

THE HAPLESS ECOSYSTEM: A FEDERALIST ARGUMENT IN FAVOR OF AN ECOSYSTEM APPROACH TO THE ENDANGERED SPECIES ACT

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INTRODUCTION

THE Endangered Species Act¹ (ESA), first passed in 1973, is possibly the most wide-ranging of the United States' protective environmental statutes. Grounded in Congress' ability to regulate interstate commerce, it purports to protect biodiversity by keeping animal species from becoming extinct.² Currently, the ESA directly protects any species that has been listed as "endangered" by the Secretary of the Interior, instead of protecting the ecosystems inhabited by the species.³ The Act has caused considerable controversy since its adoption, because it can severely interfere with the private use of personal property⁴ and may act as a roadblock for major projects in order to protect seemingly insignificant organisms.⁵ Judges have struggled to tie the Act to the commerce clause,

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¹ 16 U.S.C. §§ 1531–1544 (2006).

² 16 U.S.C. § 1531(b) (2006).

³ 16 U.S.C. § 1533 (2006).

⁴ See 16 U.S.C. § 1538 (2006).

⁵ See, e.g., *Babbitt v. Sweet Home Chapter of Cmty. for a Great Or.*, 515 U.S. 687 (1995); *Tenn. Valley Auth. v. Hill*, 437 U.S. 153 (1978). *Tennessee Valley Authority v. Hill* is the most famous example of this, where the newly minted ESA was used as a

though no case on this issue has yet reached the Supreme Court. The case *Rancho Viejo, LLC v. Norton*, however, offers a glimpse into how one Justice, in particular, would likely vote—then-Circuit Judge John Roberts, dissenting from a denial of en banc rehearing, argued that the ESA may violate federalism principles by allowing Congress to regulate and protect organisms that are entirely intrastate and have no relation to interstate commerce.⁶ In turn, scholars have predicted that Roberts, as Chief Justice, will be looking to hear a case in order to settle this issue once and for all,⁷ thereby continuing the federalism revolution started by the Rehnquist Court. Unsurprisingly, the Roberts Court has already applied federalism principles to the Clean Water Act in *Rapanos v. United States*.⁸ This Note will not take a stance on whether the Supreme Court should find the ESA unconstitutional. Instead, it will argue that a change in the law's focus—to be more concerned with ecosystems rather than with individual species—would serve to insulate it from potential federalism challenges. Essentially, while the Supreme Court *may* find the current ESA unconstitutional, an ESA with an ecosystem focus would be protected from such a finding, since it would have a stronger connection to interstate commerce and economics.

Although the stated goal of the Act is to “provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved,”⁹ the actual focus of its implementation has been dominated by actions to protect individual species, as opposed to the ecosystems on which they depend.¹⁰ Since the Act's adoption, the growth of ecology and ecosystem sciences has generated academic literature filled with arguments by environmentalists, scientists, and lawyers calling for a more ecosystem-focused statute in order to better protect biodi-

roadblock to stop the Tellico Dam, a major federal project, from being completed in order to protect the snail darter, a small, seemingly insignificant fish.

⁶ 334 F.3d 1158, 1160 (D.C. Cir. 2003) (Roberts, J., dissenting from denial of rehearing en banc).

⁷ Timothy S. Bishop, *Does the Endangered Species Act Regulate Commerce?*, 24 A.B.A. Sec. Env't, Energy, & Resources 2 (2006).

⁸ 547 U.S. 715 (2006).

⁹ 16 U.S.C. § 1531(b) (2006).

¹⁰ See Jerry F. Franklin, *Preserving Biodiversity: Species, Ecosystems, or Landscapes?*, 3 *Ecological Applications* 202, 202 (1993).

versity.¹¹ To date, however, these efforts have not been successful in reforming the Act. Recently, the federal government has made efforts to incorporate knowledge about ecosystems into its decisions regarding what species to list under the current ESA, but these management decisions have done little to change the Act's prevailing focus on species.¹²

This Note will advance a new argument in favor of the ecosystem approach in light of Chief Justice Roberts' interest in the issue and the likelihood that the Supreme Court may soon examine the Act's constitutionality. Instead of the classic environmentalist argument that an ecosystem approach will be superior in protecting species, this Note will argue in favor of an ecosystem approach because it will insulate the Act from the federalism challenges often brought against it,¹³ since "ecosystem services" have more direct and tangible effects on interstate commerce than do individual species.¹⁴

Part I of this Note will outline the various federalist challenges to the Act, evaluate these challenges in light of similar problems facing the Clean Water Act, and discuss the lower court decisions that have upheld the ESA to date. Part II will present a summary of the science and economics driving the concept of "ecosystem services," which tie the country's ecosystems to interstate commerce, and present an explanation of an ecosystem approach, including the classic environmentalist arguments. Part III will relate this ecosystem approach to the federalism problem and show how

¹¹ See, e.g., Thomas Eisner et al., Building a Scientifically Sound Policy for Protecting Endangered Species, 268 *Sci.* 1231 (1995); Daniel J. Rohlf, Six Biological Reasons Why the Endangered Species Act Doesn't Work—And What to Do About It, 5 *Conservation Biology* 273 (1991); Daniel Simberloff, Flagships, Umbrellas, and Keystones: Is Single-Species Management Passé in the Landscape Era?, 83 *Biological Conservation* 247 (1998).

¹² David Briscoe, Entire Ecosystem Proposed For Protection, Associated Press, Sept. 30, 2008, available at <http://abcnews.go.com/Technology/wireStory?id=5922554>.

¹³ See discussion *infra* Part III.

¹⁴ The concept of ecosystem services has been extremely influential in the field of ecology, especially in relation to economics. See, e.g., Charles J. Krebs, *Ecology: The Experimental Analysis of Distribution and Abundance* 603–06 (5th ed. 2001). Its roots can probably be traced back to Aldo Leopold, a naturalist who maintained that any conservation ideology must protect entire ecosystems in order to be effective. See Aldo Leopold, *A Sand County Almanac and Sketches Here and There* (1949); see also discussion *infra* Part II.

the natural interstate concerns brought on by ecosystem destruction tie it much more strongly to the commerce clause than the current weak connection exhibited by harm to individual species. Finally, Part IV will address a number of counterarguments that are often raised against the ecosystem approach, which include permitting greater restriction on the use of personal property. Although this paper will discuss substantive reasons to support an ecosystem approach, this is primarily in order to explain how such an approach would work. The argument that the ecosystem approach will insulate the Act from federalism challenges that could invalidate its protections remains valid regardless of whether or not the ecosystem approach represents a superior environmental policy to the current, species-based approach.

I. FEDERALISM AND THE ENDANGERED SPECIES ACT

When Congress first passed the ESA, the initial objections it faced were not based on federalism grounds, since few expected that the Supreme Court would once again limit Congress' power based on the commerce clause.¹⁵ Instead, outrage stemmed from how the first use of the Act effectively prevented the completion of the Tellico Dam in Tennessee, after opponents to its construction employed the ESA using a downriver discovery of the snail darter, a seemingly insignificant endangered fish.¹⁶ Supporters of building the dam made numerous attempts to find a way around the statute: arguing the case up to the Supreme Court in *Tennessee Valley Authority v. Hill*;¹⁷ amending the Act itself to allow a "God squad"¹⁸ to create exceptions to the Act; and, finally, convincing Congress to exempt the Tellico Dam from the ESA in an amendment to a sepa-

¹⁵ Geoffrey R. Stone et al., *Constitutional Law* 225–29 (5th ed. 2005).

¹⁶ A detailed history of the Snail Darter and the Tellico Dam can be found in Kenneth M. Murchison, *The Snail Darter Case: TVA versus the Endangered Species Act* (2007).

¹⁷ 437 U.S. 153 (1978).

¹⁸ Murchison, *supra* note 16, at 152, 184. The "God Squad," a small group of officials who could decide to override the ESA if the cost of protecting a species was too great, was specifically created in order to allow the dam to be finished. They found, however, the benefit of completing the dam was not worth setting a precedent of allowing the destruction of the snail darter population.

rate appropriations bill.¹⁹ Despite the eventual completion of the dam, the ESA emerged as a powerful piece of legislation that made preserving biodiversity an important goal for the government. Other early and obvious arguments against the Act were based on how invasive it could be regarding personal property. This concern was especially evident in cases like *Babbitt v. Sweet Home Chapter of Communities for a Great Oregon*, in which private landowners were prohibited from taking actions on their own lands that would harm an endangered species, even indirectly.²⁰

Most challenges to environmental laws such as the ESA, however, have been recent, due largely in part to the “federalism revolution” of the Rehnquist Court.²¹ Read literally, the commerce clause gives Congress the power “to regulate Commerce with foreign Nations, and among the several States.”²² By the 1940s, however, the Supreme Court had apparently abandoned the idea that the commerce clause was a significant restraint on Congressional power. This trend was particularly evident in cases dealing with New Deal programs.²³ By the time the ESA was passed in 1973, it is doubtful that any of its drafters seriously considered federalism concerns, since the Supreme Court had not invalidated a statute for being outside the reach of the commerce clause since before the New Deal.²⁴

Significant changes, however, came about with the Rehnquist Court’s landmark decision in *United States v. Lopez*, in which the Court struck down, by a 5–4 vote, the Gun-Free School Zones Act

¹⁹ Id. at 185. Interestingly, although the snail darter population downstream from the dam was annihilated, other populations of the fish have since been found in other rivers and the species remains extant. Id. at 184.

²⁰ 515 U.S. 687 (1995) (holding that the definition of “harm” in the statute has a broad meaning, leading to significant potential interference with personal property). Justice Scalia dissented, decrying that the Act could do more to harm poor farmers trying to work their land than to protect species. Id. at 714 (Scalia, J., dissenting).

²¹ See generally Christina E. Coleman, Note, The Future of the Federalism Revolution: *Gonzales v. Raich* and the Legacy of the Rehnquist Court, 37 U. Chi. L.J. 803 (2006).

²² U.S. Const. art. I, § 8, cl. 3.

²³ See, e.g., *Wickard v. Filburn*, 317 U.S. 111 (1942) (holding that Congress could regulate wheat grown for intrastate consumption based on the commerce clause).

²⁴ See Stone et al., *supra* note 15.

for having insufficient ties to interstate commerce.²⁵ Although the impact of *Lopez* could have been immediately catastrophic for the ESA, lower courts appeared reluctant to invoke *Lopez* to overturn significant legislation, since the law overturned in *Lopez* was relatively minor and the staying power of the new federalism doctrine had not been proven. This hesitation was clear in *National Association of Home Builders v. Babbitt*,²⁶ in which the D.C. Circuit refused to find that the ESA violated the federalism boundaries put forth in *Lopez*. Judges Wald and Henderson each described different rationales regarding how biodiversity and species are still related to interstate commerce, while Judge Sentelle wrote a vigorous dissent declaring that the ESA *clearly* violated the commerce clause if one took *Lopez* seriously.²⁷

The ESA came under even more fire after *United States v. Morrison*,²⁸ in which the Supreme Court struck down the Violence Against Women Act for reasons similar to those in *Lopez*. This was especially foreboding for the ESA, as the Court in *Morrison* specifically rejected the methodology that the *National Association of Home Builders* majority had employed to find the ESA constitutional under Congress' commerce clause authority.²⁹ Since then, there have been a number of other challenges to the ESA on federalism grounds, which have all been unsuccessful by narrow margins despite some impassioned dissents.³⁰ These cases are discussed in more detail below.³¹

Some commentators have argued that the Court's holding in *Gonzales v. Raich*, which upheld regulation of marijuana grown completely intrastate for intrastate consumption because it was part of a "comprehensive scheme,"³² implies that the Act could

²⁵ 514 U.S. 549 (1995) (holding that the Gun-Free School Zones Act, which made it a crime to bring a firearm within a certain distance of a school, was unconstitutional for going beyond Congress' powers to regulate commerce).

²⁶ 130 F.3d 1041 (D.C. Cir. 1997).

²⁷ For further discussion of this case, as well as other circuit decisions dealing with federalism and the ESA, see *infra* Section I.B.

²⁸ 529 U.S. 598 (2000).

²⁹ *Id.*

³⁰ See, e.g., *GDF Realty Invs. v. Norton*, 326 F.3d 622 (5th Cir. 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 (D.C. Cir. 1997).

³¹ See discussion *infra* Section I.B.

³² 545 U.S. 1 (2005).

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avoid federalism concerns simply by using a similar argument. These commentators claim that the ESA is a similarly protected comprehensive regulatory scheme “that would be fatally undercut if piecemeal species extinction was permitted simply because the specific listed species or activity causing the [harm to species] alone lacked a substantial effect on interstate commerce.”³³ There are a number of indicators, however, showing that the Court will not apply *Raich* to the ESA as it is currently written. The decision in *Raich* applies to the regulation of marijuana, which has a lucrative interstate trade.³⁴ Because of this trade, growing marijuana seems to have a more obvious connection to commerce than the regulation of certain species. Indeed, many of the species listed under the Act individually have negligible commercial value,³⁵ so it would be difficult to argue that their regulation is simply a part of a comprehensive federal scheme.³⁶ It also seems likely that the Court would take a different view of the federal government claiming the power to regulate marijuana as compared to the power to regulate all uses of personal property inhabited by an endangered species.³⁷

These issues aside, this Note will revisit *Raich* to evaluate whether or not it would help an ecosystem-focused Act remain within Congress’ power.³⁸

A. Federalism and The Clean Water Act

Although the ESA has survived all federalist challenges thus far without changes to its scope, other environmental regulations have not been as lucky. Another notable environmental statute that has faced significant federalism objections is the Clean Water Act.³⁹

³³ Michael C. Blumm & George A. Kimbrell, *Gonzalez v. Raich*, The “Comprehensive Scheme” Principle, and the Constitutionality of the Endangered Species Act, 35 *Envl. L.* 491, 492 (2005); see also Bradford C. Mank, *After Gonzales v. Raich: Is the Endangered Species Act Constitutional Under the Commerce Clause?*, 78 *U. Colo. L. Rev.* 375 (2007).

³⁴ *Gonzalez*, 545 U.S. at 25–26.

³⁵ Jason F. Shogren, *Economics and the Endangered Species Act*, <http://www.umich.edu/~esupdate/library/97.01-02/shogren.html>.

³⁶ See *infra* Section III.C for a discussion on how an ecosystem approach arguably makes *Raich* more relevant.

³⁷ Bishop, *supra* note 7, at 7.

³⁸ See discussion *infra* Section III.C.

³⁹ 33 U.S.C. §§ 1251 (2000).

Among the three most prominent environmental statutes—the ESA, Clean Water Act, and Clean Air Act—the ESA and the Clean Water Act are the most similar, in that neither is purely based on utilitarian principles.⁴⁰ Instead, they both appear to approach environmental protection as a moral imperative as opposed to the Clean Air Act, which is solely concerned with protecting the air in order to promote human health.⁴¹ For this reason, the Clean Water Act tends to run into similar federalism issues as the ESA. The issues are not identical, though, as the Clean Water Act protects “navigable waters,” which have traditionally been related to commerce and are thereby related to the economic benefits of fishable or swimmable waterways.⁴²

In *Solid Waste Agency of Northern Cook County v. United States Army Corps of Engineers*, the Supreme Court struck down the Corps of Engineers’ “migratory bird rule,” which claimed that any body of water in which migratory birds land can be regulated by the Clean Water Act.⁴³ This rule was based on the theory that a connection to migratory birds supplies a sufficient nexus with interstate commerce to authorize federal regulation.⁴⁴ The Court did not accept this theory, finding that the rule raises “significant constitutional and federalism questions,” since the birds did not suddenly connect wholly intrastate water bodies to interstate commerce or economics.⁴⁵ The Court also rejected the argument that regulating these waters was connected to interstate commerce because it would allow Congress to regulate the development and commercial activities around them. The Corps’ argument would have allowed them to regulate every aspect of activities around these waters as innocuous and personal as bird watching.⁴⁶ This case closely followed the reasoning in *Jones v. United States*, where the Supreme

⁴⁰ 33 U.S.C. § 1251; 16 U.S.C. § 1531 (2000).

⁴¹ 42 U.S.C. § 7401 (2000).

⁴² 33 U.S.C. § 1251 (2000).

⁴³ 531 U.S. 159, 174 (2001). The Court did not squarely address the commerce clause question, as this was a case of a failed agency policy. The case was decided under the canon of constitutional avoidance specifically to avoid answering commerce clause questions about the Clean Water Act. *Id.*

⁴⁴ Bishop, *supra* note 7, at 4–5 (discussing 51 Fed. Reg. 41,206, 41,217 (Nov. 13, 1986)).

⁴⁵ *Solid Waste Agency of N. Cook County*, 531 U.S. at 174.

⁴⁶ Bishop, *supra* note 7, at 6.

Court held that when an administrative agency adopts a statutory interpretation that raises federalism questions, the statute should be construed to avoid those questions.⁴⁷

The most recent decision dealing with the federalism conflict created by the Clean Water Act is *Rapanos v. United States*.⁴⁸ Although there has been widespread confusion about what the opinion holds, a major point of contention within the case seems to be whether or not an ecological approach should be taken to determine what waters fall under the jurisdiction of the Clean Water Act.⁴⁹ In a tortured 4-1-4 opinion, *Rapanos* seems to indicate that in order to receive protection from the Clean Water Act, a body of water needs to have a “significant nexus” to a navigable waterway. Although this ruling partially comes from the language of the Clean Water Act, it also comes from the idea that without such a significant nexus, the Clean Water Act would be going beyond the bounds of the commerce clause, since Congress would have no authority to regulate those waters. Applied to the ESA, this brand of reasoning suggests that an ecosystem approach would satisfy the Court’s commerce clause inquiry, since an ecosystem approach could provide the requisite nexus between the protected species and commerce. Still, environmentalists worry that this would lead to at least a partial crippling of the Act because it would be extremely difficult to show directly how some protected species, such as rare flies, have a nexus with interstate commerce.

Other scholars have already mentioned the ecosystem approach in regard to the Clean Water Act, and how it may have influenced Justice Kennedy’s concurring opinion in *Rapanos*.⁵⁰ Justice Ken-

⁴⁷ 529 U.S. 848, 857–58 (2000).

⁴⁸ 547 U.S. 715 (2006). Although this case had a plurality opinion by four justices, and a dissenting opinion by four justices, it is a concurrence by Justice Kennedy that is often cited from the decision, as his opinion was based on the narrowest grounds.

⁴⁹ Mark Latham, *Rapanos v. United States: Significant Nexus or Significant Confusion? The Failure of the Supreme Court to Clearly Define the Scope of Federal Wetland Jurisdiction*, in *The Supreme Court and the Clean Water Act: Five Essays* 5, 8 (Vt. J. Envtl. L. 2007), available at <http://www.vjel.org/books/pdf/PUBS10004.pdf>.

⁵⁰ See e.g., Anne McKibbin, *The Whole-Ecosystem Approach to the Commerce Clause and Article III Standing in Environmental Cases* 15–16 (Sept. 28, 2004) (unpublished manuscript, available at <http://ssrn.com/abstract=597104>) (arguing that “this whole ecosystem approach be used to find that ecological connections between isolated wetlands and navigable waters create the significant nexus required for Clean Water Act jurisdiction over isolated wetlands”). McKibbin also mentions how an eco-

neddy has seemingly attempted to solve the federalism problem by judicially imposing an ecosystems focus on the Clean Water Act. Kennedy's imposition appeared to conform to the goals of the Clean Water Act, since Congress originally wrote it to protect entire waterways, which are already ecosystems, and Kennedy's opinion seems to grant protection to entire ecosystems.⁵¹ On one hand, this approach may be applied to protect the ESA from commerce clause challenges. On the other hand, because the ESA is currently focused on individual species that are merely part of an ecosystem, it may be more difficult for a court simply to assign it an ecosystem focus without congressional intervention, as only the legislature has the power to change the regulatory target of a statute like the ESA.

B. The Circuit Courts and Their Rationale for Upholding the ESA to Date

A number of cases dealing with the federalism issues facing the ESA have reached the U.S. Circuit Courts of Appeals, and each has upheld the Act as constitutional. Despite the uniformity of their holdings, the opinions developed different rationales for why purely intrastate animals could be regulated under the Act.⁵² Although the plaintiffs surely petitioned the Supreme Court for certiorari, the Court so far has denied all petitions pertaining to federalism challenges to the ESA.⁵³

1. National Association of Home Builders v. Babbitt

In the first of these cases, *National Association of Home Builders v. Babbitt*, the D.C. Circuit rejected a federalism challenge to the

system approach would benefit the Endangered Species Act but relies on an aggregation argument that has been questioned by the Supreme Court. She does not discuss the economic importance of ecosystem services. See discussion *infra* I.B.

⁵¹ The goal of the Clean Water Act (Act), is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." 33 U.S.C. § 1251(a) (2000). Justice Kennedy's opinion in *Rapanos* drew on the Court's language in *Solid Waste Agency of North Cook County v. United States Army Corps of Engineers*, 531 U.S. 159 (2001), but seemed less concerned with the actual language of the Clean Water Act than either the plurality or dissenting opinion.

⁵² See *GDF Realty Invs. v. Norton*, 326 F.3d 622 (5th Cir. 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 (D.C. Cir. 1997).

⁵³ Bishop, *supra* note 7, at 8.

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Act in 1997, just two years after *Lopez*.⁵⁴ The majority and concurring opinions articulated different reasons for upholding the law, although both agreed that “(1) the loss of biodiversity itself has a substantial effect on the ecosystem and, by extension, interstate commerce, and (2) application of the . . . prohibition [on harming species] of the ESA to the regulated activity, in this case construction of the new hospital, would substantially affect interstate commerce.”⁵⁵ The majority focused on the idea that while the loss of one species may not have a direct effect, the loss of many species in the aggregate would have a substantial effect on interstate commerce.⁵⁶ The concurrence focused on the idea that due to the interconnectedness of species and ecosystems, any loss of biodiversity affects interstate commerce.⁵⁷ The concurrence also argued that as long as the activity that is being regulated—in this case, building a hospital—had an effect on interstate commerce, then it should be covered by the ESA.⁵⁸ Judge Sentelle wrote the dissent, arguing that this interpretation of the commerce clause effectively gives Congress the power to regulate anything:

Congress could [not] be prohibited from regulating any action that might conceivably affect the number or continued existence of any item whatsoever. A creative and imaginative court can certainly speculate on the possibility that any object cited in any locality no matter how intrastate or isolated might some day have a medical, scientific, or economic value which could then propel it into interstate commerce. There is no stopping point. If we uphold this statute . . . we have indeed not only ignored *Lopez* but made the Commerce Clause into what Judge Kozinski suggested: the “hey-you-can-do-whatever-you-feel-like clause.”⁵⁹

Later, the “aggregation” reasoning in *National Association of Home Builders* was further undercut by the Supreme Court’s decision in *United States v. Morrison*, which all but rejected the argu-

⁵⁴ *Nat’l Ass’n of Home Builders*, 130 F.3d at 1041 (preventing the construction of the hospital because of the presence of the Delhi Sand Loving Fly).

⁵⁵ Bishop, *supra* note 7, at 9.

⁵⁶ *Nat’l Ass’n of Home Builders*, 130 F.3d at 1053–54.

⁵⁷ *Id.* at 1059 (Henderson, J., concurring).

⁵⁸ *Id.*

⁵⁹ *Id.* at 1065 (Sentelle, J., dissenting) (quoting Alex Kozinski, Introduction to Volume 19, 19 Harv. J.L. & Pub. Pol’y 1, 5 (1995)).

ment that any non-economic activity that could be aggregated into an economic effect could be regulated in holding that, “[w]hile we need not adopt a categorical rule against aggregating the effects of any noneconomic activity in order to decide these cases, thus far in our Nation’s history our cases have upheld commerce clause regulation of intrastate activity only where that activity is economic in nature.”⁶⁰ Although all subsequent cases have upheld the ESA, they have had to reconcile the Act with the Court’s language in both *Lopez* and *Morrison*.

2. *Gibbs v. Babbitt*

In *Gibbs v. Babbitt*, the Fourth Circuit presented another rationale for upholding the constitutionality of the ESA to protect purely intrastate species.⁶¹ The court may have hoped to avoid the problems raised by the recently decided *Morrison*, which seemed to disallow the use of aggregate effects as a connection to interstate commerce. Instead, in a case where an extermination project threatened the endangered red wolf species, the court further developed an argument made in concurrence in *National Association of Home Builders*.⁶² Rather than focusing on the effects of the loss of biodiversity itself, the court focused on the fact that the motive for harming the red wolf was purely economic. Additionally, the court explained that the red wolf itself was important for industries such as tourism.⁶³ Judge Luttig filed a strong dissent attacking both premises. First, his dissent stated that the motive for the taking of an endangered species is not important under the Act; the ESA regulates the taking itself, which is not necessarily economic.⁶⁴ Once again, he mentioned that if Congress could regulate anything motivated by economics, then no activity would be outside the control of the commerce clause.⁶⁵ Second, as for the importance of wolves to tourism, he argued that the number of inferences needed for the court to arrive at that conclusion was even greater than the inferences needed to tie the gun-free school law in *Lopez* to com-

⁶⁰ 529 U.S. 598, 613 (2000).

⁶¹ 214 F.3d 483 (4th Cir. 2000).

⁶² *Id.*

⁶³ *Id.* at 492–97.

⁶⁴ *Id.* at 507–09 (Luttig, J., dissenting).

⁶⁵ *Id.*

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merce.⁶⁶ He concluded that the majority is simply backing away from the *Lopez* standard because of the subject matter, not because it is required under the law.⁶⁷

3. GDF Realty Investments v. Norton

In *GDF Realty Investments v. Norton*, the Fifth Circuit explicitly rejected the idea put forth in *Gibbs v. Babbitt* that as long as the rationale for the taking is connected to interstate commerce—in this case, development by Wal-Mart—then Congress has the power to regulate it.⁶⁸ Wal-Mart’s development threatened “six species of subterranean invertebrates found only within two counties in Texas.”⁶⁹ Although the court used an argument similar to the majority’s in *National Association of Home Builders*, it could no longer simply use the aggregation argument. Instead, the court focused on the potential “genetic heritage that might be lost absent regulation” as the species’ connection to interstate commerce.⁷⁰ Judge Jones vigorously dissented from the refusal to rehear the case en banc, stating that this decision completely undercut *Lopez* and *Morrison*, and that the court was allowing Congress to regulate the environment without regard to the limited powers in the Constitution. He continued: “[t]he Commerce Clause does not regulate . . . ecosystems as such—it regulates commerce.”⁷¹

4. Rancho Viejo, LLC v. Norton

Another case that upheld the ESA was *Rancho Viejo, LLC v. Norton*, this time dealing with a development that threatened the Arroyo toad.⁷² The court once again focused on the fact that economic activity connected the taking to interstate commerce, allowing regulation by Congress. Judge Ginsburg, concurring, pointed out that this created a strange dichotomy in the law, where “[t]he large-scale residential development . . . is the [harm] in this case . . .

⁶⁶ Id. at 507–08.

⁶⁷ Id. at 509–10.

⁶⁸ 326 F.3d 622 (5th Cir. 2003).

⁶⁹ Id. at 624.

⁷⁰ Id. at 639.

⁷¹ *GDF Realty v. Norton*, 362 F.3d 286, 290–93 (5th Cir. 2004) (Jones, J., dissenting from denial of rehearing en banc).

⁷² 323 F.3d 1062 (D.C. Cir. 2003).

[but] the lone hiker in the woods, or the homeowner who moves dirt in order to landscape his property, though he [harms] the toad, does not affect interstate commerce.”⁷³ Judge Roberts dissented from the court’s refusal to rehear the case en banc, echoing many of Judge Luttig’s concerns from *Gibbs*.⁷⁴

The different rationales offered by the majorities and the vigor of the dissents in these similar cases show the tenuousness of the ESA’s ability to regulate intrastate species, especially with Justice Roberts’ opinion on the issue already revealed. Judge Jones’ statement about ecosystems in *GDF Realty Investments*, however, raises an interesting point about whether or not ecosystems can be regulated under the ESA. The Supreme Court has clearly stated that the commerce clause allows Congress to regulate economic activities that substantially affect interstate commerce in addition to commerce itself.⁷⁵ It seems that Judge Jones did not consider the tremendous effects that ecosystems have on the national economy in his dissent. For years, environmentalists have been calling for Congress to regulate ecosystems, arguing that this is the only way to be truly effective in protecting species *and* commerce. Whether or not these environmentalists are correct, changing the ESA to regulate ecosystems could be the only way for Congress to protect endangered species.

II. ECOSYSTEM SERVICES AND THE ECOSYSTEM APPROACH TO THE ENDANGERED SPECIES ACT

Modern study of nature and the environment does not focus on individual species, but instead views the environment as a complex, interlocking web of biotic and abiotic factors that includes both

⁷³ Id. at 1080 (Ginsburg, J., concurring).

⁷⁴ *Rancho Viejo, LLC v. Norton*, 334 F.3d 1158, 1160 (D.C. Cir. 2003) (Roberts, J., dissenting from denial of rehearing en banc). This is the case from which this Note takes its name. Judge Roberts dissented from the circuit’s refusal to re-hear the case en banc and famously referred to the Arroyo toad as “hapless.” Judge Roberts did say in his Senate confirmation hearings that he never argued that the ESA had no power to protect endangered species, refusing to join Judge Sentelle’s more strongly worded dissent, and that he voted to hear the case en banc in order to explore “other ways of sustaining this act that don’t implicate the concern that has caused the [Fifth Circuit in *GDF Realty*] to question our approach.” Robert B. Percival et al., *Environmental Regulation: Law, Science, and Policy* 898 (5th ed. 2006).

⁷⁵ See, e.g., *United States v. Lopez*, 514 U.S. 549, 560 (1995).

natural and anthropogenic inputs. There is little doubt that humans continue to have strong effects on ecosystems all over the world, which often cause unexpected changes and feedbacks⁷⁶ that can be as extreme as drastically changing a local area's climate or completely altering the local ecosystem.⁷⁷ In turn, ecosystem degradation can lead to powerful consequences for humans, underscoring the need for protection. The National Biological Service (NBS) performed a full-fledged review of ecosystem health in 1995.⁷⁸ In this meta-analysis, compiling many studies of ecosystems across the country, the NBS determined that ecosystems have declined to the point that they could be considered endangered themselves, hinting at the possibility of a statute that protects ecosystems instead of species.⁷⁹

A. Ecosystem Services' Connection to Species and Commerce

Although the precise machinations are not yet fully understood, there has been a substantial amount of research showing that more biodiversity in an ecosystem actually causes it to be more productive and stable.⁸⁰ This concept ties into economics through the concept of "ecosystem services," the benefits to humanity that healthy ecosystems provide. Practically speaking, ecosystem services take a number of forms. Among the most important ecosystem services are managing the water table (including preventing runoff and filtering the ground water), allowing for nutrient flow through biotic and abiotic media (especially important for keeping soils fertile), and maintaining a vegetative-weather feedback cycle that prevents

⁷⁶ One of the most influential papers describing the massive effects and changes human activity causes to ecosystems is Peter M. Vitousek et al., *Human Domination of Earth's Ecosystems*, 277 *Sci.* 494–99 (1997).

⁷⁷ Ning Zeng et al., *Enhancement of Interdecadal Climate Variability in the Sahel by Vegetation Interaction*, 286 *Sci.* 1537–40 (1999). The paper hypothesizes that desertification in Sub-Saharan Africa is increased by deforestation not only because there are no plants to hold on to water, but also because rainfall actually decreases without the vegetation to recycle the water between the soil and the atmosphere, leading to a biome shift.

⁷⁸ Reed F. Noss et al., *U.S. Geological Survey, Endangered Ecosystems of the United States: A Preliminary Assessment of Loss and Degradation* (1995).

⁷⁹ *Id.*

⁸⁰ For one of the first and most influential papers on the subject, see David Tilman & John A. Downing, *Biodiversity and Stability in Grasslands*, 367 *Nature* 363–65 (1994).

climatic regime shifts (indicative of how ecosystem damage can change the general features of an area).⁸¹ Everything—from the viability of farmland to clean drinking water to property value—is directly tied to ecosystem quality.

Since greater biodiversity helps keep an ecosystem healthy,⁸² protecting it enhances ecosystem services, which then leads to economic benefits.⁸³ Often, the services are presented in six categories that show the various types of economic harm that can come from ecosystem damage.⁸⁴

First, “avoided costs” are simply the costs that are incurred directly from the absence of the services (such as the water purification caused by filtration in wetlands that can avoid health costs). Second, “replacement costs” are the costs of replacing the service with an artificial substitute (such as the cost of the waste water treatment plant to replace a wetland). Third, “factor income” is how the services can provide for the enhancement of incomes (such as how improved water quality can enhance the income of a fishery). Fourth, “travel cost” includes demand for a service that leads to travel (such as ecotourism). Fifth, “hedonic pricing” is when the presence of the service affects the prices people are willing to pay for associated goods (such as the prices of houses along a healthy coastline). Sixth, “contingent valuation” is the benefit of resources that generate utility, but do not necessarily have a market price (such as people’s willingness to pay for increased access to national parks, even though this is not reflected in market prices). All of the economic results satisfy the test set forth in *Lo-*

⁸¹ There is extensive academic literature on the importance of ecosystem services, including an entire academic journal. Influential works include James H. Brown et al., *Complex Species Interactions and the Dynamics of Ecological Systems: Long-Term Experiments*, 293 *Sci.* 643–50 (2001) and Tilman & Downing, *supra* note 80.

⁸² The ecological and economic communities have gained more interest in the intersections between their two fields. This is perhaps most evident in the existence of *Ecological Economics*, a journal dedicated solely to the subject. It published its first volume in 1989 and continues to publish today.

⁸³ This Part will explain the economic benefits ecosystems provide. For a discussion of why these benefits are enough to tie ecosystems to the economy such that they are within Congress’ power to regulate under the commerce clause, see *infra* Part III.

⁸⁴ The list of types of ecosystem services and the examples are taken from Stephen C. Farber et al., *Economic and Ecological Concepts for Valuing Ecosystem Services*, 41 *Ecological Economics* 375, 388–89 (2002).

pez to determine what is connected to interstate commerce,⁸⁵ either directly through changing the flow of goods between states to replace ecosystem services or ecotourism, or indirectly, such as through housing markets. This demonstrates that Congress should be able to pass legislation regulating individual ecosystems, as the ecosystem services they provide are economically vital.

The health of the populations in an ecosystem is closely tied to how the system will be able to provide these services. Ecosystem processes often strongly depend on their biological community in order to function.⁸⁶ There are currently three competing hypotheses to explain exactly why this relationship exists. Under the “rivet hypothesis,” each of the populations within an ecosystem acts like a rivet in a beam. Taking away any individual species may not cause the beam to collapse, but it makes the beam as a whole less effective, and thus, the removal of more species will eventually cause a collapse.⁸⁷ Under the “redundancy hypothesis,” there are a number of species that perform the same role in an ecosystem (known as a “functional role”), which gives the ecosystem stability, as it can survive the sudden extinction of a single population, but possibly not more as functional roles are eliminated.⁸⁸ Under the “portfolio hypothesis,” the diverse species create a stabilizing effect because the ecosystem is not dependent on just one species; rather, the diversity allows any disturbance to effect only a small portion of the ecosystem (similar to how a diversified stock portfolio can buffer assets from drops in the stock market).⁸⁹ All of these potential ecosystem regimes are tied together by the fact that they directly connect the economic benefits of ecosystem services to biodiversity and to the health of biological communities.

⁸⁵ *Lopez v. United States*, 514 U.S. 549, 555 (1995).

⁸⁶ See P. Stuart Chapin III, Pamela A. Matson & Harold A. Mooney, *Principles of Terrestrial Ecosystem Ecology* 265–68 (2002).

⁸⁷ Peter Stiling, *Ecology: Theories and Applications* 9 (4th ed. 2002).

⁸⁸ *Id.* at 10.

⁸⁹ Jean Paul L’homme & Thierry Winkel, *Diversity–Stability Relationships in Community Ecology: Re-Examination of the Portfolio Effect*, 62 *Theoretical Population Biology* 271 (2002).

B. Traditional Reasons for an Ecosystem Approach

The most frequent criticism of the ESA among environmentalists is that it does not take modern ecology into account in its efforts to protect species. This is not surprising, as the science of ecology was still in its infancy in the sixties and seventies when the law was developed.⁹⁰ In more recent years, scientists have suggested that the ESA would be more effective if portions were rewritten with an ecosystem focus because the only true way to protect species is to protect the ecosystems in which they reside.⁹¹ This idea is already recognized by the Act, through its ability to designate critical habitats for endangered species. While there have been a few success stories under the ESA, including the bald eagle, both environmentalists and opponents of the Act are quick to point out that it was actually other legislation that led to their recovery, most notably the regulation of pesticides.⁹² Indeed, commentators quip that the “statute’s success stories are as rare as many of the species it is designed to protect.”⁹³ Functionally, the Act performs as a last line of defense against extinction. Although the ESA has done an admirable job of preventing listed species from going extinct, it has done an extremely poor job at assisting their recovery, one of the expressed goals of the Act.⁹⁴

Another common criticism of the Act is that it is often used to protect small, insignificant organisms, such as insects or rodents.⁹⁵ Although the public tends to be in favor of preventing extinction, they generally seem to care about the “charismatic megafauna” (usually the large mammals) more than insects or other animals.⁹⁶ The Act itself, however, does not discriminate based on the “charisma” of an endangered species—all animals receive the same direct protection.⁹⁷ There are critics of this policy on both sides of the

⁹⁰ See Krebs, *supra* note 14, at 11.

⁹¹ See Rohlf, *supra* note 11, at 278.

⁹² Michelle Desiderio, *ESA Reform: Facing Hard Truths*, in *Endangered Species Act Law, Policy, and Perspectives* 533, 537 (Donald C. Baur & Wm. Robert Irvin eds., 2002); James W. Grier, *Ban of DDT and Subsequent Recovery of Reproduction in Bald Eagles*, 218 *Sci.* 1232 (1982).

⁹³ Desiderio, *supra* note 92, at 533.

⁹⁴ *Id.*

⁹⁵ *Id.* at 551.

⁹⁶ Rohlf, *supra* note 11, at 275.

⁹⁷ *Id.*

issue. Developers say that the public does not want important projects to be stopped in order to protect an uncharismatic and arguably unimportant invertebrate. In contrast, environmentalists say that this policy of directly protecting the animals leads to an internal problem within the Act. They argue that protecting species without protecting the ecosystems that the species⁹⁸ rely upon to survive prevents their recovery.

Another common complaint about the ESA's focus on individual species is that it normally does nothing to protect "metapopulations," separated populations of the same species residing in different ecosystems.⁹⁹ For example, if there were two major pods of killer whales in the world—one in the Pacific Ocean and one in the Atlantic Ocean—but only one pod in danger of dying out, the killer whale would not be eligible for listing because the entire species as a whole would not be considered to be in danger of becoming extinct. Even though the extinction of the killer whale as a species is not at issue, the courts' rationale for upholding the ESA indicates that the Atlantic Pod should still receive protection. Since they have been genetically isolated for years, unique genetic material would be lost if they died out. The loss of just one of the groups of killer whales would be even worse if the killer whales were a "keystone species";¹⁰⁰ that is, a population that has a significantly greater impact on its ecosystem than its biomass would indicate. In this case, their loss would have extremely detrimental effects on their entire ecosystem, crippling the services the system provides,

⁹⁸ In ecology, the term "population" refers to all of the members of single species in an ecosystem. The term "community" refers to all of the biological organisms of an ecosystem. Krebs, *supra* note 14, at 9.

⁹⁹ Rohlfs, *supra* note 11, at 277.

¹⁰⁰ See Krebs, *supra* note 14, at 471–73. The discovery of "keystone" species was one of the most important developments in ecology. A classic example is the starfish *Pisaster ochraceus*. Although the starfish is not a common organism in its ecosystem, it is the only predator that can eat a certain species of mussel. The removal of just a few *Pisaster* could lead to the mussels' unchecked reproduction and eventually to the collapse of the entire ecosystem when such unchecked reproduction crowds out all competitors. *Id.* at 471–72. Large, charismatic megafauna can be keystone species as well, even if their populations are smaller; sea otters, for example, are believed to have similar effects in coastal ecosystems. J.A. Estes et al., Killer Whale Predation on Sea Otters Linking Oceanic and Nearshore Ecosystems, 282 *Sci.* 473, 474 (1998).

such as coastal fishing.¹⁰¹ An ecosystem approach would take all of these negative effects into account, and protect the Atlantic killer whales in order to keep the Atlantic ecosystem healthy regardless of the status of the Pacific pod of killer whales. Environmentalists often use this example to show that the current species-based approach is not as effective in promoting either conservation or beneficial ecosystem services as the ecosystem approach.

Another critique of the species-based approach of the ESA is that it does not do enough to allow a species to recover once the species has received protection. While it is believed that only two species have gone extinct after being listed as endangered, very few species have recovered sufficiently to be taken off the list, most likely because there is no additional habitat in which the species' newly burgeoning populations may grow.¹⁰² Without more habitat protection, there is no way for an endangered species to recover. Ideally, an ecosystem approach would provide additional habitat protection in order to allow endangered populations to thrive again. Although the current Act does have provisions to allow for the designation of critical habitats of protected species, the focus on protecting the species themselves has led to the underutilization of this provision.¹⁰³ Additionally, the Fish and Wildlife Service has interpreted the law to say that actions that do not harm the current population, but could still disrupt its recovery in the future, are not covered by the Act.¹⁰⁴ An ecosystem approach has the potential to alleviate these loopholes, since endangered ecosystems would be protected regardless of whether an individual animal has already moved into a potential habitat, in order to ensure that the ecosystem services are not interrupted.

This Note is not intended to be a full-fledged argument in favor of an ecosystem approach to the Act. To make such an argument, a number of other issues would have to be addressed, including the legal definition of an "ecosystem," how to determine the range of

¹⁰¹ As explained above, the loss of the otter can lead to prey it normally keeps in check crowding out other species. See Estes et al., *supra* note 100.

¹⁰² See Rohlf, *supra* note 11, at 278. Additionally, more species have gone extinct while waiting to receive protection. Erik Stokstad, *What's Wrong with the Endangered Species Act?*, 309 *Sci.* 2150, 2151 (2005).

¹⁰³ See Briscoe, *supra* note 12.

¹⁰⁴ Rohlf, *supra* note 11, at 278.

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an ecosystem, how to determine whether an ecosystem is “endangered,” and how the provision that prohibits harming species (known as “taking” a species) of the current Act would ultimately apply to entire ecosystems. Rather, this Section has provided background information regarding common arguments generated by the ecosystem approach in order to explain better how the new approach would deal with the federalism problems currently facing the Act by tying the regulatory target of the statute directly to interstate commerce. These changes to the Act also demonstrate that the ecosystem focus would not simply be a congressional trick to get around federalism challenges, or a minor viewpoint change that could be accomplished through federal agencies. Rather, the ecosystems focus is a substantive change to the Act that changes its scope and has consequences for its protections.¹⁰⁵

III. THE FEDERALISM ARGUMENTS FOR AN ECOSYSTEM APPROACH

The traditional arguments posed by environmentalists for using an ecosystem approach to the Act are invariably based on how such an approach would be more effective in increasing biodiversity than the current, species-based method. Proponents and opponents of this approach, however, have generally ignored legal reasons why the ecosystem approach could be beneficial.¹⁰⁶ Regardless of how an ecosystem-based Act would function, this Note proposes that changing the ESA to incorporate an ecosystem focus would protect the Act from the inevitable federalism challenge holding that the Act exceeds congressional powers under the commerce clause.¹⁰⁷

¹⁰⁵ Potential problems with these changes in scope are discussed below. See *infra* Part IV.

¹⁰⁶ Instead, they focus on ecological reasons that support the change. See Rohlf, *supra* note 11, at 275. Parties to this debate also tend to be scientists or researchers rather than lawyers, who may not know about the federalism concerns with the statute.

¹⁰⁷ See discussion *supra* Part I.

A. The Difference Between Aggregating Species and the Ecosystem Approach

Although after *Lopez* the commerce clause seems to have lost its status as a blank check of congressional powers, it still remains extremely broad. While it may seem silly to tie insignificant organisms such as “hapless toads” or “sand loving flies” to interstate commerce, it seems perfectly reasonable to tie even completely intrastate ecosystems to commerce, in light of the essential ecosystem services they provide. Despite occasional language from judges that ecosystems are not commerce,¹⁰⁸ the case law indicates that the commerce power is still broad enough to incorporate the benefits such ecosystems can provide. In his dissent in *Babbitt v. Sweet Home Chapter of Communities for a Great Oregon*, Justice Scalia explained that the ESA only protects species, not ecosystems, thus limiting its protective scope.¹⁰⁹ If instead the Act protected species indirectly through explicit protection of ecosystems,¹¹⁰ not only would the Act be more effective, but it would be much more likely to satisfy the standard set down by the Supreme Court in *Lopez* and *Morrison*, placing it within the scope of the commerce clause.¹¹¹

To show that an ecosystem approach to the ESA would relieve these problems, Congress would first need the ability to regulate ecosystems. Proving that healthy ecosystems are economically vital and thus substantially affect interstate commerce would satisfy the

¹⁰⁸ See, e.g., *GDF Realty Invs. v. Norton*, 362 F.3d 286, 290–91 (5th Cir. 2004) (Jones, J., dissenting from the denial of rehearing en banc).

¹⁰⁹ 515 U.S. 687, 719–20 (1995) (Scalia, J., dissenting). Justice Scalia argued that the broad definition of “harm” given by the court was closer to ecosystem protection than species protection, further contending that habitat protection is addressed in other parts of the Act. *Id.* at 729.

¹¹⁰ In one of the most influential papers in ecology, the biodiversity of an ecosystem was found to affect the ecosystem’s stability and ability to continue functioning through disturbances significantly, thus aiding the survival of the species within the system. David Tilman, *Biodiversity: Population Versus Ecosystem Stability*, 77 *Ecology* 350, 358–59 (1996). Since this paper was written, it has been cited hundreds of times in follow-up studies. It is also worth noting that this paper refers specifically to species and ecosystem diversity as opposed to genetic diversity. There are separate arguments (not necessarily tied to ecosystem services) for why genetic diversity is also beneficial, which have been mentioned by the courts. See discussion *supra* Section II.B.

¹¹¹ *United States v. Morrison*, 529 U.S. 598, 613 (2000); *United States v. Lopez*, 514 U.S. 549, 560 (1995).

inquiry set forth in *Lopez*.¹¹² The Court looked at a number of factors in *Lopez* to decide whether a gun brought within a specified distance from a school has a substantial effect on commerce, including how attenuated the link is between the object of regulation, guns, and commerce.¹¹³ In light of the ecology and economics movement described above, there is a substantial, clear link between commerce, economics, and ecosystem health. All of the economic factors of ecosystem services create a link between commerce and ecosystems. Since ecosystems are so directly tied into economics and interstate commerce,¹¹⁴ however, no aggregation is needed for Congress to regulate ecosystems.¹¹⁵

Extensive scientific and economic analysis of ecosystems has extended our understanding of how important healthy ecosystems are to standards of living and local economies.¹¹⁶ When only discussing ecosystems, the federalism challenges brought against species regulation lose much of their merit. Individual ecosystems show a stronger connection to interstate commerce without aggregation than violence against women did in *Morrison*.¹¹⁷

B. How an Ecosystem Approach Can Still Give Individual Species Protection

If Congress can regulate ecosystems, the next step is to show that ecosystem regulation also extends protection to individual species.

¹¹² *Lopez*, 514 U.S. at 560.

¹¹³ See generally *id.* Even ecosystems that are completely intrastate affect markets for houses and other goods enough to be directly tied to interstate commerce.

¹¹⁴ See discussion *supra* Section II.A. The most obvious and striking example of this are replacement costs, as the ecosystem services available in an area directly impact what goods must be brought in, such as bottled water in areas where the natural water sources have been contaminated.

¹¹⁵ *Lopez*, 514 U.S. at 560–61.

¹¹⁶ See, e.g., Farber et al., *supra* note 84.

¹¹⁷ *United States v. Morrison*, 529 U.S. 598, 613 (2000). The government relied on the aggregation of violence against women to connect the regulation to interstate commerce. Specifically, the government argued that while any one specific example of violence against women may not have an effect on interstate commerce, the aggregate effect of all violence against women actually has a strong effect on commerce. Although the government even had research to support its claim, the Supreme Court still found that Congress could not regulate violence against women on federalism grounds, claiming that aggregation was only appropriate when the thing being aggregated was itself commercial in nature. *Id.*

The ecosystem approach to species protection seems similar to the one taken by the Fifth Circuit in *GDF Realty Investments* and by the DC Circuit's majority opinion in *National Association of Home Builders*.¹¹⁸ Both approaches can protect seemingly insignificant species because of an aggregate effect of the loss of many species on the ecosystem. The important difference, however, lies in what Congress is directly regulating. Under the current ESA, Congress directly regulates species under the commerce clause, even though individually, the species themselves do not necessarily have any economic impact or connection to interstate commerce. But if one considers all of the species together, their disappearance could cause economic harm to the state through damage to the environment. Although this system makes sense in light of ecosystem services, critics of this approach—including the Supreme Court—say that it essentially gives Congress a blank check because any activity, when aggregated in a similar method, can have an effect on interstate commerce.¹¹⁹

In contrast, the ecosystem approach does not leave the Act open to these criticisms. Most important, Congress is no longer merely regulating intrastate species with no economic impact. Instead, it is actually regulating an ecosystem, which has already been shown to be directly tied to interstate commerce through its services, which are, in turn, tied to the diversity of its own biological community.¹²⁰ Biodiversity is essential to ecosystem stability, with the various species making up the moving parts of any system,¹²¹ and therefore the damage to an ecosystem from the loss of a population is not merely speculative. Thus, judges need not rely on the controversial aggregation argument, the more ethereal value of preserving certain genes and DNA in rare species because they could be valuable one day, or the tenuous connection between regulation and the commercial activity that is causing the damage. Rather, judges only need to recognize that the elimination of an endangered species will damage its ecosystem as well as its services.

For example, the elimination of a pollinator species such as bees can lead to plant death, resulting in a litany of potential problems

¹¹⁸ See discussion *supra* Section I.B.

¹¹⁹ *Morrison*, 529 U.S. at 613.

¹²⁰ See discussion *supra* Section III.A.

¹²¹ Tilman, *supra* note 110, at 361.

ranging from the decrease of housing prices to the increase of replacement plant product prices.¹²² This is also why Congress would not be treating the commerce clause as a blank check by using the ecosystem approach to the ESA. Species can only be reached because they are an invaluable part of ecosystems, which are being regulated because of their direct and substantial effect on interstate commerce.¹²³ This connection should appease the dissenters in many of the circuit cases discussed above, since it directly links the protection of endangered species to interstate commerce without relying on aggregation (as in *National Association of Home Builders*¹²⁴ and *GDF Realty Investments*¹²⁵) or examining the motive for the damage to the population (as in *Rancho Viejo*¹²⁶ and *Gibbs*¹²⁷).

Just as studies have shown that ecosystems are directly related to economics and commerce, there has been even more scientific support for the importance of a diverse community of species to the functioning of a stable, healthy ecosystem.¹²⁸ Scientific models that demonstrate how ecosystems function have stressed both the importance of individual populations within an ecosystem and the importance of biodiversity for an ecosystem to be stable and productive.¹²⁹ In light of abundant research, it would be implausible for Congress to draft a statute to regulate ecosystems that did not also protect individual species within those ecosystems. If the argument that ecosystems and their services are strongly tied to the economy and interstate commerce is accepted, it must follow that Congress can protect species in order to keep the ecosystems functioning. Additionally, since biodiversity itself is an important feature of

¹²² See Farber et al., supra note 84; see also discussion supra Section II.A for a more in-depth look at the benefits of ecosystem services that could be lost because of the loss of a species like bees.

¹²³ See discussion supra Part III for an introduction to the science explaining how important species are to ecosystems, and how important ecosystems are to commerce.

¹²⁴ *Nat'l Ass'n of Home Builders v. Babbitt*, 130 F.3d 1041, 1053–54 (D.C. Cir. 1997).

¹²⁵ *GDF Realty Invs. v. Norton*, 326 F.3d 622, 629, 639 (5th Cir. 2003).

¹²⁶ *Rancho Viejo, LLC v. Norton*, 323 F.3d 1062, 1078 (D.C. Cir. 2003).

¹²⁷ *Gibbs v. Babbitt*, 214 F.3d 483, 492 (4th Cir. 2000).

¹²⁸ See discussion supra Section II.A.

¹²⁹ See discussion supra Section II.A. It is important to note that under every single model of ecosystem structure, the role of individual species in ecosystem stability is vital. In the rivet and portfolio hypotheses, the removal of any individual species could eliminate important niches that keep the ecosystem functioning. Chapin, Matson, & Mooney, supra note 86, at 266–68; Stiling, supra note 87, at 8–9.

ecosystem stability and productivity, protection must be afforded to species, even those that do not have any direct impact on interstate commerce. With this change, more seemingly insignificant species such as insects can still receive protection in addition to the “charismatic megafauna” that the public identifies with and defends.¹³⁰

The elimination of an entire population from an ecosystem, even a population that seems insignificant, has the potential to greatly upset ecosystem services through trophic interactions and cascades.¹³¹ Classic examples of trophic interactions causing widespread ecosystem damage involve the loss of keystone species.¹³² In many ecosystems, especially those that follow the portfolio or the rivet models, the elimination of any population can cause a severe reduction in ecosystem services, because the species each have a unique, important role in the system.¹³³ Even in ecosystems that follow the redundancy hypothesis, where populations do not perform unique functions, the destruction of a single population can lead to the destabilization of the entire system.¹³⁴ Although it can be difficult to predict which species are keystone, the removal of almost any species will still weaken the ecosystem.¹³⁵ Additionally, because of the difficulty in identifying keystone species, there is always some risk of extreme damage.¹³⁶ If Congress wants to have a form

¹³⁰ Although it may or may not have been what Congress had in mind when it initially passed the Act, the protection of small species such as insects would be important under an ecosystem approach, since they provide some of the most important ecosystem services. An obvious example would be bees, which are essential to the pollination and reproduction of plants, but many other lesser known organisms are equally important (such as dung beetles, which are important for turning organic wastes back into inorganic materials that can be taken up again by plants).

¹³¹ “Trophic levels” are the different levels of a food chain in an ecosystem, with photosynthetic organisms at the first level, and apex predators at the top. Often, interactions between trophic levels can exacerbate environmental disturbances. Krebs, *supra* note 14, at 463, 496–97.

¹³² Krebs, *supra* note 14, at 471–73. See also discussion *supra* Section II.B.

¹³³ See discussion *supra* Section II.A.

¹³⁴ Stiling, *supra* note 87, at 9–10.

¹³⁵ Tilman, *supra* note 110, at 358–59 (stating that biodiversity helps an ecosystem resist disruption). One weakness in an ecosystem approach is that some species may not receive protection if their ecosystem has already effectively been destroyed. Much may depend, then, on the level of generality Congress employs when it defines the scope of protected ecosystems.

¹³⁶ Krebs, *supra* note 14, at 473–74.

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of species protection, an ecosystem approach is the most legally sound method.

C. How Gonzales v. Raich Argues for Ecosystem Protection

The ecosystem approach would remove the aggregation step from the analysis of the connection between the regulated activity and interstate commerce. Under the aggregation approach to interpretation of the current ESA, a court using ecosystem services to tie the statute to interstate commerce needs to show that the protected species, in the aggregate, are important to ecosystems, which are important to interstate commerce. Because of its narrow focus on the protected species, this regulatory scheme ignores the fact that species are *part* of ecosystems. If Congress changed the focus of the Act to ecosystems, then courts would no longer be forced to make the extra aggregation step to explain how Congress' power can reach purely intrastate populations without any intrinsic economic value because, through ecosystem services, every species within an ecosystem is related in some way to interstate commerce and a "comprehensive scheme" to regulate such commerce. Under this approach, the protection of species would fall under the "comprehensive scheme" exception explained in *Raich*.¹³⁷ Although this Note has already argued that *Raich* will likely do little to protect the ESA as it currently stands,¹³⁸ the case's holding becomes much more relevant when the species are protected as part of a "comprehensive scheme" of protecting ecosystems that themselves directly affect interstate commerce.

In *Raich*, the Court ruled that "Congress can regulate purely intrastate activity that is not itself 'commercial,' in that it is not produced for sale, if it concludes that failure to regulate that class of activity would undercut the regulation of the interstate market in that commodity."¹³⁹ Justice Scalia wrote in his concurrence, "Congress may regulate noneconomic intrastate activities only where the failure to do so 'could . . . undercut' its regulation of interstate

¹³⁷ *Gonzales v. Raich*, 545 U.S. 1, 39 (2005) (Scalia, J., concurring).

¹³⁸ See discussion *supra* Part I.

¹³⁹ *Raich*, 545 U.S. at 18.

commerce.”¹⁴⁰ This argument ties in with the idea of protecting species in order to protect the interstate economic benefits of ecosystem services. If Congress did not have the ability to protect individual populations—even those with only weak or aggregate connections to interstate commerce—then it would be unable to regulate the ecosystems themselves or the economic benefits that the systems provide. Although the holding in *Raich* is not necessary to the conclusion that an ecosystem-focused ESA would avoid federalism concerns, it seems to strongly support the argument.

Since the cases that have considered federalism challenges to the ESA to date have been decided by close votes, the elimination of the aggregation step could be enough to end much of the federalism controversy surrounding the Act.¹⁴¹ Even though Judge Jones has argued that Congress regulates commerce—as opposed to ecosystems—in her dissenting opinion in *GDF Realty Investments v. Norton*,¹⁴² the Supreme Court has held that Congress can still regulate matters that substantially affect interstate commerce, in addition to the channels of commerce and the articles in interstate commerce themselves.¹⁴³ Based on the numerous studies on the importance of biodiversity and ecosystem services, protecting the health of ecosystems clearly satisfies the Supreme Court’s requirement that it “substantially affects commerce.”¹⁴⁴

IV. POTENTIAL PROBLEMS WITH THE ECOSYSTEM APPROACH

It would be disingenuous to argue that a shift to an ecosystem focus could save the ESA from being struck down on federalism grounds without any changes to the Act. Changing the focus would necessarily have some substantive effect on the legislation; otherwise the focus-shift would simply be a sham to avoid judicial review, which could make the Supreme Court even *more* likely to re-

¹⁴⁰ *Id.* at 38 (Scalia, J., concurring) (citing *United States v. Lopez*, 514 U.S. 549, 561 (1995)).

¹⁴¹ Strict textualists who argue that Congress can only directly regulate interstate commerce under the Act are not likely to be persuaded by a switch to an ecosystem focus. Still, the Supreme Court’s decision in *Gonzalez v. Raich* indicates that the Court does not endorse such a limited view of what can significantly affect interstate commerce. See *id.*

¹⁴² 362 F.3d 286, 290–91 (5th Cir. 2004) (Jones, J., dissenting).

¹⁴³ *United States v. Lopez*, 514 U.S. 549, 559 (1995).

¹⁴⁴ See discussion *infra* Section II.A.

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ject the reasoning. Any change could be considered problematic. Environmental legislation is notoriously difficult to draft, since there are so many interests to balance, and any change in scope brought on by the shift could be enough for strong opposition from certain interest groups.¹⁴⁵ Like any law, changes to the Act would be both over- and under-inclusive, leading the Act to increase in scope in some situations, while decreasing in others. This Note argues that these shifts to the scope of the ESA would not cause significant problems in light of the Supreme Court's current interpretations of the Act, or would arise only in relatively few circumstances. Much will depend, of course, on the policy choices of Congress in reformulating the ESA. Even a problematic ecosystem-focused Act, however, would be more protective than an unenforceable species-focused one.

A. Will the Ecosystem Approach Increase the Scope of the Act?

One of the most significant issues with the ecosystem approach is dealing with the changes in the substantive law that may arise because of the change in focus of the Act. Because of its broader protective implications, such a change may not actually mirror Congress' motivation in originally drafting the ESA.¹⁴⁶ Common sense suggests that critics are most troubled because they believe the change in focus would actually cause a large increase in the protective scope of the Act. For example, it would be difficult to imagine a form of the Act that protected ecosystems that did not offer at least some protection to endangered plant species (as ecosystems are often defined by their flora), which is not a significant part of the current ESA.¹⁴⁷ Although many environmentalists would welcome these changes, recommending this approach could lead to resistance in drafting the new legislation.

¹⁴⁵ Proposals to weaken the Act have passed in the House and it seems doubtful proponents of such bills would support any amendments that keep the Act's strength intact, much less strengthen it. See Percival et al., *supra* note 74, at 934–36.

¹⁴⁶ See Rohlf, *supra* note 11, at 275.

¹⁴⁷ Percival et al., *supra* note 74, at 929. Although there is legislation that deals with the protection of endangered plants, it does not afford them nearly the same protection that animal species receive. 16 U.S.C. § 1541 (2006).

1. Exacerbating the "Incentive Problem" and Conflicts with Property Rights

Property rights advocates may strongly resist any supposed increase in the Act's scope, since they tend to argue that the Act is already far too invasive upon private landowners who have an endangered species inhabiting their property.¹⁴⁸ Although there has never been a successful challenge to private property being rendered unusable by the ESA, there has long been tension between those who favor stronger property rights and those who favor stronger environmental protection.¹⁴⁹

The restriction of property rights for private citizens is related to another major issue with the ESA, which will be referred to as the "incentive problem." The incentive problem arises when endangered species are found on private land, its value decreases sharply, since the Act prevents the owner from using the land in specific ways for fear of harming the species. Opponents of the ESA have always argued that by threatening to make land unusable if an endangered species should settle there (or if any animals already there become endangered), the Act actually gives landowners incentive to destroy potential habitats for any endangered species, or even to kill off individual animals on their land, rather than help those animals recover.¹⁵⁰ Environmentalists, as well as strong property rights advocates, could argue that the supposed increased scope of an ecosystem approach would ultimately have an adverse effect on species, as land owners remove them to avoid regulation. Ultimately, some opponents may fear that the ecosystem approach would not only reduce the rights of citizens to enjoy their own land, but may also harm the species it is meant to protect.¹⁵¹

¹⁴⁸ Lynn E. Dwyer et al., Property Rights Case Law and the Challenge to the Endangered Species Act, 9 *Conservation Biology* 725, 731 (1995).

¹⁴⁹ Id. Dwyer et al. speculate that the lack of challenges under the takings clause to the Endangered Species Act may be due to the expense of litigation and the small chance of success in such cases. Id.

¹⁵⁰ Many people, including environmentalists, see the incentive problem as one of the biggest problems with the ESA, and much has been written about the issue. See, e.g., Desiderio, *supra* note 92, at 550.

¹⁵¹ Property rights advocates often go on to argue that if the federal government decided to compensate landowners for uses of land lost to the Act, it could greatly strengthen its protective qualities over populations of private property, since land-

These fears are mostly unfounded. The ecosystem approach is not designed to increase federal power, but to focus that power where it truly belongs. If one accepts the notion of ecosystem services described above,¹⁵² then the federal government is simply protecting an important commodity. Although it would be difficult to envision an ecosystem-based approach to the Act without some changes to the statute's current scope, these changes could, if done faithfully, have only minor effects on how the Act functions. Literally, the ESA prohibits the "taking" of endangered species, which includes the word "harm" in its definition.¹⁵³ Although the Act only gives protection to animal species (although plants on federal lands can receive protection¹⁵⁴), the Supreme Court in *Babbitt v. Sweet Home Chapter of Communities for a Great Oregon* expanded the definition of "harm" to be extremely broad, already giving the Act a form of species-based ecosystem protection.¹⁵⁵ The Court held that "harm" included any actions that indirectly damaged endangered species.¹⁵⁶ Justice Scalia's dissent even decried how the Act was becoming a protection for entire populations, when it was meant to be for individual animals, echoing the difference between a species-based approach and an ecosystem-based approach.¹⁵⁷ So, although plants do not receive direct protection under the current Act, courts had already ruled that the Act prohibited damaging plants upon which endangered animals relied.¹⁵⁸ After *Sweet Home*, even general ecosystem damage to an area, which could in turn harm an endangered species, became prohibited by the Act. Eventually, a "minimal take" provision was added to the Act to allow

owners would have less incentive to kill endangered species on their land to avoid federal regulation. Dwyer et al., *supra* note 148, at 737.

¹⁵² See discussion *supra* Section II.A.

¹⁵³ 16 U.S.C. §§ 1538(a), 1532(19) (2006). Exceptions to the ESA are codified at 16 U.S.C. § 1539 (2006).

¹⁵⁴ 16 U.S.C. § 1533 (2006).

¹⁵⁵ *Babbitt v. Sweet Home Chapter of Cmty. for a Great Or.*, 515 U.S. 687, 708 (1995).

¹⁵⁶ *Id.* Justice O'Connor wrote a concurring opinion stressing that the indirect harm has to be foreseeable to be prohibited by the Act. *Id.* at 709 (O'Connor, J., concurring).

¹⁵⁷ *Id.* at 716 (Scalia, J., dissenting).

¹⁵⁸ *Palila v. Haw. Dept. of Land and Natural Res. (Palila II)*, 852 F.2d 1106, 1108 (1988) (holding that a harm to an endangered species of sheep did include the destruction of a species of plant on which the sheep largely relied).

minor “incidental” takings as long as they were minimized. Such a provision could be easily maintained using an ecosystem approach.¹⁵⁹ Through this broad definition of “harm,” the ESA already provides protection for the habitats of endangered populations that loosely models an ecosystem approach.¹⁶⁰ Although this broad definition gives property rights advocates a strong reason to dislike the current ESA, changing to the ecosystem approach will not increase their criticism significantly.

Still, there are situations in which the increased scope of the ecosystem approach could have a meaningful effect. Some of these, which are applauded by environmentalists, are discussed above (such as meta-population protection).¹⁶¹ Other problems deal with endangered plant species on private lands that are not tied to other endangered animals. The current ESA would give these plants no protection, while an ecosystem-focused Act would have to give them some consideration, since plants are vital parts of ecosystems. Although environmentalists would applaud many of these results—especially protecting plants and meta-populations—and have been calling for more protections for some time,¹⁶² these changes do have the potential to restrict property rights and broaden the incentive problem, albeit in limited circumstances.¹⁶³ Even though these changes in scope are limited, they are the strongest argument against a shift to the ecosystem approach as a method to save the ESA, as they are the largest substantive changes the Act would undergo. There are a number of ways to offset these changes, such as compensating landowners for certain restrictions in property use, or allowing reduced protection along with simpler mitigation strategies for plants, since they can more easily be relocated than animals.

¹⁵⁹ 16 U.S.C. § 1539(a)(1)–(2)(A) (2006).

¹⁶⁰ *Sweet Home*, 515 U.S. at 691.

¹⁶¹ See discussion *supra* Section II.C.

¹⁶² See discussion *supra* Section II.C.

¹⁶³ This Note is not intended to address potential solutions to the incentive problem, as there is already a large volume of scholarship attempting to solve it. See, e.g., Dwyer et al., *supra* note 148, at 737.

B. Will the Ecosystem Approach Decrease the Scope of the Act?

As with many laws, the ecosystem approach to the ESA could also potentially be under-inclusive, actually *decreasing* the scope of protection in some instances. While an act protecting ecosystems sounds extremely broad, it could be argued that a species whose ecosystem has already been destroyed would no longer receive protection under the new Act, since it would now only protect populations through ecosystems instead of directly protecting the species themselves. In fact, according to critics of the current Act, such a lone species would also lose all connection to interstate commerce.¹⁶⁴ Connected to this issue is the added difficulty of determining how to “list” endangered ecosystems—a system similar to the one used for endangered species could be utilized, but this would doubtless cause additional problems.¹⁶⁵

Although scientists would likely say that an organism cannot exist without its ecosystem,¹⁶⁶ there has already been litigation over situations which could potentially fit this description. In *National Association of Home Builders*, the Delhi Sand Loving Fly’s habitat had almost been completely destroyed by development, with the fly’s resulting habitat limited to only twelve hundred acres of fragmented dunes.¹⁶⁷ Ultimately, whether or not a species inhabits an “ecosystem” would have to be based on the policy judgments of the drafters of the legislation, hopefully relying on ecosystem science. Such a policy could be either extremely protective (any species that exists in the natural world is inherently part of some ecosystem), or less protective (ecosystems that have already been altered significantly by humans are already “destroyed” and should

¹⁶⁴ See discussion *supra* Section I.A.

¹⁶⁵ The current Act only affords protections to species that are “listed” by the Secretary of the Interior as endangered. 16 U.S.C. § 1533 (2006). While species are added to the list quite commonly, occasionally the listing of a species itself is a large source of controversy. Although the classic example of this is the snail darter, Murchison, *supra* note 16, at 184–85, there have also been more recent examples, even with such charismatic megafauna as the polar bear. Susan Milius, Polar Bears Listed: Overdue Decision Makes Polar Bears a “Threatened Species”, *Science News*, Web Edition, May 14, 2008, http://www.sciencenews.org/view/generic/id/32155/title/Polar_bears_listed.

¹⁶⁶ See Krebs, *supra* note 14, at 10. The standard definition of an ecosystem is that it involves both the biotic community and its abiotic environment.

¹⁶⁷ Percival et al., *supra* note 74, at 886; *Nat’l Ass’n of Home Builders v. Babbitt*, 130 F.3d 1041 (D.C. Cir. 1997).

not receive protection). But one does not need to make difficult policy decisions to develop a scenario where a species would no longer receive protection under the ecosystem approach: an obvious example would be any species that only remains in captivity, and no longer exists in any natural ecosystem. Any approach to the Act that relied on an ecosystem's connection to interstate commerce would open up a loophole in which such a species could be destroyed.

Unfortunately, these loopholes would probably be impossible to fill under the ecosystem approach unless the species that are left out are directly addressed within the Act. Yet, by offering protection to species that are not part of ecosystems, the Act could lose its connection to interstate commerce and become vulnerable to all of the same criticisms as the current ESA.¹⁶⁸ In order to insulate the new legislation from these criticisms, it is inevitable that there would be some instances in which a species would receive protection under the current version of the Act, but not under the ecosystem approach. These few cases, however, would be extremely rare, and are ultimately not likely to have any effect on the Act's ability to protect populations. Additionally, it is almost impossible for any species that no longer has an ecosystem to truly benefit from the ESA's protection, since the population would be unable to recover even if it could be saved from extinction.¹⁶⁹

CONCLUSION

Since its adoption, the Endangered Species Act has been the cornerstone of the United States' environmental legislation protecting biodiversity. Although Congress may have originally written the Act with the moral goal of protecting our nation's charis-

¹⁶⁸ One could argue that animals in zoos are actually more closely connected to interstate commerce than animals in natural ecosystems because of the business and tourism that zoos generate. Although this is probably true, and the Act could directly protect such animals without raising such strong federalism concerns as the current Act, the focus of the Act is usually not on animals in zoos, and this solution still does not resolve the underlying problem caused by the under-inclusive nature of the ecosystem approach.

¹⁶⁹ While the Delhi Sand Loving Fly was an endangered species that lived in a very small habitat that was already extremely fractured, it would be difficult to argue from a purely ecological standpoint that it no longer had an ecosystem. Percival et al., *supra* note 74, at 886.

matic megafauna, the growth in understanding of ecology over the past twenty years has shown that protecting endangered and threatened species is important for myriad practical reasons, including securing the continuation of ecosystem services. Ecological research has shown that simply protecting an individual population is not enough—the interconnectedness of nature necessitates the protection of a species' ecosystem as well, if that species is expected to recover. Changing the focus of the ESA to protect ecosystems instead of individual populations would insulate it from federalism challenges without severely disrupting the protections afforded by the Act.

Although the Act has a number of flaws, most obviously the incentive problem, most environmentalists agree that some sort of species protection is important, even if they do not agree on how to implement such a regime.¹⁷⁰ This Note has argued that even if the numerous federalism-based challenges to the current ESA eventually succeed in striking down the Act's ability to regulate species on private lands, this does not mean that Congress cannot have legislation that protects vulnerable populations. By changing the Act's focus to protecting entire ecosystems instead of individual species, Congress could develop a more tangible connection to interstate commerce—bolstered by the economic value of ecosystem services—that would insulate the ESA against federalism attacks.

The main point of this Note has not been to argue that the ecosystem approach will increase the Act's effectiveness (although many reformers have argued that using an ecosystem approach will ultimately do just that¹⁷¹), but simply that this is the best way to keep the Act itself extant. Arguments about the best ways to reform the ESA will be rendered moot if the Act is declared unconstitutional. Given the difficulty in amending or drafting environmental legislation due to all of the competing concerns, Congress is unlikely to revise the ESA in the absence of strong incentives to do so. If the Roberts Court strikes down portions of the ESA on federalism grounds, however, Congress still has a method to save the Act. Congress passed the original ESA amid concerns that animals

¹⁷⁰ See, e.g., Eisner et al., *supra* note 11, at 1231; Mank, *supra* note 33, at 444; Rohlf, *supra* note 11, at 274.

¹⁷¹ See discussion *supra* Part II.

were going extinct at an unprecedented rate. Those concerns are just as relevant today, as habitats continue to be destroyed. In order to protect the country's natural resources, it is now probably *more* important to give protection to vulnerable populations and ecosystems than when Congress first passed the Endangered Species Act in 1973.