

[PUBLISH]

IN THE UNITED STATES COURT OF APPEALS

FOR THE ELEVENTH CIRCUIT

No. 05-17164

FILED U.S. COURT OF APPEALS ELEVENTH CIRCUIT FEBRUARY 8, 2007 THOMAS K. KAHN CLERK

D. C. Docket No. 01-00194-CV-HS-S

ALABAMA-TOMBIGBEE RIVERS COALITION,
an Alabama nonprofit corporation,
PARKER TOWING COMPANY, INC.,
an Alabama corporation,
CHARLES A. HAUN,
an individual,

Plaintiffs-Appellants,

versus

DIRK KEMPTHORNE,
Secretary of the United States Department of the
Interior,
SAM HAMILTON,
Regional Director of the United States Fish and
Wildlife Service,
U.S. DEPARTMENT OF THE INTERIOR,
U.S. FISH AND WILDLIFE SERVICE,
an agency of the United States Department of the
Interior,
STEVE WILLIAMS,
Director of Fish and Wildlife Service,

Defendants-Appellees.

Appeal from the United States District Court
for the Northern District of Alabama

(February 8, 2007)

Before CARNES, MARCUS and KRAVITCH, Circuit Judges.

CARNES, Circuit Judge:

Two fish, or not two fish? That is the question. More specifically, are the Alabama sturgeon and the shovelnose sturgeon separate species? The answer lies primarily in the field of taxonomy, which one observer has noted “is described sometimes as a science and sometimes as an art, but really it’s a battleground.” Bill Bryson, A Short History of Nearly Everything 437 (2003). The battle over the Alabama sturgeon has been more like the Thirty Years War. A scientist first classified this small freshwater fish found in the Mobile River Basin of Alabama as endangered in 1976. Three decades and three trips to this Court later the fight over whether the Alabama sturgeon is an endangered species continues. On one side are various business interests, including the Alabama-Tombigbee Rivers Coalition, and on the other are the Fish and Wildlife Service and several federal officials involved with it.

I.

The background facts of this litigation are set out in our 2003 opinion. See Alabama-Tombigbee Rivers Coal. v. Norton (Alabama-Tombigbee II), 338 F.3d 1244 (11th Cir. 2003). We won't wade back through all of the facts but will instead focus on those essential to the issues raised in this appeal.

The Alabama sturgeon was once so plentiful that it was captured commercially. Id. at 1247–48. At the end of the nineteenth century, an estimated 20,000 of the fish were caught commercially, but its numbers have declined drastically and it is now thought to reside only in small portions of the Alabama River channel in south Alabama and downstream to the mouth of the Tombigbee River. Final Rule to List the Alabama Sturgeon as Endangered, 65 Fed. Reg. 26,438, 26,339–41 (May 5, 2000) (to be codified at 50 C.F.R. pt. 17) (“Final Rule”). The historic decline of the species—if it is a species—is due to a combination of over-fishing, dam construction for power production, dredging and channeling to improve navigation in the Mobile River Basin, and declines in water and habitat quality resulting from river and land management practices. Id. The Service began to study the decline of the Alabama sturgeon in 1980, four years after a scientist first classified it as endangered. Id. at 26,439; Review of Three Southeastern Fishes, 45 Fed. Reg. 58,171 (Sept. 2, 1980).

In June 1993, the Fish and Wildlife Service first proposed listing the fish as

an endangered species under the Endangered Species Act of 1973. Final Rule at 26,441. That proposed listing led to these litigants' first visit to our Court, when the Alabama-Tombigbee River Coalition, a group of industries and associations opposed to the listing, obtained an order from the United States District Court for the Northern District of Alabama granting a permanent injunction against the Service's use of a scientific report prepared in violation of the Federal Advisory Committee Act in making its listing determination. Alabama-Tombigbee Rivers Coal. v. Dep't of Interior (Alabama-Tombigbee I), 26 F.3d 1103, 1104 (11th Cir. 1994). The Service appealed, and we affirmed. Id. at 1107. Several months later, the Service withdrew the proposed listing "on the basis of insufficient information that the Alabama sturgeon continued to exist." Final Rule at 26,442.

Over the next few years, the capture of several Alabama sturgeon confirmed that the fish was still around, although barely—despite diligent efforts to locate the fish, there were only eight confirmed catches in the 1990s—and in 1999 the Service again proposed listing the Alabama sturgeon as endangered. Id. at 26,439–40, 26,442. On May 5, 2000, it issued a final rule listing the fish as an endangered species. Id. at 26,438. Although the Service is responsible for designating the "critical habitat" of land animals and freshwater fish, it did not do so at the time it issued the Final Rule. Id. at 26,456–57. And it still has not done

so.

The Coalition brought suit under the citizen-suit provision of the ESA, 16 U.S.C. § 1540(g)(1), and under the judicial review provisions of the Administrative Procedure Act, 5 U.S.C. §§ 701–06, alleging several defects in the listing process. Alabama-Tombigbee II, 338 at 1249. The district court dismissed the Coalition’s lawsuit for lack of standing, but on appeal we reversed after concluding that the Coalition did have standing to challenge the listing decision. Id. at 1250–51, 1256.

On remand, the district court granted the Service’s motion for summary judgment but ordered it to issue both a proposed and a final rule designating critical habitat for the Alabama sturgeon by May 14, 2006 and November 14, 2006, respectively. The Coalition appealed the judgment, which the district court stayed pending review by this Court.

We review the district court’s grant of summary judgment de novo, viewing the facts and drawing all reasonable inferences in favor of the nonmoving party. Rowell v. BellSouth Corp., 433 F.3d 794, 798 (11th Cir. 2005). However, “even in the context of summary judgment, an agency action is entitled to great deference.” Preserve Endangered Areas of Cobb’s History, Inc. v. United States Army Corps of Eng’rs (PEACH), 87 F.3d 1242, 1246 (11th Cir. 1996). Under the Administrative Procedure Act, we must set aside any agency action that is

arbitrary, capricious, or an abuse of discretion, 5 U.S.C. § 706(2)(A), but we cannot substitute our judgment for that of the agency. Citizens to Preserve Overton Park, Inc. v. Volpe, 401 U.S. 402, 416, 91 S. Ct. 814, 824 (1971). We look at “whether an agency’s decision was based on a consideration of the relevant factors and whether there has been a clear error of judgment.” Sierra Club v. Johnson, 436 F.3d 1269, 1273–74 (11th Cir. 2006) (internal quotation marks and citations omitted).

II.

The Coalition first contends that we must vacate the Final Rule because the Fish and Wildlife Service failed to consider the relevant factors in reaching its listing decision. Section 4(b)(1)(A) of the ESA requires the Service to make listing determinations “solely on the basis of the best scientific and commercial data available.” 16 U.S.C. § 1533(b)(1)(A) (codifying Section 4(b)(1)(a)). The Coalition argues that the Service failed to rely on the best scientific data available in three ways: First, it discounted genetic typing in favor of morphological taxonomy. Second, the agency did not examine the best available taxonomic data. Third, it allegedly interfered with the research of one of its employees, Dr. Steven Fain.

The Administrative Procedure Act instructs reviewing courts to “hold

unlawful and set aside agency action, findings, and conclusions” that are “arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law.” 5 U.S.C. § 706(2)(A). We “may not set aside an agency rule that is rational, based on consideration of the relevant factors, and within the scope of the authority delegated to the agency by the statute.” Motor Vehicle Mfrs. Ass’n of U.S., Inc. v. State Farm Mut. Auto. Ins. Co., 463 U.S. 29, 42, 103 S. Ct. 2856, 2866 (1983). Under this “narrow” form of review, we may find a rule arbitrary and capricious where “the agency has relied on factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise.” Id. at 43, 103 S. Ct. at 2867. The reviewing court may not make up for these deficiencies, which is to say that “we may not supply a reasoned basis for the agency’s action that the agency itself has not given.” Bowman Transp., Inc. v. Arkansas-Best Freight Sys., Inc., 419 U.S. 281, 285, 95 S. Ct. 438, 442 (1974).

A.

The Coalition’s first argument in support of its contention that the Service failed to consider the best scientific data is that it used “the older, subjective

method of morphological taxonomy” instead of “the modern, objective science of genetics,” to classify the Alabama sturgeon as a separate species. Genetics is the superior science, according to the Coalition, and in its view “[a]ll reliable genetic evidence” confirms that the Alabama sturgeon and the more-abundant shovelnose sturgeon are “genetically identical.”

The Service responds by arguing that the Coalition is creating a false dichotomy between “taxonomy” and “genetics.” “Taxonomy” is “the science or technique of classification” or the “science dealing with the description, identification, naming, and classification of organisms.” Random House Unabridged Dictionary 1947 (2d ed. 1993). “Genetics,” which is “the science of heredity, dealing with resemblances and differences of related organisms resulting from the interaction of their genes and the environment,” id. at 796, is one tool—but not the only tool—used to resolve taxonomic questions.

The Service believes that instead of relying on genetics alone, “[t]he most scientifically credible approach to making taxonomic determinations is to consider all available data involving as many different classes of characters as possible.” Final Rule at 26,452. The class of relevant characters “include morphological, karyological (chromosomal), biochemical (including DNA analysis and other molecular genetic techniques), physiological, behavioral, ecological, and

biogeographic characters.” Id. The Service argues that it did consider genetics, and simply concluded that the available genetic studies could not definitively resolve the taxonomic status of the Alabama sturgeon, and that the balance of the relevant data supported classifying the fish as its own species.

1.

The Coalition overstates its case when it asserts that “[a]ll reliable genetic evidence” confirms that the Alabama sturgeon and shovelnose sturgeon are “identical.” The two types of fish are not “genetically identical.” If two complete samples of animal genetic material truly are identical, then they did not just come from the same species, they came from the same animal (or perhaps from a pair of twins). What the evidence tendered by the Coalition actually reveals is that when scientists have examined particular segments of the mitochondrial cytochrome *b* gene, a gene that scientists often test to help them distinguish between vertebrate species, they have found that the cytochrome *b* samples taken from those particular genetic segments of the Alabama sturgeon are very similar—not identical, but very similar—to those taken from shovelnose sturgeon.

At several points in the Final Rule, the agency addressed the significance of genetic testing. See id. at 26,438–39, 26,445–46, 26,451–52. It found that the genetic evidence was much less lopsided—and much more consistent with other

taxonomic indicators—than the Coalition suggests. The Service distinguished between three types of genetic studies. First were the studies of the mitochondria cytochrome *b* gene which we have already mentioned. Id. at 26,438. The agency agrees with the Coalition that one study by Schill and Walker “found no sequence divergence in a cytochrome *b* mtDNA sequence between a single specimen of the Alabama sturgeon and shovelnose sturgeon.” Id. at 26,451. A subsequent study by Fain et al. using a larger sample size found small but consistent differences between Alabama and shovelnose sturgeon, though the study concluded that these differences were too insignificant to support the use of cytochrome *b* testing in criminal prosecutions. Id. at 26,451–52.

The second type of genetic study discussed in the Final Rule examined the “d-loop” or “control region” of the sturgeons’ mitochondrial DNA. Id. at 26,452. In 1995, Campton et al. found that a unique haplotype (a single insertion point on a genetic chain) distinguished the Alabama sturgeon from pallid and shovelnose sturgeon. Id. at 26,438. However, the Campton report cautioned that this level of divergence was small, and suggested adding sturgeon from the lower Mississippi River to the study. In 1999, the Campton group completed phase II of that study, which included sturgeon from the lower Mississippi River. The phase II results were consistent with those of phase I, leading the scientists to conclude that

“[t]hese mtDNA results provide the first genetic evidence that the three species of [sturgeon] are indeed distinct evolutionarily and thus support current conservation efforts to protect pallid and Alabama sturgeon as endangered species under the ESA.” (emphasis in original) A study by Mayden et al. found the differences in the d-loop to be significant even after factoring in the similarity of the sturgeons’ cytochrome *b* genes. It concluded that “the Alabama sturgeon and the shovelnose sturgeon were found to exhibit significant genetic heterogeneity based on both the control region sequences and the control region and cytochrome *b* combined data sets.”

The third type of study discussed in the Final Rule examined nuclear DNA. Final Rule at 26,438, 26,445. A 1994 study by Genetic Analyses, Inc. found that “when the total available nuclear DNA markers are assessed, considerable genetic differences between the Alabama and both shovelnose and pallid sturgeon individuals are observed,” but noted that “this result is based upon only one individual” Alabama sturgeon specimen. In 1995, Genetic Analyses tested two additional Alabama sturgeon specimens. This further examination “supports previous results indicating substantial genetic divergence of Alabama sturgeons from the other two recognized [sturgeon] species,” leading Genetic Analyses to conclude that “the data presented here suggest strongly that Alabama sturgeons are

more genetically divergent from pallid and shovelnose sturgeons than the latter taxa are from each other.”

After addressing individually each type of genetic study in the administrative record, the Service expressed its general doubt that examination of genetic data could definitively resolve the Alabama sturgeon’s taxonomic status.

The Service explained in the Final Rule:

Genetic data have their greatest utility in making species-level taxonomic determinations when the putative species are sympatric (occur together) and the degree of natural genetic interaction can be evaluated. When the putative species are allopatric, as with Alabama and shovelnose sturgeons, genetic data provide a measure of divergence that must be evaluated along with all other available measures of divergence in making a determination whether species-level differences exist. When sample sizes are small, either in terms of number of individuals or number of genetic regions or loci tested, the taxonomic value of genetic data is diminished.

Id. at 26,452. The Service specifically questioned the value of cytochrome *b* studies:

Cytochrome *b* is not the best choice of a genetic region for resolving the closely related species in the genus Scaphirhynchus. In such cases it is appropriate to examine a gene region known to have a faster rate of evolution that might be reflected in a difference between species. The study of Campton et al. (in press) employed the more rapidly evolving control region of mtDNA with the results described under Issue 59. Campton et al. (in press) also discuss other cases where speciation has occurred in fishes with very little genetic divergence in cytochrome *b*, and Fain et al. (2000) identifies lack of divergence between pairs of other sturgeon species. Interpreted in light of the minimal gene regions studied, the small sample sizes of Alabama

sturgeon, and evidence from other species that species formation can occur with minimal detectable genetic differentiation in DNA regions commonly studied, the genetic data are consistent with and do not demand the rejection of taxonomic conclusions based on morphological and biogeographical data that the Alabama sturgeon qualifies for recognition as a valid species.

Id.

The Coalition emphasizes the fact that the cytochrome *b* genes of the Alabama sturgeon and the shovelnose sturgeon are very similar. As it points out, the Service uses cytochrome *b* testing to criminally prosecute defendants for violating federal species protection laws. According to the Fain report, examination of the cytochrome *b* gene can be used to positively identify fifteen of the world's twenty-seven sturgeon and paddlefish species. The implication the Coalition wishes us to draw is that if the Service considers cytochrome *b* testing to be conclusive enough for criminal prosecutions, it ought to be conclusive enough for rule-making as well.

This argument misapprehends both the conclusions of the Fain study and the role of cytochrome *b* testing in criminal trials. The Fain study did not conclude that the Alabama sturgeon is not a distinct species. The report of that study states that the 5' end of the cytochrome *b* gene exhibits significant interspecific variation in sturgeon, which is to say that some species of sturgeon have very different cytochrome *b* genes than other species of sturgeon. When the cytochrome *b* genes

of two species of sturgeon vary significantly from one another, but their intraspecific variation, or variance among individual members of each species, is low, the gene provides a useful marker to distinguish between the two types of sturgeon. Under these conditions, scientists can use cytochrome *b* testing to debunk a criminal defendant's false claim that caviar taken from an endangered species of sturgeon came from another non-endangered species.

The Fain report also states that cytochrome *b* testing cannot be used to distinguish between caviar from Alabama sturgeon and caviar from shovelnose sturgeon with sufficient reliability to be useful for forensic identification. The Coalition argues that because cytochrome *b* testing cannot reliably prove that the Alabama sturgeon is a distinct species, it must not be. Holding a position of centrality in that argument is the idea that inconclusive results of difference are conclusive proof of sameness. The reasoning is a species of argumentum ad ignorantiam, a fancier, and hence less denigrating, way of describing “an argument from ignorance.” An argument from ignorance is “the mistake that is committed whenever it is argued that a proposition is true simply on the basis that it has not been proved false, or that it is false because it has not been proved true.” Irving M. Copi & Carl Cohen, Introduction to Logic 93 (8th ed. 1990). Our point is that difficulty in proving a proposition (particularly by only one method) does not

prove its opposite.

Of course, an argument from ignorance is not always a fallacy. Under some circumstances, such as where a scientific inquiry produces a complete knowledge base, or where an experiment is certain to reveal a fact if that fact exists and it fails to do so, the lack of positive evidence can prove a negative—the absence of evidence can be conclusive evidence. Cf. id. at 94. But not here. Examining one mitochondrial DNA gene hardly provides scientists with a total picture of the entire Alabama sturgeon genome, which would be necessary for a complete knowledge base. There are a multitude of mitochondrial and nuclear genes in every species of animal. That one particular gene does not demonstrably vary between two species is not, by itself, exceptional. Humans and chimpanzees, in genetic terms, are nearly 99% identical, yet we generally have little difficulty distinguishing between the two species. Michael D. Lemonick et al., What Makes Us Different?, *Time*, Oct. 9, 2006, at 44.

Differences in the cytochrome *b* gene often correlate with speciation in vertebrates, but the Service had a reasonable basis for believing that gene would not serve as an effective, species-differentiating genetic marker in this case. Final Rule at 26,452. Biogeographic evidence indicates that the Alabama and shovelnose sturgeon diverged only within the past 10,000 years, an eyeblink in

evolutionary terms, and speciation can outpace differentiation of the cytochrome *b* marker which would explain the absence of a detectable difference. Id. The rulemaking record included evidence of other separate species of fish with very little genetic divergence in the cytochrome *b* gene. Id.

The decreased utility of the cytochrome *b* marker in younger species, combined with some evidence of divergence at other genetic markers, creates substantial doubt about whether genetic typing can conclusively resolve the proper taxonomic classification of the Alabama sturgeon. At a minimum, it justifies the Service's decision to examine the entirety of the taxonomic record, rather than ending its analysis with the DNA results. We now turn to the taxonomic evidence.

2.

The Service began its examination of the taxonomic evidence by reviewing the existing literature, which revealed that:

[t]he Alabama sturgeon is nationally and internationally considered a valid species. The Alabama sturgeon was initially described as a distinct species in a peer-reviewed, widely distributed museum periodical. The species was considered valid in a catalog of fishes of Alabama and in a catalog of fishes of North America. Species status was reassessed, reaffirmed, and published in the ichthyological journal Copeia. The Alabama sturgeon is listed as a separate species in State fish books for Alabama and Mississippi. The Alabama sturgeon is listed as a valid species in a catalog of fishes of the world. Birstein et al. included the Alabama sturgeon in a list of all sturgeon species of the world. The Alabama sturgeon is considered a distinct and valid species by the American Society of Ichthyologists and

Herpetologists, and by the Southern Fishes Council Technical Advisory Committee. Thus, the Alabama sturgeon is currently recognized as a valid taxonomic species and will continue to be so recognized unless overturned at some future date by the scientific community through the formal publication and peer review process.

Final Rule at 26,443 (internal citations omitted).

The Service acknowledged that some scientists have questioned the taxonomy of the Alabama sturgeon, but noted that the only thorough taxonomic treatment of the species since the fish was first described, which was done by Mayden and Kuhajda, concluded that the sturgeon was a distinct species. Id. Only one peer-reviewed paper—the Bartolucci et al. study—questions the taxonomy of the Alabama sturgeon. The Service found that study to be less probative than the Mayden and Kuhajda study, and also against the weight of the remainder of the taxonomic record. Id.

The Service then supplemented the existing literature by requesting that five academicians who possessed expertise on Alabama sturgeon and shovelnose sturgeon taxonomy review the proposed rule. Id. at 26,453. Of the four who responded to the Service’s request, all expressed their belief that the data supported protecting the sturgeon under the Endangered Species Act. Id. Three peer reviewers “strongly supported the taxonomic status of the Alabama sturgeon.” Id. The remaining reviewer “expressed some personal doubt regarding the taxonomic

status of the Alabama sturgeon,” but concluded that the fish represented at least a subspecies or unique population eligible for protection under the Act. Id. That reviewer also described the Mayden and Kuhajda article, which had come down on the separate species side of the question, as convincing. Id. The fifth proposed reviewer did not respond to the Service’s request to engage in peer review, but provided comments opposing the listing at the public hearing. Id.

Only after reviewing the existing literature and the additional expert opinions did the Service conclude that the available genetic evidence did not compel the conclusion that the Alabama sturgeon was not a separate species. The agency considered every available genetic study, but found that none were decisive on the issue. Two types of studies—the control region and nuclear DNA studies—supported the Service’s ultimate conclusion. While the cytochrome *b* genes of the Alabama sturgeon and the shovelnose sturgeon are nearly identical, this fact is consistent with the theory that the two species began to diverge only recently (in evolutionary terms) when the Alabama sturgeon became isolated in the Mobile River Basin approximately 10,000 years ago. Id. at 26,446. It does not rule out the two types of fish being separate species. The Service’s decision to read the mixed genetic data in conformity with the remainder of the taxonomic record, which supported classifying the Alabama sturgeon as a distinct species,

was not arbitrary and capricious.

B.

The Coalition's second argument in support of its contention that the Service failed to consider the best scientific data is that the taxonomic evidence in the administrative record demonstrates that the Alabama and shovelnose sturgeons are the same species. We have just discussed the reasoning behind the Service's conclusion that the Alabama sturgeon is a distinct species and the studies underlying that reasoning. The Coalition contends, however, that the Service "blatantly cherry-picked" a few taxonomic studies to support its position. It argues that "the Final Rule references, but erroneously discounts" studies that oppose classifying the Alabama sturgeon as a unique species.

The Coalition characterizes the Service as dismissing Bartolucci's study "primarily because it was published in a 'statistically oriented journal and not in a zoological, ichthyological, or systematics journal.'" Putting aside whether that reason alone would justify discounting Bartolucci's findings, the Final Rule deals with that study more thoroughly than the Coalition lets on:

Only a single peer-reviewed paper has been published that questions the taxonomy of the Alabama sturgeon (Bartolucci et al. 1998). However, that publication was a methods paper concerning a statistical approach to compare the significance of morphological characters. It was published in a statistically oriented journal and not in a zoological, ichthyological, or systematics journal, and it made no

attempt to formally revise the taxonomy of the Alabama sturgeon. We received letters from ichthyologists during the comment period pointing out shortcomings of Bartolucci et. al (1998) for taxonomic purposes. In a review of the systematics and taxonomy of the Alabama sturgeon, Mayden and Kuhajda (1996) presented new data, addressed many of the criticisms of the original description, and substantiated species status for the Alabama sturgeon . . . The [Bartolucci study] did not identify the measurement data that were analyzed, nor was the source of their data cited. Dr. Bartolucci later clarified in submissions at the June 1999 public hearing on the proposed rule that data provided by Williams and Clemmer (1991) were used. In addition, Bartolucci et al. (1998) did not review, criticize, or even reference the Mayden and Kuhajda (1996) evaluation of the taxonomy and systematics of the Alabama sturgeon, and additional mensural (based on measurements) and meristic (based on counts) data, as well as new diagnostic characters presented by Mayden and Kuhajda (1996) were not addressed.

Final Rule at 26,443–44. The Coalition points to two other studies that the Service addressed only summarily in its Final Rule, but as the Service points out, those studies were not made available for review by the ichthyological community through peer review and publication. Final Rule at 26,443.

Given the nature of taxonomy, it would be surprising if there were not some disagreement about the proper classification of the Alabama sturgeon, but disagreement in the field does not preclude agency decision making. “When 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. Or. Natural Res.

Council, 490 U.S. 360, 378, 109 S. Ct. 1851, 1861 (1989). This principle does not mean that the agency has wholesale latitude to arbitrarily dismiss relevant scientific data, 16 U.S.C. § 1533(b)(1)(A), but that is not what happened. The Service's finding that the Alabama sturgeon is a separate species is consistent with the position of the American Society of Ichthyologists and Herpetologists on the question, and is supported by the conclusion of the only peer-reviewed article published in an ichthyological journal addressing the issue, by the opinion of the Service's own experts, and by the views of most of the academicians asked to comment on the question. Given all of that support for the view taken in the Final Rule, we will not find that the Service failed to consider the best scientific evidence simply because it decided not to credit the contrary view, which is contained in one article published in a statistical journal and several unpublished reports.

C.

The third argument behind the Coalition's contention that the Service failed to consider the best scientific data is that it wrongfully interfered with the research of Dr. Steven Fain. Before the Service issued the final rule, Mike Howell, a scientist working for the Coalition, sent an e-mail seeking to discuss with Fain the genetic similarity between the Alabama sturgeon and the shovelnose sturgeon.

Fain initially appeared receptive to discussing the issue, but later quit communicating with Howell. He did so after speaking with Paul Hartsfield, a Service biologist.

Apparently, Hartsfield began to inquire into what Fain was doing—and with whom he was doing it—after the Coalition told the Service that it had requested samples of an Alabama sturgeon specimen from the Alabama Department of Conservation and Natural Resources so that the Coalition could conduct its own DNA work. Service officials asked the Department to whom it had sent the samples, and were told that they had been sent to Fain. Hartsfield was understandably surprised to learn that one of the Service’s own scientists was conducting studies for an interested party in an agency rule-making. He e-mailed his supervisor, asking if Fain comprehends “the taxonomic problems and implications” of the work he was doing and inquiring, “can we afford to call him off?” Another e-mail refers to the value of Hartsfield having a “frank talk” with Fain.

After a little investigation, the Service determined that Fain was unaware that Howell was passing his work on to the Coalition. Hartsfield spoke with Fain over the telephone, explained Howell’s affiliation with the Coalition, and the two men “had a very good discussion about taxonomy and cytochrome *b*.” Hartsfield

followed up the phone call by sending Fain copies of all of the relevant research in his possession.

The facts in the administrative record do not demonstrate that the Service sought to squelch Fain's research or control his opinion. They show that the Service initially inquired into whether one of its scientists was moonlighting for an interested party in a pending rule-making. Once the Service determined that Fain was simply sharing research that he was conducting in the course of his employment, Hartsfield told Fain a key fact that Howell had failed to disclose: Howell was not a disinterested scientist but was instead affiliated with the Coalition. Hartsfield also offered to send Fain copies of prior research in the area. There was nothing improper about that.

Even if we assume that Service officials engaged in improper conduct towards Fain, the Coalition's argument still fails for two reasons. First, it has presented no evidence that Fain altered his study as a result of the Service's conduct. The Coalition highlights the fact that Fain uses more cautious language in his final report than he did in his initial e-mail to Howell. Fain's "quick note" to Howell stated that "[w]e've sequenced only one sample . . . and its sequence is identical to pallid and shovelnose sturgeon . . . [w]e are currently canvassing all 250 of the Scaphirhynchus samples we have I agree with your proposal to

consider all three as conspecific.” His final report is arguably more equivocal than that statement, but Fain wrote the e-mail to Howell after he had sequenced only a single sample, before he had reviewed the Mayden and Kuhajda study, and six months before completing his final report. That final report, which Fain co-authored with two other scientists, examined ninety-nine sturgeon specimen and referred to twenty-five prior publications on genetic testing and sturgeon taxonomy. Scientists may spend months or years painstakingly producing and checking findings before publication, even though they, like everyone else, may fire off in a matter of minutes a “quick note” containing an initial inclination or beginning hypothesis. It is not at all surprising that a scientific paper about a completed study would use different language, or even reach a different conclusion, than a six-sentence e-mail sent at the very beginning of the study.

Second, even if Fain did temper his language as a result of some higher-up’s meddling, that fact would not establish that the Service violated the Endangered Species Act’s mandate to consider the “best scientific and commercial data available.” 16 U.S.C. § 1533(b)(1)(A). The Coalition agrees that the final report of Fain’s study is “entirely consistent” with the tentative views reflected in his email to Howell in 1999. Its criticism is that the final report did not state his views as explicitly as the email did. Fain’s views are clear enough to have been properly

considered, as they were, by the Service. The Endangered Species Act requires the Service to make its listing determination on the basis of the best scientific data available; it does not require scientists who produce reports relevant to the listing decision to achieve a particular level of clarity in stating their views.

If Fain had stated in the most unequivocal terms that the Alabama and shovelnose sturgeon have the same cytochrome *b* gene, which is what the Coalition says he should have done, it would not have altered the analysis in the Final Rule. The Service properly characterized Fain's report as showing an "absence of detectable differences" between the sturgeons' cytochrome *b* genes, but reasonably concluded that this similarity "only attests to the very close evolutionary relationship" between the species. Final Rule at 26,445. The Service's decision is not based on the Alabama sturgeon and the shovelnose sturgeon having dissimilar cytochrome *b* genes, and would be the same no matter how definitively the Fain report had stated that they do not.

The Coalition, which acquired the e-mails relating to this issue that we have quoted through a public records request, contends that the district court abused its discretion by refusing to allow additional discovery on the subject. "The focal point for judicial review of an administrative agency's action should be the administrative record." PEACH, 87 F.3d at 1246. Though certain circumstances

may justify the district court going beyond the administrative record, it is not generally empowered to do so. Id. It should do so only where there is initially “a strong showing of bad faith or improper behavior” by the agency. Overton Park, 401 U.S. at 420, 91 S. Ct. at 825. Here, because the Coalition failed to make such a showing, we conclude that the district court did not abuse its discretion in disallowing the discovery the Coalition sought. See PEACH, 87 F.3d at 1246.

III.

The Coalition’s second contention is that even if the Fish and Wildlife Service did consider all the relevant factors and make the listing decision on the basis of the best scientific data available, the Final Rule containing that decision still must be vacated because the Service violated Section 4 of the Endangered Species Act. That section requires the Service to designate the critical habitat of a species concurrently with its decision to list the species as endangered. Section 4 twice mentions a concurrence requirement.

The relevant provisions read:

The Secretary, by regulation promulgated in accordance with subsection (b) of this section and to the maximum extent prudent and determinable—

- (i) shall, concurrently with making a determination. . . that a species is an endangered species or a threatened species, designate any habitat of such species which is then considered to be critical habitat; and

- (ii) may, from time-to-time thereafter as appropriate, revise such designation.

16 U.S.C. § 1533(a)(3)(A) (emphasis added). Later, the section provides:

A final regulation designating critical habitat of an endangered species or a threatened species shall be published concurrently with the final regulation implementing the determination that such species is endangered or threatened, unless the Secretary deems that—

- (i) it is essential to the conservation of such species that the regulation implementing such determination be promptly published; or
- (ii) critical habitat of such species is not then determinable, in which case the Secretary, with respect to the proposed regulation to designate such habitat, may extend the one-year period specified in subparagraph (A) by not more than one additional year, but not later than the close of such additional year the Secretary must publish a final regulation, based on such data as may be available at that time, designating, to the maximum extent prudent, such habitat.

16 U.S.C. § 1533(b)(6)(C) (emphasis added). The Service did not designate critical habitat of the Alabama sturgeon when it issued the Final Rule on May 5, 2000 listing the fish as endangered, and it has not done so in the six and a half years since then.

In the proposed rule, which was issued in 1999, the Service determined that it would not be “prudent” to designate critical habitat at that time. Proposed Rule to List the Alabama Sturgeon as Endangered, 64 Fed. Reg. 14,676, 14,683 (proposed Mar. 26, 1999) (to be codified at 50 C.F.R. pt. 17) (“Proposed Rule”).

As a result of feedback received during the public comment period, however, the Service was persuaded that designation would be prudent. Final Rule at 26,456. It nonetheless declined to designate critical habitat in the Final Rule, instead finding that the Alabama sturgeon’s habitat was not then “determinable.” Id. Under Section 4(b)(6)(A) of the Act, the Service must normally issue a final rule designating critical habitat within one-year of issuing a proposed habitat designation. See 16 U.S.C. § 1533(b)(6)(A) (Section 4(b)(6)(A)). However, Section 4(b)(6)(C) allows the Service to extend this one-year period by an additional year if critical habitat is not determinable at the time of the listing decision, provided that it designates habitat to the maximum extent prudent by the end of that additional year. The Service exercised this option, which means that it had a maximum of two years from the date the Final Rule was published to issue a final rule designating critical habitat. See 16 U.S.C. § 1533(b)(6)(C) (Section 4(b)(6)(C)).

The Coalition asked the district court to vacate the Final Rule containing the listing decision because of the Service’s failure to designate critical habitat concurrently with the publication of the Final Rule. The Service conceded that it had violated the Act by failing to designate critical habitat for the Alabama sturgeon by the end of the two-year period following the publication of the Final

Rule. The district court, however, refused to order what it described as “the extraordinary and unprecedented remedy of vacating the listing decision in its entirety thus causing the Service to begin the listing process of the Alabama Sturgeon anew.” Instead, the court ordered the Service to complete the habitat decision within two years of the conclusion of this appeal. The effect is to give the Service more time to designate critical habitat than the Act allows.

A.

The district court’s remedy is improper, according to the Coalition, because the failure to propose and designate critical habitat at the same time that the endangered species listing is being proposed and decided undermines the accuracy of the listing decision itself. Providing notice of critical habitat designation may encourage some who would not otherwise do so to participate in the public comment process for the listing decision. The more people who know they will be affected, the more who may participate. The additional participation could conceivably affect the Service’s analysis and modify the decision contained in the Final Rule. The law, after all, provides notice and an opportunity to be heard because it may make a difference. Not only that, the Coalition argues, but the literal language of the Endangered Species Act can be satisfied only by starting the listing process anew, because no other result will allow the listing decision and the

habitat designation decision to be issued “concurrently.”

The Coalition’s standing to raise this challenge does not flow from any harm that it suffers from the Service’s failure to actually designate critical habitat, because the Coalition is not injured by that. Indeed, it would prefer that critical habitat never be designated. The harm the Coalition claims is that the failure to propose critical habitat may have reduced participation in the rule making process resulting in a flawed decision to list the Alabama sturgeon as an endangered species, and we have held that the listing decision does threaten the Coalition with harm. See Alabama-Tombigbee II, 338 F.3d at 1252–54.

In Sierra Club, we held that “a plaintiff has established procedural injury standing if he has established that the claimed violation of the procedural right caused a concrete injury in fact to an interest of the plaintiff that the statute was designed to protect.” 436 F.3d at 1278. In that case, we vacated an order by the Environmental Protection Agency that failed to object to issuance of a Clean Air Act permit by a state that had not implemented a required mailing list to notify the public of the proposed action and of the comment period. Id. at 1279–80. We reasoned that use of the mailing list would have led to additional public input, which in turn could have improved the permitting process. Id. at 1279. Applying the logic of Sierra Club to this case, we agree with the Coalition that it has standing

to litigate whether there is a procedural right in the Endangered Species Act to public notice, during the comment period on a listing decision, of the area that may be designated as critical habitat.

Standing to raise a claim is one thing, the merits of the claim is another. If there is a procedural right to notice during the comment period of what the critical habitat may be, that right cannot be found in the text of the Act or in its history. Neither indicates that notice of proposed habitat designation is meant to be a participation booster for the listing decision. The language of the Act does not require the Service to publish a proposed habitat designation simultaneously with the proposed listing, nor does it require that the Service publish its proposed habitat designation prior to the close of the comment period on the proposed listing. See 16 U.S.C. § 1533(a)(3)(A)(i) (requiring that the Service make a final habitat determination concurrently with the listing decision); id. § 1533(b)(5)(A) (allowing the Service to publish its proposed habitat designation “not less than 90 days before the effective date” of the final habitat designation). Instead, the Service may delay habitat designation by up to two years when it finds that designation is not “determinable.” Id. § 1533(b)(6)(C)(ii).

Nor is there anything in the history of the Act to support the Coalition’s position. As originally enacted in 1973, the Act did not even use the term “critical

habitat.” Endangered Species Act of 1973, Pub. L. No. 93–205, 87 Stat. 884.

However, the Act did require all federal agencies to take “such action necessary to insure that actions authorized, funded, or carried out by them do not . . . result in the destruction or modification of habitat of such species which is determined by the Secretary . . . to be critical.” Id. § 7. The Act required the Service to give general notice of listing decisions, but provided no guidance on how or when it should determine a species’ critical habitat. Id. § 10(B)(1).

Congress became aware of the significance of designating a species’ critical habitat when the Supreme Court issued its decision in Tenn. Valley Auth. v. Hill, 437 U.S. 153, 98 S. Ct. 2279 (1973). In that case the Supreme Court upheld the Service’s decision to protect the critical habitat of a small number of snail darters, a three-inch fish, which “would require the permanent halting of a virtually completed dam for which Congress has expended more than \$100 million.” Id. at 172, 98 S. Ct. at 2291. Within five months after the Hill decision, Congress amended the Act to provide a narrow definition of the term “critical habitat” and to establish a new set of public notice requirements for the designation of habitat. Endangered Species Act Amendments of 1978, Pub. L. No. 95–632, 92 Stat. 3751. Those 1978 amendments applied the general notice requirement for listing decisions to critical habitat determinations, and they required that notice of the

proposed habitat be given in an area newspaper of general circulation and in appropriate scientific journals, and that actual notice be given to local governments. Id. The amendments also added the requirement that “[a]t the time [a listing] is proposed, the Secretary shall also by regulation, to the maximum extent prudent, specify any habitat of such species which is then considered to be critical habitat.” Id. (emphasis added).

It did not take long for Congress to have second thoughts about the 1978 amendments. In the three years following those amendments, only one new species proposed for listing successfully navigated both the listing and habitat designation processes. S. Rep. No. 97–418, at 4 (1982) (“Senate Report”). In the view of the Senate committee with jurisdiction over the subject, “[t]he listing process under section 4 of the current law ha[d] been seriously hampered since the 1978 amendments to the Act.” Id. at 11. The requirement that the Secretary propose critical habitat “at the time a species is proposed” had “indirectly introduced economic considerations into the listing process by requiring the Secretary to consider the economic impact of specifying the habitat.” Id. “[A]s a result of numerous procedural requirements and the absence of meaningful time limits, the listing process ha[d] come to a virtual standstill.” Id. at 4. The Senate committee’s proposed amendments replaced the language from the 1978

Amendments that the Service designate tentative critical habitat at the time it issues the proposed listing with the modern “concurrently” requirement. H.R. Conf. Rep. No. 97–835, at 19–20 (1982), reprinted in 1982 U.S.C.C.A.N. 2860 (“Conference Report”). It also shortened the time line for acting on listing decisions and streamlined the notice process. Id. at 20.

The relevant House committee had similar concerns. In recommending reauthorization of the Act, it issued a report stating that “[o]ne of the principal problems noted was the decline in the pace of listing species.” H.R. Rep. No. 97–567, at 11 (1982), reprinted in 1982 U.S.C.C.A.N. 2807 (“House Report”). The House committee believed that tentatively designating critical habitat in the proposed listing “adds some confusion to the listing phase.” Id. at 11–12. The need to take into account “the economic impacts of listing such habitat as critical” had slowed the listing process to a crawl. Id. The House bill included the Senate’s requirement that the critical habitat be listed “concurrently,” and also specified that listing decisions must be based “solely” on the basis of the best scientific and commercial data available. Conference Report at 20.

The Senate and House bills went to conference. The Conference Committee adopted the amendment included by both chambers of Congress to strike the language that had been added in 1978 requiring that critical habitat be designated

in the proposed listing. Id. at 19. It instead added the “concurrently” requirement and specified that the Service must “designate critical habitat at the time a species is listed.” Id. at 24 (emphasis added). The Conference Committee then adopted the Senate’s proposed time provisions and the House’s limitation on economic analysis in listing decisions. Id. at 20. After those amendments, which were enacted into law in 1982, Pub. L. No. 97–304, no part of the Act— including Section 4(a)(3)(A) and Section 4(b)(6)(C)—required the Service to propose critical habitat at the time of the proposed listing of the species as endangered. 16 U.S.C. § 1533(a)(3)(A), id. § 1533(b)(6)(C). The only requirement was that the Service designate critical habitat concurrently with its final listing decision, if doing so then would be prudent and if the habitat would be determinable at that time.

The requirement that the Secretary designate habitat concurrently with the final listing decision, which is the current version of the law, could not have been intended to increase public participation in the listing process. It could not have been because under that provision the Service need not (indeed, if “concurrently” is read strictly, it must not) designate critical habitat until the moment it reaches a final listing decision. By then the public comment period on the listing decision will have closed. Of course, the Service could propose critical habitat before the close of the comment period for the final listing decision, but nowhere in the Act is

the Service obligated to do so. There is nothing in the Act to prevent the Service from proposing the listing, receiving comments about it and then, after that comment period has closed, proposing critical habitat and receiving comments about it. For that reason, we cannot say that the concurrence requirement was designed to spur greater public participation in the listing decision process.

We do not think that this lack of synchronization is the result of a Congressional oversight. One of the primary purposes of the 1982 amendments was to divorce from the listing decision the economic analysis that comes with critical habitat designation. See Senate Report at 11; House Report at 11–12; Conference Report at 19. The amendments added the word “solely” before the phrase “on the basis of the best scientific and commercial data available” to insulate the listing decision from the influence of economic factors. 16 U.S.C. § 1533(b)(1)(A); Senate Report at 4, 11; House Report at 20; Conference Report at 19. While “economic analysis” is meant to “offer[] some counter-point to the listing of species without due consideration for the effects on land use and other development interests,” Congress wanted “to prevent [habitat] designation from influencing the decision on the listing of a species,” and for that reason intended that the “balancing between science and economics should occur subsequent to listing through the exemption process.” House Report at 12 (emphasis added); cf.

Senate Report at 4. The Coalition’s position runs counter to Congressional intent.

That Congress did not intend the word “concurrently” to spur participation in the listing process does not mean that it was blind to the value of public input into agency action. The Act requires the Service to publish notice both of proposed listing decisions and of proposed critical habitat designations, 16 U.S.C. § 1533(b)(5), but it does not require that notice of the proposals be published concurrently. The language of the concurrence requirement applies only to the final decisions: “concurrently with making a determination,” *id.* § 1533(a)(3)(A)(i); and “[a] final regulation designating critical habitat . . . shall be published concurrently with the final regulation [listing the species],” *id.* § 1533(b)(6)(C), and even then, there are escape valves that permit the habitat designation decision to come as long as two years after the final listing decision.

The problem that the 1982 amendments were aimed was that difficulties in designating critical habitat were slowing to a virtual standstill the listing process. Congress uncoupled the two to some extent by removing the requirement, which had been added during the 1978 amendments, that habitat designation be proposed at the same time the listing was. Although Congress did not want delays in designating critical habitat to hamper listings decisions, if it had simply removed the time limits it imposed in 1978 the Service would have had free range to

indefinitely postpone habitat designation. By adding the concurrence requirement Congress provided a deadline which requires, with the escape clauses considered, that within two years of the proposed listing of the species as endangered, the Service “must designate to the maximum extent prudent, on the basis of such data as may be available at that time, critical habitat of such species.” Conference Report at 24. The term creates a “mandatory, nondiscretionary duty” that the Secretary designate critical habitat within the time specified. Senate Report at 13; see also Conference Report at 20.

For this reason, we are unpersuaded by the Coalition’s assertion that if we do not read “concurrently” to require concurrent proposals that term will serve no purpose. The purpose it serves is to prevent the Service from putting off indefinitely—more than two years after the final listing decision—the designation of critical habitat for a listed species. 16 U.S.C. § 1533(b)(6)(C).

The only other provisions governing the timing of critical habitat designation are reflexive: Section 4(b)(5) requires the Service to provide general notice of a habitat designation “not less than 90 days” before its final decision on habitat designation, and Section 4(b)(6)(A) requires the Service to make a final decision “within the one-year period beginning on the date on which general notice is published,” subject to the one-year extension under Section 4(b)(6)(C). 16

U.S.C. §§ 1533(b)(5), (b)(6)(A)–(C). It is the requirement that the regulation designating critical habitat “be published concurrently with” the listing decision that forces the Service to start those other clocks ticking. The Service’s failure to designate habitat concurrently with (or within two years of) its decision to list the Alabama sturgeon as endangered places it behind on its statutory responsibilities, but it does not necessarily mean that the Service has violated any procedural notice rule in the Act.¹

If this case were being decided under the Endangered Species Act as it existed between the time of the 1978 and the 1982 amendments, the Coalition would have a much stronger case. During that interval, the Act provided that: “At the time [a listing] is proposed, the Secretary shall also by regulation, to the maximum extent prudent, specify any habitat of such species which is then considered to be critical habitat.” Endangered Species Act Amendments of 1978,

¹ We note that unlike the Endangered Species Act, the Service’s own regulations do require that “[c]ritical habitat shall be specified to the maximum extent prudent and determinable at the time a species is proposed for listing.” 50 C.F.R. § 424.12(a) (2006) (emphasis added). We decline to address the question of whether the Service complied with its own regulatory notice provision when it found that designation of critical habitat in the proposed rule would not be prudent. Proposed Rule at 14,682–83. The Coalition has never argued that the Service’s determination in the proposed rule that designation was not prudent was erroneous. At oral argument, counsel for the Coalition said: “We are not addressing the ‘not prudent’ exception.” The Coalition did not cite Section 424.12(a) to us until its reply brief, and then only for the proposition that the Service “failed to state any sufficient reasons supporting its ‘not determinable’ finding” Any argument the Coalition might have made about the regulatory notice requirement has been forfeited. United States v. Ford, 270 F.3d 1346, 1347 (11th Cir. 2001) (“[O]ur well established rule is that issues and contentions not timely raised in the briefs are deemed abandoned.”).

Pub. L. No. 95–632, 92 Stat. 3751 (emphasis added). Congress modified the critical language, uncoupling the species listing and habitat designation, or at least moving the coupling forward to the final rule stage, leaving the Service free to make the proposals at different times with comment periods that do not overlap. Endangered Species Act Amendments of 1982, Pub. L. No. 97–304, 96 Stat. 1411. The use of the word “concurrently” refers to the final decisions, not to the initial proposals. For these reasons we do not believe that the Endangered Species Act provides a procedural right to have the critical habitat proposal issued at the same time as the listing proposal, or to have the habitat proposed before time runs out for commenting about the listing.

B.

That said, this too should be said. We are troubled by the Service’s apparent practice of routinely delaying critical habitat designation until forced to act by court order. See Ctr. for Biological Diversity v. Norton, 240 F. Supp. 2d 1090, 1103 (D. Ariz. 2003). The Congressional Research Service reports that, as of 1999, the Service had designated critical habitat “for only about 10% of listed domestic species; in every case brought against the agency for failure to designate [critical habitat], the agency has lost.” M. Lynne Corn, Endangered Species: Continuing Controversy, CRS Issue Brief for Congress, at CRS-7 (Nov. 21, 2000).

The Senate Committee on Environment and Public Works after examining the Service's practices, concluded that "[p]roblems with critical habitat have been chronic over the life of the ESA." S. Rep. 106–126, at 2 (1999).

The Service's motives for delaying designation of critical habitat may have changed over the years. Before enactment of the 1982 amendments, critics accused the executive branch of stalling on habitat designation to derail protection for species entirely. See, e.g., Endangered Species Act Oversight, Hearings before the Subcomm. on Envtl. Pollution of the S. Comm. on Env't and Pub. Works, 97th Cong. 53–54 (1981) (statement of Patrick Parenteau, Vice President, National Wildlife Federation); id. at 278–79 (statement of Michael Bean, Counsel, Environmental Defense Fund). Other critics have charged that during the late 1990s the Department of the Interior may have simply viewed the Service's failure to designate critical habitat as an acceptable budgetary policy. James Rasband et al., Natural Resources Law and Policy 353–54 (2004). Most of the protections afforded endangered species attach as soon as the species is listed, and it would be reasonable to believe that the resources required to collect and analyze critical habitat data could better be spent on listing additional species. Id.

At oral argument in this case counsel for the government, explaining the Service's failure to comply with the statutory deadlines for designating habitat for

the Alabama sturgeon, characterized the Service as “chronically underfunded to meet its obligations under [the] statute.” The Service, like all agencies, undoubtedly would be better able to carry out all of its statutory duties if it could appropriate funds for itself, but under our separation of powers that is the prerogative of the legislative branch. As a result, the same legislature that has enacted standards for an executive agency’s performance can through the appropriations process effectively prevent the agency from meeting those standards. The problem of “unfunded mandates” is not limited to federal-state relations. We do not know and have no occasion to decide whether that is what is at work here.

Regardless of the cause, it is clear that the Service chronically fails to meet its statutory duty of designating critical habitat of endangered species within the time the Endangered Species Act requires. See Norton, 240 F. Supp. 2d. at 1103. The Coalition argues that a stronger remedy is needed than the order the district court issued, which requires the Service to designate the Alabama sturgeon’s critical habitat within two years of the conclusion of this case (apparently meaning two years after the end of this appeal). Of course, the Coalition is not interested in any remedy that would force the Service to designate the fish’s habitat sooner instead of later. Instead, the Coalition’s proposed remedy, which coincides

perfectly with its interest, would not only delay the designation of habitat for many more years but would also strip the Alabama sturgeon of the protection that being listed provides. What we ought to do, the Coalition argues, is overturn the listing decision as a sanction for the Service's failure to designate habitat on time. That would teach the Service not to disregard Congressional requirements, the Coalition assures us.

It would also make a bad situation worse, and defeat the Congressional intent behind the Endangered Species Act. As the Supreme Court stated in Hill, “[t]he dominant theme pervading all Congressional discussion of the proposed [Endangered Species Act of 1973] was the overriding need to devote whatever effort and resources were necessary to avoid further diminution of national and worldwide wildlife resources.” 437 U.S. at 177, 98 S. Ct. at 2293 (internal quotation marks omitted) (brackets in original). Congress intended to protect endangered species, not to strip them of protection in order to motivate an administrative agency to protect them.

The Alabama sturgeon is a fish so near extinction that the Service withdrew its first attempt to list it as endangered because there was then no evidence that the species still existed. Final Rule at 26,441–42. Four thousand man hours of fishing effort on the rivers produced a total of five Alabama sturgeon. Id. at 26,440

Requiring the Service to re-start the listing process now could condemn the Alabama sturgeon to extinction. That result probably would not bring tears to the collective eyes of the Coalition, but it is not one to which the group is entitled. The Endangered Species Act does not require that a species be destroyed in order to preserve a part of the process meant to save it.

The legislative history of the Act contains repeated statements indicating that Congress meant for species to be protected by listing decisions even if determination of their critical habitat were delayed. The Conference Report for the 1982 amendments states:

If at the end of the one-year period (or 18 month period) provided for in new Section 4(b)(6) the scientific and commercial information indicates that the species should be listed but the analysis necessary to determine and designate critical habitat has not been completed, the Secretary must comply with the new Section 4(b)(6) time requirement and promulgate the proposal to list as a final regulation.

Conference Report at 24 (emphasis added). Likewise, the Senate Report states:

At the end of such 12 month period (or 18 month period, if an extension occurs), the Secretary must make a final determination with respect to the listing proposal. He must determine, on the basis of the information then available, either that the species should be listed or delisted, or that the proposal for listing or delisting should not be promulgated as a final regulation.

Senate Report at 14. Nothing in the language of either report suggests an exception to the listing requirement even if a court concludes that the Service

intentionally delayed designation of critical habitat, which is not surprising because one of the principal purposes of the 1982 amendments was to prevent delays in habitat designation from holding up a listing decision.

The House Report accompanying the 1982 amendments is even more emphatic. It repeatedly states that a delay in habitat designation should never be used to delay the listing of a species. First, the Report states:

The Committee feels strongly, however, that where the biology relating to the status of the species is clear, it should not be denied the protection of the Act because of the inability of the Secretary to complete the work necessary to designate critical habitat.

House Report at 19. Then it states:

The Committee expects the agencies to make the strongest attempt possible to determine critical habitat within the time period designated for listing, but stresses that the listing of a species is not to be delayed in any instance past the time period allocated for such listing if the biological data is clear but the habitat designation process is not complete.

Id. at 20. And then a third time:

At the end of the one year period, if the scientific evidence indicates that the species should be listed, the Secretary must do so regardless of whether the analysis necessary to designate critical habitat has been completed.

Id. at 21–22. And then a fourth time:

The Committee intends that this [six month extension to the listing period] apply only to those instances where the biological status of the species is being questioned by scientists knowledgeable about the

species and not to allow additional time for the economic or other analyses related to the designation of critical habitat.

Id. at 22. And finally, in case anyone missed the import of its first four statements, the House Committee states in its report that under the Act:

If, for whatever reason, a critical habitat is not designated at the end of the required period, the original listing of the species is not withdrawn.

Id. To throw out a congressionally mandated listing decision because of the Service's failure to comply with time limits for making a habitat decision would defeat, not further, congressional intent.

It may be that in an appropriate case a court should use its contempt powers or fashion some creative remedy to spur the Fish and Wildlife Service on with habitat designation. But delisting is not creative, it is destructive. A species in free fall needs all the protection it can get. We would not cut the cords of a skydiver's main parachute to punish the jump master for failing to pack the fellow a reserve chute. Any beneficial effect that sanction might have on the jump master's future performance would come at too high a cost to the poor soul hurtling toward the earth at terminal velocity. And so it is here. We will not order that the Alabama sturgeon be stripped of the protection that the listing decision provides as a remedy for the failure of the Service to extend to the creature the additional benefit that

comes from designation of critical habitat. Removing one protection is not a fit remedy for the lack of another.

IV.

The Coalition's third contention is that the Final Rule should be vacated because Congress has exceeded the power granted to it under the Commerce Clause by authorizing protection of the Alabama sturgeon, which the Coalition characterizes as an intrastate, noncommercial species. In the Coalition's view, protecting the Alabama sturgeon is not one of the three categories of activities Congress may regulate using its Commerce Clause powers. See United States v. Lopez, 514 U.S. 549, 558–59 115 S. Ct. 1624, 1629–30 (1995); United States v. Morrison, 529 U.S. 598, 608–09, 120 S. Ct. 1740, 1749 (2000). As the Supreme Court has recently summarized the law in this area, there are three permissible exercises of congressional authority over commerce: “First, Congress can regulate the channels of interstate commerce. Second, Congress has authority to regulate and protect the instrumentalities of interstate commerce, and persons or things in interstate commerce. Third, Congress has the power to regulate activities that substantially affect interstate commerce.” Gonzales v. Raich, 545 U.S. 1, 17, 125 S. Ct. 2195, 2205 (2005) (internal citations omitted). The parties agree that the

third category or power, regulating activities that substantially affect interstate commerce, is the one at issue here.²

The Coalition’s argument starts with the proposition that the Alabama sturgeon is a purely intrastate species with little, if any, commercial value, as evidenced by the fact that there have been no reported commercial harvests of the fish in more than a century. Because the Alabama sturgeon cannot be commercially harvested, the Coalition reasons that protecting the fish is a non-economic activity akin to those that the Supreme Court held in Lopez and Morrison could not be regulated by Congress. And if protecting the Alabama sturgeon does not involve the regulation of activities that “arise out of or are connected with a commercial transaction,” we are not permitted to view the effect of species loss “in the aggregate” to find a substantial connection to interstate commerce. Lopez, 514 U.S. at 561, 115 S. Ct. at 1631.

The Service counters that three circuits, in four published opinions issued since Lopez, have already upheld the constitutionality of Congress authorizing the Fish and Wildlife Service to list a purely intrastate species as endangered under the Endangered Species Act. See GDF Realty Invs., v. Norton, 326 F.3d 622 (5th Cir.

² Defenders of Wildlife, filing as amicus curiae, contends that protection of the Alabama sturgeon is also defensible as a congressional regulation of the channels of interstate commerce, a first category activity. We need not address that contention in order to resolve this appeal.

2003); Rancho Viejo, LLC v. Norton, 323 F.3d 1062 (D.C. Cir. 2003); Gibbs v. Babbitt, 214 F.3d 483 (4th Cir. 2000); Nat’l Ass’n of Home Builders v. Babbitt, 130 F.3d 1041, 1052–54 (D.C. Cir. 1997). No circuit has held to the contrary. Meanwhile the Supreme Court has had the Endangered Species Act before it several times but has never questioned its constitutionality. See, e.g., Bennett v. Spear, 520 U.S. 154, 117 S. Ct. 1154 (1997); Babbitt v. Sweet Home Chapter of Cmty. for a Great. Or., 515 U.S. 687, 115 S. Ct. 2407 (1995); Hill, 437 U.S. 153, 98 S. Ct. 2279. Not only that, but last year in Raich the Supreme Court cited the prohibition on “takes” of eagles in the Bald and Golden Eagle Protection Act, which is a close cousin to the Endangered Species Act’s “take” provision, as an example of “a rational (and commonly utilized) means of regulating commerce.” 545 U.S. at 26 n.36, 125 S. Ct. at 2211 n.36. Compare 16 U.S.C. § 668 (declaring it illegal to “take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import” a bald eagle), with 16 U.S.C. § 1538(a)(1) (declaring it illegal to “take,” “possess, sell, deliver, carry, transport, or ship,” or “sell or offer for sale” an endangered or threatened species).

The Coalition characterizes its claim as an as-applied challenge to the Final Rule, and its briefs are carefully tailored to the argument that federal protection of the Alabama sturgeon, which is one homely looking fish to be found only with the

greatest effort in one river system in one state, does not concern commerce or economic activity. Nonetheless, the necessary first step in addressing its challenge is an examination of the total economic impact of the Endangered Species Act itself. In Lopez, the Supreme Court held that aggregation of economic effects is permissible where the federal action in question is “an essential part of a larger regulation of economic activity, in which the regulatory scheme could be undercut unless the intrastate activity were regulated.” 514 U.S. at 561, 115 S. Ct. at 1631; see also United States v. Ballinger, 395 F.3d 1218, 1250 (11th Cir. 2005) (en banc) (Birch, J., dissenting) (“Realizing that certain acts which are wholly intrastate in character may affect interstate commerce, and thereby frustrate Congress' express power to regulate interstate commerce, the Supreme Court has permitted federal regulation of such activity where it substantially affects interstate commerce in the aggregate.”) (emphasis in original).

In Raich, the Court upheld the application of provisions in the Controlled Substances Act criminalizing the manufacture, distribution, and possession of marijuana to intrastate growers and users of marijuana for medicinal purposes. 545 U.S. 1, 125 S. Ct. 2195. In doing so, the Court explained the statement it had made in Lopez regarding the regulation of intrastate activity as part of a larger regulation of economic activity: “Our case law firmly establishes Congress’ power to

regulate purely local activities that are part of an economic ‘class of activities’ that have a substantial effect on interstate commerce.” Id. at 17, 125 S. Ct. at 2205 (citing Perez v. United States, 402 U.S. 146, 150, 91 S. Ct. 1357 (1971); Wickard v. Filburn, 317 U.S. 111, 128–29, 63 S. Ct. 82 (1942)). The courts “have never required Congress to legislate with scientific exactitude. When Congress decides that the ‘total incidence’ of a practice poses a threat to a national market, it may regulate the entire class.” Id. at 17, 125 S. Ct. at 2206 (citing Perez, 402 U.S. at 154–55, 91 S. Ct. at 1361–62 (quoting Westfall v. United States, 274 U.S. 256, 259, 47 S. Ct. 629, 629 (1927))).

This principle poses a problem for the Coalition’s as-applied challenge, because “when ‘a general regulatory statute bears a substantial relation to commerce, the de minimis character of individual instances arising under that statute is of no consequence.’” Id. (quoting Lopez, 514 U.S. at 558, 115 S. Ct. at 1629 (quoting Maryland v. Wirtz, 392 U.S. 183, 196, n.27, 88 S. Ct. 2017, 2024 n.27 (1968))). If the process of listing endangered species process is “an essential part of a larger regulation of economic activity,” then whether that process “ensnares some purely intrastate activity is of no moment.” Id. at 24, 125 S. Ct. at 2209; id. at 22, 125 S. Ct. at 2209; see also Gibbs, 214 F.3d at 497 (applying Lopez’s “essential part of a larger regulation” test to the Endangered Species Act).

When Congress can and has regulated a class of activities, we “have no power to excise, as trivial, individual instances of the class.” Raich, 545 U.S. at 23, 125 S. Ct. at 2209 (internal quotation marks and citations omitted).

We agree with the three circuits that have concluded the Endangered Species Act is a general regulatory statute bearing a substantial relation to commerce. See GDF, 326 F.3d at 640; Rancho Viejo, 323 F.3d at 1073; Gibbs, 214 F.3d at 497. The Coalition does not argue to the contrary, nor could it do so persuasively. The Act prohibits all interstate and foreign commerce in endangered species. 16 U.S.C. § 1538(a)(1)(F). Although the true size of an illegal market is difficult to gauge, the United Nations Environment Programme estimates the illegal component of the worldwide trade in wildlife generates \$5 billion to \$8 billion in proceeds annually. See International Institute for Environment and Development and Traffic International, Making a Killing or Making a Living 12 (2002). Other reports state that the trade in wildlife products comprises the world’s second largest black market, trailing only trade in illegal narcotics. See id. The United States is not a bit player in this market. The Service conservatively estimates that Americans pay \$200 million annually for illegally caught domestic animals and \$1 billion for those illegally caught in other countries. See Christine Fisher, Comment, Conspiring to Violate the Lacey Act, 32 Entl. L. 475, 478 (2002).

The commercial impact of the Endangered Species Act is even greater than those large numbers suggest, because the economic value of endangered species extends far beyond their sale price. The House Report accompanying the Endangered Species Act explains that as human development pushes species towards extinction, “we threaten their—and our own—genetic heritage. The value of this genetic heritage is, quite literally, incalculable.” H. R. Rep. No. 93-412, at 4 (1973). Biodiversity’s value is not ethereal; its preservation produces economic gain in even the most narrow sense. For example, species diversity is essential to medicine. Half of the most commonly prescribed medicines are derived from plant and animal species. See Gibbs, 214 F.3d at 494; NAHB, 130 F.3d at 1052–53. Nine of the ten most commonly-used prescription drugs in the United States are derived from natural plant products.

Genetic diversity is also important to improving agriculture and aquaculture. As the D.C. Circuit explained in NAHB, “the genetic material of wild species of plants and animals is inbred into domestic crops and animals to improve their commercial value and productivity.” 130 F.3d at 1053. Of the explosive growth in this nation’s farm production since the 1930s, genetic diversity is responsible “for at least one-half of the doubling in yields of rice, soybeans, wheat, and sugarcane, and a three-fold increase in corn and potatoes.” Id.; see also Gibbs,

214 F.3d at 495 (noting that wildlife management can help agriculture by protecting crops and livestock). The growing use of genetic modification in aquaculture, meanwhile, may prove essential to meeting the rising world demand for fish and fishmeal. See Christopher L. Delgado, et al., *The Future of Fish* 2–6 (International Food Policy Research Institute 2003).

A species' simple presence in its natural habitat may stimulate commerce by encouraging fishing, hunting, and tourism. A Fish & Wildlife Service report found that in 2001 recreational anglers spent \$35.6 billion, recreational hunters spent \$20.6 billion, and wildlife watchers spent \$38.4 billion. United States Fish and Wildlife Service, *2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation* 4 (2001); see also Gibbs, 214 F.3d at 493 (describing wildlife-related tourism's substantial effect on interstate commerce). The report estimated direct expenditures only, and the total commercial impact of each activity may be greater still. A 1996 estimate found that recreational anglers alone had "a nationwide economic impact of about \$108.4 billion, support[ed] 1.2 million jobs, and add[ed] \$5.5 billion to Federal and State tax revenues." United States Fish and Wildlife Service, *Final Environmental Impact Statement Double-crested Cormorant Management in the United States* 43 (2003). All of the industries we have mentioned—pharmaceuticals, agriculture, fishing, hunting, and

wildlife tourism—fundamentally depend on a diverse stock of wildlife, and the Endangered Species Act is designed to safeguard that stock.

Just as it is apparent that the “comprehensive scheme” of species protection contained in the Endangered Species Act has a substantial effect on interstate commerce, it is clear that the listing process is “an essential part” of that “larger regulation of economic activity.” Raich, 545 U.S. at 22, 24, 125 S. Ct. at 2209–10. The decision to list a species as endangered or threatened is a necessary precondition to the protections afforded species under the Act. There would be no point to the Act if no species could be listed as endangered or threatened. See generally 16 U.S.C. § 1538 (Section 9’s “prohibited acts”).

The Coalition does seek a more narrow remedy than a declaration that Congress’ delegation of listing authority to the Service is unconstitutional. It wants us to treat the Alabama sturgeon, a purely intrastate species, separately from all species that have demonstrated commercial value. Congress could have excluded all intrastate species from the scope of the Endangered Species Act, but it chose not to do so. This court has “no power to excise, as trivial, individual instances of the class.” Raich, 545 U.S. at 23, 125 S. Ct. at 2209 (internal quotation marks and citation omitted). The only remaining question before us “is whether Congress’ contrary policy judgment, i.e., its decision to include this

narrower ‘class of activities’ within the larger regulatory scheme, was constitutionally deficient.” Id. at 26, 125 S. Ct. at 2211. That depends on whether Congress could have rationally concluded that the regulation of intrastate species was an essential part of the larger regulatory scheme. Id. at 26–27, 125 S. Ct. at 2211.

There are several reasons for Congress’ decision to regulate all endangered species, instead of only interstate ones. For one thing, Congress was concerned with “the unknown uses that endangered species might have.” Hill, 437 U.S. at 178–79, 98 S. Ct. at 2294. The extinction of species poses the risk that humanity may lose forever the opportunity to learn some of nature’s secrets. Deforestation drove the rosy periwinkle, a delicate pink flower native to Madagascar, nearly to extinction before scientists discovered that it contained two substances now used to treat childhood leukemia and Hodgkin’s lymphoma. Cheryl Wittenauer, *Mission is to Protect and Preserve; Conservationists Target Native Plants*, S.D. Union-Trib., May 11, 2003, at A9. Inside fragile living things, in little flowers or even in ugly fish, may hidden treasures hide. Because Congress could not anticipate which species might have undiscovered scientific and economic value, it made sense to protect all those species that are endangered. See GDF, 326 F.3d at 632 (“Who knows, or can say, what potential cures for cancer or other scourges, present or

future, may lie locked up in the structures of plants which may yet be undiscovered, much less analyzed? More to the point, who is prepared to risk those potential cures by eliminating those plants for all time? Sheer self-interest impels us to be cautious.”) (alteration and citation omitted). Because a species’ scientific or other commercial value is not dependent on whether its habitat straddles a state line, Congress had good reason to include all species within the protection of the Act. It did not behave irrationally by taking the broader approach.

Congress also recognized “the unforeseeable place such creatures may have in the chain of life on this planet.” Hill, 437 U.S. at 178–79, 98 S. Ct. at 2294; GDF, 323 F.3d at 640. As biologist Edward O. Wilson explained: “Every species is part of an ecosystem, an expert specialist of its kind, tested relentlessly as it spreads its influence through the food web. To remove it is to entrain changes in other species, raising the populations of some, reducing or even extinguishing others, risking a downward spiral of the larger assemblage.” NAHB, 130 F.3d at 1053 n.11 (quoting Edward O. Wilson, *The Diversity of Life* 308 (1992)). An insect with no apparent commercial value may be the favorite meal of a spider whose venom will soon emerge as a powerful and profitable anesthetic agent. That spider may in turn be the dietary staple of a brightly colored bird that people, who

are notoriously biased against creepy crawlers and in favor of winsome winged wonders, will travel to see as tourists. Faced with the prospect that the loss of any one species could trigger the decline of an entire ecosystem, destroying a trove of natural and commercial treasures, it was rational for Congress to choose to protect them all.

Congress also reasoned that protection of an endangered species could “permit the regeneration of that species to a level where controlled exploitation of that species can be resumed. In such a case businessmen may profit from the trading and marketing of that species for an indefinite number of years, where otherwise it would have been completely eliminated from commercial channels.” See S. Rep. No. 91–526, at 3 (1969), reprinted in 1969 U.S.C.C.A.N. 1413, 1415; see also Gibbs, 214 F.3d at 495 (documenting how successful conservation efforts for the American alligator has restarted a trade in alligator hides). The Alabama sturgeon is potentially an example of that congressional hope. It was once harvested commercially, and over harvesting was one of the factors in the species’ decline. Final Rule at 26,440–41. The protection the Endangered Species Act affords may one day allow the replenishment of its numbers and eventual, controlled commercial exploitation of the fish. Indeed, this possibility underscores the fundamental irony in the Coalition’s position. Under the

Coalition’s theory, Congress is free to protect a commercially thriving species that exists in abundance across the United States because it has economic worth, but once economic exploitation has driven that species so close to the brink of extinction that it desperately needs the government’s protection, Congress is powerless to act.

As the Fourth Circuit stated in Gibbs, “[s]uch reasoning would eviscerate the comprehensive federal scheme for conserving endangered species and turn congressional judgment on its head.” Gibbs, 214 F.3d at 498. That result need not be, because just as Congress has the power to preserve its right-of-ways over unused railroad lines for use in future commerce, Preseault v. Interstate Commerce Comm’n., 494 U.S. 1, 110 S. Ct. 914 (1990), it has the power to protect and nurture endangered species so that controlled commercial exploitation of those species may someday resume. See Gibbs, 214 F.3d at 496 (applying Preseault to the Endangered Species Act). Speaking for the Supreme Court, Holmes expressed a related thought this way: “But for the treaty and statute there soon might be no birds for any powers to deal with. We see nothing in the Constitution that compels the government to sit by while a food supply is cut off and the protectors of our forests and our crops are destroyed.” Missouri v. Holland, 252 U.S. 416, 435, 40 S.Ct. 382, 384 (1920).

These reasons collectively convince us that Congress was not constitutionally obligated to carve out an exception for intrastate species from the otherwise comprehensive statutory scheme that is the Endangered Species Act. The issue, therefore, does not turn on the present or potential commercial value of the Alabama sturgeon alone. Even if we found a commercial nexus completely lacking here, we could not “excise individual applications of a concededly valid statutory scheme.” Raich, 545 U.S. at 72, 125 S. Ct. at 2237 (internal quotation marks omitted).

The Coalition makes only passing note of Congress’ power to regulate intrastate activities as part of a comprehensive regulatory scheme. It casts the Raich decision as part of a peculiar two-case sequence along with Wickard v. Filburn, 317 U.S. 111, 63 S. Ct. 82 (1942). Both of these cases, the Coalition notes, involve circumstances in which intrastate consumption of a fungible good could affect demand for that good in the interstate market.

We are not convinced that the principle that Congress may regulate some intrastate activity as an essential part of a larger permissible regulation is limited to the facts of Raich and Wickard. The principle has a much richer history. See Perez v. United States, 402 U.S. 146, 151–53, 91 S. Ct. 1357, 1360–61 (1971) (tracing the history of the “class of activities” principle through ten Supreme Court

decisions). The decisions espousing and applying the principle are concerned not merely with commodities pricing, but with ensuring sufficient deference to Congress' legislative authority. See id. at 154, 91 S. Ct. at 1361 (“[W]e acknowledged that Congress appropriately considered the ‘total incidence’ of the practice on commerce Where the class of activities is regulated and that class is within the reach of federal power, the courts have no power ‘to excise, as trivial, individual instances’ of the class.” (internal citations omitted)). As the Court explained in Hodel v. Indiana: “It is enough that the challenged provisions are an integral part of the regulatory program and that the regulatory scheme when considered as a whole” can survive a Commerce Clause challenge. 452 U.S. 314, 329 n.17, 101 S. Ct. 2376, 2386 n.17 (1981).

Because of the depth of the decisional law, the Coalition's assertion that Raich “was not a major development in Commerce Clause jurisprudence,” may be right, but not for the reason the Coalition argues. Raich is but the logical application of the Court's prior Commerce Clause jurisprudence. The discussion in Raich of the effect of intrastate marijuana use on national drug prices was not intended to limit to the sale of fungible goods a doctrine that had already been applied to discriminatory accommodations, see Katzenbach v. McClung, 379 U.S. 294, 302, 85 S. Ct. 377, 383 (1964), to fair labor standards, see Darby, 312 U.S. at

115, 61 S. Ct. at 451, 457–58, to extortiate credit transactions, see Perez, 402 U.S. at 154, 91 S. Ct. at 1361, and to mining safety standards, see Hodel, 452 U.S. at 329, 101 S. Ct. at 2386. Instead, the Court’s discussion of commodity pricing in Raich was part of its explanation of the rational basis Congress had for thinking that regulating home-consumed marijuana was an essential part of its comprehensive regulatory scheme aimed at controlling access to illegal drugs. 545 U.S. at 19, 125 S. Ct. at 2207.

This case, like Raich, also turns on whether Congress had a rational basis for believing that regulation of an intrastate activity was an essential part of a larger regulation of economic activity. Unlike the statute involved in Raich, Congress did not rely on commodity pricing in justifying the Endangered Species Act. Instead, it made a determination that the most effective way to safeguard the commercial benefits of biodiversity was to protect all endangered species, regardless of their geographic range. That rational decision was within Congress’ authority to make.

AFFIRMED.