cautioned, "[w]hen specialists express conflicting views, an agency must have discretion to rely on the reasonable opinions of its own qualified experts even if, as an original matter, a court might find contrary views more persuasive." *Marsh v. Ore. Natural Res. Def. Council*, 490 U.S. 360, 378 (1989).

Even a quick review of the district court's opinion shows that the appearance of an open record was the reality. The district court relied extensively on the declarations of the parties' experts-as-advocates as the basis for rejecting the BiOp. *See*, *e.g.*, *San Luis & Delta-Mendota*, 760 F. Supp. 2d at 877–79, 881–84, 889–90, 894–97, 903–07, 912, 922. In places, the district court pits the experts against each other and resolves their contrary positions as a matter of scientific fact. *E.g.*, *San Luis & Delta-Mendota*, 760 F. Supp. 2d at 884, 904–07. In effect, the district court opened the BiOp to a post-hoc notice-and-comment proceeding involving the parties' experts, and then judged the BiOp against the comments received. The ESA consultation process is not a rulemaking proceeding, but a request from one agency for the expertise of a second agency. Although we may review each of those proceedings under the APA, the agency's obligations under each is slightly different, and we must account for that difference in our review.

Our opinion in *Asarco v. EPA* addressed the question of using experts in a technical case and is on point here. In that case, the district court had a technical matter before it—involving a 1,000 foot stack at a smelter—and permitted the parties to call their experts. The court held four days of hearings in which at least ten witnesses testified. We held that some of the testimony, mainly from experts who provided "background material" on the smelter's operations, was appropriate; the rest of it was not appropriate, even if it came from experts and "served some marginal purpose":

> Most of the expert testimony, however, should not have been admitted or at least not have been considered for the purpose of judging the wisdom of the EPA's stack-testing requirement. This technical testimony was plainly elicited for the purpose of determining the scientific merit of the EPA's decision. Although the testimony may have served some marginal purpose in allowing the district court to evaluate the EPA's court of inquiry, we can only conclude that the extent of the scientific inquiry undertaken at trial necessarily led the district court to substitute its judgement for that of the agency.

616 F.2d 1155, 1160–61 (9th Cir. 1980).

The district court similarly overstepped its bounds here. Because we review the court's judgment *de novo*, however, we can confine our own scope of review to the administrative record, plus that evidence that satisfies the standards we have set forth here. *See Dow Agrosciences v. Nat'l Marine Fisheries Serv.*, 707 F.3d 462, 469 (4th Cir. 2013) (confining

review to the administrative record and disregarding an affidavit submitted to the district court). We will consider the BiOp and any other evidence in the record submitted by the parties that the FWS considered in making its decision. We will also consider the testimony of the four experts the district court appointed pursuant to Rule 706, as to whom there is no objection.

IV. MERITS OF THE BiOp

Before we consider the challenges to the BiOp, we have some preliminary observations. First, the BiOp is a bit of a mess. And not just a little bit of a mess, but, at more than 400 pages, a big bit of a mess. And the FWS knew it. In November 2008, shortly before the FWS submitted its final draft, the California Department of Water Resources commented on a portion of the FWS's draft. Under the title "The Document is Confusing and Disorganized," the DWR advised that "the document is especially unrefined. The text is often out of logical order . . . , many actions are fairly vague, and the document is unpolished." Some portions, DWR wrote, were "largely unintelligible." The FWS also submitted its draft to a peer review panel, coordinated by an outside engineering firm. One of the questions the FWS asked the panel was whether the BiOp was "organized in a manner that is clear, concise and complete (i.e., is it understandable)?" The panel pulled no punches and responded as follows: "The Panel's response to this question is 'no.' The version of the [Effects Analysis] provided to the Panel was a draft and had not been adequately edited for general organization, consistency across sections in how analyses were described and reported, and for redundancies." The bottom line was that "most readers would have a difficult time."

Both the California DWR and the peer review panel commented on the FWS's imposing schedule for issuing the BiOp. DWR observed that the "FWS was under an exceptionally difficult deadline to get this document in." In a comment letter sent from the DWR to Reclamation just two weeks before the deadline, the DWR reflected on the pressures the FWS labored under: "Our concerns with the Draft [BiOp] are extensive but are correctable before the December 15 court ordered [deadline] for its finalization. We are willing to work closely with the FWS to address these concerns quickly. . . ." And the peer review panel complained that its own "review was conducted in a four-day period under a tight schedule." *See Ass'n of Pac. Fisheries v. EPA*, 615 F.2d 794, 811 (9th Cir. 1980) ("The Agency itself recognized that its data collection was not as thorough as it otherwise would have been: 'The time constraints imposed by the statutory deadlines precluded the Agency from conducting an exhaustive sampling program.'"). This challenging deadline was not the fault of the agency, but was set by the same district court that would later hold that the FWS's rushed BiOp was arbitrary and capricious. *See San Luis & Delta-Mendota*, 506 F. Supp. at 322 (ordering the FWS to produce a revised BiOp in just nine months—a deadline that would later be extended by three months to give the FWS just one year to produce a new BiOp).[15]

[15] One of the ironies of the district court's deadlines is that the FWS had less time to produce its opinion than either the district court or we will have had to review it: The 2008 BiOp was issued in December 2008. The district court's summary judgment decision issued almost two years to the day, in 2010. This opinion issues nearly three years later.

The concerns in adhering to deadlines is familiar to courts who must occasionally rush to judgment. Justice Powell once bemoaned the problems arising from deciding cases "late in the Term" when the Court

We concur in these assessments. The BiOp is a jumble of disjointed facts and analyses. It appears to be the result of exactly what we would imagine happens when an agency is ordered to produce an important opinion on an extremely complicated and technical subject matter covering multiple federal and state agencies and affecting millions of acres of land and tens of millions of people. We expect that the document was patched together from prior documents, assembled quickly by individuals working independent of each other, and not edited for readability, redundancies, and flow. It is a ponderous, chaotic document, overwhelming in size, and without the kinds of signposts and roadmaps that even trained, intelligent readers need in order to follow the agency's reasoning. We wonder whether anyone was ultimately well-served by the imposition of tight deadlines in a matter of such consequence.[16] Deadlines become a substantive constraint on what an agency can reasonably do. In this case, the FWS not only had to write and compile the report—a substantial task in and of itself—but was under pressure to, among other things, produce a reliable population estimate of the delta smelt. *Kempthorne*, 506 F. Supp. 2d at 373 (faulting the 2005 BiOp for failing to produce such an estimate, and noting that "[t]he viability of Delta smelt has been under scrutiny for over ten years. No party has shown

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was precluded by its own deadlines from "an opportunity for more thorough consideration of the basic principles at risk." *Robbins v. California*, 453 U.S. 420, 435–36 (1981) (Powell, J., concurring in the judgment). *Robbins* was overruled the following Term in *United States v. Ross*, 456 U.S. 798, 824 (1982).

[16] We recognize that the ESA itself imposes deadlines for a consulting agency to produce a BiOp, but those deadlines may be extended by consent of the requesting agency or the concerned applicant. *See* 16 U.S.C. § 1536(b)(1), (2). Here, the district court fixed the deadline.

that producing a reliable population estimate is scientifically unfeasible"). Such scientific tasks may not be as well suited to deadlines as producing written copy; the final product will necessarily reflect the time allotted to the agency. The FWS is currently preparing its third BiOp, again under the orders of the district court and on the district court's deadlines. Although we ultimately conclude that we can discern the agency's reasoning and that the FWS's 2008 BiOp is adequately supported by the record and not arbitrary and capricious, we also recognize that Reclamation has continuing responsibilities under CVP and SWP and that this is likely not the last BiOp that the FWS will issue with respect to the delta smelt, nor is this the last legal challenge that we will hear. Future analyses should be given the time and attention that these serious issues deserve.

A. *The 2008 BiOp's Reliance on Raw Salvage Figures to Set the Upper and Lower OMR Flow Limits Was Not Arbitrary and Capricious*

Under normal pumping operations, enough water is pumped from the OMR that the river's flow reverses. BiOp at 159–60. As vast quantities of water are pumped from the river, smelt and other fish are entrained in the pumps, where they are captured and counted in fish salvage facilities. *Id.* Not all smelt are salvaged, however, as juvenile smelt smaller than 20 mm (0.79 inches), smelt still in the larval stage, and some percentage of adult delta smelt, are killed by the pumps. BiOp at 338. The prospects for salvaged smelt are also grim, as smelt rarely survive the salvage process, *id.*; up to sixty percent of the smelt population is lost each year at the pumping plants, BiOp at 210. Unsurprisingly, the 2008 BiOp found that as the OMR flows became increasingly negative, the entrainment risk and accompanying population loss

increased accordingly, thereby threatening the smelt population's continuing viability. BiOp at 163.

To mitigate this effect, the BiOp RPA imposed pumping limits expressed in terms of negative OMR flows,[17] ranging from −1,250 cubic feet per second (cfs) to −5,000 cfs. BiOp at 280. Which limit is applicable is determined by the location of the smelt population, water turbidity,[18] and a range of other factors. BiOp at 280. In determining the OMR flow limits, the FWS relied, in part, on the number of delta smelt salvaged from the fish screening facilities. Although it acknowledged that the number of smelt salvaged only represents "a small percentage of the actual number entrained," and "is not a good estimate of actual delta smelt mortality through entrainment," BiOp at 338, the FWS relied on this information because "[d]ata on the salvage of delta smelt is typically used to provide an index of entrainment into the diversion pumps," BiOp at 145.

The OMR flow limit has a great practical significance, not merely to the delta smelt but to Californians, as it represents the ultimate limit on the amount of water available to sustain California's millions of urban and agricultural users.

Appellees challenge the −5,000 cfs upper limit on OMR flows, claiming that the FWS based its calculation of the flow limit solely on information contained in two figures that show

[17] Actions 1 and 2 of the RPA protect adult delta smelt migrating upstream in winter months to spawn, and Action 3 protects larval and juvenile delta smelt in the spring after they hatch. BiOp at 280, 282.

[18] Water turbidity is the measurement of how much sediment or foreign particles are suspended in the water.

a significant increase in the number of smelt salvaged at approximately −5,000 cfs: Figures B-13 and B-14. *See* BiOp at 347, 350. These figures, appellees assert, failed to justify the −5,000 cfs limit because the number of delta smelt salvaged (raw salvage) was not adjusted for the smelt's estimated population for that year (normalized). Appellees' objection to the BiOp's use of raw salvage data, rather than normalized data, in calculating appropriate OMR flow limits is essentially an omitted variable bias argument; appellees assert that the number of smelt salvaged in a year is highly influenced by the total population of smelt that year, and that therefore the BiOp's failure to account for this relation renders its calculated flow limits unreliable. Put another way, according to appellees, when there are more smelt in the Bay-Delta, more smelt are salvaged. Any apparent relationship between OMR flows and smelt salvage, therefore, may actually be a relationship between smelt population size and smelt salvage. Failing to account for this will skew, if not invalidate entirely, the analysis.

The district court agreed, finding that "[t]he use of raw salvage data, as opposed to salvage data scaled to population size, is problematic because raw salvage figures do not account for the size (or relative size) of the smelt population." *San Luis & Delta-Mendota*, 760 F. Supp. 2d at 889. The district court further found that "the use of normalized salvage data rather than gross salvage data is the standard accepted scientific methodology." *Id.* It concluded that the FWS's use of raw salvage data in Figures B-13 and B-14 to determine restrictions on OMR flows was "scientifically unacceptable." *Id.* at 891. Because the FWS failed to use the best available scientific data, its −5,000 cfs flow limit in Actions 1, 2 and 3 was arbitrary and capricious. *Id.*; *see id.* at 891–94.

These objections, however, suffer from several problems. First, the FWS appropriately relied on Figures B-13 and B-14 to justify its −5,000 cfs flow limits. In Figures B-13 and B-14, the FWS acknowledged the uncertainty inherent to modeling the relation between OMR flows and smelt and chose a conservative model, a choice that is within the FWS's discretion to make. *See Nw. Coal. for Alts. to Pesticides v. EPA*, 544 F.3d 1043, 1050 (9th Cir. 2008). Second, the −5,000 cfs flow limit prescribed in the RPA was not solely determined from Figures B-13 and B-14, and therefore flaws in those figures do not necessarily doom the BiOp's conclusions. Third, the BiOp's OMR flow limits work in tandem with the incidental take statement (ITS), which accounts for population-level impacts.

That the FWS could have done more in determining OMR flow limits is uncontroverted. This, however, is not to say that the FWS acted arbitrarily and capriciously; we hold, contrary to the district court, that the FWS's OMR flow limits are supported by substantial evidence.

1. The FWS's choice of a more conservative model to calculate flow limits in Figures B-13 and B-14 was supported by substantial evidence

Figure B-13 in the BiOp[19] is a graph showing the relationship between salvaged adult delta smelt and the OMR flow, measured in cfs. The graph shows a positive correlation between salvaged smelt and the reverse flow of the river. That is, the greater the water pumped through the Jones and Banks pumping stations, the greater the count of smelt

[19] Figures B-13 and B-14 are reproduced in the district court's published opinion. *Kempthorne*, 506 F. Supp. 2d at 886–87.

salvaged at those stations. The FWS noted that the graph is upward sloping and linear in the lower half of the curve. At about −5,000 cfs there is a "break" in the data,[20] and for flows more negative than −5,000 cfs (meaning more water exported from the Bay-Delta), the upward slope increases at an increasing rate. The FWS sought to verify whether the break in the data was actual. It conducted additional analyses of the data to verify that there was not a natural break at any other point and that any error in the OMR flow rates or salvage could not have caused the break. BiOp at 349–51. The FWS concluded that with "flows more negative than −1683, salvage increased." BiOp at 351.

The FWS stated that "[a] major assumption of this analysis is that as the population of Delta smelt declined, the number of fish at risk of entrainment remained constant." BiOp at 349. What B-13 did was compare actual salvage numbers with OMR flow. What the FWS did not do—and what the appellees and the district court claim the FWS should have done—was prepare an additional figure in which it compared "normalized" salvage numbers with OMR flows. Normalized salvage would be the measure of the salvaged smelt divided by the total population of smelt,[21] effectively

[20] The break in the data in B-13 appears to span about −3,000 cfs to just under −6,000 cfs. BiOp at 348. The FWS did not attempt to quantify the break; it simply observed that there "appears to be a 'break' in the dataset at approximately −5,000 OMR." BiOp at 347.

[21] Part of the district court's frustration may be that, to date, no one has been able to produce a reliable population estimate for the delta smelt. In 2007 when the district court sent the 2005 BiOp back to the FWS, it commented that

yielding figures showing what percentage of smelt each year were salvaged at the pumps.

In fact, the FWS itself had stated that it could verify its conclusion "by normalizing the salvage data by the estimated population size based on the [Fall Midwater Trawl] data." BiOp at 349. The peer review had similarly suggested normalizing the data:

> The Panel suggests that the use of predicted salvage of adult smelt should be normalized for population size. . . . One way to normalize

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> The viability of Delta smelt has been under scrutiny for over ten years. No party has shown that producing a reliable population estimate is scientifically unfeasible. . . . Without population estimates, it is arbitrary for the agency to conclude that project operations will not result in jeopardy simply because the projects will take relatively fewer smelt than they did in the past, in the fact of the undisputed fact that the smelt population has been declining steadily in recent years. Failing to incorporate any information about smelt population abundance into the setting of the take limits is a fundamental failure rendering the BiOp arbitrary and capricious.

Kempthorne, 506 F. Supp. 2d at 373. Despite the court's warning, the FWS did not conduct a population study, nor did it explain why one could not be conducted. Yet, the FWS, its peer reviewers, and the district court's experts suggested that there were proxies for population (such as the FMWT count) available, even if a strict population count was not.

Sometimes we have to read the shadows to discern the reality behind it: Nearly twenty years after the smelt were declared endangered, we know the smelt population is continuing to decline and is imperiled, but still no one knows how many there are. It must tell us something about the difficulties that inhere in trying to count migrating, two-inch fish.

> salvage for population size is to divide by the previous fall Midwater Trawl (MWT) index. A similar regression model to the one fitted to salvage would relate the normalized salvage to Old and Middle River (OMR) flows. . . . Expressing salvage as a normalized index may help remove some of the confounding of the temporal trends during the baseline period . . . .

As the district court's experts acknowledged, the FWS faces significant practical challenges in setting OMR flow rates to minimize delta smelt entrainment. For example, day-to-day variations in OMR flows and "noise" in smelt sampling[22] used to establish abundance and distribution of the delta smelt are significant confounding factors in determining appropriate OMR flow rates, as is the distribution of the delta

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[22] "Noise" is a statistical term that refers to the unexplained randomness or variation that is found in a sample. It is of particular concern when statistical samples are small. As Dr. Quinn explained:

> [W]hat are the uncertainties in the population estimates themselves, and might there be shifting levels of accuracy as population levels change? . . . [It] is certainly true [that population growth rate is an appropriate and reliable measure of the population increases and decreases from year to year], if it is known without error but what are the assumptions about sampling? That is, as smelt become increasingly scarce, does their overall distribution become 'thinner all around' or is it 'patchy', and how might such changes influence the reliability of data from different surveys of abundance? In general, 'noisy' data make it more difficult to detect underlying patterns, even if the patterns are genuine.

smelt population in relation to the pumps. BiOp at 165, 331, 353–55. A lack of real-time information and variations inherent to environmental systems make precision virtually impossible. BiOp at 165, 331, 353–55. Yet, as even the district court recognized, population numbers of the delta smelt are perilously low, *San Luis & Delta-Mendota*, 760 F. Supp. 2d at 866, and entrainment by the pumping plants has a "*sporadically significant* influence on population dynamics," *id.* at 877 (emphasis added).

In such circumstances, the FWS's decision to use raw salvage data rather than population-adjusted salvage data reasonably protects the delta smelt population without regard to year-by-year fluctuation in population size. The BiOp notes that this decision was motivated by a concern for the *absolute* number of smelt entrained in the pumps, not the *relative* number of smelt: "The current population cannot tolerate direct mortality through adult entrainment at levels approaching even 'moderate' take as observed through the historic record of recent decades." BiOp at 287. Thus, the RPA is designed to "reduce entrainment of pre-spawning adult delta smelt during December to March" and to "[m]inimize the number of larval delta smelt entrained at the facilities" by controlling OMR flow from March to June. BiOp at 280, 357. The analytical approach preferred by appellees and the district court is best gauged to measure the number of smelt entrained at the pumps relative to the population size. This may be a more accurate reflection of the relative impact of OMR flows on the smelt population, but it is not tailored to protect the maximum absolute number of individual smelt, as the BiOp's approach is; the process of adjusting raw salvage for the smelt population size results in

normalized numbers, but it does so at the potential cost of minimizing the impact of each individual smelt lost.[23]

Our deference to agency determinations is at its greatest when that agency is choosing between various scientific models, as the FWS did in the present instance. *See Nw. Coal. for Alts. to Pesticides*, 544 F.3d at 1050. Facing great measurement uncertainty and a smelt population whose existence is threatened, the FWS chose to be conservative in setting the flow limits in Actions 1, 2, and 3. This choice was well within its discretion; the Supreme Court has held that an agency may choose to "counteract the uncertainties" inherent in its scientific analyses by "overestimat[ing]" known parameters without being unreasonable, *Baltimore Gas & Elec. Co.*, 462 U.S. at 103, and we have upheld an agency's reliance on models that "yield conservative data because the

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[23] Appellee-Metropolitan Water District uses "one of the data points located at about −5,000 cfs on Figure B-13" for the year 2000 as an example. An unusually high smelt salvage was observed in 2000, but, as Appellee indicates, the smelt population was also higher than usual in that year. Appellee argues that because "[i]t is to be expected that more fish would be salvaged in a year in which the population was extremely large," the raw salvage number should be normalized for total smelt population. Accepting appellee's argument that salvage rates should be normalized, the year 2000 would have actually represented a below average (normalized) salvage. Yet, it is undisputed that an extraordinary number of smelt were salvaged in that year.

A normalized analysis of smelt salvage counts the year 2000 as a below-average year, while an analysis of raw smelt salvage counts the year 2000 as an above-average year. The FWS's choice of analysis influences whether it is the OMR flow's *relative* or *absolute* impact on smelt population that is prioritized. Thus, the quality of the statistical method is not the only relevant factor at play, as the district court erroneously concluded: the BiOp's choice of one model over the other implicates significantly differing management policies.

models incorporate the higher of [known potential values] in assessing the overall risk," *Nw. Coal. for Alts to Pesticides*, 544 F.3d at 1050. Likewise, we give the FWS great deference in its choice of scientific tools, and, in these circumstances, hold that the FWS did not act arbitrarily or capriciously in choosing an analytical tool that resulted in greater protections for the imperiled smelt population.[24]

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[24] The district court relied substantially on the testimony of its experts, Dr. Andre Punt and Dr. Thomas Quinn, in concluding that the BiOp's reliance on Figures B-13 and B-14 was "scientifically unacceptable." *San Luis & Delta-Mendota*, 760 F. Supp. 2d at 891. But these experts present a more nuanced view of the FWS's use of Figures B-13 and B-14. The results confirm what the FWS had already said: that additional analyses using normalized data from B-13 could have informed the FWS's conclusions. The experts noted that B-13 was a proper measure, although not the only, and perhaps not the preferable, measure. The experts also testified as to the need for the FWS to set some parameters on OMR flows, and the difficulty in figuring out precisely where the parameters should be.

In response to the district court's question whether it was "unreasonable for FWS to rely in part on the information represented in figure B-13," Dr. Quinn answered that he did "not regard it as unreasonable for FWS to have relied in part on this figure and the data behind it." But he cautioned that "[t]o rely entirely on it would, however, have neglected the complexities of the issue . . . . Both the number of fish salvaged and the proportion salvaged . . . are relevant, in my view, as are other kinds of information." Dr. Punt had a similar reaction: "it was unreasonable . . . to have *only* relied on the information in Figures B-13 and B-14 rather than on an analysis in which salvage is expressed relative to population size." (emphasis added).

Moreover, although both experts had been critical of the FWS's failure to run the additional numbers, both were cautious about what the normalized data might have shown, whether any hard conclusions could be drawn from any data set, and even whether normalized data would be preferable to the non-normalized data produced. Dr. Quinn acknowledged that even if the FWS had normalized the data in B-13, "plotting flow

against a salvage index might not fully capture the risk to the population." With respect to what B-13 showed, Dr. Quinn cautioned that it was "unwise to overestimate the precision" of the data. He was not convinced that there was a "break" in the data, "though [his] basis for saying so [was] more intuitive than statistical." He "emphasize[d] that any point value has a measure of arbitrariness. If –5000, then why not –4900 cfs? Given the many sources of variation in the data, it strikes me as necessary to set limits even though there may not be strong statistical basis for a particular figure rather than a slightly different one." He concluded that although "the validity of [FWS's] specific flow regimes [was] undermined by the incomplete analyses that were done on the available data," it was "appropriate for the FWS to have some leeway in making decision and setting limits in their efforts to protect and recover listed species." Dr. Punt went one step further, recognizing the advantage of non-normalized data: B-13, as it is produced in the BiOp, would be justified if "any entrainment, no matter how small relative to the total population size, has long-term consequences for the population size of delta smelt."

These responses from the experts question the FWS's failure to expand its analysis and to normalize the data underlying B-13. Had it done so, the experts concluded, the FWS would have had a more complete sense of the relationship between OMR flow and salvage, although it is far from clear that that study would have affected the FWS's conclusions. What the experts' testimonies do not support is the district court's overstated conclusion that the FWS's "use of raw salvage in the analyses depicted in Figures B-13 and B-14 is scientifically unacceptable" or that "such metrics are meaningless as management tools." *San Luis & Delta-Mendota*, 760 F. Supp. 2d at 891. Were we only evaluating the experts' opinion on the BiOp, we would face a difficult question as to the continuing validity of this aspect of the BiOp: it is clear that these two experts believed the BiOp to have fallen short in this analysis, although as Dr. Punt indicates, persuasive justifications exist for the BiOp's reliance on non-normalized data. It is less clear, however, that the BiOp—even as seen through the eyes of Drs. Punt and Quinn—would be rendered arbitrary and capricious by a sole reliance on Figures B-13 and B-14. We need not reach this question, as we accept the opinions of the district court's experts only insofar as they are persuasive and informative, and—as will be subsequently described—we independently conclude that

2. The BiOp's determination of OMR flow limits was influenced by more than Figures B-13 and B-14

The district court's experts concluded that it was the BiOp's apparent *exclusive* reliance on Figures B-13 and B-14 that was problematic: as they acknowledged, the figures could be useful in tandem with other analyses and data. The district court therefore based its invalidation of the −5,000 cfs OMR flow limit on its finding that the limit "depend[s] so heavily" on Figures B-13 and B-14. *San Luis & Delta-Mendota*, 760 F. Supp. 2d at 968. After conducting an independent review of the record, however, we hold that the BiOp's determination of OMR flow limits was sufficiently influenced by several other population-level analyses in addition to Figures B-13 and B-14. Together with Figures B-13 and B-14, these analyses provide substantial evidence that supports the BiOp's −5,000 cfs OMR flow limit.

First, the BiOp expressly notes that it employed *multiple* analyses in determining the OMR flow limits, stating with regards to Actions 1 and 2 that "recent *analyses* indicate that cumulative adult entrainment and salvage are lower when OMR flows are no more negative than −5,000 cfs in the December through March period." BiOp at 281 (emphasis added). Although the BiOp fails to specify exactly which studies it relies on,[25] at least one of these studies is

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the BiOp does not exclusively rely on Figures B-13 and B-14 in determining the OMR flow limits.

[25] The BiOp should have been more explicit in describing exactly which studies it used in its analysis. Had the BiOp been similarly vague throughout its analysis, its lack of specificity may have presented a problem. Here, however, the BiOp has provided sufficient support for its conclusions.

contextually apparent: a 2008 study by Wim J. Kimmerer, *Losses of Sacramento River Chinook Salmon and Delta Smelt to Entrainment*, San Francisco Estuary and Watershed Science (hereinafter "Kimmerer 2008"). Kimmerer's study was referred to throughout the BiOp, and his data was reproduced in a chart estimating adult entrainment. BiOp at 281. The Kimmerer 2008 study quantified the relationship between population losses and OMR flows between 1995 and 2006, concluding—consistent with Figure B-14—that as OMR flow becomes more negative, delta smelt population losses increase. Moreover, in Figure E-4, the FWS read Kimmerer 2008 to show that when OMR flows are more negative than −5,000 cfs—the "break" observed in Figure B-13—population loss typically exceeds 10 percent. BiOp at 250 (Figure E-4). Figure E-4 shows a strong correlation between flows more negative than −5,000 cfs and high smelt population losses, supporting Figure B-13's "break." *See* BiOp at 250; *see also* BiOp at 213 (discussing Figure E-4).[26]

[26] Even if Figure E-4's correlation were less apparent, not all analyses will yield clear "change points," and therefore the fact that none is immediately apparent in a study does not mean that the study cannot support an agency's specifically defined limits; such a holding would effectively prohibit an agency from setting exact limits in any circumstance in which a clear change point did not emerge from the data. In the present situation, Kimmerer 2008 and Figure E-4 present a reasonable justification for a −5,000 cfs limit, which does appear to be an approximate point of some significance. That Kimmerer 2008 may also provide a reasonable justification for a −4,999 or a −5,001 limit does not make the FWS's policy choice arbitrary and capricious, especially given the significant deference owed to the agency in our review. To do so smacks more of strict scrutiny than arbitrary and capricious review under the APA and ESA.

Even were the range of the limit justified by Kimmerer 2008 substantially greater than this, and it most likely is, it is not appropriate for

Second, the BiOp was more explicit in describing its bases for determining the −5,000 cfs limit for Action 3, stating that "[t]he OMR flows associated with the protectiveness criteria defined above have been derived from particle tracking modeling[27] with the input assumptions defined below." BiOp at 360. Because Action 3 protects larval and juvenile delta smelt specifically, which are generally smaller than 20 mm (0.79 inches)—too small for salvage facility tracking—particle tracking modeling was necessary to estimate Action 3 entrainment. BiOp at 282. The district court appears to have misunderstood the distinction between the analyses supporting the Action 1 and 2 limits and those supporting the Action 3 limits. *San Luis & Delta-Mendota*, 760 F. Supp. 2d at 922 (finding that the FWS derived the −5,000 cfs limit for Action 3 from the district court's previous order, from a non-linear DWR model, and from Figure B-13, failing to mention the particle tracking modeling). The particle tracking modeling results are reflected in the BiOp's figure B-16, and demonstrate a low risk of entrainment as long as OMR flows remain below −2,000 cfs, increasing to a 20 percent risk at −3,500 cfs. BiOp at 366–67. The high entrainment at more negative flows would potentially place at risk 80 percent of all larval/juvenile smelt over the period of the approximately four months that Action 3 is under effect. BiOp at 366. As the OMR flow approaches −5,000 cfs, the modeling predicts that smelt entrainment will near 100 percent at multiple

a reviewing court to second guess the agency's scientific judgments in such matters where, as is the case here, the agency's determination appears to fall within the data-justified range.

[27] Particle tracking modeling simulates larval fish by inserting neutrally buoyant particles into a model domain with flow conditions.

stations. BiOp at 367. Given such findings, the FWS did not act unreasonably in setting the OMR flow limits; the particle tracking modeling completed for Action 3 provides independent support for the OMR limits.

Third, the DWR recommended to the FWS that it set the parameters at −5,000 cfs. In its informal comments to the FWS, it recommended that "[t]he justification for using a range of −5000 to −1250 cfs OMR rather than the −5000 cfs the FWS, USBR, and DWR proposed to the District Court last summer should be more clearly explained." In formal comments submitted to Reclamation just two weeks before the BiOp was due, the DWR criticized the RPA Component 1 (Action 2) because it "call[ed] for much more restrictive Old and Middle River Flows than supported by the best available data to reasonably minimize entrainment of adult delta smelt." As the DWR noted, the "proposed flows range from −1,250 cfs to −5,000 cfs. *The current set flow of −5,000 cfs should be used except in specific circumstances relating to fish survey and salvage data, because it is better supported by the available scientific information*." (emphasis added) The DWR added that

> [i]n DWR's October 16 submittal we presented the monthly analysis of Old and Middle River (OMR) flows and salvage of adult delta smelt that was also provided to Judge Wanger in 2007. This analysis appears to have been ignored by the FWS even though the analysis is more highly predictive of adult delta smelt salvage than any of the analysis presented by the FWS in the Draft BO. *It clearly shows that when the monthly OMR*

> *flows are more negative than about* –5,000 cfs., the risk of salvage increases dramatically.
>
> . . . .
>
> Given the lack of clear relationship between salvage and population effects, any constraints on salvage needs to focus on avoiding peak entrainment events rather than attempting to eliminate salvage. Therefore, we again suggest that this analysis be included in the BO and *that the –5,000 cfs OMR flows on a 14 day average period be used* except in rare circumstances where the data indicates that less negative flows are needed to protect against peak entrainment events.

(emphasis added).

Fourth, in its comments on an early draft BiOp, the independent peer review also urged consideration of the relationship between salvage and OMR flows: "[The relationship between OMR flows and salvage] is a sound and valuable way to set targets to reduce entrainment. The USFWS also presents a reasonable regression analysis to determine the break-point in the OMR-salvage relationship . . . . The breakpoints determined by these analyses were used to justify the selection of target OMR flows."[28] It was not arbitrary and capricious for the FWS to rely on DWR's own

[28] At the same time, the DWR criticized the draft because "the analysis appeared to be well done but was poorly described and largely undocumented."

expertise and views on the appropriate flow limits, even if it did not accept DWR's preferred recommendation.

Finally, we have one last observation in this area. When the district court remanded the 2005 BiOp as arbitrary and capricious—a BiOp that concluded that the operations of CVP and SWP would not adversely affect the delta smelt—the district court ordered Reclamation and DWR to "operate the CVP and SWP to achieve a daily average net upstream (reverse) flow in the OMR not to exceed [–]5,000 cfs on a seven-day running average." *San Luis & Delta-Mendota*, 760 F. Supp. 2d at 863–64. During the drafting of the BiOp, an interagency delta smelt team (known as the "Delta Smelt OCAP BO Technical Team") "discussed the merits of using –5,000 OMR per Wanger Order rather than –3,500 OMR as recommended in the proposed draft action." Notes of the meeting state:

> The –5,000 OMR cap was established by Wanger. The Team discussed the biological needs of the smelt to remove jeopardy and adverse modification. What might have worked in the year 2002 might not work correctly in 2009 because the population has crashed. It was suggested that scaling the amount of protection to the fall mid-water trawl (FMWT) (i.e. an estimate of abundance) would be helpful.
>
> . . . .
>
> If –5,000 OMR is the cap to protect adults, then the cap for Action #3 should be less than that, because the juvenile behave more like

> particles. . . . OMR rates directly relate to zone of entrainment. If fish are really out of the central Delta then perhaps −5,000 OMR might provide sufficient protection. However, it is extremely difficult to determine when fish are out of South/Central Delta.

The district court criticized the FWS for relying on "a provisional court order, entered as a remedial stopgap measure pending comprehensive scientific analysis." *San Luis & Delta-Mendota*, 760 F. Supp. 2d at 896. We understand the district court's concern and agree with the court's general proposition that evidence used to support a "stopgap measure" is not, without more, substantial evidence supporting a final measure. But we also think the principle is not so easily applied in this case. As the district court noted, its 2007 order—in which the −5,000 cfs figure was found—was based on an evidentiary hearing in which two studies were introduced that considered the relationship between OMR flows and delta smelt salvage. *Id.* According to the district court, one of these studies was the basis for B-13.

The FWS can hardly be faulted for thinking that the district court's acceptance of those studies and the issuing of an order with real-world consequences for people and smelt might present at least a *prima facie* case for the −5,000 cfs figure. We understand and agree with the district court that if the district court's interim order was the sole basis for the FWS's BiOp that it would not constitute substantial evidence. But, in 2008, the FWS was at least entitled to rely on the studies the district court had accepted (albeit on an interim basis) in 2007. The interagency team's infelicitous reference to the "Wanger Order" was surely a shorthand for the

evidence on which the district court based its interim order, and not just the order itself. Additionally, we can take notice of the fact that by 2008, when the BiOp was issued, the FWS had a year's experience living under the district court's order, as the members of the interagency delta smelt team undoubtedly knew. Again, if the "Wanger Order" was the sole evidence in the record for the FWS's RPA Component 2 (Action 3), we would not hesitate to find that the agency had not relied on the "best scientific data available," but where the −5,000 cfs figure in the Wanger Order was one more data point for the agency, we cannot find that the agency's reference is irrelevant or improper.

3. The OMR flow limits exist as one part in a dynamic monitoring system that accounts for the smelt population as a whole[29]

As we have described, the FWS's task of monitoring OMR flow and smelt population is a daunting one. The BiOp accounts for these challenges in a number of ways, including choosing conservative models so as to best meet its ESA obligations. One other way in which the BiOp addresses these practical difficulties is by integrating its various protections; the OMR flow limits exist as but one part of a complicated dynamic system. Another significant part of this system is a limit on the total allowable take of delta smelt: the incidental take limit (ITS). BiOp at 387.

[29] We do not believe the BiOp's OMR flow limits to be arbitrary and capricious for several alternative reasons previously described. But, even had the FWS relied entirely on Figures B-13 and B-14 in setting the OMR flow limits—it did not—and even if such total reliance would otherwise be arbitrary and capricious—it would not—we hold that the BiOp's use of whole population numbers in the ITS fully supports its OMR flow limits.

The ITS influences OMR flow levels in two primary ways. First, the ITS is used to establish a "Concern Level" estimate to "help guide implementation of the RPA." *Id.* By "indicat[ing when] salvage levels approach[] the take threshold," the Concern Level acts "as an indicator that operations need to be more constrained to avoid exceeding the incidental take." *Id.* If the Concern Level is actually reached, a meeting of the Smelt Working Group—a group comprised of interagency biologists who monitor delta smelt conditions and recommend OMR flow levels—is triggered. *Id.* Second, the ITS "functions as an action that influences operations under the RPA." *San Luis & Delta-Mendota*, 760 F. Supp. 2d at 929. Pertinent to the present discussion, the ITS is used to set actual flow levels under the RPA in real time. BiOp at 352, 354, 357. The real-time actual flow levels are set and adjusted based on the input of the Smelt Working Group and Project operators—a group informed by the ITS. BiOp at 352, 354, 357.

Thus, the actual OMR flow is highly influenced by the ITS, as these two provisions work together as part of the complex dynamic system established by the BiOp. This is relevant to the present discussion: even while the OMR flow limits, viewed in isolation, may not account for total smelt population in a manner acceptable to the district court, the ITS—and therefore the actual OMR flows—takes the total smelt population into account.

The ITS establishes take limits that vary each year based on the preceding Fall Midwater Trawl index (FMWT), an abundance proxy for the delta smelt's population size—and the proxy for population suggested both by the FWS and the court-appointed experts as they considered normalizing the data in B-13. BiOp at 287, 383–86. The ITS is calculated by

projecting future salvage from historic salvage in years with comparable flows to the RPA, BiOp at 384, and then scaling that number to overall abundance using the prior year's FMWT, BiOp at 385. This procedure "yields a discrete value for take as salvage so that the adaptive process can operate relative to an estimate of the absolute number of fish extant in the system." *San Luis & Delta-Mendota*, 760 F. Supp. 2d at 926–27. As such, the take limits are adjusted to reflect the best estimate of smelt's existing population. BiOp at 354 (noting *both* salvage and population size as "important variables" in setting flow). Thus, in making real-time operational recommendations to implement the RPA, the BiOp relies on both raw salvage numbers and the whole smelt population. BiOp at 352.

In conclusion, we agree that the FWS should have at least prepared a graph similar to B-13 based on normalized data or explained why it could not. Nevertheless, overall, its use of OMR flows is supported by substantial evidence in the record. As convoluted as the BiOp is, we can discern the path the agency took to arrive at the −5,000 cfs figure used in RPA Component 1 (Actions 1 and 2) and RPA Component 2 (Action 3). *See Bowman Transp., Inc. v. Arkansas-Best Freight Sys., Inc.*, 419 U.S. 281, 286 (1974) ("[W]e will uphold a decision of less than ideal clarity if the agency's path may reasonably be discerned."). In the sense explained by Dr. Quinn, the BiOp's choice of −5,000 cfs was arbitrary; that is, the FWS had to choose some number from a broad range—perhaps in the −4,000 cfs to −6,000 cfs range—and no graphs or charts were likely to give the FWS a precise number. In this sense, −5,000 cfs is arbitrary because no more precise number can be identified, and a number from the range must be selected; −5,000 is thus an arbitrary number because the FWS could also have chosen −4,999 or

−5,001 or some other number within the range. That −5,000 is arbitrary in this sense does not make the choice of −5,000 arbitrary in the sense captured by the APA; its decision was not the result of arbitrariness or caprice. The APA does not demand strict scrutiny. The FWS is charged with protecting the delta smelt, and it chose a reasonable figure.

B. *The 2008 BiOp's Determination of X2 Was Not Arbitrary and Capricious*

The FWS found that Reclamation and DWR's proposed operations "are likely to negatively affect the abundance of delta smelt" by "substantially decreas[ing] the amount of suitable abiotic habitat for delta smelt." BiOp at 236–37. To address the loss of habitat, the FWS proposed in RPA Component 3 (Action 4) that in September and October, in years when the preceding precipitation and runoff period was defined as "wet or above normal," Reclamation and the DWR must provide sufficient Delta outflow to maintain monthly average X2 no more eastward than 74 km from the Golden Gate in wet years and 81 km in "above normal" immediate water years. BiOp at 282, 369. The FWS had previously found that the amount and quality of spawning habitat available to delta smelt is linked to the location of X2. BiOp at 239–40. As we previously discussed, X2 represents the point in the Bay-Delta estuary where the salinity is two parts per thousand, and is the center point of the LSZ, which is considered suitable spawning habitat for the smelt. X2, in turn, depends on delta outflow, which is largely determined by the difference between the total inflow from the Sacramento and San Joaquin Rivers and the total amount of water exported through the Banks and Jones pumping

stations, which changes both annually and seasonally.[30] BiOp at 236. As the BiOp found, "CVP/SWP operations control the position of X2 and therefore are a primary driver of delta smelt habitat suitability." BiOp at 234. Because the location of X2 directly affects how much water can be exported to southern California for agricultural and domestic purposes, the determination of where X2 is located was critical to the parties.

The district court found the BiOp was arbitrary and capricious with respect to the location of X2 on two grounds. First, the district court objected to the data the FWS used to locate X2. *San Luis & Delta-Mendota*, 760 F. Supp. 2d at 903–09. Second, it found that the actual location of X2 lacked support in the record. *Id.* at 910–13, 922–23. We will address each point in turn.

1. The FWS was not arbitrary and capricious in comparing DAYFLOW to CALSIM II

The FWS used two sophisticated models to determine the impacts of past, present, and future operations of the Project on X2. The FWS chose a computer model called DAYFLOW, developed by DWR, to measure the historical environmental baseline, and a computer simulation model known as CALSIM II, developed jointly by DWR and Reclamation, to measure future operations. *Id.* at 896–98, 907. These models were used in a number of ways in the BiOp, and were important to the BiOp's determination of the

[30] It is more correct to think of X2 as a range of points rather than a single, fixed point in the estuary. As the BiOp points out, "X2 is strongly influenced by tidal cycles, moving twice daily up and downstream 6–10 km for its average daily location." BiOp at 372.

impacts of Project operation on the location of X2. BiOp at 145.[31]

The DAYFLOW computer model uses past river flow, export pumping, precipitation, and estimated agricultural diversions from 1967–2007 to estimate the outflow from the Bay-Delta to the San Francisco Bay. This data was used by the BiOp as a "historic" baseline for X2. BiOp at 207. CALSIM II is a computer simulation model that uses Central Valley hydrology from 1922–2003 to simulate Project operations. Despite the fact that environmental regulation and non-Project water demands have historically changed, the CALSIM II model assumes that these factors are fixed in its modeling scenarios. BiOp at 207. This is in contrast with the DAYFLOW model, which, because it relies largely on actual reported data, does account for changes in regulations that impact water demand. DAYFLOW and CALSIM II also differ in other ways: for example, DAYFLOW uses historical data to provide daily simulations of operation whereas CALSIM II models Project operations on a monthly basis, and DAYFLOW calculates X2 location using a mathematical method known as the "KM" method whereas CALSIM II uses the "ANN" mathematical method.

The BiOp, in analyzing the predicted location of X2, estimated that median X2 would move 10 to 15 percent farther upstream under the proposed action relative to the historic median X2 baseline. BiOp at 265; *see also* BiOp at 235. Appellees assert, however, that it is impossible to discern whether "this change was due to continued project operations into the future or whether the change was due to

[31] Action 4, which involves the management of X2, was also significantly influenced by these models.

the modeling differences between the 'historic' Dayflow-derived baseline and the Calsim II studies." Appellees argue that a CALSIM II to CALSIM II comparison would have been preferable. The district court agreed, concluding that although the FWS had discretion to use a historical baseline model such as DAYFLOW, the FWS abused its discretion when it compared the two different models without discussing or accounting for the resulting bias. *See San Luis & Delta-Mendota*, 760 F. Supp. 2d at 902–05. Although the district court acknowledged that "no superior set of models have been identified," it held that a calibration problem created by using DAYFLOW with CALSIM II made the FWS's choice of methodology arbitrary and capricious and required correction or explanation. *Id.* at 877, 899, 909. We recognize that the CALSIM II to DAYFLOW comparison is not without its limitations, but hold that the FWS's decision to use these two models together, even without further calibration, was not arbitrary and capricious.[32]

Because the FWS's decision to use the DAYFLOW and CALSIM II models together is a "scientific determination," *Baltimore Gas & Elec. Co.*, 462 U.S. at 103, that "requires a

[32] It is not clear from the record that the district court was correct in concluding that the FWS's reliance on a comparison of CALSIM II and DAYFLOW models taints the BiOp's conclusions regarding the impacts of Project operations on the location of X2, or regarding Action 4. *See San Luis & Delta-Mendota*, 760 F. Supp. 2d at 922–23. The FWS has indicated other possible bases for its conclusions. For example, the FWS refers to field sampling data, and not modeling results, as providing the basis for its conclusions about X2 conditions, at least in the fall. The BiOp also relies on historical data to demonstrate the upstream shift of fall X2 over time, BiOp at 237, 264, as well as the extent to which the Project operations influenced the upstream shift in fall X2, BiOp at 179–82, 236, 270. *See also* Note 33 *infra*.

high level of technical expertise," *Marsh*, 490 U.S. at 377, we must be at our most deferential in reviewing this provision of the BiOp, *Baltimore Gas & Elec. Co.*, 462 U.S. at 103. Therefore, the question, under the ESA is not whether the FWS should have conducted independent studies in lieu of DAYFLOW or CALSIM II, *Sw. Ctr. for Biological Diversity*, 215 F.3d at 60 ("[T]he Secretary has no obligation to conduct independent studies."), but whether these models represent the "best scientific and commercial data [currently] available," 16 U.S.C. § 1536(a)(2); *Inland Empire Public Lands Council v. U.S. Forest Serv.*, 88 F.3d 754, 762 (9th Cir. 1996). Because we agree with the district court's conclusion that "no superior set of models have been identified," *San Luis & Delta-Mendota*, 760 F. Supp. 2d at 909, the only question is whether the FWS's failure to calibrate the two models renders conclusions drawn from their evidence not merely "weak," but "arbitrary and capricious." *Greenpeace Action v. Franklin*, 14 F.3d 1324, 1336 (9th Cir. 1992) (noting that "the fact that the evidence [that an agency relies on] is 'weak'" is not dispositive); *see also Bldg. Indus. Ass'n of Superior Cal. v. Norton*, 247 F.3d 1241, 1246–47 (D.C. Cir. 2001) (holding that the fact that the "studies the Service relied on were imperfect . . . alone is insufficient to undermine those authorities' status as the 'best scientific . . . data available'").

The FWS explained why it chose to use "a combination of available tools and data."[33] *San Luis & Delta-Mendota*,

[33] The BiOp makes clear that the FWS did not rely exclusively on the CALSIM II/DAYFLOW comparison, but looked to previous government studies, and several peer-reviewed scientific studies:

760 F. Supp. 2d at 912; BiOp at 204–05. The BiOp explained that it used the DAYFLOW model as a baseline, rather than a different CALSIM II simulation, because when it compared a CALSIM II simulation of current Project operations to a CALSIM II simulation of past Project operations, it found that the two were "nearly identical," despite the fact that past and current Project operations are significantly different. BiOp at 204–05. According to the BiOp, "changes were expected" between the two CALSIM II studies. BiOp at 204. Because that comparison did not yield significant differences, as the FWS anticipated, the BiOp concluded that "the CALSIM monthly simulation model does not capture a precise Delta operation." BiOp at 204. These "inaccuracies in CALSIM [lead the FWS] to use actual data to develop an empirical baseline." BiOp at 206. The FWS chose "the DAYFLOW database . . . and OMR data obtained from USGS." BiOp at 206. The BiOp also noted that the CALSIM II simulation provided "an imperfect representation of the pre-POD [pelagic organism decline]" environmental situation and that supplemental analysis was needed "to compensate for this modeling limitation." BiOp at 205. In

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> This analysis of the effects of proposed CVP and SWP operations on the delta smelt and its critical habitat uses a combination of available tools and data, including the CALSIM II model outputs provided in the appendices of Reclamations' 2008 biological assessment, historical hydrologic data provided in the DAYFLOW database, statistical summaries derived from 936 unique 90-day particle tracking simulations published by Kimmerer and Nobriga (2008), and statistical summaries and derivative analyses of hydrodynamic and fishers data published by Feyrer et al. (2007), Kimmerer (2008), and Grimaldo et al. (accepted manuscript).

BiOp at 204.

other words, when the FWS used CALSIM II as both a baseline and as a predictor, it appeared to yield inaccurate results, so the FWS used the next best available baseline: the DAYFLOW model. Thus, the FWS explained: the "[CALSIM II] Study 7.0 was the model run that Reclamation and DWR thought best represented current operations, and was thus intended as a 'current baseline.' However, due to limitations of CALSIM II to accurately model actual operations, [the FWS] also used the 1967–2007 DAYFLOW summaries . . . to compare against CALSIM II outputs." BiOp at 207.

The district court acknowledged that "[t]he theoretical problems with using a Calsim II to Calsim II comparison were manifest," yet it found that the "FWS's decision to use a Calsim II to Dayflow comparison . . . without attempting to calibrate the two models . . . was arbitrary and capricious and ignored the best available science showing that a bias was present." *San Luis & Delta-Mendota*, 760 F. Supp. 2d at 906–07. The evidence for the modeling bias in the CALSIM II/DAYFLOW comparison was not clearly identified in the comments sent to the FWS before it issued the BiOp, and the comments largely recommended correcting the bias by comparing one CALSIM II model to another CALSIM II model—precisely the comparison the FWS found flawed and inaccurate. For example, San Luis & Delta-Mendota Water Authority, one of the plaintiffs-appellees here, submitted extensive and thoughtful comments on a portion of the draft BiOp and peer review analysis. The water authority expressed its concern that it was "methodologically inappropriate to compare historical data to simulated data. Simulated data must be compared to simulated data." The DWR advised the FWS of some of the same problems. In its comments on a portion of the draft BiOp, the DWR pointed

out that the model made assumptions that might not be borne out in the historical data and that "[g]reat caution should be taken when comparing actual data to modeled data." Like the water authority, it too recommended that CALSIM II modeling "be used to compare one set of model runs to another." In later comments, the DWR repeated its concern that the BiOp "compared model runs of future operation with historical conditions" and suggested that "[i]mpact analyses often compare only model scenarios to avoid these . . . problems." The independent peer review panel also expressed some concern with comparing the historical baseline with the CALSIM II simulated results. It pointed out that the "large difference between [CALSIM II] results and the historical baseline conditions defined with data can confuse the comparisons of metrics . . . between a simulated study and historical baseline." The panel suggested that "[i]deally, a model-simulated baseline should be available that is consistent with the historical data . . . . It is unfortunate that model-generated baselines with a high degree of reliability were not made available for this analysis."

The post-hoc views of the court's experts reflect some similar concerns. Dr. Quinn agreed that a comparison between models with identical databases and assumptions was preferable, but advised that "[a]s long as we bear in mind the fact that these are two very different models, I do not see why we cannot compare them." After discussing some of the data provided to him, he concluded that

> the outputs from the two models cannot be used interchangeably for estimating either X2 (in km) or flow (in cfs). This does not reflect any criticism of either model. Their inner workings are apparently quite different, as are

> their fundamental purposes, as explained to us. However any comparisons between them must explicitly account for the differences.

Similarly, Dr. Punt stated that

> [i]n principle, there is nothing wrong with fitting a model using a set of OMR/X2 values from one model and making predictions using OMR/X2 values which are based on the output from a different model, as long as the two sets of values are calibrated . . . .

Dr. Punt noted that the FWS had articulated its assumptions and explained why he thought the FWS should have performed additional calibration:

> It is recognized in the record that the modeled X2 does not reflect the "historical" X2 (BiOp Figure E-28), and the BiOp does compare historical and CALSIM-predicted X2 values by month (Figure E-26). However, the BiOp does not make this comparison for comparable years. Failure to attempt examination of whether it is necessary to calibrate the historical data and the CALSIM output would not normally be considered appropriate scientific practice in the field.

(internal citations omitted).

We recognize that the FWS's decision to compare its chosen baseline, produced by DAYFLOW, to its future projection, produced by CALSIM II, was not perfect—as

everyone has acknowledged. We nevertheless hold that this comparison was not arbitrary and capricious. The BiOp explained its assumptions and explained why it rejected the CALSIM-to-CALSIM comparison suggested by the DWR and others who reviewed the draft BiOp. The fact that the FWS chose one flawed model over another flawed model is the kind of judgment to which we must defer. As we said in *Environmental Defense Center, Inc. v. EPA*: "We defer to an agency decision not to invest the resources necessary to conduct the perfect study, and we defer to a decision to use available data unless there is no rational relationship between the means [the FWS] use[d] to account for any imperfections in its data and the situation to which those means are applied." 344 F.3d 832, 872 (9th Cir. 2003) (citations omitted). "The existence of a flaw . . . does not require us to hold that the agency's use of the model was arbitrary." *Am. Iron & Steel Inst. v. EPA*, 115 F.3d 979, 1005 (D.C. Cir. 1997) (per curiam). Rather, we will "reject an agency's choice of a scientific model 'only when the model bears no rational relationship to the characteristics of the data to which it is applied.'" *Nat'l Wildlife Fed'n v. EPA*, 286 F.3d 554, 565 (D.C. Cir. 2002) (quoting *Appalachian Power Co. v. EPA*, 135 F.3d 791, 802 (D.C. Cir. 1998)); *accord Envtl. Def. Ctr.*, 344 F.3d at 872. That is not the case here. The district court's determination to the contrary was heavily influenced by experts supplied by the parties which, for the reasons that we have explained, was inappropriate. The record is less certain than the district court was willing to admit.[34] That

[34] The district court refers to testimony from the parties' experts in terms that overstate what the record will bear. *See*, *e.g.*, *San Luis & Delta-Mendota*, 760 F. Supp. 2d at 909 ("undisputed expert testimony"), *id.* ("[A]ll experts in this case agree"), *id.* at 912 ("[u]ndisputed expert

appellees were able to produce post-hoc theories alluding to the possibility of bias from such a comparison does not invalidate the FWS's choices where there is no indication that a failure to calibrate would do more than add an uncertainty factor to the results, as well as no indication that a de-biasing calibration is technically feasible. Under our deferential standard of review, we therefore hold that the FWS's choice and use of models was based on the best available science.

Ideally, the FWS would have thoroughly discussed its reasoning with regard to possible issues arising from the use of DAYFLOW with CALSIM II. But, the fact that the FWS's explanation for its choices does not fully address every possible issue that flows from that choice does not render the FWS's determination unreasonable or unsupported. We do not require agencies to analyze every potential consequence of every choice they make; to do so would put an impossible burden on agencies. Rather, "we review all agency choices with respect to models, methodologies, and weighing scientific evidence" to ensure that the agency's "choices [are] supported by reasoned analysis." *Ecology Ctr. v. Castaneda*, 574 F.3d 652, 665 (9th Cir. 2009). Particularly in an area as "unwieldy and science-driven" as this, the FWS's statistical modeling "does not easily lend itself to judicial review." *Appalachian Power*, 135 F.3d at 802; *see id.* ("Statistical analysis is perhaps the prime example of those areas of technical wilderness into which judicial expeditions are best limited to ascertaining the lay of the land."). "[T]hat some or many [experts] would disapprove [of the FWS's] approach does not answer the question presented to us. In reviewing [the FWS's BiOp], we

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testimony"), *id.* at 922 ("the Calsim II to Dayflow comparison has the potential to introduce significant, if not overwhelming, bias").

do not sit as a panel of referees on a professional [scientific] journal, but as a panel of generalist judges obliged to defer to a reasonable judgment by an agency acting pursuant to congressionally delegated authority." *City of L.A. v. Dep't of Transp.*, 165 F.3d 972, 977 (D.C. Cir. 1999). In this instance, the FWS has provided a reasoned analysis explaining why the DAYFLOW model was used as the baseline.

Consequently, we hold that the FWS did not act arbitrarily and capriciously in relying on the CALSIM II and DAYFLOW models in evaluating the impacts of Project operations on the location of X2, or in justifying Action 4.

2. The BiOp sufficiently explained the fall X2 locations

The district court held that the BiOp "fails to explain why it is essential to maintain X2 at 74 km and 81 km, respectively, as opposed to any other specific location." *San Luis & Delta-Mendota*, 760 F. Supp. 2d at 923. Specifically, the court found the "Federal Defendants have not identified any record evidence that provides such an explanation. This total lack of explanation violates the APA[]." *Id.* at 922. With respect to the latter finding, the record is contrary to the district court's finding. There is record support for the BiOp's proposal. Whether the record will "explain why it is *essential* to maintain X2 at 74 km and 81 km . . . *as opposed to any other specific location*" is a different question. In fact, it is the wrong question.

As we have previously explained, as the combined pumping operations of the SWP/CVP remove hundreds of thousands of gallons of fresh water from the Bay-Delta, X2—the salinity-defined location of the smelt's primary spawning habitat—shifts eastward towards the delta. BiOp at

373. As the ocean's salty influence encroaches further upstream, it mimics drought conditions in the Bay-Delta, regardless of the previous season's precipitation. BiOp at 271, 273–74 (plotting spring and fall X2 locations). Among other things, this has resulted in an increasing divergence between spring and fall X2 locations. The BiOp determined that the "long-term upstream shift in X2 during fall has caused a long-term decrease in habitat area availability for delta smelt," and it set forth an adaptive management program to minimize the effects of Project pumping on X2: RPA Action 4. BiOp at 374. Action 4 targets the fall location of X2 during "wet" and "above normal" years: "the years in which project operations have most significantly adversely affected fall [X2 location]." BiOp at 373. Specifically, Action 4 requires that fall X2 be maintained at a location no greater than 74 km upstream from the Golden Gate Bridge following "wet" water years, and no greater than 81 km upstream following "above normal" water years. BiOp at 282–83.

The BiOp includes a number of different explanations, both specific and general, for RPA Component 3 (Action 4)'s regulation of X2 location. First, as discussed in the previous section, the FWS used CALSIM II and DAYFLOW to give it a picture of where X2 was located. Those models predicted different values for the location of X2 based on differing assumptions. DAYFLOW relied on historical data, while CALSIM II predicted where X2 might be located based on future Project operations. The FWS found that the two models offered different estimates of X2 location, and that, in general, "CALSIM II modeled scenarios were 10–15 percent further upstream than actual historic X2." BiOp at 235. Thus, "[m]edian historic fall X2 was 79 km, while median values for the CALSIM II modeled scenarios ranged from 87

to 91 km. The CALSIM II modeled scenarios all had an upper range of X2 at about 90 km." BiOp at 235. The FWS generated numerous figures and charts with information taken from these models, many of which graphed X2 location as a function of another variable. *See, e.g.*, BiOp at 260–61, 265, 270, 281, 282, 283, 284, 285. The FWS's graphing range for X2 location was 60–95 km, with most data points between 65–85 km, and a significant cluster between 70–85 km. BiOp at 270.

Second, the data from the models was consistent with the FWS's written finding that "[d]uring the past 40 years, monthly average X2 has varied from as far downstream as San Pablo Bay (45 km) to as far upstream as Rio Vista on the Sacramento River (95 km). . . . In general, delta smelt habitat quality and surface area are greater when X2 is located in Suisun Bay." BiOp at 191. Elsewhere in the BiOp, the FWS found based on an outside scientific study that "prior to spawning entrainment vulnerability of adult delta smelt increased at the SWP and CVP when X2 was upstream of 80km." BiOp at 219.

Third, the BiOp pointed out that X2 varies in response to a number of factors, both natural and man-made. The natural factors include the tides and the spring inflow. The BiOp found that "X2 is strongly influenced by tidal cycles, moving twice daily up and downstream 6–10 km from its average daily location." BiOp at 372. The spring runoff affects X2 as well. The BiOp found that "very high spring outflows have always pushed X2 far downstream resulting in delta smelt distributions distant from the influence of Banks and Jones." BiOp at 221. Aside from CVP/SWP's operations, there are other man-made factors to consider. For example, the Suisun Marsh Salinity Control Gates have historically been

operational for anywhere from 10 to 120 days a year. BiOp at 218. Operation of the salinity control gates may shift X2 as far as 3 km upstream. BiOp at 218; *see also* BiOp at 241, 243–44. The BiOp noted that the 3 km upstream shift was preferable to the "10–20 km shifts that have occurred for up to 120 or more days per year during late summer through early winter due to South Delta diversions." BiOp at 219.

Fourth, the BiOp also points out that not all habitats in the Bay-Delta are equally suited to the smelt, so that as X2 location shifts, the smelt may be affected by other factors as well. For example, as X2 location shifts, the delta smelt encounter changes in agricultural runoff; changes in turbidity, which affects smelt feeding and predation; and exposure to predators. *E.g.*, BiOp at 372 ("the daily fluctuation in X2 around an upstream point such as Brown's Island confines the [smelt] population to narrow channels, where delta smelt may be exposed to more stressors (e.g., agricultural diversions, predation) relative to a downstream X2"); BiOp at 238 ("[T]he eastward movement of X2 will shift the distribution of delta smelt upstream, and provide environmental conditions for nonnative fishes that thrive in stable conditions." (internal citation omitted)). Thus, the BiOp points out that although CVP/SWP operations remain the most important factor affecting smelt habitat, BiOp at 177–79, "there is no single driver of delta smelt population dynamics," BiOp at 238; *see also* BiOp at 202 (referring to "the multitude of factors that affect delta smelt population dynamics"). The smelt habitat is a complex and dynamic system.

Fifth, because X2 varies not only with CVP/SWP's operations, but with natural phenomena beyond the control of the agencies—such as the tides, the seasons, and the annual

rainfall—the FWS had a range of choices for X2. Its goal was to "move the habitat away from Delta impacts and into broader open waters west of Sherman Island."[35] BiOp at 373. Rather than trying to define a single point for X2, the FWS chose a range, and refined the range by whether the year was "wet" or "above normal." We think there was ample evidence in the record to support the choice of X2 between 74 and 81 km, depending on the season. The district court's finding that there was a "total lack of explanation" is belied by the record.[36]

It appears the district court focused on whether there was support in the record for the FWS's choice of 74 km, as opposed to 73 km or 75 km, hence its decision to question whether the FWS had adequately explained "why it is essential to maintain X2 at 74km and 81km . . . as opposed to any other specific location." *San Luis & Delta-Mendota*, 760 F. Supp. 2d at 923. This was not the district court's responsibility. The ESA provides that Reclamation had to seek the FWS's opinion to ensure that its operations were "not likely to jeopardize the continued existence of any endangered species or threatened species or result in the

[35] Sherman Island lies at the confluence of the Sacramento and San Joaquin Rivers. The 74–81 km range selected by the FWS lies west of Sherman Island.

[36] The district court's conclusion is especially puzzling because it accepted a similar FWS finding in its prior decision. *See Kempthorne*, 506 F. Supp. 2d at 335, 380 (noting that a survey of delta smelt abundance "increases dramatically whenever X2 is located between Chipps and Roe islands," and that "[w]hen X2 is located upstream of Chipps Island, smelt are vulnerable to entrainment and are located in an area that is not ideal for feeding or protection") (citing the administrative record). *See also* BiOp at 114, 132.

destruction or adverse modification of habitat of such species." 16 U.S.C. § 1536(a)(2). It is the FWS's responsibility to set forth its opinion and "those reasonable and prudent alternatives which [the Secretary of the Interior] believes would not violate [§ 1536(a)(2)] and can be taken by [Reclamation]." *Id.* § 1536(b)(3)(A). A "reasonable and prudent alternative" is a flexible standard for the consulting agency; it is not the equivalent of the "least restrictive alternative," which is the way the district court treated the inquiry. *Sw. Ctr. for Biological Diversity*, 143 F.3d at 523. Under the ESA, the consulting agency is "not required to explain why he chose one RPA over another," nor is it "required to pick the best alternative or the one that would most effectively protect the [species] from jeopardy." *Id.* Rather, the FWS "need only have adopted a final RPA which complied with the jeopardy standard and which could be implemented by the agency." *Id.* Accordingly, it was error for the district court to hold that the FWS must "explain why it is essential to maintain X2 at 74 km and 81 km . . . as opposed to any other specific location." *San Luis & Delta-Mendota*, 760 F. Supp. 2d at 923.

Even if we thought the ESA demanded the kind of precision insisted on by the district court, we believe there is an explanation in the record for the FWS's choice of 74 km and 81 km as its seasonal parameters. And the explanation is both logical and simple: At 74 km there is a monitoring station for the Bay-Delta at Chipps Island; at 81 km there is a monitoring station at Collinsville. BiOp at 114, 132. In its comments to the FWS, the DWR questioned the feasibility of locating fall X2, "especially if the spring X2 location is

significantly west of Port Chicago."[37] The DWR was concerned with how the agencies would measure compliance with any standard selected by the FWS and pointed out that "it would be difficult to measure an X2 at 85 km, whereas it would be much easier to measure at Collinsville (81 km) or Emmaton (92 km)." Where X2 represents a range of choices, choosing an X2 that can be measured and enforced is a perfectly rational response. *See Sw. Ctr. for Biological Diversity*, 143 F.3d at 523.

We recognize that the stakes are exceedingly high in this case, but we conclude that the FWS's choice, given the record, represented a reasonable and prudent alternative.

C. *The BiOp's Incidental Take Statement Is Not Flawed*

When the implementation of an RPA will cause "incidental take" of a species, defined as "takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant," 50 C.F.R. § 402.02, the agency is required to provide an incidental take statement (ITS) that "[s]pecifies the impact, i.e., the amount or extent, of such incidental taking on the species," 50 C.F.R. § 402.14(i)(1)(i); *see* 16 U.S.C. § 1536(b)(4)(C)(i). The FWS determined that "take of the delta smelt is likely to occur in the form of kill, capture (via salvage), wound, harm, and harass as a result of CVP/SWP operations within the action area," BiOp at 286, and prepared an ITS, BiOp at 285–310. In the ITS, the FWS provided separate take limits for juvenile and adult smelt, noting that "individuals of the larval/juvenile lifestage are

[37] The FWS did not set its fall X2 target at Port Chicago, which is west of the 74 km marker proposed by the FWS.

less demographically significant than adults." BiOp at 289. The FWS used different data sets in determining these separate limits. As the ITS notes, "[t]he mean values from 2005–2008 were used as an estimate of [juvenile] take under the RPA," BiOp at 289, while "[t]he average[] value for [water years] 2006 to 2008" was used to calculate pre-spawning adult delta smelt, BiOp at 287. In other words, the year 2005 was used in calculating the juvenile, but not the adult, take limit. BiOp at 287, 289. The ITS also acknowledges its limitations: there are numerous uncertainties inherent in the measurement of smelt take, and "salvage data (our most definitive measurement endpoint) reflects only a portion of the total mortality associated with entrainment." BiOp at 383.

The district court concluded that the BiOp's ITS was arbitrary or capricious for two reasons: First, the district court found that the FWS failed to explain adequately its decision to use 2005–2008 salvage data when setting the incidental take limit for juvenile smelt, but to only use 2006–2008 salvage data when setting the incidental take limit for adult smelt. *San Luis & Delta-Mendota*, 760 F. Supp. 2d at 925–28. Second, the district court found that the FWS failed to explain its decision to rely on an average cumulative salvage index when it set a "Concern Level," which, when triggered, requires the Smelt Working Group to make "an immediate specific recommendation to the [FWS]." BiOp at 387; *see San Luis & Delta-Mendota*, 760 F. Supp. 2d at 928–29. We hold that the ITS is not arbitrary and capricious because it includes adequate explanation and support for its determinations.

1. The ITS reasonably uses different data sets for adult and juvenile take limits

First, the district court objected to the FWS's choice of data. The ITS's use of separate data sets to calculate the separate incidental take limits for juvenile and adult smelt is adequately explained in the ITS. In discussing the use of "[t]he mean values from 2005–2008" to calculate juvenile take limits, the ITS explains that "[t]he reason for selecting this span of years is that the apparent abundance of delta smelt since 2005 as indexed by the 20-mm Survey and the [Summer Townet Survey] is the lowest on record." BiOp at 289. Accordingly, "[i]t was necessary to separate out this abundance variable, but also to account for other poorly understood factors relating salvage to OMR, distribution, and the extant conditions." BiOp at 289. As noted elsewhere in the BiOp, "[i]n contrast to adult delta smelt, there is no well established index of larval and juvenile abundance to reliably scale the take of this lifestage to abundance. . . . This should be kept in mind . . . ." BiOp at 389. Therefore, faced with a greater degree of uncertainty in calculating juvenile incidental take, the FWS chose, conservatively, to incorporate an additional year of data—a year in which smelt abundance was "the lowest on record."[38] BiOp at 389–90. The BiOp is clear that it used 2006–2008 data for adults because "these years within the historic dataset best approximate expected salvage," BiOp at 287, and 2005–2008 data for juveniles because juvenile smelt "are less demographically significant than adults," BiOp at 289, and therefore a larger data set

[38] This determination came on the heels of the district court's invalidation of the 2005 BiOp's ITS based on its failure to consider record-low population abundance in setting take limits. *See San Luis & Delta-Mendota*, 760 F. Supp. 2d at 918.

would be preferable.[39] Such a decision to use a more conservative data set, when necessary, is exactly the sort that we afford agencies discretion to make. *See, e.g.*, *Fishermen's Finest, Inc. v. Locke*, 593 F.3d 886, 893, 896–97 (9th Cir. 2010) (upholding agency's decision to rely on some data while disregarding other data).

2. The FWS reasonably uses an average cumulative salvage index

Second, the district court objected to the FWS's decision to use an average cumulative salvage index to create its "Concern Level." BiOp at 387, 389–90. The Concern Level "indicate[s] salvage levels approaching the take threshhold." BiOp at 387; *see also* BiOp at 289 (noting that the estimated number represents a concern level where "entrainment has reached high enough numbers to indicate the need for more protective OMR restrictions."). When the Concern Level is reached, two actions follow: The Smelt Working Group must convene and make "an immediate specific recommendation to the [FWS]," and OMR flows may have to be adjusted "to a more restrictive level." BiOp at 387. The Concern Level does not trigger automatic restrictions in OMR flows. It "*may* require" a reduction "unless available data indicate some greater level of exports is possible without increasing entrainment." BiOp at 387 (emphasis added).

The FWS's decision to use an average in setting the incidental take limits is, like its choice of data sets, a choice

[39] For similar reasons we disagree with the district court that the FWS must explain why it decided to *include* 2006 when it calculated larval/juvenile abundance. *See San Luis & Delta-Mendota*, 760 F. Supp. 2d at 917–18.

entitled to substantial difference. *See The Lands Council v. McNair*, 537 F.3d 981, 991 (9th Cir. 2008) (noting that it is "well-established law" that courts owe deference "to agencies and their methodological choices"). As appellees note, the ITS's "use of averaging . . . provides an 'estimate' of expected take that, based on the historical record of salvage, when applied[,] would likely be exceeded in many years." In other words, appellees object to the fact that the ITS's choice of methodology results in too restrictive of a management regime. The district court agreed, finding that "[t]he record does not explain why an 'averaging' approach was used." *San Luis & Delta-Mendota*, 760 F. Supp. 2d at 929 ("Based on known adverse water supply consequences of operating the Projects in a 'constrained' manner, it is inexplicable that the FWS did not provide a clear and rational explanation of how the ITS is set.").

We hold that the record offers an adequate explanation. As with its decision to use an additional year of data when calculating the juvenile take limit, the ITS's use of an averaging methodology "counteract[s] the uncertainties" inherent in its analyses by "overestimat[ing]" known parameters. *See Baltimore Gas & Elec. Co.*, 462 U.S. at 103. In the context of the ITS's repeated recognition of the "difficult[y] [in] definitively project[ing]" the "specific level of take of adult delta smelt at the CVP/SWP pumping facilities . . . due to inherent uncertainties," BiOp at 383, the FWS's use of an averaging methodology—that, by its nature, yields conservative limits that otherwise would have been exceeded in eleven of the past sixteen years, *San Luis & Delta-Mendota*, 760 F. Supp. 2d at 929—is a discernable, and justified path. *See Bowman Transp.*, 419 U.S. at 285–86; *see also Nw. Coal. for Alternatives to Pesticides*, 544 F.3d at 1050 (upholding an agency's discernable reliance on models

that "yield conservative data [where] the models incorporate[d] the higher of [the potential values] in assessing the overall risk"). Moreover, the establishment of a Concern Level is an enforcement norm, and thus a policy decision. "[S]election of an action level is primarily a legislative policy decision that we will uphold so long as it was reasonably drawn from the record." *Public Citizen Health Res. Group v. Dep't of Labor*, 557 F.3d 165, 184 (3d Cir. 2009). Ultimately, the appellees' objection is not really to the record support for the Concern Level, but to the Concern Level itself. The choice of the Concern Level is quintessentially one within the discretion of the agency, and we have no basis for disturbing it here.

D. *The Record Supports the BiOp's Conclusions Regarding the Indirect Effects of Project Operations*

The FWS is required to take into account both the "direct and indirect effects of an action on the species or critical habitat" when determining whether an action is likely to cause jeopardy. 50 C.F.R. § 402.02; *see also* 16 U.S.C. § 1536(a)(2). "Indirect effects" are "those that are caused by the proposed action and are later in time, but still are reasonably certain to occur." 50 C.F.R. § 402.02. Here, the BiOp identified a number of indirect effects on the delta smelt from Project operations. Among other things, it concluded that Project operations were reasonably certain to (1) limit delta smelt food supply, and (2) increase harmful pollution and contaminants. It also noted (3) the harmful indirect effects that would likely spring from three "other stressors": predation, aquatic macrophytes, and *microcystis*. *See* BiOp at 182–88, 202.

The BiOp found that a "multitude of factors . . . affect delta smelt population dynamics including predation, contaminants, introduced species, entrainment, habitat suitability, food supply, aquatic macrophytes, and *microcystis*." BiOp at 202. It concluded that "[t]he extent to which these factors adversely affect delta smelt is related to hydrodynamic conditions in the Delta, which in turn are controlled to a large extent by CVP and SWP operations." BiOp at 202. It noted that there were other sources of water diversion that affect smelt through entrainment, but that, even when "taken together," they did not "approach[] the influence of the Banks and Jones export facilities." BiOp at 202. Although the BiOp candidly assessed that there was "no single primary driver of delta smelt population dynamics" and that there were "non-CVP/SWP factors," it ultimately concluded that "the CVP and SWP are a primary driver of delta smelt abiotic and biotic habitat suitability, health, and mortality" and that CVP/SWP operations "have also played an indirect role in the delta smelt's decline by creating an altered environment in the Delta that has fostered the establishment of non-indigenous species and exacerbates these and other stressors that are adversely impacting delta smelt." BiOp at 202–03.

The district court was not persuaded, finding that "[t]he record does not support the BiOp's conclusion that food web and pollutants/contaminant impacts are indirect effects of Project operations." *San Luis & Delta-Mendota*, 760 F. Supp. 2d at 969. The district court also separately noted that "the BiOp's conclusions about the causal connections between Project operations and 'other stressors' are ambiguous," and thought the effects were "unsupported by record evidence and/or explanation" *Id.* We address each of these indirect effects in turn, and conclude that the BiOp analysis was

sufficiently clear and thorough so as not to be arbitrary and capricious, and that it was based on the best available science. *See Kern*, 450 F.3d at 1080–81.

1. Project operations indirectly affect smelt food supply

First, the BiOp explores the likely impact of Project operations on smelt food supply. The BiOp describes "entrainment of *Pseudodiaptomus forbesi* (*P. forbesi*), the primary prey of delta smelt," as a primary effect that "will adversely affect delta smelt."[40] BiOp at 203–04. Plainly stated, delta smelt appear severely food limited much of the time. *P. forbesi* is the smelt's principal food source from summer to early fall, and so any Project impact on the availability of *P. forbesi* represents a threat to the smelt. *See* BiOp 228, 380. The BiOp concludes that such a threat is present: high water exports reduce flows that would otherwise transport *P. forbesi* into the delta smelt's habitat, thereby contributing to smelt mortality and population declines. BiOp at 184–85, 228. Moreover, as water is pumped from the south Bay-Delta during June through September, *P. forbesi* are entrained in pumping stations, thereby reducing the overall availability of *P. forbesi* in the delta. BiOp at 228. Because "statistical evidence suggest[s] that the co-occurrence of delta smelt and [prey such as *P. forbesi*] has a strong . . . influence on the survival of young delta smelt from summer to fall," BiOp at 228, the BiOp concluded that the Project's effects on the *P. forbesi* population indirectly threaten the viability of delta smelt.

[40] The FWS proposed to address this through Action 6, which requires the creation or restoration of 8,000 acres of habitat in the Delta and in Suisun Marsh. BiOp at 381.

We consider whether this analysis is supported by the best available science, and whether the FWS acted arbitrarily and capriciously in concluding, to a "reasonable certainty," that Project operations indirectly affect delta smelt through its food supply. *See* 50 C.F.R. § 402.02. As both the district court and the peer review panel indicated, the FWS's analysis suffers from some methodological limitations; some of the analyses underlying the agency's conclusions involved extrapolating from a few sampling sites, and therefore may have overstated the scarcity of *P. forbesi*. The district court seized on the peer review panel's comments, which pointed out: "Rather than correct this problem, FWS's response was to abandon the quantitative analysis, choosing to advance the same, potentially flawed conclusion in a more subjective, qualitative analysis. This conduct suggests another unlawful, results-driven choice, ignoring best available science." *San Luis & Delta-Mendota*, 760 F. Supp. 2d at 940. We think the district court's criticism is incorrect.

The independent peer review panel commented directly on the FWS's analysis of the impact of CVP/SWP on *P. forbesi* and the BiOp's conclusion that the abundance of *P. forbesi* "may vary inversely with export flow . . . and directly with outflow." It stated: "The [p]anel agrees with this conceptual model and with the justification of its elements, which are well-supported." The panel offered technical suggestions and then commented, "the figures meant to support this analysis are not convincing." The panel then "suggest[ed] that this analysis be redone with the above considerations in mind. If [the] revised analysis does not show a substantial (not necessarily statistically significant) pattern, *the analysis should be mentioned but the results dropped as quantitative metric* from the EA." (emphasis added). The FWS did exactly as the panel recommended. It

omitted the statistical analysis as justification for its conclusion.

We cannot see the error in the FWS following the recommendation of the peer review panel. Moreover, the FWS had other reasons, explained in the record, for concluding that CVP/SWP operations had an effect on *P. forbesi* and that the abundance of *P. forbesi* indirectly affects the delta smelt. *See* BiOp at 184–85, 228. That it omitted a statistical study because it did not have sufficient data to justify it does not strike us as a "results-driven choice," but as responsible science. Nothing in the ESA compelled the FWS to conduct the particular study the peer review panel thought inadequately supported by the data, and nothing in the peer review panel's comments even hints that the statistics suggested a contrary conclusion—there is no evidence here to suggest that the FWS, in conspiracy with the peer review panel, was trying to hide evidence. Even if we thought that a "rigorous, large-scale study . . . would be preferable," we have no authority to compel one: "in the absence of such a study," even "credible anecdotal evidence" can "represent[] the best scientific . . . data *available*." *Nw. Ecosystem Alliance v. FWS*, 475 F.3d 1136, 1147 (9th Cir. 2007) (internal quotation marks omitted).

Like the peer review panel in question, we conclude that although the FWS's analysis here is not without its limitations, it is "based upon the best available science." *See Nw. Ecosystem Alliance*, 475 F.3d at 1147. Similarly, we are persuaded that the BiOp's conclusion that Project operations indirectly affect the delta smelt by impacting the smelt food supply was "well supported." We need not *independently* conclude that this conclusion is well supported to a "reasonable certainty." It is sufficient that we conclude that

the BiOp's conclusion was sufficiently supported such that the FWS did not arbitrarily and capriciously find this to be an indirect effect to a reasonable certainty.

2. Project operations indirectly affect the smelt through water contamination

Second, the BiOp explores the Project's impact on water contamination and therefore, indirectly, on smelt population viability. The BiOp first concludes that water contamination poses a threat to the delta smelt. Smelt throughout the Delta are exposed to various pesticides and contaminants, which "may affect embryo survival or inhibit prey production." The BiOp singles out ammonia released from a waste processing facility in Sacramento and pesticides from agricultural operations. BiOp at 153, 187, 237. The BiOp observes that "concern over contaminants in the Delta is not new" and refers to mercury, selenium, pesticides, herbicides, ammonium concentrations, and undiluted drainwater. BiOp at 187. Reclamation observes that the "delta smelt are highly sensitive to high levels of ammonia" and that such contaminants are detrimental to the health of the smelt population because they render smelt susceptible to disease. BiOp at 187–88.

The BiOp concludes that Project operations will dangerously increase the impact of contaminants on the smelt. One reason is topographical: as Project operations constrain the smelt habitat to smaller rivers and estuaries, the smelt's overall exposure to these contaminants, which result primarily from land runoff, increases. *See* BiOp at 153. Relatedly, when Project operations reduce overall suitable habitat, the impact of contaminants on the smelt in the remaining habitat become intensified. The BiOp analyzes

this latter effect in the context of recognizing the importance of fall X2 to delta smelt viability: The FWS described two "[p]otential mechanisms for the observed effect," one of which was that "a more confined distribution may increase the impact of stochastic events that increase mortality rates of delta smelt . . . includ[ing] . . . anthropogenic effects such as contaminants." BiOp at 234 (citing Sommer et al. 2007). One other harmful effect of Project operations, the FWS notes, comes from the flow created by Project pumping: Project-related flow "increase[s] exposure to many pesticides [during spawning]." BiOp at 153. This is because flows can "mobilize contaminants." BiOp at 240.

The district court concluded that "[i]t is not clear how the BiOp or any other document in the record links the impacts of contaminants to Project Operations." *San Luis & Delta-Mendota*, 760 F. Supp. 2d at 942. This criticism is not well-founded. Although the FWS recognized that "contaminant loading and its ecosystem effects within the Delta are not well understood," BiOp at 186, the fact that science must advance further before the complicated ecosystem interactions in the Bay-Delta are fully understood does not necessarily mean that the FWS failed to rely on the best available science, or that it arbitrarily and capriciously concluded that there was a reasonable certainty that Project operations will indirectly affect smelt through water contamination. Appellees would presumably have us hold that it is impossible for an agency to simultaneously recognize that some characteristics of an indirect effect "are not well understood" or are "highly uncertain," and that it is reasonably certain that those indirect effects are harmful and will result from the actions at issue. We decline to do so. We are confident that if we returned the BiOp to the agency, we could help the agency improve it by "point[ing] out errors and missing information" and

"insist[ing] on additional detail." *Churchill Cnty. v. Norton*, 276 F.3d 1060, 1081 (9th Cir. 2001). But "[t]hat is not our role, of course." *Id.* Instead, we hold that the BiOp has sufficiently explained the harmful relation between Project operations, contaminants, and delta smelt such that the FWS did not arbitrarily and capriciously conclude to a reasonable certainty that Project operations contribute to harmful contaminant-related indirect effects.

3. Project operations indirectly affect the smelt through the "other stressors" of predation, macrophytes, and *microcystis*

As part of its analysis of the impacts of Project operations on the smelt, the BiOp discusses the effect of "other stressors": "the multitude of factors that affect delta smelt population dynamics including predation, . . . aquatic macrophytes, and *microcystis*." BiOp at 202. Because "[t]he extent to which these factors adversely affect delta smelt is related to hydrodynamic conditions in the Delta, which in turn are controlled to a large extent by CVP and SWP operations," BiOp at 202, the BiOp's analysis considers these "other stressors" when determining "the effects of proposed CVP/SWP operations on delta smelt," BiOp at 203. We hold first that the BiOp's conclusion that "hydrodynamic conditions driven or influenced by CVP/SWP operations . . . influence the dynamics of delta smelt interaction with these other stressors" was sufficiently supported in the record. BiOp at 202. The BiOp explicitly relied on outside scientific studies in concluding that Project operations "affect[] or control[]" some of these other stressors impacting delta smelt abundance. BiOp at 203. Second, having determined that Project operations likely affect the impact of "other stressors"

on the smelt, the BiOp considers the harmful effects of these other stressors on the smelt population.

The district court faulted the FWS for failing to consider "available information," *San Luis & Delta-Mendota*, 760 F. Supp. 2d at 934–35, or "make a rational connection between the facts in the record and its conclusions," *id.* at 936. We disagree, and find the BiOp sufficiently thorough and hold that the FWS did not arbitrarily and capriciously reach this conclusion.

a. Predation

One stressor to the smelt is predation. As the BiOp acknowledged, there is much here that is unknown. It is known that in the 1960s, when the delta smelt were more plentiful, they were prey for striped bass, black crappie, and white catfish. BiOp at 183. The BiOp observed that "[i]t is unknown whether incidental predation by striped bass (and other lesser predators) represents a substantial source of mortality for delta smelt," in part because the scarcity of smelt means that smelt have recently gone undetected in recent studies of predator stomach contents. BiOp at 183. The BiOp speculated that "[d]elta smelt may experience high predation mortality around water diversion where smelt are entrained and predators aggregate," citing to an outside study showing that smelt eggs and larvae were prey for inland silversides. BiOp at 183. The BiOp also recognized the risks presented from other potential predators of smelt eggs and

larvae in such areas, including yellowfin goby, centrarchids, and Chinook salmon.[41] BiOp at 183.

After concluding that predation poses a harmful indirect effect to delta smelt population viability, the BiOp discusses the relation between Project operations and smelt predation. By shifting X2 further upstream, Project operations move smelt habitat to include more of these littoral areas (areas of the Bay-Delta close to shore), thereby increasing smelt exposure to predators. BiOp at 153. As the location of X2 shifts towards new Bay-Delta regions that are rife with predators the smelt follow. Moreover, the BiOp notes that "[t]he Delta-wide increase in water transparency may have intensified predation pressures on delta smelt," citing the "[w]ide documenta[tion]," including several specific studies, indicating that water clarity significantly influences predation of pelagic fishes, including many smelt species. BiOp at 183.

The district court found this analysis lacking, specifically citing the FWS's failure to explain whether striped bass predation on the smelt "should be considered significant." *San Luis & Delta-Mendota*, 760 F. Supp. 2d at 934. Here, the district court was very specific: It faulted the BiOp for failing to "include any estimates of the effect of predation on the delta smelt population" when "[s]uch information was available" and was "decidedly contrary to BiOp findings." *Id.* In support, the district court referenced a 1999 California

[41] The BiOp considered whether delta smelt are affected by competition from other fish, and cited one study suggesting that they were. The BiOp did not rely on competition as a stressor, however, because "there is no empirical evidence to support the conclusion that competition between these species is a factor that influences the abundance of delta smelt in the wild." BiOp at 183.

Department of Fish & Game report submitted to the FWS as part of an incidental take permit. *Id.* (citing California Dep't of Fish and Game, *Conservation Plan for The California Department of Fish and Game Striped Bass Management Program* (November 12, 1999)). We are not sure what the Fish & Game report adds, and we cannot see that the report is "decidedly contrary" to the FWS's conclusions.

The Fish & Game report stated that "the best available information yields imprecise, loosely constrained estimates of striped bass predation on delta smelt." It said that there was considerable overlap between the delta smelt and striped bass, but that "striped bass rarely ate delta smelt," likely because "delta smelt are surface oriented while striped bass tend to forage near the bottom." Fish & Game estimated that striped bass were responsible for "an estimated annual consumption of about 5.3% of the delta smelt population." We do not see the conflict between the Fish & Game report and the BiOp. The BiOp concluded that "[i]t is unknown whether incidental predation by striped bass . . . represents a substantial source of mortality for delta smelt." BiOp at 183. The Fish & Game report is consistent with the FWS's conclusion. If anything, the Fish & Game report might suggest that further study is required to see if the striped bass *is* a substantial source of mortality for the smelt. Although the BiOp cited post-1999 studies showing that the striped bass was not a significant predator of the delta smelt, if Fish & Game is correct (and current) in its estimates, a predator responsible for a 5.3 percent mortality rate of an endangered species might be significant. In any event, we fail to see its significance with respect to the conclusions of the BiOp. The BiOp concluded that predators—primarily fish other than the striped bass—were a potential threat to the delta smelt. More

broadly, we decline to review with a fine-toothed comb the studies on which the FWS relied in reaching its conclusions.

b. Aquatic Macrophytes

Another stressor noted in the BiOp is aquatic macrophytes. Macrophytes—aquatic plants that grow in or near water—have extensively colonized the interior Delta over the past two decades. BiOp at 182. As the BiOp notes, research suggests that these macrophytes have "altered fish community dynamics in the Delta, including increasing habitat for centrarchid fishes including largemouth bass, reducing habitat for native fishes, and supporting a food web pathway for centrarchids and other littoral fishes." BiOp at 182 (citations to scientific studies omitted). These effects impact smelt both directly and indirectly. Submerged aquatic vegetation can overwhelm littoral habitats, such as inter-tidal shoals and beaches, that serve as delta smelt spawning locations, thereby rendering them unsuitable for spawning. BiOp at 182. Moreover, macrophytes trap suspended sediment and therefore reduce water turbidity, which has contributed to a decrease in both juvenile and adult smelt habitat while increasing the available habitat for fish that prey on smelt. BiOp at 182–83 (citing Feyrer et al. 2007 and Nobriga et al. 2008 in support). This decreased turbidity also may facilitate the predation of delta smelt while hampering the smelt's own feeding, thereby further harming smelt population viability. BiOp at 183.

As the BiOp notes, hydrologic conditions and water temperature play a significant role in macrophyte colonization of the Delta. BiOp at 182. The FWS concludes that it is "likely" that Project operations' impact on Bay-Delta hydrologic conditions and reduction of seasonal flushing

flows exacerbate the spread of macrophytes in the Bay-Delta. BiOp at 277. Flushing flows are known to lead to "abrupt changes in flow and turbidity." BiOp at 146. Indeed, the FWS found that "[a]vailable information is inconclusive regarding the extent, magnitude and pathways by which delta smelt may be affected by these stressors independent of CVP/SWP operations." BiOp at 277.

The district court was also not persuaded by this analysis, finding that "[a]lthough a connection [between Project operations and macrophytes] may exist, the record does not reflect any discussion, nor have the parties pointed to any study, connecting 'seasonal flushing flows . . . the natural frequency of upstream and downstream movement of the LSZ, and lengthen[ed] upstream shifts of the LSZ' to the presence of any aquatic macrophyte." *San Luis & Delta-Mendota*, 760 F. Supp. 2d at 935–36. Again, we disagree. The BiOp set forth several plausible explanations for how Project operations will increase the detrimental impact of macrophytes on delta smelt viability, and cited studies in support. *See* BiOp at 146, 182–83, 277. That the BiOp did not, as the district court requests, point to a study directly addressing the Project's effect on Bay-Delta macrophytes does not render the FWS's conclusions unreasonable or unsupported: The FWS has drawn rational conclusions from the best available science, and, consequently, we hold that the BiOp's determination that it is reasonably certain that macrophytes will indirectly affect delta smelt is not arbitrary and capricious. It is not our job to task the FWS with filling the gaps in the scientific evidence. We must respect the agency's judgment even "in the face of uncertainty." *Ariz. Cattle Growers Ass'n v. Salazar*, 606 F.3d 1160, 1164 (9th Cir. 2010).

c. *Microcystis*

Microcystis aeruginosa is a cyanobacterium that produces toxins throughout its life cycle, with toxin concentrations sharply increasing when the bacteria population dies, usually in September or October. BiOp at 372. These high toxin levels present a threat to the delta smelt and, as the BiOp recognizes, high *microcystis* toxin levels have been associated with low delta smelt abundances. BiOp at 372. *Microcystis* can directly "pose animal and human health risks if contacted or ingested directly," although it does not appear that current concentrations are sufficiently severe to threaten smelt. BiOp at 186. Rather, *microcystis*'s primary threat to the smelt is indirect, as "it appears that *M. aeruginosa* is toxic to copepods that delta smelt eat." BiOp at 186 (citing an outside scientific study). There is also concern that *microcystis* "could out-compete diatoms[, a rich food source for zooplankton,] for light and nutrients." BiOp at 186. As the BiOp notes, however, more studies are needed, and, in fact, "are underway to determine if zooplankton production is compromised during *M. aeruginosa* blooms to an extent that is likely to adversely affect delta smelt." BiOp at 186.

As the BiOp also discusses, CVP/SWP operations are likely to increase the harmful impact of *microcystis* on delta smelt because "[l]ow flow conditions are among the factors associated with *Microcystis* blooms." BiOp at 372. By reducing flows, Project operations would cause "larval and juvenile delta smelt . . . [to] remain in the Central and South Delta, where they could . . . succumb to predation or microcystis blooms." BiOp at 224. Overall, *Microcystis* "reduce[s] habitat suitability." BiOp at 373.

The district court found that the BiOp "makes no connection whatsoever between microcystis . . . and continued CVP and SWP operation" and that "[g]iven that the impacts of regulating Project Operations are so consequential, such unsupported attributions (a result in search of a rationale) are unconscionable." *San Luis & Delta-Mendota*, 760 F. Supp. 2d at 936. Again, we disagree. The FWS has proposed several plausible evidence-based hypotheses explaining the harmful Project-related impact of *microcystis* on delta smelt. The BiOp candidly acknowledges that additional studies in this area are underway. That CVP/SWP operations are not the only dynamic force acting on the Bay-Delta does not render the BiOp's recognition of the inherent uncertainty associated with the highly interdependent ecosystem unreasonable. We should not deter agencies from recognizing the limitations of either science or their own knowledge. In this instance, the evidence linking Project operations, Bay-Delta hydrologic conditions, and *microcystis* harms is sufficient that we hold that the FWS's *microcystis* conclusions were not arbitrary and capricious.

E. *The FWS Is Not Required to Support the "Non-Jeopardy" Elements of its RPA*

When the Secretary determines that an agency action will cause jeopardy to, or an adverse habitat modification of, an endangered or threatened species, the Secretary "shall suggest those reasonable and prudent alternatives which he believes would not [jeopardize the species or adversely modify its habitat] and can be taken by the Federal agency or applicant in implementing the agency action." 16 U.S.C. § 1536(b)(3)(A); *see also* 50 C.F.R. §§ 402.14(h)(3), 402.14(g)(5). The FWS's regulations further explain its duty

under the ESA. The regulations define "reasonable and prudent alternatives"—RPAs—as

> alternative actions identified during formal consultation [1] that can be implemented in a manner consistent with the intended purpose of the action, [2] that can be implemented consistent with the scope of the Federal agency's legal authority and jurisdiction, [3] that is economically and technologically feasible, and [4] that the Director believes would avoid the likelihood of jeopardizing the continued existence of listed species or resulting in the destruction or adverse modification of critical habitat.

50 C.F.R. § 402.02. Element [4] in § 402.02 is commonly referred to as the "jeopardy" factor; elements[1] through [3] are referred to as the "non-jeopardy" factors. The FWS's *Consultation Handbook* explains further: "If the services conclude that certain alternatives are available that would avoid *jeopardy and adverse modification*, but such alternatives *fail* to meet one of the other three elements in the definition of 'reasonable and prudent alternative,' the Services should document the alternative in the biological opinion to show it was considered during the formal consultation process." U.S. Fish & Wildlife Serv. & Nat'l Marine Fisheries Serv., ESA at 4–41 (March 1998), Section 7 Consultation Handbook, *available at* http://www.fws.gov/endangered/esa-library/pdf/CH4.pdf (last visited July 27, 2013) (second emphasis added). Thus, according to the *Consultation Handbook*, if a draft alternative *fails* to meet one of the non-jeopardy "elements" of a valid RPA, the Service should provide documentation to show that it considered

alternatives during consultation. *Id.* We have previously afforded *Skidmore* deference to the FWS's *Consultation Handbook*. *See Ariz. Cattle Growers' Ass'n*, 606 F.3d at 1165 (concluding that "[t]he definition in the handbook appears to be the result of the agency's considered judgment and . . . we are persuaded [that it is a reasonable one entitled to deference]"); *see also Skidmore v. Swift & Co.*, 323 U.S. 134 (1944).

Referring to the non-jeopardy factors, the district court found that the FWS "has articulated absolutely no connection between the facts in the record and the required conclusion that the RPA is (1) consistent with the purpose of the underlying action; (2) consistent with the action agency's authority; and (3) economically and technologically feasible." *San Luis & Delta-Mendota*, 760 F. Supp. 2d at 956–57. The court continued:

> the APA requires, and the public is entitled under the law to receive, some exposition in the record of why the agency concluded (if it did so at all) that all four regulatory requirements for a valid RPA were satisfied. The RPA Actions manifestly interdict the water supply for domestic human consumption and agricultural use for over twenty million people who depend on the Projects for their water supply. "Trust us" is not acceptable. FWS has shown no inclination to fully and honestly address water supply needs beyond the species despite the fact that its own regulation requires such consideration.

San Luis & Delta-Mendota, 760 F. Supp. 2d at 957. Because the FWS had failed to explain why it chose its RPAs, "to the exclusion of implementing less harmful alternatives," the district court remanded to the FWS. *Id.* Put more simply, the district court found that both the FWS's regulation and the APA required the FWS to engage in a record exposition of the non-jeopardy factors, and that the FWS did not do so.

We disagree both with the district court's legal analysis and with its reading of the record.

First, contrary to the district court's conclusion, the FWS's "own regulation" does not require the FWS to address the non-jeopardy factors. *San Luis & Delta-Mendota*, 760 F. Supp. 2d at 957. Nothing in § 402.02 obligates the FWS to address the non-jeopardy factors when it proposes RPAs. Section 402.02 is a definitional section; it is defining what constitutes an RPA, not setting out hoops that the FWS must jump through. *See* 50 C.F.R. § 402.02; *see also id.* at § 402.14(g)(5) (the FWS shall "discuss [with an agency] . . . the availability of reasonable and prudent alternatives"); 302.02(h)(3) ("A 'jeopardy' biological opinion shall include reasonable and prudent alternatives if any."). Moreover, the *Consultation Handbook* implies that no such discussion is necessary. As the *Handbook* notes:

> [Although] it is imperative that the opinion contain a thorough explanation of how each component of the [reasonable and prudent] alternative is essential to avoid *jeopardy* and/or *adverse modification*[,] . . . [i]f the Services conclude that certain alternatives are available that would avoid *jeopardy* and *adverse modification*, but such alternatives

> fail to meet one of the other three elements in the definition of 'reasonable and prudent alternative,' the Services should document the alternative in the biological opinion to show it was considered during the formal consultation process.

Section 7 Consultation Handbook, *available at* http://www.fws.gov/endangered/esa-library/pdf/CH4.pdf (last visited July 1, 2013); *see also* 50 C.F.R. § 402.14(h)(3) ("If the Service is unable to develop such [reasonable and prudent] alternatives, it [must] indicate that to the best of its knowledge there are no reasonable and prudent alternatives."). In other words, a "thorough" documentation of jeopardy/adverse modification in the BiOp is always required, whereas documentation of the non-jeopardy factors is only required when the RPA fails to meet a non-jeopardy factor.

We fail to see anywhere that the FWS has required itself to provide an explanation of the non-jeopardy factors when it lays out an RPA. We may not "impose on the agency [our] own notion of which procedures are 'best' or most likely to further some vague, undefined public good. Nor may we impose procedural requirements [not] explicitly enumerated in the pertinent statutes." *McNair*, 537 F.3d at 993 (internal quotation marks and citations omitted).[42]

[42] We note that the Fourth Circuit recently remanded a BiOp to the FWS for failure to evaluate an RPA for its economic and technological feasibility. *Dow AgroSciences*, 707 F.3d at 474–75. We do not read *Dow* to require the FWS to address economic and technological feasibility as a procedural matter. As we read *Dow*, the court was concerned that the FWS had imposed an especially onerous requirement without any thought for whether it was feasible. *Id.* at 475 (RPA would prohibit pesticide

Second, the APA does not, as the district court held, require the FWS to address the non-jeopardy factors in this case. *See San Luis & Delta-Mendota*, 760 F. Supp. 2d at 957. Under the APA, the Supreme Court has held that agency decisions that "entirely fail[] to consider an important aspect of the problem" are arbitrary and capricious. *Motor Vehicle Mfrs. Ass'n of U.S., Inc. v. State Farm Mut. Auto Ins. Co.*, 463 U.S. 29, 43 (1983). We have held that whether an RPA will prevent jeopardy or adverse modification of critical habitat is "an important aspect of the problem." *See, e.g.*, *Wild Fish Conservancy v. Salazar*, 628 F.3d 513, 522–23 (9th Cir. 2010) (finding a BiOp that failed to explain how the RPA avoided jeopardy arbitrary and capricious); *Pacific Coast Fed'n of Fishermen's Ass'ns v. U.S. Bureau of Reclamation*, 426 F.3d 1082, 1091 (9th Cir. 2005) (same). But the jeopardy factor in the RPA is independently demanded by the ESA itself. Section 1536(a)(2) requires that each federal agency shall "insure that any action . . . is not likely to jeopardize" the species or its habitat. 16 U.S.C. § 1536(a)(2). This includes the FWS, which must warrant that its RPA "would not violate [§ 1536(a)(2)]." 16 U.S.C. § 1536(b)(3)(a). That is, the FWS, in the course of proposing an RPA, must insure that the RPA does not jeopardize the species or its habitat. We can find no similar requirement in the ESA that the FWS address the remaining three non-jeopardy factors. If the ESA does not require it, we are extremely reluctant to read such a requirement into the APA.

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applications "within 500 feet (for ground applications) and 1,000 feet (for aerial applications) of *any* waterway that is connected, *directly or indirectly*, at *any* time of the year, to *any* water body in which salmonids *might be* found at *some point*." (emphases in original)).

Moreover, we are persuaded that the district court misread what the economic feasibility factor addresses. The court faulted the FWS for not accounting for the cost of "interdict[ing] the water supply for domestic human consumption and agricultural use for over twenty million people who depend on the Projects for their water supply." *San Luis & Delta-Mendota*, 760 F. Supp. 2d at 957. This misreads the ESA and its implementing regulations. Section 402.02 is only concerned with the economic and technological feasibility of the RPA. That is, the FWS must consider whether its proposed *alternative* is financially and technologically possible. Those two considerations—economics and technology—are constraints on what *measures* the FWS can recommend to the agency as an alternative to ceasing the activity entirely. To put it into perspective in this case: Reclamation has consulted with the FWS because it has legitimate concerns whether its continued CVP activities may jeopardize the smelt or its habitat. When the FWS concludes that Reclamation's continued activities will jeopardize the smelt then, presumptively, Reclamation may not take or continue such activities. *See Nat'l Assn of Home Builders v. Defenders of Wildlife*, 551 U.S. 644, 652 (2007) ("Following the issuance of a 'jeopardy' opinion, the agency must either terminate the action, implement the proposed alternative, or seek an exemption from the Cabinet-Level Endangered Species Committee . . . ."). In this case, of course, terminating Reclamations' CVP-related activities is unthinkable. The whole point of the "reasonable and prudent alternative" is for the FWS to suggest what Reclamation can do to avoid such a result. The regulation identifies "economic and technological feasibility" as factors because these go to whether the RPA "*can* be taken by the Federal agency . . in implementing the agency action," 16 U.S.C. § 1536(b)(3)(A) (emphasis added), not to whether restricting

CVP activities will affect its consumers.[43] The "economic and technological feasibility" factor does not address the downstream economic impacts of Reclamation being unable to continue its CVP operations as it has done in the past. As important and consequential as the question is, the FWS is not responsible for balancing the life of the delta smelt against the impact of restrictions on CVP/SWP operations. That balance has already been struck by Congress in the ESA and the Central Valley Project Improvement Act. *See* CVPIA § 3406(b), Pub. L. No. 102-575, 106 Stat. 4600, 4714 (stating that the Secretary of the Interior is to "operate the Central Valley Project to meet all obligations under State and Federal law, including but not limited to the Federal Endangered Species Act, 16 U.S.C. § 1531 et seq"); *Tenn. Valley Auth.*, 437 U.S. at 185 (holding that the ESA reflects "a conscious decision by Congress to give endangered species priority over the 'primary missions' of federal agencies"). Accordingly, the FWS's duty is to opine on the viability of the smelt and "to halt and reverse the trend toward species extinction, *whatever the cost*." *Id.* at 184 (emphasis added).

Even if the APA did require the FWS to consider the non-jeopardy factors, the record shows that the FWS has sufficiently considered them. *See Motor Vehicle Mfrs. Ass'n of U.S., Inc*, 463 U.S. at 43 (holding that insufficient consideration for purposes of APA arbitrary and capricious review is an "entire[] fail[ure] to consider"). Although the FWS's consideration of the non-jeopardy factors could certainly have been even more exhaustive, or stated more expressly, its determination that the RPA satisfied the non-

[43] Neither the parties nor the district court argue that the RPAs themselves (and their proposed Actions) are not economically and technologically feasible.

jeopardy factors "may be reasonably discerned" from the record, and therefore should be upheld. *Id.* (holding that even "a decision of less than ideal clarity" should be upheld in such circumstances). Application of the non-jeopardy factors in this case is really quite straightforward. *See* 50 C.F.R. § 402.02. First, the record shows that the RPA is consistent with the purpose of the underlying action. The document that was prepared as a basis for consultation, Reclamation's biological assessment (BA), identified the purpose of this action to be "operat[ing] the [Projects] to divert, store, re-divert, and convey CVP and SWP . . . water consistent with applicable law." The RPAs—which largely deal with regulating the water that CVP/SWP export from the Delta-Bay—do not require any major changes in the way Reclamation runs its operations. Second, and similarly, the record indicates that the RPA can be implemented "consistent with the scope of the Federal agency's legal authority." Both the BA and the BiOp discuss the extent of Reclamation's authority. *See, e.g.*, BiOp at 21–25 (Reclamation's obligations under its Coordinated Operations Agreement with DWR). Finally, there is support in the record for the FWS's conclusion that the RPA is both technologically and economically feasible. We think this is nearly self-evident. The RPA closely resembles measures in the interim remedial order, the feasibility of which was proven in its mid-December 2007 through December 2008 implementation. BiOp at 327–28. Additionally, RPA incorporates feasibility-related comments that were made on a draft RPA from Reclamation and DWR. Again, the RPAs propose regulatory changes in what Reclamation does on a day-to-day basis, but the RPAs do not require major changes affecting Reclamation's ability—financially or technologically—to comply with the RPAs.

In sum, we disagree with the district court's determination that the FWS's own regulation and the APA require the FWS to explain that the RPA satisfies § 402.02 non-jeopardy factors. Alternatively, we hold that the FWS's consideration of these factors may be reasonably discerned from the record to satisfy any explanation requirements.[44]

V. CROSS-APPEAL

The appellees raise three claims of error in the district court: that the FWS violated the ESA by not separating discretionary from nondiscretionary actions when it set the environmental baseline; that Reclamation acted arbitrarily and capriciously when it accepted the BiOp; and that the FWS and Reclamation failed to prepare an environmental impact statement, as required by NEPA. We consider each in turn.

A. *Segregating Discretionary From Nondiscretionary Actions*

When determining whether an agency's operations are likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of a critical habitat, the FWS must "[e]valuate the effects of the action and cumulative effects on the listed species or critical

[44] We also hold that the FWS need not explain why it chose the RPA measures over "less harmful alternatives." *San Luis & Delta-Mendota*, 760 F. Supp. 2d at 957. In *Southwest Center for Biological Diversity*, we held that "under the ESA, the Secretary was not required to explain why he chose one RPA over another, or to justify his decision based solely on apolitical factors." 143 F.3d at 523. Consequently, we do not agree with the district court that such a failure demands remand to the agency. *San Luis & Delta-Mendota*, 760 F. Supp. 2d at 957.

habitat." 50 C.F.R. § 402.14(g)(3). This evaluation requires determining an "environmental baseline," which "does not include the effects of the action under review," and then adding the direct and indirect effects of the proposed federal action to determine whether that action will jeopardize a listed species. *See* 50 C.F.R. § 402.02; Section 7 Consultation Handbook, *available at* http://www.fws.gov/endangered/esa-library/pdf/CH4.pdf; *see also* Interangency Cooperation—Endangered Species Act of 1973 as Amended; Final Rule, 51 Fed. Reg. 19,926, 19,932 (June 3, 1986) (noting that the environmental baseline "serve[s] as the baseline for determining the effects of the action on the species or critical habitat").

In *Home Builders*, the Supreme Court held that the consultation requirement in ESA § 7(a)(2), 16 U.S.C. § 1536(a)(2), does not "impliedly repeal[] nondiscretionary statutory mandates, even when they might result in some agency action." *Nat'l Ass'n of Home Builders*, 551 U.S. at 665. In that case, the Clean Water Act required the EPA to transfer certain permitting powers to state authorities if nine criteria were satisfied. 33 U.S.C. § 1342(b). In accordance with the ESA § 7(a)(2), the EPA consulted with the FWS. The Service found that the transfer would not have any *direct* effect on any species in Arizona listed under the ESA. The FWS, however, was concerned that once EPA transferred permitting authority to Arizona, the ESA would no longer apply to permitting decisions, and Arizona could issue permits without regard to listed species. The FWS concluded that the transfer might have *indirect* effects on the species, although no decision or action of EPA was in question, other than the transfer of permitting authority. *Id.* at 653–54. The Court held that the ESA did not function as an additional constraint on the EPA's duty to transfer permitting authority

to Arizona: "[Section] 7(a)(2)'s no-jeopardy duty covers only discretionary agency actions and does not attach to actions . . . that an agency is *required* by statute to undertake once certain specified triggering events have occurred." *Id.* at 669.

Relying on *Home Builders*, San Luis & Delta-Mendota Water Authority asserts that "[a]s part of this [§ 7(a)(2)] analysis, the FWS must, among other things, distinguish between the discretionary and nondiscretionary actions of an operation, so that only the discretionary actions are considered as effects of the agency action." This argument was considered and rejected by the district court. *See San Luis & Delta-Mendota*, 760 F. Supp. 2d at 947–48. The district court reasoned that "*Home Builders* addressed whether the section 7 consultation obligation attaches to a particular agency at all." *San Luis & Delta-Mendota*, 760 F. Supp. 2d at 948. It did not, however, "address whether, once section 7 consultation is triggered, the jeopardy analysis must separately identify and segregate discretionary from non-discretionary actions, relegating the non-discretionary actions to the environmental baseline." *Id.* (emphasis removed).

We agree with the district court's analysis that *Home Builders* does not require the agency to segregate discretionary from non-discretionary actions when it considers the environmental baseline. *Home Builders* dealt only with whether § 7(a)(2) applies. The real question after *Home Builders* is what counts as a non-discretionary action, to which § 7(a)(2) does not apply.

We addressed this question in *National Wildlife Federation v. National Marine Fisheries Service*, 524 F.3d 917 (9th Cir. 2008) ("*NWF*"). In *NWF*, the National Marine Fisheries Service (NMFS) had issued a BiOp on the impacts

of the operation of the Federal Columbia River Power System (FCRPS) on a listed species. *Id.* at 921.

> The 2004 BiOp's jeopardy analysis included in the environmental baseline for the proposed action the existing FCRPS, various supposedly nondiscretionary dam operations, and all past and present impacts from discretionary operations. . . . NMFS also found, though, that certain aspects of FCRPS operations—such as operations relating to irrigation, flood control, and power generation—were nondiscretionary, given the dams' existence, *and that those aspects should not be considered part of the action under ESA review*.

Id. at 926 (emphasis added). The agency "segregated its analysis, first evaluating whether the proposed agency action—consisting of only the proposed discretionary operation of the FCRPS—would have an appreciable net effect on a species." *Id.* The agency did this "instead of assessing whether the listed fish would be jeopardized by the aggregate of the proposed agency action, the environmental baseline, cumulative effects, and current status of the species." *Id.*

This approach, we held, was incorrect: "NMFS may not avoid determining the limits of the action agencies' discretion by using a reference operation to sweep so-called 'nondiscretionary' operations into the environmental baseline, thereby excluding them from the requisite ESA jeopardy analysis." *Id.* at 929. We distinguished *NWF* from *Home Builders* on the basis of the specificity of the mandate

in question. "[I]n the present case Congress has imposed broad mandates, rather than directing the agency to take specific actions, and the agencies are perfectly capable of simultaneously obeying Section 7 and those mandates." *Id.* at 928. We repeated that "in contrast [to *Home Builders*,] Congress has imposed broad mandates which do not direct agencies to perform any specific nondiscretionary actions, but rather, are better characterized as directing the agencies to achieve particular goals." *Id.* at 928. Thus, "while the goals themselves may be mandatory, the agencies retain considerable discretion in choosing what specific actions to take in order to implement them." *Id*. at 929. "'[A]n agency cannot escape its obligation to comply with the ESA merely because it is bound to comply with another statute that has consistent, complementary objectives.'" *Id*. (quoting *Washington Toxics Coal. v. EPA*, 413 F.3d 1024, 1032 (9th Cir. 2005)).

The Water Authority has not pointed us to any statutory obligation that Congress has imposed on Reclamation that is both mandatory and inconsistent with its obligations under the ESA.[45] Like the FCRPS in *NWF*, Reclamation has a very broad mandate. Moreover, Congress has stated, as clearly as it can, that Reclamation is to administer its obligations to the CVP consistent with the mandates of the ESA. CVPIA, § 3406(b), 106 Stat. at 4714 (stating that the Secretary of the Interior is to "operate the Central Valley Project to meet all obligations under State and Federal law, including but not

[45] The Water Authority has pointed us to water contracts between Reclamation and wildlife refuge contractors, water exchange contracts with senior water rights holders, and a decision of the California State Water Resources Control Board. These do not approach the statutory mandate that the Court found EPA was under in *Home Builders*.

limited to the Federal Endangered Species Act, 16 U.S.C. § 1531 et seq.").

B. *Reclamation Did Not Violate the ESA by Accepting the 2008 BiOp*

The Water Authority argues that Reclamation committed an independent violation of the ESA by relying on the BiOp. *See Defenders of Wildlife*, 420 F.3d at 976 (noting that "[a]rbitrarily and capriciously relying on a *faulty* Biological Opinion violates [the action agency's independent and substantive] duty" (emphasis added)). Because we do not believe the 2008 BiOp to be arbitrary and capricious, we join the district court in declining to find that Reclamation's reliance on the BiOp was arbitrary and capricious. *See San Luis & Delta-Mendota*, 760 F. Supp. 2d at 966–67.

C. *Application of NEPA to the FWS and Reclamation*

NEPA requires that "to the fullest extent possible . . . all agencies of the Federal Government shall" complete an environmental impact statement (EIS) in connection with "every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment." 42 U.S.C. § 4332(2)(C). The agency may begin by preparing an environmental assessment (EA). 40 C.F.R. §§ 1501.4(a)–(c); 1508.9. It may then issue a finding of no significant impact (FONSI) rather than completing an EIS if the EA reveals that the action in question "will not have a significant effect on the human environment." 40 C.F.R. §§ 1501.4(e); 1508.13.

In this case, neither the FWS nor Reclamation prepared an EA or an EIS. We are thus confronted with two questions

concerning the scope of NEPA's requirement that agencies produce an EA and, if necessary, an EIS. First, was the FWS's issuance of the BiOp a "major Federal action[] significantly affecting the quality of the human environment" that imposed on the FWS an obligation to comply with NEPA? And second, was Reclamation's provisional adoption and implementation of the BiOp a "major Federal action[] significantly affecting the quality of the human environment" that imposed on Reclamation an obligation to comply with NEPA?[46]

Before the district court, the plaintiffs initially alleged that the FWS violated NEPA by failing to prepare an EIS when issuing the 2008 BiOp. In their first amended complaint, the San Luis plaintiffs further asserted that Reclamation violated NEPA by accepting and implementing the BiOp without completing an EIS. In three of the five consolidated cases, the plaintiffs moved for summary judgment on their claims that the FWS and Reclamation failed to comply with NEPA. The defendant-intervenors, including NRDC, filed a cross-motion for summary judgment, arguing that the agencies were not obligated to adhere to NEPA in issuing or implementing the BiOp. In November 2009, the district court issued its decision on the parties' cross-motions for summary judgment on the NEPA issues. *San Luis & Delta-Mendota Water Auth. v. Salazar*, 686 F. Supp. 2d 1026 (E.D. Cal. 2009). The district court observed that "[i]t is a close call

[46] We review an agency's decision that it need not prepare an EIS for "reasonableness." *See Northcoast Envtl. Ctr. v. Glickman*, 135 F.3d 660, 667 (9th Cir. 1998) ("Here, we have a threshold question of NEPA applicability. The Secretaries have not prepared an EIS or EA . . . contending that NEPA does not apply . . . . We hold the less deferential standard of 'reasonableness' applies to threshold agency decisions that certain activities are not subject to NEPA's procedures.").

whether FWS's *issuance* of the BiOp and its RPA under these circumstances" requires the preparation of an EIS pursuant to NEPA. *Id.* at 1044. It concluded that "[t]his call need not be made, because Reclamation, the agency with the ultimate authority to implement the RPA, is now joined as a party, whose actions must be evaluated under NEPA." *Id.* The court granted summary judgment in favor of the plaintiffs on their claim against Reclamation, concluding "that Reclamation violated NEPA by failing to perform any NEPA analysis prior to provisionally adopting and implementing the 2008 BiOp and its RPA." *Id.* at 1051.

In a subsequent motion for summary judgment, the plaintiffs again asserted that the FWS violated NEPA by not issuing an EIS along with the BiOp. The district court remarked that "[t]his was an attempt to re-argue and re-frame arguments previously decided" because the district court's "prior NEPA rulings determined that Reclamation bears the NEPA responsibility in this case." *San Luis & Delta-Mendota*, 760 F. Supp. 2d at 965. The defendants filed an opposition and cross-motion for summary judgment, urging the district court to reaffirm that the FWS did not need to comply with NEPA in issuing the BiOp. The district court denied the plaintiffs' motion and granted the defendants' motion with respect to the NEPA claims against the FWS. *Id.* at 966.

On appeal, the plaintiffs argue that both the FWS and Reclamation must comply with NEPA. The federal defendants contend that the FWS need not comply with NEPA because Reclamation will complete an EIS. And NRDC takes the position that neither the issuance of the BiOp by the FWS nor the acceptance and implementation of the BiOp by Reclamation triggers obligations under NEPA.

We affirm the district court's judgment with respect to the NEPA claims. First, we hold that, under these circumstances, NEPA does not require the FWS to prepare an EIS in conjunction with the issuance of the BiOp. Second, we hold that Reclamation's provisional adoption and implementation of the BiOp triggered its obligation to comply with NEPA. We therefore affirm the district court's order remanding to Reclamation so that it can complete an EIS evaluating the effects of its adoption and implementation of the BiOp.[47]

1. Application of NEPA to the FWS

We first consider whether the FWS's issuance of the BiOp was a "major Federal action[] significantly affecting the quality of the human environment" such that the FWS was obligated to complete an EIS. A "[m]ajor federal action includes actions with effects that may be major and which are potentially subject to Federal control and responsibility." 40 C.F.R. § 1508.18. The regulations offer several categories of major federal actions, including "[a]doption of formal plans, such as official documents prepared or approved by federal agencies which guide or prescribe alternative uses of Federal resources, upon which future agency actions will be based" and "[a]pproval of specific projects, such as

[47] Reclamation provided notice of its intent to prepare an EIS on March 28, 2012. *See* Remanded Biological Opinions on the Coordinated Long-Term Operation of the Central Valley Project and State Water Project: Notice of Intent to Prepare an Environmental Impact Statement and Notice of Scoping Meetings, 77 Fed. Reg. 18858-02 (March 28, 2012). The district court continues to actively manage Reclamation's deadline for completing the EIS process. *See* Memorandum Decision and Order Regarding Motion to Extend Remand Schedule, *Consolidated Delta Smelt Cases*, No. 1:09-cv-00407(E.D. Cal. Apr. 9, 2013), ECF No. 1106.

construction or management activities located in a defined geographic area." *Id.* at § 1508.18(b)(2), (4).

The federal defendants argue that the FWS, in its capacity as a consulting agency under Section 7 of the ESA, is merely offering its opinions and suggestions to Reclamation, which, as the action agency, ultimately decides whether to adopt or approve the plan. This view is well supported by the statute, regulations, and our case law. Section 7(b) explains that the FWS "shall provide to the Federal agency [e.g., Reclamation] . . . a written statement setting forth the Secretary's *opinion*, and a summary of the information on which the *opinion* is based, detailing how the agency action affects the species or its critical habitat." 16 U.S.C. § 1536(b)(3)(A) (emphasis added). "If jeopardy or adverse modification is found, the Secretary shall *suggest* those reasonable and prudent alternatives which he believes would not violated subsection (a)(2) of this section and can be taken by the Federal agency [e.g., Reclamation] . . . in implementing the agency action." *Id.* (emphasis added). We would not ordinarily consider an "opinion" or "suggest[ion]" a "major Federal action[]." The regulations further provide that "[f]ollowing the issuance of a biological opinion, the Federal agency [e.g., Reclamation] shall determine whether and in what manner to proceed with the action in light of its section 7 obligations and the Service's biological opinion." 50 C.F.R. § 402.15(a). Our cases confirm that an action agency like Reclamation has some discretion to deviate from the BiOp and its RPAs. *See Pyramid Lake Paiute Tribe of Indians v. U.S. Dep't of Navy*, 898 F.2d 1410, 1418 (9th Cir. 1990) ("We have recognized that the Secretary is to be afforded some discretion in ascertaining how best to fulfill the mandate to conserve under section 7(a)(1) [of the ESA] . . . . For example, [an action] agency is given discretion to decide whether to implement

conservation recommendations put forth by the FWS."); *Tribal Vill. of Akutan v. Hodel*, 869 F.2d 1185, 1193 (9th Cir. 1988) ("The agency is not required to adopt the alternatives suggested in the biological opinion . . . . [The Secretary] satisfied section 7(a)(2) if he took alternative, reasonably adequate steps to insure the continued existence of any endangered or threatened species.").

We are mindful of the fact that "while the Service's Biological Opinion theoretically serves an 'advisory function,' in reality it has a powerful coercive effect on the action agency." *Bennett v. Spear*, 520 U.S. 154, 169 (1997) (citation omitted). "The action agency is technically free to disregard the Biological Opinion and proceed with its proposed action, but it does so at its own peril (and that of its employees), for 'any person' who knowingly 'takes' an endangered or threatened species is subject to substantial civil and criminal penalties, including imprisonment." *Id.* at 170.[48] But the "powerful coercive effect" of a BiOp on an action agency like Reclamation does not render it akin to the "[a]doption of formal plans" or "[a]pproval of specific projects," which tend to trigger NEPA's requirements. 40 C.F.R. 1508.18(b)(2), (4). Unlike Reclamation, the FWS is not responsible for, and will not implement, the RPAs. And even if Reclamation felt compelled to implement the FWS's proposal, we must bear in mind that Reclamation will

[48] In *Bennett*, "The question for decision [was] whether the petitioners . . . [had] standing to seek judicial review of the biological opinion under the citizen-suit provision of the ESA . . . and the Administrative Procedure Act." *Id.* at 157. The case did not raise or resolve any questions concerning the application of NEPA to agency action under Section 7 of the ESA, which is at issue in this case.

complete an EIS evaluating the effects of implementing the BiOp. *See infra* section IV.B.2.

The fact that Reclamation, and not the FWS, bears responsibility for implementing the BiOp—or an alternative that complies with Section 7's mandate—distinguishes this case from *Ramsey v. Kantor*, 96 F.3d 343 (9th Cir. 1996), where we held that the agency issuing a BiOp and ITS was required to comply with NEPA. In *Ramsey*, the National Marine Fisheries Service (NMFS) produced a BiOp and ITS in connection with the Columbia River Fish Management Plan, which is a "unique, judicially created, federal-state-tribal compact" that "apportions the fishing rights to the state and tribal members." *Id.* at 438. Notably, "The states then enact regulations governing fishing in the Columbia River, although they must do so in compliance with the terms of the Columbia River Fish Management Plan." *Id.* After the NMFS completed its BiOp and ITS, the states of Washington and Oregon issued regulations, which "would be illegal, if not for that [incidental take] statement," permitting a specified amount of salmon fishing in the Columbia River. *Id.* at 444. The *Ramsey* court "conclude[d] that the incidental take statement in this case is functionally equivalent to a permit." *Id.* Our cases had already established that "if a federal permit is a prerequisite for a project with adverse impact on the environment, issuance of that permit does constitute major federal action and the federal agency involved must conduct an EA and possibly an EIS before granting it." *Id.* (citing *Jones v. Gordon*, 792 F.2d 821, 827–29 (9th Cir. 1986); *Port of Astoria v. Hodel*, 595 F.2d 467, 478–79 (9th Cir. 1979)). For this reason, the court held "that the issuance of [the incidental take] statement constitutes major federal action for purposes of NEPA." *Ramsey*, 96 F.3d at 444.

In *Ramsey*, the states of Washington and Oregon occupied the position typically inhabited by a federal action agency like Reclamation because the BiOp and ITS were issued as part of a federal-state-tribal compact. Because NEPA applies only to "federal actions," 42 U.S.C. § 4332(2)(C), in that case there was no downstream federal agency to complete an EIS. If the consulting agency, the NMFS, did not comply with the EIS requirement in *Ramsey*, then the action would have evaded NEPA review altogether even though the action was, in substance, identical to the process for issuing a permit, which would require the issuing agency to prepare an EIS.

Here, there is no comparable need to require the FWS to prepare an EIS because Reclamation stands ready to do so. We have held that an agency need not complete an EIS where another agency will authorize or implement the action that triggers NEPA. In *Sierra Club v. FERC*, 754 F.2d 1506 (9th Cir. 1985), the Federal Energy Regulatory Commission issued a preliminary permit to construct a hydroelectric power plant. *Id.* at 1508. The plaintiffs argued that the Commission should have conducted an EIS before issuing the permit. *Id.* at 1509. We disagreed, explaining that the applicants "can only enter federal land and conduct ground-breaking activities after obtaining Forest Service and BLM special use permits. Thus, these agencies, not the Commission, will be responsible for evaluating the environmental impact of activities authorized by their special use permits." *Id.*; *see also Conner v. Burford*, 848 F.2d 1441 (9th Cir. 1988) (holding that the sale of particular oil and gas leases did not require the Forest Service to complete an EIS because "*absent further governmental approval*, the [ ] leases absolutely prohibit surface-disturbing activity." (emphasis added)).

We see no reason to require a consulting agency like the FWS to complete an EIS when an action agency like Reclamation will either (1) prepare an EIS when it implements FWS's proposal or (2) reject FWS's proposal and prepare an EIS on whatever alternative it implements. We have condemned efforts to use NEPA as an "obstructionist tactic." *See Drakes Bay Oyster Co. v. Jewell*, 729 F.3d 967, 984 (9th Cir. 2013); *Douglas Cnty.*, 48 F.3d at 1508. Of course the fact that completing an EIS might be time consuming or costly does not excuse an agency from complying with NEPA; that is a balance struck by Congress, not the courts. But the statute requires completion of an EIS in connection with all "major Federal *actions*." 42 U.S.C. § 4332(2)(C) (emphasis added). It does *not* require completion of an EIS by all agencies that make recommendations with respect to an action or participate in formulating a proposal for action. As the district court observed, "it makes little sense to have two agencies prepare separate NEPA documents for the same agency action." *San Luis & Delta-Mendota*, 686 F. Supp. 2d at 1042.

We hold that, under these circumstances, the FWS was not required to comply with NEPA in issuing the BiOp. There are situations where a consulting agency like the FWS is required to complete an EIS in conjunction with the preparation of a BiOp under Section 7 of the ESA. We have already identified one such scenario in *Ramsey*. But neither the statute nor our case law supports the proposition that the FWS's production of a BiOp constitutes a "major Federal action[]" when its implementation is contingent on Reclamation's adoption of the BiOp, which is an action that will trigger Reclamation's obligation to complete an EIS.

2. Application of NEPA to Reclamation

Having explained why the FWS was not required to produce an EIS when it issued the BiOp, we now address why the district court correctly concluded that Reclamation's adoption and implementation of the BiOp requires the preparation of an EIS. The federal defendants do not contest the district court's decision that Reclamation should have completed an EA and, if necessary, an EIS in conjunction with its implementation of the BiOp. But NRDC appeals the district court's order granting summary judgment in favor of the plaintiffs on their claim that Reclamation violated NEPA.[49]

[49] Because the federal defendants have not appealed the district court's decision that Reclamation's adoption of the BiOp is subject to NEPA, we must first confirm that NRDC has standing to challenge the decision. *See Diamond v. Charles*, 476 U.S. 54, 68 (1986) ("[A]n intervenor's right to continue a suit in the absence of the party on whose side intervention was permitted is contingent upon a showing by the intervenor that he fulfills the requirements of Art. III.").

We hold that NRDC has standing to appeal the district court's decision. "To determine whether an intervenor may appeal from a decision not being appealed by one of the parties in the district court, the test is whether the intervenor's interests have been adversely affected by the judgment." *Didrickson v. U.S. Dep't of the Interior*, 982 F.2d 1332, 1338 (9th Cir. 1992). "To invoke this court's jurisdiction on the basis of an injury related to the judgment, Intervenors must establish that the district court's judgment causes their members a concrete and particularized injury that is actual or imminent and is likely to be redressed by a favorable decision." *W. Watersheds Project v. Kraayenbrink*, 632 F.3d 472, 482 (9th Cir. 2010). "[A] credible threat of harm is sufficient to constitute actual injury for standing purposes, whether or not a statutory violation has occurred." *Cent. Delta Water Agency v. United States*, 306 F.3d 938, 950.

We begin by noting that we agree with the district court's conclusion that Reclamation's implementation of the BiOp is a "major Federal action[] significantly affecting the quality of the human environment," even though NRDC does not directly challenge this portion of the court's decision. 42 U.S.C. § 4332(2)(C), First, implementation of the BiOp is a "major Federal action." We have held "that where a proposed federal action would not change the status quo, an

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NRDC has demonstrated, for Article III standing purposes, that the district court's judgment requiring Reclamation to complete an EIS poses "a credible threat of harm" to the delta smelt. The 2008 BiOp—which we hold today is not arbitrary and capricious—concluded that project operations jeopardized the delta smelt. There is, therefore, "a credible threat of harm" to the delta smelt if project operations continue. Although the district court remanded without vacatur, the plaintiffs can potentially use the judgment that Reclamation violated NEPA to enjoin implementation of the RPAs so long as doing so does not violate Section 7 of the ESA. *See In re Consolidated Delta Smelt Cases*, 812 F. Supp. 2d 1133, 1198 (E.D. Cal. 2011) (judgment vacated by *San Luis & Delta-Mendota Water Auth. v. Salazar*, No. 11-17143 (9th Cir. Aug. 23, 2012)) ("A court may not issue an injunction under NEPA that would cause a violation of other statutory requirements, such as those found in Section 7 of the ESA. . . . However, where the evidence indicates that the ESA will not be violated by injunctive relief issued under NEPA, the presence of a NEPA claim permits consideration of economic harm evidence."). The fact that a court cannot grant an injunction based on the judgment that Reclamation violated NEPA if doing so would cause a violation of Section 7 of the ESA does not preclude NRDC from having standing to appeal the judgment because "a credible threat of harm is sufficient to constitute actual injury for standing purposes, *whether or not a statutory violation has occurred*." *Cent. Delta Water Agency*, 306 F.3d at 950 (emphasis added). The judgment thus introduces some probabilistic chance of environmental harm short of a statutory violation of Section 7 of ESA, which is sufficient for Article III standing. *See id.* at 948 ("'Threatened environmental harm is by nature probabilistic.'" (quoting *Friends of the Earth, Inc. v. Gaston Copper Recycling Corp.*, 204 F.3d 149, 160 (4th Cir. 2000) (en banc)).

EIS is not necessary." *Upper Snake River Chapter of Trout Unlimited v. Hodel*, 921 F.2d 232, 235 (9th Cir. 1990); *see also Burbank Anti-Noise Group v. Goldschmidt*, 623 F.2d 115, 116 (9th Cir. 1980) ("An EIS need not discuss the environmental effects of mere continued operation of a facility."). In *Upper Snake River*, the court held that Reclamation's decision to reduce the flow of water from a dam to 1,000 cfs was not a major federal action. *Upper Snake River*, 921 F.2d at 233. Reclamation had already set the flow rate below 1,000 cfs during 4.75% of the total days that the dam had been in operation, which led the court to conclude that "[w]hat they did in prior years and what they were doing during the period under consideration were no more than the routine managerial actions regularly carried on from the outset without change . . . they are doing nothing new, nor more extensive, nor other than that contemplated when the project was first operational." *Id.* at 234–35. The district court correctly distinguished *Upper Snake River* by observing that the BiOp does not merely involve a "routine" adjustment to the operation of the project. Rather, it "can be determined from the face of the BiOp and uncontroverted analyses of public data . . . [that] the Projects' water delivery operations must be materially changed to restrict project water flows to protect the smelt." *San Luis & Delta-Mendota*, 686 F. Supp. 2d at 1049.

Second, Reclamation's implementation of the BiOp "significantly affect[s] the human environment." We have held that "[a]n agency is required to prepare an EIS where there are substantial questions about whether a project *may* cause significant degradation of the human environment." *Native Ecosystems Council v. U.S. Forest Serv.*, 428 F.3d 1233, 1239 (9th Cir. 2005) (emphasis in original). The district court correctly concluded that "dispositive

conclusions can be made without looking to the [administrative record]." *San Luis & Delta-Mendota*, 686 F. Supp. 2d at 1050. For example, the federal defendants' answer states that "Defendants aver that 'reductions in exports from the Delta' may 'place greater demands upon alternative sources of water, including groundwater.'" *Id.* The district court correctly concluded that Reclamation's implementation of the BiOp is a "major Federal action[] significantly affecting the quality of the human environment." 42 U.S.C. § 4332(2)(C).

NRDC's argument on appeal is that, under these circumstances, NEPA conflicts with the ESA's goal of preserving listed species like the delta smelt by imposing an additional procedural requirement on Reclamation. For this reason, NRDC contends that NEPA does not apply to Reclamation's adoption and implementation of the BiOp, even if the action is a "major Federal action[] significantly affecting the quality of the human environment" that would ordinarily trigger NEPA review. We therefore consider whether we should set aside the EIS requirement when an agency implements a BiOp and RPAs designed to ensure that its action "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." 16 U.S.C. § 1536(a)(2). We find no basis in the statute or our case law for excusing Reclamation from its NEPA obligations under these circumstances.

On its face, the statute does not permit case-by-case exceptions that assess how NEPA interacts with the substantive statute at issue. It simply requires that "to the fullest extent possible . . . all agencies of the Federal Government shall" complete an EA and, if necessary, an EIS

for all "major Federal actions significantly affecting the quality of the human environment." 42 U.S.C. § 4332(2)(C). Congress has expressly provided that NEPA does not apply to certain statutory schemes. For example, "No action taken under the Clean Air Act shall be deemed a major Federal action significantly affecting the quality of the human environment within the meaning of the National Environmental Policy Act of 1969." 15 U.S.C. § 793(c)(1). In other words, no action taken under the Clean Air Act will trigger NEPA's requirement that the agency produce an EIS. *See also* 42 U.S.C. § 8473 (stating that the EIS requirement does not apply to certain exemptions for electric powerplants); 42 U.S.C. § 5159 (providing that actions restoring particular facilities to their condition prior to a disaster or emergency are exempt from the EIS requirement). Most notably, Section 7 of the ESA—the provision at issue here—carves out a narrow exception to the EIS requirement. The ESA authorizes the formation of an "Endangered Species Committee" that is empowered to grant exemptions from the general prohibition on agency actions that "jeopardize the continued existence" of listed species or "result in the destruction or adverse modification of [their] habitat." 16 U.S.C. § 1536(e). The statute specifically provides that a decision by the Endangered Species Committee to exempt an agency action from the ESA's prohibitions is not subject to NEPA if the agency already completed an EIS concerning the effects of the action. *Id.* at § 1536(k).

This could very well be the end of our inquiry. Congress has repeatedly demonstrated that it knows how to exempt particular substantive statutes from the EIS requirement when it wishes to do so. Moreover, Congress has expressly exempted a particular subset of actions under Section 7 of the ESA—decisions by the Endangered Species Committee

where an EIS was already completed by the action agency. But Congress did not exempt all efforts to avoid jeopardizing the survival of a listed species from the EIS requirement. In fact, Congress's decision to exempt certain decisions by the Endangered Species Committee from the EIS requirement reaffirms that NEPA applies to other actions under Section 7 of the ESA, including Reclamation's implementation of the BiOp.

There is additional statutory evidence that Reclamation's adoption and implementation of the BiOp triggers its obligations under NEPA. Section 7 of the ESA provides that a biological assessment "may be undertaken as part of a Federal agency's compliance with the requirements of section 102 of the National Environmental Policy Act of 1969 (42 U.S.C. § 4332)," which is the section that governs the preparation of an EIS. 16 U.S.C. § 1536(c)(1). This is evidence that Congress specifically contemplated that an action agency discharging its duties under Section 7 of the ESA would also comply with NEPA by completing an EA and, if necessary, an EIS. The regulations also acknowledge that the agencies are expected to concurrently comply with both Section 7 of the ESA and NEPA. *See* 50 C.F.R. § 402.06 ("Consultation, conference, and biological assessment procedures under section 7 may be consolidated with interagency cooperation procedures required by other statutes, such as the National Environmental Policy Act (NEPA).").

NRDC does not cite a single case where any court has held that an action agency's obligations under Section 7 of the ESA excuse it from complying with NEPA. There are, however, a number of cases holding that other substantive statutes are exempt from the EIS requirement, even though

Congress has not expressly provided an exemption. NRDC would have us extend the rationale of those cases to these circumstances.

We have recognized two circumstances where an agency need not complete an EIS despite an absence of an express statutory exemption. First, an agency is excused from complying with NEPA where doing so "would create an irreconcilable and fundamental conflict" with the substantive statute at issue. *Flint Ridge Dev. Co. v. Scenic Rivers Ass'n of Okla.*, 426 U.S. 776, 788 (1976). Second, we have identified a limited number of instances where a substantive statute has "displaced" NEPA's requirements, even though there is not "an irreconcilable" conflict between the substantive statute and the EIS requirement. *See Douglas Cnty.*, 48 F.3d at 1502 ("[The plaintiff] argues that without this 'irreconcilable' statutory conflict NEPA must apply. We disagree, and . . . we hold that NEPA does not apply to the designation of a critical habitat.").

First, in *Flint Ridge* the Supreme Court held that the EIS requirement did not apply because requiring the agency to prepare an EIS "would create an irreconcilable and fundamental conflict with the Secretary's duties under the [substantive statute at issue]." *Flint Ridge*, 426 U.S. at 788. There, the substantive statute provided that a document filed with the agency would automatically become effective in thirty days under certain circumstances. *Id.* at 788. The Court explained that "[i]t is inconceivable that an environmental impact statement could, in 30 days, be drafted, circulated, commented upon, and then reviewed and revised in light of the comments." *Id.* at 789. But in *Jones v. Gordon*, 792 F.2d 821 (9th Cir. 1986), we observed that "*Flint Ridge* applies only when a conflict is 'clear and

unavoidable' and 'irreconcilable and fundamental.'" *Id.* at 826. The *Jones* court explained that, unlike in *Flint Ridge*, the agency "could withhold publication long enough to comply with any NEPA requirement for preparation of an environmental impact statement." *Id.*

There is no "irreconcilable and fundamental conflict" between NEPA and Section 7 of the ESA. Although the statute sets out a timetable for the consultation process, it is flexible enough to accommodate the preparation of an EIS. *See* 16 U.S.C. § 1536(b)(1)(A) ("Consultation under subsection (a)(2) of this section with respect to any agency action shall be concluded within the 90-day period beginning on the date on which initiated or, subject to paragraph (B), *within such other period of time as is mutually agreeable to the Secretary and federal agency.*" (emphasis added)); 16 U.S.C. § 1536(b)(1)(B) ("The Secretary and the Federal agency may mutually agree to extend a consultation period established under the preceding sentence if the Secretary, before the close of such period, obtains the consent of the application to the extension."); *see also Westlands Water Dist. v. United States Dep't of Interior*, 850 F. Supp. 1388, 1423 (E.D. Cal. 1994) ("Section 7 of the ESA gives agencies control over the time within which consultation is to be concluded . . . . [And] ESA § 7 provides for the inclusion of 'applicants' within the consultation process, which demonstrates access to the ESA process by interested parties . . . . Neither timing nor secrecy concerns bar the ability to comply with NEPA.").

Second, we have held that an agency action might be exempt from NEPA even "without this 'irreconcilable' statutory conflict" identified in *Flint Ridge*. *Douglas Cnty.*, 48 F.3d at 1502; *see also Drakes Bay Oyster*, 729 F.3d at 984;

Merrell, 807 F.2d at 778. In *Douglas County*, we held that the Secretary of the Interior need not complete an EIS when designating the critical habitat of a listed species pursuant to Section 4 of the ESA. *Douglas Cnty.*, 48 F.3d at 1507.[50] The *Douglas County* court concluded that "Congress intended to displace" NEPA's procedures when authorizing the agency to designate critical habitat under Section 4 of the ESA. *Id.* at 1504 n.10. But none of the factors relied on by the *Douglas County* court in reaching this decision apply with the same force where, as here, the agency action at issue is the implementation of a BiOp under Section 7 of the ESA.

The *Douglas County* court reasoned that the process for designating critical habitat under Section 4 of the ESA effectively accomplished all of NEPA's goals without requiring an EIS, thereby "mak[ing] the NEPA procedure seem 'superfluous.'" *Id.* at 1503. Section 4 of the ESA compels "the Secretary [to] consider impacts that concern NEPA, to the extent that the critical habitat designation has a positive environmental effect on the species in question." *Id.* Furthermore, "The critical designation process also provides for public notice, another goal of NEPA." *Id.*

But the same cannot be said for Section 7 of the ESA, which is at issue in this case. In *Save the Yaak Committee v. Block*, 840 F.2d 714 (9th Cir. 1988), we explained the difference between a biological assessment (BA) produced

[50] The Tenth Circuit subsequently disagreed with the result that we reached in *Douglas County*, creating a circuit split concerning whether NEPA applies to the designation of critical habitat under Section 4 of the ESA. *See Catron Cnty. Bd. of Comm'rs v. U.S. Fish & Wildlife Serv.*, 75 F.3d 1429, 1436 (10th Cir. 1996); *see also Cape Hatteras Access Pres. Alliance v. U.S. Dep't of Interior*, 344 F. Supp. 2d 108, 133–36 (D.D.C. 2004).

pursuant to Section 7 of the ESA, and an EA or EIS prepared in accordance with NEPA. The *Save the Yaak* court considered an argument that "even if the EA was inadequate, it was supplemented by the biological assessment (BA)" completed under Section 7 of the ESA. *Id.* at 718. We rejected this reasoning, explaining that "[w]hile a BA analyzes the impact of a proposed action upon endangered species, an EA analyzes the impact of the proposed action on all facets of the environment. Thus, if only a BA is prepared there may be gaps in the agency's environmental analysis." *Id.*

Courts have offered several other examples of the differences between the Section 7 process and the one prescribed by NEPA. For instance, "the ESA's Section 7 consultation process fails to provide for public comment in the same way that NEPA does." *Fund for Animals v. Hall*, 448 F. Supp. 2d 127, 136 (D.D.C. 2006). This is particularly important because "[p]ublication of an EIS, both in draft and final form, also serves a larger informational role. It gives the public the assurance that the agency 'has indeed considered environmental concerns in the decisionmaking process,' and, perhaps more significantly, provides a springboard for public comment." *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989) (quoting *Baltimore Gas & Elec. Co.*, 462 U.S. at 97) (internal citation omitted). Additionally, "the ESA only requires agencies to consider the cumulative impacts of non-federal actions, while NEPA requires agencies to consider the cumulative impacts of all actions." *Fund for Animals*, 448 F. Supp. 2d at 136; *see also* 50 C.F.R. § 402.02 (describing the cumulative effects analysis under the ESA); 40 C.F.R. § 1508.7 (describing the cumulative impacts analysis under NEPA). We cannot say that Section 7 of the ESA renders NEPA "superfluous" when the statutes evaluate

different types of environmental impacts through processes that involve varying degrees of public participation.

In *Merrell*, we held that the EIS requirement does not apply to FIFRA's scheme for registering pesticides because the two processes are markedly different. *See Merrell*, 807 F.2d at 778 ("The differences between FIFRA's registration procedure and NEPA's requirements indicate that Congress did not intend NEPA to apply."). Although both *Merrell* and *Douglas County* conclude that NEPA does not apply to a particular substantive statute, they do so for opposite reasons. *Douglas County* holds that Section 4 of the ESA renders NEPA superfluous because the processes are sufficiently similar, while *Merrell* holds that FIFRA renders NEPA superfluous because the processes are sufficiently different. *See Douglas Cnty.*, 48 F.3d at 1503 ("[T]he Secretary will consider impacts that concern NEPA, to the extent that the critical habitat designation has a positive environmental effect on the species in question. The critical designation process also provides for public notice, another goal of NEPA."); *Merrell*, 807 F.2d at 779 ("[W]hen Congress revised FIFRA in 1972, it designed a registration procedure with public notice and public participation provisions that differ materially from those that NEPA would require.").

Although we have already acknowledged the differences between Section 7 of the ESA and NEPA, we do not think that the distinctions are as pronounced as those in *Merrell*, where the court concluded that "[t]o apply NEPA to FIFRA's registration process would sabotage the delicate machinery that Congress designed to register new pesticides." *Merrell*, 807 F.2d at 779. As we have observed, Congress specifically contemplated that an agency could comply with NEPA while

discharging its duties under Section 7 of the ESA. *See* 16 U.S.C. § 1536(c)(1) (explaining that the biological assessment required by Section 7 of the ESA "may be undertaken as part of a Federal agency's compliance with the requirements of section 102 of the National Environmental Policy Act of 1969 (42 U.S.C. § 4332)"). In this very case, the federal agencies acknowledge that Reclamation will complete an EIS in conjunction with its adoption and implementation of the BiOp, which undercuts the notion that the two processes are incompatible. Under these circumstances, we cannot conclude that the process set out by Section 7 of the ESA clashes with NEPA to such an extent that requiring Reclamation to produce an EIS "would sabotage the delicate machinery that Congress designed." *Merrell*, 807 F.2d at 779. Instead, we find that Section 7 of the ESA fits within the broad swath of statutes that coexist with NEPA.[51]

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[51] A number of other circuits have held that an agency need not produce an EIS where the substantive statute at issue offers a procedure that is the "functional equivalent" of the EIS process. *See, e.g.*, *State of Ala. ex rel. Siegleman v. EPA*, 911 F.2d 499, 504 (11th Cir. 1990); *Limerick Ecological Action, Inc. v. U.S. Nuclear Regulatory Comm'n.*, 869 F.2d 719, 729 n.7 (3d Cir. 1989); *Izaak Walton League of Am. v. Marsh*, 655 F.2d 346, 367 n.51 (D.C. Cir. 1981).

We have been skeptical of the "functional equivalent" approach and have not used this language in our cases. *See Douglas Cnty.*, 48 F.3d at 1504 n.10 ("Courts have used a 'functional equivalent' test to exempt agency action from NEPA requirements . . . . The defendants here do not advance the functional equivalent argument, so we do not address it. The [plaintiff] would have us believe that the 'displacement' argument defendants make is the same as the 'functional equivalent' test. We do not agree. The 'displacement' argument asserts that Congress intended to displace one procedure with another. The 'functional equivalent' argument is that one process requires the same steps as another."); *Merrell*, 807 F.2d at 781 ("While we hesitate to adopt the 'functional

The *Douglas County* court also noted that Congress acquiesced to decisions by the agencies and courts that compliance with NEPA was not required when designating critical under habitat Section 4 of the ESA. We noted that in 1983 the Secretary of the Interior stopped preparing EAs and EISs before designating critical habitat, yet Congress did not address the agency's interpretation of the statute when it amended the ESA in 1988. *Douglas Cnty.*, 48 F.3d at 1504. The Sixth Circuit had also suggested in dicta that it might not be necessary to prepare an EIS before designating critical habitat before the 1988 amendments to the ESA. *Id.* (citing *Pac. Legal Found. v. Andrus*, 657 F.2d 829, 835 (6th Cir. 1981)). But here, neither the agencies nor the courts have interpreted Section 7 of the ESA to permit noncompliance with NEPA. As noted, the relevant regulations indicate that the action agency will complete an EIS while carrying out its duties under Section 7, and the federal defendants in this case have assumed that Reclamation will complete an EIS evaluating the effects of implementing the BiOp. *See* 50 C.F.R. § 402.06 ("Consultation, conference, and biological assessment procedures under section 7 may be consolidated

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equivalence' rationale, we are confident that Congress did not intend NEPA to apply to FIFRA registrations.").

NRDC relies on *Douglas County* and *Merrell*, which are "displacement" cases rather than "functional equivalent" cases. To our knowledge, none of the circuits that have adopted the "functional equivalent" test have held that the procedures set out by Section 7 of the ESA are equivalent to the EIS requirement. Although NRDC does not urge us to adopt the "functional equivalent" approach, we note that the factors considered in the preceding paragraphs are the same ones that we would address under that analysis. Regardless of the language used to conduct the analysis, the statutes and regulations reveal that Section 7 of the ESA and NEPA involve different processes that measure different kinds of environmental impacts.

with interagency cooperation procedures required by other statutes, such as the National Environmental Policy Act (NEPA)."). And, to our knowledge, there are no cases stating that an agency need not comply with NEPA because of its obligations under Section 7 of the ESA.

Next, the *Douglas County* court stated that there is no reason to prepare an EIS "when the action at issue does not alter the natural, untouched physical environment at all." *Douglas Cnty.*, 48 F.3d at 1505. We explained that "the purpose of NEPA is to protect the *physical* environment, and the purpose of preparing an EIS is to alert agencies and the public to potential adverse consequences to the land, sea or air." *Id.* Therefore, the designation of critical habitat, which results in the land at issue being left alone, does not require an EIS. Here, the BiOp does far more than leave nature alone. Humans have dramatically altered the Bay-Delta ecosystem. Even if we assume that implementing the BiOp is a step toward returning the ecosystem to its natural state, there is no doubt that project operations will continue to alter the physical environment, albeit in different ways. We have already interpreted this portion of *Douglas County* quite narrowly. *See Kootenai Tribe of Idaho v. Veneman*, 313 F.3d 1094 (9th Cir. 2002) (abrogated on other grounds by *Wilderness Soc'y v. U.S. Forest Serv.*, 630 F.3d 1173 (9th Cir. 2011)). In *Kootenai Tribe*, the agency announced a "Roadless Rule" that prohibited construction of new roads in certain areas. *Kootenai Tribe*, 313 F.3d at 1105. We considered an argument that NEPA should not apply to the agency's action in light of the *Douglas County* court's statement that "an EIS is not required to leave nature alone." *Id.* at 1114 (quoting *Douglas Cnty.*, 48 F.3d at 1505). We held that "[b]ecause human intervention, in the form of forest management, has been part of the fabric of our national

forests for so long, we conclude that, in the context of this unusual case, the reduction in human intervention that would result from the Roadless Rule actually does alter the environmental status quo . . . . The Forest Service's Roadless initiative thus required an EIS under NEPA." *Id.* at 1115. An action to lessen one form of pressure on the natural environment, such as Reclamation's implementation of the BiOp, is distinguishable from a decision to continue to leave a portion of nature untouched altogether.

At its broadest point, our opinion in *Douglas County* implied that the agency's designation of critical habitat did not trigger NEPA review because it was an environmental preservation effort. We explained that "[b]y designating critical habitats for endangered or threatened species, the Secretary 'is working to preserve the environment and prevent the irretrievable loss of a natural resource.' Thus the action of the Secretary in designating a critical habitat furthers the purpose of NEPA. Requiring the EPA to file an EIS 'would only hinder its efforts at attaining the goal of improving the environment.'" *Douglas Cnty.*, 48 F.3d at 1506. We recently applied this principle in *Drakes Bay Oyster*, where we wrote that "[t]he Secretary's decision is essentially an environmental conservation effort, which has not triggered NEPA in the past." *Drakes Bay Oyster*, 729 F.3d at 984 (citing *Douglas Cnty.*, 48 F.3d at 1505–06).

We do not read either *Douglas County* or *Drakes Bay Oyster* to stand for the proposition that efforts to preserve the natural environment are per se exempt from NEPA.[52] As

[52] We recently observed that our court has yet to hold that an agency that *has already produced an EA* need not produce an EIS when the action in question will only have beneficial impacts on the environment. *See*

noted, the *Douglas County* court relied on the observation that designating critical habitat under Section 4 of the ESA is an "action[] that do[es] nothing to alter the natural physical environment." *Douglas Cnty.*, 48 F.3d at 1505. Similarly, in *Drakes Bay Oyster*, the only purported "adverse environmental consequences" of designating the area in question as a wilderness were "short-term harms, such as noise associated with heavy machinery needed to remove Drakes Bay's structures" in order to return the area to its natural state. *Drakes Bay Oyster*, 729 F.3d at 984. We noted that "such relatively minor harms do not by themselves 'significantly affect[]' the environment in such a way as to

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Humane Soc'y of U.S. v. Locke, 626 F.3d 1040, 1056 (9th Cir. 2010) ("As a threshold matter, plaintiffs' argument appears to raise an issue of first impression in this circuit: whether NEPA requires an agency to prepare an EIS when an action has a significant *beneficial* impact but not significant *adverse* impact on the environment."); *see also id.* at 1046 ("[T]o comply with NEPA, NMFS prepared an environmental assessment . . . . The final environmental assessment resulted in a finding of no significant impact under NEPA."). In *Humane Society*, we did not resolve the question whether an agency that has produced an EA showing significant beneficial environmental impacts and no adverse environmental impacts must still complete an EIS. *See id.* at 1056.

In order to hold that Reclamation need not comply with NEPA, we would need to take two substantial steps forward because, in this case, Reclamation did not even complete an EA. We see no basis for holding that an agency can avoid NEPA review altogether when it believes that an agency action will have beneficial impacts on the environment when we have not even excused an agency from producing an EIS when its EA shows that its action will have exclusively beneficial impacts on the environment. In other words, even if we had some basis for assuming that Reclamation's implementation of the BiOp would have exclusively beneficial impacts on the environment, we would still lack a firm foundation for holding that Reclamation need not prepare an EA and, if necessary, an EIS.

implicate NEPA." *Id.* But here, NRDC does not even contest the district court's conclusion that implementation of the BiOp "significantly affect[s] the human environment." *See San Luis & Delta-Mendota*, 686 F. Supp. 2d at 1050. Whatever effects implementing the BiOp might have on the human environment, it is apparent that they are more complex and wide-ranging than the removal of a few buildings in *Drakes Bay Oyster*.

At this point, we can only speculate about what kind of significant effects will eventually result from implementation of the BiOp because Reclamation has not yet completed its EIS. But it is beyond dispute that Reclamation's implementation of the BiOp has important effects on human interaction with the natural environment. We know that millions of people and vast areas of some of America's most productive farmland will be impacted by Reclamation's actions. Those impacts were not the focus of the BiOp. In sum, we cannot reach an informed decision about the extent to which implementation of the BiOp is an environmental preservation action in the vein of *Douglas County* and *Drakes Bay Oyster* because we do not know how the action will impact the broader natural environment. We find no basis for exempting Reclamation from the EIS requirement. *See Methow Valley Citizens Council*, 490 U.S. at 349 ("NEPA ensures that important effects will not be overlooked or underestimated only to be discovered after resources have been committed or the die otherwise cast."). We recognize that the preparation of an EIS will not alter Reclamation's obligations under the ESA. But the EIS may well inform Reclamation of the overall costs—including the human costs—of furthering the ESA. So informed, Reclamation has

the option of seeking an exemption from the ESA from the Endangered Species Committee. *See* 16 U.S.C. § 1536(e).[53]

Finally, NRDC argues that Reclamation's issuance of the 2004 OCAP is the "major Federal action[]" that should have been subject to NEPA review instead of its implementation

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[53] The Endangered Species Committee is the exclusive avenue through which an applicant may obtain an exemption from the ESA's substantive prohibitions. *See* 16 U.S.C. §1536(a)(2) ("Each federal agency shall . . . 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 . . . unless such agency has been granted an exemption for such action by the Committee pursuant to [16 U.S.C. § 1536(h)]."); *see also Portland Audubon Soc'y v. Endangered Species Comm.*, 984 F.2d 1534, 1537 (9th Cir. 1993) ("The Committee was created by the Endangered Species Act for the sole purpose of making final decisions on applications for exemptions from the Act . . . . Because it is the ultimate arbiter of the fate of an endangered species, the Committee is known as "The God Squad."). The Committee has only convened on a handful of occasions and has only granted two exemptions. *See Portland Audubon Soc'y*, 984 F.2d at 1537. Commentators have discussed whether action from the Committee would be appropriate under these circumstances. *See generally* Eric M. Yuknis, Note, *Would a "God Squad" Exemption under the Endangered Species Act Solve the California Water Crisis?*, 38 B.C. Envtl. Aff. L. Rev. 567 (2011).

For our purposes, it is worth noting that the possibility of review by the Endangered Species Committee, however unlikely it may be, renders the preparation of an EIS more than a mere academic exercise in cases involving Section 7 of the ESA. Although the agency cannot ignore its obligations under the ESA because of the impacts on other aspects of the human environment, the Committee might wish to consider these factors in making an exemption decision. And, as previously noted, the statute contemplates that the agency will have completed an EIS by providing that the Committee itself need not do so if the agency has already prepared an EIS with respect to the action subject to the Committee's review. *See* 16 U.S.C. § 1536(k).

of the 2008 BiOp. In a different case, NRDC alleged that Reclamation's "approval and implementation" of the 2004 OCAP triggered its obligation to complete an EIS. *See Pac. Coast Fed'n of Fishermen's Ass'n/Inst. for Fisheries Res. v. Gutierrez*, No. 1:06-cv-00245, 2007 WL 1752289, at *4 (E.D. Cal. June 15, 2007). In *Gutierrez*, the district court held that the 2004 OCAP was not subject to NEPA because its was not a "final agency action." *See id.* at *12–13 ("[The OCAP] do[es] not implement any actions or inactions. They are informational. If any proposed changes are initiated that will have the requisite effect on the environment, such changes will be agency action subject to NEPA review. The purpose of the OCAP is 'to serve as a baseline description of the facilities and operating environment of the CVP and SWP.'").

NRDC contends that *Gutierrez* was wrongly decided and that the district court should have required Reclamation to complete an EIS on the 2004 OCAP. Yet NRDC and the other plaintiffs in *Gutierrez* did not appeal the district court's decision concerning its NEPA claims. Not only is NRDC collaterally estopped from relitigating the decision in *Gutierrez*, but the issue is also not pertinent to our holding that Reclamation's implementation of the BiOp requires the agency to prepare an EIS. Even if Reclamation's implementation of the 2004 OCAP was a final decision that changed the status quo of the project operations in a way that significantly affected the environment, that does not mean that Reclamation's implementation of the 2008 BiOp did not *also* change the status quo in a way that significantly alters the environment, thereby requiring an additional EIS.

NRDC bolsters its contention that NEPA should apply to the 2004 OCAP in lieu of the 2008 BiOp by referencing Section 7 of the ESA and its regulations. As noted above, the

statute and its regulations explain that an action agency like Reclamation can coordinate the preparation of its biological assessment with its obligations under NEPA. *See* 16 U.S.C. § 1536(c)(1); 50 C.F.R. § 402.06. NRDC reasons that these provisions suggest that NEPA review of the BiOp is not required because Reclamation could not complete its EIS until after its Section 7 consultation with the FWS rather than at the same time as its consultation obligations. But even if we fully credit this line of reasoning, it does not affect our conclusion that NEPA applies to Reclamation's implementation of the BiOp. We need not locate affirmative and unequivocal confirmation in every substantive statute that a particular agency action requires NEPA review; most substantive statutes never mention NEPA at all. They do not need to because NEPA itself provides that "to the fullest extent possible . . . all agencies of the Federal Government shall" complete an EA and, if necessary, an EIS for all "major Federal actions significantly affecting the quality of the human environment." 42 U.S.C. § 4332(2)(C). The fact that Section 7 of the ESA expressly mentions the EIS requirement supports, rather than rebuts, the notion that NEPA applies to the action at issue here.

Our starting point was that NEPA applies to Reclamation's implementation of the BiOp because it is a "major Federal action[] significantly affecting the quality of the human environment." We acknowledge that we have previously held that the EIS requirement does not apply to particular agency actions even in the absence of an express statutory exemption. *See Drakes Bay Oyster*, 729 F.3d at 984; *Douglas Cnty.*, 48 F.3d at 1507; *Merrell*, 807 F.2d at 781. But the factors identified in those cases are simply not present here. We are cognizant of our commitment to avoid "mak[ing] NEPA more of an 'obstructionist tactic' to prevent

environmental protection than it may already have become." *Douglas Cnty.*, 48 F.3d at 1508; *see also Drakes Bay Oyster*, 729 F.3d at 984. But, as noted, the district court remanded the BiOp and RPAs without vacatur, and it continues to actively manage Reclamation's deadline for completing the EIS process. We conclude that Reclamation is obligated to comply with NEPA, and we affirm the judgment of the district court with respect to the NEPA claims.

VI. CONCLUSION

For the forgoing reasons, the judgment of the district court is reversed in part and affirmed in part. The matter is remanded to the district court for further proceedings consistent with this opinion. Each party shall bear its own costs on appeal.

REVERSED IN PART AND AFFIRMED IN PART.

GLOSSARY OF TERMS

APA	Administrative Procedure Act
BA	Biological Assessment
Bay-Delta	San Francisco Bay and Sacramento-San Joaquin Delta
BiOp	2008 biological opinion
CALFED	CALFED Bay-Delta Program
cfs	cubic feet per second
CVP	Central Valley Project
CVPIA	Central Valley Project Improvement Act
DWR	California Department of Water Resources
EIS	Environmental Impact Statement
ESA	Endangered Species Act
FCRPS	Federal Columbia River Power System
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FMWT	Fall Midwater Trawl index
FWS	U.S. Fish and Wildlife Service

ITS	incidental take statement
NMFS	National Marine Fisheries Service
NEPA	National Environmental Protection Act
OCAP	2004 Operating Criteria and Plan
OMR	Old and Middle Rivers
RPA	reasonable and prudent alternatives
Reclamation	U.S. Bureau of Reclamation
SWP	State Water Project

ARNOLD, Circuit Judge, concurring in part and dissenting in part:

I respectfully dissent from Parts III, IV.A, IV.B, IV.E, and V.B of the court's opinion and concur in the rest of it. I address the issue dealt with in Part III as it arises in considering the merits of the challenges to the BiOp.

1. I do not believe that the district court erred in holding that the BiOp's OMR flow limits were set arbitrarily and capriciously. First of all, I discern no error in admitting a portion of the declaration from Dr. Richard Deriso, who holds advanced degrees in mathematics and biomathematics, discussing the use of raw salvage data to justify the flow prescription. A decision to include evidence that is outside the administrative record is reviewed for abuse of discretion,

see Lands Council, 395 F.3d at 1030 n.11, and admitting this evidence fell within one of the narrow exceptions to the general rule against extra-record evidence, because it was necessary to explain technical terms or complex subject matter, *see Nw. Envtl. Advocates v. Nat'l Marine Fisheries Serv.*, 460 F.3d 1125, 1145 (9th Cir. 2006). Furthermore, Dr. Deriso's declarations were consistent with advice offered by independent peer reviewers and draft notes of a delta smelt evaluation team at FWS assembled before the final BiOp issued, and with the testimony of Rule 706 experts Dr. Punt and Dr. Quinn, who recognized Dr. Deriso's declarations and stated that the validity of the flow regimes specified in the BiOp was undermined by its incomplete analysis. Nor was there any "battle of the experts" here, as the court maintains, because the responses to Dr. Deriso's declarations from FWS's mathematical statistician, Dr. Ken Newman, were mostly vague, and he generally agreed with Dr. Deriso that salvage should be scaled by some measure of population abundance.

As for the merits of this issue, Appellants do not contend that the use of raw salvage data was scientifically acceptable; they maintain instead that the flow prescription also relied on and was supported by other information. Based on my review of this information, however, the BiOp did not connect it to flow limits at all, or there was no explanation for why it yielded the flow prescription that the BiOp specified. As to FWS's use of normalized data in the ITS, I am not convinced that this is relevant to whether it was scientifically sound for FWS to use only raw salvage data to set the flow prescription. While certain DWR comments support the flow prescription, the parties do not dispute that these comments arose from the district court's previous remedial imposition of such a prescription, which, as the district court noted,

occurred before the court became aware that using raw salvage data was not accepted scientific methodology. Because FWS based its flow prescription solely on the unexplained use of raw salvage data, I believe that its expertise in methodological matters is not entitled to deference, since that use was not rationally connected to the best available science, *see W. Watersheds Project v. Kraayenbrink*, 632 F.3d 472, 493 (9th Cir. 2011); and because FWS did not consider all relevant factors or articulate a rational connection between the facts found and the choices made, I agree with the district court that its determination as to the flow prescription was arbitrary and capricious, *see id.* at 496.

2. I also concur in the district court's conclusion that the BiOp's determination of X2 was arbitrary and capricious. First of all, there was no abuse of discretion in the district court's decision to admit the declarations of Aaron Miller, a DWR technical engineer who worked closely with Reclamation to develop Calsim II, which were relevant to the Calsim II-Dayflow comparison. *See Lands Council*, 395 F.3d at 1030 n.11. No battle of the experts was created by doing so: Miller's assessment of the validity of the Calsim II-Dayflow comparison was consistent with the testimony of Rule 706 experts Drs. Quinn and Punt, who recognized Miller's assessment; and the declarations of FWS hydrologist Derek Hilts—whose credentials and experience are similar to Miller's, and who helped draft the BiOp—were mostly unresponsive to Miller's declarations on the several sources of bias that the comparison introduced. In my view, the district court relied on this extra-record evidence simply to determine whether FWS had considered all relevant factors, here, the sources of bias, *see Nw. Envtl. Advocates*, 460 F.3d at 1145, before relying on the comparison to analyze the

effects of proposed Projects operations on smelt and its habitat, including X2's location. Doing so was well within the court's role. Because highly technical matters were involved, it was difficult to determine if FWS considered all relevant factors without looking outside the record to see what matters should have considered, but were not. *See Inland Empire Pub. Lands Council v. U.S. Forest Serv.*, 88 F.3d 754, 760 n.5 (9th Cir. 1996). The district court could not properly discharge its duty to engage in "'substantial inquiry'" by simply taking FWS's word that it had considered all relevant matters. *See Asarco*, 616 F.2d at 1160.

FWS's choice to use the Calsim II-Dayflow comparison was unsupported by the requisite reasoned analysis. *See Ecology Ctr. v. Castaneda*, 574 F.3d 652, 665 (9th Cir. 2009). Comments received from DWR and other entities—which were echoed by the Rule 706 experts' testimony—alerted FWS to the several sources of bias, yet the only explanation in the BiOp for using the comparison was that a Calsim II to Calsim II comparison that FWS had conducted did not show differences that were expected. As the district court noted, the record did not reflect that FWS considered, much less recognized, the sources of bias. Furthermore, there are significant differences between the two models, including how X2 positions are determined. FWS would have to address these significant differences in some way to obtain information on which it could reasonably rely to base the BiOp's conclusions, including Action 4 on the management of X2's location. FWS was required to provide some evidence supporting its conclusions to ensure that no clear error of judgment rendered its actions arbitrary and capricious. *See League of Wilderness Defenders-Blue Mountains Biodiversity Project v. U.S. Forest Serv.*, 549 F.3d 1211, 1218 (9th Cir. 2008). Appellants do not dispute that

the sources of bias existed, or that the biases were significant or material; and the clear purpose of requiring FWS to use the best scientific evidence available is to ensure that the ESA is not implemented haphazardly or based on surmise or speculation. *See Pac. Coast Fed'n of Fishermen's Ass'ns*, 426 F.3d at 1094–95.

Finally, I agree with the district court that FWS did not sufficiently explain why 74 km and 81 km were selected as critical points for X2 to preserve smelt habitat. The district court was not therefore required to give FWS deference on this matter, as FWS's reasoning could not be reasonably inferred from the record. *See San Luis & Delta-Mendota Water Auth.*, 672 F.3d at 700. As to the other justifying evidence, it either does not relate to the choice of critical points or it is undisputed that it was offered for the first time in post-judgment proceedings. I am reluctant to pass over the absence of an adequate explanation in the administrative record by relying on Appellants' post-hoc rationalizations. *See Humane Soc'y of United States v. Locke*, 626 F.3d 1040, 1049–50 (9th Cir. 2010).

3. I find no authority requiring FWS to address specifically and analyze, in the BiOp or administrative record, the question of whether the RPA meets the non-jeopardy elements. I also question the district court's reliance on *Greenpeace v. Nat'l Marine Fisheries Serv.*, 55 F. Supp. 2d 1248 (W.D. Wash. 1999), for the proposition that there must be some explanation in the administrative record as to why FWS concluded that all four elements for a valid RPA were satisfied. Nonetheless, I would affirm the district court on this issue, because the record belies Appellants' contention that DWR and Reclamation raised no concerns about the non-jeopardy elements. The record shows that concerns were

raised relating to RPA feasability and its relationship to the action's intended purpose (providing water for various uses), and possibly to DWR's and Reclamation's authority to implement the RPA. Thus, under FWS's own interpretation of § 402.02, it was required to consider and address these elements specifically in the instant BiOp or administrative record.

4. Finally, as the action agency, Reclamation could not rely solely on FWS's BiOp to establish conclusively its compliance with its substantive obligations under ESA § 7, because it could not delegate its responsibility to see that its actions would not jeopardize smelt, *see Pyramid Lake*, 898 F.2d at 1415; and as the action agency it could not blindly adopt FWS's conclusions because it is ultimately responsible for ESA compliance, *see City of Tacoma, Wash. v. Fed. Energy Regulatory Comm'n*, 460 F.3d 53, 76 (D.C. Cir. 2006). I agree with the district court that Reclamation would be subject to independent ESA liability if it possessed new information not considered by FWS which challenged the BiOp's conclusions, *see Pyramid Lake*, 898 F.3d at 1415, and that there is no indication that this occurred here. But the district court failed to consider another basis for finding an action agency independently liable, namely, reliance on a legally flawed BiOp. Discerning such flaws involves no technical or scientific expertise, so failure to do so may result in action based on reasoning not in accordance with the law thus rendering the action arbitrary and capricious. *See Wild Fish Conservancy v. Salazar*, 628 F.3d 513, 532 (9th Cir. 2010). The district court's legal conclusions necessarily arose from fact-finding, but the court clearly, and I believe correctly, concluded that FWS had not used the best available science or considered relevant factors, and had acted arbitrarily and capriciously, because, among other things, it

relied on the Calsim II-Dayflow comparison, and did not use normalized salvage data to set the flow prescription. The district court therefore should have found Reclamation independently liable under ESA § 7 for accepting a legally flawed BiOp and immediately beginning implementation of the RPA by modifying operations.

In sum, I find no abuse of discretion in the district court's limited admission of evidence outside the administrative record as relevant to the OMR flow limits and the determination of X2, including the use of the Calsim II-Dayflow comparison. I believe that in determining whether FWS's decisions on these matters in the BiOp were arbitrary, capricious, or otherwise not in accordance with the law, the district court's analysis was thorough and well-reasoned. While I disagree with the basis for the district court's conclusion that the non-jeopardy elements must be addressed in the BiOp or administrative record, I nonetheless believe that affirmance is warranted on this issue. Finally, I believe the district court should have found Reclamation independently liable under the ESA for relying on a legally flawed BiOp.

RAWLINSON, Circuit Judge, concurring in part and dissenting in part:

I concur in the bulk of the majority opinion. I disagree only with the rationale and conclusion that the Bureau of Reclamation's adoption and implementation of the Biological Opinion triggered its obligation to comply with the National Environmental Policy Act (NEPA) by preparing an

Environmental Impact Statement that is generally required under the Endangered Species Act.

It is important to keep in mind that the Bureau of Reclamation adopted and implemented the detailed Biological Opinion in this case to alleviate harm to threatened and endangered species and/or their critical habitat caused by operation of the federally operated Central Valley Water Project and the state operated State Water Project.

As an initial matter, I do not agree that the adoption of "reasonable and prudent alternatives" to alleviate harm to threatened and endangered species and/or their critical habitat from *ongoing* operations of the water projects constituted a "major Federal action" triggering the requirement of an Environmental Impact Statement. *See* 42 U.S.C. § 4332(2)(C) (requiring the preparation of an Environmental Impact Statement for "major Federal actions"). I am persuaded toward that view by our rationale in two cases with facts similar to those in this case. The first is *Upper Snake River Chapter of Trout Unlimited v. Hodel*, 921 F.2d 232 (9th Cir. 1990). In *Upper Snake River*, the panel posed the following question: "Did the District Court err in concluding that the National Environmental Policy Act) ("NEPA") did not require the Bureau of Reclamation ("Bureau") to prepare environmental impact statements ("EIS") before periodically adjusting the flow of water from the Palisades Dam?" The panel responded: "We are clear that the answer is 'No.'" *Id.* at 233.

To apply the reasoning of *Upper Snake River*, we need only change the name of the dam in the question posed. To me, the answer is equally clear. The Bureau of Reclamation was not required to prepare an Environmental Impact

Statement when it adopted the reasonable and prudent alternatives from the Biological Opinion to set flow limits for water controlled by the Central Valley water project.

Much like the water supply in the Central Valley, the amount of water in the Snake River "fluctuates considerably from year to year, depending on the amount of snow pack in the mountains. . . ." *Id*. Water from the river is captured in reservoirs and the water flow is controlled and regulated by dams. *See id*. The Plaintiffs challenged the Bureau of Reclamation's decision to reduce the flow rate below 1,000 cubic feet per second in times of less precipitation. *See id*. at 234. In rejecting the contention that NEPA was applicable, the district court held:

> In the case of the Palisades Dam, the fluctuating flows are routine actions which are contingent upon Mother Nature for snow-pack, runoff, precipitation and carryover. As part of its routine and ongoing operations, the Bureau of Reclamation fluctuates the flows depending upon weather conditions past and future. Overall, the Court views the fluctuation of flows below Palisades as "ongoing operations," *which do not have to comply with . . . NEPA*.

Id. (alterations omitted) (emphasis added).

Once again and without equivocation, the panel concluded: "[W]e are clear that the district court's conclusion was correct." *Id*. The panel explicitly determined that water flow fluctuation was not a "major Federal action" under NEPA. *Id*. As with Central Valley operations, the

Palisades project was completed well before the effective date of NEPA. *See id*. According to the panel, post-construction fluctuation of water flow constituted routine operation of the dam rather than a major action triggering NEPA requirements. *See id*. at 234–35.

The panel relied heavily on the reasoning in *Trinity County v. Andrus*, 438 F. Supp. 1368 (E.D. Cal. 1977). In *Trinity County*, Plaintiffs sought an injunction prohibiting the Bureau of Reclamation from lowering the water level in the Central Valley water project during a drought year. *See id*. at 1371. The district court framed the issue as "not whether the actions are of sufficient magnitude to require the preparation of an [Environmental Impact Statement], but rather whether NEPA was intended to apply at all to the continuing operations of completed facilities. . . ." *Id*. at 1388 (citation omitted).

The district court distinguished water flow determinations from cases "when a project takes place in incremental stages of major proportions or when a revision or expansion of the original facilities is contemplated . . ." *Id*. (citations omitted). The district court in *Trinity County* also noted that the Bureau of Reclamation had not enlarged its diversion capacity, or revised its procedures or standards for release of water or draws from reservoirs. *See id*. at 1388–89. Under these circumstances, the requirements of NEPA simply were not triggered. *See id*. Taking its cue from *Trinity County*, the panel in *Upper Snake River* reasoned that:

> The Federal defendants in this case had been operating the dam for upwards of ten years before the effective date of [NEPA]. During that period, they have from time to

> time and depending on the river's flow level, adjusted up or down the volume of water released from the Dam. What they did in prior years and what they were doing during the period under consideration were no more than the routine managerial actions regularly carried on from the outset without change. They are simply operating the facility in the manner intended. In short, they are doing nothing new, nor more extensive, nor other than that contemplated when the project was first operational. . . .

921 F.2d at 235.

Because the Bureau of Reclamation similarly continued to do nothing more than "monitor[ ] and control . . . the flow rate to ensure that the most practicable conservation of water is achieved," *id*. at 235–36, the panel concluded that no Environmental Impact Statement was required. *See id*. at 236; *see also Grand Canyon Trust v. United States Bureau of Reclamation*, 691 F.3d 1008, 1021–22 (9th Cir. 2012), *as amended* (citing *Upper Snake River* and similarly concluding that execution of annual operating plans regulating fluctuations in water flow was "not a major federal action requiring compliance with NEPA"); *Burbank Anti-Noise Group v. Goldschmidt*, 623 F.2d 115, 116 (9th Cir. 1980) ("An EIS need not discuss the environmental effects of mere continued operation of a facility. . . .") (citation omitted).

The second case with similar facts is *Douglas County v. Babbitt*, 48 F.3d 1495 (9th Cir. 1995). In *Douglas County*, the panel considered whether the designation of critical habitat under the Endangered Species Act required

compliance with NEPA. *See id*. at 1497. In the process of deciding that issue, the panel focused on the difference between the requirements and purpose of NEPA and the requirements and purpose of the Endangered Species Act. "The [Endangered Species Act] furthers the goals of NEPA *without demanding an [Environmental Impact Statement*]. . ." *Id*. at 1506 (emphasis added). Indeed, "[t]he [Endangered Species Act] is a substantive statute whose goal is to prevent extinction . . . By designating critical habitats . . . the Secretary is working to preserve the environment . . ." *Id*. at 1506 (citations and internal quotation marks omitted). The panel concluded that the designation of critical habitat "further[ed] the purpose of NEPA [and] [r]equiring the [agency] to file an EIS would only hinder its efforts at attaining the goal of improving the environment." *Id*. (citation and internal quotation marks omitted).

In contrast to the substantive nature of the Endangered Species Act, "NEPA is essentially a procedural statute designed to insure that environmental issues are given proper consideration in the decisionmaking process. . . ." *Trustees for Alaska v. Hodel*, 806 F.2d 1378, 1382 (9th Cir. 1986) (citation omitted). "NEPA does not mandate particular results, but simply provides the necessary process to ensure that federal agencies take a hard look at the environmental consequences of their action." *Kootenai Tribe of Idaho v. Veneman*, 313 F.3d 1094, 1115–16 (9th Cir. 2002), *overruled in part on other grounds, Wilderness Soc'y v. United States Forest Serv*., 630 F.3d 1173, 1178–79 (9th Cir. 2011) (citation and internal quotation marks omitted). "The purpose of NEPA is to provide a mechanism to enhance or improve the environment and prevent further irreparable damage." *Drakes Bay Oyster Co. v. Jewell*, No. 13-15227, 2014 WL 114699 at *12 (9th Cir. Jan. 14, 2014), *as amended* (citation

and internal quotation marks omitted). An Environmental Impact Statement implements the NEPA regulations by "rigorously explor[ing] and objectively evaluat[ing] all reasonable alternatives to a proposed action . . ." *Southeast Alaska Conserv. Council v. Federal Highway Admin*., 649 F.3d 1050, 1056 (9th Cir. 2011) (quoting 40 C.F.R. § 1502.14(a)). An agency does not violate NEPA by declining to re-examine alternatives that have previously been evaluated. *See, e.g.*, *Honolulu Traffic.com v. Federal Transit Admin*., No. 13-15277, 2014 WL 607320 at *6 (9th Cir. February 18, 2014).

It is undisputed that the Biological Opinion "rigorously explore[d] and objectively evaluate[d] all reasonable alternatives" over hundreds of pages. 40 C.F.R. § 1502.14(a). Indeed, the express purpose of the Biological Opinion was to develop reasonable and prudent alternatives to the existing activities that were harmful to the environment. *See* 50 C.F.R. § 402.14 (setting forth formal consultation procedures to ensure that the impact of proposed actions on listed species and their critical habitat are fully considered); *see also Save the Yak Committee v. Block*, 840 F.2d 714, 718 (9th Cir. 1988), *as amended* (noting the NEPA requirement that an environmental assessment "include brief discussions of the environmental impacts of the proposed action and *alternatives*") (emphasis added).

As with the habitat listing in *Douglas County*, the Biological Opinion in this case served the same function as an Environmental Impact Statement. *See* 48 F.3d at 1498 ("The EIS is a procedural obligation designed to assure that agencies give proper consideration to the environmental consequences of their actions. . . .") (citation and internal quotation marks omitted). Because the NEPA requirements

are designed to "provide a mechanism to enhance or improve the environment and prevent further irreparable damage" to the environment, no Environmental Impact Statement is needed "for federal actions that conserve the environment. . . ." *Id*. at 1505 (citation and footnote reference omitted). In this circumstance, as in *Douglas County*, "the NEPA procedure seem[s] superfluous." *Id*. at 1503 (internal quotation marks omitted). As the panel recognized in *Drakes Bay*, if the federal decision "is essentially an environmental conservation effort," NEPA obligations are not triggered. 2014 WL 114699 at *12. The panel explained that the Endangered Species Act "*furthers the goals of NEPA* without demanding an EIS. . . ." *Id*. (quoting *Douglas County*, 48 F.3d at 1505, 1506) (emphasis in *Drakes Bay*). We should be similarly "reluctant to make NEPA more of an obstructionist tactic to prevent environmental protection than it may already have become." *Id*. at *13 (quoting *Douglas County*, 48 F.3d at 1508). At this point, imposing an overlay of NEPA requirements "would only hinder [the Bureau of Reclamation's] efforts at attaining the goal of improving the environment." *Douglas County*, 48 F.3d at 1506 (citation omitted). *See Majority Opinion*, pp. 149–50 ([T]he preparation of an EIS will not alter Reclamation's obligations under the ESA. . . ."). There is no need to require the Bureau of Reclamation to engage in scientific busywork. "This case simply does not present the type of situation NEPA was intended to address." *Burbank Anti-Noise Group*, 623 F.2d at 117.

I respectfully dissent.