

**BIG BROTHER WATCHING MOTHER NATURE:
CONSERVATION DRONES AND THEIR INTERNATIONAL AND
DOMESTIC PRIVACY IMPLICATIONS**

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INTRODUCTION

Drones have become a controversial component of modern warfare. The United States has been heavily criticized by countries around the globe for its reliance on drones and the civilian casualties associated with its use in the military, and often not in a positive way.¹ But drones have a multitude of uses outside the context of warfare, ranging from scientific

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1. *Global Opposition to U.S. Surveillance and Drones, but Limited Harm to America's Image*, PEW RESEARCH GLOBAL ATTITUDES PROJECT (July 14, 2014), <http://perma.cc/8N69-7VZ3>.

research to search and rescue missions.² Last year, drones were used to aid in the search of missing University of Virginia student Hannah Graham.³

The United States has been reluctant to embrace drone technology in the context of environmental issues. But drones have potential to revolutionize the enforcement of environmental laws. Humans around the world extract many different wildlife resources at unsustainable levels, and it is nearly impossible to monitor and protect the resources effectively when the problem is so large. Drones could provide the essential missing tool to improve observation techniques, which could help protect these vulnerable resources.

Critics of drones argue that they unreasonably invade the right to privacy, especially if they are used to conduct arrests.⁴ This has spurred a patchwork state regulatory approach, where some states ban certain uses of drones within the state.⁵ At the federal level, the National Park Service temporarily banned the use of drones in all parks across the country due primarily to noise complaints from visitors and worries that the drones may disturb the wildlife and their habitats.⁶ These bans—coupled with a negative public perception and lack of understanding—severely limit the ability of drones to be used to protect the environment.

In this Note, I argue that conservation drones do not violate privacy rights when they are used on government-owned land, and when their environmental benefits far outweigh minor privacy concerns. By extrapolating the open fields test used in the United States to determine when the right to privacy applies, illegal fishing and poaching arguably occur in areas where the right to privacy should not extend. If enough states adopted the test, it would become part of customary international law and bind the remaining States. This would allow for a more widespread international use of conservation drones to monitor natural resources.

Part II provides background information on what drones are, their current uses in the United States, and how they relate to our right to privacy. Part III discusses how Belize uses drones to combat illegal fishing,

2. Shirley Li, *A Drone for the Environment*, ATLANTIC (Nov. 17, 2014), <http://perma.cc/CS9Q-VVZB>.

3. Jacob Demmitt, *Virginia Tech Lends Drones to Search for Hannah Graham*, ROANOKE TIMES (Oct. 1, 2014, 8:28 PM), <https://perma.cc/BQ2U-8S35?type=image>.

4. See generally Chris Schlag, Note, *The New Privacy Battle: How the Expanding Use of Drones Continues to Erode Our Concept of Privacy and Privacy Rights*, 13 PITT. J. TECH. L. & POL'Y 1, 22 (2013) (arguing that there should be a comprehensive regulatory approach adopted before allowing widespread domestic use because of the privacy concerns drones raise).

5. Dana Liebelson, *Map: Is Your State a No-Drone Zone?*, MOTHER JONES (Sept. 30, 2013, 6:00 AM), <http://perma.cc/2UBL-V4RK>.

6. *Unmanned Aircraft to be Prohibited in National Parks*, U.S. NAT'L PARK SERV. (June 20, 2014), <http://perma.cc/W8LK-D4AV>.

and why the Fisheries Department's use of drones does not violate the Belizean right to privacy. Part IV discusses how Kenya could use drones to thwart illegal poaching, and why that would not violate the Kenyan right to privacy. Part V introduces the concept of customary international law, and postulates that the open fields doctrine should be adopted through customary international law to allow a more widespread use of conservation drones. Part VI concludes with a policy argument for the continued use of drones for conservation purposes.

I. DRONE USAGE IN THE UNITED STATES

The right to privacy in the United States has a long history and has been altered over time by Supreme Court jurisprudence. Currently, the United States uses the open fields doctrine to determine the physical scope of the right to privacy. This section defines the open fields doctrine and argues that the use of conservation drones does not violate the right to privacy if they are used in an open field to enforce environmental statutes.

A. *Definitions and Uses in the United States*

Drones—also referred to as “unmanned aircraft systems”—are small aircrafts that pilots operate at a distance with a ground control system or an autonomous onboard computer.⁷ Drones have a wide range of uses, including “remote sensing, aerial surveillance, transportation, scientific research, weaponry, and search and rescue.”⁸ The Federal Aviation Administration (“FAA”) licenses drones and determines where they can be used domestically.⁹ FAA divides unmanned aircraft systems into three categories: Civil, Public, and Model.¹⁰ Civil operators are non-governmental operators and they must obtain a Special Airworthiness Certificate demonstrating that their unmanned aircraft system can operate safely in civil airspace without endangering the public.¹¹ Public operators are government entities and in order to operate they must submit a Certification of Authorization from FAA that delineates the purpose and

7. *Unmanned Aircraft Systems (UAS) Frequently Asked Questions*, FAA (last modified July 24, 2015), <https://perma.cc/QUJ9-L7AA?type=source>.

8. Schlag, *supra* note 4, at 6.

9. *Id.* at 2.

10. *Unmanned Aircraft Systems*, FAA (Aug. 27, 2015), <https://perma.cc/R9U9-VLCW?type=source>.

11. *Civil Operations (Non-Governmental)*, FAA (July 15, 2014 1:49PM), <https://perma.cc/6Y8V-N5CE?type=source>.

area of operation.¹² Model operators are recreational users and do not require FAA approval.¹³

Under the current regulations, if non-governmental environmental organizations want to use conservation drones, they would need to obtain a Special Airworthiness Certificate. But if a governmental entity wanted to use conservation drones for enforcement measures, it would only need to submit the Certification of Authorization. The current drone regulations restrict non-governmental drone usage heavily. Civil drone operators are not allowed to fly in navigable airspace unless they have a Special Airworthiness Certificate.¹⁴ Obtaining a certification from FAA can be an arduous process that requires applicants to describe “how their system is designed, constructed, and manufactured, including engineering processes, software development and control, configuration management, and quality assurance procedures used, along with how and where they intend to fly.”¹⁵

When Congress passed the FAA Modernization and Reform Act of 2012, it charged the agency with the task of integrating unmanned aerial systems into the navigable air space.¹⁶ FAA is currently developing a small Unmanned Aircraft Systems rule under Section 333 of the FAA Modernization and Reform Act.¹⁷ The rule—which closed for public comment on April 24th, 2015—would allow small unmanned aircraft systems to operate in navigable airspace without the lengthy certification process.¹⁸

Public or governmental unmanned aircraft systems have myriad uses in the environmental field in the United States. For example, the National Oceanic and Atmospheric Administration currently uses drones to collect atmospheric samples¹⁹ and monitor river recovery after dam removal.²⁰ The National Aeronautics and Space Administration uses drones to monitor and study hurricane formation in the Atlantic Ocean through the Hurricane and

12. *Public Operations (Governmental)*, FAA (Feb. 10, 2015, 4:34 PM), <https://perma.cc/SCE5-EF3T?type=source>.

13. *What Can I Do With My Model Aircraft?*, FAA (Aug. 12, 2014, 10:29 AM), <https://perma.cc/PQ45-B8Z4?type=source>.

14. *Know Before You Fly: Unmanned Flight Safety Guidance*, FAA (Feb. 12, 2014), <http://perma.cc/2D4C-YW7J>.

15. *Civil Operations*, *supra* note 11.

16. *Section 333*, FAA (Sep. 25, 2014, 2:42 PM), <https://perma.cc/Y8ZS-AQNL?type=source>.

17. *Id.*

18. *Small UAS Notice of Proposed Rule Making (NPRM)*, FAA <https://perma.cc/QDB2-X5Q2?type=source> (last modified June 1, 2105).

19. *Monitoring Atmospheric Composition with SkyWisp*, NOAA. (2012), <https://perma.cc/5DBJ-M7W9?type=source>.

20. Sandi Doughton, *Northwest Scientists Using Drones to Spy on Nature*, SEATTLE TIMES (July 16, 2013), <http://perma.cc/2X6G-5BH8>.

Severe Storm Sentinel.²¹ The U.S. Geological Survey National Unmanned Aerial Systems Project Office uses drones to monitor the migration of Sandhill Cranes from Arizona to Montana and Wyoming.²²

Some scientists have obtained airworthiness certificates from FAA for research purposes. Drones can be used to gather data too dangerous for humans to gather. Wildlife biologists lose their lives gathering data, and light aircraft crashes are their number one killer.²³ Drones allow biologists to monitor osprey nests,²⁴ locate missing California condors that stray from their feeding habitat,²⁵ and observe the restoration of the Elhwa River after dam removal²⁶—without the added risk of losing human life.

B. Privacy Rights in the United States and How Drones Affect Them

In *Griswold v. Connecticut*, the Supreme Court articulated our right to privacy as an amalgam of the other rights protected in the Bill of Rights, including the rights citizens retain through the Ninth Amendment.²⁷ The case established a zone of privacy through the First, Third, Fourth, Fifth, and Ninth Amendments.²⁸ Most notably for drone purposes, the Fourth Amendment guarantees the right to be “secure in [our] persons, houses, papers, and effects against unreasonable searches and seizures.”²⁹ The hallmark of the Fourth Amendment is its requirement that searches be “reasonable.”³⁰ It requires the government to obtain a warrant based on probable cause before conducting searches.³¹ Without probable cause, the search violates the Fourth Amendment because it is unreasonable.

The Fourth Amendment applies to all searches, but Supreme Court precedent limited the definition of a search. Determining when a search has occurred is a two-step process.³² First, the individual must have a protected

21. *HS3 Hurricane Mission*, NASA, <http://perma.cc/YP8C-4J94> (last visited Sept. 2, 2015) (explaining the mission of the Global Hawk, an unmanned aircraft used for high-altitude, long-duration Earth scientific research).

22. *National Unmanned Aircraft System (UAS) Project Office*, USGS, <http://perma.cc/CGH8-4XQ3> (last visited Sept. 12, 2015).

23. Nancy Averett, *Drones Take Off as Wildlife Conservation Tool*, AUDUBON MAG. (July-Aug. 2014), <http://perma.cc/5GRD-H2VH>.

24. *Id.*

25. *Id.*

26. Doughton, *supra* note 20.

27. David Helscher, *Griswold v. Connecticut and the Unenumerated Right of Privacy*, 16 N. ILL. U. L. REV. 33, 33 (1994).

28. *Id.* at 35.

29. U.S. CONST. amend. IV.

30. Schlag, *supra* note 4, at 15.

31. U.S. CONST. amend. IV.

32. THOMAS CLANCY, *THE FOURTH AMENDMENT: ITS HISTORY AND INTERPRETATION* 284 (Carolina Academic Press, 2008).

interest that the government invaded.³³ Second, the search methods used must be permissible.³⁴ The determinative factor that triggers Fourth Amendment protection is whether society has a reasonable expectation of privacy to the area being searched and information obtained from the search.³⁵ The Supreme Court first articulated this “reasonable expectation” test in *Katz v. United States*.³⁶ Katz challenged evidence that the Federal Bureau of Investigation obtained by placing an electronic listening device on the outside of a public telephone booth, arguing that the device violated his Fourth Amendment right to privacy.³⁷ The Court concluded that the government’s actions violated the Fourth Amendment because Katz had a reasonable expectation of privacy and did not shed that expectation when he entered the phone booth to conduct his phone call.³⁸ With this holding, the Court first articulated the “reasonable expectation of privacy” test that triggers Fourth Amendment protection from unreasonable searches.

The Fourth Amendment applies only to four discrete categories: persons, houses, papers, and effects.³⁹ Anything outside these categories may be searched without a warrant.⁴⁰ Through its precedent, the Supreme Court created the open fields doctrine, which expressly limits the scope of the Fourth Amendment. In *Hester v. United States*, the Supreme Court held that the Fourth Amendment does not apply to open fields that are not associated with a house, noting that the difference between the two was as old as common law itself.⁴¹ The home and its curtilage—the “area that is so intimately tied to the home itself that it should be placed under the home’s ‘umbrella’ of Fourth Amendment protection”⁴²—are protected, but open areas not associated with a private home do not receive protection. The Court next addressed the open fields doctrine in *Oliver v. United States*, where it affirmed that the right to privacy does not extend to activities conducted outdoors in open fields.⁴³ The Court held that open fields are not included in houses or effects, and an individual cannot seek the protection

33. *Id.*

34. *Id.*

35. David James, Note, *The Fourth Amendment, Future Methods of Environmental Enforcement, and Warrantless Inspections*, 33 REV. LITIG. 183, 186 (2014).

36. *Katz v. United States*, 389 U.S. 347 (1967).

37. *Id.* at 348–49.

38. *Id.* at 352.

39. CLANCY, *supra* note 32, at 117.

40. *Id.*

41. *Id.* at 124.

42. *Id.*

43. *Oliver v. United States*, 466 U.S. 170, 178 (1984) (“[A]n individual may not legitimately demand privacy for activities conducted out of doors in fields, except in the area immediately surrounding the home.”).

of the Fourth Amendment for activities that occur in open fields.⁴⁴ Activities occurring out in the open do not garner the same protection as activities within the home.

Technological improvements have changed how police conduct searches, and the Supreme Court has had to interpret the Fourth Amendment in the context of new technology to determine whether these methods comport with the Fourth Amendment. The Court first addressed aerial surveillance and how it relates to the Fourth Amendment in *California v. Ciraolo*, and held that a warrantless search through aerial surveillance comported with the Fourth Amendment.⁴⁵ Ciraolo had a privacy fence around his backyard, which enclosed his marijuana crops.⁴⁶ Police officers could not easily see the marijuana from the ground, so they flew over the fields to observe the plants before obtaining a warrant.⁴⁷ The Court held that this search still complied with the Fourth Amendment because even though the crops were in the curtilage of the home, they were still exposed to the public and the officers were lawfully in the public airspace.⁴⁸

The Court expanded the use of aerial photography surveillance in *Dow Chemical v. United States* when it held that the Environmental Protection Agency (“EPA”) could use aerial photography to conduct exterior site inspections of industrial complexes under the Clean Air Act without a warrant.⁴⁹ The Court reasoned that the exterior of the industrial complex did not fall within the protection of the Fourth Amendment because it was not truly curtilage.⁵⁰ The complex was more analogous to an open field, and since it was visible from the public airspace, EPA did not need a warrant to conduct the search.⁵¹

The Court addressed the advancement of searching technology again in *Kyllo v. United States*, and it held that if the technology used to conduct the search was not readily available to the public, then the general public could not reasonably expect that it needed to protect its privacy interests from that type of technology.⁵² In *Kyllo*, the Court held that use of radar and sense-enhancing technology violated the Fourth Amendment when agents of the Department of Interior used the thermal imagers to search Kyllo’s house for

44. CLANCY, *supra* note 32, at 124.

45. *California v. Ciraolo*, 476 U.S. 207, 215 (1986).

46. *Id.* at 209.

47. *Id.*

48. *Id.* at 212–13.

49. *Dow Chem. Co. v. United States*, 476 U.S. 227, 239 (1986).

50. *Id.*

51. Schlag, *supra* note 4, at 14 (citing *Dow Chem. Co.*, 476 U.S. at 239).

52. *Id.* (citing *Kyllo v. United States*, 533 U.S. 27, 28 (2001)).

marijuana.⁵³ The Court applied the *Katz* test and held that the use of sense-enhancing technology violated a reasonable expectation of privacy in the home.⁵⁴ Because the technology was not readily available to the public, the public was not on notice to protect their privacy interests.⁵⁵

Opponents of drones argue that they unreasonably invade our right to privacy, especially if they are used in the context of warrantless searches. But under our Fourth Amendment jurisprudence, drones can arguably be used for conservation purposes without interfering with our right to privacy. Drone technology is widely available to the public, unlike the radar and sense-enhancing technology at issue in *Kyllo*. The Supreme Court has already defined the boundary of the right to privacy, and that boundary does not extend to activities conducted in open fields. If environmental groups or the government use conservation drones to monitor activity occurring out in the open, then the Fourth Amendment will not apply. The Fourth Amendment would only apply if the activity being monitored occurs in the confines of private property, but the purpose of conservation drones does not lend itself to this kind of conflict. Current uses of conservation drones in the United States include monitoring large open areas for wildlife research, not private backyards. The FAA regulations regarding civil unmanned aerial systems are restrictive, and do not allow wide-scale private drone usage. Government entities that want to use drones to enforce environmental statutes can legally do so, as long as the area they are surveying does not fall within the curtilage of a private home. As drone technology becomes more sophisticated and accessible to the public, the public will reasonably expect the need to protect its privacy interest from drone surveillance of private homes.

The open fields doctrine could easily be transposed to other privacy rights. The framers included the Fourth Amendment in the Constitution as a response to the Crown's use of writs of assistance, which authorized "officers of the crown . . . 'to enter into any vessel, house, warehouse, or cellar, search in any trunk or chest and breach any bulk whatsoever'" without needing to show suspicion of illegal activity.⁵⁶ The purpose of the Fourth Amendment is to protect individuals from the unreasonable searches and seizures allowed under the writs of assistance.⁵⁷ Supreme Court jurisprudence defines the outer bounds of our right to privacy with the open fields doctrine. Other countries could apply the test to their right to privacy,

53. *Kyllo*, 533 U.S. at 29–30.

54. Schlag, *supra* note 4, at 14.

55. *Id.*

56. CLANCY, *supra* note 32, at 28–29.

57. *Id.* at 40.

especially if the construction of the right mirrors our own right to privacy. By applying the open fields doctrine, conservation drones could arguably be used more expansively worldwide to protect vulnerable wildlife resources.

II. DRONE USAGE IN BELIZE

The prolific coral reef system off the coast of Belize supports local economies and entices illegal fishers from neighboring countries to strip the reef of important fishery resources. Because of the problems caused by illegal fishing—both at a domestic and international scale—Belize turned to drone technology to monitor the reef. This section describes the problem of illegal, unregulated, and unreported fishing in Belize, and how the Belize Fisheries Department (“BFD”) has begun to supplement their fisheries management measures with conservation drones to combat the problem. It also analyzes the Belizean right to privacy, how the Belize Fisheries Act alters that right, and ultimately concludes that drones do not violate the right to privacy.

A. The Problem: Illegal, Unregulated, and Unreported Fishing

Belize is home to the Mesoamerican Barrier Reef—the largest reef ecosystem in the Western Hemisphere that spans the coasts of Mexico, Belize, Guatemala, and Honduras.⁵⁸ The coastal country’s economy relies heavily on fishing off the reef. Fish products are one of the main exports of the nation.⁵⁹ Approximately 2,400 Belizeans (out of a population of 340,844)⁶⁰ are employed as registered fishers, and 15,000 are employed in ancillary positions in the processing and exporting industries.⁶¹ Many problems plague this important ecosystem, but illegal, unregulated, and unreported fishing is one of the most persistent and ecologically devastating.

Illegal, unregulated, and unreported fishing plagues fisheries at an international level; it is one of the most ecologically destructive illegal

58. *Mesoamerican Reef*, WORLD WILDLIFE FUND, <http://perma.cc/ZWU7-PJU5> (last visited Sept. 2, 2015).

59. *The World Factbook: Belize*, CENT. INTELLIGENCE AGENCY (Aug. 11, 2015), <https://perma.cc/ER4L-6QFK>.

60. *Id.*

61. James R. Foley, *Managed Access: Moving Towards Collaborative Fisheries Sustainability in Belize*, PROC. 12TH INT’L CORAL REEF SYMP. (2012), <http://perma.cc/8BUK-DHAJ>.

activities⁶² that affects the long-term sustainability of fisheries management.⁶³ Illegal fishing occurs when vessels operate in violation of the laws that govern the fishery.⁶⁴ Illegal fishing activities include fishing without a license, fishing out of season or in reserve areas, harvesting prohibited and protected species, overfishing quotas, or using banned gear.⁶⁵ Unreported fishing occurs when fishermen misreport or fail to report their catches.⁶⁶ Unregulated fishing occurs when vessels fish under no nation flag, or the flag of a state that does not participate in international fishing treaties.⁶⁷ Illegal, unregulated, and unreported fishing occurs on a large scale with factory ships that catch thousands of tons of fish illegally at the high seas, or with smaller vessels that collectively fuel legitimate markets with illegally caught fish.⁶⁸ Illegal, unregulated, and unreported fishing contributes to approximately one-third of the global total catches.⁶⁹

Because of the reef's economic importance, the Belizean government is taking steps to create more sustainable fisheries.⁷⁰ BFD is revising the regulations of the Fisheries Act—which governs fishing in Belize to address the persistent problem of overfishing on the reef.⁷¹ While the revisions are underway, BFD has been working with the Toledo Institute for Development and Environment (“TIDE”), Environmental Defense Fund (“EDF”), Wildlife Conservation Society (“WCF”), and Belize fishermen towards eliminating open access fisheries and replacing them with Managed Access Fisheries.⁷²

Most fisheries in Belize are open access and do not limit the number of licensed fishermen. But the Managed Access Fisheries program implements catch shares. Unlike open access fisheries, catch shares divide up and allocate quotas to a discrete number of fishermen based on the health of the fishery.⁷³ There are two main types of catch shares: individual transferable quotas (“ITQs”) and territorial user rights fisheries (“TURFs”). ITQs grant

62. DONALD R. LIDDICK, *CRIMES AGAINST NATURE: ILLEGAL INDUSTRIES AND THE GLOBAL ENVIRONMENT* 71–72 (2011).

63. ROB WHITE, *TRANSNATIONAL ENVIRONMENTAL CRIME: TOWARD AN ECO-GLOBAL CRIMINOLOGY* 67 (Routledge, 2011).

64. LIDDICK, *supra* note 62, at 72.

65. *Id.* at 71–72.

66. *Id.* at 72.

67. *Id.*

68. WHITE, *supra* note 63, at 67.

69. LIDDICK, *supra* note 62, at 71.

70. Britt Groosman & Janet Gibson, Op-Ed., *European Union Fisheries Ban Ignores Belize Conservation Success Story*, NAT'L GEOGRAPHIC (Mar. 14, 2014), <http://perma.cc/V7TX-P5KY>.

71. *Belize Fisheries Department Holds Revised Fisheries Regulation Consultation in San Pedro Town*, SAN PEDRO SUN (Sept. 6, 2013), <http://perma.cc/3FSJ-M9VN>.

72. Foley, *supra* note 61.

73. *Id.*

fishermen a percentage of the total allowable catch.⁷⁴ TURFs are spatial property rights that designate specific areas for fishermen to fish.⁷⁵ Both forms of catch shares reduce the number of fishermen who have access to specific areas of the reef, which in turn reduces fishing pressures and total takes.

In 2011 BFD implemented TURFs in Port Honduras and Glover's Reef.⁷⁶ But outside of Port Honduras Reef and Glover's Reef, Belize still operates open access fisheries. The Fisheries Act governs the licensing process in Belize.⁷⁷ It requires all commercial fishermen to obtain a boat license⁷⁸ and a personal license in order to fish in the waters of Belize.⁷⁹ The High Seas Fishing Act governs the actions of Belizean vessels that operate outside the territorial waters of the country.⁸⁰ It requires all vessels fishing on the high seas to obtain an additional high seas fishing license⁸¹ and to comply with international conservation measures.⁸²

Even though Belize implements a licensing scheme, the country does not limit the number of vessels that can obtain a license.⁸³ From 2004 to 2008, the number of licensed fishermen in Belize increased 30%, but the overall lobster catches from 1999 to 2009 declined 24% because too many boats were fishing for too few fish.⁸⁴ Licensed boats are not the only boats fishing; unlicensed boats still illegally fish in Belize.⁸⁵ This creates a "tragedy of the commons" where licensed fishermen do not exercise restraint with their catches because if they did, illegal fishermen would take the fish they refrain from catching.⁸⁶ This lack of restraint and increased

74. *Id.*

75. Groosman, *supra* note 70; Foley, *supra* note 61, at 11.

76. Groosman, *supra* note 70.

77. Fisheries Act, CAP. 210 (2000) (Belize).

78. *Id.* § 6 ("No person shall use or employ any boat in commercial fishing unless there is in force in respect of such boat a 'licen[s]e to fish' issued under the provisions of any regulations made under this Act.").

79. *Id.* § 7 ("No person shall engage in commercial fishing or be engaged or employed in or on any boat while in use for commercial fishing unless he is the holder of a valid 'fisherman's licen[s]e' issued under the regulations made under this Act.").

80. High Seas Fishing Act, CAP. 210:01 (2003) (Belize).

81. *Id.* § 4 (requiring that "no Belize fishing vessel shall fish on the high seas without a valid license issued under this Act").

82. *Id.* § 16(1) (requiring that "no Belize fishing vessel shall engage in any activity on the high seas which undermines the effectiveness of international conservation and management measures").

83. Foley, *supra* note 61.

84. *Id.*

85. *Id.*

86. *Id.*

number of boats in the fishery drives down fish stocks and quickly depletes fish resources.⁸⁷

Even though the Belizean government made progress in its fisheries through Managed Access programs, illegal fishing still occurs both within the reef and outside the Exclusive Economic Zone (“EEZ”)⁸⁸ by Belizean fishing boats. Vessels from Guatemala and Honduras fish in Belize without proper licenses, and take the catch back to their countries, which removes money from the Belize economy.⁸⁹ Outside the EEZ, a few ships flying the Belizean flag continue to violate international fishing agreements,⁹⁰ prompting the European Union to ban all fish imports from Belize.⁹¹ Illegal, unregulated, and unreported fishing still persists in Belize because the Fisheries Department does not have the capability to fully monitor the country’s expansive reef system; there are only 70 enforcement officers to patrol the 240 miles of coastal reef and 200 islands.⁹² Fishermen often fish and store illegal catches in the coastal mangrove forests, which are difficult to monitor.⁹³ Because of the difficulty of monitoring such a large area, the government of Belize has turned to conservation drones as another possible solution to combat illegal, unregulated, and unreported fishing.

The Wildlife Conservation Society, a United States environmental group, currently works with BFD to combat illegal fishing on Glover’s Reef Marine Reserve with the help of conservation drones.⁹⁴ The drones took flight in June 2014 after the Belizean government conducted testing the previous summer.⁹⁵ The drones allow BFD to monitor more of the reef and detect illegal fishing activity faster.⁹⁶ Once the drones spot a vessel in a closed fishing area (either a seasonal closure or a permanent reserve), patrol vessels can reach them in the water faster and conduct searches under the authority of the Fisheries Act.⁹⁷

87. *Id.*

88. See *What is the EEZ?*, NAT’L OCEAN SERV., <http://perma.cc/D5BP-YPUM> (last modified Dec. 8, 2014) (defining the EEZ as the zone extending from a coastal nation’s territorial sea baseline, where that nation has exclusive jurisdiction over natural resources).

89. Foley, *supra* note 61.

90. Groosman, *supra* note 70.

91. *EU Bans Fish Trade with Vessels Flagged to Belize, Guinea, Cambodia over IUU*, UNDERCURRENT NEWS (Mar. 21, 2014, 3:02 PM), <http://perma.cc/8HGV-HPG8>.

92. Brian Clark Howard, *Can Drones Fight Illegal “Pirate” Fishing?*, NAT’L GEOGRAPHIC (Jul. 18, 2014, 7:11 PM), <http://perma.cc/MU5Z-F5A9>.

93. *Wildlife Conservation Society Helps Safeguard Belize’s Barrier Reef with Conservation Drones*, WILDLIFE CONSERVATION SOC’Y (July 22, 2014), <http://perma.cc/SJG5-KSRZ> [hereinafter *Wildlife Conservation Society*].

94. *Id.*

95. *Id.*

96. *Id.*

97. *Id.*

B. Privacy Rights in Belize and How Drones Affect Them

The Belize Constitution explicitly grants its citizen a right to privacy: “A person shall not be subjected to arbitrary or unlawful interference with his privacy, family, home or correspondence, nor to unlawful attacks on his honour and reputation. The private and family life, the home and the personal correspondence of every person shall be respected.”⁹⁸

This right differs from U.S. citizens’ right to privacy because it explicitly references attacks on individual’s reputations and requires that communications be respected. But like U.S. citizens’ right to privacy, the protection decreases with respect to activities that occur in the open, like fishing on the reef.

Even though the citizens of Belize do have a right to privacy, the Belize Fisheries Act practically eliminates the right aboard fishing vessels. The Belize Fisheries Act states that “any police officer may—without any warrant—stop, board and search any boat, vehicle or aircraft which he reasonably suspects is being used or employed in fishing or carrying fish contrary to the provisions of this Act or any regulations made under this Act.”⁹⁹ In addition, the Belize High Seas Fishing Act also allows officers to board any vessel flying the Belize flag for suspected violations of fishing regulations.¹⁰⁰ The statute states that:

An authorized officer may exercise any of the following powers with respect to any Belize fishing vessel on the high seas – (a) he may stop the vessel; . . . (d) he may go on board the vessel and take with him such other persons as he may require to assist him in the exercise of his powers; . . . (h) he may make any search, examination or enquiry which he shall consider necessary to find out whether this Act has been contravened; . . . (k) he may seize or take copies of any document which he believes may be relevant to any such offence.¹⁰¹

These statutory provisions grant fisheries officers broad authority to board vessels and conduct searches without legal justification in the form of a warrant, which severely limits the right to privacy aboard vessels in Belize.

Because the Belize fishing statutes restrain the right to privacy aboard fishing vessels, conservation drones arguably would not impinge on privacy

98. The Constitution of Belize Sept. 21, 1982, Part II, art. 14.

99. Fisheries Act CAP. 210 § 5 (2000) (Belize).

100. High Seas Fishing Act, CAP. 210:01 § 12(1) (2003) (Belize).

101. *Id.*

rights. The conservation drones used in Belize only videotape activity out on the reef. The fisheries department uses the footage captured by drones to locate the vessels and conduct legal searches before making an arrest.¹⁰² This is arguably no different than a fisheries officer spotting and boarding a vessel while patrolling the reef. The drones cut down costs and allow for speedier and more accurate searches by the fisheries department¹⁰³ whose agents conduct searches under the authority already vested in them by the Fisheries Act. The arrests are not being made directly from the footage, but after a subsequent search, so the drones do not impede on privacy rights any further than the Fisheries Act already does.

Even if the Fisheries Act did not limit the right to privacy on the reef, the test used in the United States to delineate where the Fourth Amendment applies would not cover the illegal fishing that takes place in the EEZ and on the reef. Belize has exclusive economic control over the natural resources 200 miles beyond the territorial sea, which includes its coral reefs and fisheries. And the marine reserves are under the control of BFD. These areas fall squarely in what the United States would define as open fields. They are government-managed areas that are not associated with any private home, and the Fisheries Act already restricts privacy on the boats. The vulnerability of the Belize coral reef system made the government consider alternatives to its traditional management and monitoring scheme, which included incorporating conservation drones to increase monitoring efficiency. The conservation drones can be used without violating the right to privacy because that right does not extend to activities on the reef.

III. DRONE USAGE IN KENYA

Kenya faces an equally pernicious wildlife resource problem: illegal poaching. African elephants in Kenya constantly face the risk of being killed for their tusks. This section describes why poaching still persists in Kenya, and how drones could be used to combat the poachers. It also analyzes the Kenyan right to privacy, and why the use of drones would not violate that right when applied to activity in the national parks and reserves.

A. The Problem: Illegal Poaching

102. *Wildlife Conservation Society*, *supra* note 93.

103. *Id.*

Kenya is home to the largest land dwelling mammal on earth: the African Elephant.¹⁰⁴ African Elephants develop large ivory tusks, which they use to forage for food, and to fight other elephants.¹⁰⁵ These tusks put the African Elephant in grave danger of being killed for their ivory. The only way to obtain the tusks is to first kill the elephant, and then remove the tusks.¹⁰⁶

The demand for ivory contributes significantly to elephant poaching, both historically and today. Elephant populations declined sharply in the 1970s and 1980s due primarily to poaching.¹⁰⁷ During this period, the ivory trade operated legally at an international level, but illegal poaching still contributed to a large percentage of ivory traded.¹⁰⁸ African nations began to realize the threat the ivory trade posed to the continued survival of elephant populations and took action. In order to minimize the threat to elephant populations, Kenya banned the export of ivory in 1988.¹⁰⁹ A year later, at the seventh Convention of the Parties for the Convention on International Trade in Endangered Species of Wild Flora and Fauna (“CITES”), the African Elephant was moved to an Appendix-I listing.¹¹⁰ All Appendix-I species are effectively banned from international commercial trade.¹¹¹

CITES created the Monitoring the Illegal Killing of Elephants (“MIKE”) system in 1997 in order to help elephant range countries more effectively manage populations and enforce poaching laws.¹¹² The MIKE program collects data on the number of elephants killed illegally and researches human factors that could cause an increase in poaching.¹¹³ The program found that countries with high poverty levels, low food security, and weak governance had higher levels of poaching.¹¹⁴ Illegal poaching has increased at an alarming rate since 2005, and peaked in 2011.¹¹⁵ CITES’s

104. Emily Hutchens, *The Law Never Forgets: An Analysis of the Elephant Poaching Crisis, Failed Policies, and Potential Solutions*, 31 WIS. INT’L L.J. 934, 935 (2013–14).

105. *African Elephant*, NAT’L GEOGRAPHIC, <https://perma.cc/9SLS-9QL7?type=image> (last visited Nov. 13, 2014).

106. Hutchens, *supra* note 104, at 935.

107. Andrew M. Lemieux & Ronald V. Clarke, *The International Ban on Ivory Sales and Its Effects on Elephant Poaching in Africa*, 49 BRIT. CRIMINOLOGY 451, 453 (2009).

108. Hutchens, *supra* note 104, at 935.

109. *Id.* at 935–36.

110. *CITES and Elephants*, U.S. FISH AND WILDLIFE SERV. (Nov. 2013), <http://perma.cc/GD4V-KQWU>.

111. *Id.*

112. *Id.*

113. *Id.*

114. *Id.*

115. *Elephant Poaching and Ivory Smuggling Figures Released Today*, CITES, (June 13, 2014), <https://perma.cc/S7PP-TXQU>.

most recent report found that poachers killed more than 20,000 elephants in 2013 across the continent.¹¹⁶ There were 18 large-scale ivory seizures—which CITES defines as seizures of more than 500 kgs of raw or worked ivory seized at a single time—made in 2013, which represented the largest number of large-scale seizures since 1989.¹¹⁷

Even though there is an international ban on ivory trade—as well as a ban in Kenya—illegal poaching and exportation continues at an unprecedented rate.¹¹⁸ Because of this, CITES recommended Kenya adopt a National Ivory Action Plan in order to reduce the illegal exportation of ivory out of the West African nation.¹¹⁹ Regardless of the strict anti-poaching laws in place in Kenya, poaching still persists because of the demand from Asian markets.¹²⁰ Currently, a pound of ivory can be sold for up to \$1,500 on the black market.¹²¹ Ivory carvings are prized possessions in China, especially for the growing middle class who can now afford such luxury items.¹²² Former professional basketball player Yao Ming has become an advocate for elephants; he urges the people of China to “Say No to Ivory”—the title of his campaign with WildAid—in order to reduce the demand for ivory in China.¹²³

Kenya has made significant legislative efforts to protect its wildlife resources. In December 2013, Kenya enacted the Wildlife Conservation and Management Act (hereinafter “the Wildlife Act”), which repealed the old wildlife management regulatory framework.¹²⁴ The statute categorizes wildlife by four different categories: critically endangered species; vulnerable species; nearly threatened species; and protected species.¹²⁵ African Elephants are listed as critically endangered species.¹²⁶ The statute prohibits sport hunting,¹²⁷ subsistence hunting,¹²⁸ and hunting for bush-meat

116. *Id.*

117. CITES, *Elephant Conservation, Illegal Killing and Ivory Trade*, at 28, SC65 Doc. 42.1 (July 7, 2014), <http://perma.cc/S4LX-SC68>.

118. Hutchens, *supra* note 104, at 936.

119. CITES, *National Ivory Action Plan*, SC65 Doc 42.2 (July 7, 2014), <http://perma.cc/82VW-TMZK>.

120. Hutchens, *supra* note 104, at 948.

121. *The Tragic Price of Ivory*, WEEK (Mar. 15, 2014), <http://perma.cc/RJ3E-R4EM>.

122. Rebecca Rosen, *What Is It About an Elephant's Tusks That Make Them So Valuable?*, ATLANTIC (Sept. 6, 2012, 11:19 AM), <http://perma.cc/8KJ9-PN7K>.

123. *Yao Ming Urges China to 'Say No To Ivory and Rhino Horn' with New Film*, WILDAID (Aug. 8, 2014), <http://perma.cc/LV44-U9NC>.

124. Hanibal Goitom, *Kenya: Implementation of New Wildlife Law Expedited*, L. LIBR. OF CONGRESS (Apr. 24, 2014), <http://perma.cc/628D-22PJ>.

125. The Wildlife Conservation and Management Act, KENYA GAZETTE SUPPLEMENT NO. 181 (ACTS NO. 47) § 47 (2013).

126. *Id.* §47, SIXTH SCHEDULE.

127. *Id.* §96 (“A person who engages in sport hunting or any other recreational hunting commits an offence and shall be liable” for a conviction with punishment through fines, prison

trade¹²⁹ of any listed species. The statute authorizes members of the Kenya Wildlife Service to use firearms against individuals unlawfully hunting wildlife with a firearm.¹³⁰ The statute applies to the publically owned lands in the Kenyan National Park and Reserve system, as well as community and private lands.

The Wildlife Act also governs the import and export of wildlife species in and out of Kenya in an attempt to suppress international trade. The statute explicitly prohibits “trade in, import, export, re-export or introduc[tion of] any specimen of a wildlife species into or from Kenya without a permit issued by the Service under this Act.”¹³¹ And anyone who is “found in possession of a wildlife trophy or deals in a wildlife trophy, or manufactures any item from a trophy without a permit issued under this Act or exempted in accordance with any other provision of this Act, commits an offence and shall be liable upon conviction.”¹³² The statute defines “trophy” as “any wild species alive or dead and any bone, claw, egg, feather, hair, hoof, skin, tooth, tusk or other durable portion whatsoever of that animal whether processed, added to or changed by the work of man or not, which is recognizable as such.”¹³³ But even with these strict anti-poaching provisions in the Wildlife Act, illegal poaching continues because the elephant tusks are still so valuable on the black market.

The ineffective policing of national parks contributes to continued illegal poaching. Like the Mesoamerican Barrier Reef in Belize, Kenya’s national parks are expansive. Eight percent of the nation’s land mass is protected as a national park, national reserve, or national sanctuary.¹³⁴ The Kenya Wildlife Service is responsible for managing 23 terrestrial national parks—which completely protect resources from human activities except tourism and research—and 28 terrestrial national reserves that allow limited

time, or a combination of both. Prison sentences range from two years to life, and fines range from one million to twenty million shillings.)

128. *Id.* § 97 (explaining that the prohibition against subsistence hunting is less strict than the prohibition against sport hunting. It states in relevant parts that “A person who engages in hunting for the purposes of subsistence commits an offence and shall be liable on conviction to a fine of not less than thirty thousand or imprisonment for a term of not less than six months or to both such fine and imprisonment.”).

129. *Id.* § 98 (“A person who engages in hunting for bush-meat trade, or is in possession of or is dealing in any meat of any wildlife species, commits an offence and shall be liable on conviction.”).

130. *Id.* § 112.

131. *Id.* § 99.

132. *Id.* § 95.

133. *Id.* § 3.

134. *Overview, KENYA WILDLIFE SERVICE*, <http://perma.cc/JAU5-5DDU> (last visited Nov. 18, 2014).

human activities.¹³⁵ But poaching still persists because “under-equipped and under-staffed African wildlife law-enforcement agencies are easily outmaneuvered in their attempts to fight poaching by sophisticated crime syndicates operating freely across national borders.”¹³⁶ Additionally, elephant populations do not recognize the boundaries of the parks and reserves, and can move freely from protected areas to private land where the Kenya Wildlife Service does not patrol.¹³⁷

Environmental groups proposed the use of conservation drones as a useful tool for monitoring large reserves for illegal activity. The drones could be used to monitor national parks and reserves from above for any illegal poaching, which could make the Wildlife Service more efficient at enforcing the Wildlife Act. Plans were underway to implement a conservation drone program in the private Ol Pejeta Conservancy until Kenya banned the private use of drones.¹³⁸ The Conservancy received approval in early 2014 to begin using drones in the park.¹³⁹ It conducted a successful two week trial launch of the drones and was ready to fully implement the project in June 2014 before the government halted the project with the ban.¹⁴⁰ Local news coverage on the ban quoted government sources who cited “rising insecurity” as the impetus behind the ban, without further elaborating on the reason for the ban.¹⁴¹

B. Privacy Rights in Kenya and How Drones Affect Them

The Constitution of Kenya explicitly grants its citizens the right to privacy: “Every person has the right to privacy, which includes the right not to have—(a) their person, home or property searched; (b) their possessions seized; (c) information relating to their family or private affairs unnecessarily required or revealed; or (d) the privacy of their communications infringed.”¹⁴² Like the Belizean right to privacy, it protects communications and private and family affairs. Nevertheless, this right to privacy is still limited when applied to activities that occur out in the open.

135. *Id.*

136. ROSALEEN DUFFY, NATURE CRIME: HOW WE’RE GETTING CONSERVATION WRONG 81 (2010) (internal quotations omitted).

137. KENYA WILDLIFE SERV., *supra* note 134.

138. James Kariuki, *Government Bans Drone Use to Fight Poaching in Ol Pejeta*, DAILY NATION (May 30, 2014), <http://perma.cc/6AMH-AAJX>.

139. *Id.*

140. *Id.*

141. *Id.*

142. CONSTITUTION art. 31 (2010) (Kenya).

By extrapolating the test the United States uses to determine whether the right to privacy applies, I suggest that the right to privacy does not apply to poaching activities that occur in the parks and reserves. Kenyan case law does not clarify how the right to privacy is applied to activity outside the home. But intuitively, the illegal poaching activities occurring on publicly owned land would not garner the protection of the right to privacy the way activities occurring inside the home would. This follows from the open fields doctrine the United States uses. Only activities that occur within the home—or the land immediately connected to it—are protected by the Fourth Amendment. Because illegal poaching occurs mostly on land owned by the Kenyan government and not on privately owned land, the Kenyan right to privacy should not protect it. This would mean that conservation drones used in the national parks and national reserves would not violate the right to privacy.

If the right to privacy does not apply in the reserves, conservation drones would not interfere. The Kenya Wildlife Service could use the drones to spot illegal poachers, and potentially deter them from killing the elephants. Private conservancies like the Ol Pejeta Conservancy would not be able to enforce the Wildlife Act against the poachers, but the drones could be used to notify the Wildlife Service of the areas the bad actors are poaching. Conservation drones could be the monitoring solution to Kenya's poaching problem if the country lifts the ban on private drones, and begins to incorporate the drones into the Wildlife Service monitoring program.

IV. THE OPEN FIELDS DOCTRINE AND CUSTOMARY INTERNATIONAL LAW

Drone technology could improve natural resource monitoring at an international level if the open fields doctrine was adopted as part of customary international law. The International Court of Justice considers customary law as one of the sources of international law, defined as “international custom, as evidence of general practice accepted as law.”¹⁴³ A rule becomes customary international law when “it is manifested in the general practice of the States.”¹⁴⁴ Customary international law requires two elements: state practice and *opinio juris sive necessitates* (*opinio juris*).¹⁴⁵ State practice can be defined broadly, and any official government acts may

143. Statute of the International Court of Justice art. 38, <http://perma.cc/FB7P-P4VV>.

144. VAUGHN LOWE, INTERNATIONAL LAW 36 (2007).

145. BARRY E. CARTER & ALLEN S. WEINER, INTERNATIONAL LAW 116 (6th ed. 2011).

constitute state practice.¹⁴⁶ In order for a state practice to become customary law, there must also be the element of *opinio juris*, whereby states follow the practice out of a sense of legal obligation.¹⁴⁷ If the practice is “sufficiently extensive and representative, the resulting rule is binding on *all* states.”¹⁴⁸

The establishment of customary international law often happens over decades, with countries actively adopting policies or passively acquiescing to practices of other states.¹⁴⁹ If countries are to adopt rules as customary law, it is necessary to show that the rule is “rooted in community, and not an ephemeral reflection of the views or aspirations of particular litigants or lawyers.”¹⁵⁰ The length of time countries have followed a practice is “good evidence that the rule evidenced by the practice is firmly established.”¹⁵¹ Customary international law therefore takes time to develop. In the 1945 Truman Proclamation, the United States first made claim to exclusive control and ownership of the continental shelf, which extended past the three-mile territorial sea.¹⁵² Other states followed suit, and began claiming exclusive control over their own continental shelf.¹⁵³ This process occurred throughout the 1940s and 1950s, and amounted to a “general practice” that now binds other countries as part of customary international law.¹⁵⁴

Not all tenants of international law developed slowly. In some instances, customary international law developed rapidly as a response to the changes in the international community. Space law provides a relevant example of customary international law developing quickly to address new concerns raised by novel technological improvements. The United Nations debated the issue of who has jurisdictional control over space and other celestial bodies at the General Assembly in 1963.¹⁵⁵ The 1963 Declaration of Legal Principles Governing Activities of States in the Exploration and Use of Outer Space set out the basic tenants of space law, including the principle that no state can own the moon or other celestial bodies.¹⁵⁶ The

146. LOWE, *supra* note 144, at 43.

147. IAN BROWNLIE, *PRINCIPLES OF PUBLIC INTERNATIONAL LAW* 7 (7th ed. 2008).

148. CARTER, *supra* note 145, at 126 (internal quotations omitted).

149. LOWE, *supra* note 144, at 39 (discussing how states may have hypothetically responded to the United State’s Truman Proclamation).

150. *Id.* at 41.

151. *Id.*

152. *Id.* at 36.

153. *Id.* at 36–37.

154. *Id.*

155. *Id.* at 41–42.

156. *Id.* at 42.

resolution passed unanimously, creating “instant” customary international law.¹⁵⁷

Customary international law could provide a unique pathway for conservation drones to be used at a more widespread and international level. If enough states adopt the open fields doctrine through official state practice, and they follow the doctrine out of a sense of obligation, the doctrine would become part of customary law. This would then bind the remaining states that had not adopted the open fields doctrine as their own state practice. Countries could use conservation drones in public lands not associated with a private home to monitor illegal resource extraction. This could expand the potential uses of conservation drones to monitor other extractive practices like illegal logging.¹⁵⁸ Ideally, the open fields doctrine would be adopted into customary international law quickly, similar to the way space law developed. Global natural resources run the risk of being irreversibly depleted if the current monitoring scheme (or lack thereof) remains in place as states slowly adopt the open fields doctrine to allow conservation drone usage.

Belize is arguably already applying the open fields doctrine by allowing the Fisheries Department to use conservation drones to monitor its reef. As conservation drones become more prevalent, more states may follow Belize’s footsteps and allow their use through official state action that applies the open fields doctrine. If this happens, the open fields doctrine would become customary international law, and bind countries like Kenya that have halted the use of conservation drones. The problem of illegal poaching requires a unique solution, and conservation drones could be the answer if Kenya were to move forward with integrating them into the Wildlife Service monitoring program. Customary international law may be the push countries like Kenya need to adopt conservation drones into their wildlife resource management regime.

CONCLUSION

Wildlife resources across the globe are being overexploited, which puts species in danger of extinction and bodes ecosystem destruction. Effective monitoring of wildlife resources is the first step in ensuring species and ecosystem recovery, and conservation drones could be the answer to this global problem. From the coral reefs in Belize to the savannahs in Kenya,

157. *Id.*

158. Joshua Barrie, *These Before and After Drone Photos Shows How Illegal Logging is Destroying the Rainforest*, BUS. INSIDER (NOV. 5, 2014), <http://perma.cc/K6ZL-2JAA> (conservation drones have already begun monitoring illegal logging in Indonesia).

conservation drones can and are being used to monitor illegal resource exploitation and prevent wildlife resource depletion.

Conservation drones do not infringe on privacy rights when countries use them to monitor illegal activity occurring in public areas, like marine protected areas and national parks. In Belize, the use of conservation drones does not infringe on privacy rights, because of the limited privacy Belize grants vessels fishing in Belizean waters and under their flag on the high seas. In Kenya, the government ban on private drones is a step back for effective wildlife management; their privacy right does not extend to public land and the penalties within the Wildlife Management and Conservation Act have not worked to solve the poaching problem. The Kenya Wildlife Service would benefit from conservation drones because they could more effectively locate poachers before they have the opportunity to kill the animals.

Critics of conservation drones argue that drone technology violates privacy rights. While the right to privacy is not universal worldwide, most privacy rights do not extend to activities occurring in open fields separated from the home. United States case law draws a sharp line between the home and open fields, and does not extend the right to privacy to activity in the open fields. If enough states apply this test, it could be adopted as customary international law, which would allow countries and environmental groups to use conservation drones worldwide to protect valuable and vulnerable natural resources.