

United States Court of Appeals For the First Circuit

No. 23-1501

NANTUCKET RESIDENTS AGAINST TURBINES; VALLORIE OLIVER,

Plaintiffs, Appellants,

v.

U.S. BUREAU OF OCEAN ENERGY MANAGEMENT; NATIONAL OCEANIC AND
ATMOSPHERIC ADMINISTRATION; NATIONAL MARINE FISHERIES SERVICE;
DEBRA HAALAND, Secretary of the Interior; GINA M. RAIMONDO,
Secretary of Commerce; VINEYARD WIND 1, LLC,

Defendants, Appellees.

APPEAL FROM THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF MASSACHUSETTS

[Hon. Indira Talwani, U.S. District Judge]

Before

Kayatta, Lynch, and Gelpí,
Circuit Judges.

Thomas Stavola, Jr. for appellants.

Thekla Hansen-Young, with whom Todd Kim, Assistant Attorney General, Environment & Natural Resources Division, U.S. Department of Justice, Luther L. Hajek, Perry Rosen, Mark Arthur Brown, Angela Ellis, Kevin W. McArdle, Pedro Melendez-Arreaga, Assistant Solicitor, U.S. Department of the Interior, Stephen R. Vorkoper, Lea Tyhach, Attorney Advisor, Office of General Counsel, National Oceanic and Atmospheric Administration, and Scott Farley were on brief, for the federal appellees.

Peter R. Steenland, with whom David T. Buente, Jr., Peter C. Whitfield, James R. Wedeking, Kathleen Mueller, Brooklyn Hildebrandt, Jack W. Pirozzolo, and Sidley Austin LLP were on brief, for appellee Vineyard Wind 1, LLC.

April 24, 2024

KAYATTA, Circuit Judge. After consulting with the National Marine Fisheries Service ("NMFS"), the U.S. Bureau of Ocean Energy Management ("BOEM") approved the construction of Vineyard Wind, a wind power project off the coast of Massachusetts. A group of Nantucket residents -- organized as Nantucket Residents Against Turbines ("Residents") -- allege that the federal agencies violated the Endangered Species Act by concluding that the project's construction likely would not jeopardize the critically endangered North Atlantic right whale. The Residents further allege that BOEM violated the National Environmental Policy Act by relying on NMFS's flawed analysis.

We disagree. NMFS and BOEM followed the law in analyzing the right whale's current status and environmental baseline, the likely effects of the Vineyard Wind project on the right whale, and the efficacy of measures to mitigate those effects. Moreover, the agencies' analyses rationally support their conclusion that Vineyard Wind will not likely jeopardize the continued existence of the right whale. We therefore affirm the judgment of the district court. Our reasoning follows.

I.

A.

This case lies at the intersection of four federal environmental statutes: (1) the Outer Continental Shelf Lands Act ("OCSLA"), (2) the Endangered Species Act ("ESA"), (3) the Marine

Mammal Protection Act ("MMPA"), and (4) the National Environmental Policy Act ("NEPA").

1.

OCSLA authorizes the Secretary of the Interior to issue leases for offshore wind development. 43 U.S.C. § 1337(p)(1)(C). The Secretary has delegated her leasing authority to BOEM. 30 C.F.R. § 585.100. Before issuing an offshore lease, BOEM must "coordinate and consult with relevant [f]ederal agencies," and it must comply with the consultation requirements of other federal environmental statutes, such as the ESA. Id. § 585.203.

Once BOEM issues an offshore lease, its work is not done. The agency must also approve a site assessment plan and a construction and operations plan. See id. §§ 585.605, 585.620. The construction and operations plan must describe "all planned facilities that [the lessee] will construct and use," as well as "all proposed activities including [the lessee's] proposed construction activities, commercial operations, and conceptual decommissioning plans." Id. § 585.620(a)-(b). No construction may begin until BOEM approves the construction and operations plan. Id. § 585.620(c).

2.

Under section 7 of the ESA, a federal agency must consult with NMFS whenever an agency action "may affect" an endangered marine species like the right whale. 50 C.F.R. § 402.14(a); 16

U.S.C. § 1536(a)(2); see also 35 Fed. Reg. 18319, 18320 (Dec. 2, 1970) (declaring the right whale an endangered species). A section 7 consultation ends with NMFS issuing a biological opinion. 16 U.S.C. § 1536(b)(3)(A). In that opinion, NMFS must determine if the agency action is "likely to jeopardize the continued existence" of the endangered species. 50 C.F.R. § 402.14(h)(iv). NMFS must reach this determination after reviewing the "best scientific and commercial data available." Id. § 402.14(g)(8).

Section 9 of the ESA generally prohibits the "take" of an endangered species. 16 U.S.C. § 1538(a)(1)(B). To "take" an endangered species means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect," the species, or "to attempt . . . any such conduct." Id. § 1532(19). Relevant here are so-called "incidental takes." These are takes that "result from, but are not the purpose of," an agency's or applicant's otherwise lawful activity. 50 C.F.R. § 402.02.

Some incidental takes are allowed. 16 U.S.C. § 1536(b)(4), (o). As relevant here, incidental take approval requires NMFS to issue an "incidental take statement" along with the biological opinion. 50 C.F.R. § 402.14(i); 16 U.S.C. § 1536(b)(4). That statement must, among other things, (1) describe the extent of the anticipated incidental take; (2) outline reasonable measures to reduce and monitor such take;

and (3) incorporate measures to comply with section 101(a)(5) of the MMPA. See 50 C.F.R. § 402.14(i)(1).

3.

When the animal to be taken is an endangered marine mammal, NMFS may not "issue an incidental take statement . . . under the ESA until the take has been authorized under the MMPA. The incidental take statement must incorporate any mitigation measures required under the MMPA." Ctr. for Bio. Diversity v. Bernhardt, 982 F.3d 723, 742 (9th Cir. 2020) (internal citations omitted).

Like the ESA, the MMPA regulates actions that "harass" endangered species. See 16 U.S.C. §§ 1362(13), 1372(a). Under the MMPA, there are two types of harassment. Level A harassment is "any act of pursuit, torment, or annoyance" that has the "potential to injure a marine mammal or marine mammal stock in the wild." Id. § 1362(18)(A)(i), (18)(C). Level B harassment is less serious, and encompasses "any act of pursuit, torment, or annoyance" that has the "potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns." Id. § 1362(18)(A)(ii), (18)(D). NMFS may authorize the incidental harassment of a protected marine mammal if it makes

certain factual findings.¹ See 16 U.S.C. §§ 1373, 1374. This permission is called an incidental harassment authorization.

4.

Finally, there is NEPA. When a major federal agency action will have significant environmental effects, NEPA requires that the acting agency draft an environmental impact statement. See 42 U.S.C. § 4332(C); 40 C.F.R. § 1502.3. That statement must analyze, among other things, the "reasonably foreseeable environmental effects" of the proposed action, the "reasonable range of [technically and economically feasible] alternatives" to the proposed action, and reasonable measures to mitigate the environmental effects of the proposed action. 42 U.S.C. § 4332(C); see also Dubois v. U.S. Dep't of Agric., 102 F.3d 1273, 1286 (1st Cir. 1996). When considering the effects of a proposed agency action on an endangered species, the environmental impact statement may rely on, or incorporate the findings of, a biological opinion. See City of Tacoma v. FERC, 460 F.3d 53, 75-76 (D.C. Cir. 2006).

¹ The necessary findings will depend on the endangered marine mammal. See 16 U.S.C. § 1373(a) (requiring the Secretary of the Interior to prescribe regulations governing take of "each species of marine mammal as he deems necessary and appropriate"); id. § 1374(b)(1) (mandating that any permit for taking an endangered marine mammal comply with any applicable regulation promulgated under section 1373).

NEPA is a procedural statute. It "does not mandate particular results, but simply prescribes the necessary process" for evaluating an agency action's environmental effects. Robertson v. Methow Valley Citizens Council, 490 U.S. 332, 350 (1989). If an environmental impact statement sufficiently analyzes the likely environmental effects of a proposed agency action, the agency can still proceed on the grounds that "other values outweigh the environmental costs." Id.

B.

In 2014, BOEM made a small portion of the Massachusetts Wind Energy Area -- a section of the Outer Continental Shelf -- available for lease. See 79 Fed. Reg. 34771 (June 18, 2014). One year later, the agency leased a plot measuring 675 square kilometers to Vineyard Wind 1, LLC.

In 2017, Vineyard Wind submitted a construction and operations plan, proposing to build an offshore wind project in the northern portion of the lease area (the "wind development area"). The wind development area is located approximately fourteen miles southeast of Martha's Vineyard, and it will host turbines capable of generating approximately 800 megawatts of clean wind energy. That is enough energy to power 400,000 homes.

The federal agencies then began the environmental review process. In 2018, BOEM requested consultation with NMFS pursuant to section 7 of the ESA. Consultation began in April 2019. NMFS

issued its first biological opinion in September 2020, finding that the Vineyard Wind project would likely not jeopardize the continued existence of the right whale. The opinion also outlined mitigation measures to reduce the project's effects on the right whale. After new science became available, NMFS reinitiated consultation, eventually issuing an updated biological opinion in October 2021. The updated opinion also found that the project would likely not jeopardize the right whale's continued existence. Both the 2020 and 2021 versions of the biological opinion included incidental take statements. Those statements both concluded that, once Vineyard Wind adopted appropriate mitigation measures, the maximum anticipated take from project construction was Level B harassment -- caused by installation noise -- of twenty right whales.

BOEM issued its final environmental impact statement in March 2021. The environmental impact statement included its own analysis of how the proposed project would affect right whales and other marine mammals. It also included an appendix of mitigation measures.

In June 2021, relying on BOEM'S final environmental impact statement, NMFS published notice of its decision to issue an incidental harassment authorization for Level B harassment of up to twenty right whales. The Residents do not challenge the

incidental harassment authorization, which is the subject of a separate appeal before this court.

One month later, in July 2021, BOEM formally approved the Vineyard Wind construction and operations plan. Because NMFS's updated biological opinion was still pending at the time, BOEM's approval was subject to any new conditions or mitigation measures later identified in the updated biological opinion. In the meantime, BOEM's approval notice imposed the mitigation measures discussed in the environmental impact statement and the 2020 biological opinion. Several of those measures are relevant here:

- **Seasonal restrictions:** Vineyard Wind may not conduct any pile driving between January 1 and April 30. Right whales are more likely to be present in the lease area during this time of year.
- **Noise attenuation:** Vineyard Wind must install technology that reduces the distance that pile driving noise can travel underwater.
- **Soft start requirements:** Vineyard Wind must precede pile driving with "three strikes from the impact hammer at reduced energy, followed by a 1-minute waiting period." This process must take place three times before pile driving, so whales have time to leave the area.

- **Clearance and shutdown zones:** Vineyard Wind must determine that no whales are within the clearance zone before pile driving may begin, and it must immediately suspend pile driving if a whale enters the shutdown zone. The precise size of the clearance zone depends on several factors, such as time of year and type of foundation being installed. The radius of the shutdown zone is 3.2 kilometers for all foundation types.
- **Protected species observers:** Vineyard Wind must employ trained observers to watch for whales in the clearance and shutdown zones.
- **Passive acoustic monitoring:** Vineyard Wind must install monitoring technology to detect whale noise within the clearance and shutdown zones.
- **Vessel speed limits:** Project vessels must travel at ten or fewer knots while going to, from, or within the wind development area. Vessels carrying crew members may go faster, but they must use species observers and acoustic monitoring to watch for whales. If the crew vessels detect a whale, all vessels must obey the ten-knot speed limit for the rest of the day.

BOEM also imposed various post-construction mitigation measures. Among other things, Vineyard Wind must clean up the installation sites, monitor the health of the seabed and local plankton populations, monitor operational noise for at least three years, and share survey data with both indigenous tribes and the federal government.

In January 2022, after approving construction of Vineyard Wind, BOEM expressly adopted the findings of the updated October 2021 biological opinion. Given the similarity between the 2020 and 2021 versions of the biological opinion, BOEM concluded that "no further action [was] required in order for Vineyard Wind to proceed with construction and operation of the [wind project]."

C.

In August 2021, the Residents challenged BOEM's approval of Vineyard Wind in the District of Massachusetts. The Residents alleged that NMFS had violated the ESA by issuing a deficient biological opinion about Vineyard Wind's effects on the right whale. They further alleged that BOEM violated NEPA by failing to take the requisite "hard look" at Vineyard Wind's environmental impacts, and by relying on the allegedly defective updated biological opinion. The district court granted summary judgment to the federal agencies on all claims. The Residents appealed.

In their main brief on appeal, the Residents focus exclusively on alleged errors in NMFS's updated biological

opinion. They challenge BOEM's environmental impact statement only to the extent it relied on that opinion. We train our review accordingly, treating as waived any other independent challenges to the environmental impact statement. See Rife v. One W. Bank, F.S.B., 873 F.3d 17, 19 (1st Cir. 2017) (explaining that arguments not raised or properly developed in the opening brief are waived). Thus, we construe the Residents as arguing on appeal that (1) NMFS violated the ESA by issuing a flawed biological opinion,² and (2) BOEM violated NEPA by relying on NMFS's ostensibly flawed biological opinion.

II.

We review the district court's grant of summary judgment de novo. Dubois, 102 F.3d at 1283. Summary judgment is appropriate if there is "no genuine issue as to any material fact and . . . the moving party is entitled to judgment as a matter of law." Fed. R. Civ. P. 56(c).

We review biological opinions under § 706 of the Administrative Procedure Act.³ See Pac. Coast Fed. of Fishermen's Ass'ns v. U.S. Bureau of Reclamation, 426 F.3d 1082, 1090 (9th Cir. 2005); Strahan v. Linnon, No. 97-1787, 1998 WL 1085817, at *2

² For the remainder of this opinion, the phrase "biological opinion" will refer to NMFS's updated 2021 biological opinion, unless otherwise specified.

³ The same goes for environmental impact statements. See Dubois, 102 F.3d at 1284.

(1st Cir. July 16, 1998) (per curiam) (unpublished). As a result, we have a "narrow role to play." Dist. 4 Lodge of the Int'l Ass'n of Machinists & Aerospace Workers Loc. Lodge 207 v. Raimondo, 18 F.4th 38, 44 (1st Cir. 2021). We may set aside "an otherwise proper agency action if [the action] is arbitrary and capricious or . . . not based on substantial evidence." Id. (citing 5 U.S.C. § 706(2)(A), (E)). This standard of review is deferential, especially when the agency action involves "technical or scientific matters within the agency's area of expertise." Citizen's Awareness Net., Inc. v. U.S. Nuclear Reg. Comm'n, 59 F.3d 284, 290 (1st Cir. 1995). To survive judicial review, the agency need only show that it has "considered the relevant factors and articulated a rational connection between the facts found and the choice made." Balt. Gas & Elec. Co. v. Nat. Res. Def. Council, Inc., 462 U.S. 87, 105 (1983); see also Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co., 463 U.S. 29, 43 (1983).

Meanwhile, when reviewing a lead agency's reliance on a consulting agency's biological opinion, we must ask whether the reliance itself was arbitrary and capricious. See City of Tacoma, 460 F.3d at 75. Reliance can be arbitrary and capricious if the underlying biological opinion was deficient, or if the agency blindly adopted the biological opinion without conducting its own independent investigation. Id. at 75-76.

III.

The Residents' critiques of the biological opinion upon which BOEM's environmental impact statement relied fall into three buckets. First, the Residents allege that the biological opinion failed to properly analyze the current status and environmental baseline of the right whale. Second, they allege that the biological opinion ignored the effects of the Vineyard Wind project on right whales, while relying on flawed measures to mitigate those effects. Third, they allege that the biological opinion ignored the project's additive effects on the right whale's long-term recovery prospects.

We address each contention in turn.

A.

A consulting agency's biological opinion must "[e]valuate the current status and environmental baseline" of the affected endangered or threatened species. 50 C.F.R. § 402.14(g)(2). The phrase "environmental baseline" refers to the "condition of the listed species . . . without the consequences . . . caused by the proposed action." Id. § 402.02. NMFS must root this evaluation in the best available commercial and scientific data. Id. § 402.14(g)(8).

The Residents claim that the biological opinion ignored the best available data about the right whale's current status and

environmental baseline. They give three examples to support this argument. None of them is persuasive.

1.

The Residents argue that the biological opinion ignored a recent study -- the Quintana-Rizzo study -- that highlighted the growing importance of southern New England waters for right whale survival. Specifically, the Residents point to Quintana-Rizzo's findings that right whales are "becoming more reliant" on southern New England waters, and that certain spots in southern New England waters are "hotspot[s]" for whales to feed and socialize.

The record belies this challenge to the biological opinion. The opinion expressly acknowledged the growing importance of southern New England waters for right whales. For instance, the opinion noted that, as global temperatures have ticked up, "the location of feeding grounds has shifted, with . . . more [right whales] being observed in Cape Cod Bay . . . and south of Nantucket." The biological opinion also expressly cited Quintana-Rizzo for the proposition that waters off Rhode Island and Massachusetts "could be a feeding location for whales that stay in the mid-Atlantic and north during the winter-spring months and a stopover site for whales migrating to and from calving grounds." Finally, the biological opinion again cited Quintana-Rizzo to note that right whales "have been increasingly sighted" in waters off the coast of Massachusetts. Thus, NMFS

repeatedly acknowledged that right whales are increasingly present in southern New England waters.⁴

Furthermore, the biological opinion cited Quintana-Rizzo to note that certain "'hotspots' of higher use" had emerged in southern New England waters. But NMFS also noted Quintana-Rizzo's finding that whales have only used hotspots located in the project area during the spring, when pile driving is banned. So, nothing in Quintana-Rizzo's hotspot analysis rendered unreasonable the agency's conclusion that Vineyard Wind likely did not imperil the long-term survival of the right whale by interfering with "hotspots" in southern New England.

2.

The Residents next point to a chart in Quintana-Rizzo that illustrates a high rate of right whale sightings in the Massachusetts and Rhode Island Wind Energy Areas during August 2019. Broadly, Quintana-Rizzo looked at aerial survey data collected between 2011-2015 and 2017-2019. And in most surveyed years, sighting rates were highest between January and April, when pile driving for the Vineyard Wind project is banned. But in August 2019, there was a spike in sighting rates. According to

⁴ The Residents also suggest, in passing, that NMFS ignored another study -- Hayes 2021 -- that emphasized the importance of southern New England for the right whale. Because we find that the biological opinion expressly considered that phenomenon, we need not analyze Hayes 2021 individually.

the Residents, NMFS ignored the implication of this spike -- that right whales are increasingly present during a month (August) when pile driving is allowed. Thus, on the Residents' view, NMFS inadequately analyzed the current status and environmental baseline of the right whale.⁵

We disagree. In the biological opinion, NMFS concluded that the "best available information regarding marine mammal densities in the project area is provided by habitat-based density models" produced by a laboratory at Duke University. According to those models, right whales were most likely to be in the project area between January and April, with minimal presence in August. The agency then concluded that Quintana-Rizzo -- even though it relied on aerial surveys rather than habitat modeling -- was consistent with the habitat-based models. Indeed, Quintana-Rizzo found consistently high sighting rates during the January-April period, with a solitary outlier in August 2019. Thus, it was hardly unreasonable for NMFS to conclude that January-April was still the most popular timeframe for right whales in the project area.

⁵ The Residents also make this point to argue against the efficacy of seasonal restrictions as a mitigation measure. Our analysis here refutes that argument as well. We discuss the Residents' other challenges to Vineyard Wind's mitigation measures later in this opinion.

At bottom, the Residents are basically arguing that NMFS should have weighed Quintana-Rizzo's August 2019 finding more heavily than it did. But courts must "exercise great deference when [evaluating] claims about competing bodies of scientific research." See Nat'l Ass'n of Mfrs. v. EPA, 750 F.3d 921, 924 (D.C. Cir. 2014). NMFS concluded that habitat-based density models were the best available science on right whale distribution patterns. The Residents have not shown that this conclusion -- which itself "deserv[es] deference" -- was unreasonable. See Miccosukee Tribe of Indians of Fla. v. United States, 566 F.3d 1257, 1265 (11th Cir. 2009) (citing Marsh v. Or. Nat. Res. Council, 490 U.S. 360, 377-78 (1989)). NMFS then concluded that Quintana-Rizzo was consistent with the habitat-based density models. And based on our review of Quintana-Rizzo, we cannot say that this conclusion "jumped the rails of reasonableness." Nat'l Ass'n of Mfrs., 750 F.3d at 924. Accordingly, the agency's decisionmaking survives review.

3.

The Residents also argue that NMFS ignored data from two other studies -- Pettis 2021 and Hayes 2021. Both studies are annually updated assessments of right whale population and mortality trends. The Residents claim that NMFS ignored Pettis 2021's finding that whale deaths are outnumbering whale births, while dismissing Hayes 2021's finding that right whales have low

resilience to human-induced mortality. The Residents are mistaken once again.

Citing an earlier version of Pettis 2021 (i.e., Pettis 2020), the biological opinion clearly acknowledged that "numbers of births are well below the number needed to compensate for expected mortalities." And the opinion cited Pettis 2021 for the proposition that whale births are less frequent because they now occur (on average) every 7.6 years, which is an increase from historic calving intervals of 3-5.8 years. Thus, NMFS acknowledged the very finding in Pettis 2021 that the Residents claim went unacknowledged: that right whales face long-term population decline.

The Residents' claims about Hayes 2021 fare no better. While the biological opinion cites extensively to Hayes 2021, the Residents complain that the agency did not cite the study for the proposition that the right whale has a potential biological removal of 0.8,⁶ and is therefore susceptible to human-induced mortality. However, the biological opinion plainly acknowledges that the right whale's "resilience to future perturbations is expected to be very low." Elsewhere, the biological opinion also describes

⁶ Potential biological removal means the "maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population." 16 U.S.C. § 1362(20).

the right whale's population size as "small enough for the death of any individual to have measurable effects."

So, the biological opinion plainly discussed the unique vulnerability of the right whale population to human-induced mortality. Even if the agency did not explicitly cite Hayes 2021 to support that proposition, this does not render the biological opinion's findings arbitrary and capricious. What matters is that the agency recognized and acknowledged the phenomenon -- low resilience to the human-caused death of just one whale -- that Hayes 2021 identified.⁷

B.

The Residents next take aim at the biological opinion's analysis of Vineyard Wind's effects on right whales, and its related conclusion that certain measures could mitigate those effects. The Residents' arguments address four of Vineyard Wind's potential effects on right whales: (1) construction noise; (2) operational noise; (3) line entanglement; and (4) vessel strikes. We address each in turn.

⁷ To the extent the Residents are arguing that NMFS had to cite Hayes 2021's precise finding that right whales had a potential biological removal of 0.8, that argument is waived. The district court found that the Residents had not provided adequate notice of this argument in their notice of intent to sue, and the Residents do not challenge that holding on appeal. Nantucket Residents Against Turbines v. U.S. Bureau of Ocean Energy Mgmt., 675 F. Supp. 3d 28, 54-55 (D. Mass. 2023).

1.

The Residents argue that the biological opinion improperly analyzed the impact of construction noise (i.e., pile driving) on right whales. Basically, they argue that pile driving is guaranteed to cause Level A harassment, even though the biological opinion found that such harassment was "extremely unlikely."

The Residents' argument proceeds in three parts. First, they assert that a whale is subject to Level A harassment from construction noise when it is within 7.25 kilometers of the construction site. Second, they note that the shutdown zone -- that is, the zone in which pile driving must cease if a right whale is spotted -- only extends 3.2 kilometers from the site. The Residents suggest this zone is too small, because a whale can linger in the noisy zone (and thereby suffer Level A harassment) without triggering a shutdown. Third, the Residents claim that the measures to detect a whale in either the shutdown zone or the broader noisy zone are only marginally effective. So, the Residents argue, Level A harassment of at least one whale is effectively guaranteed, despite the biological opinion's contrary finding.

Each link in the Residents' logical chain is flawed.

First, the Residents' foundational premise is wrong. Level A harassment does not automatically occur when a whale is

within 7.25 kilometers of pile driving. The Residents fundamentally misread the relevant section of the biological opinion. As the government correctly notes in its brief, the "7.25-kilometer area corresponds to the area where Level A harassment . . . would result after cumulative exposure during a 24-hour period in which [a jacket foundation was] installed,"⁸ and where the only minimization measure was 6-dB sound attenuation. (Emphasis added). In other words, a whale within 7.25 kilometers of jacket foundation pile driving could only experience Level A harassment if it remained in that zone throughout the installation process, and if Vineyard Wind only used one minimization measure. Under those same conditions, immediate Level A harassment would only occur during jacket foundation installation if a right whale got within four meters of the pile driver. The Residents never assert that this is likely to happen.

Second, the Residents' challenge to the size of the 3.2-kilometer shutdown zone is moot to the extent it applies to jacket foundation installation. An appeal is moot if the reviewing court "cannot affect the matter in issue or cannot grant effectual relief." In re Cont. Mortg. Invs., 578 F.2d 872, 877 (1st Cir.

⁸ As the government's brief explains, Vineyard Wind uses pile driving to install two types of foundation. Monopile foundations are for wind turbine generators, and they require "a single pile driven into the ground." Jacket foundations are for support infrastructure and electrical service platforms. They require "three or four smaller piles driven into the ground."

1978). Here, Vineyard Wind has completed all jacket foundation pile driving. There is no indication that it will resume. So, even if NMFS violated the ESA by relying on a 3.2-kilometer shutdown zone to mitigate noise-related take from jacket foundation installation (an issue we expressly do not decide), we can no longer grant any injunctive relief that would remedy that violation. See Ogunquit Vill. Corp. v. Davis, 553 F.2d 243, 245-47 (1st Cir. 1977) (finding that the court was "unable to fashion a [generally applicable] remedy" for NEPA violations once the challenged project had been completed, and further stating that the responsibility for crafting such a remedy lay with Congress).

The Residents retort that NMFS's alleged violation of the ESA falls under the mootness exception for claims "capable of repetition, yet evading review." But this exception applies only when: "(1) the challenged action was in its duration too short to be fully litigated prior to its cessation or expiration, and (2) there [is] a reasonable expectation that the same complaining party [will] be subjected to the same action again." Weinstein v. Bradford, 423 U.S. 147, 149 (1975) (per curiam). There is no reasonable expectation that Vineyard Wind will install jacket foundations at the same location again. Accordingly, the exception does not apply, and the Residents' challenge to the 3.2-kilometer

exclusion zone -- as it pertains to jacket foundation installation -- is moot.⁹

Because the jacket foundations are complete, the only remaining pile driving involves monopile foundations. So, could the Residents simply apply their "shutdown zone is too small" argument to monopile foundation installation? The answer is no. According to the biological opinion, the cumulative Level A harassment threshold for monopile foundation installation (assuming 6-dB noise attenuation) is just under 3.2 kilometers. In other words, the standard 3.2-kilometer shutdown zone completely covers the area in which a right whale could be subject to cumulative Level A harassment from monopile foundation installation. So, if a right whale is detected in the zone affected by monopile foundation installation noise, a shutdown is mandatory.

Therefore, the Residents' only remaining argument is that NMFS's proposed mitigation measures cannot reliably detect a whale within the 3.2-kilometer shutdown zone around monopile

⁹ The Residents also assert that their claims fall under a mootness exception for issues of "great public import." But they cite only California state case law to support the existence of such an exception. The Residents do not identify -- nor could we find -- any controlling federal case that has recognized a "public importance" exception to the mootness doctrine. And this makes sense. Federal courts may only decide live "Cases" or "Controversies." See U.S. Const. art. III, § 2. Where no actual controversy exists, a federal court may not offer an advisory opinion. Mangual v. Rotger-Sabat, 317 F.3d 45, 60 (1st Cir. 2003).

installation. And that brings us to the third faulty link in the Residents' logic. The Residents cite no record data for the proposition that NMFS's proposed mitigation measures -- soft start procedures, protected species observers, and passive acoustic monitoring -- are ineffective at deterring a whale from, or detecting a whale within, the 3.2-kilometer shutdown zone.

The biological opinion found that soft start procedures -- which require Vineyard Wind to precede pile driving with quieter strikes that give right whales time to swim away -- were "expected to reduce [the] effects" of pile driving noise on right whales. The Residents retort that the biological opinion found no evidence that soft start procedures were effective. But once more, the Residents misapprehend the biological opinion's plain language. NMFS expressly stated that soft start procedures would "likely . . . reduce the duration of exposure to noise that could result in Level A or Level B harassment." The agency then stated that it could not precisely quantify the effect of soft start procedures on right whale take. So, the agency opted for a conservative approach, and did not "modify the estimated take numbers to account for any benefit provided by the soft start." Read in context, then, the biological opinion did not reflect a lack of confidence in soft start procedures. Instead, it reflected NMFS's cautious approach to calculating incidental take.

The biological opinion also found that acoustic monitoring and protected species observers, deployed in concert, are "highly effective." In response, the Residents' brief cites data from Natural Resources Defense Council v. Pritzker, 62 F. Supp. 3d 969 (N.D. Cal. 2014).¹⁰ That case reviewed an NMFS rule approving the United States Navy's use of low frequency sonar during peacetime training and testing operations. Pritzker, 62 F. Supp. 3d at 979. Among other things, the challenged final rule concluded that passive acoustic monitoring had a "25 percent detection probability" with respect to marine mammals, while visual monitoring by protected species observers had a "nine percent detection probability." Id. at 996 (quoting 77 Fed. Reg. 50290, 50307 (Aug. 20, 2012)). Thus, the Residents argue, NMFS's proposed mitigation measures are at best 34 percent effective (25 percent plus 9 percent), which is purportedly too low to justify NMFS's confidence that construction noise is highly unlikely to cause Level A harassment to right whales.

We leave aside the broader question of whether a 34 percent detection probability is indeed too low to avoid Level A harassment. We also leave aside the fact that Pritzker is a decade-old, vacated district court decision involving an entirely

¹⁰ The district court's decision in Pritzker was later reversed and remanded by the Ninth Circuit. See Nat. Res. Def. Council, Inc. v. Pritzker, 828 F.3d 1125, 1142 (9th Cir. 2016).

different project. The Residents' argument fails for a more fundamental reason: The Residents never brought the Pritzker data to the agencies' attention. As the government notes, the Residents never flagged the Pritzker data in their comment letters or notice of intent to sue. And the Residents do not contend otherwise. Accordingly, we cannot consider the Pritzker data for the first time on review.¹¹ See, e.g., Camp v. Pitts, 411 U.S. 138, 142 (1973) (per curiam) (noting that in a case applying the Administrative Procedure Act, "the focal point for judicial review should be the administrative record already in existence, not some new record made initially in the reviewing court"); United States v. L.A. Trucker Truck Lines, Inc., 344 U.S. 33, 37 (1952) (describing the "general rule" that "courts should not topple over administrative decisions unless the administrative body . . . has erred against objection made at the time appropriate under its practice").

In sum, the Residents cannot show that NMFS's conclusion that operational noise from Vineyard Wind was unlikely to subject any right whale to Level A harassment was arbitrary and capricious. Accordingly, their challenge under the ESA must fail.

¹¹ The Residents also cite Native Village of Chickaloon v. NMFS, 947 F. Supp. 2d 1031 (D. Alaska 2013) to argue that passive acoustic monitoring is ineffective. We reject this argument for the same reason we reject the Residents' reliance on Pritzker.

2.

The Residents next argue that NMFS irrationally dismissed a study (Stober 2021) that analyzed the effects of wind turbine operational noise on right whales.

The Residents entirely ignore the biological opinion's extensive analysis of Stober 2021. After detailing the study's methodology, NMFS gave four reasons for limiting its reliance on the study. First, the study itself acknowledged "unresolved uncertainty in [its] methods." Second, the study's estimates of operational noise for the turbines that Vineyard Wind would use were "just a prediction and . . . not based on an in situ evaluation of underwater noise of a 10 MW direct-drive turbine."¹² Third, Stober 2021 did not consider contextual factors that could alter how turbine noise moved through water, such as "water depth, sediment type, [and] wind speed." Fourth, Stober 2021 itself suggested that turbine operational noise "may not be detectable above ambient noise," undermining the argument that operational noise would harass nearby marine mammals.

Given these limitations, the biological opinion instead relied on operational noise measurements from a wind farm off Block Island. The agency's determination that these measurements were

¹² Contrary to the Residents' assertions, NMFS did not dismiss Stober 2021 on the grounds that it only analyzed older gearbox turbines. The agency expressly acknowledged that the study evaluated the "direct-drive turbines" deployed by Vineyard Wind.

the best available science commands deference. See Miccosukee Tribe, 566 F.3d at 1265. And the Residents scarcely engage with the agency's stated rationale for relying on the Block Island data rather than Stober 2021. Accordingly, we will not substitute our judgment for that of the expert agency. See Nat'l Ass'n of Mfrs., 750 F.3d at 924.

3.

The Residents next argue that the biological opinion ignored two phenomena that heighten the risk of right whales dying from entanglement in fishing lines.

First, the Residents claim that the biological opinion ignored the entanglement risk from lines that Vineyard Wind will install to perform fishery studies. This is simply not true. The biological opinion expressly considered the risk of entanglement in those lines. It found such entanglement "extremely unlikely,"¹³ given the low density of whales during the period when Vineyard Wind will conduct fishery studies; the small number of fishing lines; the short duration of the proposed fishery studies; and the tiny territory in which the study will take place. The Residents

¹³ The Residents cherry-pick this language to suggest that NMFS dismissed as "extremely unlikely" the prospect that a whale would ever die from entanglement in fishing lines. Of course, that is not at all what the biological opinion said. The "extremely unlikely" language refers to the risk of entanglement from the Vineyard Wind fishery studies, not overall entanglement risk within or outside the wind development area.

neither acknowledge nor discredit the agency's reasoning on this front.

Second, the Residents claim that the biological opinion ignored the best available science on entanglement risk, which allegedly suggested that construction and operational noise would drive whales into a fishing area ("Area 537") with densely concentrated fishing lines. This enforced shift in whale distribution would, in turn, increase entanglement risk. The Residents assert that this phenomenon was outlined in a memorandum -- which NMFS supposedly neglected -- called the Atlantic Large Whale Take Reduction Team Key Outcomes Memorandum ("TRT Memo").

NMFS considered the broader impact of construction and operational noise on whale distribution patterns. For example, the agency examined whether construction noise would drive whales into parts of Area 537 with more ship traffic. The agency concluded that this was unlikely, given that pile driving is banned during months with high whale density. The same logic applies to the Residents' concern about entanglement risk, because entanglement is most likely in the January-April period when pile driving is banned. The biological opinion also found that noise pollution from the project would not alter the overall distribution of right whales. The Residents do not challenge these clear findings.

Moreover, NMFS did, in fact, review the TRT Memo. And nothing in that memo states that construction or operational noise will drive whales into portions of Area 537 with greater entanglement risk. The memo simply says that NMFS should consider fishing closures in Area 537. So, the Residents' fear about increased entanglement risk is purely speculative. And NMFS was not required to account for entirely speculative environmental effects that were neither suggested nor supported by the scientific evidence. See 50 C.F.R. § 402.14(h)(iii) (biological opinion must discuss "effects" of proposed action on endangered or threatened species); id. § 402.02 (the "effect" of a proposed agency action is a consequence that is "reasonably certain to occur"); see also Endangered and Threatened Wildlife and Plants; Regulations for Interagency Cooperation, 84 Fed. Reg. 44976, 44993 (Aug. 27, 2019) ("[T]he determination of a consequence to be reasonably certain to occur . . . should not be based on speculation or conjecture").¹⁴

¹⁴ After oral argument in this case, the U.S. Fish and Wildlife Service published new regulations revising the definition of "effects of the action" under the ESA. See Endangered and Threatened Wildlife and Plants; Regulations for Interagency Cooperation, 89 Fed. Reg. 24268 (Apr. 5, 2024) (to be codified at 50 C.F.R. pt. 402). But NMFS and BOEM issued their environmental review documents under the prior regulations, which were published in 2019. We therefore limit our analysis to those earlier regulations.

4.

The Residents then argue that the biological opinion ignores how the Vineyard Wind project will increase the risk of vessel strikes on right whales.

The Residents first argue that the ten-knot restrictions on vessel speed in the wind development area are insufficient, because crew transfer vessels are exempt. But crew transfer vessels must include species observers and passive acoustic monitoring to survey for nearby whales. If a whale is spotted, the ten-knot speed limit applies to all crew transfer vessels for the rest of the day. And as discussed above, the Residents have supplied no adequate ground on which to challenge the efficacy of passive acoustic monitoring or protected species observers. They therefore cannot demonstrate that NMFS acted arbitrarily by relying on those measures to mitigate the risk of vessel strikes.

The Residents also argue that project noise will drive whales into portions of Area 537 with more vessel traffic. As already discussed, the biological opinion expressly rejected this argument. And this is unsurprising -- it is not even clear that there are areas near the wind development area with substantially higher vessel traffic. Indeed, as the government notes, the "only areas outside of the lease [area] with higher vessel traffic are shipping lanes with commercial traffic located 21 to 30 miles from the project." The Residents do not explain why any project-related

noise disturbance would not dissipate well before a whale had swum thirty miles away from the wind development area. Thus, the Residents' concern about project noise increasing vessel strike risk is speculative, and insufficient to support a challenge under the ESA.

C.

The Residents next contend that NMFS failed to consider how the additive effects of the Vineyard Wind project would jeopardize the continued existence of the right whale. Under the implementing regulations of the ESA, NMFS must "[a]dd the effects of the action and cumulative effects to the environmental baseline and in light of the status of the species and critical habitat, formulate [an] opinion as to whether the action is likely to jeopardize the continued existence of" the listed species. 50 C.F.R. § 402.14(g)(4).

The Residents' briefing on this topic breaks little new ground. Instead, the Residents largely repeat the arguments detailed above, which we have already found unpersuasive. There is only one new argument in the Residents' briefing that might be relevant. The Residents point to language in Quintana-Rizzo, which suggests that widespread wind farm development in southern New England could broadly "affect the use of [the] region by right whales" and influence right whale migration throughout the mid-Atlantic.

These generalized statements do not render the biological opinion's no-jeopardy conclusion arbitrary and capricious. As an initial note, Quintana-Rizzo was describing the potential risks of "[t]he construction and maintenance of hundreds of wind turbines" throughout southern New England. It was not specifically analyzing Vineyard Wind. Also, the Quintana-Rizzo study did not suggest that right whale survival was incompatible with wind energy development. Instead, it urged policymakers to implement comprehensive monitoring and mitigation plans. That is what NMFS did here. And as discussed, the Residents have not demonstrated that the agency's proposed mitigation measures are inadequate, or that reliance on those measures was arbitrary and capricious.

D.

Finally, the Residents argue that BOEM violated NEPA by relying on NMFS's allegedly defective biological opinion. Recall that while an agency may rely on the findings in a biological opinion, such reliance is arbitrary and capricious if (1) the biological opinion is defective, or (2) the agency blindly relies on the biological opinion without conducting its own independent analysis. See City of Tacoma, 460 F.3d at 75-76.

Neither criterion is satisfied here. For the reasons discussed above, NMFS's biological opinion was not defective. Therefore, BOEM properly relied on it. Id. Moreover, BOEM did

not blindly rely on the biological opinion. Instead, BOEM's environmental impact statement includes a lengthy analysis of the Vineyard Wind project's likely effects on right whales.¹⁵ As a result, we cannot conclude that BOEM's reliance on the NMFS biological opinion violated NEPA. Id.

IV.

For the foregoing reasons, the judgment of the district court is affirmed.

¹⁵ Although the Residents try to challenge portions of that standalone analysis in their reply, they failed to invoke those arguments in their opening brief. So, as discussed above, the Residents' specific challenges to BOEM's environmental impact statement are waived. See Rife, 873 F.3d at 19.