Case Critique of a Cat with Crypsis and Call for Court Caution

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The jaguar is an elusive animal that survives by being cryptic, eluding detection, and sneaking up on its prey. The United States Fish and Wildlife Service (USFWS) performed no field surveys to detect the jaguar in parts of New Mexico at the time the agency listed the animal as endangered under the Endangered Species Act. Additionally, by the time of the endangerment listing, there were few incentives for the public to report jaguar sightings. For these reasons, it is no surprise that there were no reported sightings of jaguars in the southwestern potion of New Mexico at that time. There were, however, sightings of jaguars in this area both before and after (when detection probabilities were higher).

USFWS did not designate critical habitat for the jaguar until decades after its listing, but chose to include the New Mexico portion. It reasoned that, though there was some uncertainty due to the lack of data, it was likely that the jaguar had occupied the area at the time of its listing. The Tenth Circuit Court of Appeals, in the case New Mexico Farm & Livestock Bureau v. United States Department of Interior*, disagreed with USFWS.*[1] *The court incorrectly refused to defer to the agency on this issue even though the relevant standard of review was sufficient for the court to defer. In fact, the court should have applied an even more deferential standard of review because USFWS was managing the detection of a cryptic species. In such a circumstance, a reasonable likelihood of occupation should be sufficient under the Endangered Species Act (ESA).*

This Note proposes a new standard for review in the spirit of both the precautionary principle and the deference owed to agency decisions on technical matters. Such a standard is grounded in the ESA and the Supreme Court's reasoning in Tennessee Valley Authority v. Hill.

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1. N.M. Farm & Livestock Bureau v. U.S. Dep't of the Interior, 952 F.3d 1216, 1227 (10th Cir. 2020).

INTRODUCTION

The jaguar's name comes from *yaguar*, the Tupí-Guaraní word meaning "he who kills with one leap."[2] This may be a reference to the jaguar's terrifying hunting strategy of stealthily stalking its prey before ambushing it.[3] An alternative origin of the name comes from *yaguareté*, the Tupí-Guaraní word meaning "true, fierce beast."[4] The jaguar, *Panthera onca*, is just that.[5] It is the largest species of the cat family Felidae in the western hemisphere.[6] It is the third-largest cat in the world behind tigers and lions.[7] The male jaguar is generally larger than the female jaguar and stands with a shoulder height of 2.3–

2. Editors of Encyclopaedia Britannica, *Jaguar*, ENCYCLOPAEDIA BRITANNICA, https://www.britannica.com/animal/jaguar-mammal (last visited Oct. 10, 2021).

3. *See id.*

4. *See Jaguar Natural History*, CENTER FOR BIOLOGICAL DIVERSITY, https://www.biologicaldiversity.org/species/mammals/jaguar/natural_history.html (last visited Oct. 10, 2021).

5. *Id*.

6. *Id*.

7. *Id*.

2.6 feet.[8] Its length reaches six to nine feet, including a tail of two to three feet.[9] It weighs from 100 to 160 kg (220 to 350 pounds).[10]

The jaguar has a varied appearance. While the base color of the jaguar can range from white to black, it is typically orange to tan, covered by black rosettes with black spots in the center.[11] These spots in the middle of the rosettes differentiate the jaguar from the leopard found in Asia and Africa.[12] The rosettes and spots may merge into a black stripe along the jaguar's midline, creating a false stripe.[13]

The jaguar inspires imagery of a tropical jungle and thoughts of Central and South America. The jaguar's range, however, has historically included large swaths of North America.[14] There is some ambiguity as to the extent of the jaguar's range prior to its recent confinement to the southwestern states of Arizona, New Mexico, and Texas, but fossils and artifacts in northern states indicate a once more expansive range.[15] The jaguar inhabits many different types of habitats, including swamps, wooded regions, scrublands, and deserts.[16] The largest known remaining population exists in the Amazon rainforest.[17]

Historical records indicate a declining population of jaguars in Arizona and New Mexico up until the mid-twentieth century.[18] Three policy changes led to a dramatic decrease in recorded observations during that time period: bounties on predators were removed in the late 1960s; it became illegal to kill jaguars in Arizona in 1969; and the jaguar endangerment listing in 1972 discouraged

8. Editors of Encyclopaedia Britannica, *Jaguar*, *supra* note 2 (explaining that this translates to a shoulder height of 0.7–0.8 meters).

9. *Id*. (explaining that the metric equivalent is a total length of 1.7–2.7 meter and tail of 0.6–0.9 meters).

10. *Id*. (explaining that that the jaguar's weight is 100 to 160 kg).

11. Rosettes are "jagged black circles resembling roses." Liz Langley, *Can You Spot the Difference Between a Jaguar and a Leopard?*, NAT'L GEOGRAPHIC, (Dec. 15, 2017), https://www.nationalgeographic.com/animals/article/animals-big-cats-jaguars-leopards. The black panther refers to melanistic (displaying a black base color) panthers of different species. The Editors of Encyclopaedia Britannica, *Black Panther*, ENCYCLOPAEDIA BRITANNICA, https://www.britannica.com/animal/black-panther-mammal (last visited Oct. 10, 2021). Some jaguars display such base color and are known colloquially as black panthers. *Id.* Others display much brighter case-colors while the predominant color ranges from orange to tan. The Editors of Encyclopaedia Britannica, *Jaguar*, *supra* note 2.

12. The Editors of Encyclopaedia Britannica, *Jaguar*, *supra* note 2.

13. *Id*.

14. Alan R. Rabinowitz, *The Present Status of Jaguars (Panthera Onca) in the Southwestern United States*, 44 SW. NATURALIST 96, 96-97 (1999).

15. *Id.* at 96; *see also* Pierre M. Daggett & Dale R. Henning, *The Jaguar in North America*, 39 AM. ANTIQUITY, 165, 465–69 (1974) (explaining that jaguar fossils have been found in North America including in Alabama and Tennessee and the animals were thought to inhabit the northern ranges of Arizona, Texas, and New Mexico as recently as the 1940s).

16. The Editors of Encyclopaedia Britannica, *Jaguar*, *supra* note 2.

17. *Id*.

18. Emil B. McCain & Jack L. Childs, *Evidence of Resident Jaguars (*Panthera onca*) in the Southwestern United States and the Implications for Conservation*, 98 J. MAMMALOGY 1, 1 (2008).

private property owners from reporting sightings for fear of federal restrictions.[19] Previously, hunters were the primary source of recorded jaguar presence.[20] Thus, the main method for detecting jaguars disappeared before the species listing in 1972, and property owners were disincentivized to report any sightings. As observations suddenly decreased, it appeared that the jaguar was no longer present in the southwestern United States.[21] This may be why the United States Fish and Wildlife Service (USFWS) overlooked the jaguar for habitat protection under the Endangered Species Act of 1973 (ESA).[22] It was only in the late-twentieth and early-twenty-first century that scientists started to use camera traps for presence-absence surveys.[23] Previous methods of jaguar detection were not as effective and it may be no coincidence that sightings did not take place prior to the use of more advanced survey methods.

The lack of sighting may be to blame for the prolonged process USFWS took to designate "critical habitat," or protected area, for the jaguar. In 1972, the jaguar was listed in the United States as a foreign endangered species, or a species in danger of extinction that is not found domestically.[24] USFWS relisted the jaguar in 1997 to include domestic populations.[25] Still, USFWS determined in that rule that a critical habitat designation was not prudent because designation might call attention to the species and increase the likelihood of humans disturbing or killing jaguars.[26] Poaching, or illegal hunting, was one of the predominant threats to the jaguar.[27] In 2006, USFWS again found that it was not prudent to designate critical habitat for the jaguar,[28] but the U.S. District Court for the District of Arizona set aside this determination.[29] USFWS published a critical habitat designation for the jaguar in 2014.[30]

This Note focuses on the Tenth Circuit's treatment of this habitat designation. The court ignored how the precautionary principle, a concept describing risk-averse behavior, should factor into its treatment of USFWS's designation. The court also incorrectly applied the current standard—the

19. *Id*. at 1–2. A species is "endangered" when it is in danger of extinction throughout all or a significant portion of its range. 16 U.S.C. § 1532(6). Endangered species receive ESA protection when they are listed at 50 C.F R. § 17.11 (2021).

20. McCain & Childs, *supra* note 18, at 3.

21. *Id*. at 2.

22. *Id.*

23. *Id*. at 3.

24. List of Endangered Foreign Fish and Wildlife, 37 Fed. Reg. 6453, 6476 (Mar. 30, 1972) (stating that the jaguar's range was confined to Central and South America).

25. Endangered and Threatened Wildlife and Plants; Final Rule to Extend Endangered Status for the Jaguar in the United States, 62 Fed. Reg. 39,147, 39,147 (July 22, 1997).

26. *See id.* at 39,155 (referring to how designating areas where jaguars can be found would allow hunters of jaguars to be able to more easily find and hunt jaguars).

27. *See id*.

28. *See generally* Endangered and Threatened Wildlife and Plants; Determination That Designation of Critical Habitat Is Not Prudent for the Jaguar, 71 Fed. Reg. 39,335 (July 12, 2006).

29. Ctr. for Biological Diversity v. Kempthorne, 607 F. Supp. 2d 1078, 1080 (D. Ariz. 2009).

30. *See generally* Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Jaguar, 79 Fed. Reg. 12,572 (Mar. 5, 2014).

"arbitrary and capricious" standard under the Administrative Procedure Act (APA)—for reviewing the agency's determination of critical habitat. However, even if this standard had been applied correctly, the court should have applied an even more deferential standard than that which is currently understood to apply under the APA. A reasonable likelihood that a cryptic species occupies an area should be sufficient to establish occupation for critical habitat under the ESA. Part I of this Note will provide a brief background of the precautionary principle, the ESA, and the case, *New Mexico Farm & Livestock Bureau v. United States Department of Interior* (*N.M. Farm & Livestock Bureau*).[31] Part II discusses what crypsis is and its importance in this analysis. Part III focuses on the current judicial standard for reviewing these kinds of decisions and how the court failed to follow this standard. Finally, Part IV will describe the precautionary principle and how the court should adopt a more deferential standard of review for cryptic species. Ultimately, this Note proposes a new standard, in the spirit of the precautionary principle, as well as the deference owed to agency decisions on technical matters.

I. BACKGROUND

This section will explain the precautionary principle in the context of endangered species, describe the ESA, and summarize the Tenth Circuit's decision in *N.M. Farm & Livestock Bureau* regarding the habitat designation for the jaguar.

A. The Precautionary Principle

Uncertainty surrounds many environmental problems. This is especially relevant to humanity's understanding of global systems like climate change, habitat, and biodiversity.[32] Endangered species and their associated best management practices are reliant on these systems and are therefore shrouded in uncertainty.[33] The precautionary principle provides the necessary framework to deal with this uncertainty. Though it may have different definitions, it generally provides the "better safe than sorry" mentality that allows scientists and policymakers to make more reliable decisions.[34]

Conservation scientists and managers deal with uncertainty and risk aversion in their work.[35] One way of decreasing uncertainty for sensitive or threatened species involves drawing on empirical evidence, or *a priori*

31. N.M. Farm & Livestock Bureau v. U.S. Dep't of the Interior, 952 F.3d 1216 (10th Cir. 2020).

32. *See* Daniel Farber, *Probabilities Behaving Badly Complexity Theory and Environmental Uncertainty*, 37 U.C. DAVIS L. REV. 145, 148 (2003).

33. *See* Stefano Canessa et al., *Risk Aversion and Uncertainty Create a Conundrum for Planning Recovery of a Critically Endangered Species*, 2 CONSERVATION SCI. PRAC. 138, 139 (2019).

34. *See* Holly Doremus, *Precaution, Science, and Learning While Doing in Natural Resource Management*, 82 WASH. L. REV. 547, 551 (2007).

35. *See generally* Canessa et al., *supra* note 33.

hypotheses: logical inferences based on conclusions from such evidence.[36] For better-studied endangered species with low known population numbers, such empirical evidence may be readily available.[37] For species that are less understood or more difficult to detect, like the jaguar, removing uncertainty is not feasible.[38]

Many definitions of the precautionary principle have evolved from the original, and, considered together, they suggest a cautious approach to uncertainty.[39] Originating in German environmental policy, the precautionary principle has influenced international environmental law over the past 40 years.[40] One of the most commonly cited definitions comes from the 1992 Rio Declaration.[41] It states that, "[w]here there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation."[42] Some view this approach as overly-cautious,[43] but the principle advises such caution in light of the seriousness of the harm at risk.[44] Not all definitions place such emphasis on the cost-effectiveness of the precautionary principle. One definition describes the principle with a focus on forestry management, explaining that "when we do not know the effects of our actions we should proceed with caution, or even wait to act, particularly when the potential results are serious or catastrophic."[45] This approach highlights the importance of caution in the face of uncertainty and unknown risk of harm.[46] Such an approach can be applied to endangered species through the ESA.[47]

B. The Endangered Species Act

Congress enacted the ESA in 1973 to conserve threatened and endangered species, as well as the ecosystems on which those species rely.[48] Congress created the ESA shortly after the Endangered Species Preservation Act of 1966

36. *Id.* at 139.

37. *Id.*

38. *See id.*; Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Jaguar, *supra* note 30, at 12,578–79.

39. David Kriebel et al., *The Precautionary Principle in Environmental Science*, 109 ENV'T HEALTH PERSPS. 871, 871 (2001).

40. *See id.* (explaining that the original concept was less reactive and more anticipatory, and it might have better been described as the "foresight principle" but was instead translated as the "precautionary principle").

41. Doremus, *supra* note 34, at 550.

42. *Id.* at 550–51 (quoting Rio Declaration on Environment and Development, June 14, 1992, U.N. Doc. A/CONF. 151/26/Rev. I (Vol. I), princ. 15, reprinted in 31 I.L.M. 874, 879 (1992)).

43. *See* Doremus, *supra* note 34, at 559.

44. *See id.* at 550–51.

45. Courtney Schultz, *Responding to Scientific Uncertainty in U.S. Forest Policy*, 11 ENV'T SCI. & POL'Y 253, 254 (2008).

46. *See id.*

47. *See id.* at 253–54.

48. *See generally* Endangered Species Act of 1973, Pub. L. No. 93-205, 87 Stat. 884 (1973) (codified as amended at 16 U.S.C. §§ 1531–44).

and the Endangered Species Conservation Act of 1969.[49] However, the ESA "represented the most comprehensive legislation for the preservation of endangered species ever enacted by any nation."[50]

The ESA sets forth procedures for USFWS to list species as threatened or endangered using the "best scientific and commercial data."[51] An "endangered species" means "any species which is in danger of extinction throughout all or a significant portion of its range."[52] The ESA makes it unlawful for "any person" to "take" any endangered species.[53] To "take" means to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."[54]

Similarly, USFWS is charged with designating "critical habitats" for endangered species "on the basis of the best scientific data available and after taking into consideration the economic impact, the impact on national security, and any other relevant impact, of specifying any particular area as critical habitat."[55] A critical habitat for a threatened or endangered species includes "occupied areas"—those within the geographical areas the species occupied at the time of its listing—or "unoccupied areas"—those outside the geographic areas the species occupied at the time of its listing.[56] These specific areas are known as "critical habitat units."[57] Occupied areas are critical habitats when they contain "physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection."[58] Unoccupied areas are considered critical habitats once the Secretary of the Department of the Interior designates that that they "are essential for the conservation of the species."[59] USFWS has the authority to designate an area as occupied if a species uses it "with sufficient regularity that it is likely to be present during any reasonable span of time."[60]

The ESA includes a consultation requirement that recognizes the precautionary principle. This Section Seven consultation requirement is highly influential—the Ninth Circuit has described it as the "heart of the ESA."[61] Section Seven requires consultation on agency actions with either the Secretary

49. *See generally* Endangered Species Preservation Act of 1966, Pub. L. No. 89-669, 80 Stat. 926 (1966); Endangered Species Conservation Act of 1969, Pub. L. 91-135, 83 Stat. 275 (1969).

50. Tenn. Valley Auth. v. Hill, 437 U.S. 153, 180 (1978).

51. 16 U.S.C. § 1533(b).

52. *Id*. § 1532(6) (excluding insects considered pests that could pose a risk to people).

53. *Id*. § 1538(a)(1).

54. *Id*. § 1532(19).

55. *Id*. § 1533(b)(2).

56. *Id*. § 1532(5)(A).

57. *Id*. § 1532.

58. *Id*. § 1532(5)(A)(i).

59. *Id*. § 1532(5)(A)(ii) (explaining further at § 1532(3) that "conservation" means "to use and the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this Act are no longer necessary").

60. Ariz. Cattle Growers' Ass'n v. Salazar, 606 F.3d 1160, 1165 (9th Cir. 2010).

61. W. Watersheds Project v. Kraayenbrink, 632 F.3d 472, 495 (9th Cir. 2011).

of the Interior or the affected state, to consider potential harm to protected species.[62] When considering this harm, an agency must "use the best scientific and commercial data available."[63] The ESA further provides that an agency may not take any action that is "likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species."[64] Rather than requiring that the action will jeopardize the existence of the species, the ESA merely requires that the action is "likely" to jeopardize the species or its habitat.[65] This language reflects the inherent cautionary approach in dealing with the extinction of protected species present in the ESA. Courts must recognize this inherent caution intended by Congress to fully realize the purpose of the ESA, and they do not always do so.

C. New Mexico Farm & Livestock Bureau v. U.S. Department of Interior

In *N.M. Farm & Livestock Bureau*, the Tenth Circuit held that USFWS's decision to designate certain areas as critical habitat for jaguar under the ESA was arbitrary and capricious.[66] This holding was based on the lack of evidence that the jaguar had occupied the areas in question at the time of the listing.[67] The court further held that USFWS had not complied with its obligation to designate unoccupied areas as critical only when occupied areas are inadequate to ensure the conservation of the species.[68]

USFWS issued a rule designating critical habitat for the jaguar in New Mexico and Arizona, known as the Northwestern Recovery Unit, but it was immediately challenged.[69] Less than a year after it was published, New Mexico Farm & Livestock Bureau, New Mexico Cattle Growers' Association, and New Mexico Federal Lands Council—property rights organizations—filed suit in the U.S. District Court for the District of New Mexico challenging the designation.[70] The Northwestern Recovery Unit contained six critical habitat units and the property rights organizations challenged the validity of Units Five and Six (hereinafter "the Units," located in New Mexico and affecting the rights of property owners therein).[71] The court found that USFWS's statements asserting

62. *See* 16 U.S.C. § 1536(b)(3)(A) (requiring biological opinion); *id.* § 1536(c) (requiring biological assessment).

63. *Id*. § 1536(a)(2).

64. *Id*. § 1536(a)(2).

65. *See id.*

66. N.M. Farm & Livestock Bureau v. U.S. Dep't of the Interior, 952 F.3d 1216, 1227 (10th Cir. 2020).

67. *See id*.

68. *Id.* at 1228; *see also* 50 C.F.R. § 424.12(e) (2013).

69. *N.M. Farm & Livestock Bureau*, 952 F.3d at 1220; Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Jaguar, *supra* note 30, at 12,573.

70. N.M. Farm & Livestock Bureau v. U.S. Dep't of the Interior, No. 2:15-cv-00428-KG-CG, 2017 U.S. Dist. LEXIS 177250, at *1–3 (D.N.M. Oct. 25, 2017).

71. *Id*.

that the jaguar was likely present but difficult to count were not enough to establish occupation of the Units.[72] The court explained that even with the deferential treatment the court gives agencies in making such a determination, such uncertainty prevented a finding that the jaguar occupied the Units.[73] However, the court deferred to the agency's determination that even if the area was unoccupied, it was essential to the conservation of the jaguar and constituted critical habitat.[74] The property rights organizations also argued that USFWS needed to establish targets or objectives for when the jaguar would be conserved during the critical habitat designation phase, but the court rejected this argument.[75] The district court denied the property rights organizations' petition to overturn the final agency rule and affirmed USFWS's final decision.[76] The property rights organizations appealed.[77]

The Tenth Circuit discussed whether the Units were occupied by jaguars when USFWS listed the species.[78] The property rights organizations claimed that the jaguar must reside on the land to occupy it, but the court rejected that argument.[79] Instead, it embraced the language from the Ninth Circuit's decision in *Arizona Cattle Growers' Association v. Salazar* that an area is occupied if it is used with "sufficient regularity that [the animal] is likely to be present during any reasonable span of time."[80] The Tenth Circuit explained that its review under the arbitrary and capricious standard was confined to ascertaining if the agency adequately examined the facts and provided a reasonable justification between the facts found and the decision made.[81] The court held that the occupation designation was arbitrary and capricious for two reasons: (1) the lack of certainty made the USFWS's factual finding unreasonable, and (2) the lack of certainty and evidence made this a policy decision that did not deserve the deference owed to a scientific or technical matter within an agency's expertise.[82]

First, the court explained that USFWS did not make a factual finding of jaguar presence in the Units during 1972, the year of the listing.[83] Occupation is

72. *Id* at *12–13.

73. *Id.*

74. *Id*. at *16–17.

75. *Id.* at *17–18. The ESA does dot require USFWS to establish what counts as viable population size, or what areas are necessary habitat at the threshold stage. *Id.* at *17. The ESA does not require knowledge of when a species is conserved. *Id.* at *17–18 (quoting 16 U.S.C. § 1533(f)(1)(B)(ii)). Thus, the lack of this in the designation was of no consequences to the court. *See id.*

76. *Id.* at *18.

77. N.M. Farm & Livestock Bureau v. United States U.S. Dep't of the Interior, 952 F.3d 1216, 1221 (10th Cir. 2020).

78. *Id.* at 1225.

79. *Id.*

80. *Id.* at 1226 (quoting Ariz. Cattle Growers' Ass'n v. Salazar, 606 F.3d 1160, 1165 (9th Cir. 2010)).

81. *Id.* (quoting Colo. Wild v. U.S. Forest Serv., 435 F.3d 1204, 1213 (10th Cir. 2006)).

82. *See id.* at 1226–27.

83. *See id.* at 1224–26 (explaining that the jaguar was listed in 1972 as USFWS asserted rather than 1997).

determined at the time of the listing.[84] The court explained that USFWS was uncertain about jaguar occupation in the Units during the time of the listing because it determined that jaguars only "may have" occupied the Units.[85] This lack of substantial evidence caused the court to hold that the agency's designation of the Units as occupied was speculative and not based on fact.[86]

Second, the court explained that it did not owe USFWS deference because this was not a scientific or technical matter, but rather a policy one.[87] Deference to an agency is at its greatest when reviewing technical matters within the agency's area of expertise, especially regarding the agency's chosen scientific data and statistical methodology.[88] The court did not consider USFWS's decision here to be subject to such deference.[89] The court held that because the agency lacked certainty, its finding was not factual, and therefore not of a scientific or technical nature.[90] Thus, although the court acknowledged the difficulty in ascertaining jaguar occupation, it regarded this as a policy decision.[91] It stated that the lack of evidence of jaguar occupation within a ten-year time period before and after the year of the listing[92] made USFWS's occupation finding speculative and, therefore, arbitrary and capricious.[93]

Ultimately, the court held that the Units were essential, unoccupied units.[94] However, the court also ruled that USFWS did not comply with the regulatory procedure in the agency's additional finding that the "unoccupied" Units were essential.[95] This made designation improper, and the circuit court reversed the

84. 16 U.S.C. § 1532(5)(A).
85. *N.M. Farm & Livestock Bureau*, 952 F.3d at 1226.
86. *Id.* at 1226–27.
87. *See id.*
88. *See id.*
89. *Id.* at 1227.
90. *See id.*
91. *See id*.
92. The year of the listing was 1972. To satisfy this time limit, there needed to be a jaguar sighting anytime from 1962-1982. There was no jaguar sighting until 1995, outside of the required window. *Id.*
93. *Id.*
94. *Id.* at 1229–33.
95. Although property rights organizations only challenged the "unoccupied" designation for the units as being nonessential to the conservation of the jaguar, the court raised the issue of USFWS's compliance with 50 C.F.R. § 424.12(e) (2013) (requiring USFWS to "designate as critical habitat areas outside the geographical area presently occupied by a species only when a designation limited to its present range would be inadequate to ensure the conservation of the species."). Under this "rigid step-wise approach," USFWS must first designate occupied areas for critical habitat, then designate unoccupied areas only if the occupied areas are insufficient. *N.M. Farm & Livestock Bureau*, 952 F.3d at 1228–29. The court stated that because USFWS did not find its designation was inadequate before designating the Units, or provide a rational explanation for not doing so, its designation of the Units was arbitrary and capricious. *Id.* at 1231.

decision of the district court.[96] Neither the circuit nor the district court gave weight to the fact that jaguars are cryptic and more difficult to detect.[97]

II. CRYPSIS

Crypsis is a physical and behavioral characteristic found in organisms, including the jaguar. It makes organisms, especially those imperiled, more difficult to detect. Jaguars possess several different forms of crypsis, making them especially difficult to detect.

A. What is Crypsis?

Crypsis is a characteristic that generally describes the ability of an organism to avoid detection by other organisms; it is used for avoiding predators or sneaking up on prey.[98] The occupation designation at issue in *N.M. Farm & Livestock Bureau* was more difficult than other designations partly because the cryptic nature of jaguars makes them difficult to detect.[99] Jaguar crypsis is not limited to one physical characteristic. Instead, it is made up of both physical and behavioral crypsis.

Cryptic coloration is a physical crypsis that makes an animal difficult to detect because of its coloration.[100] Both predators and prey display this form of crypsis in the form of background matching or disruptive coloration.[101] While biologists such as Charles Darwin and Alfred Russel Wallace have observed and recognized background matching coloration by different names for centuries, few studies have addressed the characteristic in much depth.[102] This visual camouflage simply involves the color of the organism matching the environment it is in.[103] A tan jaguar in a tan desert or scrubland is an example of cryptic coloration known as background matching or concealment.[104]

Disruptive coloration, another kind of physical crypsis, is a visual camouflage composed of false edges and boundaries.[105] Many animals with

96. *Id.* at 1231.

97. *See generally N.M. Farm & Livestock Bureau*, 952 F.3d at 1216; N.M. Farm & Livestock Bureau v. U.S. Dep't of the Interior, No. 2:15-cv-00428-KG-CG, 2017 U.S. Dist. LEXIS 177250 (D.N.M. Oct. 25, 2017).

98. *See* John Egan et al., *Edge Enhancement Improves Disruptive Camouflage by Emphasizing False Edges and Creating Pictorial Relief*, 6 SCI. REPS. 1, 1 (2016).

99. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Jaguar, *supra* note 30, at 12,581–82 (explaining that the jaguar was extremely rare by 1972, is cryptic, and is nocturnal).

100. Michael Allaby, *Cryptic Coloration (Crypsis)*, OXFORD REF, https://www-oxfordreference-com.libproxy.berkeley.edu/view/10.1093/acref/9780198845089.001.0001/acref-9780198845089-e-2243# (last visited July 16, 2022).

101. *See id*.

102. Martin Stevens & Sami Meilaita, *Crypsis Through Background Matching*, *in* ANIMAL CAMOUFLAGE: MECHANISMS AND FUNCTION 17 (Martin Stevens & Sami Merilaita eds., 2011).

103. *Id.*

104. *See id.* at 17–18.

105. *Id.* at 27.

disruptive coloration have enhanced edges: darker outlines surrounding dark spots or lighter outlines surrounding light spots.[106] The disruptive coloration "hinders the detection or recognition of an object's, or part of an object's, true outline and shape."[107] The jaguar's rosettes, which are darker outlines surrounding dark spots, are an example of this pattern.[108] Such enhancements increase the jaguar's visual camouflage, making the animal harder to detect through a complex and scientifically uncertain process that researchers continue to study.[109]

In addition to cryptic coloration, jaguars exhibit cryptic behavior, or a behavior modification that makes an animal harder to detect.[110] While some large predators, like tigers, are able to conceal themselves with their coloration alone, they also display cryptic behavior.[111] Movement draws prey's attention to the organism.[112] Thus, a predator may deploy other strategies to conceal itself, such as moving slowly and watching prey to gauge response to movement.[113] These larger cats are also known to modify their gait to move more stealthily or hide amongst foliage.[114] The jaguar not only displays such behavior, but is also nocturnal—a behavior making it even more difficult to perceive.[115] This combination of cryptic behavior and cryptic appearance can lead to animals that are especially difficult to detect.[116]

Jaguars can be extremely difficult to find because they display all of the above listed types of crypsis: background matching, disruptive coloration, stealthy behavior, and nocturnal behavior.[117] Attempts to establish if the jaguar occupies a given area are mired with the possibility of false negatives—incorrect results suggesting jaguars are absent—indicating that the jaguar is not present when it really is.[118] It follows that an agency should be more cautious about concluding the jaguar is not present, especially when there is some evidence to the contrary.[119]

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106. *See id.*
107. *Id.*
108. *See id.*; Langley, *supra* note 11.
109. *See* John Egan et al., *supra* note 9898, at 2.
110. *See* Michael Allaby, *Cryptic Behavior*, OXFORD REF., https://www.oxfordreference.com/view/10.1093/acref/9780199233410.001.0001/acref-9780199233410-e-9716 (last updated 2009); Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Jaguar, *supra* note 30, at 12578–79.
111. HUGH B. COTT, ADAPTIVE COLORATION IN ANIMALS 141 (1940).
112. *Id*.
113. *See id*. at 141–42.
114. *See id*.
115. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Jaguar, *supra* note 30, at 12581–82.
116. *See* COTT, *supra* note 111, at 141–42.
117. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Jaguar, *supra* note 30, at 12,581–82.
118. *See id.*
119. *See id.*

B. Difficulties in Detecting Imperiled and Cryptic Species

Cryptic behavior and appearance make detection difficult. Such traits, especially in conjunction with a declining population, can lead to false negatives when attempting to establish species occupancy.[120] These results can have severe impacts on management efforts for those species and may lead to extinction.[121]

Lack of data makes conservation efforts and predictions about range-wide trends challenging.[122] Because of the high level of difficulty associated with detecting imperiled cryptic species, researchers recommend using detection probabilities.[123] This technique involves biologists using other factors associated with species presence to determine the likelihood of detection and corresponding occupation.[124] These factors can include temperature and shade, among others.[125] However, such probabilities require robust datasets, and this process still produces false negatives.[126] Indeed, experienced observers are far less likely to report false positives for areas than they are to report false negatives.[127]

Other species, such as the European red fox, the puma, and the now extinct eastern puma, are exemplary of some of the difficulties associated with cryptic species detection, especially for imperiled animals. The European red fox (*Vulpes vulpes*) is a cryptic species that displays background matching, nocturnal behavior, and stealthy behavior and has low densities in Australia.[128] The fox is detected with methods like locating tracks, scat, dens, and carcasses, as well as spotlighting.[129] Where foxes are more abundant, detection is fairly reliable.[130] However, where fox populations are less abundant, these commonly used methods for detection are inconclusive.[131] Researchers describe two novel ways of detecting the red fox in these situations: camera traps and DNA collection and analysis.[132] Such methods have not been available or used until recently,

120. *See* John A. Crawford et al., *Factors Affecting the Detection of an Imperiled and Cryptic Species*, 12 DIVERSITY 177, 177–78 (2020).
121. *See id*.
122. *Id*. at 178.
123. *Id.*
124. *Id.*
125. *See* Crawford, *supra* note 120, at 177.
126. *See id.* at 189–90.
127. *Id.* at 181.
128. S.J. Vine et al., *Comparison of Methods to Detect Rare and Cryptic Species A Case Study Using the Red Fox (Vulpes vulpes)*, 36 WILDLIFE RSCH. 436, 436 (2009); *see also* Australian Government Department of Sustainability, Environment, Water, Population, and Communities, *European Red Fox (Vulpes Vulpes)*, AUSTRALIAN GOV'T DEP'T SUSTAINABILITY, ENV'T, WATER, POPULATION & CMTYS., EUROPEAN RED FOX (*VULPES VUPLES*) 1 (2010) (explaining that the European red fox was purposefully brought to Australia in 1865 for hunting).
129. *See* Vine et al., *supra* note 128, at 436–37 (referring to spotlighting, an activity that involves walking in transects and using a flashlight to look for species at night).
130. *Id.* at 436.
131. *Id.*
132. *Id.* at 437.

however, during a revolution in data collection around the early-twenty-first century.[133] Similarly, such methods were not available for jaguar detection in 1972.

The puma provides a particularly good comparison to the jaguar. Also known as cougars, mountain lions, and *Puma concolor*, pumas are the most widely distributed large predator in the western hemisphere.[134] They are cryptic, wide-ranging, and notoriously difficult to detect.[135] Thus, few areas in the puma's occupied range have reliable information for this species.[136] Instead, biologists manage populations based on "population indices, such as hunter effort, mortality trends, or expert opinion, extrapolation of densities from small study areas and other jurisdictions, or a combination thereof, all of which may be unreliable and could result in flawed conservation and management."[137]

While the puma population is decreasing, it has not decreased as significantly as the jaguar population.[138] Still, researchers suspect that jaguars are competitively dominant in areas that contain pumas because of their larger size.[139] Both of these species are difficult to detect because of their cryptic natures.[140] Jaguars are rarer than pumas in the United States.[141] A male jaguar in the Southwest occupies an area of several hundred square miles,[142] while a male puma only occupies an area of about one hundred square miles.[143] And while the puma only has background matching as its physical crypsis, the jaguar has background matching and disruptive camouflage for physical crypsis.[144] This increased rarity, range-distance, and cryptic appearance make detection of jaguars much more difficult than pumas.[145] Therefore, the indirect methods for puma population projections were all that were available for jaguar detection

133. *Id*. at 437; SCOTT SILVER, WILDLIFE CONSERVATION SOC'Y, ASSESSING JAGUAR ABUNDANCE USING REMOTELY TRIGGERED CAMERAS 3 (2004) (explaining that researchers have similarly applied camera trapping methods to jaguars beginning around the end of the twentieth century and into the early twenty-first century).

134. Sean M. Murphy et al., *Improving Estimation of Puma (*Puma concolor*) Population Density Clustered Camera-Trapping, Telemetry Data, and Generalized Spatial Mark-Resight Models*. 9 SCI. REPS. 1, 1 (2019).

135. *Id.*

136. *Id.*

137. *Id.* at 1–2.

138. *See* Rahel Sollmann et al., *Using Occupancy Models to Investigate Space Partitioning Between Two Sympatric Large Predators, the Jaguar and Puma in Central Brazil*, 77 MAMMALIAN BIOLOGY 41, 41 (2012).

139. *Id.*

140. *See id.*; Murphy et al., *supra* note 134.

141. *Jaguar Natural History*, *supra* note 4; *Mountain Lion Population (In Each U.S. State)*, WILDLIFE INFORMER, https://wildlifeinformer.com/mountain-lion-population/ (last visited Oct. 17, 2021).

142. *Id*.

143. Paul Beier, *Puma*, ENCYCLOPAEDIA BRITANNICA, https://www.britannica.com/animal/puma-mammal-species (last updated May 26, 2022).

144. *Id.*; The Editors of Encyclopaedia Britannica, *Jaguar*, *supra* note 2.

145. *See* Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Jaguar, *supra* note 30, at 12,578–79.

before the use of camera traps.[146] This left jaguar detection even more difficult and unreliable than establishing puma population projections.[147]

The jaguar draws an interesting comparison to another species of puma. The eastern puma (*Concolor couguar*) was listed as an endangered species in 1973.[148] However, the last confirmed breeding population of the species dates back to the 1920s.[149] Due in part to unverified sightings and expert belief that some populations may have persisted, USFWS did not publish a delisting until 2018.[150] USFWS seemed to acknowledge the inherent difficulty of detecting the presence of an imperiled cryptic species and waited to ensure that the animal was extinct.[151] In the delisting, USFWS relied on the International Union for Conservation of Nature's criteria to find a species extinct.[152] USFWS weighed factors like the eastern puma's crypsis against the "evidence beyond a reasonable doubt that the last individual of a [species] has died."[153] In contrast, the court refused to acknowledge that difficulty when ruling on USFWS's jaguar occupation designation for the Units.[154]

III. THE COURT INCORRECTLY APPLIED THE CURRENT STANDARD

The current standard of review for agency decisions under the APA requires a more deferential standard of review than what the court offered in *N.M. Farm & Livestock Bureau*. Case law demonstrates how scientific and technical decisions such as this occupation designation should receive more deference. The specific facts of *N.M. Farm & Livestock Bureau* establish how the court should have ruled in favor of USFWS using the current standard of review as demonstrated in the latter part of this section.

A. Current Standard of Review

Because the ESA does not provide for a standard of review, courts rely on the APA, 5 U.S.C. § 706, and apply the arbitrary and capricious standard.[155] The

146. *See supra* notes 133–134.

147. *Id*.

148. Endangered and Threatened Wildlife and Plants; Removing Eastern Puma (=Cougar) From the Federal List of Endangered and Threatened Wildlife, 83 Fed. Reg. 3086, 3088 (Jan. 23, 2018).

149. *Id.*

150. *Id.*

151. *See id.*

152. *See id.* at 3092–93 (explaining that deciding whether a species is extant or extinct is a difficult inquiry, but the IUCN is an international organization made up of conservation biologists who have provided guidance on this determination; this includes weighing support of extinction against any crypsis a species may possess, the lack of adequate detection surveys, reasonably reliable local reports of recent sightings, and suitable habitant still in existence within the species' known range).

153. *See id.* at 3092.

154. *See* N.M. Farm & Livestock Bureau v. U.S. Dep't of the Interior, 952 F.3d 1216, 1226 (10th Cir. 2020).

155. Lora A. Lucero, Annotation, *Standard of Review Under the Endangered Species Act of 1973, 16 U.S.C.A. §§ 1531–1544*, 93 A.L.R. Fed. 2d 121, Art. 1 (2015); *see also* Cabinet Mountains

APA provides for judicial review when one has suffered an injury from agency action.[156] Such a review is only stymied when the relevant statute precludes review or if the action is committed to agency discretion.[157] An agency action should be set aside when it is "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law."[158] Courts begin with a strong presumption in favor of the agency and may not substitute their judgment for that of the agency.[159] Indeed, the reviewing court's role is not one of *de novo* policy review, and it must only review what is available in the administrative record.[160] A decision is arbitrary and capricious when there is not a reasonable relationship between the facts in the administrative record and the agency decision.[161] As such, an agency can avoid an arbitrary and capricious judgment by merely showing it has "exercised reasoned discretion."[162]

The Supreme Court has clarified this standard.[163] An agency action is arbitrary and capricious if:

> the agency has relied on factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise.[164]

Courts cannot provide their own rational explanation for agency decisions, but must accept explanations that are "less than ideal clarity if the agency's path may reasonably be discerned."[165] In *Kleppe v. Sierra Club*, the Court explained that issues requiring a high level of technical or scientific expertise were better left to the responsible agencies familiar with those matters.[166] Absent a showing of arbitrary action, the Court must assume that the agency acted within its discretion.[167] Where challengers do not show that the agency action is obviously incorrect and that there could be a rational basis for the agency action, the Court will not find that the action was arbitrary and capricious.[168]

Wilderness/Scotchman's Peak Grizzly Bears v. Peterson, 685 F.2d 678, 685 (D.C. Cir. 1982) (explaining that 16 U.S.C.A. § 1540 merely provides for a right of action and not *de novo* review; thus, the arbitrary and capricious standard still applies); 5 U.S.C. § 706

156. Abbott Laboratories v. Gardner, 387 U.S. 136, 140 (1967).

157. 5 U.S.C. § 701(a).

158. Weyerhaeuser Co. v. U.S. Fish & Wildlife Serv., 139 S. Ct. 361, 370 (2018) (quoting Heckler v. Chaney, 470 U.S. 821, 829 (1985)).

159. Citizens to Preserve Overton Park, Inc. v. Volpe, 401 U.S. 402, 416 (1971).

160. Camp v. Pitts, 411 U.S. 138, 142 (1973).

161. Sierra Club v. Costle, 657 F.2d 298, 323 (D.C. Cir. 1981).

162. *See id.*

163. *See* e.g., Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co., 463 U.S. 29 (1983); Bowman Transp., Inc. v. Ark.-Best Freight Sys., Inc., 419 U.S. 281 (1974); Kleppe v. Sierra Club, 427 U.S. 390 (1976).

164. *Motor Vehicle Mfrs. Ass'n*, 463 U.S. at 43.

165. *Bowman Transp., Inc.*, 419 U.S. at 286.

166. 427 U.S. at 412.

167. *Id.*

168. *See generally id.* at 414.

Although not discussed in detail in *Kleppe*, courts owe a special level of deference to agency decisions of a scientific or technical nature.[169] According to the Tenth Circuit, "where challenged agency decisions involve technical or scientific matters within the agency's area of expertise, our deference to the agency is especially strong."[170] Thus, where specialists have conflicting views, the court must defer to the reasonable view of the agency specialist, even if the court finds the alternative view more persuasive.[171]

Courts similarly give greater deference to agencies making predictions at the edge of science. When reviewing a scientific determination that is a "prediction" at the "frontiers of science. . .as opposed to simple findings of fact, a reviewing court must generally be at its most deferential."[172] A decision may be at the frontiers of science when there is uncertainty related to a potential catastrophe.[173] For example, an agency making a prediction about the storage of nuclear waste and radioactive releases deserves a greater level of deference than a normal scientific or technical decision because its decision is a scientifically advanced determination within its expertise.[174] Similarly, a court reviewing a prediction concerning the extinction of a species should give greater deference because of the uncertainty related to a potentially catastrophic event. As such, the court's only role is to determine that the agency has considered the relevant factors and provided a rational connection between the facts and the agency's decision.[175]

B. How the Court Was Wrong

The court owed USFWS's designation of occupation more deference than it proffered, and it should not have found that the designation was arbitrary and capricious. The court impermissibly substituted its own judgment for that of the agency.[176] USFWS's designation was a scientific or technical decision at the edge of science, and was reasonable given the evidence that the agency had at its disposal.[177]

USFWS's occupation designation was a scientific or technical decision and deserved more deference.[178] The court admitted that such deference is proper

169. *See generally id*.

170. Wild Watershed v. Hurlocker, 961 F.3d 1119, 1132 (10th Cir. 2020) (internal quotations omitted).

171. *See id.*

172. Baltimore Gas & Elec. Co. v. Nat. Res. Def. Council, Inc., 462 U.S. 87, 103 (1983).

173. *See id.*

174. *See id.*

175. *See id.* at 105.

176. *See* Citizens to Preserve Overton Park, Inc. v. Volpe, 401 U.S. 402, 416 (1971); N.M. Farm & Livestock Bureau v. U.S. Dep't of the Interior, 952 F.3d 1216, 1226–27 (10th Cir. 2020).

177. *See generally Baltimore Gas & Elec. Co.*, 462 U.S. at 103; *N.M. Farm & Livestock Bureau*, 952 F.3d at 1226–27.

178. *N.M. Farm & Livestock Bureau*, 952 F.3d at 1226–27.

when reviewing technical matters within USFWS's area of expertise.[179] It did not claim that an occupation designation lies outside of USFWS's area of expertise.[180] The court claimed that reliance on sightings of jaguars in the designated area to demonstrate occupation was not based on expert opinion, so it was not technical.[181] The court noted the difficulty in jaguar detection and the consequent lack of data.[182] It did not acknowledge, however, the technical strategies USFWS relied on.[183] These included a systematic review of the Class I records indicating jaguar presence in the Units.[184] Class I records are undisputed reports considered "verified" or "highly probable" of jaguar presence.[185] USFWS chose not to use Class II records since they only indicate jaguar presence is "probable" or "possible."[186] This is because Class II observations, unlike Class I observations, do not contain physical evidence of jaguar presence, like a skin, skull, or photograph.[187] This technical decision-making process within USFWS's area of expertise demonstrates the agency's occupation designation was a scientific or technical decision and deserved more deference.

Similarly, the court incorrectly concluded that it did not owe USFWS more deference because the agency was uncertain; however, decisions at the edge of science require more deference, not less.[188] USFWS explained that the occupation designation was more difficult here because jaguars are rare, are difficult to detect, and had not been adequately studied with detection surveys at the time of their listing.[189] USFWS was forced to adopt its own method of establishing presence or absence for the jaguar in an area with substantial uncertainty. Therefore, this decision was at the frontiers of science and was owed a greater level of deference.[190]

Finally, the court's ruling that the occupation designation was arbitrary and capricious was wrong because the connection between the record and the decision was reasonable. USFWS provided ample evidence to indicate that the

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179. *Id*. at 1227.

180. *See id.*

181. *See id.*

182. *See id.*

183. *See id.;* Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Jaguar, *supra* note 30, 12,572–81.

184. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Jaguar, *supra* note 30, at 12,579–80.

185. *See id.* at 12,579.

186. *See id.*

187. *See id.*

188. *See* Baltimore Gas & Elec. Co. v. Nat. Res. Def. Council, Inc., 462 U.S. 87, 103 (1983); *N.M. Farm & Livestock Bureau*, 952 F.3d at 1226–27.

189. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Jaguar, *supra* note 30, at 12,581–82 (explaining that jaguars were extremely rare by 1972, are cryptic, and are nocturnal).

190. *See id.* at 12,578–81; *Baltimore Gas & Elec. Co.*, 462 U.S. at 103 (explaining that courts should generally be at their most deferential when an agency is "making predictions, within its area of special expertise, at the frontiers of science")

jaguar was likely present at the time of its listing in 1972.[191] USFWS was required to use the "best scientific data available."[192] Even though there were no jaguar surveys at the time of the listing, USFWS retroactively conducted a robust analysis to conclude that this area was likely occupied at that time.[193] Endangerment implies a reduction in population or rarity, making a species harder to find. But instead, external factors such as the predator hunting ban simply made the jaguar more difficult to detect.[194] It is reasonable to expect that, even if there had been surveys, jaguars that were present might not have been detected.[195] With Class I records indicating jaguars were present in the areas at other times, as well as topographic and geographic data indicating that these areas have the features for jaguar habitat, it seems reasonable to conclude that these areas were occupied at the time of listing, too.[196]

USFWS's occupation designation was a technical decision at the edge of science, and it was reasonable given the evidence that the agency had at its disposal. For these reasons, the court should have deferred to USFWS. The court wrongly found the decision to be arbitrary and capricious, even applying the current standard of review.

IV. RELYING ON THE PRECAUTIONARY PRINCIPLE: A REASONABLE LIKELIHOOD OF OCCUPATION SHOULD BE SUFFICIENT FOR CRYPTIC SPECIES

While the current standard of review, alone, should have been sufficient to avoid an arbitrary and capricious judgment, institutionalized caution would have made this less ambiguous for the court. The precautionary principle has been adopted into U.S. law in the ESA, and it should be extended to create a more deferential standard of review for agency decisions about cryptic species occupation and the designation of critical habitat. This Note proposes a new standard, in the spirit of the precautionary principle, as well as the deference owed to agency decisions on technical matters. This section provides a description of the judicial recognition of institutionalized caution; how the court should have applied it here; and why courts should use this standard.

A. Judicial Recognition of Institutionalized Caution

The Supreme Court first described the concept of the precautionary principle as "institutionalized caution" in *Tennessee Valley Authority v. Hill*.[197] The Court drew out this concept from the ESA to explain that Congress had

191. *See* Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Jaguar, *supra* note 30, at 12,578–81.

192. *See* 16 U.S.C. § 1533(b)(2).

193. *See* Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Jaguar, *supra* note 30, at 12,578–82.

194. *See id.*

195. *See id.*

196. *See id.*

197. Tenn. Valley Auth. v. Hill, 437 U.S. 153, 194 (1978).

struck the balance in favor of valuing the worth of an endangered species over other interests.[198] The Court explained that "Congress has spoken in the plainest of words, making it abundantly clear that the balance has been struck in favor of affording endangered species the highest of priorities, thereby adopting a policy which it described as 'institutionalized caution.'"[199] The Court arrived at this conclusion by relying on congressional deliberations to supplement the ESA.[200] Indeed, the Court took the stance in *Tennessee Valley Authority* that the goal of the ESA was to stop and reverse the extinction crisis, "whatever the cost."[201]

Several years after *Tennessee Valley Authority*, the Ninth Circuit Court of Appeals cited institutionalized caution in *Sierra Club v. Marsh*.[202] The Army Corps of Engineers did not consult with USFWS on using essential habitat for two endangered birds, the California least tern and light-footed clapper rail.[203] The case concerned a project that included widening a flood control channel in connection with a transportation infrastructure expansion.[204] The court explained that, due to institutionalized caution, a project could not move forward until substitute habitat was made available or the project was altered so as not to adversely modify the existing habitat of the protected birds.[205] Specifically, the court stated the "institutionalized caution mandated by section 7 of the ESA requires the COE to halt all construction that may adversely affect the habitat until it insures the acquisition of the mitigation lands or modifies the project accordingly."[206] The court held that, although its ruling would create delay and substantial financial consequences, it was required by the ESA in order to avoid jeopardizing the continued existence of the species.[207]

The Ninth Circuit continued to build on this standard in *Defenders of Wildlife v. United States EPA*.[208] There, the court explained that weighing the risks to the survival of an organism under the ESA required an analysis based on institutionalized caution.[209] It found that the project in question was improper because it did not adequately address the risks to the survival of the species.[210] The court explained that the loss of a species is the "crucial factor" in such an analysis.[211] It noted that an agency decision is reasonable when it adequately considers the risk of the harm to the species and has some assurances to prevent

198. *Id.* at 178, 194.
199. *Id.* at 194.
200. *Id.* at 185–86.
201. *Id.* at 184.
202. Sierra Club v. Marsh, 816 F.2d 1376, 1389 (9th Cir. 1987).
203. *Id.* at 1378.
204. *Id.*
205. *Id.* at 1389.
206. *Id.*
207. *Id.* at 1388–89.
208. Defs. of Wildlife v. United States EPA, 420 F.3d 946, 978 (9th Cir. 2005).
209. *Id.* at 978–79.
210. *See id.*
211. *Id.* at 978.

such harm.[212] Such an analysis applies a higher degree of deference to an agency decision when it favors the survival of a species, and a higher degree of review when it does not.[213]

Another Ninth Circuit decision citing institutionalized caution was *Ariz. Cattle Growers' Association v. Salazar*.[214] The Arizona Cattle Growers' Association challenged USFWS's critical habitat designation for the Mexican spotted owl on the grounds that USFWS had designated areas as occupied even though the species was not present at the time of the listing.[215] The court explained that "[w]here data are inconclusive or where habitat is used on a sporadic basis, allowing the FWS to designate as occupied habitat where the species is likely to be found promotes the ESA's conservation goals and comports with the ESA's policy of institutionalized caution."[216] As such, the court deferred to USFWS's finding of occupation despite the lack of evidence showing the species was present at a given time.[217] Such an approach represents a recognition of the precautionary principle.[218]

B. How Institutionalized Caution Would Have Applied to the Jaguar's Occupation Designation

Under a standard of institutionalized caution, this court's review of *N.M. Farm & Livestock Bureau* would be much simpler. Institutionalized caution would change the court's review of the designation in three ways: the court would defer to the agency in cases of uncertainty; the definition of occupied would be more flexible to include species that were "likely" present; and an occupation designation would be allowed even when species are absent at the time of the listing.

First, institutionalized caution drastically influences the court's treatment of uncertainty.[219] The court presented the case as if USFWS's lack of certainty due to the jaguar's crypsis made this decision *prima facie* unreasonable.[220] Such an approach not only ignores, but contradicts past decisions on issues concerning uncertainty under the ESA.[221] This is especially true in the context of decisions

212. *Id.*; *but see* Nat'l Ass'n of Home Builders v. Defs. of Wildlife, 551 U.S. 644 (2007) (reversing and remanding the Ninth Circuit's ruling in *Defs. of Wildlife* (2005)).

213. *See Defs. of Wildlife*, 420 F.3d at 978–79.

214. Ariz. Cattle Growers' Ass'n v. Salazar, 606 F.3d 1160 (9th Cir. 2010).

215. *Id.* at 1162.

216. *Id.* at 1166–67 (internal quotations removed).

217. *See id.*

218. *See id.*

219. *See* N.M. Farm & Livestock Bureau v. U.S. Dep't of the Interior, 952 F.3d 1216, 1226–27 (10th Cir. 2020); *Ariz. Cattle Growers' Ass'n*, 606 F.3d at 1166–67.

220. *N.M. Farm & Livestock Bureau*, 952 F.3d at 1226–27 (holding that the court would defer more strongly when scientific conclusions had reasonable basis but because the agency lacked certainty, it was not owed this deference and was therefore unreasonable).

221. *See, e.g.*, *Ariz. Cattle Growers' Ass'n*, 606 F.3d at 1164 (citing *Pub. Citizen Health Rsch. Grp. v. U.S. Dep't of Lab.*, 557 F.3d 165, 176 (3d Cir. 2009)); *see also* Greenpeace Action v. Franklin, 982 F.2d 1342, 1354-55 (9th Cir. 1992).

which recognize institutionalized caution.[222] The standard set by these decisions does not require USFWS to only act when it can support its decision with "absolute confidence."[223] Instead, courts routinely hold that the ESA authorizes USFWS to make decisions even when there is uncertainty.[224] Following this precedent, the lack of certainty over the presence of jaguars in the areas at issue should not weigh against the designation.[225]

Second, under institutionalized caution, the definition of "occupied" habitat would be more flexible, allowing the court to more readily defer to the agency in cases of uncertainty, such as for cryptic species detection.[226]An agency need not prove a species resides in an area, nor demonstrate any existing activity by the species in that area, to designate the area as occupied.[227] Determining if an area is occupied is a "highly contextual and fact-dependent inquiry . . . within the purview of the agency's unique expertise."[228] This extends to allowing USFWS to designate areas as occupied even where data is inconclusive, but the agency finds that the species was likely present, as was the case for jaguar occupation.[229] The agency used the best available science to find that the jaguar likely occupied the area at the time of the listing.[230] Under institutionalized caution, the court not only would be more likely to defer to the agency,[231] but it would find USFWS's designation reasonable and deserving of this deference.[232]

Finally, the court could use institutionalized caution to infer occupation even without establishing the presence of jaguars at the time of the listing.[233] Under that framework, a court would not necessarily prevent USFWS from designating an area as occupied just because a given species was not present in the areas at the time of listing.[234] A more flexible court would find USFWS's connection between its record and decision, as here, easier to accept because USFWS was at least certain of jaguar presence in the Units outside of the time of listing.[235] However, this court refused to defer to the agency, because USFWS lacked certainty due to the jaguar's cryptic nature.[236] Under an institutionalized

222. *See Ariz. Cattle Growers' Ass'n*, 606 F.3d at 1166–67.

223. *See id.* at 1164.

224. *See, e.g.*, *id.*; *see also* Sierra Club v. Marsh, 816 F 2d 1376, 1389 (9th Cir. 1987); Defs. of Wildlife v. United States EPA, 420 F.3d 946, 978–79 (9th Cir. 2005).

225. *See N.M. Farm & Livestock Bureau*, 952 F.3d at 1226–27.

226. *See id.*; *Ariz. Cattle Growers' Ass'n*, 606 F.3d at 1164.

227. *See Ariz. Cattle Growers' Ass'n*, 606 F.3d at 1164; Alaska Oil & Gas Ass'n v. Jewell, 815 F.3d 544, 556 (9th Cir. 2016).

228. *Ariz. Cattle Growers' Ass'n*, 606 F.3d at 1164–65.

229. *See id.* at 1166–67; Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Jaguar, *supra* note 30, at 12,578–82.

230. *Id*.

231. *See Ariz. Cattle Growers' Ass'n*, 606 F.3d at 1164–65; *N.M. Farm & Livestock Bureau*, 952 F.3d at 1226–27.

232. *Id*.

233. *See Ariz. Cattle Growers' Ass'n*, 606 F.3d at 1167 n.6.

234. *See id.*

235. *See id.*; *N.M. Farm & Livestock Bureau*, 952 F.3d at 1226–27.

236. *See N.M. Farm & Livestock Bureau*, 952 F.3d at 1226–27.

caution approach, the court would be able to give greater credence to the robust data USFWS had, even though that data was not temporally proximate to the time of listing.[237]

Ultimately, an approach that applied institutionalized caution would have led to a more favorable outcome for USFWS.[238] The court would have recognized the difficulty apparent in detecting this animal, and used a more deferential attitude, because USFWS decided in favor of the survival of the species.[239] The uncertainty in detection due to the jaguar's cryptic nature would have been properly considered.

C. Courts Should Apply Institutionalized Caution for Cryptic Species' Designation of Occupation for Critical Habitat

Courts should apply institutionalized caution to their review of agency decisions about cryptic species because this approach better aligns with the precautionary principle at the heart of the ESA.[240] The Supreme Court has explained that Congress clearly intended to prioritize the continued existence of species and prevent further extinctions, "whatever the cost."[241] The ESA demands a standard that responds to uncertainty by prioritizing species survival.[242]

Endangered species are inherently difficult to find due to their rarity, but cryptic species are even more difficult to detect.[243] Because of the higher risk of false negatives, cryptic species require a more precautionary approach when establishing habitat occupation.[244] Additionally, deferring to a more precautionary approach, reliant on agency evidence, may create fewer false positives than a less cautious approach, reliant on courts to determine whether the evidence indicates occupation, especially where the cryptic species has not been adequately surveyed.[245] Further, by prioritizing species survival in the ESA, Congress expressed its preference for these false positives and their consequences over false negatives.[246]

Courts may fear that deferring to agencies would lead to policy- rather than science-based rulings, but this would not be the case. The court in *N.M. Farm &*

237. *See id.*; Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Jaguar, *supra* note 30, at 12,578–82.

238. *See N.M. Farm & Livestock Bureau*, 952 F.3d at 1226–27; *Ariz. Cattle Growers' Ass'n*, 606 F.3d at 1166–67.

239. *See N.M. Farm & Livestock Bureau*, 952 F.3d at 1226–27.

240. *See* Tenn. Valley Auth. v. Hill, 437 U.S. 153,178–79 (1978).

241. *See id*. at 184.

242. *See id*. at 178–79, 194.

243. *See* Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Jaguar, *supra* note 30, at 12,578–79.

244. *See* Crawford, *supra* note 120, at 189–90.

245. *See id.*; Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Jaguar, *supra* note 30, at 12,578–79.

246. *See Tenn. Valley Auth.*, 437 U.S. at 178–79, 194.

Livestock Bureau may have let this suspicion influence its decision.[247] The court could have feared deferring to precautionary decisions would encourage a shift away from limiting uncertainty, and instead toward a world where agencies collect less data and make predictions accordingly.[248] This fear, however, is unsubstantiated, as the standard of institutionalized action does impose limits on deference and does not excuse inadequate scientific investigation.[249] This fear does not apply to the case of the jaguars because the nature of the animal limited the agency's ability to collect data, and the decision had been made years before by a different administration with different scientific capabilities.[250] Thus, institutionalized caution should be applied to the approval of cryptic species occupation designations.

Institutionalized caution permits agencies to preserve more open spaces in the course of protecting the species that need them. This is a positive outcome, though not directly obvious from the stated purpose of the ESA.[251] Under the ESA, preservation of wild spaces is necessary, since lack of protection would result in loss of habitat for species that have already lost much of their habitat to development.[252] There may be a fear that agencies could exploit institutionalized caution to protect areas that are not supported by the presence of a cryptic endangered species. Such fears do not appreciate that agencies must only consider certain factors and are prevented from considering other factors in decision making.[253] The fact that institutionalized caution provides more deference to occupation designations for cryptic species does not affect this.[254] Agencies still must demonstrate a reasonable likelihood of presence in the area.[255]

While institutionalized caution would allow agencies to make more precautious occupation designations for cryptic species, an unfriendly agency or changing administration could undo these efforts. One antidote to this is that the concept of institutionalized caution can be used to increase a court's review, rather than increasing deference.[256] An agency should have to demonstrate that there is not a reasonable likelihood that an area is occupied by a cryptic species to avoid protecting that area. A lack of a reasonable likelihood of occupation

247. *See* N.M. Farm & Livestock Bureau v. U.S. Dep't of the Interior, 952 F.3d 1216, 1227 (10th Cir. 2020).

248. *See id.*

249. Ariz. Cattle Growers' Ass'n v. Salazar, 606 F.3d 1160, 1167 (9th Cir. 2010).

250. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Jaguar, *supra* note 30, at 12,578–82.

251. *See generally* 16 U.S.C. § 1531.

252. *See generally id*.

253. Richard J. Pierce Jr., *What Factors Can an Agency Consider in Making a Decision?*, 2009 MICH. ST. L. REV. 67, 67 (2009).

254. *See id.*

255. Ariz. Cattle Growers' Ass'n v. Salazar, 606 F.3d 1160, 1165–67 (9th Cir. 2010).

256. *See* Defs. of Wildlife v. U.S. EPA, 420 F.3d 946, 978 (9th Cir. 2005); *but see* Nat'l Ass'n of Home Builders v. Defs. of Wildlife, 551 U.S. 644 (2007) (reversing and remanding the Ninth Circuit's ruling in *Defs. of Wildlife* (2005)).

could be supported by demonstrating that there are no known records of the species in the area that indicate it was occupied at the time of the listing.

Likewise, where a court thinks the record suggests a reasonable likelihood of occupation at the time of listing, through direct evidence or scientifically supported predications, it should be able to overrule an agency's finding that an area is unoccupied. Institutionalized caution allows the court to do this. Where an agency attempts to remove an area's designation, it would have to provide a more substantial justification than previously required and would need to meet the institutionalized caution standard that there is not a reasonable likelihood of the cryptic species' presence in the area.[257] This creates a barrier for entering administrations to remove the additional protections that institutionalized caution would provide to cryptic species.

Institutionalized caution still requires that there actually be decisions from agencies to review. While centering institutionalized caution in judicial review of these decisions would help to protect some areas' critical habitat designations, agencies could still avoid making decisions at all, and current trends suggest they are increasingly doing so.[258] Institutionalized caution does not prevent agencies or a new administration from diverging from the spirit of the ESA. Still, this standard of review is beneficial in the context of many decisions.

Finally, an institutionalized caution approach may relieve the challenges created by USFWS's lack of guidance for making occupation designations. In the case of the jaguar, the court's misunderstanding of how to deal with uncertainty may have been influenced by that lack of guidance.[259] Because the Secretary of the Interior, represented by USFWS here, determines occupation on a case-by-case basis, the methodology for these designations lacks the uniformity that this court may have wanted in order to defer to the agency.[260] Requiring such uniformity may not make sense where methods for cryptic species detection are diverse and dependent on the species in question.[261] An institutionalized caution approach would have helped resolve this by giving more deference to the approval of cryptic species occupation designations, while making sure that agency designations are reasonable given the data available.[262]

Institutionalized caution is especially important for cryptic species occupation designations because they deal with a high risk of false negatives. A reasonable likelihood of occupation should be sufficient to establish occupation.

257. *See, e.g.*, Perez v. Mortg. Bankers Ass'n, 575 U.S. 92, 106 (2015) (explaining that an agency must provide a more substantial justification for an action that contradicts its prior work).

258. J. B. Ruhl and Kyle Robisch, *Agencies Running from Agency Discretion*, 58 Wm. & Mary L. Rev. 97, 104 (2016).

259. *See* N.M. Farm & Livestock Bureau v. U.S. Dep't of the Interior, 952 F.3d 1216, 1227 (10th Cir. 2020).

260. *See id*.

261. *See* Vine et al., *supra* note 128.

262. *See* Ariz. Cattle Growers' Ass'n v. Salazar, 606 F.3d 1160, 1166–67 (9th Cir. 2010).

Such an approach is consistent with the precautionary principle and how the judiciary has previously incorporated its approach of institutionalized caution.

CONCLUSION

The Tenth Circuit ignored how the precautionary principle should factor into its treatment of USFWS's designation for the jaguar. The court applied the current standard of review incorrectly and should have applied a significantly more deferential standard. The standard proposed in this Note better aligns with the spirit of the precautionary principle, as well as the deference owed to agency decisions on technical matters. The standard would be rooted in the existing case law surrounding the ESA and based on the concept of institutionalized caution. It would demand that a reasonable likelihood that a cryptic species occupied an area is sufficient to establish occupation for critical habitat under the ESA. While the current standard under the APA should have been enough for the court to find USFWS's decisions reasonable and for it to defer to the agency's judgment on this issue, the proposed standard would reduce ambiguity for courts reviewing decisions like this that deal with the inherently uncertain occupation of cryptic species.

Embracing a precautionary approach to cryptic endangered animals, like the jaguar, is essential because of the difficulty in detecting these species.[263] Otherwise, they could go extinct. The jaguar may be one of the deadliest predators in the United States. [264] However, even an animal this powerful may disappear if courts do not recognize institutionalized caution for agencies' cryptic species occupation designations.

263. *See* Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Jaguar, *supra* note 30, at 12,578–82.

264. *See* Editors of Encyclopaedia Britannica, *Jaguar*, *supra* note 2.