

UNLOCKING THE “VIRTUAL CAGE” OF WILDLIFE SURVEILLANCE

HENRY LININGER[†] AND TOM LININGER^{††}

ABSTRACT

The electronic surveillance of wildlife has grown more extensive than ever. For instance, thousands of wolves wear collars transmitting signals to wildlife biologists. Some collars inject wolves with tranquilizers that allow for their immediate capture if they stray outside of the boundaries set by anthropocentric management policies. Hunters have intercepted the signals from surveillance collars and have used this information to track and slaughter the animals. While the ostensible reason for the surveillance programs is to facilitate the peaceful coexistence of humanity and wildlife, the reality is less benign—an outdoor version of Bentham’s Panopticon.

This Article reconceptualizes the enterprise of wildlife surveillance. Without suggesting that animals have standing to assert constitutional rights, the Article posits a public interest in protecting the privacy of wildlife. The very notion of wildness implies privacy. The law already protects the bodily integrity of animals to some degree, and a protected zone of privacy is penumbral to this core protection, much the same way that human privacy emanates from narrower guarantees against government intrusion.

Policy implications follow that are akin to the rules under the Fourth Amendment limiting the government’s encroachment on human privacy. Just as the police cannot install a wiretap without demonstrating a particularized investigative need for which all less intrusive methods would be insufficient, so too should surveillance of wildlife necessitate a specific showing of urgency. A detached, neutral authority should review all applications for electronic monitoring of wildlife. Violations of the rules should result in substantial sanctions. The Article concludes

Copyright © 2017 Henry Lininger & Tom Lininger.

[†] Primary author. This article is based on the affirmative case that I ran on the national debate circuit in 2016.

^{††} Orlando J. and Marian H. Hollis Professor, University of Oregon School of Law. My role was to explain legal concepts, edit and help with the footnotes for this article.

by considering—and refuting—foreseeable objections to heightened requirements for the surveillance of wildlife.

TABLE OF CONTENTS

Introduction	208
I. Increasing Use of Surveillance Collars.....	214
II. Harms Caused by Collars.....	220
A. Harms to Collared Wolves.....	221
B. Other Harms	229
III. Inadequacy of Current Regulation.....	233
IV. Toward a Conception of Wildlife Privacy.....	240
A. Privacy as Integral to Animal Welfare	242
B. Privacy as Legally Cognizable Penumbra.....	246
V. Borrowing Requirements for Infringement of Human Privacy...	249
A. Balancing of Particularized Need vs. Privacy Interest.....	251
B. Consideration of Less Intrusive Alternatives.....	252
C. Minimization	253
D. Review by Neutral, Detached Authority	254
E. Return and Inventory.....	255
F. Separate Regulation of Restraint on Movement	256
G. Prohibition of Lethal Measures Absent Exigency	256
H. Sanctions for Noncompliance	257
VI. Responses to Foreseeable Objections.....	258
Conclusion.....	262

INTRODUCTION

What distinguishes wildlife from other forms of life? The *sine qua non* of wildlife is freedom from domination. To be sure, humans are capable of subjugating animals in a variety of ways. But when a human exercises dominion over an animal, the animal is no longer “wild” in any meaningful sense.¹ Wildness is what separates an autonomous creature in nature from a house cat or a dairy cow.

1. Martin Drenthen, a professor of environmental philosophy in the Netherlands, uses the term “wild” to describe “species that have their own agency, that cannot fully be controlled.” Martin Drenthen, *The Return of the Wild in the Anthropocene: Wolf Resurgence in the Netherlands*, 18 *ETHICS, POL’Y & ENVT.* 318, 318–19 (2015) (discussing human reaction to the return of wild wolves in the Netherlands); accord Reed Elizabeth Loder, *Toward Reconciling Environmental and Animal Ethics: Northeast Wolf Reintroduction*, 10 *J. ANIMAL & NATURAL RESOURCE LAW* 95, 127 (2014) (“Something wild is largely free of human control and able to carry out the activities suited to its nature relatively unimpeded.”).

One clear line of demarcation is freedom of movement. Wild animals are free to roam. Animals in cages or enclosures lack this freedom. The constraint of their movement extinguishes their wildness. An altruistic reason for the constraint does not change the fact of captivity.² Zoos are to wildness what prisons are to freedom.³

A more difficult question of taxonomy has arisen since humans started affixing surveillance devices to wild animals. According to Professor Etienne Benson at the University of Pennsylvania, “American wildlife biologists incorporated Cold War-era surveillance technologies into their practices in order to render wild animals and their habitats legible and manageable.”⁴ Among other strategies, biologists have trapped wild animals and outfitted them with telemetry collars.⁵ The collars have grown more sophisticated over time and now collect extensive data about metabolic changes as well as movement.⁶ Animals wearing these collars cannot escape the watchful eyes of their monitors.⁷ Over 10,000 creatures currently wear electronic transmitters of some sort.⁸

2. Richard Posner, *Animal Rights*, 110 YALE L. J. 527, 539 (2001) (suggesting that even when the enclosure of an animal amounts to “protective custody,” it is still “the antithesis of freedom.”).

3. Holly Doremus, *Biodiversity and the Challenge of Saving the Ordinary*, 38 IDAHO L. REV. 325, 338 (2002) (arguing that by confining animals in zoos or their functional equivalents, we are “giving up the wildness of nature and the ability of species to pursue their own evolutionary destiny.”).

4. Etienne Benson, *The Wired Wilderness: Electronic Surveillance and Environmental Values in Wildlife Biology*, PhD dissertation at MIT, 2 (2008) (tracing the evolution of wildlife surveillance in the U.S. and around the world). Benson’s thesis evolved into a book, *WIRED WILDERNESS: TECHNOLOGIES OF TRACKING AND THE MAKING OF MODERN WILDLIFE 2* (Johns Hopkins University Press 2010).

5. Caleb Price, *SMART Collars Reveal the Hidden Lives of Wolves*, U.S. NATIONAL PARK SERVICE (2015), www.nps.gov/articles/denali-smart-collars.htm (last accessed on July 7, 2016).

6. *Id.* (“The SMART (Species Movement, Acceleration, and Radio Tracking) collar . . . simultaneously measures the geographic location, behavior, and physiology of the animal wearing it.”); Bethany Augiliere, *Beyond GPS: The Next High-Tech Frontier in Wild Animal Tracking*, SCIENTIFIC AMERICAN, Dec. 30, 2015 (noting that these sophisticated collars keep track of all wolves’ activities). Biology Professor Terri Williams at U.C. Santa Cruz explained to the New York Times that the collars allow biologists to monitor all aspects of the animals’ daily routine. Kirk Johnson, ‘Smart Collar’ in the Works to Manage Wildlife Better, N.Y. TIMES, Aug. 30, 2011 (“What you end up with is a diary for the animal, a 24-hour diary that says he spent this much time sleeping, and we know from the GPS where that was . . . Then he woke up and went for a walk over here. He caught something over here. He ate something and we know what it was because the signatures we get for a deer kill vs. a rabbit kill are very different.”).

7. See Kirk Johnson, ‘Smart Collar’ in the Works to Manage Wildlife Better, N.Y. TIMES, Aug. 30, 2011.

8. According to Professor Terry Tempest Williams, the Tanner Scholar in Environmental

When an animal is subject to unrelenting surveillance of its location, diet and physiological reactions to external stimuli, is the animal still wild? The modern use of surveillance collars—some of which administer tranquilizers⁹ or shocks¹⁰ if animals travel too far—restricts the freedom of animals by “erect[ing] a virtual cage” around them, according to Holly Doremus, a professor of environmental law at Berkeley.¹¹ The surveillance collar itself is a draconian device that French philosopher Gilles Deleuze associated with nightmarish “societies of control.”¹² A New York Times column on the new high-tech strategies for wildlife management described “operations that read like science fiction about humans trapped in a game reserve managed by alien overlords.”¹³ The historical view of animals as soulless, subordinate species¹⁴ might abide such treatment, but the

Humanities at the University of Utah, “[t]ens of thousands of animals in the United States are numbered and scanned, then monitored through biological surveillance.” TERRY TEMPEST WILLIAMS, *FINDING BEAUTY IN A BROKEN WORLD* 113 (Vintage 2009).

9. Holly Doremus, *Restoring Endangered Species: The Importance of Being Wild*, 23 HARV. ENV'T'L L. REV. 1, 60 (1999) (reporting that U.S. Department of Interior “routinely installs monitoring devices such as radio-equipped collars on reintroduced animals, monitoring the population to ensure that it stays within a designated area . . . Interior agreed to fit the wolves with ‘capture collars’ designed to deliver a sedative dose in response to a radio signal”); see also INTERNATIONAL WOLF CENTER, www.wolf.org/programs/educator-resources-wolf-link/track-wild-wolves/ (last accessed July 7, 2016) (“These special radio collars can also be equipped with darts holding a tranquilizer, which can be triggered from a distance. This allows researchers to easily recapture an animal.”).

10. Candace Gaukel Andrews, a columnist for the World Wildlife Fund, has reported that wildlife managers have designed wolf collars that can give painful shocks if the wolves stray outside of approved areas. Candace Gaukel Andrews, *Traditional Tracking vs. Electronic Surveillance: Has Wildlife Management Become Too High-Tech?*, April 2, 2013, www.goodnature.nathab.com/traditional-tracking-vs.-electronic-surveillance-has-wildlife-research-become-too-high-tech/ (last accessed on July 7, 2016) (“But wildlife radio tracking has created concerns as well as capabilities; it has provided opportunities for connection as well as for control. It’s been reported, for instance, that shock collars have been tested on wolves. When the wolves tried to roam beyond a fence of sensors controlled by satellite, they were shocked.”).

11. Doremus, *supra* note 9, at 60 (“These direct control measures erect a virtual cage around the animals, converting them from wild creatures into semidomesticated ones.”).

12. Gilles Deleuze, *Postscript on the Societies of Control*, OCTOBER 3, 7 (Winter 1992) (“The conception of a control mechanism, giving the position of any element within an open environment at any given instant (whether animal in a reserve or human in a corporation, as with an electronic collar), is not necessarily one of science fiction.”).

13. Daniel Duane, *The Unnatural Kingdom: If Technology Helps Us Save the Wilderness, Will the Wilderness Be Wild?*, N.Y. TIMES, Mar. 11, 2016 (describing wildlife management strategy involving surveillance collars and forced movement).

14. See, e.g., IMMANUEL KANT, *LECTURES ON ETHICS*, Louis Infield, trans., 239 (The Century Co. 1930) (“Animals are not self-conscious and are there merely as a means to an end. That end is man.”) Kant could tolerate cruel practices such as vivisection because of they are valuable to man. “Vivisectionists, who use living animals for the experiments, certainly act

modern naturalist despairs at the sight of a wild creature encumbered by a bulky radio transmitter.¹⁵

Although we intuitively sense that fastening spy gear to an animal’s neck is incongruous with wildness,¹⁶ virtually no scholarship has proposed a doctrine of wildlife privacy. A few authors have lamented the lack of wildlife privacy without suggesting any new rules to address the problem.¹⁷ In fact, to the extent that legal scholars¹⁸ and animal researchers¹⁹ have considered the topic of privacy in the great

cruelly, although their aim is praiseworthy, and they can justify their cruelty, since animals must be regarded as man’s instruments.” *Id.*

15. See Williams, *supra* note 8, at 113 (describing birds “burdened by radio collars dangling around their long, thin necks”).

16. National Park Service, Wolf Monitoring 1986-2014. Denali National Park & Preserve, <https://www.nps.gov/articles/denali-wolf-monitoring.htm> (last visited July 7, 2016) (“So, how exactly can a collar measure metabolic costs of wolf activities in the wilds of Denali? The answer is surprisingly anything but wild.”).

17. See, e.g., WILLIAMS, *supra* note 8, at 113 (offering no policy proposals, but raising the question, “If wildlife is tagged, painted and weighed with transmitters, do the animals become less wild?”); Duane, *supra* note 13 (indicating that “I would miss the unmanipulated wild if it entirely disappeared,” but offering no suggestions for new rules) Brandon Keim, *Should Animals Have a Right to Privacy?*, BACKCHANNEL Jan. 25, 2016, www.backchannel.com/should-animals-have-a-right-to-privacy-ddce06d1a094#j14c0js8s (last accessed on July 7, 2016) (“How might animal privacy become a legal right rather than a cultural custom? Should it? I don’t know. These are complicated questions.”); Brett Mills, *Why We Should Consider the Privacy of Animals*, THE GUARDIAN, Apr. 30, 2010 (criticizing intrusiveness of wildlife documentaries and “wondering whether it’s appropriate to think about” animals’ privacy).

18. E.g., Ed Haden & Adam Israel, *The Fourth Amendment, Game Wardens, and Hunters*, 46 CUMB. L. REV. 79 (2015–16) (urging that game wardens should be subject to stricter Fourth Amendment standards when they search hunters); Katerina Kuh, *Environmental Privacy*, 2015 UTAH L. REV. 1 (2015) (arguing that hunters and other humans causing environmental harm should not be able to invoke privacy protections in order to prevent government surveillance of these activities); Bryan Mull, *The Hidden Cost of Rod and Rifle: Why State Fish and Game Laws Must Be Amended in Order to Protect Against Unreasonable Search and Seizure in the Great Outdoors*, 42 U. BALT. L. REV. 801 (2013) (contending that anglers and hunters need stronger protection from searches by officials enforcing fish and game laws); Edwin Butterfoss and Joseph Day, *State v. Colosimo: Minnesota Anglers’ Freedom from Unreasonable Searches and Seizures Becomes “The One That Got Away,”* 31 WM. MITCHELL L. REV. 527 (2004) (criticizing decision by Minnesota Supreme Court that allowed fish and game officers wide latitude to search fishing vessels); Donald Douglas, *A Comment on Louisiana Wildlife Agents and Probable Cause: Are Random Game Checks Constitutional?*, 53 LA. L. REV. 525 (1992) (analyzing whether hunters may assert constitutional rights when wildlife agents conduct searches without probable cause).

19. The ethical guidelines for animal researchers virtually never make reference to the privacy of animals. When a guideline calls for the protection of privacy in field research involving animals, chances are that the guideline is referring to the privacy of humans who live near the animals. See, e.g., AMERICAN PSYCHOLOGICAL ASSOCIATION, GUIDELINES FOR ETHICAL CONDUCT IN THE CARE AND USE OF NONHUMAN ANIMALS IN RESEARCH, Feb. 24, 2012, www.apa.org/science/leadership/care/guidelines.aspx. The following language appears under the heading “Field Research”: “Research in populated areas must be done with respect for the

outdoors, they have generally focused on the privacy of humans, not animals.²⁰ The time has come to make wildlife the focus of a discussion about privacy in the wilderness.

This Article suggests that nonhuman species deserve some degree of privacy. Rather than attempt to extend a constitutional privacy right to wildlife, this Article conceives of privacy as a penumbra of the current statutory scheme protecting the welfare of wild animals. As the Supreme Court famously determined in *Griswold v. Connecticut*, humans derive their privacy rights from a penumbra of other rights enumerated in the Constitution.²¹ If a constitutional penumbra is an adequate basis for human privacy, perhaps a statutory penumbra could support a limited notion of privacy for wild animals.

How can a doctrine of wildlife privacy help to regulate the use of surveillance collars on animals? Imputing privacy to animals presents the opportunity to import a basic version of the familiar privacy-based regulations that govern searches and seizures in the context of criminal investigations. Of course, these rules should not be as strict as their counterparts under the Fourth Amendment, but they should cover some of the same ground: demanding a particularized showing of need for surveillance, requiring insufficiency of less intrusive alternatives, limiting the scope and duration of surveillance, mandating review of applications by a neutral third party, requiring separate authorization and a higher level of urgency for seizures or lethal measures, and sanctioning noncompliance with meaningful penalties.²²

A wide-ranging discussion of wildlife privacy and its application to all species in all locations would be too expansive to engage in here. Instead, this Article will develop its argument by focusing on one species, the gray wolf. No mammal in the United States has evoked stronger feelings of loathing—and, more recently in certain circles, admiration—than the wolf.²³ Wildlife managers have collared

property and privacy or the inhabitants of the area.” While this sentence does not refer explicitly to humans, the context makes clear that humans are the focus: only humans own property.

20. Even wildlife advocacy groups seem to associate privacy more with humans than with wildlife. A Google search on June 6, 2016 using the words *wildlife*, *privacy* and *policy* did not turn up proposals to protect the privacy of wildlife, but did yield a long list of links to web pages in which conservation groups promised not to disclose information about their human donors.

21. 381 U.S. 479 (1965).

22. See, e.g., *id.*

23. Tom Murphy, EARTHJUSTICE, July 22, 2015, <http://earthjustice.org/blog/> (“People either love [wolves] or hate them.”).

thousands of wolves,²⁴ and while the resulting surveillance has helped the wolves’ recovery in some respects, it has also caused serious hardships ranging from loss of privacy to death.²⁵

The topic of surveillance collars on wolves has become particularly urgent in light of a recently approved amendment by the U.S. House of Representatives that would end all federal funding for wolf conservation.²⁶ The purpose of the legislation is to give states most of the responsibility for monitoring wolves with collars.²⁷ Some state officials have declared that they intend to track down and shoot most wolves within their jurisdictions.²⁸ For example, state officials in Alaska and Idaho seem to kill wolves whenever the opportunity arises, and surveillance collars make this task easier.²⁹ Sometimes the states’ hunters collar a “Judas wolf” that leads them back to its pack; the

24. For a breakdown showing total collared wolves by jurisdiction, see *infra*, Part I.

25. For a list of potential harms relating to collaring, see *infra*, Part II.

26. Associated Press, *Plan for Federal Wolf Delisting Clears House*, N.Y. TIMES, July 15, 2016 (reporting that delisting would take effect in 2017). The momentum for such legislation will be stronger under the new Trump Administration, according to Amaroq Weiss, a former attorney with the Center for Biological Diversity. Amaroq Weiss, *Can California’s Wolves Survive Trump’s America?*, SACRAMENTO BEE, Dec. 22, 2016.

27. Hillary Corrigan, *Gray Wolf Listing Targeted in Amendment to Funding Bill*, BEND BULLETIN, July 15, 2016 (noting that House amendment would give states control over wolves).

28. Jim Robbins, *For Wolves, A Recovery May Not Be the Blessing It Seems*, N.Y. TIMES, Feb. 6, 2007 (reporting that Idaho governor planned to reduce the state’s wolf population from 650 to 100, and he said that, “I’m prepared to bid for that first ticket to shoot a wolf myself”); see *Idaho Lawmakers Approve Spending \$400,000 to Kill Wolves*, www.localnews8.com, Mar. 8, 2016 (Idaho killed 78 wolves in 2015, and Idaho’s legislature appropriated \$400,000 to kill more in the future); Krista Lanlois, *Wolf Wars: Alaska’s Republican Governors Find Vicious Ways to Kill Predators and Mark Their Territory with the Feds*, SLATE, Oct. 31, 2014 (noting that a succession of Alaska governors vowed to reduce wolf populations).

29. Ken Fischman, *A Modest Proposal: One Solution to Idaho’s Wolf Problem*, BOISE WEEKLY, Jan. 13, 2016 (discussing wolf advocates’ criticism that “radio-collaring wolf pups will enable agents to more easily track and find wolves in order to kill” them); Tim Preso, *Idaho Breaks Agreement Using Helicopter Drops to Collar Wolves in Frank Church Wilderness*, Earthjustice, Jan. 13, 2016, <http://earthjustice.org/news/press/2016/idaho-breaks-agreement-using-helicopter-drops-to-collar-wolves-in-frank-church-wilderness> (“There is every reason to believe that these new wolf collars will be used by a state trapper to locate wolves for the purpose of killing them.”); Opening Brief of Plaintiffs-Appellees, *Alliance for the Wild Rockies v. Salazar*, 2011 WL 6980674 *28 (9th Cir. Sept. 8, 2011) (indicating that in Idaho, “[s]ome of the wolves killed via aerial gunning by state agents are being tracked by radio collars initially implemented for the purpose of scientific research.”); cf. Corbin Hiar, *NPS Abandons Study After Alaska Shoots Research Animals*, ENVT. & ENERGY NEWS, Aug. 8, 2016 (“The state of Alaska has gunned down so many radio-collared wolves outside the Yukon-Charley Rivers National Preserve that the National Park Service has abandoned a 23-year-old study of the predators.”).

collared wolf then watches the hunters kill its entire pack but is spared so the hunters can slaughter the next pack that it joins.³⁰

The argument for wildlife privacy will proceed in several analytical steps. Part I will discuss the increasing use of telemetry collars to monitor wolves. Part II will analyze how this surveillance harms wolves. Part III will survey the government's current regulation of wolf surveillance. Part IV will propose a new doctrine of wildlife privacy. Part V will explore the policy implications of the privacy-based model, and will advocate the importation of certain Fourth Amendment principles to the context of wildlife surveillance. Part VI will consider foreseeable objections to this Article's arguments and proposals.

I. INCREASING USE OF SURVEILLANCE COLLARS

Telemetry collars came into widespread use as part of the initiative to reintroduce gray wolves in the United States. Before the arrival of Europeans in North America, gray wolves numbered in the hundreds of thousands.³¹ Settlers spread west and wiped out entire wolf populations.³² By the 1930s, the gray wolf had nearly disappeared from forty-eight states.³³ In the 1980s, the Department of the Interior ("DOI") launched a program to transplant gray wolves from Canada into the Northern Rocky Mountain region of the United States.³⁴ Proponents of this plan sought to mollify critics by classifying the relocated wolves as an "experimental, nonessential population" under

30. Cathy Taibbi, *USDA-Collared "Judas Wolves" Used Over and Over to Lead Killers to Their Families*, *TIMBER WOLF INFORMATION NETWORK*, Feb. 26, 2016 <http://www.timberwolfinformation.org/usda-collared-judas-wolves-used-over-and-over-to-lead-killers-to-their-families/> (discussing Idaho officials' use of Judas wolf); Hiar, *supra* note 29 (reporting Alaska's use of Judas wolves).

31. Julie Thrower, *Ranching with Wolves: Reducing Conflicts between Livestock and Wolves through Integrated Grazing and Wolf Management Plans*, 29 *J. LAND RESOURCES & ENVTL. L.* 319, 319 (2009) (estimating that there were over 200,000 wolves in the grasslands and plains of North America before Europeans arrived on this continent).

32. Professor Jon Coleman at Notre Dame has chronicled how European settlers and their descendants zealously exterminated wolves. *JON COLEMAN, VICIOUS: WOLVES AND MEN IN AMERICA* (2004).

33. W. Ryan Stephens, *Gray Wolf Rising: Why the Clash over Wolf Management in the Northern Rockies Calls for Congressional Action to Define "Recover" under the Endangered Species Act*, 36 *WM. & MARY ENVTL. L. & POL'Y REV.* 917, 919 (2012) (explaining that the wolf "had nearly been eradicated throughout the lower forty-eight states by the 1930s," except for small populations in northern Michigan and Minnesota).

34. Emily Cowan Brown, *The "Wholly Separate" Truth: Did the Yellowstone Wolf Reintroduction Violate Section 10(J) of the Endangered Species Act*, 27 *B.C. ENVTL. AFF. L. REV.* 425, 436-41 (2000) (summarizing the steps taken by the Department of the Interior, and the Fish and Wildlife Service in particular, to reintroduce the gray wolf in the United States).

Section 10(j) of the Endangered Species Act.³⁵ This classification made it easier to kill wolves whenever there were conflicts with humans and livestock.³⁶ Some observers have lamented the designation because it seems paradoxical. How could gray wolves be both important and expendable?³⁷

DOI directed wildlife managers to devise a strategy for keeping track of the reintroduced wolves.³⁸ DOI’s regulations indicated that surveillance collars were one possible means of monitoring.³⁹ Wildlife managers began using the collars for three purposes. First, the collars provided a wealth of information about the wolves including their numbers, range, predation, and habits.⁴⁰ Second, the collars helped the managers keep wolves away from livestock and human communities.⁴¹ Third, the data from the collars allowed the wildlife managers to promote certain wolves as celebrities, drawing a large following on the internet⁴² and fueling a multi-million dollar tourist industry in and around national parks.⁴³

35. Ted Williams, *Should Wolves Stay Protected Under the Endangered Species Act?*, YALE ENVT. 360, July 18, 2013, http://e360.yale.edu/features/should_wolves_stay_protected_under_endangered_species_act (recounting political circumstances at this time and arguing that if the Department of the Interior had not been willing to use this special designation for the reintroduced wolf population, “wolf recovery was impossible”).

36. *Id.*

37. Kieran Suckling, executive director of the Center for Biological Diversity, indicated that the status is risky for the gray wolves because “we have maximum discretion to kill them” and “we have few to no long-term commitments about the management of these populations.” (quoted in IRUS BRAVERMAN, *WILD LIFE: THE INSTITUTION OF NATURE* 164 (2015)).

38. 50 CFR § 17.84 (2015). (“The reintroduced wolves will be monitored during the life of the project.”).

39. *Id.* (mentioning “the use of radio telemetry” as a way to monitor the reintroduced wolves).

40. See Thomas Meier et. al, *Tracking the Movement of Denali’s Wolves*, NATIONAL PARK SERVICE, (last visited Mar. 8, 2017), <https://www.nps.gov/articles/aps-v5-i1-c8.htm>.

41. Doremus, *supra* note 7, at 60 (discussing how wildlife officials have used surveillance collars to minimize conflicts between wolves and humans; if the collars indicate that wolves have gone outside of the approved areas, managers tranquilize and move them).

42. Associated Press, *New Website Maps Celebrity Wolf OR-7’s Travels*, OREGON LIVE (Jan. 13, 2012), http://www.oregonlive.com/pacific-northwest-news/index.ssf/2012/01/new_website_maps_celebrity_wol.html (“People interested in the far-flung wanderings of Oregon’s celebrity wolf, OR-7, can keep up with his progress on a new website.”).

43. Stephens, *supra* note 30, at 944 (“wolves add an estimated thirty-five million dollars to the Yellowstone region’s economy from the tens of thousands of tourists who come to watch them.”).

The use of surveillance collars came to pervade virtually the entire wolf habitat in the United States.⁴⁴ A conservative estimate is that wildlife managers have attached surveillance collars to thousands of wolves.⁴⁵ Areas with large populations of collared wolves include Denali National Park,⁴⁶ Yellowstone National Park,⁴⁷ Arizona,⁴⁸ Idaho,⁴⁹ Michigan,⁵⁰ Minnesota,⁵¹ Montana,⁵² New Mexico,⁵³ North

44. ROBERT BUSCH, *THE WOLF ALMANAC, NEW AND REVISED: A CELEBRATION OF WOLVES AND THEIR WORLD* 216 (2007) (“In fact, for the past three decades, collar-crazy biologists have swarmed over most of the wolf’s north American habitat.”).

45. NATIONAL PARK SERVICE, *Wolf Information Continued*, <https://www.nps.gov/yell/learn/nature/wolfinfo.htm> (explaining that in Yellowstone alone “US Fish and Wildlife Service in 2013 estimated about 1,592 wolves and 71 breeding pairs in the Northern Rocky Mountain Distinct Population Segment including areas of Idaho, Montana, and Wyoming.”).

46. NATIONAL PARK SERVICE, *WOLF MONITORING 1986-2014* (2014) (“More than 400 wolves have been captured and collared” in Denali National Park alone.).

47. See Gordon Hunt, *Meet Doug, the wolf watcher of Yellowstone National Park*, (July 8, 2015), <https://www.siliconrepublic.com/discovery/meet-doug-smith-wolf-watcher-yellowstone-national-park> (explaining Doug Smith’s role in “[t]racking the 100 wild wolves incessantly, his team collar up to 20 a year, keeping tabs on the animals’ movement, hunting habits, pack traits, biology and disease.”).

48. Mexican Wolf Interagency Field Team, *Monthly Status Report*, (May 20, 2016), <http://www.mexicanwolves.org/index.php/news/1648/51/mexican-wolf-reintroduction-%20project-news> (“At the end of April 2016, the wild Mexican wolf population consisted of 53 wolves with functional radio collars,” some of which were in Arizona and some in New Mexico).

49. See John O’Connell, *Biologist changing way wolves are tracked*, CAPITAL PRESS, Dec. 4, 2015, 11:51 AM), <http://www.capitalpress.com/Livestock/20151204/biologist-changing-way-wolves-are-tracked> (explaining that “There are currently 88 collared wolves in Idaho.”).

50. Keith Creagh, *Michigan Wolf Management Program*, MICHIGAN DEPARTMENT OF NATURAL RESOURCES (Jun 11, 2015), http://www.michigan.gov/documents/dnr/wolf_management_plan_492568_7.pdf.

51. Website of International Wolf Center, *Track Wild Wolves*, INTERNATIONAL WOLF CENTER, <http://www.wolf.org/programs/educator-resources-wolf-link/track-wild-wolves/> (last visited on July 11, 2016) (explaining “[m]ore than 700 wolves have been tracked in northern Minnesota. . .”).

52. Montana Department of Fish, Wildlife and Parks, *Montana Gray Wolf Conservation and Management 2015 Annual Report* 14 (Mar. 26, 2016), <http://fwp.mt.gov/fishandwildlife/management/wolf/> (last visited on July 11, 2016) (indicating that in 2015, state officials monitored “[f]ifty radio-collared wolves in 32 packs.”).

53. Mexican Wolf Interagency Field Team, *Monthly Status Report*, (May 20, 2016), <http://www.mexicanwolves.org/index.php/news/1648/51/mexican-wolf-reintroduction-%20project-news> (“At the end of April 2016, the wild Mexican wolf population consisted of 53 wolves with functional radio collars,” some of which were in Arizona and some in New Mexico).

Carolina,⁵⁴ Oregon,⁵⁵ Washington, and Wyoming.⁵⁶ Some wildlife managers aspire to monitor every pack within their territorial jurisdiction by collaring at least one wolf per pack.⁵⁷ In other words, we may be approaching a time in which every wolf in the U.S. is under direct or indirect surveillance. The number of wolves wearing collars continues to increase in part due to the increasing population of wolves⁵⁸ as well as the declining cost of collars.⁵⁹

The technology of the collars has advanced rapidly over the years. The earliest versions of the collars emitted VHF signals that managers could monitor with receivers as long as they were in range.⁶⁰ Newer collars use GPS technology, which allows for monitoring from a remote location.⁶¹ In recent years, researchers have devised an array of sensors for the collars that measure various metabolic functions⁶² so as to provide a “daily diary” of the wolves’ activities.⁶³ Researchers can use

54. Bruce Sicheloff, *Conservations protest as red wolf numbers fall*, Charlotte News and Observer (Apr. 2, 2016), <http://www.newsobserver.com/news/local/article69609417.htm> (explaining that “there are nearly 40 collared wolves” in North Carolina).

55. See Oregon Department of Fish and Wildlife, *Oregon Wolf Conservation and Management 2015 Annual Report 2* (Mar. 18, 2016), dfw.state.or.us/wolves/docs/oregon_wolf_program/2015-annual-wolf-report-3-18-16-FINAL.pdf (last visited on July 11, 2016) (explaining “throughout the year as many as 21 GPS radio-collared wolves were monitored”).

56. See Wyoming Game and Fishing Department, *Wyoming Gray Wolf Population Monitoring and Management Interim Report*, (Jan. 1 2014), https://www.fws.gov/mountain-prairie/es/species/mammals/wolf/annualrpt14/2014_Wyoming_Annual_Report.pdf (noting that “[s]eventy radio-collared wolves . . . were being monitored in Wyoming.”).

57. See, e.g., Ann McCreary, *Loup Loup pack wolves fitted with radio collars for monitoring*, METHOW VALLEY NEWS (July 8, 2016), <http://methowvalleynews.com/2016/05/26/lo-up-loup-pack-wolves-fitted-with-radio-collars-for-monitoring/> (explaining “[s]tate wildlife officials are working to capture and place radio collars on at least wolf in every pack in order to monitor the pack’s activities.”).

58. Alex Sakariassen, *Collaring the Wild*, MISSOULA INDEPENDENT, Sept. 11, 2014 (noting “the wolf population—and, subsequently, the number of collars in the wild—has increased.”).

59. See Merritt Clifton, *Field Mortalities in Wildlife Research: It’s Time for a Conversation*, ANIMALS 24-7 (Aug. 13, 2014), <http://www.animals24-7.org/2014/08/13/field-mortalities-in-wildlife-research-its-time-for-a-conversation/> (explaining “[r]adio-tracking technology has improved [in the last few years]—and the price of the needed equipment has plummeted, enabling more and more researchers to tag more and more animals.”).

60. VHF signals are radio frequencies that can only travel a limited distance. See DAVID MECH, *A CRITIQUE OF WILDLIFE RADIO-TRACKING AND ITS USE IN NATIONAL PARKS: A REPORT TO THE U.S. NATIONAL PARK SERVICE 11-20* (2002), <http://npshistory.com/publications/wildlife/radio-tracking-2002.pdf> (providing a detailed discussion of VHF radio collars).

61. *Id.* at 23–29 (discussing GPS telemetry and contrasting it with older VHS system).

62. Price, *supra* note 7 (“The SMART (Species Movement, Acceleration, and Radio Tracking) collar . . . simultaneously measures the geographic location, behavior, and physiology of the animal wearing it.”).

63. Johnson, *supra* note 5 (quoting biology professor Terri Williams at U.C. Santa Cruz, who

the collars to monitor when, how and where the wolves eat, socialize, mate, and interact with their pups.⁶⁴ The new collars also have features designed to control wolves in a manner that exemplifies Foucauldian biopower.⁶⁵ Some collars can inject wolves with tranquilizer darts⁶⁶ while others are capable of administering painful shocks.⁶⁷ Wildlife managers can use these features to keep wolves from crossing certain boundaries in management areas.⁶⁸ The degree of control exerted by modern collars is so great that one conservationist facetiously suggested wildlife managers should devise a collar to detect the odor of livestock and inject wolves with poison if they come too near this forbidden prey.⁶⁹

said that, “What you end up with is a diary for the animal, a 24-hour diary that says he spent this much time sleeping, and we know from the GPS where that was . . . Then he woke up and went for a walk over here. He caught something over here. He ate something and we know what it was because the signatures we get for a deer kill vs. a rabbit kill are very different.”); see Bethany Augliere, *Beyond GPS: The Next High-Tech Frontier in Wild Animal Tracking*, SCIENTIFIC AMERICAN, Dec. 30, 2015 (noting that sophisticated collars keep track of all wolves’ activities).

64. See Emily Anthes, *Tracking the Pack*, N.Y. TIMES (Feb. 3, 2013), <http://www.nytimes.com/2013/02/04/opinion/tracking-the-pack.html> (explaining “the use of wildlife tags has proliferated as the devices have become smaller and more powerful . . . Is this particular predator a pack leader or a lone wolf? A dedicated hunter or a mooch? How much time does it spend with its pups? Who are its associates, rivals and mates?”).

65. JACK TURNER, *TRAVELS IN THE GREATER YELLOWSTONE* 58 (St. Martin’s 2009) (“Unfortunately, collaring is also a means of control . . . A collar entails a power relationship. There is nothing wilder than wolves and more symbolic of wildness. To collar a wolf says a lot about our attitude toward the wild”); Sara Rinfret, *Controlling Animals: Power, Foucault, and Species Management*, 22 SOCIETY & NAT. RES. 571, 575 (2009) (applying Foucauldian philosophy in analyzing government’s use of “tracking devices to monitor and modify the movements” of wolves); see Braverman, *supra* note 34, at 13 (“Although Foucault admittedly uses the term ‘biopower’ only to describe the project of governing human bodies populations and life, *Wild Life* joins a growing scholarship that extends the scope of biopolitics to the realm of governing nonhuman animals.”).

66. See MECH, *supra* note 60 (“Researchers locate the animal via telemetry and then signal its collar to fire a dart containing drugs into the animal. The collars are also equipped with a back-up dart. The researchers then follow the signal until the animal is under the effects of the injected drugs.”)

67. See Jason Hawley et al., *Assessment of Shock Collars as Nonlethal Management for Wolves in Wisconsin*, 73 J. WILDLIFE MGMT. 518, 522–23 (2009) (discussing use of shock collars on wolves).

68. Doremus, *supra* note 9, at 60 (reporting use of capture collars to control wolves).

69. Fischman, *supra* note 28 (using in the satirical tone of Jonathan Swift, proposing that wolf collars “be furnished with remote scent detectors and strychnine self-injection devices, which could be adjusted in such a manner that if wolves were to approach domestic livestock within a certain distance (let us say 50 feet), the strychnine injector could be automatically triggered to deliver a lethal dose to the wolf that would kill it within seconds.”).

The use of surveillance collars enjoys strong support in certain circles of wildlife managers and biologists.⁷⁰ To be sure, most of these people have a sincere interest in helping wolves,⁷¹ and they believe that surveillance collars will enhance the wolves’ odds of survival.⁷² But there are many factors that lead to an excessive emphasis on collars. These devices allow humans to “turn nature’s dials” to an unprecedented extent,⁷³ and it is hard to resist the temptation to use such powerful technology.⁷⁴ Professor Etienne Benson wrote that researchers became enamored with radio telemetry: “Wedding Americans’ fascination with the wild to their equally fervent enthusiasm for technology, the rise of radio tracking as the privileged mode of knowing wild animals seemed both ironic and inevitable.”⁷⁵ The radio collar came to epitomize man’s dominion over nature — a gratifying notion for the few who could utilize this equipment.⁷⁶ The technophiles also found that their use of surveillance collars generated ample data that they could present in scholarly journals,⁷⁷ thereby

70. Busch, *supra* note 44 (referring to “collar-crazy biologists” who gather information about wolves); see Zoe Jewell, *Effect of Monitoring Technique on Quality of Conservation Science*, 27 CONSERVATION BIOLOGY 501, 501 (2013) (explaining “[i]n the last few decades, there has been an enthusiastic adoption of invasive techniques for gathering ecological and conservation data.”); *id.* at 505 (decrying the “slavish addiction to GPS telemetry.”).

71. Duane, *supra* note 13 (while disturbing in some respects, the increasing use of technology in the wilderness is well intentioned; “hardworking biologists—thank heaven—use the best tools available to protect whatever wild creatures remain.”); accord Yellowstone Park Foundation, *supra* note 37 (discussing the value of data that wildlife biologists have obtained through their use of collars on wolves).

72. Paul Henson & Kurt Melcher, *Why Wolves Should Continue to Wear Radio Collars*, THE OREGONIAN (Dec. 22, 2014), http://www.oregonlive.com/opinion/index.ssf/2014/12/why_wolves_should_continue_to.html (explaining, for example, Paul Henson, Oregon state supervisor for the U.S. Fish and Wildlife Service, and Kurt Melcher, interim director for the Oregon Department of Fish and Wildlife, made an earnest case to continue the practice of collaring wolves despite criticism of the infringement on wolves’ wildness and privacy).

73. See generally Duane, *supra* note 13 (explaining that the high-tech “infrastructure is proliferating and improving so quickly, thanks to advances in digital technology, that wildlife managers are seizing more and more of nature’s relevant dials—predator and prey alike—and turning those dials to keep nature looking the way we want it to.”).

74. ETIENNE BENSON, WIRED WILDERNESS: TECHNOLOGIES OF TRACKING AND THE MAKING OF MODERN WILDLIFE 2 (2010) (noting that of the various techniques used by biologists to monitor wildlife, none has “inspired so many encomiums to the potential for technology to ‘save nature’ as wildlife radio tracking or radiotelemetry.”).

75. *Id.*

76. *Id.* (referencing a historian who views radio collar as ‘the perfect symbol of our effort to come to terms with out knowledge of nature’s order, our power over it.”).

77. See generally BUSCH, *supra* note 44, at 216 (observing that “the use of radio collars, widely used since 1960s, has now made the wolf a favorite research target.”).

enhancing their professional stature. A large-scale collaring operation could bring in significant grant money as well.⁷⁸ For these reasons, the proponents of surveillance collars continue to rely heavily on this technique, even as critics have raised concerns about potentially detrimental consequences.⁷⁹

II. HARMS CAUSED BY COLLARS

This Part will survey a wide range of possible harms that could result from the use of telemetry collars on wolves. The purpose of this Part is not to argue that the harms of surveillance always outweigh the benefits; on the contrary, there may very well be instances in which the instrumental value of data derived from the collars⁸⁰ justifies any hardship that the surveillance entails.⁸¹ Rather, the point of itemizing

78. TURNER, *supra* note 65, at 58 (mentioning that the collaring of wolves can be “a well funded, open-ended science project for federal, state and academic biologists, and a fresh marketing ploy for conservation foundations.”).

79. See Andrews, *supra* note 10 (“While researchers are aware of the limitations and dangers of telemetry, other factors—such as a seemingly insatiable appetite for new and improved gadgetry—often take precedence.”); Busch, *supra* note 44 (“In the rush to gather data [about wolves], the human aspects of biology are sometimes left behind.”).

80. Some critics have disputed the value of the data obtained through continued use of surveillance collars. Professor Terry Tempest Williams, the Tanner Scholar in Environmental Humanities at the University of Utah, has expressed doubts that further telemetry can add substantially to our understanding of the collared animals’ biology, at least by comparison to other less intrusive surveillance techniques. “I think about the ethics of wild animals being tagged and collared, the grizzlies and wolves of Yellowstone . . . Tens of thousands of animals in the United States are numbered and scanned, then monitored through biological surveillance. What are we learning that we didn’t know? That we couldn’t learn simply by observation?” TERRY TEMPEST WILLIAMS, *FINDING BEAUTY IN A BROKEN WORLD* 113 (2009). Professor Etienne Benson, while noting certain benefits of radiotracking wildlife, also pointed out some of the limitations: “Radiotracking produced large amounts of movement data that could be easily quantified, but that did not necessarily have any connection to the environment in which the movements took place.” Etienne Benson, *Minimal Animal: Surveillance, Simulation and Stochasticity in Wildlife Biology*, 30 *ANTENNAE* 39, 49 (2014); see Susan Rehm-Westoff, *All About Those Collars*, LEGENDS OF LAMAR VALLEY, www.legendoflamarvalley.com/all-about-those-collars/ (last visited on July 12, 2016) (noting the criticism that “we have learned enough about wild wolves and they should now be left to live in peace without the weight of a collar around their neck”); Larry Thorngren, *Yellowstone Researcher Has Collared 759 Wolves*, Nov. 1, 2010, www.thewildphotographer.com/2010/11/yellowstone-wolf-researcher-has.html (criticizing the continued use of wolf collars at Yellowstone National Park because “[a]ny useful information was retrieved years ago and the study is now is more about locating wolves for tourists to watch than for any biological reason” and alleging that “[n]ot one wolf has been helped by the study and 759 Yellowstone wolves have been treated like lab rats.”).

81. It is undeniable that past surveillance of wolves has advanced our understanding of the species and has aided recovery in certain contexts. For example, Doug Smith, leader of the Yellowstone Wolf Project and one of the foremost experts on wolf biology, derived a great deal of his insight into the species by collaring and monitoring hundreds of Yellowstone wolves. See

all the possible deleterious effects is to allow a careful marginal analysis that takes account of harms and benefits for every increment of surveillance.⁸²

The following Subparts will discuss several categories of problems caused by surveillance collars. The collars can harm wolves by inflicting physical injury, reducing privacy, or some combination of the two.⁸³ In addition to the harms that befall wolves, the collaring and segregation of wolves can disrupt entire ecosystems. The mistreatment of wolves can even harm humans, as it fosters a prejudice that has led to victimization of humans who seem to share certain wolf-like characteristics.

A. Harms to Collared Wolves

One of the biggest hazards associated with collaring is the high rate of injury that occurs at the time of capture. Trapping sometimes results in broken bones, lacerations, or even death.⁸⁴ The alternative

Yellowstone Park Foundation, *Collars Are Key to Wolf Studies*, Oct. 19, 2010, <http://www.ypf.org/site/News2?page=NewsArticle&id=5473> (listing various benefits of monitoring wolves with collars); *cf.*, Duane, *supra* note 13 (“There had not been a wolf sighting in California since 1924, so OR-7’s walkabout—and the fact that he wore a collar— was responsible for the listing of gray wolves as a California endangered species.”). The question remains, however, whether each future increment of surveillance is justifiable in a marginal cost-benefit analysis. The fact that past surveillance led to useful discoveries does not necessarily warrant indefinite continuation of surveillance—especially because surveillance of animals by biologists (unlike, say, observation of a particular criminal suspect by police) generally can provide cumulate benefits that apply outside the context of the particular investigation.

82. According to Paul Joslin, director of research at Wolf Haven International, “current technologies for catching them are so traumatic that wolves should not be caught unless there is a reasonable expectation that the results will have some potential positive benefit for the animals involved.” Paul Joslin, *quoted in* Busch, *supra* note 44, at 216 (describing harm to wolves trapped for collaring). One academic has noted the irony that increasing human knowledge of wolves has not necessarily redounded to the benefit of the wolves. COLEMAN, *supra* note 32, at 81 (“Whereas luck once brought humans and wolves together, now pricey gadgets allow people to spy on the elusive beasts. Humans know more about wolves today than at any time in the two species’ eons-long association on this planet. Ironically, this knowledge has accumulated at a low point in this relationship. Human beings learned about wolves at the same time as they pushed the animals to the edge of extinction. Enlightenment and annihilation occurred in tandem.”).

83. Brandon Keim, *Should Animals Have a Right to Privacy?*, BACKCHANNEL (Jan. 25, 2016), www.backchannel.com/should-animals-have-a-right-to-privacy-ddce06d1a094#j14c0js8s (arguing that, for collared animals, “privacy is intertwined with physical protection.”).

84. “Unfortunately, many of the wolves caught for radio-collaring are injured during the trapping process. In one study of 109 wolves live-captured in Minnesota and Alaska from 1969 to 1976, 41 percent had skin lacerations, dislocations, or broken bones because of trap injuries. Almost half (46 percent) had tooth, lip, or gum injuries caused by the wolves’ attempts to chew off the trap.” Busch, *supra* note 44, at 216. Zoe Jewell, an adjunct associate professor at Duke’s Nicholas School of the Environment, has noted that “invasive techniques, relying on capture and

of shooting wolves with tranquilizer darts can also cause injuries because the wounds from the darts can become infected, and the sedatives used in the darts are occasionally toxic.⁸⁵ Ed Bangs, a Forest Service employee who collared a large number of wolves when he supervised the reintroduction in the Northern Rocky Mountain region, estimated that two percent of the captured wolves died.⁸⁶ Even those that survive without physical injury experience lasting psychological effects, as the trauma of capture leads to a phenomenon akin to posttraumatic stress disorder in humans.⁸⁷ Sometimes captured wolves are absent from their packs for a prolonged period,⁸⁸ which can disrupt their socialization.⁸⁹

immobilization for marking or tagging, can negatively impact species in a variety of ways.” Zoe Jewell, quoted in *Using—and Sharing—New Technologies is Key for Conservation*, DUKE TODAY (Oct. 5, 2015), www.today.duke.edu.

85. Don Jenkins, *Capture Leads to Fatal Infection for Washington Wolf*, CAPITAL PRESS (May 10, 2016), <http://www.capitalpress.com/Washington/20160510/capture-leads-to-fatal-infection-for-washington-wolf> (“The breeding female of southeastern Washington’s only wolfpack was found dead of an infection five days after being captured and fitted with a transmitting collar . . . The wolf, a member of the Tuconnan pack, likely picked up the infection from a wound she received while being shot with a dart to immobilize her”); *2 Gray Wolves Die During Annual Government Count*, SANTA FE NEW MEXICAN (Feb. 3, 2016), http://www.santafenewmexican.com/news/briefs/mexican-gray-wolves-die-during-annual-government-count/article_9684f143-e5fe-517b-889d-04245dc145a9.html (reporting two deaths in an operation to capture and collar Mexican gray wolves; one wolf died “within minutes of being darted,” and the other died four days after release).

86. Margaret Guthrie, *Wolf Whistle*, SCIENTIST MAGAZINE (Dec. 1, 2009), www.the-scientist.com/?articles.view/articleNo/27813/title/Wolf-whistle/ (“Ed Bangs, of the U.S. Fish & Wildlife service, who’s in charge of the interagency cooperation on managing the wolf population, estimates that approximately 2 percent of the wolves trapped for radio collaring die from the trauma.”); see Rehm-Westoff, *supra* note 80 (raising concerns about researchers’ reliance on telemetry collars because “several wolves died during the collaring process.”).

87. Joslin, *supra* note 82, at 216 (“some preliminary data to suggest that wolves not only remember what happens to them [during their capture for collaring], but are capable of suffering from post-traumatic stress.”); Rehm-Westoff, *supra* note 80 (noting critics’ “concern for the trauma, both emotionally and physically, that the collaring procedures inflict on the wolves.”); Jay Mallonee & Paul Joslin, *Traumatic Stress Disorder Observed in an Adult Wild Captive Wolf (Canis Lupus)*, 7 J. APPLIED ANIMAL WELFARE SCIENCE 107 (2010) (observing that darting and capture resulted in “symptoms that were similar to those of humans with posttraumatic stress disorder.”); see generally Jewell, *supra* note 70, at 501 (describing “wide-ranging psychological effects of acute and chronic stress” that animals suffer during capture; observing that the “emergency literature on the immediate and longer-term effects of capture and handling procedure indicate that it can no longer be assumed that a wild animal’s survival of the process implies the safety of the procedure.”).

88. *Wyoming v. Livingston*, 443 F.3d 1211, 1214 (10th Cir. 2006) (discussing the process of capture and collaring, which can sometimes take a long time because wildlife officials move the captured wolves to a central location before returning them to their packs).

89. See Jewell, *supra* note 70, at 505 (“Even apparently minor interference in the life of a free-ranging animal can have serious negative effects [T]emporary removal of individuals

The collars themselves can cause significant and ongoing harm to wolves. The size of wolves’ necks may change as they age or their diet varies. Collars that become too restrictive to cause edema or wounds.⁹⁰ Even if the collars continue to fit, they can still harm the wolves by providing a hiding place for ticks⁹¹ and a warm home for mange mites.⁹² The radio signals emitted by surveillance collars might also pose health risks to wolves over time, although there is disagreement among scientists concerning the extent of this hazard.⁹³ Certain types of collars are quite bulky relative to a wolf’s body weight, and this encumbrance causes discomfort that can disrupt the wolf’s behavior.⁹⁴ It is no wonder

from a population can cause social disruption and lead to permanent hierarchical changes, particularly in social animals such as wolves.”) (internal citations omitted).

90. Zoe Jewell, a researcher affiliated with Duke University, made the following comment on ResearchGate, an online community of researchers: “A collar that is comfortable on fitting can quickly change fit with the condition of the animal and become too tight causing peripheral oedema and/or wounding.” *What is the Optimal Way of Putting a Collar Around an Animal’s Neck?*, RESEARCHGATE.NET (May 19, 2015), https://www.researchgate.net/post/What_is_the_optimal_way_of_putting_a_collar_around_an_animals_neck.

91. The ethical guidelines for radio tracking in Australia note that, “[i]n areas where ticks occur, care should be taken in using collars as they may prevent the animal from grooming normally and removing the tick.” *Radio Tracking Wildlife Research*, ANIMAL ETHICS INFOLINK, www.animaethics.org.au/policies-and-guideliens/wildlife-research/radio-tracking (last visited July 11, 2016) (indicating that “alternatives to collars should be used” in these areas). Cf. Andrews, *supra* note 10 (indicating that surveillance collars inhibit howler monkeys’ grooming and removal of small pests from their fur).

92. *Nowhere to Hide...The Intrusive Collaring of Wolves*, HOWLING FOR JUSTICE: BLOGGING FOR THE GRAY WOLF (Nov. 14, 2010), <https://howlingforjustice.wordpress.com/tag/sarcoptic-mange/> (“Another adverse effect of collaring [wolves] is the dreaded mange mite. It finds a warm home under their collars, which can torment wolves who are infested with the pest, causing itching and distress, leading to further deterioration of their condition.”); Paul Cross, *Effects of Sarcoptic Mange on Gray Wolves in Yellowstone Park*, U.S. GEOLOGICAL SURVEY, www.usgs.gov/centers/norock/science/effects-sarcoptic-mange-gray-wolves-yellowstone-national-park (last visited on July 12, 2016) (“Sarcoptic mange is a highly contagious canine skin disease . . . which eventually lead to death.”); see also Paul Cross et al., *Energetic Costs of Mange in Wolves Estimated from Infrared Thermography*, 97 *ECOLOGY* 1938 (2016) (explaining how mange infection causes heat loss, reduce movement, and change predation by wolves because they are losing energy so rapidly).

93. See *Microwaves, Radio Waves, and Other Types of Radiofrequency Radiation*, AMERICAN CANCER SOCIETY (May 31, 2016), www.cancer.org/cancer/cancercauses/radiationexposureandcancer/radiofrequency-radiation (noting that International Agency for Research on Cancer has identified RF exposure as a possible carcinogen, but observing that the U.S. Environmental Protection Agency and the U.S. National Toxicology Program have not yet formally classified RF radiation as to its cancer-causing potential).

94. According to Jewell, “Even mild discomfort [attributable to a surveillance collar] can distort behavior.” Jewell, *supra* note 90.

that wolves try to chew off their collars and free themselves of this menace.⁹⁵

A different set of harms arises when wildlife managers use surveillance collars to confine wolves within a particular area. Genetically programmed to roam great distances as they pursue prey or escape predation, wolves are nomadic by nature.⁹⁶ Their territory can extend for hundreds of miles.⁹⁷ Surveillance collars provide a means of controlling wolves' movements⁹⁸ and substantially reducing their territory.⁹⁹ Managers who monitor the collars' transmissions can track down and recapture wolves that have strayed too far. Some collars even administer shocks¹⁰⁰ or tranquilizers¹⁰¹ to prevent wolves from leaving their approved areas.¹⁰² New York Times columnist John

95. *Wolves near Idaho City Learn to Chew off Radio Collars*, WOLF SAGA (July 27, 2006), <http://wolfsaga.blogspot.com/2006/07/wolves-near-idaho-city-learn-to-chew.html>. (reporting that wolves have “found a way to chew off their radio collars.”); see Andrews, *supra* note 10 (reporting that howler monkeys also tried to extricate themselves from their surveillance collars).

96. According to David Mech, a senior research scientist employed by the U.S. Geological Survey, “wolves are nomadic for about half the year, after their pups have grown and developed enough to move with them . . . Wolves are capable and inveterate travelers . . . Packs can travel up to 56 km (35 miles) at night and 76 km (45 miles) by day.” DAVID MECH ET AL., *WOLVES: BEHAVIOR, ECOLOGY AND CONSERVATION* 32 (2010).

97. See, e.g., Brown, *supra* note 34, at 432 (observing that wolves' territory can extend up to a thousand miles); Linda Maples, *New Wolf Pack in Washington*, SEATTLE TIMES (Nov. 25, 2015), <http://www.seattletimes.com/seattle-news/environment/wolf-pack/> (“Wolves are also legendary travelers A year-and-a-half-old female traveled more than 3,00 miles in just six months.”); Press Release, U.S. Fish & Wildlife Service, *Canid North of Grand Canyon Confirmed to be a Rocky Mountain Gray Wolf* (Nov. 10, 2014), https://www.fws.gov/news/shownews.cfm?ref=canid-north-of-grand-canyon-confirmed-to-be-a-rocky-mountain-gray-wolf&_ID=34770 (“The DNA results indicate this wolf traveled at least 450 miles from an area in the northern Rocky Mountains to northern Arizona.”).

98. TURNER, *supra* note 65, at 57 (“Unfortunately, collaring is also a means of control—a cop collars a criminal; a farmer uses a collar to manage draft animals.”); Rinfret, *supra* note 65 (applying Foucauldian philosophy in analyzing government's use of “tracking devices to monitor and modify the movements” of wolves); see BRAVERMAN, *supra* note 37, at 13 (discussing “a growing scholarship that extends the scope of biopolitics to the realm of governing nonhuman animals.”).

99. See Jewell, *supra* note 70, at 505 (citing research indicating that animals with surveillance collars have smaller ranges than animals with collars).

100. Andrews, *supra* note 10 (discussing use of shock collars on wild wolves: “When the wolves tried to roam beyond a fence of senses controlled by satellite, they were shocked.”).

101. Doremus, *supra* note 9 (reporting that government fitted wolves “with ‘capture collars’ designed to deliver a sedative dose in response to a radio signal”). See INTERNATIONAL WOLF CENTER, *supra* note 7 (“These special radio collars can also be equipped with darts holding a tranquilizer, which can be triggered from a distance. This allows researchers to easily recapture an animal.”).

102. Doremus, *supra* note 9, at 60.

Mooellem refers to such a device as a “kill switch”¹⁰³ because it essentially shuts down the wolf, much like cutting the power to a machine. Mark Phillips, a wildlife biologist who formerly worked with collared wolves, expressed his dismay that he was essentially a “zookeeper” in the wilderness.¹⁰⁴ Professor Holly Doremus has gone so far as to say that such restrictions on movement deprive wolves of their wildness.¹⁰⁵ Limitations on movement not only suppress wolves’ true nature but also impair their physical health by limiting their access to prey and their ability to adapt to stressors by relocating to more hospitable environments.¹⁰⁶

Surveillance collars also increase wolves’ vulnerability to hunting. Certain types of collars have bright colors, making the collared animals more easily visible to hunters.¹⁰⁷ Critics have suggested that hunters can track the signals from telemetry collars, either because the hunters can intercept the signals surreptitiously,¹⁰⁸ or because the hunters gain

103. JON MOOALLEM, *WILD ONES: A SOMETIMES DISMAYING, WEIRDLY REASSURING STORY ABOUT LOOKING AT PEOPLE LOOKING AT ANIMALS IN AMERICA* 262 (2013) (“When red wolves were reintroduced in North Carolina, the animals were outfitted with special collars that could be triggered remotely to stick the wolves in the neck with a sedative. It was a kind of a kill switch, in case the humans who were monitoring the wolves saw an animal’s signal wander outside the designated territory but couldn’t get on the ground quickly enough to intercept it.”); BRAVERMAN, *supra* note 37, at 164 (when collared wolves move outside an “arbitrary zone,” humans will “go and kill them, or capture them and put them back”).

104. Loder, *supra* note 1, at 127 (quoting Mike Phillips, a wildlife biologist whose duties involved collaring and moving wolves as part of the reintroduction initiative: “What are we doing? . . . I’m starting to feel like a damned zookeeper.”).

105. Doremus, *supra* note 9, at 61 (“These direct control measures erect a virtual cage around the animals, converting them from wild creatures into semi-domesticated ones”); *see* Doremus, *supra* note 3 (arguing that by confining animals in finite spaces, we are “giving up the wildness of nature and the ability of species to pursue their own evolutionary destiny”).

106. Jewell has written that, “for free-ranging animals that need to predate and avoid predation, any negative impact on movement could cause very significant reduction in fitness.” Zoe Jewell, *What is the Optimal Way of Putting a Collar Around an Animal’s Neck?*, RESEARCH GATE (May 25, 2015), www.researchgate.net/post/What_is_the_optimal_way_of_putting_a_collar_around_an_animals_neck.

107. *See* Tariku Gutema, *Wildlife Radio Telemetry: Use, Effect and Ethical Consideration with Emphasis on Birds and Mammals*, 24 INT’L J. SCIENCES: BASIC & APPLIED RESEARCH 306, 309 (2015) (observing that the mortality rate was higher for collared white-tailed deer than for their uncollared counterparts; one possible explanation was that the collars “allowed hunters to more easily see the deer”).

108. Declaration of James Peek, professional biologist and former professor of wildlife management at University of Idaho, submitted to U.S. District Court for the District of Idaho, *Wolf Recovery Foundation vs. U.S. Forest Service*, Jan. 22, 2010, available on WestLaw at 2010 WL 2150437 (“It is not hard for outfitters or other members of the public to get the signal information from radio collars and therefore the locations of the wolves. This information would make it much easier to locate the wolves and kill them”); *see also* Jeff Hull, *Out of Bounds:*

access to signals when the government shares the frequencies with ranchers.¹⁰⁹ According to some reports, poachers who are able to monitor the government's telemetry have killed collared animals within hours after the initial collaring.¹¹⁰ Sometimes government officials are the ones who shoot the collared animals.¹¹¹ The agencies that spend millions to collar and protect wolves might abruptly decide to slaughter them,¹¹² and surveillance collars facilitate the efficient

The Death of 832F, Yellowstone's Most Famous Wolf, OUTDOOR MAGAZINE, Feb. 13, 2013 (pointing out that after the shooting deaths of collared wolves at Yellowstone, commenters on a hunting website claimed responsibility and "admitted that they would go after collared wolves"); Jeffrey St. Clair, *Sacrificial Wolves of Yellowstone*, THE ECOLOGIST, Oct. 29, 2013 ("There is compelling evidence that anti-wolf hunters in Wyoming had been honing in on the telemetry frequencies from the radio collars to track and kill the wolves . . .").

109. See, e.g., *Wyoming v. Livingston*, 443 F.3d 1211, 1214 (10th Cir. 2006) ("The USFWS also provides the radio frequencies [for wolf collars] to local ranchers to alert them when wolf packs are near."); Matthew Weaver, *Lawmakers Question Wolf Collar Data Blackout for Ranchers*, CAPITAL PRESS, May 6, 2016 (indicating that Washington wildlife officials share wolf tracking data with ranchers except during denning season); Chris Roberts, *New Mexico Ranchers' Use of Technology to Track Wolves Debated*, EL PASO TIMES, Aug. 16, 2010 (revealing that U.S. Fish and Wildlife officials have shared telemetry equipment and tracking frequencies with ranchers in Arizona and New Mexico). *But see* George Plaven, *Ranchers Want More Precise Wolf Locations from GPS Collars*, CAPITAL PRESS, Oct. 13, 2014 (reporting frustration of Oregon ranchers when the state's fish and game officials only provided general information, not exact location of wolves).

110. Merritt Clifton, *Field Mortalities in Wildlife Research: It's Time for a Conversation*, Aug. 13, 2014, www.animals24-7.org/field_mortalities_in_wildlife_research#-V38E2DfW_AE (last visited on July 7, 2016) (pointing to over 50 cases in which poachers have apparently intercepted transmissions from radio-tagged animals, "often within days and sometimes within hours of the radio tracking devices being attached to the animals.").

111. Fischman, *supra* note 29 (discussing criticism that "radio-collaring wolf pups will enable agents to more easily track and find wolves in order to kill enough of them to drive down Idaho's wolf population"); Jody Emel, *Are You Man Enough, Big and Bad Enough? Ecofeminism and Wolf Eradication in the USA.*, reprinted in ANIMAL GEOGRAPHIES: PLACE, POLITICS and IDENTITY IN THE NATURE-CULTURE BORDERLANDS 102 n. 47 (1988) ("Wolves are tranquilized and collared with radio collars, then tracked by planes and shot down."); e.g., Montana Department of Fish, Wildlife and Parks, Montana Gray Wolf Conservation and Management 2015 Annual Report 14 (Mar. 26, 2016), <http://fwp.mt.gov/fishandwildlife/management/wolf/> (last visited on July 11, 2016) (noting that the population of collared wolves declined due in part to state officials' "control"); *ODFW Kills Four NE Oregon Wolves after Five Livestock Attacks*, KTVZ.COM (Mar. 31 2016) <http://www.ktvz.com/news/odfw-kills-four-ne-oregon-wolves-after-five-livestock-attacks/69132996> (indicating that Oregon officials killed four wolves, two with collars). See USDA Animal and Plant Health and Inspection Service, PROGRAM DATA REPORT G-2015, https://www.aphis.usda.gov/wildlife_damage/pdr/PDR-G_Report.php?fy=2015&fld=&fld_val= (last visited on July 17, 2016) (stating that in 2015, federal officials killed 383 gray wolves).

112. Christopher Ketcham, *Wolves to the Slaughter*, AMERICAN PROSPECT, Mar. 13, 2016 ("After spending upward of \$40 million studying the animals—then capturing, collaring, tracking, and protecting them—the federal government last year scheduled wolves to be killed in huge numbers . . ."); Opening Brief of Plaintiffs-Appellees, *Alliance for the Wild Rockies v. Salazar*, available on Westlaw at 2011 WL 6980674 *28 (9th Cir. Sept. 8, 2011) (indicating that in Idaho, "[s]ome of the wolves killed via aerial gunning by state agents are being tracked by radio collars

extermination of the animals.¹¹³ Certain states such as Alaska and Idaho have shown a particular zeal for killing wolves, including collared wolves.¹¹⁴ The recent congressional amendment delisting the gray wolf portends ominously for their future in these states.¹¹⁵

The use of surveillance collars on wolves is objectionable even when this invasion of privacy does not result in physical harm to the animals.¹¹⁶ The intrusion violates their autonomy and wildness.¹¹⁷ Numerous studies have shown that animals cherish their ability to hide and conduct certain intimate affairs in private.¹¹⁸ While some categories of professionals, such as documentary filmmakers, have begun to value wild animals’ privacy for its own sake,¹¹⁹ wildlife

initially implemented for the purpose of scientific research”).

113. GRETTA NILLSON, *ENDANGERED SPECIES HANDBOOK: VANISHING SPECIES 4* (2005) (“Some hunters use the signals emitted by radio transmitters placed in wild animal collars by biologists for tracking, to hone in and better pursue them to their deaths. . . These devices give humans such an advantage that they render the natural protections animals have evolved over eons completely ineffective”). *E.g.*, KTVZ.com, *supra* note 116 (surveillance collars allowed state’s hunters to kill wolves within hours after receiving authorization).

114. Roger Phillips, *Idaho: radio collars are vital tool for game management*, IDAHO DEPT. FISH & GAME, Jan. 25, 2016 (discussing Idaho’s “use of radio collars to ensure targeted removal” of wolves); Sean Cockerham, *Collared Wolves Killed During Aerial Predator Control*, ALASKA NEWS, (Mar. 18, 2010) (“the Alaska Department of Fish and Game resumed killing wolves from helicopters this week in the Interior and immediately sparked controversy by wiping out a pack that included wolves collared for research . . .”). *See supra* note 26–27 and accompanying text (noting legislation to give states control over wolves).

115. Delisting would allow states to control management (including collaring) of most wolves in the United States. *See supra* note 26–27 and accompanying text.

116. As noted previously, surveillance collars can result in concomitant privacy violations and physical injuries. Keim, *supra* note 17.

117. *See* Doremus, *supra* note 3 (arguing that by collaring animals and limiting their ability to engage in instinctive behaviors, we are “giving up the wildness of nature and the ability of species to pursue their own evolutionary destiny”).

118. *See, e.g.*, Henry F. Fradella, et al., *Quantifying Katz: Empirically Measuring “Reasonable Expectations of Privacy” in the Fourth Amendment Context*, 38 AM. J. CRIM L. 289, 301 (2011) (“Although privacy is a concept that is often perceived as being a unique characteristic of human beings, several decades of growing evidence suggest human and animals both share biological needs for privacy.”). *See* JUDITH DECEW, *IN PURSUIT OF PRIVACY: LAW, ETHICS AND THE RISE OF TECHNOLOGY 12* (Cornell University Press 1997) (“[V]irtually all animals seek periods of individual seclusion or small group intimacy,” and this inclination to be private serves “various biological purposes, especially that of ensuring propagation of the species”); Peter Klopfer and Daniel Rubenstein, *The Concept of Privacy and Its Biological Bases*, 33 J. SOCIAL ISSUES 52, 64 (1977) (“In sum, there are innumerable instances of nonhuman animals acting in a manner that characterizes humans seeking privacy”).

119. Professor Brett Mills at the University of East Anglia has argued that filmmakers shooting wildlife documentaries should respect the privacy of their nonhuman subjects. “[P]rivacy as it is commonly understood it [sic] is a culturally human concept,” Mills acknowledged. Brett Mills, *Television Wildlife Documentaries and Animals’ Right to Privacy*, 24

biologists and managers have been surprisingly slow to acknowledge the intrinsic importance of privacy in the wild.¹²⁰ The use of surveillance collars denies wolves any privacy altogether; an animal wearing a surveillance collar is “never able to hide.”¹²¹ These collars allow ubiquitous, incessant surveillance as if the wolves were inmates in Bentham’s Panopticon.¹²² Some wildlife biologists appear more interested in sustaining the lives of the animals they monitor (or at least a minimal number within a species) than in preserving the behavioral characteristics that are the essence of that species.¹²³ The obsession with preserving life is understandable given the vulnerability of many species to extinction, but the gray wolf is not such a species,¹²⁴ so the preservation of its wildness merits higher priority.

Some might argue that surveillance does not jeopardize wildness because animals do not understand that they are under surveillance.¹²⁵

CONTINUUM: J. OF MEDIA & CULTURAL STUD. 193, 196 (2010). “We can never really know if animals are giving consent but they often do engage in forms of behaviour which suggest they’d rather not encounter humans, and we might want to think about equating this with a desire for privacy.” Alessandro Torello, *Do Animals Deserve Privacy, Too?*, April 30, 2010, WALL ST. J., <https://blogs.wsj.com/brussels/2010/04/30/do-animals-deserve-privacy-too/> (quoting Mills).

120. To the contrary, the people who conduct surveillance of wildlife have shown an alarming willingness to invade animals’ privacy and even showcase the animals on social media. *See supra* note 66. There is nothing private about the life of an animal with a Facebook page that chronicles all of that animal’s activities. “Knowing a wolf’s number and collar frequency are gateways to knowing an astonishing amount of information about it, rather like knowing a person’s Social Security number and computer passwords. A wolf without a number and collar is anonymous: no control, no knowledge.” TURNER, *supra* note 65, at 58; Emily Anthes, *Tracking the Pack*, N.Y. TIMES, Feb. 3, 2013 (observing that by using high-tech devices “to track free-ranging animals, biologists are providing us with intimate access to the daily lives of other species”).

121. Animals in the modern “wired wilderness” are “never able to hide, never out of surveillance.” Jacob Hamlin, *Introduction*, 3 H-ENV’T ROUNDTABLE REV. 2, (2013) (describing modern surveillance of wilderness as “Orwellian” and comparing high-tech control of nature to the scenario depicted in the movie *The Hunger Games*, with “‘wild’ inhabitants completely manufactured at will by the game managers”).

122. Michael Lewis, *Comments on Wired Wilderness: Technologies of Tracking and the Making of Modern Wildlife*, 3 H-ENV’T ROUNDTABLE REV. 11, (2013) (discussing the “greater tolerance for radio tracking of animals,” and suggesting that, “[t]he panopticon is not just for people anymore”).

123. This perspective is evident in some arguments for captive breeding of animals that are on the verge of extinction. *See* the New York Times’ online colloquium, *Does Captive Breeding Distract from Conservation?*, July 5, 2012, www.nytimes.com/roomfordebate/2012/07/05/does-captive-breeding-distract-from-conservation.

124. There are over 10,000 gray wolves in the U.S. (including Alaska, where the species has never been endangered), so the gray wolf is nowhere near the precipice of extinction. U.S. Fish and Wildlife Service, *Gray Wolf (Canis Lupus) Biologue*, (Dec. 2011), <https://www.fws.gov/midwest/wolf/aboutwolves/biologue.htm>.

125. Although both Benson and Coleman seem to value wildness, they do note that animals

However, this fact does not excuse the violation of their privacy, any more than a human subject’s ignorance of surveillance excuses the violation of human privacy. To condition a privacy-based objection on the subject’s full understanding of the surveillance technology at issue would disqualify many humans from defending their privacy against modern surveillance techniques. The Supreme Court has never imposed such a requirement.¹²⁶ In any event, it seems clear that wolves do understand the hardships that result when they wear surveillance collars¹²⁷ (even if the wolves do not comprehend exactly how the collars operate.) For instance, wolves know when they black out and wake up with bulky objects fastened to their necks,¹²⁸ when they cannot roam beyond a confined area,¹²⁹ and when ineluctable hunters shoot at them from helicopters.¹³⁰ The government’s surveillance of wolves is hardly surreptitious. It is conspicuous and overbearing.

B. Other Harms

The use of surveillance collars on wolves may cause harm to entire ecosystems. For example, one common objective of wildlife managers is to limit wolves’ predation on elk, so that human hunters do not face competition in pursuing their prey.¹³¹ Surveillance collars are quite

are unaware of the surveillance by wildlife researchers. Coleman, *supra* note 32, at 82 (observing that a typical collared wolf is “clueless to his status as well-monitored subject”); Etienne Benson, *The Wired Wilderness: Technologies of Tracking and the Making of Modern Wildlife*, 3 H-ENV’T ROUNDTABLE REV. (2013) (acknowledging that “wild animals are unlikely to be aware that the radiotags attached to them are mechanisms of surveillance”).

126. The Supreme Court has repeatedly vindicated human privacy rights despite the fact that targets of then-novel surveillance techniques were completely unaware of the investigation and the technology used in the surveillance. *Katz v. United States*, 389 U.S. 347, 350–53 (1967) (ruling that the government’s attachment of a surveillance device to the exterior of a phone booth—a cutting-edge surveillance technique at the time—violated the target’s privacy rights); *Kyllo v. United States*, 533 U.S. 27, 34–41 (2001) (similar ruling for thermal imaging device); *Jones v. United States*, 565 U.S. 400, 132 S.Ct. 945, 949 (2012) (similar ruling for a “bumper beeper,” or GPS tracking device, secretly attached to defendant’s car without his consent).

127. See Benson, *supra* note 130 (while animals do not understand exactly how electronic surveillance works, “[n]onetheless, systems of pervasive, continuous, invisible surveillance transform the conditions and quality of their lives, just as they do those of numerous humans”).

128. *Supra* note 91 and accompanying text.

129. *Supra* notes 96–102 and accompanying text.

130. Keith Ridler, *20 Wolves Killed in Northern Idaho to Boost Elk Population*, FLATHEAD BEACON, Feb. 11, 2016 (indicating that Idaho agents shot 20 wolves from a helicopter); Sean Cockerham, *Collared Wolves Killed During Aerial Predator Control*, ALASKA NEWS, Mar. 18, 2010 (“The Alaska Department of Fish and Game resumed killing wolves from helicopters this week in the Interior and immediately sparked controversy by wiping out a pack that included wolves collared for research . . .”).

131. Ridler, *supra* note 130 (reporting that Idaho killed wolves to increase population of elk);

effective in segregating wolf and elk populations,¹³² but this strategy can lead to collateral consequences. When wolves are absent, the elk population increases greatly.¹³³ The growing numbers of elk can devastate trees and other vegetation that elk eat.¹³⁴ As a result, other species that depend on this vegetation will diminish in number.¹³⁵ The reintroduction of wolves in Yellowstone appears to have brought down the elk population and helped to restore balance to the ecosystem, although some scientists have disputed whether wolves should be given all of the credit for this development.¹³⁶ Apart from their salutary effect in reducing elk browsing of trees at Yellowstone, wolves have helped the ecosystem by providing food for several species of scavengers.¹³⁷ It is naive to characterize the wolf as the “hero” of the Yellowstone ecosystem,¹³⁸ because the precise role of wolves in any ecosystem is

see Stephens, *supra* note 33 at 936 (“In a region where hunting is often engrained in the culture, hunters classify wolves ‘land piranhas,’ fearing that they will devastate local game populations and deprive them of prized animals such as elk”); Emel, *supra* note 111, at 102 (one purpose of wolf eradication has been “to sustain big game animals so that human hunters could kill them”).

132. Collars allow wildlife managers to keep wolves in designated areas. *Supra* note 95–102 Collars also allow managers to determine which wolves are attacking elk. Johnson, *supra* note 63. Managers can then use the collars to track and kill the wolves quickly. *See, e.g.*, Ridler, *supra* note 130.

133. Scientists have found an inverse relationship between the size of the wolf population and the size of the elk population at Yellowstone. The wolves either prey on or scare away elk. *See* www.yellowstonepark.com/gray-wolves-impact-elk/ (last visited July 18, 2016).

134. William Ripple, et al., *Trophic Cascades among Wolves, Elk and Aspen on Yellowstone National Park's Northern Range*, 102 *BIOLOGICAL CONSERVATION* 227, 232–33 (2001) (discussing evidence that Yellowstone wolves helped to restore trees by killing or scaring elk that were browsing on the trees).

135. *Id.* (explaining that influence of wolves extends to several trophic levels and benefits other species that elk had adversely affected, e.g., by reducing their food supply or nesting areas); William Ripple and Robert Beschta, *Trophic Cascades in Yellowstone: The First Fifteen Years after Wolf Reintroduction*, 145 *BIOLOGICAL CONSERVATION* 205, 211–13 (2011) (indicating that presence of wolves in Yellowstone helped beavers and bison by limiting elk browsing).

136. Kristin Marshall, et al., *Interactions Among Herbivory, Climate, Topography and Plant Age Shape Riparian Willow Dynamics in Northern Yellowstone National Park, USA*, 102 *J. ECOLOGY* 667, 676–77 (2014) (discussing complex interrelationship of several variables, not just wolves, as explanation for increased growth of willows and related effects at Yellowstone).

137. Christopher Wilmers and Wayne Getz, *Gray Wolves as Climate Change Buffers in Yellowstone*, *PLOS BIOLOGY*, Mar. 15, 2005, www.journals.plos.org (last visited on July 18, 2016) (observing that wolves can help scavengers by providing late-winter carrion); *see generally* William Ripple, et al., *Status and Ecological Effects of the World's Largest Carnivores*, 343 *SCIENCE* 151 (2014) (reviewing several studies providing evidence of “trophic cascades” attributable to the size of large predator populations in various ecosystems).

138. According to Arthur Middleton, a postdoctoral fellow at the Yale School of Forestry and Environmental Studies, the characterization of wolves as the lynchpin of the Yellowstone ecosystem is too facile. Arthur Middleton, *Is the Wolf a Real American Hero?*, *N.Y. TIMES*, Mar. 9, 2014 (suggesting that prior earlier studies overlooked possible alternative explanations).

difficult for scientists to determine,¹³⁹ but this uncertainty is exactly why scientists should be wary of using surveillance collars to manipulate wolf populations.¹⁴⁰

Does the collaring of wolves cause harm to humans? Collaring may fan the flames of anti-wolf hysteria, which is dangerous to wolves and humans alike. Some Americans harbor a “deep ancestral hostility to wolves.”¹⁴¹ Those who feel this contempt may see surveillance collars as a tool for subjugating the species—keeping wolves a safe distance from humanity¹⁴²—and ensuring that wolves are quickly accessible as soon as the law permits a cull.¹⁴³ According to Professor Jody Emel at Clark University, “[w]ild animals, and particularly predators like the wolf. . . have been targets for hatred, the same hatred that launched armies and lynch mobs against human ‘others.’”¹⁴⁴ Emel has stressed the urgency of challenging prejudice against wolves:

[F]or many of us, wolves and wilderness are symbols of resistance. These animals are metaphors for oppositional ways of thinking and feeling. Passion for their survival results from *not* anesthetizing oneself to the oppression of animals and its links to other forms and sites of oppression. . . To leave unexamined the structures [of prejudice] that teach us to slice off or repress empathy and to distance ourselves from the “other,” invites oppression, brutality, holocaust. . . The license to hate and aggress guaranteed by both racism and speciesism is written in one paranoid and sadistic hand.¹⁴⁵

Other authors have equated antipathy toward wolves with mistreatment of various human groups.¹⁴⁶ Man’s contempt for wolves

139. Marshall, *supra* note 136; Middleton, *supra* note 138.

140. Duane, *supra* note 13 (criticizing hubris of those who believe they can manipulate environment as if they were merely removing and replacing bricks in a Lego structure).

141. Verlyn Klinkenborg, *Science, Mythology, Hatred, and the Fate of the Gray Wolf*, N.Y. TIMES, Apr. 12, 2009 (describing some Americans’ deep-seated, irrational hatred of wolves).

142. *Supra* notes 95–100.

143. In states like Idaho, wildlife managers seemed poised to slaughter collared wolves to the extent that the federal rules allow them to do so. *See supra* note 25–27. Critics have argued that these managers collar wolves in order to track and kill the animals. *Supra* note 107; *infra* n. 151.

144. *Id.* at 102.

145. *Id.* at 112.

146. *See, e.g.*, TURNER, *supra* note 65, 60–61 (“Wolves were humiliated, mutilated, and tortured, often with what can only be described as glee. The historical record suggests not defense but sadism. There are inexplicable, irrational hatreds hidden in the human soul that are eternally fresh, the blend of fear and ignorance we see in Rwanda, Bosnia, Palestine, and Kashmir. Wolves suffer from the same blend of fear, hatred and ignorance”); *see* Thomas Kuhne, *The Claims of Community*, in PETER HAYES, ED., HOW WAS IT POSSIBLE: A HOLOCAUST READER 129 (U. Nebraska Press 2015) (“Germany was infected with a germ that causes its people to treat their victims as if they were wolves”) (internal quotes omitted); *see* Aviva Cantor, *The Club, The Yoke*

belies the reality that human nature can be every bit as vicious as lupine nature.¹⁴⁷ Ironically, the demonizing and attempted segregation of wolves brings out in humans the very qualities that humans deplore in wolves.

A related irony is that humans actually reduce their own privacy vis-a-vis wolves when they show disrespect for wolves' privacy. Evidence indicates that the more humans intrude in the world of wolves, the more habituated wolves become to human contact, and the more likely wolves will venture into areas populated by humans.¹⁴⁸ Thus, one of the primary arguments offered by the anti-wolf lobby in favor of surveillance collars—that they can minimize wolves' contact with humans—may be fallacious. If extensive human contact with collared wolves is necessary for installing and maintaining the

and the Leash: What We Can Learn from Patriarchy's Treatment of Animals, quoted in CHARLES PATTERSON, *ETERNAL TREBLINKA: OUR TREATMENT OF ANIMALS AND THE HOLOCAUST* 12 (Lantern 2002) ("Nowhere is patriarchy's iron fist as naked as in the oppression of animals, which serves as the model and training ground for all other forms of oppression"); MORTIMER ADLER, *THE DIFFERENCE OF MAN AND THE DIFFERENCE IT MAKES* 265 (Fordham U. Press 1993) ("Why, then, should not groups of superior men be able to justify their enslavement, exploitation, or even genocide of inferior human groups on factual and moral grounds on those we now rely on to justify our treatment of the animals [that we classify] as dangerous predators?") (brackets added).

147. Professor Jon Coleman's apt title for his 2008 book, *VICIOUS: WOLVES AND MEN IN AMERICA*, conveys his thesis: this adjective describes not only the wolves inhabiting the North American continent, but also the humans who hunted and trapped them. COLEMAN *supra* note 32 at 1–15 (exploring motives for human extirpation of wolves, and drawing certain parallels between wolves and humans). In a similar vein, the noted historian William Cronon at the University of Wisconsin has pointed out how wolves' attributes reflect human attributes in many ways. William Cronon, *Foreword: A Strange Violent Intimacy*, in BRETT WALKER, *THE LOST WOLVES OF JAPAN* xi–xiv (U. Washington Press 2009).

148. See, e.g., Colette Drworiz, *Banff National Park to Consider Restraints on Wildlife Photography after Wolf Put Down*, CALGARY HERALD, June 15, 2016 (reporting that in Banff National Park, more frequent interaction between wolves and humans leads to "habituation" that emboldens wolves to venture near human communities); see also Website of Washington Department of Fish and Wildlife, *Gray Wolf Conservation and Management*, http://wdfw.wa.gov/conservation/gray_wolf/humans_pets.html (last visited on July 18, 2016) ("Wolves can become habituated to humans in areas where they regularly encounter humans"); see generally Diane Boyd, *Wolf Habituation as a Conservation Conundrum*, companion website for *PRINCIPLES OF CONSERVATION BIOLOGY* (Sinauer 2006), <http://sites.sinauer.com/groom/article.php?id=24> (last visited on July 18, 2016) (indicating that "an increase in human-wolf interaction may result in harm to humans").

surveillance equipment,¹⁴⁹ as well as moving “problem” wolves,¹⁵⁰ than the collars may be compounding the problem of human-wolf conflicts in the long term.

III. INADEQUACY OF CURRENT REGULATION

Given the potentially harmful effects of wolf surveillance listed above, why hasn’t the government adopted uniform rules limiting the use of surveillance collars? Part of the answer lies in the diffuse nature of the current regulations for wildlife telemetry. There is a patchwork of rules imposing varying restrictions depending on the location of the surveillance and the affiliation of the personnel conducting the surveillance. These quirks—combined with the willingness of some state officials to flout existing rules—have created an environment in which surveillance of wolves can occur with little accountability.

The regulations of federal agencies with jurisdiction over wolf habitats contain rules governing wolf surveillance. For example, the U.S. Fish and Wildlife Service, the National Park Service and the U.S. Forest Service have jurisdiction over vast areas that include the ranges of several wolf packs.¹⁵¹ The Code of Federal Regulations authorizes these agencies and their delegates to use surveillance collars on wolves,¹⁵² but provides scant guidance concerning the procedures for

149. Humans sometimes need to handle wolves extensively in the initial capture and collaring process. *See, e.g.*, *Wyoming v. Livingston*, 443 F.3d 1211, 1214 (10th Cir. 2006) (noting that the process of capture and collaring can sometimes take a long time because wildlife officials move the captured wolves to a central location before returning them to their packs). Then humans periodically need to change the batteries and otherwise maintain the surveillance equipment. *Mech, supra* note 60, at 8–9 (noting that retrapping may be necessary for replacement of batteries or recollaring).

150. Mark Phillips, who had responsibility for collaring and managing a large number of reintroduced wolves, indicated that he had to intervene so frequently that he felt his role was analogous to that of a “zookeeper.” *Loder supra* note 104.

151. Wolves wear surveillance collars on land controlled by all three of these agencies. *See, e.g.* Brief of Appellee United States in *Wyoming v. Jiminez*, 2004 WL 312771 *i (10th Cir. Dec. 6, 2004) (indicating that for the U.S. Fish and Wildlife Service, “radio collaring of reintroduced wolves is an essential component of wolf control under the Wolf Reintroduction Program”); National Park Service, WOLF MONITORING 1986-2014 (2014) (“More than 400 wolves have been captured and collared” in Denali National Park alone); WILLIAM RODGERS, ENV’T. L. INDIAN COUNTRY 1:27 (2016) (noting that on land controlled by the Forest Service in Idaho, “biologists trap wolves and place radio collars around the animals’ necks”).

152. For example, the Department of Interior’s regulations allow surveillance collars as one possible means of monitoring reintroduced wolves. 50 CFR §17.84(iii)(8) (“The reintroduced wolves will be monitored during the life of the project, including by the use of radio telemetry”). *See* Appellee’s brief filed with U.S. Supreme Court in *Wyoming v. Jiminez* on Oct. 6, 2006, available on Westlaw at 2006 WL 2849234 *2 (noting the duty of federal officials to monitor

assessing applications, reviewing ongoing operations, or sanctioning unauthorized use. The paucity of procedural regulations is an invitation for abuse. For example, in 2016, the U.S. Forest Service permitted the Idaho Department of Fish and Game to land helicopters in the Frank Church-River of No Return Wilderness in order to place surveillance collars on elk.¹⁵³ The states' contractors not only collared elk, but also wolves, plainly exceeding the Forest Service's authorization.¹⁵⁴ When environmental groups sued in protest,¹⁵⁵ state officials insisted that the wolf collaring was inadvertent, but that they would continue to monitor the improperly collared wolves anyway.¹⁵⁶ This episode illustrates the limited effectiveness of federal regulations in constraining the collaring of wolves.¹⁵⁷

An additional set of rules may come into play when collaring involves wolves covered by the Endangered Species Act (ESA).¹⁵⁸ The ESA and its regulations penalize the unauthorized "tak[ing]" of any

wolves, and indicating that the officials do so "primarily by fitting the wolves with radio collars").

153. *Court Rules That Forest Service Illegally Authorized Helicopter Intrusions in Premiere Wilderness Area*, Earthjustice (Jan. 19, 2017), <http://earthjustice.org/news/press/2017/court-rules-that-forest-service-illegally-authorized-helicopter-intrusions-in-premiere-wilderness-area>.

154. Rocky Barker, *Idaho Fish and Game Breaks Agreement, Uses Helicopter to Collar Wolves in Wilderness*, IDAHO STATESMAN, Jan. 13, 2016 ("An Idaho Department of Fish and Game crew using a helicopter in the Frank Church-River of No Return Wilderness to attach radio collars to elk broke an agreement with the U.S. Forest Service and collared four wolves").

155. Earthjustice attorney Tim Preso accused the Idaho Fish and Game officials of collaring the wolves as part of a long-term plan to exterminate them. "There is every reason to believe that these new wolf collars will be used by a state trapper to locate wolves for the purpose of killing them . . ." Tim Preso, *Idaho Breaks Agreement Using Helicopter Drops to Collar Wolves in Frank Church Wilderness*, Jan. 13, 2016, on Earthjustice.org (last visited on July 8, 2016).

156. Rob Chaney, *Idaho Fish and Game Will Keep Monitoring Wolves Improperly Collared in Wilderness*, DAILY MISSOULIAN, Jan. 21, 2016 (quoting IDFG spokesman Mike Keckler, who said, "The only way to remove those collars would be to go back in with helicopters"). Idaho officials' hostility to wolves is no secret. The Idaho Legislature has declared that, "It is the policy of the state of Idaho to use every option to assert state sovereignty and mitigate the impact of gray wolves on residents of the state. . ." Quoted in WILLIAM RODGERS, ENV'T. L. INDIAN COUNTRY 1:27 (2016). The Idaho governor has called for killing most of the wolves in the state's boundaries, and he said that "I'm prepared to bid for that first ticket to shoot a wolf myself." Jim Robbins, *For Wolves, A Recovery May Not Be the Blessing It Seems*, N.Y. TIMES, Feb. 6, 2007 (reporting governor's plan to reduce wolf population from 650 to 100).

157. See Eric Barker, *Fish and Game Taken to Task Over Wilderness Copter Flights*, LEWISTON TRIBUNE, Jan. 21, 2016 (indicating that Forest Service documented the noncompliance of Idaho officials without taking enforcement action); but see Babcock, *infra* n. 283 (discussion intervention of federal court after environmentalists sued).

158. In some parts of the U.S., such as Alaska, wolves are not subject to the ESA. Lance Richardson, *Wolves May Be Losing a Nasty Political Battle*, SLATE, Feb. 21, 2014, http://www.slate.com/blogs/wild_things/2014/02/21/gray_wolf_endangered_species_act_conflict_should_fish_and_wildlife_service.html

endangered species,¹⁵⁹ which applies to capturing or otherwise harming such a species.¹⁶⁰ As noted previously, the collaring of wolves often entails capture and other harms,¹⁶¹ so the technique could arguably violate the ESA.¹⁶² Regulations under the ESA establish a procedure through which federal agencies may obtain permits to place surveillance collars on endangered or threatened species.¹⁶³ The regulations include a short list of evaluative criteria, but are very general and omit any mention of privacy.¹⁶⁴ The regulations allow the routine collaring of gray wolves because they have a “non-essential” status under the ESA,¹⁶⁵ and therefore are not subject to the strictest protections.¹⁶⁶ In general, the applicability of the ESA depends on political considerations. The unpopularity of wolves makes them vulnerable to “delisting” (i.e., exemption from certain protections under the ESA).¹⁶⁷ For example, the Fish and Wildlife Service decided

159. See generally, Paul Boudreaux, *Understanding “Take” in the Endangered Species Act*, 34 AZ. ST. L. J. 733, 735-41 (2004) (explaining ESA and “take” provisions in detail).

160. The term “take” means “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.” 16 U.S.C. §1532(19).

161. Zoe Jewell, a researcher at Duke’s Nicholas School of the Environment, has noted that “invasive techniques, relying on capture and immobilization for marking or tagging, can negatively impact species in a variety of ways.” Zoe Jewell, quoted in *Using—and Sharing—New Technologies Is Key for Conservation*, DUKE TODAY, Oct. 5, 2015, <https://today.duke.edu/2015/10/pimm-consv-tech-release-sh-kl> (last visited on July 9, 2016) (advocating that researchers instead rely on non-invasive techniques such as footprint analysis).

162. Jewell made the following comment on ResearchGate, an online community of researchers: “I agree surgery is certainly not an option for an endangered species.” *Has Anyone Ever Tried to Attach a Radio Transmitter on a Fossorial Species?*, www.researchgate.net, Feb. 14, 2015 (last visited on July 9, 2016).

163. See 50 CFR §17.22 (establishing procedural requirements for endangered species); 50 CFR §17.32 (establishing a procedure for threatened species).

164. E.g. 50 CFR §17.22(a)(2) (brief listing criteria used in reviewing applications to obtain permits for scientific purposes or for the enhancement of propagation or survival)

165. Williams, *supra* note 35 (explaining that Interior Secretary Bruce Babbitt sought the ESA’s classification of “non-essential experimental population” for transplanted wolves because “without such a designation, wolf recovery was impossible”).

166. 50 CFR §17.84(iii)(8) (allowing use of surveillance collars to monitor reintroduced wolves); Brief of Appellee United States in *Wyoming v. Jiminez*, filed on Dec. 6, 2014 (“Federal regulations implementing the ESA require the monitoring of reintroduced wolves, and the regulations specify radio collaring as an appropriate monitoring method”).

167. The politicization of the delisting process under the ESA is the subject of extensive scholarship. E.g., Hope Babcock, *The Sad Story of the Northern Rocky Mountain Gray Wolf Reintroduction Program*, 24 FORDHAM ENVTL. L. REV. 25, 50 n. 106 (2013) (suggesting that “the majority party determines the recovered status of an endangered species purely in response to political pressure”); Crystal Anderson, *Reconsidering a Weakened Regulation: A Critical Analysis of Delisting in the Endangered Species Act*, 9 FLA. A & M U. L. REV. 207 (2013) (contending that Congress undermined the ESA for reasons of political expediency).

to delist gray wolves in Idaho, Montana, and Wyoming, among other areas because of pressure from Congress.¹⁶⁸ Ironically, under the ESA, an agency might spend millions of dollars collaring and protecting wolves, only to abruptly switch to authorizing the slaughter of the same wolves once they lose their protected status.¹⁶⁹

The Animal Welfare Act (“AWA”) also potentially governs the use of surveillance collars on wolves. Passed primarily to protect the welfare of animals in laboratory testing,¹⁷⁰ this statute also includes provisions that could apply to wildlife in field research. For example, researchers are supervised by institutional animal care and use committees (“IACUCs”) that review protocols to ensure animal cruelty is not excessive.¹⁷¹ However, the AWA’s procedures have not been effective in limiting the use of surveillance collars on wolves for numerous reasons. First, and most fundamentally, the AWA protects against excessive infliction of physical pain, but does not purport to protect privacy.¹⁷² By allowing prolonged experimentation on animals in laboratories, the AWA sets a very low bar for impermissible constraints on animals’ freedom. Second, the AWA regulations are highly permissive for any research classified as a “field study,”¹⁷³ and

168. Somerset Perry, *The Gray Wolf Delisting Rider and State Management Under the Endangered Species Act*, 39 *ECOLOGY L.Q.* 439, 441 (2012) (“Politicians in Idaho, Montana and Wyoming repeatedly called for gray wolf delisting”). Pressured by Congress, the U.S. Fish and Wildlife acceded to these demands, but environmental groups filed lawsuits that led to partial modification of the delisting. See generally Martha Williams, *Lessons from the Wolf Wars: Recovery vs. Delisting Under the Endangered Species Act*, 27 *FORDHAM ENVTL. L. REV.* 106, 131-46 (2015) (discussing delisting in Wyoming and Western Great Lakes region). President Trump’s nominee for secretary of the interior, Ryan Zinke, has “consistently supported harmful, anti-wildlife legislation that would severely undermine the Endangered Species Act and remove or block protections for hundreds of imperiled species, including gray wolves . . .” Timothy Cama, *Trump Picks GOP Rep. Zinke for Interior Secretary*, *THE HILL*, Dec. 15, 2016 (quoting Jamie Rappaport, president of Defenders of Wildlife).

169. Ketcham, *supra* note 112 (“After spending upward of \$40 million studying the animals—then capturing, collaring, tracking, and protecting them—the federal government last year scheduled wolves to be killed in huge numbers.”)

170. Jonathan Lindzey, et al., *A Unique Application to the IACUC for Studies of Wild Animals in or from Natural Settings*, 24 *CONTEMPORARY TOPICS* 33, 33-34 (2002) (noting that AWA originally regulated the treatment of lab animals, and only later came to regulate treatment of animals in field research, so the AWA procedures are not well suited for the latter context).

171. 9 CFR §2.31(d)(1) (“In order to approve proposed activities or proposed significant changes in ongoing activities, the IACUC shall conduct a review of those components of the activities related to the care and use of animals and determine that the proposed activities are in accordance with this subchapter unless acceptable justification for a departure is presented”).

172. 9 CFR §1.1 (defining physical pain for purposes of AWA, and excluding brief pain caused by procedures such as injections; definition makes no mention of psychological harm).

173. 9 CFR §2.31(d)(1) (exempting field studies from certain categories of IACUC review).

animal telemetry generally falls into this category.¹⁷⁴ Third, the AWA does not call for follow-up review of any field research approved by an IACUC, even field research considered too invasive to qualify as a field study.¹⁷⁵ Fourth, the AWA’s narrow scope does not cover enough categories of professionals and activities to regulate all use of surveillance collars on wolves.¹⁷⁶ Finally, some researchers subject to the AWA may resent their accountability to IACUCs, which could hinder the IACUC’s effectiveness in supervising wildlife surveillance.¹⁷⁷ For the foregoing reasons, “compliance with the

Jon Geller, director of the Veterinary Emergency and Rehabilitation Hospital in Fort Collins, Colorado, and former member of an IACUC in the National Park Service, has criticized the AWA’s permissive treatment of field studies, which “gain summary IACUC approval because they presumptively do not cause pain or distress, or significantly alter the behavior of the animals being studied, and are intended to be mostly observational in nature.” According to Geller, “field studies may not be as benign as depicted.” Jon Geller, *Field Mortalities in Wildlife Research: It’s Time for a Conversation*, posted on the website of the Humane Society Veterinary Medical Association, July 21, 2014, available at www.havmsa.org/field_mortalities_in_wildlife_research#-V38E2DFW_AE (last visited on July 7, 2016). A group of mammalogists headed by Professor Robert Sikes at the University of Arkansas-Little Rock has noted that the AWA’s definitions distinguishing “field studies” from other categories of research are ambiguous, and as a result, “[c]onsiderable misunderstanding has surrounded the application of the AWA to field studies.” Robert Sikes, et al., *Guidelines of the American Society of Mammalogists for the Use of Wild Mammals in Research*, 97 J. MAMMALOGY 663, 670 (2016).

174. According to the regulations adopted by the U.S. Department of Agriculture under the AWA, “[f]ield study means any study done on free-living wild animals in their natural habitat, which does not involve an invasive procedure, and which does not harm or materially alter the behavior of the animals under study.” 9 CFR §1.1.; see, e.g., University of Maryland Center for Environmental Science, Institutional Animal Care and Use Committee (IACUC) Field Studies, Oct. 21, 2011, www.UMCES.org (last visited on July 8, 2016) (explaining that animal telemetry falls under the definition of field study unless surgery is necessary); University of Houston Guidelines for Field Research, www.uh.edu/ (last visited on July 8, 2016) (same); Sikes, *supra* note 173, at 670 (indicating that most categories of wildlife observation involving capture at outset will still qualify as field studies under USDA regulations pursuant to AWA).

175. Geller, *supra* note 173 (“Principal investigators for government-funded field research projects must submit proposed studies to the appropriate Institutional Animal Care and Use Committee, or IACUC, to ensure compliance with the Animal Welfare Act. Unfortunately, unlike institutional animal research, there is no protocol for inspection or follow up, often leading to unfortunate outcomes that may not be reported.”).

176. Tadlock Cowan, Congressional Research Service, *The Animal Welfare Act: Background and Selected Animal Welfare Legislation*, 2, Jan. 5, 2016, <https://www.fas.org/sgp/crs/misc/RS22493.pdf> (last visited on July 8, 2016) (explaining that AWA covers dealers, exhibitors, animal transporters, research facilities, pet stores and organizers of events involving fights between animals).

177. Daniel Mulcahy, *Does the Animal Welfare Act Apply to Free-Ranging Animals?*, 44 INST. LAB. ANIMAL RESOURCES J. 252, 255 (2003) (“Government researchers working with free-ranging animals . . . may resent the intrusion of AWA-mandated review of their projects. IACUC review has only recently been introduced to many federal and state agencies, and some researchers view it as unwarranted criticism and an unnecessary additional burden on their professional lives.”).

“[A]WA can be insufficient for government natural resource agencies that use free-ranging animals in research and management studies.”¹⁷⁸

Ethical guidelines might apply to the collaring of wolves for surveillance, but these guidelines do little to protect wolves’ privacy. Generally, there is far less authority on ethical boundaries for wildlife research than that concerning ethical boundaries for research involving humans.¹⁷⁹ Some professional organizations whose members place surveillance collars on wolves have ethical codes that regulate the practice to varying degrees. Examples of such organizations include the Wildlife Society,¹⁸⁰ the Society for Conservation Biologists,¹⁸¹ the American Society of Mammalogists,¹⁸² and the American Psychological Society.¹⁸³ However, for the most part the language in

178. *Id.* at 252.

179. See Zoe Jewell, *Effect of Monitoring Technique on Quality of Conservation Science*, 27 CONSERVATION BIOLOGY 501, 502 (2013) (pointing out that far fewer articles on research ethics appear in conservation and ecology journals than in medical journals).

180. THE WILDLIFE SOCIETY, CODE OF ETHICS, date of adoption unknown, available at wildlife.org/governance/code-of-ethics/ (last accessed on July 6, 2016). The code does not address animals’ privacy. Paragraph 4 of the Code urges members to “[e]xercise high standards in the care and use of live vertebrate animals used for research, in accordance with accepted professional guidelines for the respective classes of animals under study.”

181. THE SOCIETY FOR CONSERVATION BIOLOGY, CODE OF ETHICS, adopted in August 2004, available at www.combio.org/about-scb/who-we-are/code-of-ethics/ (last accessed on July 10, 2016). The Code includes general language about animal welfare but omits any mention of privacy. Paragraph 15 of the Code exhorts members to “[a]dhere to the highest standards for treatment of animals used in research in a way that contributes most positively to sustaining natural populations and ecosystems”).

182. For its guidelines, the ASM has adopted a document authored by Robert Sikes, et al., *Guidelines of the American Society of Mammalogists for the Use of Wild Mammals in Research*, 97 J. MAMMALOGY 663 (2016). This document offers more detail than the other groups’ guidelines, and addresses such matters as trapping, tissue sampling, maintenance of wild-caught mammals in captivity, and euthanasia, but the ASM guidelines still do not discuss privacy or any related concept. One purpose of the ASM guidelines is to provide a protocol that an IACUC might adopt. The ASM guidelines note that regulations under the AWA do not require IACUC review for field studies—including studies that may involve capture at the outset—but some agencies that provide grants to wildlife research might insist on IACUC oversight, so IACUC review of such studies is inconsistent. *Id.* at 670. The ASM guidelines suggest that researchers should seek IACUC review even when not required to do so. *Id.*

183. AMERICAN PSYCHOLOGICAL ASSOCIATION, GUIDELINES FOR ETHICAL CONDUCT IN THE CARE AND USE OF NONHUMAN ANIMALS IN RESEARCH, adopted by the APA Council of Representatives on February 24, 2012, available at www.apa.org/science/leadership/care/guidelines.aspx (last visited on July 6, 2016). “Field research that carries a risk of materially altering the behavior of nonhuman animals and/or producing damage to sensitive ecosystems is subject to IACUC approval. Field research, if strictly observational, may not require animal care committee approval . . . Psychologists conducting field research should disturb their populations as little as possible, while acting consistent with the goals of research. Every effort should be made to minimize potential harmful effects of the student on the population and on other plant and animal

these guidelines is very general, and does not address the need to protect the privacy of wildlife.¹⁸⁴ Moreover, these professional organizations do not have the means to enforce their ethical codes effectively: they lack the power of licensure, and their strongest sanction is censuring or suspending members, which does not prevent the violators from engaging in further wildlife research.¹⁸⁵ Some of these organizations’ publications have set forth guidelines that could be effective if widely adopted and enforced.¹⁸⁶ However, for the most part the role of professional organizations is to share information about best practices rather than to compel compliance with protocols.

In sum, the present approach to regulating wolf surveillance is inadequate in many respects. The rules that exist lack uniformity. They leave large gaps in which wolf collaring can occur with little

species in the area.” (cross-referencing other regulation such as the AWA and the ESA.)

184. Only one of the codes listed here, the APA code, makes any reference to privacy, and that reference concerns the privacy of *humans* who are near field research projects. “Research in populated areas must be done with respect for the property and privacy or the inhabitants of the area.” *Id.* While this sentence does not refer explicitly to humans, the context makes clear that humans are the focus: because only humans own property. The codes of both the Wildlife Society and the Society of Conservation Biologists provide that members should protect the rights of humans (presumably including privacy), but the codes have no comparable language for animals. WILDLIFE SOCIETY, CODE OF ETHICS, ¶5; SOCIETY OF CONSERVATION BIOLOGISTS, CODE OF ETHICS, ¶14.

185. To put it differently, membership in these organizations is not a condition for professionals to practice, as it is the case for state bar associations, which can suspend or disbar members and thereby prevent them from practicing altogether (at least within a particular state). Indeed, the organizations listed here accept members who are not even practitioners of conservation science. *See, e.g.*, WILDLIFE SOCIETY, www.wildlife.org/join/ (last visited on July 10, 2016) (“Membership is open to wildlife professionals, students and supporters who are interested in wildlife science, management and conservation”); SOCIETY FOR CONSERVATION BIOLOGY, www.combio.org/membership/become-a-member/ (last visited on July 10, 2016) (“The Society For Conservation Biology has been advancing the science and practicing of conserving the Earth’s biological diversity since 1985 and represents conservation professionals and students worldwide . . . If you are working to prevent loss of biodiversity—no matter where you are in your career or in the world—this is your professional community”); AMERICAN SOCIETY OF MAMMALOGISTS, www.mammalsociety.org/membership/ (last visited on July 10, 2016) (“Anyone interested in mammalogy may become a member of the American Society of Mammalogists upon payment of dues”).

186. For example, the ASM has published a set of guidelines that IACUCs could use in reviewing proposals for research involving wildlife. Sikes, *supra* note 173, at 670. The ASM has collaborated with the Ornithological Council to develop a template that researchers can use when submitting such proposals to IACUCs. This form is accessible at http://ornithologyexchange.org/articles/_/community/new-model-protocol-form-for-wildlife-research-now-available-r150. As noted previously, however, telemetry may qualify as a field study that is automatically exempt from IACUC review, even though ASM urges its members to submit their protocols to IACUCs.

regulation. To the extent that guidelines apply, they tend to be general in nature, and do not mention animals' privacy.

IV. TOWARD A CONCEPTION OF WILDLIFE PRIVACY

Neither the U.S. Constitution nor any statute recognizes an animal's legally enforceable privacy right.¹⁸⁷ Animals have no rights at all.¹⁸⁸ The constitutional doctrine of privacy protects against interference with a privately owned animal to the extent that the owner asserts this right,¹⁸⁹ but the animal has no claim to privacy independent of the owner's right,¹⁹⁰ and even the derivative privacy right sometimes yields to other priorities.¹⁹¹ In some jurisdictions, the law deems wild animals to be the property of the government,¹⁹² so government

187. James Grimadli, *National Zoo Cites Privacy Concerns in Its Refusal to Release Animal's Medical Records*, WASH. POST, May 6, 2002, p. E3 ("The notion that animals have a right to privacy is, from a legal standpoint odd, because courts have long held that they don't").

188. According to Hope Babcock of Georgetown, "The law is clear": "animals have no legally cognizable right." Hope Babcock, *A Brook with Legal Rights: The Rights of Nature in Court*, 43 *ECOLOGY L. Q.* 1, 39 (2016) (internal citations omitted). Accord Cara Feinberg, *HARVARD TODAY*, Mar.-Apr. 2016 (animals are property and have no rights); Annie Dryden, *Overcoming the Inadequacies of Animal Cruelty Statutes and the Property-Based View of Animals*, 38 *IDAHO L. REV.* 177, 178 (2001) ("As property, animals logically lack 'rights'").

189. See, e.g., *Massachusetts v. Hurd*, 743 N.E.2d 841, 844-45 (Mass. App. 2001) (in prosecution for animal cruelty, defendant had a reasonable expectation of privacy that protected against government's attempts to view condition of animal); see generally Jenni James, *When Is Rescue Necessary? Applying the Necessity Defense to the Rescue of Animals*, 7 *STAN. J. ANIMAL L.* 1, 33 (2014) (observing that "judges frequently find that the privacy interest of an animal enterprise outweighs the right of an animal not to suffer," so animal rights' activists cannot invoke necessity defense to overcome animal abusers' reliance on trespass and privacy laws).

190. Humans tend to invoke privacy rights with respect to animals if the invocation of privacy would benefit the humans. For example, the National Zoo denied the Washington Post access to the medical records of a recently deceased giraffe, asserting that disclosure would violate the animal's privacy rights. Martin Halstuk *Shielding Private Lives from Prying Eyes: The Escalating Conflict between Constitutional Privacy and the Accountability Principle of Democracy*, 11 *COMMLAW CONSPECTUS* 71, 95 (2003); see James Grimadli, *National Zoo Cites Privacy Concerns in Its Refusal to Release Animal's Medical Records*, WASH. POST, May 6, 2002, E3 ("The problem with standing is we have to assert human interests when it is the animal that has been adversely affected," said the [Animal Defense Fund's] managing attorney, Wendy Anderson").

191. See, e.g., Martha Neil, *City Wins Federal Civil Rights Case over Police Shooting of Dog Attacked by Pit Bull*, ABA J., June 13, 2015 (reporting that federal jury found for defendant when plaintiff sued city alleging seizure in violation of Fourth Amendment privacy rights after colorblind police officer shot and killed plaintiff's dog; officer mistakenly thought was a pit bull that posed a safety risk, and this earnest belief was sufficient to overcome plaintiff's rights); see also *State v. Newcomb*, ___ P.3d. ___, 2016 WL 3476247 *4-9 (Or. June 16, 2016) (rejecting defendant's claim that privacy right prohibited government from seizing and drawing blood from defendant's dog).

192. See, e.g., David Warner, *Environmental Endgame: Destruction for Amusement and a Sustainable Civilization*, 9 *S.C. ENVTL. L. J.* 1, 56 (2000) (indicating that wild animals are property

officials are free to control wildlife with virtually no legal constraints whatsoever. The Supreme Court has declared that animals are the paradigmatic example of creatures that may be photographed and filmed without violating legally cognizable privacy interests.¹⁹³

The current lack of constitutional rights for animals should not discourage advocates from demanding protection of animals' privacy. Constitutional protections have been under-inclusive for most of this country's history. For example, the Constitution failed to protect the rights of African-Americans until the 1860s¹⁹⁴ and the equal rights of women were not acknowledged until 1920.¹⁹⁵ The Supreme Court did not recognize the constitutional right of privacy until the 1960s,¹⁹⁶ the right of reproductive freedom until 1973,¹⁹⁷ and a constitutional protection for same-sex marriage until 2015.¹⁹⁸ The gradual accretion of rights in the U.S. offers some hope that the doctrine of privacy could eventually extend to animals.

There are at least two conceivable strategies for reforming the law to protect the privacy of wildlife. One would be a rights-based approach recognizing animals as autonomous creatures entitled to some version of dignity rights, including privacy.¹⁹⁹ While the idea of

owned by the state); *State v. Halverson*, 277 N.W.2d 723, 724 (S.D. 1979) (“Wild animals in this state are the property of the state”); *Recent Case: Interstate Commerce—Control by States—Prohibition of Exportation of Natural Gas*, 25 HARV L. REV. 90, 90 (1911) (discussing “state’s property right in wild animals”). According to David Favre, a law professor at Michigan State and one of the nation’s top experts on animal law, “[t]he legal control of wildlife, as recognized under the state ownership doctrine, is based on the fundamental premise that state government has the power to control the taking (by capturing or killing) of all wild animals found within their jurisdiction.” David Favre, *Animal Wildlife Law—An Introduction*, ANIMAL LAW WEB CENTER, 2003, available at www.animallaw.info/article/american-wildlife-law-introduction (last accessed on July 5, 2016).

193. *Houchins v. KQED, Inc.*, 438 U.S. 1, 5 n.2 (1978) (indicating that animals in a zoo may be “filmed and photographed at will by the public or by media reporters”).

194. See U.S. CONST. amend. XIII (prohibiting slavery), amend. XIV (establishing equal protection, among other provisions), and amend. XV (protecting voting rights).

195. See U.S. CONST. amend. XIX (allowing women to vote).

196. See *Griswold v. Connecticut*, 381 U.S. 479 (1965) (recognizing a right of privacy that the government violates when it criminalizes the use of contraception).

197. See *Roe v. Wade*, 410 U.S. 113 (1973) (holding that a woman has a right to terminate her pregnancy under certain circumstances).

198. See *Obergefell v. Hodges*, 135 S. Ct. 2584 (2015) (determining that same-sex couples have a constitutional right to marry just as if they were heterosexual couples).

199. Steven Wise is one of the foremost advocates for animal rights in the United States. He is the president of the Nonhuman Rights Project. He grounds his argument for animal rights in a Kantian conceptions of autonomy and dignity. See, e.g., Steven Wise, *Hardly a Revolution—The Eligibility of Nonhuman Animals for Dignity-Rights in a Liberal Democracy*, 22 VT. L. REV. 793, 861 (1998) (arguing that animals exhibit some of the attributes that Kant and others have deemed

conferring some form of rights on nonhumans is appealing in theory,²⁰⁰ this approach has achieved little success to date,²⁰¹ perhaps because it appears to be a radical departure from the anthropocentric conception of rights.

A second possible strategy would be to protect animals' privacy as a matter of policy, not as a matter of right.²⁰² This strategy might be viable if advocates could demonstrate that protecting animals' privacy is a modest and logical extension of current animal welfare statutes.²⁰³ This Article argues that this latter policy-based approach offers the best avenue to establish a legal doctrine of wildlife privacy. Furthermore, this Article also contends that protection of animals' privacy is a natural corollary—or “penumbra”—of existing statutes.

A. *Privacy as Integral to Animal Welfare*

Federal and state law currently protect against abusive treatment violating the bodily integrity of animals.²⁰⁴ The underlying rationale is

necessary for autonomy and personhood, so animals should be theoretically eligible for some version of the dignity rights attendant to autonomy; while this article was not primarily about privacy, it did incidentally mention privacy among other dignity rights).

200. For an excellent recent discussion of the case for extending rights to nonhumans, see Babcock, *supra* note 188, at 3 (urging that a natural resource should be able to appear in court “in its own right to complain of threats to its continued existence”); see also Christopher Stone, *Should Trees Have Standing?—Toward Legal Rights for Natural Objects*, 45 S.C. L. REV. 450 (1972) (envisioning the possibility that trees could sue or intervene in suits).

201. Courts in the U.S. have generally rejected such arguments. Babcock, *supra* note 194, at 18 (arguing that nature “cannot gain access to the courts to protect itself”). In the U.S., no constitutional provision at the federal or state level accords dignity rights to animals, but Germany amended its constitution in 2012 to include such a provision. Emily Fitzgerald, *[Ape]rsonhood*, 34 REV. LITIG. 337, 351 (2015) (brackets in title of original).

202. Legislatures may deal with gaps in the coverage of the U.S. Constitution or state constitutions by legislating rights and protections that exceed the constitutional minimums or otherwise fill constitutional interstices. See, e.g., Tom Lininger, *Reconceptualizing Confrontation after Davis*, 85 TEX. L. REV. 271, 291 (2006) (arguing that states should adopt statutes to fill gaps in the coverage of the Sixth Amendment); Margaret Paris, *Trust, Lies and Interrogation*, 3 VA. J. SOC. POL'Y & L. 3, 8 (1996) (urging a legislative response to address gaps in the coverage of the Fifth Amendment); David Schuman, *Taking Rights Seriously: Communitarian Search and Seizure*, 27 AM. CRIM. L. REV. 583, 603 (1990) (suggesting the same approach to deal with areas beyond the scope of the Fourth Amendment).

203. Judge Richard Posner has stressed the need for animal advocates to “proceed incrementally, building on existing cases and legal concepts, toward [their] goal of radically enhanced legal protections for animals.” Richard Posner, *Animal Rights*, 110 YALE L. J. 527, 528 (2000) (brackets added).

204. See *id.* at 539 (referring to federal statute addressing animal welfare as “comprehensive”); see also Jeni James, *When Is Rescue Necessary? Applying the Necessity Defense to the Rescue of Animals*, 7 STAN. J. ANIMAL L. & POL'Y 1, 3 (2014) (“Every state prohibits animal cruelty to some extent, with provisions dating back to the 19th century”); Janet

clear: it would be inhumane to allow the purposeful infliction of suffering on animals.²⁰⁵ Animal cruelty laws generally prevent physical mistreatment of nonhuman creatures where such mistreatment is grossly disproportionate to the benefits humans derive from the activity at issue.²⁰⁶ Specifically, laws exist to protect wild animals against poaching,²⁰⁷ certain categories of scientific experimentation,²⁰⁸ mistreatment in activities that implicate interstate commerce.²⁰⁹ Other laws safeguard the health of endangered species.²¹⁰ While critics have raised valid complaints about the limited scope of animal welfare

McDonald, *Defending Those Who Cannot Speak: Civil and Criminal Prosecution of Animal Abuse*, 88-NOV FLA. BAR J. 30, 30 (2014) (“Animal cruelty, neglect, and abandonment laws are codified in every state”). For a complete list of laws regulating cruelty to animals, see the website of the Michigan State University College of Law’s Animal Legal and Historical Center, www.animallaw.info/site/comparative-tables (last visited on July 5, 2016).

205. See *United States v. Stevens*, 599 U.S. 460, 495–96 (2010) (Alito, J., dissenting) (declaring that the government “has a compelling interest in preventing the torture depicted in crush videos”); cf. Posner, *supra* note 203, at 534 (suggesting that, within a utilitarian framework that posits a moral duty to maximize happiness, “it seems axiomatic that people should be forbidden to mistreat those animals that have a sufficiently developed nervous system to be able to experience pain”).

206. *Humane Soc’y v. Lyng*, 633 F. Supp. 480, 486 (W.D.N.Y. 1986) (“It has long been the public policy of this country to avoid unnecessary cruelty to animals.”); Gary Francione, *Animals, Property and Legal Welfareism: ‘Unnecessary’ Suffering and the ‘Humane’ Treatment*, 46 RUTGERS L. REV. 721, 723 (1994) (“There are, of course, many laws on the federal and state levels that purport to protect animals from ‘inhumane’ treatment, but these laws do not really confer rights in the sense that we usually use that term. Rather, these laws concern animal welfare, or the notion that animals may be exploited by humans as long as the exploitation does not result in the infliction of ‘unnecessary’ pain, suffering, or death.”).

207. See, e.g., Ruth Musgrave et al., *The Status of Poaching in the United States—Are We Protecting Our Wildlife*, 33 NAT. RESOURCES J. 977, 985–1002 (1993) (reviewing federal and state laws that restrict poaching); Christine Fisher, *Conspiring to Violate the Lacey Act*, 32 ENVTL L. 475, 485–500 (2002) (explaining the provisions of the Lacey Act, which criminalizes trafficking in certain categories of wildlife).

208. See Fitzgerald, *supra* note 207 (summarizing many different nations’ laws concerning animal testing, and concluding that “banning the use of non-human animals in scientific testing and invasive experimentation has become the norm”).

209. See Posner, *supra* note 203, at 539 (“The Animal Welfare Act provides comprehensive federal protection of wild animals.”); but see Carole Nowiicki, *The Animal Welfare Act: All Bark and No Bite*, 23 SETON HALL LEGIS. J. 443, 477 (1999) (expressing concern that “the AWA only regulates research facilities, exhibitors, and dealers of animals in interstate commerce”).

210. 16 U.S.C. § 1531(b) (2012) (declaring that a congressional purpose in passing the Endangered Species Act was to protect endangered species from harm).

statutes,²¹¹ it is undeniable that the law now offers some protection for the physical integrity of animals.

Once one accepts the premise that the law should protect animals' corporeal integrity, it is a small additional step to support the protection of animals' privacy. Animals need privacy to thrive.²¹² Alan Westin, a professor at Columbia, summarized the scientific evidence concerning the value of privacy to animals:

One basic finding of animal studies is that virtually all animals seek periods of individual seclusion or small-group intimacy. This is usually described as the tendency toward territoriality, in which an organism lays private claim to an area of land, water, or air and defends it against intrusion by members of its own species.²¹³

Adam Moore of the University of Washington indicated privacy may be a matter of life and death in the animal kingdom:

To get a sense of the importance of privacy and separation, it is helpful to consider similar interests shared by many non-human animals [E]cological studies demonstrat[e] that a lack of private space, due to overpopulation and the like, will threaten survival. In such conditions, animals may kill each other or engage in suicidal reductions of their population Moreover, these results hold across a wide range of species, supporting the connection that having the ability to separate, like food and water, is a necessity of life.²¹⁴

According to Professor Westin, “[t]here have to be moments ‘off-stage.’” Westin recognized that, “[t]o be ‘on’ always would destroy the organism.”²¹⁵

211. See, e.g., James, *supra* note 210, at 3 (“Actual [animal] protection, however, exists more in theory than in practice. Anti-cruelty laws are often limited in scope, and protection varies according to an animal’s species and economic utility.”); Darian M. Ibrahim, *The Anticruelty Statute: A Student in Animal Welfare*, 1 J. ANIMAL L. & ETHICS 175, 176 (2006) (contending that anticruelty statutes “do not challenge the majority of modern practices that exploit animals”).

212. Henry F. Fradella et al., *Quantifying Katz: Empirically Measuring “Reasonable Expectations of Privacy” in the Fourth Amendment*, 38 AM. J. CRIM. L. 289, 301 (2011) (“Although privacy is a concept that is often perceived as being a unique characteristic of human beings, several decades of growing evidence suggest human and animals both share biological needs for privacy”). Animals find privacy to be beneficial even though they do not value it for the same reason reasons that humans do. For an excellent discussion of the reasons why privacy is valuable to humans, see Julie Cohen, *What Is Privacy For?*, 126 HARV. L. REV. 1904, 1905–1911 (2013).

213. ALAN WESTIN, *PRIVACY AND FREEDOM* 8 (Atheneum 1967); see Peter Klopfer & Daniel Robenstein, *The Concept of Privacy and Its Biological Bases*, 33 J. SOC. ISSUES 52, 64 (1977) (“In sum, there are innumerable instances of nonhuman animals acting in a manner that characterizes humans seeking privacy.”).

214. ADAM MOORE, *PRIVACY RIGHTS: MORAL AND LEGAL FOUNDATIONS* 47-48 (Penn St. U. Press 2010) (internal citations omitted).

215. WESTIN, *supra* note 219, at 35.

The necessity of privacy for survival is even clearer when considering the full range of animals’ activities requiring some degree of privacy. Mating usually occurs in private.²¹⁶ Child rearing is also highly private,²¹⁷ as some animals will abandon their young altogether in response to intrusion.²¹⁸ Animals build or find secluded residences—sometimes permanent, sometimes temporary—because they have a physiological need to rest periodically without disturbance.²¹⁹ Injured animals need solitude in order to recuperate.²²⁰ Many animals pursue prey stealthily, needing privacy to hunt.²²¹ These are but some of the reasons demonstrating why privacy is a basic necessity for virtually all animals, many of whom “will die without it.”²²²

216. JUDITH DECEW, IN PURSUIT OF PRIVACY: LAW, ETHICS AND THE RISE OF TECHNOLOGY 12 (Cornell U. Press 1997) (stating that “virtually all animals seek periods of individual seclusion or small group intimacy,” and this inclination toward privacy serves “various biological purposes, especially those of ensuring propagation of the species”).

217. Alan Westin, *The Origins of Modern Claims to Property*, in PHILOSOPHICAL DIMENSIONS OF PRIVACY 56, 57–58 (Ferdinand Schoeman ed., Cambridge U. Press 1984) (indicating that a lack of privacy can disrupt nest building and rearing of young); WILLIAM HORNADAY, OUR VANISHING WILD LIFE: ITS EXTERMINATION AND PRESERVATION 322 (Scribner 1913) (“Every breeding wild animal craves seclusion and immunity from excitement and all forms of molestation. Nature demands this as her unassailable right.”).

218. E.g., Robyn Boyd, *Fact or Fiction? Birds (and Other Critters) Abandon Their Young at the Slightest Human Touch*, SCIENTIFIC AMERICAN (July 26, 2007), <https://www.scientificamerican.com/article/fact-or-fiction-birds-abandon-young-at-human-touch/> (noting that birds may abandon their nests in response to human disturbance, although this abandonment may only be temporary; rabbits may abandon their nests altogether).

219. Professor Brett Mills at the University of East Anglia stressed that documentary filmmakers should not intrude in animals dens or burrows for this reason. UNIVERSITY OF EAST ANGLIA, *Animals’ Right to Privacy Denied by Wildlife Documentary Makers*, Academic Says, SCIENCE DAILY (Apr. 29, 2010), <https://www.sciencedaily.com/releases/2010/04/100429092934.htm> (“For example, many species could be read as desiring not to be seen—animals in burrows and nests have constructed a living space which equates with the human concept of a home, and commonly do this in locations which are, by their very nature, explicitly hidden, often for practical purposes.”).

220. Wildlife experts recognize that privacy is crucial for healing. E.g., SAFEWINGS BIRD SANCTUARY, *About Us*, UK SAFARI, www.uksafari.com/safewings/aboutus.htm (last visited on July 20, 2016) (mentioning that healing from injury requires privacy from human intrusion); HORNADAY, *supra* note 223, at 322 (arguing that when an animal “is struggling to recuperate, it deserves to be left *entirely unmolested*”) (emphasis in original).

221. Ella Davies, *Which Animal is the Stealthiest Hunter on the Planet?*, BBC.COM (Dec. 22, 2015), <http://www.bbc.com/earth/story/20151222-which-animal-is-the-deadliest-hunter-on-the-planet> (observing that some animals are stealthy hunters and “rely on the element of surprise to catch their prey”).

222. Lenore Garon, *Protecting Privacy in Credit Reporting*, 24 STAN. L. REV. 550, 554 (1972) (discussing basic biological necessity for privacy among many species of animals).

B. Privacy as Legally Cognizable Penumbra

The law should protect animals' privacy from human encroachment because privacy implicates the same concerns as those underlying the statutes protecting animals' health. In other words, protecting animals' privacy is a penumbral implication of the current laws protecting animals' welfare and bodily integrity.²²³ In the legal context, the term *penumbral* refers to an emanation from a plain provision in existing law. The basic concept is that a penumbral implication is so intertwined with other more straightforward provisions that it ought to be enforceable alongside those provisions.²²⁴

Using penumbral analysis to infer a legal basis for wildlife privacy seems sensible because human privacy also derives from a penumbra. In *Griswold v. Connecticut*,²²⁵ the Supreme Court discerned a human right to privacy even though the Constitution does not expressly mention privacy.²²⁶ The Court in *Griswold* found that privacy is a penumbra of other rights expressly set forth in the Constitution.²²⁷ According to the Court, specific guarantees in the Bill of Rights have penumbras, formed by emanations from those guarantees that give them life and substance. The Court relied on this penumbra to strike down a state statute that criminalized the use of contraception.²²⁸ The

223. The word *penumbra* means "partially shaded outer region of the shadow cast by an opaque object." This definition of *penumbra* appears in the online version of the Oxford English Dictionary, www.oxforddictionaries.com/us/definition/american_english/penumbra (last visited on July 20, 2016).

224. See Benjamin Zipursky, *Practical Positivism Versus Practical Perfectionism: The Hart-Fuller Debate at Fifty*, 839 N.Y.U. L. REV. 1170, 1176 (2008) (noting that penumbral analysis entails considering "the goals of the law" as evident in the language used in the law).

225. 381 U.S. 479 (1965).

226. *Roe v. Wade*, 410 U.S. 113, 152 (1973) ("The Constitution does not explicitly mention any right of privacy."). See SONU BEDI, *REJECTING RIGHTS* 146–47 (Cambridge Press 2009) (indicating that "the modern right to privacy has little textual basis in the Constitution").

227. 381 U.S. at 484. The constitutional guarantees giving rise to the penumbra of privacy included the following: the First Amendment's provisions guaranteeing freedom of association; the Third Amendment's protection against quartering of soldiers; the Fourth Amendment's safeguard against unreasonable searches and seizures; and the Fifth Amendment's prohibition of compulsory self-incrimination. *Id.*

228. *Id.* at 485.

Court later embraced penumbral reasoning in a series of other cases regarding privacy,²²⁹ including *Roe v. Wade*.²³⁰

While penumbral reasoning is most prominently invoked in the context of constitutional jurisprudence,²³¹ it also applies to statutory interpretation.²³² Even H.L.A. Hart, the famous advocate of legal positivism,²³³ argued that penumbral analysis of statutes is appropriate in certain circumstances.²³⁴ Hart wrote that a court should faithfully apply the “core of settled meaning” in a statute, but should also apply the principles underlying the statute to adjudicate the “penumbra of debatable cases.”²³⁵ For example, a statute forbidding vehicles in a park would logically extend to prohibit bicycles, roller skates and toy cars in that park.²³⁶ Extension of the statute to cover additional matters

229. Spears, *supra* note 19 (noting that *Griswold* brought the term “penumbra” into the national lexicon, “and since its issuance has served as an important basis on which other significant privacy rulings have relied”); see BEDI, *supra* note 226, at 148, 156 (discussing role of *Griswold*’s privacy right in later cases permitting abortion and consensual homosexual relations).

230. 410 U.S. at 152. There is some irony in attempting to derive a doctrine of wildlife privacy from the penumbral reasoning that protects human reproductive freedom. The pro-life movement and the animal rights movement are arguably similar in that they seek to extend rights beyond what current law considers to be the limits of the human realm. For a fascinating discussion of this parallel, see SHERRY COLB & MICHAEL DORF, *BEATING HEARTS: ABORTION AND ANIMAL RIGHTS 2* (2016).

231. Brandon Denning & Glenn Reynolds, *Comfortably Penumbral*, 77 B.U. L. REV. 1089, 1120 (1997) (noting increased use of penumbras in constitutional interpretation by liberal and conservative justices); Glenn Reynolds, *Penumbral Reasoning on the Right*, 140 U. PA. L. REV. 1333, 1120 (1992) (observing that right-wing jurists engage in penumbral interpretation even as the right ostensibly advocates strict interpretation and reliance on original intent); *but see* Alex Kozinski & Eugene Volokh, *A Penumbra Too Far*, 106 HARV. L. REV. 1639, 1647 (1993) (criticizing penumbral interpretation, and suggesting that results could be “perilous”).

232. “The concept of penumbra is commonly used in resolving questions of constitutional and statutory interpretation.” Brief of Appellant Max C. Maloney at 30, *Maloney v. Valley Medical Authorities*, 946 A.2d 702 (Pa. Super Ct. 2007) (No. 346 WDA 2007) (emphasis added). *See, e.g.*, *Textile Workers Union v. Lincoln Mills*, 353 U.S. 448, 457 (1957) (“Other problems will lie in the penumbra of express statutory mandate. Some will lack express statutory sanction but will be solved by looking at the policy of the legislation and fashioning a remedy that will effectuate that policy.”).

233. In a nutshell, positivists believe that interpretation of law should depend on the law itself, not on extrinsic concepts of morality or “natural law.” Zipursky, *supra* note 231.

234. *See* H.L.A. Hart, *Positivism and the Separation of Law and Morals*, 77 HARV. L. REV. 593, 607 (1958).

235. *Id.*

236. Anthony D’Amato has explained Hart’s example involving the statute forbidding vehicles.

Each statute, according to Hart, has a core and a penumbra, and thus his theory is a general one. In line with his positivist predecessors, Hart considers the court’s ability to transform the penumbral part of the message as authorized by delegation from the legislature. In other words, when a legislature passes a statute, it is saying to the court:

not explicitly mentioned is necessary to achieve the underlying goals of the statute.

In a similar manner, protecting animals' privacy is essential to achieve the goals underlying animal welfare statutes. As noted previously, privacy is vital for animals' health because it provides opportunities for hunting, mating, rearing offspring, resting, and recuperating from injury.²³⁷ Just as a statute prohibiting disruption in a park should logically extend beyond vehicles to other vehicle-like equipment, so too should a legislative scheme protecting animal welfare protect animals' privacy, which is indispensable to their welfare.

There are many ways in which practical rules could express the doctrine of animal privacy. The most straightforward approach would be for legislatures to amend their animal welfare statutes in order to protect privacy. Courts could also employ penumbral reasoning to derive privacy protections from the more general language in current animal welfare statutes. As Judge Posner has noted, the cause of animal protection would benefit from characterizing its objectives as closely related to objectives that judges and lawmakers already consider legitimate.²³⁸ The importance of privacy (at least for humans) is one of the few principles on which virtually all legislators and judges agree.²³⁹ Protecting privacy with procedural rules limiting government

transmit the core portion of this message intact, but you are hereby delegated to 'legislate' or otherwise be creative (i.e., add information) with respect to the penumbral portion of this message. [In the case of statute prohibiting vehicles in the park,] the term 'vehicle' might cast a wider net than simply encompassing the automobile. This Hart calls the area of the 'penumbra.' The penumbra might include bicycles, roller skates, toy automobiles that are battery propelled, or airplanes.

ANTHONY D'AMATO, JURISPRUDENCE: A DESCRIPTIVE AND NORMATIVE ANALYSIS OF LAW 132-33 (1984) (brackets added).

237. See *supra* note 222-38 and accompanying text.

238. Judge Posner has suggested that animal advocates would be more likely to succeed if "departures from existing law are treated as applications of it guided by analogy or deduction." *Supra* note 209 at 533. These advocates should not overlook "an approach to the question of animal welfare that is more conservative, methodologically as well as politically, but possibly more efficacious, than rights-mongering. That is simply to extend, and more vigorously enforce, laws designed to prevent gratuitous cruelty to animals." *Id.* at 539.

239. Jeffrey Rosen, a law professor at George Washington, has observed that, "conservative and liberal justices have joined in unexpected alliances, proving that on the Supreme Court, as on Capitol Hill, privacy is a cross-cutting, bipartisan issue." Jeffrey Rosen, *A Victory for Privacy*, WALL ST. J., June 18, 2001, at A.18. See also Craig Bradley, "Knock and Talk" and the Fourth Amendment, 84 INDIANA L. J. 1099, 1099 (2009) (noting that Republican appointees on the Supreme Court have surprisingly similar to Democratic appointees in their zeal to protect privacy; they have demanded warrants for even "minor intrusions" that infringe privacy rights); e.g., Joint letter from Senator Chuck Grassley, chairman, and Patrick Leahy, ranking member, U.S. Senate

intrusion is a familiar task for legislators and judges. They have already formulated extensive rules to protect privacy in the context of criminal investigations. The next Part considers the possibility of importing and adapting some of these rules.

V. BORROWING REQUIREMENTS FOR INFRINGEMENT OF HUMAN PRIVACY

Currently, a legal patchwork governs the surveillance of wildlife.²⁴⁰ This article argues that it is time to take animals’ privacy seriously by establishing a uniform, comprehensive, and predictable set of rules for the use of surveillance collars on wild animals. Such rules should prescribe the procedure and limitations for monitoring wildlife, and should set forth penalties for misuse of surveillance information.

The rules that protect human privacy during criminal investigations provide a useful model. Of course, it would be inappropriate to import the exact same rules to the context of wildlife surveillance. No one would argue that the government should read Miranda warnings to animals or seek their consent for searches. However, the analogous example of criminal procedure deserves careful consideration for several reasons. First, the surveillance technology used in the wilderness derives from investigations of human criminals and spies.²⁴¹ Second, the rules of criminal investigation are familiar not only to judges, lawyers, and police, but also throughout popular culture. This familiarity might improve the likelihood of compliance and the consistency of application. Third, the ample case law addressing the fine points of Fourth Amendment jurisprudence could provide analogous—if not on-point—authority guiding the implementation of rules for wildlife surveillance. Finally, the cross-application of rules protecting human privacy may reduce speciesism and increase humans’ appreciation for animals’ privacy.

The best way to safeguard wildlife privacy, like human privacy, is

Judiciary Comm., to Attorney Gen. Eric Holder (Jan. 22, 2015) (expressing bipartisan disapproval of investigative tactics that infringed privacy).

240. *See supra*, Part III.

241. Benson, *supra* note 4 (recounting that wildlife biologists derived their surveillance technology from investigations of crime and espionage). At the present time, wildlife biologists are not only using this high-tech investigative techniques to learn about wildlife behavior, but also to investigate possible crimes by humans against wildlife. U.S. FISH AND WILDLIFE SERV., *About the Laboratory*, <https://www.fws.gov/lab/about.php> (last visited on July 22, 2016) (explaining that lab uses advanced forensics technology to solve cases in which animals seem to be victims of human crimes).

with “bright-line rules.” These rules are predictable and help officials readily discern all the boundaries limiting their conduct.²⁴² Because bright-line rules are necessary to protect privacy, penumbral analysis does not usually play a significant role in enforcing the privacy rules on a day-to-day basis. In other words, it is not necessary to cite the underlying rationale for a bright-line rule and then argue why a particular application of the rule would serve that rationale.²⁴³ For example, a ban on contraception violates human privacy whether or not the claimant has experienced the same sort of harm that led to passage of the First Amendment’s guarantee of free speech, the Third Amendment’s prohibition of quartering soldiers, the Fourth Amendment’s protection against unreasonable searches, or the Fifth Amendment’s right against self-incrimination, even though the right of privacy emanates as a penumbra from these four constitutional provisions.²⁴⁴ So too must the doctrine of animal privacy have a life of its own, free of any requirement that violations must be linked to the health concerns giving rise to the penumbra. Protection of wildlife privacy must be intrinsically important. Health concerns may be the original rationale for the penumbra, but they do not set the limits of animal privacy. If application of the doctrine depended on proof of health risks in each instance, the analysis would be too speculative and the protection provided by the doctrine would be inconsistent. A bright-line rule would not be very bright if its application were so contingent.

242. Antonin Scalia, *The Rule of Law as a Law of Rules*, 56 U. CHI. L. REV. 1175, 1179–80 (1989) (arguing that bright-line rules are preferable because they improve predictability and consistency).

243. Justice Scalia, who has been one of the strongest proponents of bright-line rules, has expressed his disapproval of “reasoning that abstracts from the right to its purposes,” because such reasoning could make the interpretation of a rule inconsistent, and could even undermine or eliminate the right at issue. Scalia, J., dissenting, *Maryland v. Craig*, 497 U.S. 836, 862 (1990) (criticizing the Supreme Court’s jurisprudence under the Confrontation Clause for abstracting from the confrontation right to its purposes, and then determining the right was unnecessary in a particular case because it would not achieve the underlying purposes in that case). Scalia’s majority opinion in *Crawford v. Washington* offered an illustration that showed the merit of this argument: a judge should not assume that the right to a jury trial is instrumental to the goal of discovering the truth, and then dispense with the defendant’s right to a jury trial when he seems to be obviously guilty. 541 U.S. 36, 60 (2004). Bright-line rules must be more secure and must be immune to consequentialist analysis.

244. *Griswold*, 381 U.S. at 484 (explaining how the right of privacy that led to invalidation of Connecticut’s statute criminalizing contraception emerged as a penumbra from the first, third, fourth and fifth amendments, but not requirement any showing that the ban on contraception directly violated those four amendments or implicated the concerns that led to passage of those amendments).

It is beyond the scope of this Article to determine whether statutes, regulations, or judicial rules would provide the best vehicle for protection of animals’ privacy. A significant amount of scholarship has already addressed the relative merits of these different approaches.²⁴⁵ Assuming uniform enforcement might be possible, the remainder of this Part will focus on the substance of the proposed rules.

A. *Balancing of Particularized Need vs. Privacy Interest*

Criminal investigations generally may not infringe human privacy without a showing that the infringement is reasonable.²⁴⁶ Absent a categorical rule for investigations in particular settings such as airports or prisons, reasonableness turns on a balancing of the government’s particularized need for information against the privacy interest of the suspect or class of suspects.²⁴⁷ This same balancing should be necessary for the use of surveillance collars on wildlife. Specifically, a wildlife biologist or manager should submit a written application setting forth the rationale for the monitoring.²⁴⁸ The requirement of a written submission imposes discipline on the applicant to take account of competing interests, and creates a record for later reference if the propriety of the surveillance is ever in doubt.²⁴⁹ The grounds for

245. David Steinberg, *Sense-Enhanced Searches and the Irrelevance of the Fourth Amendment*, 16 WM. & MARY BILL RTS. J. 465, 471–79 (2007) (comparing the institutional competence of legislatures and courts to protect privacy against modern surveillance techniques); Orin Kerr, *The Fourth Amendment and New Technologies: Constitutional Myths and the Cause for Caution*, 102 MICH. L. REV. 801, 857–82 (2004) (arguing the same).

246. Akil Amar, *Fourth Amendment First Principles*, 4 HARV. L. REV. 107 at 758 (explaining that the Fourth Amendment requires that all searches and seizures be reasonable).

247. David Gray and Danielle Cintron, *The Right to Quantitative Privacy*, 98 MINN. L. REV. 62, 107 (2013) (“‘reasonableness’ requires balancing the legitimate interests of law enforcement against the privacy interests of citizens”).

248. Institutional animal care and use committees (IACUCs) sometimes review applications for surveillance, but the requirements for these applications are not sufficiently standardized, and the use of surveillance collars does not always require review by IACUCs. *See supra* notes 168–75.

249. John Taylor, *Using Suppression Hearing Testimony to Prove Good Faith under United States v. Leon*, 54 KAN. L. REV. 155, 157 (2005) (contending that “the process of preparing a warrant application also imposes on police officers the valuable discipline of having to sit down and write out precisely why they believe they have probable cause to search”; suggesting further that “the effort to justify a search to a neutral third party causes police to exercise greater care in their probable cause judgments”); *see* Priscilla Smith, *When Machines Are Watching: How Warrantless Use of GPS Surveillance Technology Violates the Fourth Amendment Right against Unreasonable Searches*, 121 YALE L. J. FORUM, OCT. 11, 2011 (“Even if judges grant warrants for GPS surveillance liberally, the requirement that law enforcement authorities justify each use of surveillance prevents them from multiply this monitoring by millions.”).

surveillance should include some discussion of benefits to the particular animal that will wear the surveillance equipment, or in the absence of such individual benefits, the significant collective benefits that will accrue to the population of animals including the animal under surveillance.²⁵⁰ The application should not rest entirely on the past value of surveillance, because scientific research has cumulative benefits, and scientists do not need to repeat past experiments to validate their findings.²⁵¹ The authority reviewing each application should use what economists refer to as “marginal analysis”²⁵² focusing on whether surveillance of the next animal would bring benefits exceeding the costs.

B. Consideration of Less Intrusive Alternatives

In criminal investigations, the government cannot use the most intrusive types of investigative techniques, such as wiretaps, without demonstrating that less intrusive strategies would be insufficient.²⁵³ A similar requirement should apply to wildlife surveillance. Like a wiretap, a surveillance collar is one of the most intrusive tools that the government can use in an investigation: it gives investigators access to a vast amount of intimate data on an ongoing basis.²⁵⁴ Thus, the government should reserve this particular tool for circumstances in which less intrusive tools are insufficient. In the case of wolf surveillance, several other less intrusive techniques are available that could avoid the need for a telemetry collar. These techniques include analysis of scat²⁵⁵ and footprints,²⁵⁶ visual monitoring by wildlife

250. Joslin, *supra* note 83, at 216 (arguing that wildlife biologists should not capture and collar animals “unless there is a reasonable expectation that the results will have some potential positive benefit for the animals involved”).

251. *See supra* note 80 (raising doubts about incremental value of scientific data obtained from surveillance collars); Lewis, *supra* note 127, at 9 (questioning the value of this data)

252. PAUL KRUGMAN, ET AL., *ESSENTIALS OF ECONOMICS* 202 (Macmillan 2010) (defining marginal analysis as consideration of incremental benefits and costs).

253. Stephen Arthur and Robert Hunter, *Wiretapping Evidence*, 1 *FED. TRIAL HANDBOOK: CRIMINAL* § 29:3 (2015) (explaining that government may not use a wiretap unless other investigative techniques would be inadequate).

254. *See supra* notes 59–61 and accompanying text.

255. Rebecca Kessler, *Catch a Whiff? Device Aims to Reveal Age, Gender, and Identity of Endangered Wolves from the Scent of Their Poop*, *ENVTL. NEWS*, June 11, 2015 (discussing technology that can identify individual wolves with 94% accuracy based on analysis of scat); e.g., John O’Connell, *Biologist Changing the Way Wolves Are Tracked*, *CAPITAL PRESS*, Dec. 4, 2015 (reporting that the Idaho Department of Fish and Game is beginning to rely on scat analysis in addition to telemetry in tracking wolves).

256. Zoe Jewell and Sky Alibhai of Duke University have promoted a noninvasive technique

biologists and managers on the ground,²⁵⁷ or the use of a “howl box” to determine the presence of wolves in the vicinity.²⁵⁸ If the purpose of collaring wolves is to keep them away from livestock, there are many other potentially viable alternatives.²⁵⁹ Only when the government demonstrates that these less intrusive techniques would be insufficient should the use of surveillance collars be permissible.²⁶⁰

C. *Minimization*

When obtaining permission to use highly intrusive surveillance techniques such as wiretaps in criminal investigations, the government must minimize both the scope and duration of the surveillance. For example, a wiretap order usually directs police to conclude all monitoring within 90 days and stop listening to a phone conversation once it becomes clear that the topic of the conversation is not germane to the investigation.²⁶¹ Similar boundaries are appropriate for the use of surveillance collars on wildlife. For example, permits for surveillance should have a finite duration; a period of a few months should be the default unless the applicant makes a compelling showing for a longer period. The present practice of indefinite surveillance—

that relies on footprint analysis to identify wild animals. See <http://wildtrack.org/> (last visited on July 24, 2016).

257. Andrews, *supra* note 10 (indicating that traditional wildlife tracking may be preferable to telemetry collars in certain circumstances, because observations on the ground can gather a wider range of information).

258. A howl box emits the sound of a wolf’s howl and records responses by any wolves in the facility. Each response is distinctive and allows researchers to keep track of individual wolves. Guthrie, *supra* note 88 (indicating that the howl box is efficient, inexpensive and less intrusive, so it is “an improvement over existing devices”).

259. Stephens, *supra* note 33, at 951–52 (“Perhaps the most effective, and ultimately the most intuitive, is to reduce the number of attractions for the wolves. Quick and effective handling of dead, diseased, or dying livestock and the management of calving, which are all enticing to predators, can significantly reduce the chance of attracting wolves. The use of guard dogs has also been shown to be an effective measure in preventing wolf predation as the canine presence may act as a deterrent, and dogs can be effective in alerting humans when predators enter the area. The use of barriers such as permanent or portable fencing and fladry, the hanging of red or orange cloth flags at eighteen-inch intervals along a thin rope, have proven effective under a variety of circumstances Range riders patrol livestock herds, keeping track of their location with respect to the are wolf packs, and taking proactive measures such as removing carcasses quickly. Their presence is generally effective in deterring wolves from entering the area, as wolves actively avoid humans.”).

260. In Australia, the ethical rules for radio tracking direct wildlife managers to “[u]se alternative methods whenever possible.” *Radio Tracking Wildlife Research*, ANIMAL ETHICS INFOLINK, www.animaethics.org.au/policies-and-guideliens/wildlife-research/radio-tracking (last visited on July 11, 2016) (setting forth various guidelines for the use of radio tracking devices).

261. Arthur and Hunter, *supra* note 253 (discussing minimization requirement).

continuing until the demise of the wolf or the batteries—allows for privacy violations that are too attenuated from the original rationale for surveillance.²⁶² Additionally, researchers should make use of new remote-release technology that frees a wolf from its collar upon expiration of a preprogrammed time period or receipt of an electronic signal from a remote location.²⁶³ Researchers should also stop utilizing data from an active surveillance collar during time periods when the rationale for surveillance is inapplicable. For instance, in a research project focusing on wolves' possible predation of an endangered species in area A, researchers should not monitor the signals from collars when the wolves are far away in area B. Just as in the case of a wiretap, the propriety of collar surveillance depends on dynamic circumstances. The initial order should not provide carte blanche for ongoing surveillance at the sole discretion of the researchers.

D. Review by Neutral, Detached Authority

Police seeking to infringe human privacy in a criminal investigation—for example, by conducting surveillance in an area such as a residence—must first obtain authorization from a judicial officer.²⁶⁴ Involving a neutral, detached official in screening applications for such surveillance provides a system of checks and balances that safeguards privacy.²⁶⁵ If officers were not accountable to a neutral third party, their haste or institutional interests might lead them to undervalue the privacy of the subjects under investigation.²⁶⁶

262. See, e.g., Mark Freeman, *OR-7 Could Be Recollared Next Month*, MEDFORD MAIL TRIBUNE, Aug. 24, 2014 (indicating that Oregon's most famous wolf, OR-7, had worn the same surveillance collar for three and a half years).

263. Surveillance collars are now available that drop off automatically when they receive a signal from the researcher or manager who is monitoring data from the collar. E.g., website of Lotek Fish and Wilderness Monitoring, www.lotek.com/dropoff.htm (last visited on July 24, 2016) (explaining that drop-off mechanism avoids the need for recapture in order to remove the collar).

264. There are exceptions to the warrant requirement for certain settings in which people have a diminished expectation of privacy, such as schools, prisons, automobiles, border checkpoints, airports, heavily regulated industries, etc. See JOSHUA DRESSLER AND ALAN MICHAELS, *UNDERSTANDING CRIMINAL PROCEDURE VOL. 1: INVESTIGATION* 297–317 (2010).

265. *Id.* at 161 (summarizing the law and indicating that “if people are going to be secure in their persons, houses, papers, and effects from unreasonable searches and seizures, as the Fourth Amendment guarantees, a neutral party—the judge, and not the police officer (no, for that matter, the person whose privacy or security is at risk)—should make the initial determination whether there is sufficient basis to intrude on an individual’s security”).

266. Mona Shokrai, *Double-Trouble: The Underregulation of Surreptitious Video Surveillance in Conjunction with the Use of Snitches in Domestic Government Investigations*, 13 RICHMOND J. L. & TECH. 3, 55 (2006) (indicating that requirement of authorization by neutral, detached officer

In the case of wildlife biologists, the vast majority have noble interests, but some are unduly enthusiastic about the use of surveillance collars.²⁶⁷ This enthusiasm might desensitize them to the importance of wildlife privacy. Whereas police officers know they will eventually face the scrutiny of a defense attorney in an adversarial proceeding if their seized evidence leads to prosecution, it is unlikely that wildlife researchers will ever be subjected to such legal scrutiny in representing the interests of the wildlife they have monitored. These circumstances heighten the need for outside review at the outset of the investigation. The requirement of review by an IACUC, while not universally applicable, demonstrates that Congress recognizes the value of external accountability for researchers who work with animals.²⁶⁸ Such a requirement should extend to all uses of wildlife surveillance collars.²⁶⁹

E. Return and Inventory

In the criminal justice system, a police officer who obtains a search warrant must provide the issuing authority with a “return and inventory” after executing the warrant.²⁷⁰ In other words, the officer must report on what the search found.²⁷¹ This procedure provides an incentive for candor and caution in applications, because the results may contradict an exaggerated argument for a search. Requiring a “return and inventory” also helps to educate the official who is determining whether to issue search warrants. The official can learn about the patterns of criminal activity in the area and the trustworthiness of officers who frequently apply for warrants. Importing the same requirements to animal surveillance would improve the accountability of applicants and help the issuing authorities learn more about the tendencies of the animals under surveillance. In time, these safeguards could reduce surveillance to a

reduces potential for police bias in favor of surveillance); see Smith, *supra* note 243 (discussing importance of warrant requirement in “placing a check on the unlimited discretion otherwise afforded officers,” and thereby reducing abuse of surveillance technology”); Phyllis Bookspan *Reworking the Warrant Requirement: Resuscitating the Fourth Amendment*, 44 VANDERBILT L. REV. 473, 529 (1991) (arguing that judicial review “counterattacks the passions of the moment”).

267. *Supra*, notes 68–76 and accompanying text.

268. *Supra*, note 167.

269. Currently the involvement of IACUCs is not mandatory for all use of surveillance collars on wildlife. See *supra* notes 159–73 and accompanying text.

270. FED. R. CRIM. PROC. 41(f) (requiring return and inventory).

271. *Id.*

minimum and best protect animals' privacy. The compilation of all these reports in a central database would reduce the likelihood of duplicative research, and would thereby help to reduce surveillance in the long run.²⁷²

F. Separate Regulation of Restraint on Movement

Police officers who obtain permission to conduct long-term electronic surveillance do not have blanket authorization to imprison any person they encounter during that surveillance.²⁷³ Similarly, when wildlife researchers obtain a permit to use surveillance collars for monitoring wildlife, this permit should not automatically authorize researchers to immobilize, capture and move the animals however they see fit. Wolves naturally migrate, which suggests limitations on their range could be harmful to their health.²⁷⁴ The issuing authority should generally disfavor the use of collars with tranquilizer darts and only allow the use such collars in a permit with a clearly defined list of contingencies that would warrant immobilization. The wholesale movement or enclosure of a wildlife population should require entirely separate authorization. Shock collars are so inconsistent with our understanding of "wildness" that it is hard to imagine any justification for the use of such a technique on a wild animal. In any event, judicial authorization should be necessary.

G. Prohibition of Lethal Measures Absent Exigency

No police officer would assume that a surveillance warrant carries with it the authorization to execute the person who is the subject of the surveillance. Oddly, however, some wildlife managers, who collar wolves for the ostensible reason of protecting them later, use the collars to track down and kill the same wolves when management objectives change.²⁷⁵ Laws should forbid the use of surveillance collars

272. See Joslin, *supra* note 83, at 216 (arguing that wildlife biologists should refrain from additional capturing and collaring of wild animals except when this intervention is absolutely necessary to achieve beneficial results for the animals).

273. Detaining a person suspected of criminal activity requires that an officer reasonably suspect his criminality or otherwise have probable cause to arrest him. *Whren v. United States*, 517 U.S. 806 at 809 (reciting that defendants alleged that their arresting officer lacked reasonable suspicion or probable cause to seize their vehicle). Absent indicia supporting either belief, a surveilled person cannot be detained by an officer.

274. See Jewell, *supra*, note 103 (indicating that limitations on movement can harm wolves' health).

275. See Ketcham *supra*, note 108.

to kill wolves unless separate authorization is obtained from the same issuing authority. If the issuing authority determines that the surveillance application was a ruse to enable the killing of the subject wolves,²⁷⁶ the authority should immediately require the remote release of the collars in question. Hopefully, the policy of minimization²⁷⁷ would reduce the opportunistic use of high-tech surveillance gear for the purpose of stalking and killing collared animals. There are few spectacles in wildlife management that are more shameful—and more unsportsmanlike—than the shooting of a collared wolf by a wildlife manager who once purported to protect the wolf. Of course, the killing of a collared animal would still be permissible if that animal poses an imminent lethal threat to a human being (a circumstance that also permits the use of deadly force against a human suspect under current law).²⁷⁸

H. Sanctions for Noncompliance

Consistent enforcement of bright-line rules is necessary to protect against invasions of privacy.²⁷⁹ In the context of criminal investigations, police officers who violate rules for searches and surveillance face a range of penalties. This includes suppression at trial of any evidence that is the “fruit of the poisonous tree.”²⁸⁰ Animals have no standing to sue²⁸¹ and few trials rely on evidence derived from surveillance of animals. Therefore, a different set of penalties is necessary to assure compliance with wildlife surveillance rules. Sanctions could include fines and “suppression” of data via a court injunction against publication or dissemination.²⁸² Courts might also enjoin further

276. Some critics have suggested that Idaho’s unauthorized use of surveillance collars in 2016 was such a ruse. See Bourdeaux *supra*, note 159.

277. The minimization requirement would limit the duration of permissible surveillance, and would reduce the number of collared wolves at any given instant in time. Freeman, *supra* note 262.

278. *Tennessee v. Garner*, 471 U.S. 1, 11 (1985).

279. Joshua Levy, *Towards a Brighter Fourth Amendment: Privacy and Technology Change*, 16 VA. J. L. & TECH. 499, 513 (2011) (urging that “bright line Fourth Amendment rules are the only way to adequately protect privacy against new technologies” because “such rules enable police to know precisely how far they can intrude when conducting an investigation and, importantly, where they cannot intrude”).

280. DRESSLER, *supra* note 271, at 347-92.

281. Babcock, *supra* note 188, at 18 (arguing that nature “cannot gain access to the courts to protect itself”).

282. An example of the suppression remedy is the order of the U.S. District Court that reviewed the state of Idaho’s unlawful use of surveillance collars on wolves in the Frank Church Wilderness. See *supra*, n. 153-57. The court not only enjoined future use of the surveillance

surveillance by the offending officials. Courts could forbid such officials from venturing back into wilderness areas for a certain time period after their violations. In an extreme case of willful failure to follow surveillance regulations, the court might even outfit the offending official with an electronic ankle bracelet to ensure against any return to the wilderness—a fitting penalty that would be likely to increase the official’s sensitivity to the intrusiveness of surveillance technology.²⁸³

VI. RESPONSES TO FORESEEABLE OBJECTIONS

A number of objections to this Article’s arguments are likely. One possible criticism is that the reduced use of surveillance collars could harm wolves. Proponents of collaring argue that it is necessary for scientific research that will improve wolves’ odds of survival.²⁸⁴ The value of continued research based on animal telemetry is unclear, however.²⁸⁵ In fact, the use of collars sometimes results in inaccurate data because the collars distort wolves’ behavior.²⁸⁶ If scientists can demonstrate a particularized need for research involving collars and that the value of it would exceed the hardship on the wolves, the scientists could still obtain authorization for the research under the rules proposed in this Article.²⁸⁷ When collaring is not available, there are several alternate means of monitoring wolves, including visual observation, scat analysis, footprint tracking, and the utilization of “howl boxes.”²⁸⁸ Recent evidence suggests that collars are not necessary to keep wolves safe from people or other predators. In Europe, where the density of human settlement is much higher than in

collars on wolves in this area, but the court also ordered destruction of the data obtained from the collars up to that point. According to U.S. District Judge B. Lynn Winmill, “The only remedy that will directly address the ongoing harm is an order requiring destruction of the data.” *Wilderness Watch v. Vilsack*, __ F.Supp. 3d __, 2017 WL 241320 *9 (Jan. 18, 2017).

283. *C.f.* Samuel Wiseman, *Pretrial Detention and the Right to Be Monitored*, 123 YALE L. J. 1344, 1364-82 (2014) (advocating the wider use of GPS tracking devices on humans in lieu of pretrial detention).

284. Sarah Skinner, *Tracking Collars: The Good, the Bad, and the Necessary*, California Wolves (Oct. 2, 2014), <https://californiawolves.wordpress.com/2014/10/02/tracking-collars-the-good-the-bad-and-the-necessary/> (arguing that a lone wolf being collared is “the best thing that could have happened” to it).

285. Jewell, *supra* note 179, at 505.

286. *Id.* at 502–05 (mentioning that invasive monitoring techniques can lead to misleading results because these techniques alter animals’ behavior;).

287. *See* Joslin, *supra* note 82, at 216.

288. Kessler, *supra* note 255; Jewell, *supra* note 256; Andrews, *supra* note 10; Guthrie, *supra* note 86.

the U.S., government officials do not rely as heavily on surveillance collars to manage wolves and the human and wolf populations manage to coexist peacefully.²⁸⁹

Another foreseeable objection is that restricting the use of collars would increase wolves’ conflicts *vis-a-vis* humans and livestock. But, wolves have almost never attacked humans²⁹⁰ and the practice of collaring wolves could lead to habituation that might draw wolves closer to human communities.²⁹¹ Some authors suggest that ranchers have exaggerated predation of livestock by wolves,²⁹² these authors also point out that coyotes and domestic dogs kill more livestock than do wolves.²⁹³ The strategy of collaring and culling wolves to reduce livestock predation could perhaps prove counterproductive, because disruption of packs sometimes leads to desperation that actually

289. Guillaume Chapron, et al., *Recovery of Large Carnivores in Europe’s Modern Human-Dominated Landscapes*, SCIENCE MAGAZINE, (Dec. 2014) (reporting that European wolves are “successful in adapting to human-dominated landscapes”; these wolves are thriving even though “Europe hosts twice as many wolves as the contiguous United States . . . despite being half the size . . . and more than twice as densely populated”).

290. “While people have a strong hatred for the animals, wolf contacts with humans are fairly rare and extremely unlikely to result in harm to the person. In fact, a study of wolf-human encounters in Alaska and Canada (where the largest gray wolf populations exist) found that over the 100 years there have been fewer than twenty reported cases of unprovoked wolves attacking humans (out of eighty cases of published wolf-human interactions), none of which resulted in a fatality. These findings suggest that humans may little to fear from wolves.” Brandon Berrett, *Is Defenders of Wildlife v. Salazar Correct that Successful State Management of Recovered Rocky Mountain Gray Wolves Is Not Compatible with the Endangered Species Act?* 47 IDAHO L. REV. 596, 598 (2011); see Whitney Stohr, *Trophic Cascades and Private Property: The Challenges of a Regulatory Balancing Act and Lessons the UK Can Learn from the Reintroduction of the American Gray Wolf*, 2 U. BALT. J. LAND & DEV. 15, 40 (2012) (“Folklore and exaggerated news reports are largely to blame for the public’s view of wolves as a danger to humans. Wolf attacks are extraordinarily rare . . .”); Craig Enochs, *Gone Today, Here Tomorrow: Policy and Issues Surrounding Wildlife Reintroduction*, 4 HASTINGS WEST-NORTHWEST J. ENVTL. L. & POL’Y 91, 101 (1997) (“Rather than preying on humans, wolves actually avoid human contact”).

291. Duane, *supra* note 13; Klinkenborg, *supra* note 141 and accompanying text.

292. See, e.g., Stohr, *supra* note 290, at 47 (suggesting that “the frequency of livestock depredation by wolves is significantly exaggerated by those opposed to reintroduction programs”).

293. Wendy Keefover, *Government Report: Less Than 1% of Cattle Killed by Native Carnivores and Domestic Dogs*, HUFFINGTON POST, July 18, 2011 (“Less than a quarter of one percent, 0.23%, of the American cattle inventory was lost to native carnivores and dogs in 2010, according to a Department of Agriculture report released last week. These findings call into question the tens of millions per year taxpayers and livestock growers spend on lethal control of native carnivores. The government’s own data show that the real killers of cattle are not a few endangered wolves or other wildlife—they’re illness and weather.”); Thrower, *supra* note 31, at 348 (“However, wolves are not the primary predators of livestock. In both cattle and sheep deaths, U.S.D.A. statistics show that coyotes make up the majority carnivore group—domestic dogs come in second”).

increases predation on domesticated animals.²⁹⁴ Ranchers have many other less invasive means of protecting livestock from wolves.²⁹⁵ When wolves do attack livestock, environmental groups compensate ranchers for the value of lost animals.²⁹⁶

Some might argue that it is inappropriate to extend rules designed for criminal investigations to the context of wildlife surveillance, in part because fish and game officials do not have an adversarial relationship with wildlife the way police are adversarial to suspected criminals. However, some state officials who utilize surveillance collars are indeed adversarial toward wolves.²⁹⁷ Even those who have genuine concern for helping wolves are sometimes too enthusiastic about surveillance collars and too insensitive to the hardships that this technology causes for collared animals.²⁹⁸ The extension of rules from criminal procedure to wildlife surveillance is not so incongruous, especially after wildlife biologists decided to import technology from the world of criminal investigation. This Article does not impute bad faith to wildlife managers, nor does it deny them access to the technology for wildlife surveillance. Rather, it proposes that the use of such technology should require proof of a particularized need, just as it does in the context of criminal investigation.

Other critics might contend this Article does not go far enough, because it derives privacy from a statutory penumbra rather than insisting on the extension of rights to animals. There can be no doubt that animal rights, if enshrined in law, would be more efficacious than the policies proposed in this Article. The campaign for animal rights is commendable and finds no opposition here. Others have criticized the movement, however.²⁹⁹ Even advocates for animals concede that legal

294. Robert Wiegles & Kaylie Peebles, *Effects of Wolf Mortality on Livestock Depredations*, PLOS ONE, Dec. 3, 2014 (reporting findings that wolf mortality disrupted packs and led remaining wolves to kill livestock that they otherwise would have avoided).

295. Stohr, *supra* note 290, at 40.

296. *Id.* at 47. (discussing compensation programs for ranchers who lose livestock to wolves).

297. Robbins, *supra* note 28; Fischman, *supra* note 29; Taibbi, *supra* note 30.

298. Fischman, *supra* note 29; Busch, *supra* note 74; Duane, *supra* note 13; Henson, *supra* note 72; Benson, *supra* note 74.

299. As Judge Richard Posner declared in the Yale Law Journal, “There is a sad poverty of imagination in an approach to animal protection that can think of it only on the model of the civil rights movement.” Posner, *supra* note 209, at 539. “The most aggressive implementations of animal-rights thinking would undoubtedly benefit animals more [than incremental reform, but] those implementations are unlikely, so the modest alternatives are worth serious consideration. We may overlook this simple point, however much we love animals, if we listen too raptly to the siren song of ‘animal rights.’” *Id.* at 541.

recognition of animal rights seems unlikely in the imminent future.³⁰⁰ This Article aspires to help in the near term by laying a preliminary groundwork³⁰¹ for recognizing wildlife privacy—a groundwork that a rights-based regime may one day supersede. This Article’s policy-based approach permits a broader analysis than does a rights-based approach. As Professor Sonu Bedi has observed, the focus on rights can divert attention from the flawed rationale for government policies³⁰² and advocates for wolves need to shine a light on the irrational justification for subjugation of these animals.³⁰³

A final possible criticism is that this Article errs by limiting its privacy doctrine to wildlife, excluding domesticated animals and livestock. This Article does not purport to explore the full extent of the privacy doctrine. As noted in the introduction, space does not permit a sweeping analysis of how the privacy doctrine might potentially affect other animals in different contexts. This Article has focused on wildlife, in part because wild animals seem to have the strongest claim for privacy. Future scholarship might address whether privacy should extend to livestock, household pets and zoo animals.³⁰⁴

300. Steven Wise “is the first to admit that his tactics haven’t proven successful so far.” Lewis Beale, *The Case for Treating Animals as Humans*, THE DAILY BEAST, May 26, 2016, <http://www.thedailybeast.com/articles/2016/05/26/the-case-for-treating-animals-as-humans.html>. Chris Green, executive director of Harvard’s Animal Law and Policy Program, is a former student of Wise and is a strong voice for animal protection. He believes “the jury is still out” on animal rights. *Id.*

301. Colb and Dorf criticize incrementalism in the context of advocacy for animal welfare, but do suggest that some principled incrementalism could be useful. *Supra* note 237 at 143–45 (generally expressing pessimism about viability of incrementalism as a strategy for reforming animal exploitation, but advocating “laws that reduce governmental support for harmful practices”; such advocacy amounts to “incremental-but-uncompromising activism”). Green notes that some advocates for animal rights consider arguments for animal welfare to be akin to putting “nicer wallpaper at a prison,” but Green believes that arguments to improve the treatment of wild animals might have traction over the next five years. *See* Beale *supra* note 300.

302. Bedi criticizes the preoccupation with rights, and suggests that scrutiny of the justification for policies could eliminate the need to resort to rights. He offers the compelling example of morals legislation – that is, legislation lacking a justification in the prevention of demonstrable harm. He argues that a privacy right should not be necessary to overturn a law forbidding consensual homosexual relations between adults, because the lack of justification for such a law should be a sufficient basis on which to overturn it. The repudiation of improper justification renders the right obsolete. *BEDI, supra* note 226, at 149.

303. Humans have persecuted wolves for centuries due in large part to irrational hatred. Klinkenborg, *supra* note 146 and accompanying text. The currently pervasive use of surveillance collars is not always justifiable based on the demonstrable harm posed by unmonitored wolves (e.g., possible predation on humans and livestock). Jewell, *supra* note 175 at 505 and accompanying text.

304. *See, e.g., COLB, supra* note 230, at 184–87 (raising questions about ethics of sterilizing

Perhaps animal privacy should be universal, or perhaps it should vary according to setting like human privacy does.³⁰⁵

CONCLUSION

It is fitting to close an article about lupine privacy by citing a case in which a Wolf was a party. In *Wolf v. Colorado*, the Supreme Court insisted on safeguarding “the security of one’s privacy against arbitrary intrusion” by the government.³⁰⁶ Intrusive surveillance conducted “without authority of law but solely on the authority of police, did not need the commentary of recent history to be condemned . . .”³⁰⁷ Such surveillance offends one of the most basic principles on which Americans have agreed since the founding of this country: the government’s ability to intrude should depend on judicial authorization following a particularized showing of need.

This Article has argued that wild animals deserve privacy—not the same degree of privacy that humans enjoy, but a lesser amount that is consistent with the seclusion and autonomy one would expect in the wild. The experience of the gray wolf in the United States illustrates the danger of infringing privacy. A doctrine of wildlife privacy derives naturally from statutes that protect the welfare of animals. Decades of research have shown that privacy is indispensable to the wellbeing of animals.

Implementing the doctrine of wildlife privacy requires that we borrow certain notions from the rules of criminal procedure. These include the requirements of balancing government need versus privacy interests, showing the insufficiency of alternatives, minimizing surveillance to the extent possible, submitting applications for review

companionate animals).

305. DRESSLER, *supra* note 264; *United States v. Knotts*, 480 U.S. 276, 281-82 (1983) (indicating that the legality of GPS surveillance depends on the location where the surveillance takes place, because people have more privacy in certain locations); see Timothy Horstmann, *Protecting Traditional Privacy Rights in a Brave New Digital World: The Threat Posed by Digital Phone-Cameras and What States Should Do to Stop It*, 111 PENN. ST. L. REV. 739, 746 (2007) (noting that, under one common view, “whether a person has an expectation of privacy depends on that person’s physical location”); cf. Kevin Winters, *A Proposed Amendment to the Military Rules of Evidence on Inspections and the Probable Cause Search Standard for Operational Units*, 40 NAVAL L. REV. 143, 153 (1993) (“[A] man’s home is usually given greater constitutional protection than his prison cell; a child at home or on the street has greater constitutional protection than a child at school; and courts are loath to cloak automobiles with traditional fourth amendment protection.”).

306. *Wolf v. Colorado*, 338 U.S. 25, 27 (1949).

307. *Id.*

by neutral third parties, and furnishing a report of the information obtained. Other necessary reforms include a requirement of separate authorization for restraints on movement, as well as a prohibition on attaching surveillance collars simply to track and kill wolves. The uniform adoption of such rules would help to establish the principle that privacy should be the norm in the wilderness.

An animal is either wild or it is not. The idea of partial wildness³⁰⁸ is fanciful, like partial pregnancy or partial death. We do have a word for the domesticated version of a wolf. That animal is a dog. A dog generally wears a collar.³⁰⁹ A wolf should not — absent a particularized, compelling justification that overrides the wolf’s privacy.

308. See Mooallem, *supra* note 103, at 4 (“We are gardening the wilderness”).

309. Appellee’s Answer Brief, *Comins v. Van Voorhis*, 2012 WL 12285258 *51 (Fla. App. Nov. 12, 2012) (challenging man’s claim that he shot a dog because he mistook it for a wolf; the collar showed the animal was “domesticated” and “belied” any claim that it might be a wolf).