RED WOLF COALITION V. NORTH CAROLINA WILDLIFE RESOURCES COMMISSION: BETTER RED THAN DEAD

By
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This Article demonstrates how federal district court decisions have protected the threatened red wolf. The history of red wolf introduction and the Fourth Circuit decision in Gibbs v. Babbitt *are reviewed. In 2012, North Carolina allowed coyote hunting in the red wolf recovery area. The District Court for the Eastern District of North Carolina correctly issued an injunction stopping the action. The court held North Carolina set in motion events that led to the killing of red wolves and violated federal regulations regarding the taking of red wolves. The resulting settlement agreement precluded state interference with red wolf recovery. Genetic studies have questioned the red wolf's taxonomic status. This Article posits that the red wolf should retain Endangered Species Act protections even if it is a gray wolf-coyote hybrid. The U.S. Fish and Wildlife Service attempted to curtail red wolf recovery in 2016. The federal district court properly halted the proposal.*

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I. INTRODUCTION

The reintroduction of the threatened red wolf to its historic range in North Carolina has been very controversial. In 1988, the U.S. Fish and Wildlife Service (FWS) released red wolves into Alligator River National Wildlife Refuge in North Carolina pursuant to section 10(j) of the Endangered Species Act (ESA).[1] The red wolf prospered, but many migrated from the refuge onto private lands.[2] After several counties enacted resolutions objecting to the reintroduction, North Carolina enacted a statute that permitted the taking of red wolves on private land under conditions more lenient than the federal regulations.[3] Several individuals and counties brought suit, alleging that the Commerce Clause did not allow the federal government to regulate wildlife on private land, which is a traditional state function.[4] The Fourth Circuit in *Gibbs v. Babbitt* correctly determined that the Commerce Clause supports the federal regulation preventing the taking of red wolves on private land pursuant to section 9 of the ESA.[5]

The red wolf population expanded until 2006, when it began to decline, in part because red wolves were being shot.[6] In August 2012, North Carolina Wildlife Resources Commission (NCWRC) allowed coyote hunting at night with artificial lights on public and private lands, including the five counties in the red wolf recovery area (Dare, Tyrell, Hyde, Washington, and Beaufort).[7] Environmental groups brought suit, challenging the NCWRC regulation.[8] The night-hunting-with-spotlight program remained until November 2012, when it was sus-

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Resources Law, Criminal Law, Constitutional Law, Law & Society, International Law, and American Government.

[1] Endangered Species Act of 1973, 16 U.S.C. § 1539(j) (2012); Gibbs v. Babbitt, 214 F.3d 483, 488 (4th Cir. 2000). *See generally* Edward A. Fitzgerald, Wyoming Farm Bureau Federation v. Babbitt: *The Children of the Night Return to the Northern Rocky Mountains*, 16 J. NAT. RESOURCES & ENVTL. L. 79 (2001–2002) (providing a comprehensive overview of the legislative history of Section 10(j)).

[2] *Gibbs*, 214 F.3d at 488.

[3] *Id.* at 489.

[4] *Id.*

[5] *Id.* at 487. *See generally* Edward A. Fitzgerald, *Seeing Red:* Gibbs v. Babbitt, 13 VILL. ENVTL. L.J. 1 (2002) (analyzing *Gibbs*, 214 F.3d 483, and concluding the case was correctly decided).

[6] *See Saving the Red Wolf*, CTR. FOR BIOLOGICAL DIVERSITY, http://www.biologicaldiversity.org/species/mammals/red_wolf/ [https://perma.cc/W4KG-6PL8] (accessed Apr. 9, 2017) (discussing the red wolf reintroduction into North Carolina).

[7] Order on Motion for Preliminary Injunction at 1–2, Red Wolf Coal. v. N.C. Wildlife Res. Comm'n, No. 12-CV-01262 (N.C. Super. Ct. Nov. 21, 2012) [hereinafter *Red Wolf Coal. I*].

[8] *Id.* at 1.

pended by Wake County Superior Court[9] for violating the North Carolina Administrative Procedure Act.[10]

In July 2013, the NCWRC again authorized coyote hunting in both the day and night with spotlights.[11] After six red wolves were shot and killed in a six-week period, the Southern Environmental Law Center sought an emergency ban on coyote hunting in the red wolf area.[12] In May 2014, the U.S. District Court for the Eastern District of North Carolina in *Red Wolf Coalition v. NCWRC* (*Red Wolf Coalition II*) granted an injunction banning all coyote hunting in the red wolf recovery area.[13] The court found the NCWRC violated section 9 and section 10(j) by disrupting breeding and pack formation.[14] The regulation also frustrated the placeholder strategy developed by the FWS to stop hybridization.[15] Eventually, the parties negotiated a settlement, which bans coyote hunting by spotlight at night and requires a permit and reporting of a daytime coyote hunt in the five-county red wolf recovery area.[16] The NCWRC in January 2015 passed a resolution demanding the FWS end the red wolf program, which at the time had between forty-five to sixty wolves.[17] FWS responded by halting red wolf reintroductions pending a "feasibility study" that would re-examine the recovery program.[18] Existing red wolves in the wild continued to be managed as a nonessential experimental population.[19] Environmental groups petitioned the FWS for the emergency relisting

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[9] *Id.* at 3–4; *see also* Press Release, Animal Welfare Inst., Court Halts N.C. Spotlighting of Coyotes After 4th Endangered Red Wolf Shot (Nov. 26, 2012), https://awionline.org/content/court-halts-n-c-spotlighting-coyotes-after-4th-endangered-red-wolf-shot [https://perma.cc/ET8C-HAT8] (accessed Apr. 9, 2017) (discussing the preliminary injunction of NCWRC's regulation).

[10] N.C. GEN. STAT. §§ 150B-1 to 150B-57 (2016).

[11] Red Wolf Coal. v. N.C. Wildlife Res. Comm'n, No. 2:13-CV-60-BO, 2014 U.S. Dist. Lexis 65601, at *5–6 (E.D.N.C. May 13, 2014) [hereinafter *Red Wolf Coal. II*].

[12] Press Release, S. Envtl. Law Ctr., Court Protects World's Only Wild Red Wolves (May 14, 2014), https://www.southernenvironment.org/news-and-press/press-releases/court-protects-worlds-only-wild-red-wolves [https://perma.cc/HP5P-S6VD] (accessed Apr. 9, 2017).

[13] *Red Wolf Coal. II*, 2014 U.S. Dist. LEXIS 65601, at *2, *28.

[14] *Id.* at *18–22.

[15] *Id.* at *23.

[16] Press Release, Defs. of Wildlife, Settlement Reached on Protecting World's Only Wild Red Wolves from Deadly Mistaken Identity in Five County Area, http://www.defenders.org/press-release/settlement-reached-protecting-world%E2%80%99s-only-wild-red-wolves-deadly-mistaken-identity [https://perma.cc/F8E3-6SGR] (accessed Apr. 9, 2017).

[17] LISA FAUST ET AL., RED WOLF *(Canis rufus)* Population Viability Analysis—Final Report for U.S. Fish and Wildlife Service (USFWS) Feasibility Study 14 (2016); *USFWS Red Wolf Recovery Review / Proposal*, WOLF CONSERVATION CTR., http://nywolf.org/redwolves/red-wolf-review [https://perma.cc/6WAC-WSRA] (accessed Apr. 9, 2017).

[18] *Service Halts Red Wolf Reintroductions Pending Examination of Recovery Program*, U.S. FISH & WILDLIFE SERV. (June 30, 2015), https://www.fws.gov/news/ShowNews.cfm?ref=service-halts-red-wolf-reintroductions-pending-examination-of-recovery-prog&_ID=35109 [https://perma.cc/2SLH-DTP6] (accessed Apr. 9, 2017).

[19] Chick Jacobs, *Red Wolf Program Suspended in N.C.*, FAYETTEVILLE OBSERVER (June 30, 2015), http://www.fayobserver.com/news/local/red-wolf-program-suspended-

of the red wolf as an essential experimental population and filed suit challenging the FWS's suspension of the red wolf recovery program.[20] A recent 2016 genetic study raised questions regarding the taxonomy of the red wolf that could jeopardize its status as a threatened species.[21] The FWS in September 2016 decided to severely constrain the red wolf recovery program.[22] The FWS plan, however, has been halted by a preliminary injunction issued by the U.S. District Court for Eastern North Carolina preventing the removal of non-problem red wolves from private lands that do not pose a threat to humans or livestock.[23]

This Article demonstrates how federal court decisions protected the red wolf from aggressive state policies that jeopardized this threatened species. The history of the red wolf reintroduction into North Carolina and the Fourth Circuit decision in *Gibbs v. Babbitt* are reviewed. The federal district court decision in *Red Wolf Coalition II* is analyzed. The Article asserts that the court was correct in holding North Carolina liable for instituting coyote hunting policies that put the threatened red wolf at risk thereby violating section 9 of ESA and federal regulations governing red wolf takings. Events following the litigation are discussed. The Article posits that the red wolf should retain ESA protections even if it is a gray wolf–coyote hybrid and that FWS should not abandon red wolf recovery efforts. Finally, the recent federal district court decision halting the FWS effort to constrain red wolf recovery in North Carolina is examined.

II. RED WOLF REINTRODUCTION

The red wolf originally inhabited the southeastern region of the United States from the Atlantic to central Texas and Oklahoma and from the Gulf of Mexico to central Missouri and Illinois.[24] Human activities, such as the drainage of lands for agriculture, the construction of dams, and federal and state predator control, led to the red wolf's demise.[25] The red wolf was viewed as a nuisance, even though it was

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in-n-c/article_ef7e11c3-3872-5d5b-89e8-0f91aba14899.html [https://perma.cc/5H64-6L9D] (accessed Apr. 9, 2017).

[20] ANIMAL WELFARE INST. ET AL., BEFORE THE U.S. FISH AND WILDLIFE SERVICE—EMERGENCY PETITION TO REVISE THE RED WOLF'S 10(J) RULE 2 (2016).

[21] Bridgett M. vonHoldt et al., *Whole-Genome Sequence Analysis Shows That Two Endemic Species of North American Wolf Are Admixtures of Coyote and Gray Wolf*, 2 SCI. ADVANCES, July 27, 2016, at 1, 8–9, http://advances.sciencemag.org/content/advances/2/7/e1501714.full.pdf [https://perma.cc/4NZX-XF9A] (accessed Apr. 9, 2017).

[22] *Science Leads Fish and Wildlife Service to Significant Changes for Red Wolf Recovery*, U.S. FISH & WILDLIFE SERV. (Sept. 12, 2016), https://www.fws.gov/redwolf/evaluation.html [https://perma.cc/M3XF-MSPF] (accessed Apr. 9, 2017).

[23] Red Wolf Coal. v. U.S. Fish & Wildlife Serv., No. 2:15-CV-42-BO, 2016 U.S. Dist. LEXIS 134020, at *1 (E.D.N.C. Sept. 29, 2016) [hereinafter *Red Wolf Coal. III*].

[24] U.S. FISH & WILDLIFE SERV., FAR TRAVELER—A Teacher's Companion to Red Wolf Recovery 3 (2008), http://redwolves.com/wp/downloads/other/far_traveler_2008.pdf [https://perma.cc/MT7U-YLKV] (accessed Apr. 9, 2017).

[25] *Id.*; *Gibbs*, 214 F.3d at 488.

important to the ecosystem and posed no threat to livestock where adequate prey was available.[26]

The red wolf was forced into the lower Mississippi region, and finally into southeast Texas.[27] The red wolf was declared an endangered species in 1967.[28] Low numbers, poor health, and threats posed by coyotes nearly drove the red wolf to extinction.[29] In the 1970s the FWS captured the remaining red wolves and placed them in captive breeding programs for future reintroduction.[30] Several limited experimental releases in 1976 and 1978 demonstrated that the red wolf could be reintroduced back into the wild.[31] The FWS in 1986 proposed the reintroduction of the red wolf into Alligator River National Wildlife Refuge in northeastern North Carolina.[32] This refuge, which contains 120,000 acres of wetlands, provides the ideal habitat. A 47,000-acre U.S. Air Force bombing range with similar habitat and limited activity is adjacent to the refuge.[33]

From September 14, 1987 through September 30, 1992, the U.S. FWS released forty-two wolves on fifteen occasions.[34] Red wolves were introduced as a nonessential experimental population pursuant to section 10(j) of the ESA.[35] Many red wolves remained in captive breeding programs, so there was no threat to the species if any member of the reintroduced population died.[36] Section 10(j) requires the experimental population to be released outside the current range of the natural population and to be geographically separate from the natural population.[37] Since no red wolves existed in the wild, the Alligator River National Wildlife Refuge satisfied this requirement. The Secretary of Interior (Secretary) can establish flexible regulations regarding the experimental population to ease public concerns.[38] Members of the ex-

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[26] Endangered and Threatened Wildlife and Plants; Determination of Experimental Population Status for an Introduced Population of Red Wolves in North Carolina, 51 Fed. Reg. 41,790 (proposed Nov. 19, 1986) (to be codified at 50 C.F.R. pt. 17).

[27] Warren T. Parker, U.S. Fish & Wildlife Serv., Red Wolf Management Series Technical Report No. 1—A Plan for Reestablishing the Red Wolf on Alligator River National Wildlife Refuge North Carolina 1 (1987).

[28] Endangered Species, 32 Fed. Reg. 4001 (Mar. 11, 1967).

[29] *Gibbs*, 214 F.3d at 488.

[30] *Id.*

[31] Parker, *supra* note 27, at 3; Wildlife Mgmt. Inst., A Comprehensive Review and Evaluation of the Red Wolf (*Canis rufus*) Recovery Program 73 (2014), https://www.fws.gov/redwolf/reviewdocuments/WMI-Red-Wolf-Review-FINAL-11142014.pdf [https://perma.cc/6WSN-UMUJ] (accessed Apr. 9, 2017).

[32] *Gibbs*, 214 F.3d at 488.

[33] 51 Fed. Reg. at 41,790.

[34] Michael K. Phillips, Alligator River Nat'l Wildlife Refuge, U.S. Fish & Wildlife Serv. Manteo. N.C., Red Wolf Management Series Technical Report No. 10—Reestablishment of Red Wolves in the Alligator River National Wildlife, North Carolina: September 14, I987 through September 30, 1992 1 (1994).

[35] 51 Fed. Reg. at 41,790.

[36] *Id.*

[37] 16 U.S.C. § 1539(j).

[38] *Id.*

perimental population are treated as a threatened population when on federal land and only considered to be a species proposed for listing when off federal land.[39]

III. *GIBBS V. BABBITT*

There was opposition to red wolf reintroduction in North Carolina. In October 1990, Richard Mann shot a red wolf that he feared might threaten his cattle.[40] Mann was prosecuted by the federal government, pled guilty, and was sentenced to building wolf houses and feeding the wolves.[41] There was, however, a great deal of sympathy for Mann in the region.[42] In 1994, North Carolina passed "An Act to Allow the Trapping and Killing of Red Wolves by Owners of Private Land," which allowed the killing of red wolves on private land if the landowner "reasonably believes" that the wolf may be a threat to people or livestock and previously requested the FWS to remove the wolves.[43] The law initially covered Hyde and Washington counties, but was expanded to include Beaufort and Craven counties. The state law contradicted the federal regulations, which only allowed a taking "when the wolves are in the act of killing livestock or pets" or when wounded or dead livestock or pets are evident, and the taking is reported within 24 hours.[44] Charles Gibbs, Richard Mann, and Hyde and Washington Counties filed suit in the U.S. District Court for the Eastern District of North Carolina challenging federal authority to protect wolves pursuant to section 9 of the ESA for violating the Commerce Clause. They requested an injunction to stop the program because the red wolf was a "menace to citizens and animals in the Counties."[45] They also alleged that federal protection of the wolf precluded any effective defense of their property.

Federal Judge Terrence W. Boyle rejected the claims and found congressional power to regulate interstate commerce included the authority to prevent the taking of red wolves on private land.[46] The court determined that red wolves are "things in interstate commerce" because they cross state lines and their movement is followed by "tourists, academics, and scientists."[47] Each of these activities has economic

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[39] 51 Fed. Reg. at 41,790.

[40] *Whom the Gods Would Destroy*, NEWSMAX (May 15, 2002), http://www.newsmax.com/Pre-2008/Whom-the-Gods-Would/2002/05/15/id/666708/ [https://perma.cc/GNM7-PFSZ] (accessed Apr. 9, 2017).

[41] *Id.*

[42] *See* Gibbs v. Babbitt, 31 F. Supp. 2d 531, 532 (E.D.N.C. 1998) (discussing regulations allowing for the taking of red wolves on private land).

[43] 1994 N.C. Sess. Laws 299. The Act was amended to include Beaufort and Craven Counties. 1995 N.C. Sess. Laws 83.

[44] 50 C.F.R. § 17.84(c)(4)(iii) (2017).

[45] *Gibbs*, 31 F. Supp. 2d at 532–36.

[46] Anne Blythe, *Judge Sides with Conservationists Fighting to Protect Red Wolves in NC*, NEWS & OBSERVER (Sept. 23, 2016), http://www.newsobserver.com/news/local/article104941571.html [https://perma.cc/V7NR-6HZP] (accessed Apr. 9, 2017).

[47] Fitzgerald, *supra* note 5, at 8.

consequences, which substantially affect interstate commerce. The court concluded that the regulation is "a legitimate exercise of federal power under the Commerce Clause."[48]

The Fourth Circuit employed the analytical framework set forth in *U.S. v. Lopez*,[49] which held that the federal government's Commerce Clause authority extends to (1) "the channels of the interstate commerce," (2) "the instrumentalities of interstate commerce, or persons or things in interstate commerce," and (3) "activities having a substantial relation to interstate commerce."[50] The federal government can regulate intrastate "activities that arise out of or are connected with a commercial transaction, which viewed in the aggregate, substantially affects interstate commerce."[51] Intrastate activities can also be regulated if they are "an essential part of a larger regulation of economic activity" that will "be undercut unless the intrastate activity [is] regulated."[52] Jurisdictional boundaries must be established between federal and state authority.[53] There must be a distinction between "what is truly national and what is truly local."[54] Federal regulation must not impinge on an "area of traditional state concern" to which "States lay claim by right of history and expertise."[55]

The Fourth Circuit, upholding the district court, determined that the section 9 taking prohibition is part of a larger regulatory scheme.[56] Forty-one of the seventy-five red wolves are living on private land.[57] The cumulative impact of individual takings will have a substantial impact on interstate commerce by precluding tourism, scientific study, and the possibility of a renewed trade in wolf pelts. Wildlife regulation is not solely within state authority, but is shared with the federal government.[58] A coherent national regime is necessary to prevent states from lowering their wildlife protection standards to achieve any interstate market advantages. The ESA does not disrupt state authority over conservation because federal authority is limited to endangered and threatened species. The Fourth Circuit noted that the Supreme Court's new Commerce Clause jurisprudence protects the states, but does not undermine federal authority.[59]

The red wolf case was significant because the Fourth Circuit, more than other circuits, was engaged in an ongoing dialogue with the

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[48] *Id.*

[49] United States v. Lopez, 514 U.S. 549, 549 (1995).

[50] *Id.* at 558–59.

[51] *Id.* at 561.

[52] *Id.*

[53] *Id.* at 567.

[54] *Id.* at 567–68.

[55] *Id.* at 580, 583 (Kennedy, J., concurring).

[56] Gibbs v. Babbitt, 214 F.3d 483, 497 (4th Cir. 2000).

[57] *Id.*

[58] *Id.*

[59] *Id.* at 493–506.

Court.[60] Furthermore, the decision occurred during a period when the Supreme Court was changing its Commerce Clause jurisprudence. The Court resurrected federalism to limit the federal government's regulatory authority.[61] From 1937 through 1995, the Court deferred to congressional determinations that activities were sufficiently related to interstate commerce to justify federal regulation pursuant to the Commerce Clause.[62] The Court only asked if this decision was rational and if the means chosen were reasonably related to the ends sought. In 1995 the Court changed the conceptual framework in *U.S. v. Lopez* and began to scrutinize the exercise of federal Commerce Clause authority.[63] The Supreme Court returned to a more traditional deferential posture regarding federal Commerce Clause authority in *Gonzalez v. Raich*,[64] which reaffirmed the rationale of the Fourth Circuit decision.

IV. *RED WOLF COALITION V. NORTH CAROLINA WILDLIFE RESOURCES COMMISSION*

Red wolf recovery prospered. The red wolf recovery area expanded to 1.7 million acres.[65] There were between 100 and 130 wolves in 2006.[66] Subsequently, the population began to decline annually. At the start of the litigation the red wolf population was estimated to be between 90 and 110.[67]

In August 2012, NCWRC allowed coyote hunting at night with artificial lights on public and private lands, including the five counties in the red wolf recovery area.[68] The Red Wolf Coalition, Animal Welfare Institute, and Defenders of Wildlife, which were represented by the Southern Environmental Law Center (SELC), brought suit challenging the hunt.[69] The night-hunting-with-spot-light program remained until November 2012, when it was suspended by the Wake County Su-

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60 Warren Richy, *Two Kindred Courts Break Legal Ground*, CHRISTIAN SCI. MONITOR, June 19, 2000, at 1–2.

61 Lainie Rutkow & Jon S. Vernick, *The U.S. Constitution's Commerce Clause, the Supreme Court, and Public Health*, 125 PUB. HEALTH REP. 750, 750–51 (2011).

62 *Id.*

63 *Lopez*, 514 U.S. at 554–57.

64 Gonzalez v. Raich, 545 U.S. 1, 4 (2005).

65 U.S. FISH & WILDLIFE SERV., RED WOLF RECOVERY PROGRAM, 3RD QUARTER REPORT 1 (2013), https://www.fws.gov/redwolf/Images/20130709_RedWolf_QtrReport_FY13-03.pdf [https://perma.cc/2J9L-BD7H] (accessed Apr. 9, 2017).

66 U.S. FISH & WILDLIFE SERV., ENDANGERED RED WOLVES 19 (2016), https://www.fws.gov/southeast/pubs/alwolf.pdf [https://perma.cc/UUW3-6S6M] (accessed Apr. 9, 2017).

67 *Red Wolf Coal. II*, 2014 U.S. Dist. LEXIS 65601, at *3.

68 Order on Motion for Preliminary Injunction, *supra* note 7, at 2.

69 Plaintiffs' Motion for Preliminary Injunction and Request for Expedited Hearing, at 1, 8, *Red Wolf Coal. II*, 2014 U.S. Dist. Lexis 65601.

perior Court for violating the North Carolina Administrative Procedures Act.[70]

In July 2013, NCWRC reinstituted the rule permitting coyote hunting on private land anytime during day or night, and on public land during the day without a permit and at night with a permit.[71] Artificial lights are permitted for hunting coyotes at night.[72] Red Wolf Coalition brought suit in the U.S. District Court for the Eastern District of North Carolina seeking a preliminary injunction to stop coyote hunting in the red wolf recovery area in Dare, Tyrrell, Hyde, Washington, and Beaufort counties.[73] The federal district court had to assess (1) the likelihood of the plaintiffs' success on the merits, (2) whether the plaintiffs will likely suffer irreparable harm, (3) if the balance of equities tips in the plaintiffs' favor, and 4) whether the injunction is in the public interest.[74] In May 2014, Federal Judge Terrence W. Boyle issued the injunction halting coyote hunting on public and private land.[75] The court held that the red wolf, even though designated as a nonessential experimental population, receives federal protection under the ESA.[76] The NCWRC regulation allowing the taking of coyotes in the five counties increases danger of red wolf mortality through hunter error.[77] Human-caused mortality disrupts red wolf breeding and frustrates the FWS placeholder strategy.[78]

A. Likelihood of Success on the Merits

1. Vicarious State Liability

Section 9 of the ESA prohibits any person from taking an endangered or threatened species.[79] "Person" includes federal, state, and lo-

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[70] *See* Order on Motion for Preliminary Injunction, *supra* note 7, at 1, 4 ("Defendants are enjoined from allowing night hunting of coyotes with artificial lights within the Red Wolf Recovery Area in Dare, Tyrrell, Hyde, Washington, and Beaufort counties under the *temporary* rule pending a trial on the merits of this case.").

[71] *Red Wolf Coal. II*, 2014 U.S. Dist. Lexis 65601, at *5–6 (citing 15A N.C. ADMIN. CODE 10B.0219(a)(2)–(3) (2016)).

[72] *Id.* at *6.

[73] *Id.* at *3.

[74] *Id.* at *13 (citing Winter v. Nat. Res. Def. Council, 555 U.S. 7, 20 (2008)).

[75] *Id.* at *28.

[76] *See id.* at *15 ("The ESA extends its protection to . . . nonessential experimental populations . . . [, and] [r]ed wolves . . . are designated as a nonessential experimental population and are therefore subject to protective regulations that have been established for their conservation.").

[77] *See* Plaintiffs' Memorandum in Support of Motion for Preliminary Injunction at 8, *Red Wolf Coal. II*, 2014 U.S. Dist. Lexis 65601 ("Night hunting increases the risk that red wolves will be mistakenly shot as it is nearly impossible to distinguish red wolves from coyotes under nighttime conditions.").

[78] *See id.* at 8–9 ("[C]oyote hunting causes the take of red wolves by disrupting red wolf breeding when red wolves are shot . . . and undermines the [USFWS] management strategy to use coyotes as placeholders in making progress toward red wolf recovery.").

[79] *See* 16 U.S.C. § 1538(a)(1)(B) ("[W]ith respect to any endangered species of fish or wildlife . . . it is unlawful for any person . . . to . . . take any such species . . . .").

cal governments.[80] "Take" is defined to mean "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."[81] The Supreme Court upheld FWS's decision to define "take" broadly to prevent "significant habitat modification or degradation that actually kills or injures wildlife."[82] The application of direct harm to the endangered or threatened species is therefore not required. Furthermore, the Court held that both the "ordinary requirements of proximate causation," as well as "but for" standards of causation apply to such takings.[83]

NCWRC argued it was not liable because its licensing of coyote hunting was not the proximate cause of death for any red wolf.[84] The independent action of hunters is an intervening and supervening event breaking the chain of causation.[85] The federal district court correctly held that NCWRC violated section 9 of the ESA because the killing of red wolves was directly related to the NCWRC regulation.[86] NCWRC was responsible for allowing the indiscriminate killing of the red wolf through unregulated coyote hunting in the red wolf recovery area. North Carolina classified the coyote as a nongame animal.[87] The NCWRC set bagging and seasonal limits for hunting and trapping.[88] No bagging or seasonal limitations were established for the hunting or trapping of coyotes, but hunting was limited to daylight hours.[89] NCWRC changed the regulations in July 2013 to allow coyote hunting on private land anytime day or night, and on public lands during daytime without a permit and at night with a permit.[90] The use of artificial lights was permitted when hunting coyotes at night.[91]

It is difficult to distinguish red wolves from coyotes, especially at night. Coyotes can easily be mistaken for red wolves because of their

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[80] *Id.* § 1532(13).

[81] *Id.* § 1532(19).

[82] Babbitt v. Sweet Home Chapter of Cmtys. for a Great Or., 515 U.S. 687, 708 (1995).

[83] *See id.* at 699 n.13 ("[T]he regulation merely implements the statute, and it is therefore subject to . . . ordinary requirements of proximate causation and foreseeability. The Secretary did not need to include 'actually' to connote 'but for' causation, which the other words in the definition obviously require.").

[84] *See* Defendants' Memorandum in Response to Plaintiffs' Motion for Preliminary Injunction at 12–13, *Red Wolf Coal. II*, 2014 U.S. Dist. LEXIS 65601 (arguing that violations of the ESA are caused by an individual's conscious and independent decision-making, thus shielding NCWRC from vicarious liability).

[85] *Id.*

[86] *See Red Wolf Coal. II*, 2014 U.S. Dist. LEXIS 65601, at *15–16, *20 ("The red wolf experimental population regulations expressly extend the prohibition on taking under Section 9 to the red wolf population . . . . The [NCWRC] may therefore be liable for the unauthorized takes of red wolves where its actions have greatly increased the likelihood of the take.").

[87] *Id.* at *5.

[88] *Id.*

[89] *Id.*

[90] *Id.* at *5–6.

[91] *Id.*

similar size and coloring. "Adult red wolves weigh an average of fifty pounds, stand a little over two feet tall at the shoulder, and are roughly four and half feet long with their tail."[92] "Coyotes located in the recovery area weigh about thirty pounds, are roughly two feet tall at the shoulder, and are about four feet long with their tail."[93] Red wolf pups and adolescents are quite similar in size to coyotes.[94] "Both species may appear to be buff, tan, grey, or reddish brown in color."[95]

The NCWRC rule was the proximate cause of the death of the red wolf because it set in motion a series of events leading to the violation of the ESA. The Restatement (Third) of Torts regarding intervening cause states, "when a force of nature or an independent act is also a factual cause of harm, an actor's liability is limited to those harms that result from the risk that made the actor's conduct tortious."[96] An actor is liable "when there is a foreseeable risk of improper conduct, including criminal activity, by another."[97] The Supreme Court also held that third-party action can potentially break the chain of causation, but does not do so if the third-party action was caused or influenced by the defendant.[98] Hunters' and trappers' actions in North Carolina are not an independent intervening cause. Hunters and trappers act pursuant to state law. Hunting and trapping are not allowed unless authorized by NCWRC.

Federal courts have held federal[99] and state governments[100] liable for their policies that third parties followed in harming listed species.[101] For example, the First Circuit in *Strahan v. Coxe*[102] invali-

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92 *Id.* at *7.

93 *Id.*

94 *Id.*

95 *Id.*

96 RESTATEMENT (THIRD) OF TORTS: LIABILITY FOR PHYSICAL AND EMOTIONAL HARM § 34 (AM. LAW INST. 2010).

97 *Id.*

98 Bennett v. Spear, 520 U.S. 154, 169 (1997); *see* Aransas Project v. Shaw, 775 F.3d 641, 656–63 (5th Cir. 2014) (taking an alternate view). The Fifth Circuit held that the issues of "remoteness and foreseeability [are] inherent in proximate cause." *Aransas Project*, 775 F.3d at 659. The court concluded that "establishing proximate cause from 'authorizing' any activity that 'caused' a take creates liability far beyond the contours of current ESA case law." *Id.*

99 Oregon Nat. Desert Ass'n v. Tidwell, 716 F. Supp. 2d 982, 1005 (D. Or. 2010); Sierra Club v. Yeutter, 926 F.2d 429, 439 (5th Cir. 1991); Defs. of Wildlife v. EPA, 882 F.2d 1294, 1301 (8th Cir. 1989).

100 Loggerhead Turtle v. Cty. Council, 148 F.3d 1231, 1249 (11th Cir. 1998); Palila v. Haw. Dep't of Land & Nat. Res., 852 F.2d 1106, 1110 (9th Cir. 1988); Palila v. Haw. Dep't of Land & Nat. Res. (Palila I), 639 F.2d 495, 407 (9th Cir 1981); Pac. Rivers Council v. Brown, No. CV 02-243-BR, 2002 WL 32356431, at *11 (D. Or. Dec. 23, 2002); United States v. Town of Plymouth, 6 F. Supp. 2d 81, 85–86 (D. Mass. 1998).

101 Only the First, Eighth, Ninth, and Eleventh Circuits have determined that federal and state governments are liable for policies that result in the taking of endangered species by third parties. Devon Lea Damiano, *Licensed to Kill: A Defense of Vicarious Liability Under the Endangered Species Act*, 63 DUKE L.J. 1543, 1568 nn.191–92 (2014). The Fifth Circuit rejected the theory in *Aransas Project*, 775 F.3d at 659.

102 Strahan v. Coxe, 127 F.3d 155 (1st Cir. 1997).

dated the Massachusetts licensing scheme permitting fishing gear that entangled the endangered North Atlantic right whale (*E.glacialis*). The First Circuit held that "a governmental third party pursuant to whose authority an actor directly exacts a taking of an endangered species may be deemed to have violated the provisions of the ESA."[103] Regarding causation, Massachusetts argued that the common law of causation should be applied. Since its licensing was not the direct cause of the taking, it should not be held liable.[104] The First Circuit rejected Massachusetts's argument and declared "the state has licensed commercial fishing operations to use gillnets and lobster pots in specifically the manner that is likely to result in a violation of federal law.[105] The causation here, while indirect, is not so removed that it extends outside the realm of causation as it is understood in the common law."[106]

The U.S. District Court for the District of Minnesota in *Animal Protection Institute v. Holsten*, relying on *Strahan*, struck down the Minnesota Department of Natural Resources' (MDNR) authorization of trapping and snaring in the range of the threatened lynx for violating section 9 of ESA.[107] MDNR argued that its licensing was not the proximate cause of the taking of the lynx.[108] The trapper's action was an independent intervening cause that relieved MDNR of any liability. The court, citing Restatement (Second) of Torts, held an independent intervening action "is one the operation of which is not stimulated by a situation created by the actor's conduct. An act of a human being or animal is an independent force if the situation created by the actor has not influenced the doing of the act."[109] The court noted that there is no trapping in Minnesota without a state license. MDNR licensed the trapping, which was the "'stimulus' for the trappers conduct that results in incidental takings."[110] The issue is "whether a risk of taking exists if trappers comply with all applicable laws and regulations in place, not whether it is possible to avoid a taking if the laws and regulations are followed."[111] MDNR allowed trappers to take the threatened lynx.[112] The trappers' action was not an independent intervening cause breaking the chain of causation between the MDNR and the taking of the threatened lynx.

In a similar case, Maine's authorization of trapping in threatened lynx range was challenged for violating section 9 of the ESA.[113] Maine

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103 *Id.* at 163.
104 *Id.* at 163–64.
105 *Id.* at 164.
106 *Id.*
107 Animal Prot. Inst. v. Holsten, 541 F. Supp. 2d 1073, 1073 (D. Minn. 2008).
108 *Id.* at 1077.
109 Restatement (Second) of Torts § 441 (Am. Law Inst. 1965).
110 *Holsten*, 541 F. Supp. 2d at 1079.
111 *Id.*
112 *Id.* at 1080.
113 Animal Welfare Inst. v. Martin, 588 F. Supp. 2d 70, 98–99 (D. Me. 2008).

argued that "there is nothing in the ESA that imposes any legal obligation on states to take affirmative actions to protect listed species. Further there is no provision in the ESA suggesting that when states license an activity, they have a legal obligation to ensure that the activity poses no risk to listed species."[114] Even if private licensed activity takes a listed species, the state licensing is not the proximate cause of the harm caused by the licensee.[115] The U.S. District Court for the District of Maine in *Animal Welfare Institute v. Martin*, following the logic of *Strahan* and *Holsten*, agreed the ESA does not impose an obligation on states to prevent private actions that harm listed species.[116] The issue is not whether the state has an obligation to undertake an affirmative act, but whether, when it undertakes an affirmative act such as authorizing trapping, it is violating the ESA. Maine does have power to "conserve, protect and regulate its wildlife" and its authority to regulate hunting rests on its "power to preserve and regulate the exploitation of an important resource."[117] There is, however, no hunting or trapping in Maine without a state license.[118] The authorization of trapping makes it more likely that the lynx will be trapped. Maine is liable under the ESA for takings resulting from state regulation.[119]

Scholars have divergent views regarding vicarious state liability for ESA violations.[120] Critics argue that Congress never intended to hold states liable for their regulatory policies that jeopardize endangered species. Congress established specific restrictions on the federal government in section 7 of ESA.[121] Similar restrictions were not placed on state governments in section 9 of the ESA. Furthermore, imposing vicarious liability on the states will force the states to implement federal law in violation of the Tenth Amendment. Overall, the balance between federal and state authority in the ESA will be disrupted.[122]

Other scholars more accurately perceive the benefits of the concept. Proponents argue vicarious liability "plays a valuable role in effectuating the objectives of the ESA and the regulations put in place . . . [and is] consistent with the text and structure of the ESA and important for furthering the ESA's ultimate goal of protecting endan-

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114 *Id.*

115 *Id.*

116 *Id.*

117 *Id.* at 99.

118 *Id.*

119 *Id.* at 98–99.

120 Jonathan H. Adler, *Judicial Federalism and the Future of Federal Environmental Regulation*, 90 IOWA L. REV. 377, 428–30 (2005); Valerie J.M. Brader, *Shell Games: Vicarious Liability of State and Local Governments for Insufficiently Protective Regulations Under the ESA*, 45 NAT. RES. J. 103, 132–33 (2005); J.B. Ruhl, *State and Local Government Vicarious Liability Under the ESA*, 16 NAT. RES. & ENV'T 70, 73–77 (2001).

121 16 U.S.C. § 1536.

122 Brader, *supra* note 120, at 133 (cautioning against the dangers of vicarious liability).

gered species."[123] Holding the state liable for policies that allow individuals to take endangered species facilitates enforcement of the ESA, which is difficult with respect to individual actors.[124] Precluding state misfeasance will also "prevent large-scale takes without also exposing states to unpredictable liability."[125]

2. Status of Nonessential Experimental Population

NCWRC acknowledged that federal and state government action posing a risk to endangered and threatened species can be halted. However, NCWRC asserted that the case law only protected endangered and threatened species, not a nonessential experimental population reintroduced pursuant to section 10(j).[126] The federal district court correctly rejected this contention.[127]

Section 4 of the ESA allows listing of an endangered species, which is "any species which is in danger of extinction throughout all or a significant portion of its range," and a threatened species, which is "any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range."[128] The Secretary has greater flexibility regarding regulations for the conservation of threatened species.[129] Section 9 of the ESA prohibits private action that takes a threatened species in violation of regulations promulgated by FWS.[130] Reintroduced experimental populations under section 10(j), like the red wolf, are considered to be a threatened species.[131] Federal regulations state "an experimental population shall be treated as if it were listed as a threatened species for

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123 Damiano, *supra* note 101, at 1588 (listing the benefits of vicarious liability).

124 Michael Bean points out: "As a practical matter, enforcing the taking prohibitions of the ESA against these myriad actors is exceedingly difficult. However, if the activities of these actors are subject to regulation by some intermediary, such as a city or county government, it may be much more practical to influence what the various individual actors do by influencing how the intervening regulatory body wields its authority. Indeed, if a regulatory body could itself be deemed liable for the taking of endangered species by those whose activities it regulates, then the practical alternative to enforcing the ESA's prohibitions against thousands of individual actors would be to enforce those prohibitions against the regulatory body." Michael J. Bean, *Major Endangered Species Act Developments in 2000*, 31 ENVTL. L. REP. 10,283, 10,285 (2001).

125 Damiano, *supra* note 101, at 1588 (describing some benefits to disposing of vicarious liability).

126 Defendants' Memorandum in Response to Plaintiffs' Motion for Preliminary Injunction, *supra* note 84, at 7–8.

127 *Red Wolf Coal. II*, 2014 U.S. Dist. LEXIS 65601, at *20–*21. For an alternative analysis of the issues, see Wildearth Guardians v. Lane, No. CIV 12-118 LFG/KBM, 2012 U.S. Dist. LEXIS 176180 (D. N.M. Dec. 3, 2012). *See also*, William M. McLaren, *An Endangered Theory: Vicarious Liability Under the Endangered Species Act*, 44 ENVTL. L. 1203, 1211–15 (2014) (discussing ESA vicarious liability claims in the context of experimental species).

128 16 U.S.C. § 1532.

129 16 U.S.C. § 1533(d).

130 16 U.S.C. § 1538(a)(G).

131 16 U.S.C. § 1539(j)(C).

establishing protective regulations . . . and" the Secretary can establish "special rules adopted for experimental population [that] will contain applicable prohibitions, as appropriate, and exceptions for that population."[132] Section 10(j) establishes the special rules regarding the taking of reintroduced experimental population.[133] Since the nonessential experimental population of red wolves is a threatened species, it is protected under section 9(g) of the ESA, which states "it is unlawful for any person subject to the jurisdiction of the U.S. to attempt to commit, solicit another to commit, or cause to be committed, any offense defined in this section."[134]

The Secretary established specific rules for taking the red wolf.[135] These rules do not allow for the indiscriminate killing of red wolf under the guise of coyote hunting. The rules allow the taking of red wolves under the following conditions:

> i) any person may take red wolves found on private land . . . [p]rovided that such a taking is not intentional or willful, or is in defense of that person's own life or the lives of others . . . .
> ii) any person may take red wolves found on lands managed by Federal, State, or local government agencies . . . [p]rovided that such a taking is incidental to lawful activities, is unavoidable, unintentional, and not exhibiting a lack of reasonable due care, or is in defense of that person's own life or the lives of others . . . .
> iii) any private landowner, or any other individual having his or her permission, may take red wolves found on his or her property when the wolves are in the act of killing livestock or pets . . . .
> iv) any private landowner, or any other individual having his or her permission, may harass red wolves found on his or her property . . . provided that all such harassment is by methods that are not lethal or physically injurious to the red wolf . . . .
> v) any private landowner may take red wolves found on his or her property . . . after efforts by project personnel to capture such animals have been abandoned.[136]

Furthermore, all takings have to be reported.[137]

These are constrained conditions: (i) and (ii) allow any person to take a red wolf in defense of life; (iii) allows a private landowner to take a red wolf in the act of killing livestock or pets; (iv) does not permit private landowners to take, but only harass, a red wolf; and (v) only permits a private landowner to take a red wolf with federal approval. The NCWRC rule can only be justified pursuant to the unintentional and non-willful killing on private land and/or the unavoidable, unintentional, non-negligent killing on public land.[138]

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[132] 50 C.F.R. § 17.83 (2016).
[133] 16 U.S.C. § 1539(j).
[134] 16 U.S.C. § 1538(g).
[135] 50 C.F.R. § 17.84.
[136] *Id.*
[137] *Id.*
[138] *Id.*

One (i) does not apply because it is restricted to private landowners and those with the permission of private landowners, and does not extend to random hunters, who are engaged in otherwise legal activity on private lands. The regulations state that section 9 only covers intentional and willful taking on private lands. This provision makes the taking of a red wolf on private lands a specific intent crime, unlike the protection afforded to all endangered and most threatened species. This provision will apply to all private landowners.[139] The North Carolina Landowner Protection Act restricts hunting on private land to those who have the permission of the landowner.[140] Furthermore, the broad interpretation of this section has produced the informal "McKittrick Policy," which leads to reluctance on the part of federal prosecutors to pursue killers of red wolves who allege they were hunting only coyotes.[141]

Two (ii) makes the killing of a red wolf on public lands a general intent crime. Federal regulations state: "The concept of a general intent violation (i.e., avoidable take or take through mistaken identity) that was present in the earlier rule is now used only on lands owned or managed by Federal, State, or local government agencies."[142] Furthermore, "[t]he basic premise is that a red wolf that is incidentally taken . . . on private lands will not be a violation of the special rule. However, a higher standard of conduct is expected on public lands, where the conservation of the red wolf is an objective."[143]

Under the NCWRC rule, any hunter who kills a red wolf on public land, mistakenly believing it is a coyote, is subject to federal prosecu-

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139 Revision of the Special Rule for Nonessential Experimental Populations of Red Wolves in North Carolina and Tennessee, 60 Fed. Reg. 18,940, 18,946 (Apr. 13, 1995) (to be codified at 50 C.F.R. pt. 17).

140 2011 N.C. Sess. Laws 231.

141 Press Release, Lobos of the Sw., Groups Sue U.S. for Failure to Prosecute Under the Endangered Species Act (July 23, 2015), http://mexicanwolves.org/index.php/news/1490/51/Press-Release-Groups-Sue-U-S-for-Failure-to-Prosecute-Under-the-Endangered-Species-Act [https://perma.cc/TG9D-LG5W] (accessed Apr. 9, 2017). The McKittrick Policy is the 1998 informal, unpublished policy of the Department of Justice, which holds that an individual who kills a protected species will not be prosecuted unless the government can show the individual knew of the protected status of the animal before he killed it. The McKittrick Policy was recently challenged in the District of Arizona, where Judge Bury found it to be arbitrary and capricious in violation of the Administrative Procedure Act. WildEarth Guardians v. U.S. Dept. of Justice, 181 F. Supp. 3d 651, 657 (D. Ariz. 2015) (denying the Department of Justice's motion to dismiss); WildEarth Guardians v. U.S. Dept. of Justice, No. CV-13-00392-TUC-DCB (D. Ariz. June 21, 2017) (final order). *See also* U.S. FISH & WILDLIFE SERV., ASSOCIATION OF FISH AND WILDLIFE AGENCIES THREATENED AND ENDANGERED SPECIES POLICY COMMITTEE REPORT (2011) ("The McKittrick policy requires that the federal prosecutor prove a defendant knew he or she was killing an endangered species – prove the mental state."); Julie Cart, *U.S. Sued over Policy on Killing Endangered Wildlife*, L.A. TIMES (May 29, 2013), http://articles.latimes.com/2013/may/29/local/la-me-0530-endangered-species-lawsuit-20130530 [https://perma.cc/ANX8-PBPR] (accessed Apr. 9, 2017).

142 60 Fed. Reg. at 18,946.

143 *Id.* at 18,944.

tion.[144] ESA requires that violations are done "knowingly."[145] A person must "knowingly violate[ ] . . . any provision of this chapter, or any provision of any permit or certificate issued hereunder."[146] The term "knowingly" only applies to the act being committed, not to the hunter's understanding of the law. The hunter does not have to know the animal shot was endangered, only that he knew he was shooting something. This differs from the private landowner, who must have the specific intent to commit the illegal act. Since the killing of a red wolf on public land is a general intent crime, the defendant only has to intend to commit the act and the act turned out to be a crime.[147]

The ESA originally was a specific intent statute.[148] The prosecutor had to show the defendant acted "willfully" to establish criminal violation.[149] This was changed by amendments to the ESA in 1978.[150] The Conference Committee Report stated: "The committee does not intend to make knowledge of the law an element of either civil penalty or criminal violations of the Act. In furtherance of this intent, the committee has reduced that standard for criminal violations from 'willfully' to 'knowingly.'"[151]

Courts have recognized the congressional change in the *mens rea* requirement. Justice Stevens in *Babbitt v. Sweet Home Chapter of Communities for a Great Oregon* stated: "Congress added 'knowingly' in place of 'willfully' in 1978 to make 'criminal violations of the act a general rather than a specific intent crime.'"[152] The Fourth Circuit in *United States v. Wilson* stated: "[I]nterpreting the phrase 'knowingly violate' to mean violation with knowledge of an act's illegality would require us to ignore the distinction between a knowing and a willful violation, a distinction that Congress recognized in amending the law . . . ."[153]

Defendants have been convicted of "knowing" violations of the ESA without being aware of the status of the dead animal. McKittrick was convicted of "knowingly" killing a threatened gray wolf.[154] The Ninth Circuit, upholding the conviction, declared that McKittrick "need not have known he was shooting a wolf to 'knowingly violate[ ]'

144 *Red Wolf Coal. II*, 2014 U.S. Dist. LEXIS 65601, at *1.

145 16 U.S.C. § 1540 (a)(1) (2012).

146 *Id.*

147 Ed Newcomer et al., *The Endangered Species Act v. The United States Department of Justice: How the Department of Justice Derailed Criminal Prosecutions Under the Endangered Species Act*, 17 ANIMAL L. 251, 260 (2011); Joel Plainfield, Derailing the Endangered Species Act: How the Department of Justice Has Driven Criminal Prosecutions Off the Right Track?? (2013), Law School Student Scholarship, Paper 228, 14–23.

148 H.R. REP. NO. 95-1625 (1978), *reprinted in* A Legislative History of the ESA of 1973, as Amended in 1976, 1977, 1978, 1979, and 1980, 725, 750.

149 *Id.*

150 *Id.*

151 *Id.*

152 *Babbitt*, 515 U.S. at 696 n.9.

153 United States v. Wilson, 133 F.3d 251, 263 (4th Cir. 1997).

154 United States v. McKittrick, 142 F.3d 1170, 1177–78 (9th Cir. 1998).

the regulations protecting the experimental population."[155] Congress altered the wording of section 11 of the ESA in 1978 to "reduce[ ] the standard for criminal violations from 'willfully' to 'knowingly.'"[156] It did this to "make criminal violations of the act a general rather than a specific intent crime."[157] The court noted that "[t]he critical issue is whether the act was done knowingly, not whether the defendant recognized what he was shooting."[158] Section 11 only requires "that McKittrick knew he was shooting an animal, and that the animal turned out to be a protected gray wolf."[159] This case led to the informal "McKittrick Policy."[160]

Billie killed an endangered Florida panther.[161] Billie argued that "in order to convict, the Government must prove beyond a reasonable doubt his knowledge that (1) the animal he shot was a Florida panther, and (2) it was a crime to do so on the Seminole Indian Reservations."[162] The U.S. District Court for the Southern District of Florida in *United States v. Billie* found Billie guilty of violating the ESA, stating that the "legislative history of the Act indicates that Congress did 'not intend to make knowledge of the law an element' of a criminal violation" of the ESA.[163] The court found that "knowingly means that the act was done voluntarily and intentionally and not because of mistake or accident."[164] The court noted that "it would be nearly impossible to prove that the average hunter recognized the particular subspecies protected under the Act."[165] The court held that the "Government need prove only that [Billie] acted with general intent when he shot the animal in question."[166]

St. Onge killed a protected grizzly bear and argued "that he believed he was shooting an elk at the time he allegedly shot the [protected] bear in question."[167] The U.S. District Court for the District of Montana in *United States v. St. Onge*, citing the legislative history of the ESA, held that the "construction of the 'knowingly' requirement would best give effect to the regulatory and protective nature of the Act," which was "enacted to conserve and protect endangered species, and that its purposes would be eviscerated if the government had to

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155 *Id.* at 1177 (alteration in original).

156 *Id.* (quoting H.R REP. NO. 95-1625, at 26 (1978), *reprinted in* 1978 U.S.C.C.A.N. 9453, 9476) (alteration in original).

157 *Id.*

158 *Id.* (quoting United States v. St. Onge, 676 F. Supp. 1044, 1045 (D. Mont. 1988)).

159 *Id.*

160 *See supra* note 141 and accompanying text.

161 United States v. Billie, 667 F. Supp. 1485, 1487 (S.D. Fla. 1987).

162 *Id.* at 1492.

163 *Id.*

164 *Id.*

165 *Id.*

166 *Id.* at 1493.

167 United States v. St. Onge, 676 F. Supp. 1044, 1044 (D. Mont. 1988).

prove that the hunter recognized the particular subspecies protected under the Act."[168] The court noted that

> [t]he critical issue is whether the act was done knowingly, not whether the defendant recognized what he was shooting. The scienter element applies to the act of taking; thus, defendant could only claim accident or mistake if he did not intend to discharge the firearm, or the weapon malfunctioned, or similar circumstances occurred.[169]

The court held the government must prove three elements for a conviction: "first, that the defendant knowingly took an animal within the United States; second, that the animal was a grizzly bear; and third, that the defendant did not have permission from the United States Department of Interior to take the bear."[170] St. Onge was convicted of violating the ESA.[171]

The Fifth Circuit followed this reasoning in *United States v. Nguyen*.[172] Nguyen was accused of possessing and importing a threatened loggerhead sea turtle.[173] Nguyen argued the government must show that he knew he had a threatened species.[174] The Fifth Circuit upheld his conviction. The court noted that Congress "did 'not intend to make knowledge of the law an element of either civil penalty or criminal violations of the Act.'"[175]

These cases demonstrate that the government is not required to prove a defendant knew the species of animal he has harmed or that the species was protected by the ESA. The government must show only that the defendant intended to take the animal and that the animal was protected. NCWRC engaged in misfeasance by licensing hunters to kill coyotes in the red wolf recovery area.[176] Any person who harmed or killed a red wolf on public land, mistakenly believing it to be a coyote, violated the ESA. This is similar to the First Circuit decision *Strahan v. Coxe*, which found the Commonwealth of Massachusetts liable under the ESA for authorizing private activity—commercial fishing—that posed a risk to the endangered Northern Atlantic right whale.[177] The First Circuit stated, "it is not possible for a licensed commercial fishing operation to use its gillnets or lobster pots in the manner permitted by the Commonwealth without risk of violating the ESA by exacting a taking."[178]

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168 *Id.* at 1045.

169 *Id.*

170 *Id.*

171 *Id.*

172 United States v. Nguyen, 916 F.2d 1016, 1017–18 (5th Cir. 1990).

173 *Id.* at 1017.

174 *Id.* at 1018.

175 *Id.* at 1019.

176 Damiano, *supra* note 101, at 1568–71.

177 *Strahan*, 127 F.3d at 158.

178 *Id.* at 164.

B. Irreparable Harm

The North Carolina federal district court correctly determined that the plaintiffs would suffer irreparable harm.[179] The NCWRC rule permitting unregulated coyote hunting in the red wolf recovery area jeopardizes recovery in several ways. First, it increases the risk of gunshot mortality because red wolves are easily mistaken for coyotes.[180] From 1987 through 2000, 12% of the red wolf mortalities resulted from gunshots.[181] This increased from 2000 to 2013 to 29% of the red wolf mortalities.[182] Since 2008, 10% of the red wolf population was shot annually.[183] There were forty-eight suspected or confirmed wolf deaths by gunshot over this period.[184]

Between December and the end of January in the winters of 2011 to 2012 and 2012 to 2013, seven red wolves were killed by guns.[185] Nine of the fourteen red wolf deaths in 2013 attributed to humans were the result of gunshot.[186] This was approximately 8% of the red wolf population of 90–110.[187] These figures only accounted for the sixty-one radio-collared wolves in the recovery area. More non-collared wolves were likely shot.[188]

Second, unregulated coyote hunting disrupts red wolf breeding. Gunshot deaths constitute the largest cause of death for red wolf breeders.[189] The number of breeding pairs increased between 2002 to 2006, but has since decreased. The number of breeding pairs in 2014 was the same as in 1999 through 2000.[190] This reduces the number of pups born and increases the chance of hybridization as red wolves mate with coyotes. Red wolf recovery is threatened by genetic introgression. The risk is particularly egregious because most of the red wolves were shot during the fall hunting season, which follows the red wolf mating season.[191]

Studies support this position. A recent study by Joseph W. Hinton et al. of red wolf breeding patterns from 1991 through 2013 demonstrates that human-caused mortality accounted for 40.6% of breeding pair disbandment, with gunshots being the primary cause of mortal-

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179 *Red Wolf Coal. II*, 2014 U.S. Dist. LEXIS 65601, at *14–15.

180 Plaintiffs' Memorandum in Support of Motion for Preliminary Injunction, *supra* note 77, at 7.

181 *Id.*

182 *Id.*

183 *Id.*

184 *Id.*

185 *Id.* at 22.

186 *Id.*

187 *Id.*

188 *Id.*

189 *Id.* at 8.

190 WILDLIFE MGMT. INST., *supra* note 31, at 23.

191 Plaintiffs' Memorandum in Support of Motion for Preliminary Injunction, *supra* note 77, at 8.

ity.[192] Red wolves replaced the disbanded breeding pair more than 75% of the time when the pairs were disbanded because of natural causes or the result of management actions.[193] Since the mid-2000s human caused mortality has caused the annual preservation rates of red wolf breeding pairs to decline by 34% and the replacement of breeders by red wolves to decline by 30%.[194]

Gunshot deaths have a strong negative effect on the longevity of red wolves, reducing their mean life expectancy in the wild to 3.2 years.[195] The mean duration of a breeding pair is two years.[196] Low life expectancy prevents the long-term pair bonding required for developing the social structure and stability necessary to maintain pack dynamics. It also affects the territorial behavior and mating of wolves and coyotes. Human killing of red wolves allows coyotes to encroach on territory of disbanded red wolf pairs and mate with red wolves.[197]

Another study by Justin H. Bohling and Lisette P. Waits demonstrated that from 2001 to 2013 there were over four times (126 versus 30) as many red wolf litters as hybrid litters.[198] Over half of the hybrid events followed the disruption of stable breeding pairs caused by the mortality of one or both breeders.[199] Humans caused 69% of these disruptions, primarily by gunshot.[200] The majority of the hybridization events involved female wolves.[201] Young first-time breeders with slightly higher levels of coyote ancestry were responsible for the hybrid litters.[202] Only 16% of hybrid litters occurred in the inner core of red wolf recovery areas.[203]

Third, unregulated coyote killing undermines the FWS adaptive management program. The FWS "capture[s] and sterilize[s] a hormonally intact coyote and then release[s] the sterile canid back into its territory."[204] Sterile coyotes cannot mate or interbreed with wild red wolves, which precludes hybridization. Eventually, the placeholder coyotes are replaced by larger red wolves, either naturally or through selective management. The plan also calls for the cross-fostering of

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192 Joseph W. Hinton et al., *Effects of Anthropogenic Mortality on Critically Endangered Red Wolf* Canis rufus *Breeding Pairs: Implications for Red Wolf Recovery*, 51 ORYX 174, 174 (2015).

193 *Id.*

194 *Id.*

195 *Id.* at 179.

196 *Id.*

197 *Id.*

198 Justin H. Bohling & Lisette P. Waits, *Factors Influencing Red Wolf-Coyote Hybridization in Eastern North Carolina, USA*, 184 BIOLOGICAL CONSERVATION 108, 108 (2015).

199 *Id.*

200 *Id.*

201 *Id.*

202 *Id.*

203 *Id.*

204 Plaintiffs' Memorandum in Support of Motion for Preliminary Injunction, *supra* note 77, at 9.

captive born wolf pups with wild red wolves.[205] FWS declared that the killing of a sterile coyote "undermine[s] our management strategy to use coyotes as placeholders in making progress toward red wolf recovery."[206]

NCWRC questioned the FWS placeholder strategy and argued that FWS must receive state permission to capture, sterilize, and release coyotes back into the wild because coyotes are a public trust resource.[207] This harkens back to the state ownership of wildlife theory advanced in *Geer v. Connecticut*,[208] which was overturned in *Hughes v. Oklahoma*.[209] The state does have exclusive authority to manage wildlife within its borders; it shares this authority with the federal government.

NCWRC asserted that the placeholder strategy was just a theory.[210] FWS cannot use the lawsuit to force this management strategy upon the NCWRC while it was determining the efficacy of the experiment.[211] Admittedly, there are questions regarding the efficacy of the placeholder strategy.[212] Recent studies, however, demonstrate the program's effectiveness.[213] For example, Eric M. Gese and Patricia A. Terletzky's study shows the placeholder strategy has been successful at preventing coyote-wolf hybridization. From 1999 to 2013, red wolves displaced or killed 51 of 182 sterile coyotes and managers removed another 16.[214] This led to more red wolf litters than hybrid litters.[215] Most displacements occurred during winter (43%) and were always by

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205 *Id.*

206 *Id.*

207 Defendants' Memorandum in Response to Plaintiffs' Motion for Preliminary Injunction, *supra* note 84, at 16.

208 *See* Geer v. Connecticut, 161 U.S. 519, 529 (1896) (advancing the state ownership of wildlife theory).

209 *See* Hughes v. Oklahoma, 441 U.S. 322, 323 (1979) (overturning the exclusive state ownership of wildlife theory).

210 For example, David Raybon, FWS red wolf program coordinator, stated that "preventing hybridization using reproductive sterilization techniques is heavy handed and a short-term strategy to jump start red wolf colonization." Defendants' Memorandum in Response to Plaintiffs' Motion for Preliminary Injunction, *supra* note 84, at 16. *See also* Joseph W. Hinton, Michael J. Chamberlain, & David R. Rabon, *Red Wolf (*Canis rufus*) Recovery: A Review with Suggestions for Future Research*, 3 ANIMALS 722, 734–36 (2013) (noting that implementation of the placeholder strategy in the reintroduction area make a number of assumptions that require further testing). There is a question if it can apply over a large area. *Id.* Cobb declared that testing the placeholder strategy, which is an experiment, is deemed top priority. *Id.* at 736.

211 *Id.* at 17.

212 Dennis L. Murray et al., *The Challenges of Red Wolf Conservation and the Fate of an Endangered Species Recovery Program*, 8 CONSERVATION LETTERS 338, 343 (2015).

213 WILDLIFE MGMT. INST., *supra* note 31, at 85–86.

214 Eric M. Gese & Patricia A. Terietzky, *Using the "Placeholder" Concept to Reduce Genetic Introgression of an Endangered Carnivore*, 192 BIOLOGICAL CONSERVATION 14 (2015).

215 *See id.* at 17 (illustrating these results with a table showing the difference in red wolf litters and hybrid litters between 2001 and 2013).

the same sex.[216] Males were more likely to be displaced than females. No placeholder coyote ever replaced a red wolf. Without this intervention, purebred red wolves would likely be gone.[217]

NCWRC argued that FWS cannot conserve an unlisted species, sterilized coyotes, to protect an endangered or threatened species.[218] This is contrary to case law, which recognizes that injury to an unlisted species can harm a protected endangered or threatened species.[219] The Eighth Circuit in *Defenders of Wildlife v. EPA* found that the agency violated section 9 of the ESA because it registered a pesticide under FIFRA, strychnine, which resulted in the taking of endangered black-footed ferrets.[220] Ranchers use strychnine to kill prairie dogs, but it also killed black-footed ferrets that live in prairie dog habitat.[221] The court held that "the EPA's decision to register pesticides containing strychnine or to continue these registrations was critical to the resulting poisonings of the endangered species. . . . We thus conclude the EPA's registrations constituted takings of endangered species."[222]

The U.S. District Court for the Western District of Washington in *Greenpeace v. National Marine Fisheries Service* invalidated the National Marine Fisheries Service's (NMFS) biological opinion because it failed to adequately consider the impact of the North Pacific Ground Fishery Management Plans on the prey of the endangered stellar sea lion.[223] The court held that the NMFS biological opinion "fails to critically analyze how core management measures such as the processes for deriving acceptable biological catch, overfishing, and total allowable catch, impact endangered species."[224]

C. Balance Between Public and Private Interests

The North Carolina Federal District Court correctly concluded that the public interest in red wolf preservation outweighed NCWRC's

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216 *Id.* at 11.

217 *Id.*

218 *See generally* Defendants' Memorandum in Response to Plaintiffs' Motion for Preliminary Injunction, *supra* note 84, at 17 (denying the knowledge of any cases where anyone has violated the ESA by taking an unlisted species which may cause harm to a protected species).

219 *See generally* Defs. of Wildlife v. Envtl. Prot. Agency, 882 F.2d 1294, 1301 (8th Cir. 1989) (resulting in a decision that allowed for the protection of an unlisted species because to do otherwise would have injured an endangered species).

220 *See id.* at 1303 (concluding that the EPA's actions violated an ESA provision).

221 *See id.* at 1296 (explaining that ranchers use strychnine to control rodents on their land and that the FWS prohibited strychnine use against prairie dogs in the presence of black-footed ferrets, who are a listed species).

222 *Id.* at 1301.

223 Greenpeace v. Nat'l Marine Fisheries Serv., 80 F. Supp. 2d 1137, 1146 (W.D. Wash. 2000).

224 *Id.* at 1148.

interest in allowing coyote hunting in the red wolf recovery area except according to 10(j) rules.[225]

The red wolf provides many public benefits. The red wolf helps to preserve biodiversity and maintain ecosystem balance. Biodiversity is the total of genes, species, and ecosystems on the earth.[226] Biodiversity is "living, exploitable, renewable resources," which have economic importance and potential consumptive and transformative uses.[227] The preservation of genes is important for the development of food and medicine and the maintenance of the ecosystem.[228] Companies seek genetic material.[229]

Plants and animals exist in interconnected ecosystems. The loss of one species affects the entire system.[230] Disruptions cause environmental instabilities that diminish nature's ability to establish food chains, cycle nutrients, maintain the quality of the atmosphere, control the climate, regulate the fresh water supply, maintain the soil, dispose of wastes, pollinate crops, and control pests and disease.[231] For example, the red wolf is an apex predator that triggers a trophic cascade. The red wolf keeps raccoons, deer, and rabbits that destroy farm crops in check.[232] The red wolf also increases bird nesting by decreasing the raccoon population.[233]

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225 *Red Wolf Coal. II*, 2014 U.S. Dist. LEXIS 65601, at *21.

226 Mark A. Urbanski, Note, *Chemical Prospecting, Biodiversity Conservation, and the Importance of International Protection of Intellectual Property Rights in Biological Materials*, 2 BUFF. J. INT. L. 133, 134–35 (1995).

227 *Id.* (citations omitted).

228 *Id.* at 135 n.9; *see also* George Cameron Coggins & Anne Fleishel Harris, *The Greening of American Law?: The Recent Evolution of Federal Law for Preserving Floral Diversity*, 27 NAT. RESOURCES J. 247, 253–56 (1987) (describing humanity's heavy reliance on a handful of genetically similar food crops and limited knowledge of plants with medicinal potential, which exposes both agricultural networks and medicinal supplies to potential destabilization due to a lack of genetic diversity); Eric Christensen, Note, *Genetic Ark: A Proposal to Preserve Genetic Diversity for Future Generations*, 40 STAN. L. REV. 279, 285–89 (1987) (explaining the importance of genetic diversity in agricultural production); Keith Saxe, Note, *Regulated Taking of Threatened Species Under the Endangered Species Act*, 39 HAST. L.J. 399, 407–08 (1988) (listing reasons for the importance of genetic diversity and highlighting the impact of a reduced gene pool on the environment and on society's ability to produce food and medicine).

229 Urbanski, *supra* note 226, at 139; *see also* Omar White, Comment, *The Endangered Species Act's Precarious Perch: A Constitutional Analysis Under the Commerce Clause and Treaty Power*, 27 ECOLOGY L.Q. 215, 244–45 (2000) (demonstrating industry and corporate interests in owning proprietary rights to genetic material).

230 George Cameron Coggins, *Federal Wildlife Law Achieves Adolescence: Developments in the 1970s*, 1978 DUKE L.J. 753, 756–57 (1978); Patrick Parenteau, *Rearranging the Deck Chairs: ESA Reforms in an Era of Mass Extinctions*, 22 WM. & MARY ENVTL. L. & POL'Y REV. 227, 240–42 (1998).

231 PAUL & ANNE EHRLICH, EXTINCTION: THE CAUSES AND CONSEQUENCES OF THE DISAPPEARANCE OF SPECIES 91–95 (1981).

232 *Gibbs*, 214 F.3d at 495.

233 *Id.*

Robert Costanza estimated the value of ecosystems services to be in the range of $16–$54 trillion.[234] With an estimated annual value of $33 trillion per year, ecosystems provide services that cost almost twice the total gross national product of all the nations of the world combined.[235] Costanza notes that:

> [B]ecause ecosystems services are not fully 'captured' in commercial markets or adequately quantified in terms comparable with economic services and manufactured capital, they are often given too little weight in policy decisions. This neglect may ultimately compromise the sustainability of humans in the biosphere. The economies of the Earth would grind to a halt without the services of ecological life-support systems, so in one sense their total value to the economy is infinite.[236]

Robert Costanza's updated 2011 study, utilizing the same study parameters, concluded that ecosystem services provide benefits worth between $125–$145 trillion per year.[237]

Human action threatens biodiversity.[238] Population expansion, pollution, rapid industrialization, and the loss of habitats due to the demands for land and urbanization are causing extinction and climate change. Rates of extinction are 100 times the natural rate.[239] Four thousand plants and 5,400 animals face extinction.[240] Genetic erosion represents the permanent loss of the unique and highly valuable genetic resources found in each species.[241] The ESA recognizes that "these species of fish, wildlife, and plants are of esthetic, ecological, educational, historical, recreational, and scientific value to the Nation and its people."[242]

The legislative history of the ESA is replete with references regarding the necessity for protecting biodiversity.[243] The 1969 Senate Committee Report on the Endangered Species Conservation Act notes that:

> [W]ith each species we eliminate, we reduce the pool of germ-plasm available for use by man in future years. Since each living species and subspecies

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234 Robert Costanza et al., *The Value of the World's Ecosystem Services and Natural Capital*, 387 NATURE 253, 259 (1997).

235 *Id.*

236 *Id.* at 253.

237 Robert Costanza et al., *Changes in the Global Value of Ecosystem Services*, 26 GLOBAL ENVTL. CHANGE 152, 152 (2014).

238 Willam S. Boyd, *Federal Protection of Endangered Wildlife Species*, 22 STAN. L. REV. 1289, 1289 (1970).

239 UNITED NATIONS ENV'T PROGRAMME, GLOBAL BIODIVERSITY ASSESSMENT 232 (V.H. Heywood ed., 1995).

240 *Id.* at 234.

241 Christensen, *supra* note 228, at 281.

242 16 U.S.C. § 1531(a)(3).

243 William Eskridge provides a hierarchy of legislative sources that is based on their comparative reliability. The most reliable sources are the committee reports, which represent the "collective understanding of those Congressmen involved in drafting and studying proposed legislation." William N. Eskridge, Jr., *The New Textualism*, 37 UCLA L. REV. 621, 636–40 (1990).

> has developed in a unique way to adapt itself to the difficulty of living in the world's environment, as a species is lost, its distinctive gene material, which may subsequently prove invaluable to mankind in improving domestic animals or increasing resistance to disease or environmental contaminants, is also irretrievably lost.[244]

The 1973 House Committee Report on the ESA states:

> The value of [endangered species] is, quite literally, incalculable. . . .
> . . . .
> From the most narrow possible point of view, it is in the best interest of mankind to minimize the loss of genetic variations. The reason is simple: they are potential resources. They are the keys to puzzles, which we cannot solve, and may provide answers to questions which we have not yet learned to ask.[245]

Senator Tunney (D-Cal.), the floor leader and member of the conference committee regarding the ESA,[246] pointed out that each species is important for science. The diversity of genetic types is necessary for thorough scientific knowledge. The unknown potential of investigation into genetic structure must remain unhindered to produce knowledge for the benefit of man.[247]

Federal courts have recognized the importance of biodiversity.[248] The Supreme Court in *Tennessee Valley Authority v. Hill* acknowledged Congress's concern "about the unknown uses that endangered species might have and about the unforeseeable place such creatures may have in the chain of life on this planet."[249] Judge Wald in *National Association of Home Builders v. Babbitt* stated that "plants and animals that are lost through extinction undoubtedly have economic uses that are, in some cases, as yet unknown but which could prove vitally important in the future."[250]

The ESA is also concerned with ecosystem maintenance, which also relies on a diverse gene pool.[251] Senator Tunney declared that each species provides a service to the environment and is part of a complex ecosystem that depends on all its components for stability. The value of each species is unknown, so its loss cannot be assessed.[252]

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244 S. REP. NO. 91-526, at 3 (1969), *reprinted in* 1969 U.S.C.C.A.N. 1413, 1415.

245 H.R. REP. NO. 93-412, at 4–5 (1973).

246 William Eskridge points out that the "statements by sponsors and/or floor managers," who know the language, intent, and purposes of the statute, are important because other congresspersons defer to their judgement. Eskridge, *supra* note 243, at 637.

247 119 CONG. REC. 25, 668–70 (1973) (statement of Sen. Tunney).

248 Nat'l Ass'n of Home Builders v. Babbitt, 130 F.3d 1041, 1054 (D.C. Cir. 1997); United States v. Bramble, 103 F.3d 1475, 1482 (9th Cir. 1996); Bldg. Indus. Ass'n of Superior Cal. v. Babbitt, 979 F. Supp. 893, 907 (D.D.C. 1997).

249 Tenn. Valley Auth. v. Hill, 437 U.S. 153, 178–79 (1978) (emphasis omitted).

250 *Nat'l Ass'n of Home Builders*, 130 F.3d at 1053.

251 Parenteau, *supra* note 230, at 238–41.

252 119 CONG. REC. 25,668–70.

Courts have recognized the importance of ecosystem maintenance.[253] Judge Henderson, in *National Association of Home Builders v. Babbitt*, determined that endangered species have to be preserved to maintain the interconnected ecosystem.[254] If one species is harmed, this will disrupt the ecosystem and cause interstate impacts. Congress can regulate land use and development, which harms the ecosystem and substantially affects interstate commerce.[255]

The reintroduction of the red wolf is designed to restore balance to the ecosystem, enhance biodiversity, and manage the ecosystem. The nonessential population designation is relevant to the management of the red wolf, not to the red wolf's importance to the ecosystem. A nonessential population designation simply means that there are other red wolves in captive breeding programs and the released population is not "essential to the continued existence of an endangered species or threatened species."[256]

NCWRC argued coyote hunting produces social tolerance, which is necessary for successful red wolf recovery. Private land owners manage 50,000 acres on the Albemarle Peninsula.[257] Coyotes kill livestock and commercial wildlife.[258] Coyotes decimated the quail population in some areas.[259] Coyotes took 100–150 captive mallards resulting in a $2,000–$3,000 loss.[260] Coyotes and wolves also impact the deer population, which diminishes hunting opportunities and reduces state revenues. Landowners in the area view coyote hunting as an important management tool. Night hunting is particularly important because coyotes are nocturnal. Residents support night hunting by a three to one margin.[261] If landowners and hunters cannot hunt coyotes, their support for red wolf recovery will decrease.[262] Federal courts[263] and FWS[264] recognize the need for social tolerance.

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253 Zabel v. Tabb, 430 F.2d 199, n.24 (5th Cir. 1970); *Nat'l Ass'n of Home Builders*, 130 F.3d at 1057–60; *Bramble*, 103 F.3d at 1480–82.

254 *Nat'l Ass'n of Home Builders*, 130 F.3d at 1057–60.

255 *Id.*

256 16 U.S.C. § 1539(j)(2)(B).

257 Defendants' Memorandum in Response to Plaintiffs' Motion for Preliminary Injunction, *supra* note 84, at 52.

258 *Id.*

259 *Id.*

260 *Id.*

261 *Id.*

262 *Id.*

263 *Gibbs*, 214 F.3d at 488 ("[I]n order to insure that other agencies and the public would accept the proposed reintroduction, the FWS relaxed the taking standards for [red] wolves found on private land under its authority over experimental populations."); Wyoming v. U.S. Dep't of Interior, 2010 WL 4814950, at *10 (D. Wyo. 2010); Revisiting the Listing of the Gray Wolf (*Canis lupus*) in the Western Great Lakes, 76 Fed. Reg. 81,666, 81,718 (Dec. 28, 2011).

264 FWS noted that "attempts to reintroduce red wolves and other endangered species, particularly predators, were routinely unsuccessful because of local opposition." Revision of the Special Rule for Nonessential Experimental Populations of Red Wolves in North Carolina and Tennessee, 60 Fed. Reg. 18,940, 18945 (Apr. 13, 1995). Local

Nevertheless, the indiscriminate killing of coyotes as an effective method of predator control is not supported by science. Indiscriminate killing does not decrease, but increases the coyote population. Indiscriminate killing fragments family units and reduces the size of pack territory. This results in coyote population comprised of younger animals, more breeding, smaller pack size, and an incentive to kill livestock. Younger replacement breeding pairs produce more litters. More pups survive because more resources are available. More pups create a greater incentive to kill livestock. Furthermore, night hunting of coyotes is dangerous for humans, wildlife, and pets. Night hunting poses a risk to law enforcement officers and recreational hunters. Night hunting does not teach coyotes to avoid humans. It endangers other protected wildlife in red wolf recovery areas, including the Carolina northern flying squirrel, gray bat, Indiana bat, and Virginia bat. Coyotes also provide ecological benefits.[265] Coyotes control the rodent population and clean the environment of carrion. Coyotes help the bird populations by keeping other mesopredators (foxes and skunks) in check.[266]

Scientific studies question the efficacy of indiscriminate killing of predators. Robert B. Wielgus and Kaylie A. Peebles' study of predator control in the northern Rocky Mountains from 1987 through 2012 demonstrated that the number of livestock depredated was positively associated with the number of livestock and number of wolf breeding pairs.[267] It also found that livestock depredation in the following year was positively, not negatively, associated with the number of wolves killed the previous year.[268] The odds of livestock depredation increased 4% for sheep and 5%–6% for cattle with increased wolf control, up until wolf mortality exceeded the mean intrinsic growth rate of wolves at 25%.[269] Once mortality exceeded 25% of the total breeding population, wolves and livestock depredations decreased. Mortality rates over 25% are, however, unsuitable in the long-term.[270]

Scientific studies challenge the relationship between lethal predator control and social tolerance. Adrian Treves and Jeremy T. Bruskotter's study found predator poaching is influenced more strongly by social factors, such as peer group norms and government

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support is "essential," and without such support, "reintroductions are doomed." *Id.* at 18,946.

265 Letter from Tara Zuardo, Wildlife Attorney, Animal Welfare Inst., to N.C. Wildlife Res. Comm'n (Apr. 16, 2012) (on file with Animal Law Review).

266 *Id.*; *see also* Dan Flores, *Stop Killing Coyotes*, N.Y. TIMES (Aug. 11, 2016), https://www.nytimes.com/2016/08/11/opinion/stop-killing-coyotes.html [https://perma.cc/M7FM-F44T] (accessed Apr. 9, 2017) (commenting on the eventual population increase of coyotes as a result of increased hunting and slaying efforts to reduce coyote populations).

267 Robert B. Wielgus & Kaylie A. Peebles, *Effects of Wolf Mortality on Livestock Depredations*, 9 PLOS ONE 1, 1 (2014).

268 *Id.*

269 *Id.*

270 *Id.*

sanctioned predator killing. Toleration of predators is not enhanced by allowing people to kill them.[271] The Treves and Chapron study demonstrates that killing wolves does not increase social toleration, but increases wolf poaching.[272] As wolves lost the legal protections that were designed to protect them, the political signal sent to the public resulted in four times as many wolves being killed during the period because the policies seemingly devalued wolves.[273] These studies undermine the government's proposition that it is necessary to cull the wolf population to increase social tolerance.[274]

Not all landowners in the region opposed red wolf recovery. One hundred citizens in the five red wolf counties, 1,500 North Carolina residents, and over 110,000 individuals across the United States supported red wolf recovery in North Carolina.[275]

D. The Settlement Agreement

After the preliminary injunction halting coyote hunting in the red wolf recovery area was issued, the parties negotiated a settlement agreement.[276] Coyote hunting was banned at night and during the day except under limited circumstances.[277] Private landowners had to obtain permits for and report coyote killings in the recovery area.[278]

Critics of vicarious state liability argue that it is a violation of the Tenth Amendment,[279] which provides that "[t]he powers not delegated to the United States by the Constitution, nor prohibited by it to the

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271 Adrian Treves & Jeremy T. Bruskotter, *Tolerance for Predatory Wildlife*, 344 SCI. 476, 477 (2014).

272 Adrian Treves & Guillaume Chapron, *Blood Does Not Buy Goodwill: Allowing Culling Increased Poaching of a Large Carnivore*, PROC. ROYAL SOC'Y B, Apr. 1, 2016, at 1, 1–2, http://faculty.nelson.wisc.edu/treves/pubs/Chapron_Treves.pdf [https://perma.cc/2UEK-RKSQ] (accessed Apr. 9, 2017).

273 *Id.* at 2.

274 The Center for Biodiversity commented that the Treves–Chapron study "disproves a convenient myth used to rationalize government persecution of wolves . . . . We hear over and over that individual wolves have to die in order to placate a wolf-hating public and prevent illegal killing—but this shows that to decrease poaching, the government should send the message that wolves have a high public value." Press Release, Ctr. for Biological Diversity, Study: Government Wolf-Killing Reduces Tolerance, Spurs Wolf-Poaching (May 11, 2016), https://www.biologicaldiversity.org/news/press_releases/2016/wolf-05-11-2016.html [https://perma.cc/8N5J-RCTK] (accessed Apr. 9, 2017).

275 Press Release, Ctr. for Biological Diversity, Red Wolf Population Plunges to as Few as 50 as Feds Gut Recovery Program (Feb. 16, 2016), https://www.biologicaldiversity.org/news/press_releases/2016/red-wolf-02-16-2016.html [https://perma.cc/K9M4-K3DC] (accessed Apr. 9, 2017).

276 Press Release, Defs. of Wildlife, Settlement Reached on Protecting World's Only Wild Red Wolves from Deadly Mistaken Identity in Five County Area (Nov. 20, 2014), http://www.defenders.org/press-release/settlement-reached-protecting-world%E2%80%99s-only-wild-red-wolves-deadly-mistaken-identity [https://perma.cc/98P6-7L4D] (accessed Apr. 9, 2017).

277 *Id.*

278 *Id.*

279 Adler, *supra* note 120, at 429; Brader, *supra* note 120, at 128; Ruhl, *supra* note 120, at 76.

States, are reserved to the States respectively, or to the people."[280] The federal government cannot "'commandeer' state governments into service of federal regulatory purposes, [because it is] inconsistent with the Constitution's divisions of authority between federal and state governments."[281] Neither Congress nor the federal courts can force the state to implement federal law on a third party.

Critics rely on *New York v. United States*, in which the Supreme Court struck down provisions of the Low Level Radioactive Waste Policy Act (LLRWPA), which commanded states to deal with the disposal of their low level radioactive wastes within their borders or incur liability.[282] The Court found the resulting liability provisions violated the Tenth Amendment, noting that Congress can prohibit or require certain acts, but "it lacks the power directly to compel the States to require or prohibit those acts."[283] Congress cannot "require the States to govern according to Congress' instructions."[284] Critics also cite *Printz v. United States*, in which the Court struck down provisions of the Brady Handgun Bill, requiring state law enforcement officers to conduct background checks on gun purchasers, for violating the Tenth Amendment.[285] The Court held that the "federal Government may neither issue directives requiring the States to address particular problems, nor command the States' officers, or their political subdivisions, to administer or enforce a federal regulatory program."[286] The Court determined that "such commands are fundamentally incompatible with our constitutional system of dual sovereignty."[287]

Critics are correct that the Tenth Amendment applies to all branches of the federal government, including the federal courts. The aforementioned cases, however, are not dispositive. The North Carolina federal district court did not commandeer the state apparatus in violation of the Tenth Amendment. The court simply prohibited North Carolina from interfering with federal law by halting coyote hunting in the red wolf recovery area, essentially precluding state malfeasance.[288] North Carolina was liable for enacting a law that resulted in the violation of federal law. Federal courts have not found the imposition of liability on the states for ESA violations to be a violation of the Tenth Amendment. The First Circuit addressed the Tenth Amendment argument in *Strahan v. Coxe*, and held Massachusetts was not being asked to conduct activity under federal mandate.[289] Instead, the

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280 U.S. CONST. amend. X.

281 New York v. United States, 505 U.S. 144, 176 (1992).

282 *Id.* at 167.

283 *Id.* at 166.

284 *Id.* at 162.

285 Printz v. United States, 521 U.S. 898, 933 (1997).

286 *Id.*

287 *Id.*

288 Damiano, *supra* note 101, at 1588.

289 *Strahan*, 127 F.3d at 167–70.

state was halted from taking action in violation of federal law.[290] The court did not mandate any state action, but allowed parties to reach a settlement agreement.[291]

V. POST-LITIGATION DEVELOPMENTS

Following the litigation, the Wildlife Management Institute (WMI) released its 2014 study, "A Comprehensive Review and Evaluation of the Red Wolf (*Canis rufus*) Recovery Program," which was commissioned by the FWS.[292] WMI pointed out that the FWS underestimated the habitat required to meet recovery goals. The original recovery plan covered 144,000 acres and envisioned three self-sustaining populations, each with thirty-five to fifty red wolves. The FWS's assumption that wolves will stay on public land was unrealistic. As the red wolf population increased, the restoration area expanded to 1.7 million acres (twelve times its original size). Wolves left public lands and went to private land. Sixty percent of the red wolves in 2014 occupied private land.[293]

WMI observed that climate change will affect the Albemarle Peninsula, which is the primary red wolf habitat.[294] North Carolina is the third-lowest state.[295] Estimates are that there will be a 0.4 to 1.4 meter of sea level rise over the next century.[296] This will adversely affect the Albemarle Peninsula and put much of the red wolf recovery area under water. Red wolves will move west to agricultural lands, which will increase conflict with humans. Even these western lands will be under threat, particularly by severe storms.[297] WMI also noted that there is a significant scientific debate regarding the taxonomy of the red wolf.[298]

NCWRC in January 2015 passed a resolution echoing the WMI report, demanding that the FWS end the red wolf program, which at

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[290] *Id.*

[291] *See id.* ("The defendants' argument ignores the distinguishing facts of those cases. First, the states in those cases were not found to be in violation of a congressional act passed pursuant to its constitutional authority. Second, the states in those cases were directed to take positive action with respect to a particular field. Here, the defendants are not being ordered to take positive steps with respect to advancing the goals of a federal regulatory scheme. Rather, the court directed the defendants to find a means of bringing the Commonwealth's scheme into compliance with federal law."); *see also Martin*, 588 F. Supp. 2d at 79–84 (applying the *Strahan* analysis to a suit involving the government of Maine); *Holsten*, 541 F. Supp. 2d at 1081 ("To the extent that Plaintiffs seek an order directing the DNR to bring its trapping scheme into compliance with federal law, Plaintiffs are not barred by the Tenth Amendment.").

[292] WILDLIFE MGMT. INST., *supra* note 31, at 1.

[293] *Id.* at 29–32.

[294] *Id.* at 3.

[295] *Id.* at 40.

[296] *Id.* at 41.

[297] *Id.* at 91–98

[298] *Id.* at 82–83.

the time had sixty-two wolves.[299] The NCWRC asserted that red wolves cannot be managed on federal lands and many red wolves now live primarily on private lands.[300] Conflicts with landowners are unresolved and increasing.[301] Climate change will inundate the red wolves' current habitat.[302] The coyote population in the recovery area has increased, resulting in hybridization and genetic introgression.[303] While the existence of a pure red wolf genome has been questioned from the beginning, the expanded coyote population has eliminated any purebred red wolves.[304] The NCWRC requested the FWS to declare the red wolf extinct, terminate any further reintroductions in North Carolina, repeal all federal rules for red wolf restoration in North Carolina, designate all wild canids other than foxes on the Albemarle Peninsula as coyotes or coyote hybrids, and declare that no federal trust canids exist on the Albemarle Peninsula and all wild canids there are state trust resources under the jurisdiction of NCWRC.[305]

The red wolf population experienced a serious decline. In June 2015, the FWS estimated the red wolf population to be fifty to seventy-five, but might be as low as forty-five.[306] The number of breeding pairs has also been sharply reduced. The FWS estimated that there were seventeen breeding pairs in the wild in 2012, but that the amount declined to only seven in 2015.[307] Thirty of the sixty-five red wolf deaths from 2012 to 2015 were attributed to gunshot.[308]

In June 2015, the FWS officially halted all releases of red wolves from captivity into the recovery area.[309] The FWS announced it would address many of the concerns raised by WMI and NCWRC in a study regarding the feasibility of red wolf recovery in the wild.[310] The study will examine

> whether there are management techniques available to sufficiently ensure the red wolf's genetic makeup; whether there are geographical areas within the species' historical range that are suitable to serve as core red wolf popu-

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299 FAUST ET AL., *supra* note 17, at 14; N.C. WILDLIFE RES. COMM'N, RESOLUTION REQUESTING THAT UNITED STATES FISH & WILDLIFE SERVICE DECLARE RED WOLF (*Canis rufus*) Extinct in the Wild and Terminate Red Wolf Reintroduction Program in Beaufort, Dare, Hyde, Tyrell, and Washington Counties, North Carolina 1–2 (2015).

300 N.C. WILDLIFE RES. COMM'N, *supra* note 299, at 1.

301 *Id.* at 2.

302 *Id.* at 1.

303 *Id.* at 2.

304 *Id.*

305 *Id.*

306 Letter from Ctr. for Biological Diversity to Daniel Ashe, Dir., U.S. Fish & Wildlife Serv., and Sally Jewell, Sec'y, U.S. Dep't of Interior (Mar. 24, 2016) (on file with Animal Law Review) [hereinafter Notice of Intent to Sue].

307 *Id.* at 4.

308 *Id.*

309 U.S. FISH & WILDLIFE SERV., RED WOLF NON-ESSENTIAL POPULATION MANAGEMENT DECISION Q &A (2015).

310 *Id.*

> lation sites; if there are suitable geographical areas, whether there is sufficient public and state support in each of those areas to establish three core red wolf populations in accordance with the Red Wolf Recovery Plan; and, whether the red wolf can coexist with coyotes in the wild.[311]

FWS declared that WMI's

> evaluation identified areas in which our management actions have been successful as well as those areas that need improvement. The Institute also highlighted a number of areas in which there is uncertainty as well as issues that pose serious challenges to the ultimate recovery of the red wolf in the wild.[312]

FWS stated: "[a]s we've said before, we recognize too that there were misunderstandings, particularly about the non-essential, experimental population, and we did not always meet the expectations we set. Now, we need to do a thorough and deliberate evaluation of the red wolf recovery program."[313]

The Center for Biological Diversity (the Center) in March 2016 announced its intention to bring suit challenging the FWS management of red wolf recovery.[314] The Center pointed out that the FWS reassigned the program's recovery coordinator in August 2014, and did not refill the position.[315] The FWS stopped investigating red wolf deaths and halted the red wolf education program, which is a key factor in red wolf recovery.[316] There have been no law enforcement press releases since October 2014, although thirty-three wolves have died since then.[317] FWS has failed to implement a recovery plan to conserve the red wolf.[318] FWS has not conferred with other federal agencies regard-

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311 *Id.* FWS is gathering information to meet the ESA best available science requirement on four components: "1) appropriate taxonomic designation and historic distribution of the red wolf; 2) long-term viability of the captive red wolf population; 3) recovery needs of the red wolf population given pressures such as hybridization with coyotes, human caused mortality, and climate change; and 4) how people and red wolves can coexist." Press Release, U.S. Fish & Wildlife Serv., Red Wolf Recovery Review Progressing Towards Recommendations (Oct. 27, 2015), https://www.fws.gov/news/ShowNews.cfm?ID=AA349245-04DF-B5F8-78049E1AD97B717B [https://perma.cc/9WLR-5VGH] (accessed Apr. 9, 2017).

312 U.S. FISH & WILDLIFE SERV., *supra* note 309.

313 Press Release, U.S. Fish & Wildlife Serv., Service Halts Red Wolf Reintroductions Pending Examination of Recovery Program (June 30, 2015), https://www.fws.gov/news/ShowNews.cfm?ID=456CB36D-F587-7CD1-7021195729AF7928 [https://perma.cc/CNL6-G7U5] (accessed Apr. 9, 2017) (internal quotation marks omitted).

314 Notice of Intent to Sue, *supra* note 306, at 1.

315 *Id.* at 4.

316 *Id.* at 1.

317 *Id.* at 4–5.

318 *Id.* at 5–6; The 1990 Red Wolf Recovery Plan "calls for the establishment and maintenance of at least three reintroduced populations within the historic range of the red wolf. The Recovery Plan makes clear that conservation of the red wolf 'must be based on viable populations.' While there is no single 'magic number' that constitutes a 'minimum viable population' (MVP) size for the red wolf, FWS determined that a captive population of 320 red wolves and a reintroduced wild population of 220 red wolves 'would be able to maintain 80 to 85 percent of the original genetic diversity from the

ing its decision to suspend the release of captive red wolves.[319] The Center stated that "[t]he reintroduction of red wolves to the wild was one of the country's most innovative and successful programs to restore a critically endangered carnivore . . . . But under Dan Ashe, this highly successful program has been quietly dismantled to appease a few anti-wildlife zealots. It's a disgrace."[320]

The Center, in May 2016, filed an emergency petition requesting that the FWS revise its current regulations to reduce shooting deaths and establish additional wolf populations as essential experimental populations.[321] This will provide greater protection for red wolves and fulfill the goal of the original recovery plan for three separate red wolf populations.[322] The Center stated: "Records recently obtained via the Freedom of Information Act demonstrate that the Service's red wolf biologists recommended strengthening protections by eliminating loopholes in regulations that have facilitated excessive illegal shootings of red wolves. As recently as 2013, the Service had considered following these recommendations and had even drafted new regulations. But the biologists' recommendations were ignored, the regulations were never finalized, and the red wolf continues to suffer unsustainable levels of mortality."[323]

There continues to be support for red wolf recovery in North Carolina. In July 2016, a petition including approximately 500,000 signatures was sent to the FWS urging the agency to fulfill its responsibility under ESA to protect the red wolf.[324] A recent survey found that 73% of North Carolina residents support red wolf recovery and 80% of the registered voters in North Carolina believe that the FWS should do more to bring back the red wolf.[325] In August 2016, twenty-seven

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captured wild stock that probably occurred in the wild gene pool' of the species. However, the Recovery Plan also noted that depending on the status of the species' genetic diversity, or lack thereof, 'the MVP might have to be 2,000 [wolves].'" *Id.* at 3.

319 *Id.* at 6.

320 Press Release, Ctr. for Biological Diversity, Lawsuit Launched to Challenge Feds' Dismantling of Red Wolf Recovery Program: Fewer Than 50 Red Wolves Survive in North Carolina (Mar. 24, 2016), https://www.biologicaldiversity.org/news/press_releases/2016/red-wolf-03-24-2016.html [https://perma.cc/G5KQ-MMRQ] (accessed Apr. 9, 2017) (internal quotation marks omitted).

321 Press Release, Ctr. for Biological Diversity, Emergency Petition Filed to Save Plummeting Red Wolf Population: Stronger Regulations Needed to Stem Illegal Shootings, Expand Where Wild Wolves Can Roam (May 25, 2016), https://www.biologicaldiversity.org/news/press_releases/2016/red-wolf-05-24-2016.html [https://perma.cc/Y935-JH47] (accessed Apr. 9, 2017).

322 *Id.*

323 *Id.*

324 *Revival of Red Wolf Reintroduction Urged*, RUIDOSO NEWS (July 14, 2016), http://www.ruidosonews.com/story/news/local/2016/07/14/revival-red-wolf-reintroduction-urged/87045110/ [https://perma.cc/P542-3ARS] (accessed Apr. 9, 2017).

325 Press Release, S. Envtl. Law Ctr., Court Stops U.S. Fish & Wildlife Service from Capturing and Killing Wild Red Wolves (Sept. 29, 2016), https://www.southernenvironment.org/news-and-press/press-releases/court-stops-u.s.-fish-wildlife-service-from-capturing-and-killing-wild-red-wolves [https://perma.cc/83TV-DYMS] (accessed Apr. 9, 2017).

North Carolina legislators sent a letter to the FWS complaining that the FWS failed to control coyote hunting in the red wolf recovery area, eviscerated the recovery program, and halted several successful management programs, including hybridization control, pup fostering, wild red wolf introductions, and red wolf education efforts.[326] Furthermore, there has not been a single prosecution regarding the seventeen wolves killed by gunshot since 2013.[327] The legislators urged the FWS to resume recovery efforts, follow the recommendations of the WMI study, and abandon the "feasibility study."[328]

VI. RED WOLF'S TAXONOMIC STATUS

A study by Bridgett vonHoldt et al. was released in July 2016 that raised questions regarding the red wolf's status as a threatened species.[329] The study sequenced twenty-eight canid genomes, including wolves, coyotes, and dogs,[330] and found wolf-coyote admixtures across the United States and Canada.[331] The red wolves that were tested had no more than 20% wolf ancestry,[332] which is similar to gray wolf genes. The study concluded that there was no unique eastern or red wolf species; both were gray wolf-coyote hybrids with differing degrees of wolf-coyote genetic admixtures.[333]

The study posited that the gray wolf was driven from the South and East by loss of habitat, decimation of prey, and predator control.[334] As the gray wolf retreated westward, the remaining wolves mated with coyotes, creating red and eastern wolf hybrids beginning in

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326 Mark MacAllister, *NC Legislators Voice Concerns to USFWS*, RED WOLF COALITION (Aug. 31, 2016), http://redwolves.com/wp/?p=928 [https://perma.cc/LQ27-DYNE] (accessed Apr. 9, 2017).

327 *Id.*

328 Letter from Jay Chaudhuri, Senator, N.C. Gen. Assembly, to Sally Jewell, Sec'y, Dept. of Interior (Aug. 29, 2016), http://redwolves.com/wp/wp-content/uploads/2016/08/jewell_letter_final.pdf [https://perma.cc/LN8G-RXE6] (accessed Apr. 9, 2017).

329 *See* vonHoldt et al., *supra* note 21, at 1 ("The differing consequences of species listing, despite the possibility of similar admixed origin, provide a marked example of how taxonomy can both protect and threaten endangered species under the ESA.").

330 *Id.* at 3.

331 *Id.* at 5 ("Alaskan and Yellowstone wolves have 8% to 8.5% coyote ancestry, Great Lakes wolves have 21.7% to 23.9% coyote ancestry, [Canadian] Algonquin wolves have at least 32.5% to 35.5% coyote ancestry, and Quebec sequences have more than 50% coyote ancestry.").

332 *Id.* at 3 (reporting that red wolves contain 9%–20% wolf-derived alleles).

333 *See id.* at 8 ("Our analyses suggest that all of the North American canids diverged from a common ancestor . . . and that both Great Lakes region wolves and red wolves are highly admixed with different proportions of gray wolf and coyote ancestry.").

334 *See id.* ("[W]olf-like canids disappeared first from the American South and East, concurrent with early European Colonization and the conversion of woodland habitat to agricultural landscape. Extirpation of wolves in the southeast followed shortly after the advent of private, state, and federal bounty beginning in the 1880s.").

the late nineteenth century.[335] The wolf-coyote hybrids advanced westward, accounting for a higher percentage of wolf DNA in eastern and Great Lake wolves than red wolves.[336]

The study is the latest in the ongoing scientific debate regarding the red wolf's taxonomic status. The red wolf's listing as a separate species in 1967 was based on morphological data.[337] The FWS captured more than 400 wild canids in red wolf population area, but only 10% were considered to be purebred red wolves.[338] Fourteen of the captive red wolves constituted the founding population.[339] Morphologically the founders manifested more wolf than coyote traits.[340]

Genetic studies in the 1990s questioned the reliance on morphological data and indicated that the red wolf is not a separate species, but a gray wolf-coyote hybrid.[341] This generated a great deal of controversy[342] and several petitions to delist the red wolf.[343] The FWS denied the 1997 petition on the grounds that the genetic data was derived from a few studies, which showed that past hybridization had not continued.[344] The scientific literature demonstrated that "historic and current red wolves lack coyote, gray wolf, or hybrid phenotypic and morphological traits."[345] Furthermore, all available data must be utilized and "molecular characters are only one piece of the puzzle and

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335 *See id.* ("As wolves became sparse, dispersing individuals would have a low probability of finding conspecific mates, resulting in an increase in coyote-wolf admixture.").

336 *See id.* at 3 (reporting that the number of wolf-derived alleles is 61%–67% in Great Lakes region wolves, 39%–47% in eastern wolves, and 9%–20% in red wolves).

337 *See* Endangered Species, 32 Fed. Reg. at 4001 (declaring red wolf as an endangered species); *see also*, R.K. Wayne & S.M. Jenks, *Mitochondrial DNA Analysis Implying Extensive Hybridization of the Endangered Red Wolf Canis Rufus,* 351 NATURE 565, 566 (1991) (discussing the morphologic criteria of red wolf DNA).

338 Richard J. Fredrickson & Phillip W. Hedrick, *Dynamics of Hybridization and Introgression in Red Wolves and Coyotes*, 20 CONSERVATION BIOLOGY 1272, 1273 (2006).

339 *Id.*

340 Hinton et al., *supra* note 210, at 723–24.

341 *See, e.g.*, *id.* at 565 ("Thus, the red wolf is entirely a hybrid form or a distinct taxon that hybridized with coyotes and grey wolves over much of its previous geographical range."); M.S. Roy et al., *Patterns of Differentiation and Hybridization in North American Wolflike Canids, Revealed by Analysis of Microsatellite Loci*, 11 MOLECULAR BIOLOGY & EVOLUTION 553, 565 (1994) ("The results of our microsatellite analysis are consistent with the red wolf's historic origin being due to hybridization between coyotes and gray wolves . . . .").

342 *See* R.M. Nowak & N.E. Federoff, *Validity of the Red Wolf: Response to Roy et al.*, 12 CONSERVATION BIOLOGY 722, 722 (1998) ("Although [the] hypothesis [that the red wolf is not a valid species or subspecies] has achieved limited support . . . , it has been challenged by other genetic authorities . . . .").

343 Endangered and Threatened Wildlife and Plants, 57 Fed. Reg. 1246, 1246 (Jan. 13, 1992) (to be codified at 50 C.F.R. pt. 17); Endangered and Threatened Wildlife and Plants, 62 Fed. Reg. 64,799, 64,799 (Dec. 9, 1997) (to be codified at 50 C.F.R. pt. 17).

344 Endangered and Threatened Wildlife and Plants, 62 Fed. Reg. 64,800, 64,800 (Dec. 9, 1997) ("[T]he scientific data supporting hybridization in red wolves came from a few related studies. These studies suggest past hybridization, but provide no support for continuing hybridization in the existing red wolf populations.").

345 *Id.*

are no more valid than other types of scientific evidence, including morphology, behavior, ecology, ontogeny, and paleontology."[346]

A genetic study by Bridgett vonHoldt et al. in 2011 reaffirmed that the red and eastern wolves are gray wolf-coyote hybrids.[347] Critics of the study argued that the sample size was too small and the type of genetic data analyzed should not be used in isolation of other biological and complementary genetic data. A broader frame of reference is needed.[348] Furthermore, other non-genomic evidence demonstrates a separate eastern wolf lineage. Historical reports indicate that there were two distinct wolves in the east.[349] The larger wolf disappeared, but the smaller wolf, which is morphologically between the gray wolf and coyote, survived to the present.[350] Eastern wolves behave differently than the western wolves. Western wolves generally kill coyotes and do not interbreed with them.[351] Eastern wolves, however, are more tolerant and often breed with coyotes.[352]

The FWS conducted an in-house study by Steven Chambers et al., which reviewed the existing scientific literature regarding wolf taxonomy.[353] The Obama administration relied on the study when it proposed delisting the wolf across much of the United States in 2013.[354] The Chambers study determined that there were three distinct species of North American wolves: *Canis lupus* (gray wolf), *Canis lycaon* (Eastern wolf), and *Canis rufus* (red wolf).[355] The study specifically acknowledged the hybrid status of the red wolf and concluded that "genetic information confirms that most red wolves are closer to coyotes than to gray wolves" and are "outside of the gray wolf lineage and . . . not within the species limits of *C. lupus*."[356] The study found that *Canis lycaon* and *Canis rufus* "remain identifiable lineages that have evolved in North America with the coyote," but remain separate spe-

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346 *Id.*

347 Bridgett M. vonHoldt et al., *A Genome-Wide Perspective on the Evolutionary History of Enigmatic Wolf-Like Canids*, 21 GENOME RES. 1294, 1294 (2011).

348 Linda Y. Rutledge et al., *Conservation Genomics in Perspective: A Holistic Approach to Understanding* Canis *Evolution in North America*, 155 BIOLOGICAL CONSERVATION 186, 188 (2012).

349 *Id.* at 188.

350 *Id.* at 187.

351 *Id.* at 190.

352 *Id.*

353 Steven M. Chambers et al., *An Account of the Taxonomy of North American Wolves from Morphological Genetic Analysis*, 77 N. AM. FAUNA 1, 1 (2012).

354 Endangered and Threatened Wildlife and Plants, 78 Fed. Reg. 35,664, 35,665 (June 13, 2013) (to be codified at 50 C.F.R pt. 17); *see also* Edward A. Fitzgerald, *Wolf Delisting: Old Wine in New Bottles*, 44 ENVTL. L. REP. 10413, 10413 (2014) (discussing the Obama administration's proposal to delist the gray wolf across most of the United States).

355 Chambers et al., *supra* note 353, at 2.

356 *Id.* at 29.

cies.[357] Nevertheless, the study admitted that wolf taxonomy remains open for debate and further inquiry.[358]

U.S. Geological Survey and the University of North Carolina convened a panel of experts in May 2016 to discuss the taxonomic classification of the red wolf and determine if current genetic evidence supports continued ESA protection for the red wolf.[359] The participants offered different theories on the red wolf taxonomy that are divided into two groups, the Pre-Columbian (historic) and Modern (modern) North American Canis Taxonomic Hypotheses.[360] Experts could not agree on the historic origin of the red wolf, but the majority agreed that the red wolf can be listed under the ESA.[361] They differed on whether it should be considered a separate species, subspecies, modern hybrid, or distinct population segment of *Canis lupus* or *Canis lycaon*.[362]

The conclusion that the red wolf is a gray wolf–coyote hybrid raises the question of whether it can be protected by the ESA. The meaning of species in the ESA is not well defined.[363] The term "includes any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature."[364] The Secretary must use the best available scientific information to define the ESA terms.[365] Interior policy for "determining whether a particular taxon or population is a species for purposes of the Act" requires the Secretary to "rely on standard taxonomic distinctions and the biological expertise of the Department and the scientific community concerning the relevant taxonomic group."[366] However, "standard taxonomic distinctions" and "expertise of the De-

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357 *Id.* at 32–33.

358 *Id.* at 42–44.

359 WORKSHOP PLANNING TEAM, EXECUTIVE SUMMARY: WORKSHOP ON INTERACTIONS OF HUMAN-CAUSED MORTALITY, GENETIC INTROGRESSION, AND MANAGEMENT AMONG RED WOLVES: DEVELOPING SCIENTIFIC CONSENSUS 1 (2016). The experts also agreed that "a number of factors including hybridization with coyotes, high human-caused mortality particularly by gunshots, low public support, [and] small population size lead to poor prospects for success of the reintroduction project in northeastern NC." *Id.* at 2. They recognized "the importance of continuing the recovery program and of finding alternative reintroduction locations" and acknowledged "there are many scientific understandings derived from the northeastern NC reintroduction project that will assist red wolf and other species reintroductions." *Id.*

360 Eric M. Gese et al., *Managing Hybridization of a Recovering Endangered Species: The Red wolf* Canis rufus *as a Case Study*, 61 CURRENT ZOOLOGY 191, 192 (2015).

361 *Id.*

362 Memorandum from Assistant Reg'l Dir. for Ecological Servs., Se. Region, to Reg'l Dir., Se. Region (Sept. 12, 2016) (on file with Animal Law Review) [hereinafter Recommended Decisions].

363 *See* 16 U.S.C. § 1532(16) (stating the broad definition of "species").

364 *Id.*

365 *Id.* § 1533(b)(1)(A).

366 50 C.F.R. § 424.11(a)–(b) (2016).

partment and the scientific community" are not always clear regarding species distinction.[367]

The concept of species is a tool with limitations, rather than a natural phenomenon. The current scientific definition of species is a group of actually or potentially interbreeding populations reproductively isolated from other such groups.[368] Reliance on reproductive isolation is dubious because species evolve and closely related species can interbreed, e.g., dogs, coyotes, and wolves. Furthermore, taxonomic categories are particularly suspect in border areas between species where there is often hybridization.[369]

Taxonomy is an art, not a science.[370] The key criteria employed for taxonomic distinctions are morphology and genetics. Until the mid-1960s taxonomy was based on morphological characteristics. Morphology is not good at identifying hybrids. The emergence of molecular genetic techniques simplifies identification, description, and evolution of hybrids.[371] Exclusive reliance on molecular genetic detection is, however, criticized on several grounds. There is no one gene that appropriately accounts for biodiversity. Rates of genetic mutations are different for different species. Analysis of different genetic data provides for contrary conclusions. Focusing solely on genetic data provides for a biased perspective.[372]

FWS questioned exclusive use of DNA for identifying species as evidenced in the denial of a red wolf delisting petition in 1997. In another case, regarding the Alabama sturgeon, the FWS stated, "genetics is the best science for making taxonomic determinations and trumps morphological analysis."[373] Nevertheless, the "most scientifically credible approach to making taxonomic determinations is to consider all available data involving as many different classes of characters as possible . . . [including] morphological, karyological (chromosomal), biochemical (including DNA analysis . . . ,) physiological, behavioral, ecological and biogeographic characters."[374] The weight given to each

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367 Oliver Frey, *When Science and the Statute Don't Provide an Answer: Hybrid Species and the ESA*, 26 DUKE ENVTL. L. & POL'Y F. 181, 183–86 (2015).

368 Endangered and Threatened Wildlife and Plants, 68 Fed. Reg. 15,804, 15,836 (Apr. 1, 2003) (to be codified at 50 C.F.R. pt. 17).

369 Holly Doremus, *Listing Decisions Under the ESA: Why Better Science Isn't Always Better Policy*, 75 WASH. U. L. REV. 1029, 1097–104 (1997).

370 *Id.* at 1087.

371 Fred W. Allendorf et al., *Intercrosses and the U.S. ESA: Should Hybridized Populations Be Included as Westslope Cutthroat Trout?*, 16 TRENDS IN ECOLOGY & EVOLUTION 613, 614 (2001).

372 Anna L. George & Richard L. Mayden, *Species Concepts and the ESA: How a Valid Biological Definition of Species Enhances the Legal Protection of Biodiversity*, 45 NAT. RESOURCES J. 403, 404–05 (2005).

373 Endangered and Threatened Wildlife and Plants; Final Rule to List the Alabama Sturgeon as Endangered, 65 Fed. Reg. 26,452, 26,452 (June 5, 2000).

374 Blake Hood, *Transgenic Salmon and the Definition of "Species" Under the ESA*, 18 J. LAND USE & ENVTL. L. 75, 90 (2002).

factor depends on the availability, quality, appropriateness, and utility of each to particular organisms.[375]

FWS attempted to address the hybrid issue. The Department of Interior Solicitor in 1977 determined that the ESA covered hybrids.[376] The Solicitor relied on the statutory language for the terms *fish* and *wildlife*, and held the terms included any offspring of an endangered and threatened species.[377] FWS asked for reconsideration. The Solicitor reversed his position and held that the ESA did not protect hybrids because they disrupt the parent gene pool and compete with natural species. Furthermore, protection of hybrids was contrary to congressional intent to preserve the genetic purity and diversity of disappearing species.[378]

The Solicitor reaffirmed this interpretation in 1983 and held that hybrids between two listed species, the red wolf and gray wolf, were not entitled to protection.[379] The Solicitor stated:

> While the entire genetic stock of such a hybrid would be that of the two endangered species, it would not be in such a form as to protect either of the two pure genetic stocks of the parents. That is to say, if two wolves of the type at issue here (hybrids between red and gray) were themselves to be bred, they would not produce purebred red wolves and purebred gray wolves. The genetic heritage of the gray wolf and the red wolf would thus not be conserved by the protection of the hybrids.[380]

FWS softened its stance on hybrids in 1990.[381] FWS determined that "[n]ew scientific information concerning genetic introgression has convinced us that the rigid standards set out in those previous opinions should be revisited. In our view, the issue of 'hybrids' is more properly a biological issue than a legal one."[382]

FWS and National Marine Fisheries Service in 1996 proposed the "intercross policy" that would allow listing of hybrids when they "more closely resemble a parent belonging to a listed species than they resemble individuals intermediate between their listed and unlisted parents."[383] The proposal was not finalized, but was also never

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375 *Id.*

376 Kevin D. Hill, *The ESA: What Do We Mean by Species?*, 20 B.C. ENVTL. AFF. L. REV. 239, 243–44 (1993).

377 *Id.* at 243.

378 *Id.* at 244.

379 *Id.* at 245–46.

380 *Id.* at 246.

381 Frey, *supra* note 367, at 188.

382 Endangered and Threatened Wildlife and Plants, 68 Fed. Reg. 4710, 4710 (Dec. 14, 1990) (to be codified at 50 C.F.R. pt. 424).

383 The proposed hybrid policy allowed the listing of "hybrid" individuals that more closely resemble a parent belonging to a listed species than they resemble individuals intermediate between their listed and unlisted parents. *Id.* The Services propose to add to their joint regulations the terms 'intercross' and 'intercross progeny' and indicate the inclusion of intercross individuals within the original listing action for the parent entity. *Id.* The proposed policy is intended to allow the Services to aid in the recovery of listed species by protecting and conserving intercross progeny, eliminating intercross

withdrawn.[384] In 2000, both agencies adopted a new policy regarding the controlled propagation of species listed under the ESA.[385] The policy permits the use of intercross or hybrid species in a recovery plan under certain conditions.[386]

The proposed hybrid and controlled propagation policies both support and undermine the protection of the hybrid red wolf. First, the policy allows for the protection of a stable population of hybrids under the ESA "if they have developed outside of confinement, are self-sustaining, naturally occurring taxonomic species, and meet the criteria for threatened or endangered species under the Act."[387] The reintroduced red wolf population under proper management meets these conditions.

Second, the proposed hybrid policy acknowledged that the eastern wolf is a protected wolf-coyote hybrid. The eastern wolf and red wolf are closely related.[388] Richard Theil and Adrian Weydeven posited several possibilities regarding red and eastern wolf taxonomy: first, the red wolf, the eastern wolf, and gray wolf are distinct species. Second, the red wolf and eastern wolf are subspecies of the gray wolf. Third, the red wolf and eastern wolf are the same species. Fourth, the eastern wolf is a hybrid between red and gray wolves.[389] Steven M. Chambers's 2012 study asserts that the red wolf and eastern wolf are different species, but evolved from a common ancestor along with the coyote.[390] Both are also different species than the gray wolf.[391] Bridgett vonHoldt's 2011 and 2016 genetic studies argue that the eastern and red wolf are gray wolf-coyote hybrids "respectively."[392] The eastern wolf is 21%–36% coyote.[393] Since the eastern wolf is a protected hybrid, similar treatment should be afforded to the red wolf.

Third, the proposed hybrid policy recognizes the possible introduction of "ecologically equivalent forms" in habitats formerly occupied by endangered and threatened species. The ecological equivalents must

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progeny if their presence interferes with conservation efforts for a listed species, and fostering intercrossing when this would preserve remaining genetic material of a listed species. *Id.* The proposed policy would only sanction these actions where recommended in an approved recovery plan, supported in an approved genetics management plan (which may or may not be part of an approved recovery plan), implemented in a scientifically controlled and approved manner, and undertaken to compensate for a loss of genetic viability in listed taxa that have been genetically isolated in the wild as a result of human activity. *Id.*

384 Susan M. Haig & Fred W. Allendorf, *Hybrids and Policy*, *in* 2 THE ENDANGERED SPECIES ACT AT THIRTY: CONSERVING BIODIVERSITY IN HUMAN-DOMINATED LANDSCAPES 150, 154 (J. Michael Scott et al. eds., 2006).

385 *Id.*

386 *Id.*

387 68 Fed. Reg. at 4711.

388 WILDLIFE MGMT. INST., *supra* note 31, at 82–83.

389 *Id.* at 83.

390 *Id.*

391 *Id.*

392 vonHoldt et al., *supra* note 347, at 1294.

393 *Id.*

be a recognized species, subspecies, or population.[394] Fossil (morphological) and historic evidence indicates the existence of an intermediate-sized wolf in the South and East that no longer exists.[395] The hybrid red wolf replaces this earlier wolf and performs the same ecological functions.[396]

The principle argument in the proposed hybrid policy against listing the hybrid red wolf is that the policy only protects "hybrid individuals that more closely resemble a parent belonging to a listed species than they resemble individuals intermediate between their listed and unlisted parents."[397] The red wolf more closely resembles the unlisted coyote than the much larger listed western gray wolf, which is one of the reasons the red wolf was being shot during coyote hunting. There is, however, another protected smaller wolf/coyote hybrid, specifically the eastern wolf, that the red wolf resembles.[398] Since this wolf-coyote hybrid is protected, the red wolf should be granted the same treatment.

The FWS recognizes the hybrid red wolf as a protected species, but has decided to conduct further study of the issue, which should be completed in 2017.[399] FWS should continue to afford ESA protection to the hybrid red wolf. Section 4(e) of the ESA allows the Secretary to treat unlisted species as endangered or threatened species if:

> A) such species so closely resembles in appearance, at the point in question, a species which has been listed pursuant to such section that enforcement personnel would have substantial difficulty in attempting to differentiate between the listed and unlisted species; B) the effect of this substantial difficulty is an additional threat to an endangered species or threatened species; C) such treatment of unlisted species will substantially facilitate the enforcement and further the policy of this chapter.[400]

The red wolf resembles the eastern wolf, which is currently protected under the ESA.[401]

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394 Endangered and Threatened Wildlife and Plants, 61 Fed. Reg. 4710, 4712 (Feb. 7, 1996) (to be codified at 50 C.F.R. pt. 424).

395 *See* Nowak & Federoff, *supra* note 342, at 723–24 (explaining that archaeological evidence shows a sharp distinction between the southeastern wolf and both the gray wolf and coyote); Rutledge et al., *supra* note 348, at 190–91 (illustrating the existence of an intermediate-sized wolf based on fossil evidence).

396 Wayne & Jenks, *supra* note 337, at 567–68; vonHoldt et al., *supra* note 21, at 9.

397 61 Fed. Reg. at 4710. Furthermore, FWS stated the policy will not protect the "classical hybrid," that is "an intermediate organism AB that has received half its characteristics from an unlisted parent species A and half from a listed parent species B. The offspring AB does not sufficiently resemble B to warrant protection under the Act." *Id.* at 4712.

398 Chambers et al., *supra* note 352, at 32–33; *see also* vonHoldt et al., *supra* note 21, at 1 (implying that eastern and western Great Lake wolves resemble the red wolf).

399 Recommended Decisions, *supra* note 362.

400 16 U.S.C. § 1533(e).

401 Chambers et al., *supra* note 352, at 32–34; *see generally* vonHoldt et al., *supra* note 21, at 1 (illustrating the visual and genome similarities between the red wolf and the eastern and western Great Lake wolves).

There is sufficient evidence to indicate that Congress intended to protect fish and wildlife, including hybrids. The ESA defines species as subspecies and distinct populations of vertebrate fish or wildlife which interbreeds when mature.[402] Red wolves are vertebrate wildlife that can breed with parent species and subspecies of gray wolves. Bridgett vonHoldt's 2016 study shows "high rates of gene flow from the gray wolves and coyotes into the red wolf and the Great Lakes region wolf."[403] The study estimated that the gene flow from the Yellowstone wolves to the western Great Lake wolves is 37%–48% and between the western Great Lake wolves and red wolves is 21%–35%.[404]

Protecting the hybrid red wolf realizes the purposes of the ESA, which "are to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, to provide a program for the conservation of such endangered species and threatened species, and to take such steps as may be appropriate to achieve the purposes of the treaties and conventions set forth in subsection (a) of this section."[405] Protection of the hybrid red wolf will prevent extinction, preserve biodiversity, and protect ecosystems.[406]

If the red wolf loses its threatened species status, there is an alternative argument to protect the red wolf, which is as a "conservation-reliant species."[407] The Property Clause grants Congress the "Power to dispose of and make all needful Rules and Regulations respecting the Territory or other Property belonging to the United States."[408] The reintroduced red wolves were born in federal captive breeding programs and released on federal land.[409] The federal government has spent over $17 million in the red wolf recovery program.[410] The annual budget for the program has been over $1 million.[411] The red wolves can be considered federal property.

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402 16 U.S.C. § 1532(16).

403 vonHoldt et al., *supra* note 21, at 7.

404 *Id.*

405 16 U.S.C. § 1531(b).

406 *See supra* pp. 15–21 (discussing the benefits of protecting the red wolf for both the species and its surrounding ecosystem).

407 This means that the threat to the continued existence of the species cannot be sufficiently controlled or eliminated without perpetual intensive management. GROUP SOLUTIONS, RED WOLF RECOVERY TEAM RECOMMENDATIONS FACILITATED AND PREPARED BY GROUP SOLUTIONS, INC. 6 (2016). *See also* Carlos Carroll et al., *Connectivity Conservation and Endangered Species Recovery: A Study in the Challenges of Defining Conservation-Reliant Species*, 8 CONSERVATION LETTERS 132, 132–33 (2014) (defining the term "conservation-reliant species" and its scope); D.D. Goble et al., *Conservation-Reliant Species*, 62 BIOSCIENCE 869, 872 (2012) (explaining the benefits of managing species before they are listed as endangered under the ESA).

408 U.S. CONST. art. IV, § 3.

409 *See* WILDLIFE MGMT. INST., *supra* note 31, at 3, 17, 67 (implying that captive red wolves are reintroduced onto federal lands).

410 *Id.* at 49.

411 *Id.*

The Supreme Court has held the federal government can regulate activities on private land that affect federal property.[412] Congress has plenary power over federal lands that overrides any inconsistent state authority. Congress can protect and conserve wildlife that is physically present on federal land and prevent activities on private land that threaten public land.[413]

The Supreme Court in *Kleppe v. New Mexico* recognized the federal government's broad authority under the Property Clause, which can support protection of the red wolf.[414] At the request of a federal lessee, New Mexico authorities removed wild burros from federal lands and sold them.[415] The U.S. Bureau of Land Management demanded compensation pursuant to the Wild Free-Roaming Horses and Burros Act (WFRHBA), which protects unbranded and unclaimed horses on public lands.[416] New Mexico brought suit, challenging the constitutionality of WFRHBA.[417] The Court, reiterating congressional findings, held that these animals are "living symbols of the historic and pioneer spirit of the West."[418] They are "an integral part of the natural system of public lands," whose proper management is essential to "achieve and maintain a thriving natural ecological balance on the public lands."[419] Their preservation will "contribute to the diversity of life forms within the Nation and enrich the lives of the American people."[420] The Court upheld the WFRHBA, noting that the "furthest reaches of the Property Clause have not yet been definitively resolved," but the power "necessarily included the power to regulate and protect the wildlife living there."[421]

VII. FWS CURTAILS RED WOLF RECOVERY

In September 2016, FWS released the results of its "feasibility study," which recommended continued genetic investigation, recognition of a larger historic range, expansion of the captive breeding program, retooling or termination of the North Carolina project,

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412 United States v. Alford, 274 U.S. 264, 264 (1927); Camfield v. United States, 167 U.S. 518, 524 (1897).

413 William S. Boyd, *Federal Protection of Endangered Wildlife Species*, 22 STAN. L. REV. 1289, 1295 (1970); George Cameron Coggins, *Wildlife and the Constitution: The Walls Come Tumbling Down*, 55 WASH. L. REV. 295, 324–25 (1980); Eugene R. Gaetke, *The Boundary Waters Canoe Area Wilderness Act of 1978: Regulating Nonfederal Property Under the Property Clause*, 60 OR. L. REV. 157, 162–69 (1981).

414 Kleppe v. New Mexico, 426 U.S. 529, 546 (1976); Mary Elizabeth Plumb, *Expansion of National Power Under the Property Clause: Federal Regulation of Wildlife*, XII LAND & WATER L. REV, 181, 181 (1977); Linda Williams, *Constitutionality of the Free Range Wild Horses and Burros Act*, 7 ENVTL. L. 137, 139 (1976).

415 *Kleppe*, 426 U.S. at 533–34.

416 *Id.* at 529.

417 *Id.* at 534.

418 *Id.* at 535–36.

419 *Id.* at 529–31.

420 *Id.* at 535–36 (quoting 16 U.S.C. § 1331 (2016)).

421 *Kleppe*, 426 U.S. at 539.

improvement in relations between FWS and private landowners, updating the current recovery plan, and exploring new reintroduction sites.[422] The study also suggested that there should not be any additional releases from the captive population, failure to enforce the existing rules, or removal of wolves from the wild without a plan to humanely handle them.[423]

Following the report, the FWS acknowledged there is an ongoing debate regarding the taxonomy of the red wolf. The historic range of the red wolf is larger than assumed in the recovery program.[424] The captive breeding program needs to be expanded. Hybridization poses an existential threat to the red wolf population. Stakeholder support is essential. FWS noted that its Population Viability Analysis indicated that continued management will lead to extirpation of the current red wolf population (twenty-eight monitored individuals in five packs with three breeding pairs) within eight years.[425]

The FWS made two proposals. First, the recovery program will still be supported, but there will be "significant shifts in the resource allocation to secure the captive [Species Survival Plan (SSP)] population and evaluate new [Non-Essential Experimental Population (NEP)] project sites across the historic range of the species."[426] The captive breeding program must be greatly expanded from the present 200 individuals and 29 breeding pairs to a minimum of 400 individuals and 52 breeding pairs.[427]

Second, FWS will restrict the North Carolina recovery program to federal lands in Dare County where self-sustaining red wolf populations exist.[428] FWS will remove red wolves from private and inaccessible lands and focus its attention on minimizing the risks associated with hybridization on federal lands.[429] The captive and wild populations will be managed as a single population.[430] Wolves removed from the wild will be used in the captive breeding program to improve the genetic diversity of the red wolf population.[431] Small island populations will be established within the National Wildlife Refuge System in the red wolf's historical range.[432]

Critics of the plan aptly noted that there will be more red wolves in zoos than in the wild.[433] Representative Grijalva, ranking Democrat on the House Resources Committee, stated: "The Service is making a

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422 GROUP SOLUTIONS, *supra* note 407, at 7.
423 *Id.*
424 Recommended Decisions, *supra* note 362, at 2–3.
425 *Id.* at 6.
426 *Id.* at 5.
427 *Id.*
428 *Id.* at 7–8.
429 *Id.* at 8.
430 *Id.*
431 *Id.*
432 *Id.* at 9.
433 Darryl Fears, *Red Wolves Will Still Be Protected—But More by Zoos Than in the Wild*, WASH. POST (Sept. 13, 2016), https://www.washingtonpost.com/news/energy-envi

profoundly disappointing decision to snatch defeat from the jaws of victory. . . . This sets a terrible precedent for management of similar species . . . . The Service needs to do its job and follow the science on species recovery, not the loud voices of a few anti-government fear mongers."[434] Several scientists, whose work on the Population Viability Analysis was cited by the FWS, claimed that the FWS misinterpreted their work. The "most conspicuous misinterpretation" was that the captive SSP population was at risk, a statement that was used to justify the reduction of the wild population.[435] Nevertheless, the shift in resources to the captive breeding program and limitation of red wolf management to federal lands in Dare County lend support to the contention that the red wolf should be considered federal property.

VIII. *RED WOLF COALITION V. U.S. FWS*

The Red Wolf Coalition brought suit in the U.S. District Court of the Eastern District of North Carolina in June 2016, challenging the FWS's implementation of the red wolf recovery program.[436] The Red Wolf Coalition alleged that the FWS misinterpreted the regulation regarding the taking of red wolves on private property.[437] Previously the FWS only allowed the taking of problem wolves, those which posed a risk to livestock, pets, or humans.[438] Beginning in 2014, the FWS also permitted the taking of non-problem wolves on private property at the request of the landowner.[439] This resulted in the death of a 6-year-old female red wolf that had previously born sixteen pups and was probably nursing a litter.[440] This change in policy occurred at the same time the FWS stopped the reintroduction of red wolves into the wild and terminated the adaptive management program that sterilized coyotes

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ronment/wp/2016/09/12/red-wolves-will-still-be-protected-but-more-by-zoos-than-in-the-wild/ [https://perma.cc/K933-6MLW] (accessed Apr. 9, 2017).

434 Press Release, Nat. Res. Comm. Democrats, Grijalva: Fish and Wildlife Service Should Follow Science, Not Cave to Red Wolf Opponents, in Protecting North Carolina Population (Sept. 14, 2016), https://democrats-naturalresources.house.gov/media/press-releases/grijalva-fish-and-wildlife-service-should-follow-science-not-cave-to-red-wolf-opponents-in-protecting-north-carolina-population [https://perma.cc/NE4H-2D8Y] (accessed May 28, 2017).

435 *Scientists Dispute Agency Plan to Pull Red Wolves from the Wild*, DEFS. WILDLIFE (Oct. 18, 2016), https://www.defenders.org/press-release/scientists-dispute-agency-plan-pull-red-wolves-wild [https://perma.cc/Z253-29XG] (accessed Apr. 9, 2017).

436 *Court Asked to Stop US Fish and Wildlife Service from Capturing, Killing Wild Red Wolves*, ANIMAL WELFARE INST. (June 21, 2016), https://awionline.org/content/court-asked-stop-us-fish-wildlife-service-capturing-killing-wild-red-wolves [https://perma.cc/AZ3A-S2YM] (accessed Apr. 9, 2017).

437 *Red Wolf Coal. III*, 2016 U.S. Dist. LEXIS 134020, at *12–13.

438 ANIMAL WELFARE INST., *supra* note 436.

439 *Red Wolf Coal. III*, 2016 U.S. Dist. LEXIS 134020, at *12–13.

440 *Id.* at *16. FWS also authorized the taking of another red wolf in June 2014, which was unsuccessful.

to avoid hybridization.[441] Furthermore, these changes in policy required formal environmental analysis.[442]

In September 2016, Federal Judge Terrence W. Boyle granted a preliminary injunction of the taking of non-problem red wolves on public and private property.[443] The court held that the FWS action expanding the taking of non-problem red wolves violated section 4(d) of the ESA, which mandates the FWS to issue regulations "necessary and advisable to provide for the conservation of such species,"[444] and section 7 of the ESA, which requires federal agencies to use their authorities in order to carry out programs for the protection of endangered species.[445] The court rejected FWS's claim that it was simply following the existing regulation.[446] The court noted that the rapid decline in red wolf population since 2014 indicated a change in management focus. The taking of non-problem wolves increases the chances of hybridization, disrupts pack structure, and increases the threat to the declining red wolf population.[447] This change in policy is a "major federal action[ ] significantly affecting the quality of the human environment" that requires an environmental assessment under NEPA.[448] The FWS must take a "hard look" at the environmental consequences of its action.[449] The Southern Environmental Law Center, which represented the Red Wolf Coalition, declared that "the court was clear that it's the Fish and Wildlife Service's job to conserve this endangered species, not drive it to extinction. The agency cannot simply abandon that responsibility."[450]

IX. CONGRESSIONAL REACTION

Several Democratic congresspersons have urged the Secretary of Interior to overrule the FWS decision.[451] They relied on the criticism of scientists involved in the program, who declared the FWS plan "is full

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441 Plaintiffs' Memorandum in Support of Motion for Preliminary Injunction, *supra* note 77, at 6–8, 13.

442 *Id.* at 20–24.

443 *Red Wolf Coal. III*, 2016 U.S. Dist. LEXIS 134020, at *1–*2.

444 16 U.S.C. § 1533(d).

445 *Id.* § 1536(a)(1).

446 *Red Wolf Coal. III*, 2016 U.S. Dist. LEXIS 134020, at *17–*19.

447 *Id.* at *15.

448 42 U.S.C. § 4332(C); *Red Wolf Coal. III*, 2016 U.S. Dist. LEXIS 134020, at *19–*20.

449 *Red Wolf Coal. III*, 2016 U.S. Dist. LEXIS 134020, at *19.

450 *See* Press Release, S. Envtl. Law Ctr., *supra* note 325 (noting the world's known population of red wolves is down to twenty-nine after USFWS ended protective efforts even though these efforts remain FWS's responsibility); *see also* Letter from Dozens of Scientists to Sally Jewell, Sec'y Dep't of Interior & Dan Ashe, Dir. U.S. Fish & Wildlife Serv. (Nov. 30, 2016), https://www.biologicaldiversity.org/species/mammals/red_wolf/pdfs/Red_wolf_Scientist_ltr_FWS_proposals_11-30-16.pdf [https://perma.cc/LU2M-AMLQ]) (accessed Apr. 9, 2017) (urging FWS to promote, not curtail, red wolf recovery).

451 Letter from Rep. Grijalva et al. to Sally Jewell, Sec'y Dep't of Interior (Dec. 7, 2016) (on file with Animal Law Review) (urging the Secretary of the Interior to revive the red wolf recovery program).

of 'alarming misinterpretations' that distract from the recovery program and jeopardize the continued existence of the species in the wild."[452] The representatives recommended that the Secretary institute several measures. First, the FWS should be instructed to resume prior red wolf recovery efforts, including landowner education. Second, the FWS should release captive red wolves back into the wild and revive adaptive management practices. Third, the FWS should increase law enforcement and persecute the illegal killing of red wolves.[453]

X. CONCLUSION

Federal courts have been crucial in protecting the threatened red wolf from hunters in North Carolina. The federal government reintroduced the red wolf into North Carolina as a non-essential experimental population.[454] North Carolina enacted a law that permitted the taking of the red wolf in violation of the federal regulations.[455] The federal regulations were challenged on the grounds that they could not be supported under Federal Commerce Clause authority.[456]

The Fourth Circuit correctly determined that the federal regulation regarding the taking of the red wolf under section 9 of the ESA was supported under the Commerce Clause.[457] Federal protection of the red wolf under section 9 generates interstate commerce because the red wolf encourages tourism and scientific study.[458] The red wolf is important for the protection of biodiversity and maintenance of the ecosystem, both of which provide products for interstate commerce.[459] Section 9 prevents any state from establishing a competitive market

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[452] *Id.*; *see also* Letter from Lisa Faust, Vice President of Conservation & Sci., Lincoln Park Zoo, to Cynthia Dohner, Reg'l Dir., Se. Region, U.S. Fish & Wildlife Serv. (Oct. 11, 2016), https://www.defenders.org/press-release/scientists-dispute-agency-plan-pull-red-wolves-wild [https://perma.cc/D46Q-ELLF] (accessed Apr. 9, 2017) (disputing agency plan to pull red wolves from the wild); Jonathan Drew, *Scientists Say Study Was Misinterpreted in Red Wolf Decision*, ASSOCIATED PRESS INT'L (Oct. 18, 2016), http://www.ksl.com/public/cmscommentAbuse/report/576/8406879/26/Snow%20basin%20Season%20Passes?nid=157&sid=41898499&title=scientists-say-study-was-misinterpreted-in-red-wolf-decision [https://perma.cc/8JM3-9X3L] (accessed Apr. 9, 2017) (arguing that FWS misinterpreted the PVA study).

[453] Letter from Rep. Grijalva et al. to Sally Jewell, *supra* note 451.

[454] *Gibbs*, 214 F.3d at 488.

[455] *Id.* at 489.

[456] *Id.*

[457] *Id.* at 487; *see generally* Fitzgerald, *supra* note 5, at 3 (analyzing *Gibbs*, 214 F.3d 483, and concluding the case was correctly decided).

[458] *Gibbs*, 214 F.3d at 492–93.

[459] *See id.* at 494 (discussing scientific research conducted on the red wolf and its impact on the ecosystem, and how this research affects interstate commerce).

advantage.[460] Section 9 is part of a larger economic structure that would be imperiled if intrastate activities were not regulated.[461]

The red wolf case is significant because it occurred during a period when the Supreme Court was changing its Commerce Clause jurisprudence.[462] The Court resurrected federalism to limit the federal government's regulatory authority.[463] This new judicial activism posed a threat to environmental statutes.[464] The Fourth Circuit decision dampened this fear.[465] Furthermore, the Court's recent return to a more deferential position regarding Congress's Commerce Clause authority supports the rationale of the Fourth Circuit.[466]

NCWRC in 2012 again allowed the hunting of coyotes in the red wolf recovery area that resulted in the killing of red wolves.[467] The U.S. District Court for the Eastern District of North Carolina in *Red Wolf Coalition II* properly issued an injunction halting the indiscriminate killing of coyotes in the red wolf recovery area for violating section 9 of the ESA.[468] The court found the RWC was likely to prevail on the merits because the NCWRC policy set in motion a series of events that led to the killing of red wolves.[469] NCWRC also violated federal regulations that make the killing of red wolves on private land a specific intent crime for the private landowner or anyone on his/her land with permission and a general intent crime on public land.[470] The RWC would suffer irreparable harm because the NCWRC policy in-

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460 *See id.* at 501–03 (noting that the ESA, and therefore section 9, may "arrest the 'race to the bottom' in order to prevent interstate competition whose overall effect would damage the quality of the national environment").

461 *See id.* at 497 ("The protection of the red wolf on both federal and private land substantially affects interstate commerce through tourism, trade, scientific research, and other potential economic activities. To overturn this regulation would start courts down the road to second-guessing all kinds of legislative judgments.").

462 *See* Edward A. Fitzgerald, Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers*: Isolated Wetlands, Migratory Birds, Statutory and Constitutional Interpretation*, 43 NAT. RESOURCES J. 11, 51 (2003) ("The Rehnquist Court has resurrected federalism to restrict federal Commerce Clause power.").

463 *Id.*

464 *See id.* at 71 (concluding that the Supreme Court's decision in a Clean Water Act case went beyond the role of the Court and undermined the Clean Water Act).

465 *Compare* Solid Waste Agency of N. Cook Cty. v. U.S. Army Corps of Eng'rs, 121 S. Ct. 675, 677–78 (2001) (holding that the Army Corps of Engineers is not given deference for its interpretation of "navigable waters" under the Clean Water Act, which included migratory bird habitat), *with Gibbs*, 214 F.3d at 486–87 (holding that the U.S. FWS is given deference for its regulation limiting taking of red wolves on private land).

466 *Compare Gonzales*, 125 S. Ct. at 2209 (holding that Congress was within its authority to regulate interstate manufacture and possession of marijuana), *with Gibbs*, 214 F.3d at 486–87 (holding that the FWS was within its authority to regulate the taking of red wolves on private land).

467 *Red Wolf Coal. II*, 2014 U.S. Dist. Lexis 65601, at *5–*6; Press Release, S. Envtl. Law Ctr., *supra* note 12.

468 *Red Wolf Coal. II*, 2014 U.S. Dist. Lexis 65601, at *2, *28.

469 *Id.* at *21–*24.

470 Endangered and Threatened Wildlife and Plants; Revision of the Special Rule for Nonessential Experimental Populations of Red Wolves in North Carolina and Tennessee, 60 Fed. Reg. 18,940, 18,946 (Apr. 13, 1995) (codified at 50 C.F.R. pt. 17).

creased the risk of gunshot mortality, interfered with red wolf breeding and pack formation, and frustrated the FWS placeholder strategy.[471] The public interest in the protection of biodiversity and maintenance of the ecosystem outweighed the private interest in the questionable practice of indiscriminate coyote killing.[472] The settlement agreement negotiated by the parties did not violate the Tenth Amendment, but merely stopped North Carolina from interfering with federal red wolf recovery.[473]

The recent 2016 genetic study determined that the red wolf is a gray wolf–coyote hybrid, which may jeopardize the red wolf's status under the ESA.[474] Nevertheless, the FWS should continue to recognize the red wolf as a threatened species. This is consistent with the text, intent, and purposes of the ESA. The study argued that the protection of hybrids, like the red wolf, is important for evolutionary and ecological reasons.[475] The hybrid red wolf demonstrates the adaptation and evolution of the species to a changing environment. Smaller wolf-canids, like the red and eastern wolf, are more suited to the fragmented habitats in the east, than the larger western gray wolf.[476] The ESA should be interpreted in the modern evolutionary framework that recognizes natural selection provides for the evolution of species more adaptable to anthropogenic changes in the environment.[477] The hybrid red wolf performs a valuable historic ecological function performed by the earlier, extinct wolf. There is also the possibility of restoring more of the original wolf ancestry in the red wolf with proper management.[478]

The FWS, in September 2016, decided to severely curtail the once successful red wolf recovery program that has decreased from a high population of 130 wolves, now to a low of 45 red wolves.[479] The FWS is in part responsible for this failure because it did not stop and prose-

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471 *Red Wolf Coal. II*, 2014 U.S. Dist. Lexis 65601, at *18–*23.

472 *See id.* at *25–*27 (concluding that the public interest in protecting endangered species outweighs private landowner interest).

473 *See* Press Release, Defs. of Wildlife, *supra* note 16 (summarizing a court-approved settlement which bans coyote spotlight hunting at night and requires permits and reporting for coyote hunting during the day).

474 vonHoldt et al., *supra* note 21.

475 *Id.*

476 *Id.*

477 Allendorf et al., *The Problems with Hybrids: Setting Conservation Guidelines*, 16 TRENDS IN ECOLOGY & EVOLUTION 613, 619 (2001).

478 vonHoldt et al., *supra* note 21, at 1. The authors are not optimistic regarding the future of the red wolf. *Id.* at 9. They conclude that "the reintroduced population of red wolves in eastern North Carolina is doomed to genetic swamping by coyotes without the extensive management of hybrids as is currently practiced by the USFWS. *Id.* Further, the absence of the ancestral population of gray wolves that once existed in the American South means that the historical gene pool cannot be readily reconstructed by conservation actions." *Id.*; *see also* Murray et al., *supra* note 212, at 343 (discussing that the red wolf may be an ideal candidate for reevaluation of recovery goals).

479 *USFWS Sets Dangerous Precedent Affecting Future of Red Wolf Recovery*, WOLF CONSERVATION CTR. (Sept. 12, 2016), http://nywolf.org/usfws-sets-dangerous-precedent-

cute illegal wolf killings, failed to engage in rigorous outreach with local landowners, and refused to confront anti-wolf landowners opposed to red wolf recovery.[480] The FWS decision undermines red wolf recovery, which involves the restoration of the species' ecosystems and the removal of threats to the species so that a self-sustaining population "can be supported as persistent members of native biotic communities."[481] Environmental groups properly criticized the plan, stating:

> This action would likely all but doom the world's most endangered wolf to extinction in the wild . . . .
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> . . .
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> Never before has FWS so directly turned its back on an endangered species recovery effort. The agency is essentially giving up on the red wolves in the wild today, with vague promises of reintroduction efforts elsewhere, sometime in the future.[482]

The U.S. District Court for the Eastern District of North Carolina, however, halted the FWS proposal by issuing a preliminary injunction, which prevents the FWS "from taking red wolves, either directly or by landowner authorization, . . . without first demonstrating that such red wolves are a threat to human safety or the safety of livestock or pets."[483]

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affecting-future-of-red-wolf-recovery/ [https://perma.cc/MT8M-XFKX] (accessed Apr. 9, 2017).

480 Jonathan Drew, *Judge Says US Officials Fail to Protect Endangered Red Wolf*, ASSOCIATED PRESS (Sept. 29, 2016 5:48 PM EDT), http://bigstory.ap.org/article/fbdb340ecb40428796ad739e3c239585/federal-judge-sides-conservationists-red-wolf-fight [https://perma.cc/SMP2-7RWD] (accessed Apr. 9, 2017).

481 U.S. FISH & WILDLIFE SERV. & NAT'L MARINE FISHERIES SERV., ENDANGERED SPECIES: CONSULTATION HANDBOOK, 4–36 (1998); *see also* Trout Unlimited v. Lohn, 559 F.3d 946, 957–58 (9th Cir. 2009) ("[T]hat the purpose of the ESA is to promote populations that are self-sustaining without human interference can be deduced from the statute's emphasis on the protection and preservation of the habitats of endangered and threatened species.").

482 HM, Comment to *The Last Howl? New Poll Reveals Overwhelming Support for Red Wolf Recovery*, BLUE RIDGE OUTDOORS (Aug. 30, 2016), http://www.blueridgeoutdoors.com/go-outside/last-howl-new-poll-reveals-overwhleming-support-red-wolf-recovery/ [https://perma.cc/3CMC-3A8L] (accessed Apr. 9, 2017).

483 *Red Wolf Coal. III*, 2016 U.S. Dist. LEXIS 134020, at *24; Drew, *supra* note 480 (reporting that Federal Judge Terrence Boyle sided with conservationists in red wolf fight).