

OIL DEVELOPMENT IN ANWR: THE PRECAUTIONARY PRINCIPLE IS COMPATIBLE WITH THE FISH AND WILDLIFE SERVICE'S STATUTORY MANDATE

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Abstract: The potential for oil production in the Arctic National Wildlife Refuge (ANWR) coastal plain, otherwise known as the 1002 Area, is significant, with a current value of \$770 billion. Yet, there are considerable knowledge gaps and disagreements over the environmental impacts of oil development in ANWR. The Fish and Wildlife Service (FWS) manages ANWR and is tasked with advancing the refuge's mission of ecological conservation. Before it can approve oil development in ANWR, the FWS is statutorily required to ensure that oil development is compatible with ANWR's mission. This Comment argues that the precautionary principle is embedded within the laws governing FWS management of ANWR. Simply, the precautionary principle is "foresight planning," in that it demands proactive prevention of potentially serious threats to human health and the environment. Therefore, until sufficient scientific information demonstrates oil development is compatible with ecological conservation, the FWS must proceed with caution and prohibit oil development in ANWR's 1002 Area.

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I. INTRODUCTION

The debate over whether to drill for oil in the Arctic National Wildlife Refuge (ANWR) provokes fierce ethical, moral and political passions.¹ In recent years, this debate has

1. U.S. GEOLOGICAL SURVEY, CIRCULAR 1370, AN EVALUATION OF THE SCIENCE

intensified as a result of significant increases in gasoline prices and continuing instability in oil-rich countries of the Middle East.² The total amount of oil available in ANWR is considerable. The U.S. Geological Survey (USGS) estimates that the mean technically recoverable oil in ANWR is 7.7 billion barrels.³ As a comparison, the United States currently uses approximately 7.0 billion barrels per year.⁴ With oil prices currently at \$100 per barrel and increasing, oil development in ANWR will likely yield much more than \$770 billion.⁵

In sharp contrast to ANWR's great potential for oil production, ANWR is the largest national wildlife refuge in this country and accounts for 19.3 million acres in the Alaska North Slope region.⁶ Home to an astounding abundance of plant and animal life, this refuge includes calving grounds of the porcupine caribou, migration paths of tens of thousands of birds and insects, snow dens and birthing places of threatened polar bears, and all-year activities of sheep, oxen, and wolves.⁷ For instance, the porcupine caribou herd, numbered at 129,000, moves annually from south of the Brooks Range in the Arctic Refuge and Canada to give birth to their young on the arctic coastal region.⁸

NEEDS TO INFORM DECISIONS ON OUTER CONTINENTAL SHELF ENERGY DEVELOPMENT IN THE CHUKCHI AND BEAUFORT SEAS, ALASKA 1 (Leslie Holland-Bartels & Brenda Pierce eds., 2011) [hereinafter U.S. GEOLOGICAL SURVEY].

2. M. LYNNE CORN, MICHAEL RATNER & KRISTINA ALEXANDER, CONGRESSIONAL RESEARCH SERVICE, ARCTIC NATIONAL WILDLIFE REFUGE (ANWR): A PRIMER FOR THE 112TH CONGRESS 1 (2011), *available at* <http://fpc.state.gov/documents/organization/167865.pdf> [hereinafter CRS PRIMER]. The CRS issued an updated version of this report in 2012. The 2012 report is largely similar to the report on which this Comment relied. Due to differences in pagination, this Comment cites the 2011 report. The 2012 report can be found online. M. LYNNE CORN, MICHAEL RATNER & KRISTINA ALEXANDER, CONGRESSIONAL RESEARCH SERVICE, ARCTIC NATIONAL WILDLIFE REFUGE (ANWR): A PRIMER FOR THE 112TH CONGRESS (2012), *available at* <http://www.fas.org/sgp/crs/misc/RL33872.pdf>.

3. *Id.* There is a possibility that economically recoverable oil is as much as 10.7 billion barrels.

4. *Id.*

5. Mia Bennett, *After Years of Waiting, Shell Oil Drillships Poised to Explore Arctic Alaska*, ALASKA DISPATCH, June 2, 2012, <http://www.alaskadispatch.com/article/after-years-waiting-shell-oil-drillships-poised-explore-arctic-alaska>.

6. ROBERT L. FISCHMAN, THE NATIONAL WILDLIFE REFUGES: COORDINATING A CONSERVATION SYSTEM THROUGH LAW 190 (2003).

7. CRS PRIMER, *supra* note 2, at 2.

8. U.S. FISH AND WILDLIFE SERVICE, POTENTIAL IMPACTS OF PROPOSED OIL AND GAS DEVELOPMENT ON THE ARCTIC REFUGE COASTAL PLAIN: HISTORICAL OVERVIEW AND ISSUES OF CONCERN 13 (2001),

This Comment opens by explaining the circumstances that allow oil development to take place in ANWR. ANWR, like other parts of the wildlife refuge system (“the System”), is managed by the Fish and Wildlife Service (FWS).⁹ Although conservation is the top-tier use for ANWR,¹⁰ oil exploration and drilling are allowed in ANWR’s coastal plain, known as the “1002 Area,” if authorized by Congress.¹¹

Next, it describes the discord around the sufficiency of scientific information available to evaluate the environmental repercussions of oil development in this region.¹² Although oil has been in production for many years in Arctic Alaska, a USGS report on energy development in Arctic Alaska found gaps in scientific knowledge that led the USGS to question whether there is sound basis upon which to make decisions regarding oil development in the region.¹³ For example, various sources predict totally disparate effects of oil development on the porcupine caribou.¹⁴

http://library.fws.gov/Pubs7/arctic_oilandgas_impact.pdf [hereinafter FWS POTENTIAL IMPACTS].

9. 16 U.S.C. § 668dd (2006). Under current law for FWS management of national wildlife refuges (16 U.S.C. § 668dd (2006)) and Alaskan refuges (43 C.F.R. § 3101.5-3 (2012)), an activity may be allowed in a refuge only if it is compatible with the purposes of the particular refuge and the refuge system holistically. Many past bills proposed to open the 1002 Area for energy activities—none has passed to become law—bypassed the compatibility issue by stating that energy development is concluded to be compatible with ANWR’s purpose at the refuge’s establishment and no further decisions is required. See CRS PRIMER, *supra* note 2, at 25.

10. 16 U.S.C. § 3101 (2006).

11. *Id.* § 3143; Alaska National Interest Lands Conservation Act, PL 96-487, December 2, 1980, 94 Stat 2371 [hereinafter ANILCA] (This Act expanded the Arctic Wildlife Range by 9.2 million acres and renamed it ANWR. ANILCA section 702(3) designated 8 million acres of the original Range as a wilderness area. In section 1002, the remainder 1.5 million acres Coastal Plain was excluded.).

12. U.S. GEOLOGICAL SURVEY, *supra* note 1, at 1.

13. *Id.* On March 31, 2010, Secretary of the Interior Ken Salazar asked the USGS to “conduct an initial, independent evaluation of the science needs that would inform the Administration’s consideration of the right places and the right ways in which to develop oil and gas resources in the Arctic OCS, particularly focused on the Beaufort and Chukchi Seas.” *Id.*

14. The porcupine caribou is an example of a species whose fate in the presence of oil development is unclear. The FWS states that one of several potential impacts to the porcupine caribou herd from oil development—pipelines, roads, and structures—is a significant reduction in the amount and quality of food resources during and after calving. FWS POTENTIAL IMPACTS, *supra* note 8, at 13. The Congressional Research Service’s (CRS) recent report on ANWR acknowledges inconclusive findings of impacts to the porcupine caribou. CRS PRIMER, *supra* note 2, at 16-17. On the other hand,

The sections that follow elucidate the roles of the National Environmental Policy Act (NEPA) and the FWS with respect to oil development in ANWR. Although NEPA's objective is to prevent damage to the environment,¹⁵ NEPA cannot fill the gap created by insufficient scientific knowledge.¹⁶ The FWS, in its responsibility for ANWR's management, is charged with evaluating whether oil development is compatible with ANWR's mission of ecological conservation.¹⁷ This is known as the compatibility test.¹⁸

Finally, this Comment contends that the FWS's statutory mandate and its compatibility requirement embody the precautionary principle, and accordingly, the FWS's compatibility decisions should be grounded in the precautionary principle. The precautionary principle is "foresight planning."¹⁹ It requires actors to be proactive in preventing significant harms to human health and the environment.²⁰ With the current insufficiency of scientific knowledge about the effects of oil development in ANWR, a FWS compatibility test that is based on the precautionary principle will yield a more environmentally sound decision than a decision not based on the precautionary principle. At this time, the FWS should proceed cautiously and deny oil development in ANWR's 1002 Area in order to achieve ANWR's goals of "conservation, management, and . . . restoration of the fish, wildlife, and plant resources and their habitats."²¹

proponents of oil development in the 1002 Area claim that there will be no negative impact to the caribou. ARCTIC NATIONAL WILDLIFE REFUGE, *Top Ten Reasons to Support ANWR Development*, <http://www.anwr.org/ANWR-Basics/Top-ten-reasons-to-support-ANWR-development.php> (last visited Oct. 21, 2012) [hereinafter *Top Ten Reasons to Support ANWR Development*]. They point to the growth of the Central Arctic Caribou Herd that migrates directly through the Prudhoe Bay oil field (the Central Arctic Caribou Herd has grown from 5000 animals in the early 1970s to well over 66,000 animals today). *Id.*

15. 42 U.S.C. §§ 4331, 4332 (2006).

16. *See infra* pp. 247–54.

17. 16 U.S.C. § 668dd(a)(2) (2006); U.S. FISH AND WILDLIFE SERVICE, NATIONAL WILDLIFE REFUGE SYSTEM USES, SERVICE MANUALS, 603 FW 2 (2000), available at <http://www.fws.gov/policy/603fw2.pdf> [hereinafter FWS MANUAL].

18. FISCHMAN, *supra* note 6, at 112.

19. Robert V. Percival, *Who's Afraid of the Precautionary Principle?*, 23 PACE ENVTL. L. REV. 21, 23 (2006).

20. *Id.* at 22.

21. 16 U.S.C. § 668dd(a)(2) (2006).

II. THE CONDITIONS AND MEANS THAT ALLOW OIL DEVELOPMENT IN ANWR

Refuges such as ANWR may be put to a variety of uses.²² Conservation is ANWR's dominant purpose, as dictated by the Alaska National Interest Lands Conservation Act (ANILCA), but other uses have legitimacy in ANWR.²³ ANILCA requires that the FWS develop a mandatory comprehensive unit plan and manage the refuge according to a defined hierarchy of purposes.²⁴ A second federal statute, the 1997 National Wildlife Refuge System Improvement Act (Improvement Act), also governs the use of ANWR's lands.²⁵ The Improvement Act builds upon the hierarchical framework of ANILCA, prioritizing three levels of use, from highest to lowest priority: (1) conservation; (2) wildlife-dependent recreation; and (3) other uses.²⁶ Oil development resides in the lowest position in this hierarchy and faces additional tests of compatibility and affirmative contribution.²⁷

ANILCA also designates all of ANWR, except for the 1002 Area, as wilderness area.²⁸ In not designating the 1002 Area as wilderness, Congress avoided deciding to either allow development or extend further protections of this region.²⁹ Instead, Congress included a provision in ANILCA requiring studies of all of the resources of the 1002 Area.³⁰ Meanwhile, ANILCA barred any energy development absent Congressional authorization.³¹

A. *Oil Development is One of the Refuge System's Designated Uses*

Oil development, as an economic use of natural resources,

22. 16 U.S.C. § 668dd(a)(4) (2006).

23. 16 U.S.C. § 3101 (2006).

24. *Id.*

25. National Wildlife Refuge System Improvement Act, Pub. L. No. 105-57, 111 Stat. 1252 (1997) (codified at 16 U.S.C. §§ 668dd–668ee (2006)).

26. FISCHMAN, *supra* note 6, at 93.

27. *Id.*

28. ANILCA § 1003; 16 U.S.C. § 3143 (2006).

29. CRS PRIMER, *supra* note 2, at 4–5.

30. 16 U.S.C. § 3142 (2006).

31. *Id.* § 3143.

inhabits the lowest place in the hierarchy of designated uses of the wildlife refuge system.³² Although less preferable than other uses of the System, oil development is properly permitted in the System when: (1) it is compatible with the System's primary use; (2) it does not conflict with secondary uses; and (3) it positively affects a primary use.³³ In 2001, some type of oil or gas exploration or development activity took place in twenty-two states, with forty-five wildlife refuges in fifteen states actually producing oil or gas.³⁴

Mineral resource development in the System generally occurs where the federal government leases its own subsurface oil and gas rights.³⁵ The Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE) manages the issuance and extension of leases.³⁶ Through lease stipulation, these lessees are required to follow regulations that ensure adherence to the System's conservation mission.³⁷ The FWS, as the agency with control over lands dedicated for wildlife conservation, possesses comprehensive power to manage oil development.³⁸

B. ANILCA did not Designate the 1002 Area Coastal Plain as Wilderness

In 1960, a secretarial public land order established the nine million acre Arctic National Wildlife Range (the Range).³⁹ The Range encompasses the extremely valuable and controversial coastal plain.⁴⁰ The federal government retains control over the land and beds underlying navigable and tidal waters, which encompasses the coastal plain.⁴¹ This area of the Range was separated from the unreserved public lands in 1957, thus placing it off limits for selection of state lands under Alaska's

32. FISCHMAN, *supra* note 6, at 93.

33. *Id.* at 193.

34. *Id.* (citing U.S. GOVERNMENT ACCOUNTABILITY OFFICE, GAO-02-64R, U.S. FISH AND WILDLIFE SERVICE: INFORMATION ON OIL AND GAS ACTIVITIES IN THE NATIONAL WILDLIFE REFUGE SYSTEM (2001)).

35. FISCHMAN, *supra* note 6, at 193.

36. *Id.* at 197.

37. *Id.* at 194.

38. 43 C.F.R. § 3101.5-1 (2011).

39. See Pub. Land Order 2,214, 25 Fed. Reg. 12,598 (Dec. 9, 1960).

40. FISCHMAN, *supra* note 6, at 190.

41. *Id.*

statehood statute.⁴² The 1960 establishment document permitted oil and gas leasing in the Range.⁴³

In 1980, ANILCA added 9.2 million acres to the Range and renamed it the Arctic National Wildlife Refuge.⁴⁴ Most of the original national wildlife range was designated as wilderness, though 1.5 million acres of coastal plain were excluded.⁴⁵ Areas designated as wilderness must be left unimpaired for future use, preserved in their wilderness state.⁴⁶ As such, wilderness areas are completely precluded from oil development activities.⁴⁷ However, because the coastal plain of ANWR was not designated as a wilderness area, oil exploration and drilling could potentially occur in that area. In fact, Congress labeled most of the coastal plain as the 1002 Area in order to arrange for a special study on the future leasing of oil and gas therein.⁴⁸ ANILCA prohibits “leasing or other development leading to production of oil . . . from the range” unless otherwise authorized by Congress.⁴⁹

The Congressionally ordered resources study of the 1002 Area was completed in 1987 by the Secretary of the Interior.⁵⁰ Known as the 1002 Report or the Final Legislative Environmental Impact Statement (FLEIS), the Secretary documented potential uses of the 1002 Area, ranging from total availability of the 1002 Area for oil and gas exploration and development (alternative A) to wilderness designation (alternative E).⁵¹ The Secretary recommended alternative

42. *Id.* Because Alaska entered the union in 1959 and the area covered by the Arctic National Wildlife Range in 1960 had been segregated from the unreserved public domain since 1957, this segregation explains why Alaska does not have control of the beds underlying navigable and tidal waters to the state.

43. *Id.*

44. Pub. L. No. 96-487, 94 Stat. 2374 (codified at 16 U.S.C. § 3101 (2006)).

45. 16 U.S.C. § 1132 (2006).

46. *Id.* § 1131.

47. *Id.*

48. *Id.* § 3141.

49. *Id.* § 3143.

50. U.S. DEPARTMENT OF THE INTERIOR, ARCTIC NATIONAL WILDLIFE REFUGE, ALASKA, COASTAL PLAIN RESOURCE ASSESSMENT: REPORT AND RECOMMENDATION TO THE CONGRESS OF THE UNITED STATES AND FINAL LEGISLATIVE ENVIRONMENTAL IMPACT STATEMENT (1987), *available at* http://library.fws.gov/Pubs7/ANWR_coastal_LEIS.pdf [hereinafter FLEIS].

51. *Id.* at 102.

A.⁵² However, because ANILCA prohibits leasing and other oil development activities, the 1002 Area is currently managed as specified in alternative D (maintenance of status quo) until Congress directs otherwise.⁵³

III. SCIENTIFIC KNOWLEDGE OF POTENTIAL ENVIRONMENTAL IMPACTS FROM OIL DEVELOPMENT IN ANWR IS INSUFFICIENT

The production of oil in Arctic Alaska has been ongoing for many years, including in the Nation's largest oil field at Prudhoe Bay, located just west of ANWR's 1002 Area.⁵⁴ Despite years of proximate oil activities, there is considerable divergence of opinion regarding the adequacy of available scientific information to evaluate the environmental effects of oil development in ANWR's coastal plain.⁵⁵ Disagreements abound on what science is necessary, whether the right information is being collected, what scientific issues need to be addressed, and the status of the body of scientific information for those issues.⁵⁶ Independent reports, including the USGS report, Congressional Research Service Primer for the 112th Congress, and FWS publications, have analyzed the state of scientific knowledge surrounding oil development and readily acknowledge discrepancies of opinions and data.⁵⁷ For instance, the USGS report states that "[t]here are areas of significant scientific research that form a sound basis upon which to make decisions; there are areas where additional science is needed; but there also is an area in which more than science is needed."⁵⁸

A. *Oil Development Proponents: advances in technology and safety adequately minimize adverse environmental effects from oil development*

Oil development proponents claim several new technologies reduce the environmental footprint of oil development

52. *Id.* at 97–100.

53. *Id.* at 102.

54. U.S. GEOLOGICAL SURVEY, *supra* note 1, at 1.

55. *Id.*

56. *Id.*

57. *Id.* passim; see also CRS PRIMER, *supra* note 2, passim.

58. U.S. GEOLOGICAL SURVEY, *supra* note 1, at 221.

activities in the harsh and changing Arctic environment.⁵⁹ One of these advances is a reduction of operational area.⁶⁰ New drill bits and fluids enable a less intrusive method of lateral drilling.⁶¹ This drilling type produces “designer” wells that allow a horizontal reach far beyond the footprint of the drill platform.⁶² The current record for a designer well reaches seven miles in radius, compared to the current industry standard for down-hole operations in Alaska at five miles.⁶³ Proponents claim the relatively small footprint of the surface well pad, coupled with the larger horizontal reach of the designer wells, lessens the environmental impact from oil-related operations.⁶⁴

Another improvement is in ice-based transportation infrastructure.⁶⁵ In the exploratory phase, ice pads are about ten acres in size.⁶⁶ These relatively small pads are unstaffed and feasible when linked to bigger pads that provide housing, storage, maintenance facilities, airfields, and other support functions.⁶⁷ Oil companies have also made improvements in response to changing climatic conditions, such as warming trends, which have shortened the utility of ice roads and pads and require instead the use of gravel structures. For example, some companies maximize the utility of ice roads and pads by using “two drilling rigs, rotating rigs at drill sites, starting ice road construction from both ends simultaneously, using

59. CRS PRIMER, *supra* note 2, at 14.

60. *Id.* Operational area of oil drilling includes above ground drillsite or pad and the below ground down-hole operation. *Id.* The drillsite or pad contains the drilling platform, rigs, equipment, storage, airfields, and other production infrastructure. *Id.* In 1970, for a down-hole operation, a drill site was about sixty-five acres above ground and reached approximately two miles in diameter underground. *Id.* at Figure 6. In comparison, in 1999, a down-hole operation drill site was about thirteen acres above ground and reached approximately eight miles in diameter underground. *Id.*

61. *Id.* at 14.

62. *Id.*

63. *Id.*

64. *Id.* at 13–14.

65. *Id.* at 14.

66. *Id.* Ice pads are drillsites made of ice, instead of the typical gravel. *Id.* Utilizing ice pads eliminates or reduces construction of gravel pads, which inherently leave greater environmental impact. *Id.* Ten-acre ice pads are considered small; in comparison, a modern Conoco-Phillips Alpine development located west of Prudhoe Bay, containing two pads, a connecting road, and an airstrip, totals 100 acres. *Id.*

67. *Id.* at 14–15.

aircraft to reach remote sites, and prepositioning equipment and materials.”⁶⁸ Tasks can then be accomplished faster during the shorter winter season,⁶⁹ lessening the length and extent of disruption to the Arctic environment.

In the course of planning for its oil exploration and development in ANWR, Shell, for example, responds to environmental concerns by gathering information that could help predict what it would encounter from nature.⁷⁰ Shell hired a team of hydrologists, soil experts, and oceanographers to study the Arctic environment and the feeding and migratory habits of wildlife.⁷¹ For instance, after Shell’s consultants discovered that walrus calls stopped each time a seismic survey (firing of sound and impulses through the water) was conducted, Shell began studying how to muffle some of the noise from drilling operations.⁷² Shell is also mapping migration patterns of sea mammals tagged with tracking devices in order to plan its exploration activities with as little impact as possible.⁷³ Moreover, in an effort to understand the effect of an oil spill in the Arctic, Shell uses underwater gliders to collect real time maps of currents.⁷⁴ These maps along with oceanography studies of underwater fronts will provide data of where spilled oil is likely to end up.⁷⁵

Some Native people, such as the Alaska Natives (Inuit), support companies like Shell in their efforts to open energy development in ANWR.⁷⁶ They argue that oil development can be carried out without harming the environment, including avoiding damage to the porcupine caribou herd.⁷⁷ They reference the central arctic caribou herd that is found

68. *Id.* at 15 (“The Alpine Development Example”).

69. *Id.*

70. Steven Mufson, *Proposed Oil Drilling Off Alaska Coast Prompts Studies of Environmental Impact*, THE WASHINGTON POST, Aug. 22, 2011, http://www.washingtonpost.com/business/economy/proposed-oil-drilling-off-alaska-coast-prompts-studies-of-environmental-impact/2011/08/02/gIQA06vsWJ_story.html.

71. *Id.* at 2.

72. *Id.* The report also said, “Repeated disruptions of vocal communications could potentially affect the maintenance of mother-pup bonds and herds’ integrity . . . Both rely almost exclusively on calls to remain in contact when separated by larger distances.” *Id.*

73. *Id.* at 3.

74. *Id.* at 4.

75. *Id.*

76. CRS PRIMER, *supra* note 2, at 16.

77. *Id.*

seasonally in the oil fields area of Prudhoe Bay.⁷⁸ This herd of caribou has increased significantly in numbers.⁷⁹

Although oil-related activities will always present an element of risk, companies like Shell argue that technological progress in equipment and infrastructure and sound practices based on scientific information adequately minimize the potential for adverse environmental impacts from oil exploration and drilling in ANWR.⁸⁰ Oil companies want to convince their critics and governmental agencies that their recent research and their commitment to ongoing research are enough and they can drill safely with minimal environmental impacts.⁸¹

B. Oil Development Opponents: too many unknowns and potential impacts from oil development

Environmental organizations contend “[s]cience, not politics, needs to guide decision-making in America’s extreme, remote, and fragile Arctic Ocean. If we are to avoid irreparable harm to an ecosystem found nowhere else in the country, we need to develop a comprehensive research and monitoring plan and set aside significant areas for protection.”⁸² Moreover, the Pew Environment Group (Pew), a conservation organization with a stated mission of saving and protecting the natural environment and its inhabitants, contends these same harsh environmental conditions make avoiding, containing, or cleaning up an oil spill very difficult.⁸³

Unknown effects of oil development are also a concern. Pew criticizes any oil activity in the Arctic for lack of scientific understanding of the environmental effects.⁸⁴ Pew points out that ice seals, polar bears, bowhead whales, and other marine mammals make their homes in the Beaufort and Chukchi Seas

78. *Id.*

79. *Id.*; *Top Ten Reasons to Support ANWR Development*, *supra* note 22.

80. CRS PRIMER, *supra* note 2, at 15.

81. Mufson, *supra* note 70.

82. Marilyn Heiman, *Science Must Guide Offshore Arctic Conservation, Development*, THE PEW ENVIRONMENT GROUP, Oct. 6, 2011, <http://www.pewenvironment.org/news-room/opinions/science-must-guide-offshore-arctic-conservation-development-85899364957#>.

83. *Id.*

84. *Id.*

of the 1002 Area, a setting not found anywhere else in the United States.⁸⁵ These animals have adapted to the area's extreme conditions of sub-zero temperatures, high winds, and shifting ice plates.⁸⁶

Pew's stance to halt any oil development in the Arctic because of inadequate information is echoed by many other organizations, scientists, and independent experts.⁸⁷ Entities such as the Ocean Conservancy, the Sierra Club, Defenders of Wildlife, and the Center for Biological Diversity hold similar beliefs.⁸⁸ Pew and the Ocean Conservancy asked scientists of various specializations for an assessment of the 2011 USGS report, discussed below.⁸⁹ Although Pew's resulting commentary praised the USGS assessment as thorough, thoughtful, unbiased, and structurally clear, it identified areas of incompleteness, such as historical context, identification and dissemination of recent and ongoing research, and setting research priorities.⁹⁰

Pew's report points out that many scientific knowledge gaps, major and minor, were identified, but faults the USGS report because it did not rank its recommendations by importance in order to help guide policymakers and other decision-makers.⁹¹ Thus, according to Pew, the USGS report represents a "good start"⁹² because it identifies necessary improvements in data collection and synthesis, which in turn can form the basis "for crafting a long-term, broad-scale monitoring program that is needed for almost all of the identified issues revolving around energy development impacts."⁹³ Ultimately, Pew concludes that oil development should wait for further scientific

85. *Id.*

86. *Id.*

87. *Arctic Shell Game: No Spill Plan, No Problem—Feds Say Just Drill*, EARTHJUSTICE, Sept. 29, 2011, <http://earthjustice.org/news/press/2011/arctic-shell-game-no-spill-plan-no-problem-feds-say-just-drill>.

88. *Id.*

89. PEW ENVIRONMENT GROUP & OCEAN CONSERVANCY, AN INDEPENDENT REVIEW OF USGS CIRCULAR 1370: "AN EVALUATION OF THE SCIENCE NEEDS TO INFORM DECISIONS ON OUTER CONTINENTAL SHELF ENERGY DEVELOPMENT IN THE CHUKCHI AND BEAUFORT SEAS, ALASKA" (Robert B. Spies ed.) (Aug. 28, 2011), <http://www.pewenvironment.org/uploadedFiles/PEG/Publications/Report/USGS-Report-Review-Sept2011.pdf>.

90. *Id.*

91. *Id.* at 7.

92. *Id.* at 29.

93. *Id.* at 19.

knowledge.⁹⁴

C. Government Reports Show Scientific Uncertainty and Lack of Knowledge

As the debate over energy development in ANWR continued in Congress, the Congressional Research Service (CRS) prepared a primer to provide background information on the contested issues.⁹⁵ The CRS report acknowledges that the crux of the debate lies in the divergent opinions as to whether an intrusion on ANWR's ecosystem can be justified.⁹⁶ The CRS primer points out that the debate about energy development in ANWR has been ongoing for over fifty years, but the sharp rise in energy prices in current years has intensified this controversy.⁹⁷ Substantively, this report confirms the widely divergent perspectives about oil development in ANWR. On one hand, development advocates assert that "ANWR oil could be developed with minimal environmental harm, and . . . development could be limited to a total of 2000 acres."⁹⁸ Conversely, environmental advocates claim that "intrusion on this ecosystem cannot be justified on any terms . . . [and] development would be widely scattered, with irreparable impacts."⁹⁹

Meanwhile, with approval of oil activities in the Arctic seas, the Secretary of the Interior asked the USGS to summarize existing key scientific data, develop a process to figure out where knowledge gaps are, and give preliminary advice on what research is required to improve decision-making for outer continental shelf energy development in the Chukchi and Beaufort Seas near ANWR.¹⁰⁰ The USGS was tasked with addressing four topics: "climate change considerations, marine mammals and seismic activities, oil-spill response, and cumulative impacts."¹⁰¹ The USGS team examined available

94. *Id.* at 31.

95. CRS PRIMER, *supra* note 2, passim.

96. *Id.*

97. *Id.* at i.

98. *Id.*

99. *Id.*

100. U.S. GEOLOGICAL SURVEY, *supra* note 1, at 1.

101. *Id.* at 3.

literature, including hundreds of reports, workshop findings, policy publications, web sites, and science journals, and engaged forty-six entities in an inclusive effort to understand the science gap and sufficiency.¹⁰²

The USGS's initial analysis of public policy documents confirmed the variation in what are considered "science gaps" and what constitutes "sufficient science."¹⁰³ "Interpretation of concepts are [sic] dynamic, tied to an individual's or organization's held beliefs, and what they most strongly value within their thought process when dealing with complexity and uncertainty."¹⁰⁴ Moreover, the multiple layers of federal, state, local, and regional organizations and communities that have differing perspectives on the degree of required scientific data only exacerbate the situation.¹⁰⁵

According to the USGS, "[t]here is no 'silver bullet'" to address the critical gaps of scientific knowledge in the Arctic.¹⁰⁶ But, it believes its recommended strategic actions should commence to better support decision-making.¹⁰⁷ The USGS promotes a transparent process to balance "tradeoffs associated with 'inaction until more information is in hand' versus 'action not sufficiently informed'" for evaluating the impacts and challenges of the emerging Arctic oil development.¹⁰⁸

The USGS identified key recommendations crucial to informed decision-making.¹⁰⁹ These include:

- Conduct more research on the effects of climate change on storms and ocean circulation, as they are critical to the safety of oil development.
- Gather 3-D seismic data to better understand geological history of the area and its oil potential.
- Improve understanding of the physical oceanography, like circulation processes and wind for oil-spill modeling, oil-spill response, and cleanup efforts, noting that the physical understanding of the

102. *Id.*

103. *Id.*

104. *Id.*

105. *Id.*

106. *Id.* at 221.

107. *Id.*

108. *Id.*

109. *Id.* at 217.

Arctic Outer Continental Shelf is not comparable with the Gulf of Mexico Outer Continental Shelf.

- Continue to research the impact of noise on marine mammals and how overall ambient noises vary seasonally and spatially; large uncertainty still exists even with multiple studies conducted.
- Require evaluation of all relevant data and formulation of guidelines, best practices, regulations, and policies, including ongoing monitoring to understand changes in the ecosystem and its health.
- Continue facilitating the gathering, integration, and sharing of data to understand the Arctic as an interdependent system and the cumulative impacts of human activities.¹¹⁰

Therefore, although some valuable information has been compiled, including identification of key information gaps, the USGS report highlights the extensive gaps in knowledge about the environmental impacts of oil development in the Arctic.¹¹¹

IV. THE NATIONAL ENVIRONMENTAL POLICY ACT

Some might argue that the National Environmental Policy Act (NEPA) can adequately protect against environmental injuries in ANWR. NEPA advances two purposes: first, to prevent damage to the environment; second, to educate decision makers of the environmental impact of their decisions.¹¹² The instrument through which NEPA meets its stated intentions is the Environmental Impact Statement (EIS). NEPA requires federal agencies to prepare an EIS for all

110. *Id.* at 217–21.

111. The USGS evaluation illustrates how little is known about the environmental impacts of oil development in the Arctic region. The sources used in the USGS further suggest that little is known about the environmental effects of oil development in the Arctic region. The USGS's report is not specifically about oil development in ANWR's 1002. Rather, it discusses development in the Arctic's Beaufort and Chukchi Seas Outer Continental Shelves. Furthermore, in discussing anticipated impacts to the porcupine caribou, for example, the FWS refers to the 1987 FLEIS findings. *See* FWS POTENTIAL IMPACTS, *supra* note 8, at 4. This suggests that no scientific study more comprehensive or recent has been done regarding oil development in ANWR. Therefore, scientific knowledge of environmental impacts on 1002 Area oil development, versus the Arctic generally, may be lacking even more than stated in the USGS report.

112. 42 U.S.C. §§ 4331, 4332 (2006).

actions “significantly affecting the quality of the human environment.”¹¹³ Oil development in ANWR clearly requires the preparation of an EIS. However, NEPA is a procedural mandate that does not dictate the level or type of information federal agencies must consider in their decision-making process. Therefore, NEPA does not solve the problem of insufficient knowledge.

A. *NEPA’s Environmental Impact Statement*

The EIS serves NEPA’s “action-forcing” objective by requiring that federal agencies take a “hard-look” at available evidence and fully consider detailed information about environmental impacts.¹¹⁴ The EIS requirement “inevitably bring[s] pressure to bear on agencies to respond to the needs of environmental quality.”¹¹⁵ This mandated process focuses the agency’s attention on the effects of the action on the environment so that vital impacts are not overlooked, underestimated, or discovered after the action and/or resources have already deployed.¹¹⁶ Further, the publication of an EIS serves to give the public the assurance that the agency has studied and contemplated the environmental impacts; creates an opportunity for public comment; and offers affected entities notice of the expected consequences.¹¹⁷ And when there is an “irretrievable commitment of resources,” the analysis in the EIS has to be site specific.¹¹⁸

An important component of an EIS is the discussion of mitigation measures.¹¹⁹ NEPA requires agencies to thoroughly explore and document “any adverse environmental effects which cannot be avoided should the proposal be implemented”¹²⁰ and a *reasonable* discussion on possible mitigation measures to counter these effects.¹²¹ Without such

113. *Id.* § 4332(C).

114. *Northern Alaska v. Kempthorne*, 457 F.3d 969, 975 (9th Cir. 2006).

115. *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989) (citing 115 CONG. REC. 40,425 (1969)) (referring to the strong precatory language of NEPA § 101).

116. *Northern Alaska*, 457 F.3d at 975.

117. *Id.*

118. *Id.* at 975–76 (citing *Conner v. Burford*, 848 F.2d 1441 (9th Cir. 1988)).

119. *Id.* at 352 (citing 40 C.F.R. § 1508.20 (1987)) (CEQ definition of mitigation).

120. 42 U.S.C. § 4332(C)(ii) (2006).

121. *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 351 (1989).

preparation regarding mitigation, NEPA's "action-forcing" function is undermined and thus, "neither the agency nor other interested groups and individuals can properly evaluate the severity of the adverse effects."¹²² But, although a reasonable study of mitigation steps is mandated through a "hard-look" of the environmental impacts, there is no requirement that a complete mitigation plan is drafted and enacted.¹²³ This reasonableness standard is consistent with NEPA's reliance on mechanisms of procedure rather than substantive regulations.¹²⁴

B. NEPA's Procedural Limitations When There is Scientific Uncertainty

As a major action that is expected to significantly affect the environment, oil development in ANWR will likely trigger NEPA's EIS requirement. However, NEPA is solely a procedural directive, and case law suggests that NEPA will not fill existing gaps in scientific knowledge.

In *National Parks & Conservation Ass'n v. Babbitt*,¹²⁵ the Ninth Circuit Court of Appeals held that preparation of an EIS is required where there are effects that are highly uncertain or have unique or unknown dangers to the environment.¹²⁶ The purpose of an EIS is to avoid speculation and confirm that available data is gathered and analyzed before the action is allowed.¹²⁷ Thus, although there is a lack of scientific knowledge about the environmental impacts from oil development in ANWR, an EIS will still be required before oil development can commence.

NEPA, however, does not oblige an agency to make a "worst

122. *Id.* at 352.

123. *Id.*

124. *Id.* at 353.

125. *Nat'l Parks & Conservation Ass'n v. Babbitt*, 241 F.3d 722 (9th Cir. 2001) (The Park Service was required to prepare an EIS under NEPA, rather than an environmental assessment (EA) that resulted in a Finding of No Significant Impact (FONSI), for the fact that the increase of cruise ships into the unique, important environment of Glacier Bay is a "major Federal action . . . [that] significantly affects the quality of the human environment" even in the presence of great scientific uncertainty and controversy.).

126. *Id.*

127. *Id.*; see also *Sierra Club v. U.S. Forest Serv.*, 843 F.2d 1190, 1195 (9th Cir. 1988).

case analysis” in its EIS, even if it is unable to reasonably assess a proposed action’s environmental impact.¹²⁸ In *Robertson v. Methow Valley Citizens Council*,¹²⁹ the United States Supreme Court concluded that although the worst case rule was admittedly more demanding, NEPA favors a “hard look” and public disclosures, rather than a highly speculative emphasis on harms.¹³⁰ As in *Methow Valley*, an EIS for oil development in ANWR is not required to contemplate a worst case scenario where human or machine failure causes catastrophic environmental injuries.

The *Northern Alaska v. Kempthorne*¹³¹ court defined a “hard look” by an agency as one that “‘consider[s] all foreseeable direct and indirect impacts’ . . . [and] should involve a discussion of adverse impacts that does not improperly minimize negative side effects.”¹³² The hard look requires agencies to consider the environmental impacts of all stages of a process, and any later plans for actual exploration and development by lessees is reviewable before the action can take place.¹³³ But, agencies are not expected to delay decisions until all environmental effects are understood.¹³⁴ Moreover, courts will be highly deferential to agency decisions, reviewing them under the “arbitrary, capricious, abuse of discretion, or

128. *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 333 (1989) (discussing the amendment to CEQ regulations removing the worst case requirement in EIS analysis; NEPA does not require that uncertainty in predicting environmental damage be tackled solely by a worst case analysis).

129. *Id.* (In consideration of whether the Forest Service, faced with scientific uncertainty, was required to make a “worst case analysis” and a fully developed mitigation plan in its EIS, the Supreme Court held that the Forest Service was not so required and NEPA simply requires agencies to summarize “existing relevant and credible scientific evidence and an evaluation of adverse impacts based on generally accepted scientific approaches or research methods.”).

130. *Id.* at 334.

131. *Northern Alaska v. Kempthorne*, 457 F.3d 969 (9th Cir. 2005) (Where plaintiff-environmental organization claimed that the EIS analysis for an action to make the entire Northwest Petroleum Reserve-Alaska (NWPA) available for oil and gas leasing should have been site specific since there were legitimate concerns of uncertainty of adverse consequences that future development may cause, the court pointed out that concerns of uncertainty of future actions are inherent in any program of natural resources development and thus, plaintiff’s assertion that the agency violated NEPA fails at this juncture but can be raised at the exploration and permit stages of the leasing program.).

132. *Id.* at 975 (quoting *Idaho Sporting Congress, Inc. v. Rittenhouse*, 305 F.3d 957, 963 (9th Cir. 2002)).

133. *Id.* at 977 (see 43 C.F.R. § 3162.3-1(c)).

134. *Id.* at 977 (quoting *North Slope Borough v. Andrus*, 642 F.2d 589, 600 (1980)).

otherwise not in accordance with the law” standard.¹³⁵ As such, under the “hard look” mandate, mitigation plans for oil development in ANWR—those based on utilization of best technologies or those that respond to actual conditions—must be considered by FWS, but under *Kempthorne* the FWS need not perform field tests or implement mitigation plans in order to be in compliance with NEPA.

NEPA also requires that an EIS include a detailed statement of alternatives to an agency’s proposed action.¹³⁶ This alternatives requirement attempts to ensure that the most optimal decision will be made.¹³⁷ But, NEPA does not require that every possible alternative be considered by the agency so long as it has an explanation for eliminating that alternative.¹³⁸ As the CRS Primer explains, the precise location of oil in ANWR is unknown.¹³⁹ Alternative methods of oil development, such as changing drilling methods, platform locations, and infrastructure design, are likely to be numerous and highly divergent. In turn, each variable changes the expected environmental impacts. Although NEPA’s goal is to ultimately achieve the best decision,¹⁴⁰ here, NEPA compliance may mean that the selected option will result in more adverse environmental impacts than other available alternatives.

Additionally, in *Sierra Club v. Marita*,¹⁴¹ the court held that “NEPA itself does not mandate particular results, but simply prescribes the necessary process.”¹⁴² Although the agency is

135. *Id.* (citing *Blue Mountains Biodiversity Project v. Blackwood*, 161 F.3d 1208, 1211 (9th Cir. 1998) (quoting Administrative Procedure Act, 5 U.S.C. § 706(2)(A) (2006))).

136. *Id.* at 978 (see 42 U.S.C. § 4332(2)(C)(iii) (2006)).

137. *Id.* at 978 (quoting *Calvert Cliffs’ Coordinating Comm., Inc. v. United States Atomic Energy Comm’n*, 449 F.2d 1109, 1114 (D.C. Cir. 1971)).

138. *Id.* at 978 (citing *Westlands Water District v. United States Dep’t of the Interior*, 376 F.3d 853, 871 (9th Cir. 2004)).

139. CRS PRIMER, *supra* note 2, at 22.

140. *Northern Alaska*, 457 F.3d at 978.

141. *Sierra Club v. Marita*, 46 F.3d 606 (7th Cir. 1995) (Plaintiff, an environmental organization, sued the Forest Service to enjoin timber harvesting, road construction, and creation of wildlife openings for the Service’s failure to consider certain ecological principles of biological diversity. Although the court found biological diversity should be further explored, the science in general “had not been applied to forest management in the Lake States,” thus, the court held that the Forest Service was not required to apply conservation biology in its environmental analysis under NEPA.).

142. *Id.* (citing *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989)).

required to look at and disclose foreseeable impacts to the environment from the proposed alternatives, “NEPA does not require . . . an EIS [to be] based on the best scientific methodology available, nor does it require resol[ution of] disagreements among various scientists as to methodology.”¹⁴³ The *Marita* court deferred to the agency’s chosen scientific method. In this recurring theme of deference to agency’s decisions, for oil development in ANWR the FWS has discretion to choose the science it wishes to follow because NEPA is a procedural law. To comply with NEPA, the FWS is not required to attain a defined level of information prior to evaluating the environmental impacts of oil development. Thus, NEPA cannot fill the gap when there is a lack of knowledge.

V. THE FISH AND WILDLIFE SERVICE MANAGES ANWR

The FWS manages ANWR as part of the System’s public lands classification.¹⁴⁴ In addition, ANILCA imposes special rules on ANWR’s management that require the FWS to prepare a comprehensive refuge unit plan and delineate tiers of purposes.¹⁴⁵ Federal law allows oil exploration and drilling in ANWR’s coastal plain, the 1002 Area, with the approval of Congress.¹⁴⁶ Following such approval, the FWS must then determine if oil development is compatible with the refuge’s higher-tiered purposes and contributes to the System’s conservation mission.¹⁴⁷ This is known as the compatibility test.¹⁴⁸

143. *Id.* at 623 (quoting *Friends of Endangered Species, Inc. v. Jantzen*, 760 F.2d 976, 986 (9th Cir. 1985)); *see also* *Salmon River Concerned Citizens v. Robertson*, 32 F.3d 1346, 1359 (9th Cir. 1994) (stating that responsibility of the court “is to ensure that the Forest Service’s procedures resulted in a reasoned analysis and disclosure of the evidence before it”).

144. 16 U.S.C. § 668dd (2006).

145. *Id.* § 3101.

146. *Id.* § 3143.

147. *Id.* § 668dd.

148. FISCHMAN, *supra* note 6, at 112.

A. *ANWR is Part of the Wildlife Refuge System Under the Public Lands Classification*

Congress delegates the power to make rules and implement policy to land management agencies such as the FWS and the National Park Service.¹⁴⁹ For ANWR, this power is given to the FWS through the Improvement Act.¹⁵⁰ This entrustment of authority allows Congress to avoid entanglement in the details.¹⁵¹ The FWS, with its particular expertise, can adapt quickly to changing situations.¹⁵² The Supreme Court has consistently held that Congress' broad power over public lands goes beyond the rights of a regular, private owner and federal preemption trumps all conflicting state laws.¹⁵³

The System occupies a notable place in the public land classification in that its dominant purpose is nature protection.¹⁵⁴ During the past four decades, economic, political, and social forces shaped many land classifications, including the System, into accommodating multiple uses rather than a single-purpose, exclusive use.¹⁵⁵ These forces also influenced the System to accept other uses alongside its promotion of ecological values.¹⁵⁶ Currently, federal public lands' dominant use systems consist of the national parks and the national wildlife refuges.¹⁵⁷ The System is comprised of acquired and reserved lands that are primarily managed by the FWS.¹⁵⁸

The System is comprised of two major categories: coordination areas and refuges.¹⁵⁹ States manage coordination areas under cooperative agreements or leases from the FWS.¹⁶⁰ Coordination areas are also excluded from comprehensive planning and compatibility determination requirements

149. *Id.* at 16.

150. National Wildlife Refuge System Improvement Act, Pub. L. No. 105-57, 111 Stat. 1252 (1997) (codified at 16 U.S.C. §§ 668dd–668ee (2006)).

151. FISCHMAN, *supra* note 6, at 16.

152. *Id.*

153. *Id.* at 16 (citing *Kleppe v. New Mexico*, 426 U.S. 529 (1967)).

154. *Id.* at 19.

155. *Id.*

156. *Id.*

157. *Id.* at 21.

158. *Id.*

159. *Id.* at 25.

160. *Id.*

arising from the Improvement Act.¹⁶¹ Refuges, however, are managed by the FWS through strict adherence to mandates of the Improvement Act.¹⁶²

There is at least one unit of refuge in every state.¹⁶³ Alaska holds eighty-five percent of the System's acreage in four percent of refuge units.¹⁶⁴ ANWR sits at the top of the list of giant refuges with 19.3 million acres.¹⁶⁵ The System's purpose of wildlife conservation is apparent in its support of more than 700 bird, 220 mammal, 250 reptile and amphibian, and 200 fish species, including a total of 180 animal and 78 plant types listed under the Endangered Species Act.¹⁶⁶

The System accommodates many other uses and brings in approximately 37 million visitors each year.¹⁶⁷ Significant wildlife-dependent recreation, such as hunting, fishing, wildlife observation, and environmental education, occurs in the System.¹⁶⁸ Nonwildlife-dependent recreation, such as boating, swimming, and camping, is also common.¹⁶⁹ Further, economic uses like logging, commercial fishing and trapping, and mining, along with their requisite rights-of-way for roads, pipelines, and other utilities, occur with regularity.¹⁷⁰ Not surprisingly, conflicts arise between these uses and the conservation mission of the System.

B. The Mandates of ANILCA and the Improvement Act

ANILCA imposes additional administrative and managerial requirements on the FWS in its management of ANWR.¹⁷¹ First, the FWS must prepare a comprehensive refuge unit plan.¹⁷² A comprehensive refuge unit plan requires the FWS to engage in full-scale, complete refuge planning.¹⁷³ Second,

161. *Id.*

162. 16 U.S.C. § 668dd (2006).

163. FISCHMAN, *supra* note 6, at 29.

164. *Id.*

165. *Id.*

166. *Id.*

167. *Id.* at 25, 30.

168. *Id.* at 30.

169. *Id.* at 31.

170. *Id.*

171. 16 U.S.C. § 668dd (2006).

172. *Id.* § 668dd(e)(1)(A).

173. *Id.*

ANILCA establishes a hierarchy of purposes to which the FWS must adhere when managing ANWR.¹⁷⁴

1. *ANWR's Comprehensive Refuge Unit Plan*

A comprehensive refuge unit plan must explain the natural and cultural significance of the refuge, define areas suitable for access and use as administrative facilities, and identify problems that may result in adversities for the populations and habitats of fish and wildlife.¹⁷⁵ Providing a basic roadmap to meet the refuge's goals, ANILCA mandates that each Alaska refuge has a "comprehensive conservation plan" (CCP) that addresses four substantive elements:

- Designate areas within the refuge according to their respective resources and values;
- Specify programs for conserving fish and wildlife, and other special values, to be implemented within each area;
- Specify the uses within each area that may be compatible with the major purposes of the refuge; and
- Set forth those opportunities that will be provided (if compatible with refuge purposes) for fish and wildlife-oriented recreation, ecological research, environmental education, and interpretation.¹⁷⁶

These four planning elements are the only substantive statutory management requirements for the contents of a CCP.¹⁷⁷ Taken together, they force the FWS to look ahead at how to zone the refuges in order to achieve its goals, anticipate future actions, and incorporate public input.¹⁷⁸ The original CCP for ANWR was signed into effect in 1988.¹⁷⁹ The FWS is now midway through a two year undertaking to revise the 1988 CCP.¹⁸⁰ Cautionary in nature, these planning mandates

174. *Id.*

175. *Id.* § 668dd(e).

176. *Id.* § 668dd(e)(2).

177. *Id.*

178. FISCHMAN, *supra* note 6, at 55.

179. U.S. FISH AND WILDLIFE SERVICE, *Revising the Comprehensive Conservation Plan (CCP)*, <http://arctic.fws.gov/ccp.htm> (last visited Oct. 3, 2012).

180. *Id.*

contain proactive measures that look to survey future conditions towards the refuge's goals.

2. ANWR's Designated Uses

Although there is general agreement that conservation is the top-line use for refuges, disagreement still exists over what other uses have legitimacy in the System.¹⁸¹ For Alaskan refuges, ANILCA's tiering system controls subordinate uses with statements of intent such as "to the maximum extent practicable" and "in a manner consistent with [higher priority conservation purposes]."¹⁸² In 1997, the Improvement Act built upon ANILCA's tiering system when the Act constructed three basic tiers, from highest to lowest: 1) conservation; 2) wildlife-dependent recreation; 3) other uses for all refuges in the System.¹⁸³

ANILCA permits subsistence uses,¹⁸⁴ which are accorded a high priority, allowing for displacement of other uses.¹⁸⁵ Subsistence uses are unique in ANWR because in Alaska, hunting and fishing are neither fully recreational nor fully commercial; they include customary uses by rural Alaskan inhabitants for direct consumption as food, shelter, fuel, clothing, tools, or transportation, and for indirect consumption such as barter or sharing.¹⁸⁶ Subsistence use allowance is limited only by public safety, administrative, and conservation limitations,¹⁸⁷ though the FWS acknowledges these constraints can be very broad and subject to the agency's discretion.¹⁸⁸ The FWS affirms that administrative limitation may be employed to safeguard the refuge's purposes and to responsibly manage the refuge.¹⁸⁹

As an economic use, oil development occupies the lowest rung of designated uses in ANWR.¹⁹⁰ In order to be permitted, oil development must be compatible with ANWR's primary

181. FISCHMAN, *supra* note 6, at 89.

182. 16 U.S.C. § 668dd (2006).

183. FISCHMAN, *supra* note 6, at 89.

184. 16 U.S.C. § 3101(c) (2000).

185. *Id.* §§ 3112(2), 3114.

186. *Id.*

187. *Id.* §§ 668dd(a)(3)(C), 3126(b).

188. FISCHMAN, *supra* note 6, at 185.

189. *Id.*

190. *Id.* at 93.

use—conservation—and secondary uses such as subsistence.¹⁹¹

VI. THE FISH AND WILDLIFE SERVICE'S COMPATIBILITY TEST

The FWS possesses statutory authority under the Improvement Act to require uses in national wildlife refuges, like ANWR, to be compatible with the refuge's dominant use.¹⁹² This means that the Secretary “shall not initiate or permit a new use of a refuge or expand, renew, or extend an existing use of a refuge, unless the Secretary has determined that the use is a compatible use and is not inconsistent with public safety.”¹⁹³

A. *The Compatibility Test*

The Improvement Act requires the Secretary to issue regulations to “maintain the biological integrity, diversity, and environmental health of the National Wildlife Refuge System for present and future generations of Americans.”¹⁹⁴ Uses that may conflict with the maintenance of ecological integrity are not compatible.¹⁹⁵ The FWS regulates permitting of proposed uses on refuges by administering its compatibility test.

1. *The Refuge Manual*

In order to promulgate a consistent compatibility evaluation that satisfies the System's mission of conservation, the FWS prepared and published a Refuge Manual.¹⁹⁶ The manual specifically requires a compatibility test for all refuge uses and their associated facilities and improvements.¹⁹⁷

The manual provides guidelines for making a compatibility test.¹⁹⁸ It lists all information required for making a compatibility decision. Among the items in this list are: the

191. *Id.* at 193.

192. 16 U.S.C. § 668dd (2006).

193. *Id.*

194. FWS MANUAL, *supra* note 17, at 1.

195. *Id.*

196. *Id.* at 5.

197. *Id.*

198. *Id.*

name of the refuge and its purpose(s), detailed description of the proposed use (action), the resource requirements of administration and management of the use, anticipated impacts from the use, public comments, and what stipulations are necessary to confirm compatibility.¹⁹⁹ In each step of the compatibility test—from the preparation of the description and assessment of impacts of the proposed use to the professional review of the issues involved with that proposed use—a wealth of information and scientific data are needed to fulfill the test’s objective.

2. *The Role and Responsibilities of the Refuge Manager*

Refuge managers are tasked with determining whether proposed or existing uses are subject to the compatibility requirements.²⁰⁰ If the use is required to be compatible, the refuge manager must determine whether that use is compatible.²⁰¹ The refuge manager is required to document all determinations in writing.²⁰² In addition, the refuge manager must ensure that the FWS provides a forum for the public to review and comment on compatibility determinations.²⁰³

Through the FWS Director’s delegation, refuge managers have the authority to make compatibility determinations.²⁰⁴ Because of the complexities in determining compatibility, refuge managers are directed to consider their knowledge and experiences of the biological resources under examination.²⁰⁵ Additionally, refuge managers must “make conclusions that are consistent with the principles of sound fish and wildlife management and administration”

Refuge managers rely on “sound professional judgment” in their administration of the compatibility test.²⁰⁶ Using their sound professional judgment, they must determine issues such as whether the proposed action will materially frustrate, either directly or indirectly, the fulfillment of the System’s mission or

199. *Id.* at 11–15.

200. *Id.* at 4.

201. *Id.*

202. *Id.*

203. *Id.*

204. *Id.* at 8.

205. *Id.*

206. *Id.*

the purpose(s) of the refuge.²⁰⁷ Refuge managers have to look at tangible impacts, current or future, that affect the FWS's ability to fulfill the refuge's mission and purposes. For instance, a regulated taking of many animals from a refuge may actually help manage and improve the health of a wildlife population.²⁰⁸ But, the removal of one animal of a threatened or endangered species or minor harassment of a species during critical biological times could irreparably harm the refuge's ability to maintain and perpetuate that species.²⁰⁹ Thus, refuge managers must be able to appropriately evaluate the types of effects being contemplated from a proposed use. Further, refuge managers are required to consider direct and indirect impacts from the proposed use, including cumulative impacts, when other existing or planned uses in the refuge or adjacent areas are at play.²¹⁰

3. *The Compatibility Test is Refuge-Specific*

In addition to using sound professional judgment in making compatibility determinations, refuge managers base their evaluation "on a refuge-specific analysis of reasonably anticipated impacts of a particular use on refuge resources."²¹¹ In this section of the Refuge Manual, the FWS requires that the refuge manager's evaluation be focused and targeted to the refuge at issue, rather than the broader system.²¹² This section again prohibits an affirmative finding of compatibility when there is not enough information available to the refuge manager.²¹³

Refuge managers utilize information from field experience and familiarity with refuge resources, data from states, tribes, proponents or opponents of the use, and public input.²¹⁴ Although refuge-specific analysis need not be based on refuge-specific biological data, such information may be considered if

207. *Id.*

208. *Id.*

209. *Id.*

210. *Id.*

211. *Id.*

212. *Id.*

213. *Id.*

214. *Id.*

the data is gathered from a similarly situated area and thus is relevant to the inquiry.²¹⁵ Managers should also differentiate between short-term and long-term impacts.²¹⁶ A use that may have only minor impact on the refuge's resources at the onset could become cumulatively significant over time.²¹⁷ Additionally, refuge managers must be mindful of indirect impacts that may be "reasonably associated with a specific use" such as those that take away or divert resources away from an activity that does contribute to the refuge's mission.²¹⁸

B. The Failures of the Compatibility Test

Theoretically, the compatibility test for proposed uses should curb the proliferation of incompatible uses.²¹⁹ However, the FWS has broad discretion to choose how to implement the test.²²⁰ As a result, incompatible secondary uses are now permitted in many refuges.²²¹ Incompatible secondary uses that are often approved by the FWS include mining, off-road vehicles, air boats, military exercises, waterskiing, power boats, rights-of-way, grazing, logging, hunting, and beach use.²²²

The Des Lacs Refuge in North Dakota is an example of a refuge that suffered as a result of incompatible use.²²³ The Des Lacs Refuge is home to wetlands and migratory birds, but is also a popular destination for recreational boating.²²⁴ The FWS kept the water level high at the lake for recreational boating.²²⁵ As a result, the FWS could not manage the

215. *Id.*

216. *Id.* at 13.

217. *Id.*

218. *Id.*

219. FISCHMAN, *supra* note 6, at 58. A report by the Government Accounting Office released in 1989 documented the failure of the FWS to make changes to widespread approvals of incompatible uses. U.S. GENERAL ACCOUNTING OFFICE, GAO/RCED-89-196, NATIONAL WILDLIFE REFUGE SYSTEM: CONTINUING PROBLEMS WITH INCOMPATIBLE USES CALL FOR BOLD ACTION (1989) [hereinafter CONTINUING PROBLEMS WITH INCOMPATIBLE USES CALL FOR BOLD ACTION].

220. FISCHMAN, *supra* note 6, at 59.

221. *Id.*

222. *Id.* (citing CONTINUING PROBLEMS WITH INCOMPATIBLE USES CALL FOR BOLD ACTION, *supra* note 240).

223. *Id.* at 59.

224. *Id.*

225. *Id.*

wetlands for the refuge's primary purpose, which was migratory bird production.²²⁶ Noise from power boats and waterskiing also unsettled the nesting activities of the birds.²²⁷ The U.S. Government Accounting Office (GAO) looked into the FWS's management of the Des Lacs Refuge and found two main causes for mismanagement.²²⁸ First, the FWS allowed nonbiological factors, such as political and economic (local commerce) interests, to influence its approval.²²⁹ Second, the FWS lacked financial data on the costs of managing the secondary recreational uses.²³⁰

The mismanagement of the Des Lacs Refuge inspired the hierarchy of uses in the Improvement Act.²³¹ After the findings in Des Lacs Refuge, the Improvement Act was the vehicle that strengthened the FWS's commitment to its compatibility test by prioritizing uses.²³² This tiering system, in part, aims to assist refuge managers in their determination of compatibility.²³³ The Improvement Act also dictates protection of wildlife, plants, and the environment, encouraging the FWS to "just say no" to incompatible, nonpriority uses.²³⁴ However, there are real limitations to the compatibility test. For instance, the last sentence in the Refuge Manual's chapter on compatibility, states: "Compatibility determinations are an integral part of our decision about refuge uses; however, it is important to note that compatibility is only one of many factors that we take into account when we consider allowing or not allowing a refuge use."²³⁵

C. *The Language of the Compatibility Test Declares Caution*

As designed, the compatibility test is infused with caution. Compatibility is a threshold determination on whether the

226. *Id.*

227. *Id.*

228. FISCHMAN, *supra* note 6, at 59.

229. *Id.*

230. *Id.*

231. *Id.* at 62.

232. *Id.* at 61.

233. *Id.* at 62–63.

234. *Id.* at 201.

235. FWS MANUAL, *supra* note 17, at 16–17.

proposed use will “materially interfere with or detract” from the ability to meet the System’s mission or refuge’s purpose(s).²³⁶ The compatibility test must evaluate the use separately and in aggregate with other existing or planned uses.²³⁷ The burden of proof is on the proposer of the use.²³⁸ For anticipated impacts of the use, refuge managers:

[W]ill use and cite available sources of information Sources may include planning documents, environmental impact statements, field management experience and consultation with wildlife research professionals, state wildlife resource managers and industry professionals If available information is insufficient . . . then the refuge manager would be unable to make an affirmative finding of compatibility and we must not authorize or permit the use.²³⁹

If the use is a priority public use and there is insufficient information available, a refuge manager does not need to generate her own data in making compatibility evaluations.²⁴⁰ She is directed to work with the proponent of the use to attain the needed information.²⁴¹ The burden to collect information does not shift to the manager.²⁴² But, she should move towards identifying the gaps in data and assist in facilitation of information gathering.²⁴³ In all cases, a refuge manager should not approve a proposed use until there is an affirmative showing of compatibility, thus eliminating the risk of unexpected adverse impacts.²⁴⁴ These protective measures demonstrate the cautious makeup of the FWS’s compatibility regulations.

236. *Id.* at 8.

237. *Id.*

238. *Id.*

239. *Id.* at 13.

240. *Id.*

241. *Id.*

242. *Id.*

243. *Id.*

244. *Id.*

VII. THE FWS SHOULD RECOGNIZE AND CARRY OUT THE PRECAUTIONARY PRINCIPLE EMBEDDED IN ITS COMPATIBILITY STATUTE AND REGULATIONS

Protective mechanisms are in place to protect against environmental injuries in ANWR. Caution is inherent in the prohibition on oil development in ANWR absent Congressional approval and the FWS compatibility test for any proposed use. This paper advocates that the precautionary principle, as defined at the 1992 Rio de Janeiro Earth Summit, is already part and parcel of ANILCA's compatibility requirement and the FWS's corresponding regulations. As such the FWS should utilize the precautionary principle in assessing potential environmental impacts of oil development in ANWR's 1002 Area. Because of the likely irreparable and permanent effects on the environment from oil exploration and drilling,²⁴⁵ sufficient information is critical and should be demanded. Relying on best available science is not enough to determine compatibility. Employing the precautionary principle ensures that the FWS makes decisions with full comprehension of the environmental impacts and protects ANWR's biological integrity and diversity, environmental health, and mission of conservation.

A. *The Precautionary Principle Generally*

The precautionary principle embraces scientific uncertainty, which is often intrinsic to predictions of environmental impacts.²⁴⁶ At its core, the precautionary principle "cautions that regulatory policy should be proactive in ferreting out potentially serious threats to human health and the environment, as confirmed by the history of human exposure to substances such as lead and asbestos."²⁴⁷

The precautionary principle originates from the German concept of *Vorsorgeprinzip*, which was developed in the 1970s to prevent air pollution's harm to forests.²⁴⁸ When translated, *Vorsorgeprinzip* means "foresight planning." The German

245. FWS POTENTIAL IMPACTS, *supra* note 8, at 7–15.

246. Percival, *supra* note 19, at 23–24.

247. *Id.* at 22.

248. *Id.* at 23.

Federal Interior Ministry explained the precautionary principle as one that “commands that the damages done to the natural world . . . should be avoided in advance and in accordance with opportunity and possibility. *Vorsorge* further means the early detection of dangers to health and environment by comprehensive, synchronized . . . research, in particular about cause and effect relationships, . . . acting when conclusively ascertained understanding by science is not yet available.”²⁴⁹ The precautionary principle was utilized by many countries in their early environmental statutes, beginning in the 1960s through the 1980s.²⁵⁰ At the 1992 Earth Summit in Rio De Janeiro, the principle, in its most universally accepted formulation, found its most noteworthy endorsement when 178 nations, including the United States, signed the Rio Declaration on Environment and Development.²⁵¹ At this summit, the participating nations agreed that “[i]n order to protect the environment, the precautionary approach shall be widely applied by States”²⁵²

Today, there are many iterations of the precautionary principle. The numerous versions vary in their degree of balance and integration of scientific, economic, political, and social values with the objective of risk management and protection of the environment.²⁵³ The approaches are differentiated by the amount of risk and uncertainty necessary as a threshold matter to trigger the principle, the weights appropriated to competing interests and values, and the rights and responsibilities of the pertinent party(ies) being regulated.²⁵⁴ A robust version of the precautionary principle is one of preemption, where the burden is placed on proving that the action is not harmful or when the activity is banned

249. *Id.* at 24 (citing NORA MORAG-LEVINE, CHASING THE WIND: REGULATING AIR POLLUTION IN THE COMMON LAW STATE 11 (2003)).

250. Percival, *supra* note 19, at 24.

251. *Id.* at 28.

252. *Id.* (citing United Nations Conference on Environment and Development, Rio de Janeiro, Braz., June 3–14, 1992, *Rio Declaration on Environment and Development*, U.N. Doc. A/CONF.151/26/Rev.1 (Vol. 1), Annex 1, Principle 15 (Aug. 12, 1992)).

253. Phillip M. Kannan, *The Precautionary Principle: More Than a Cameo Appearance in United States Environmental Law?*, 31 WM. & MARY ENVTL. L. & POL'Y REV. 409, 418 (2007).

254. *Id.*

altogether.²⁵⁵ At this extreme end, the cost of being precautionous is paralysis, and critics contend that utilization of the precautionary principle deprives society of benefits, eliminates opportunities for innovation, and may carry other substitute risks.²⁵⁶ A more balanced precautionary approach is one that was embraced at the Rio de Janeiro Summit. The Rio de Janeiro Summit defined the precautionary principle as: “Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.”²⁵⁷ Under this version of the precautionary principle, the principle is invoked when identification of the potential danger has been made and, even with objective assessment, the risk for that danger cannot be calculated with sufficient certainty.²⁵⁸

Domestically, the United States government has used this balanced precautionary approach more often than the preemptive precautionary approach in addressing ecological harms. For example, NEPA incorporates the principle in spirit by requiring federal decision makers to be fully informed of the environmental consequences of their decisions through the EIS process.²⁵⁹ The Clean Air Act, as another example, requires the Environmental Protection Agency to monitor fuel additives that “*may reasonably be anticipated* to endanger public health or welfare.”²⁶⁰ This differs from the Clean Air Act’s previous language that applied regulation only for additives that “*will* endanger public health or welfare.”²⁶¹ In a landmark holding in *Ethyl Corp. v. Environmental Protection Agency*, the D.C. Circuit Court of Appeals upheld EPA’s regulation in the Clean

255. *Id.* at 419.

256. *Id.*

257. United Nations Conference on Environment and Development, Rio de Janeiro, Braz., June 3–14, 1992, *Rio Declaration on Environment and Development*, U.N. Doc. A/CONF.151/26/Rev.1 (Vol. 1), Annex 1, Principle 15 (Aug. 12, 1992).

258. *Kannan*, supra note 253, at 420.

259. Sanne Knudsen, *A Precautionary Tale: Assessing Ecological Damages After the Exxon Valdez Oil Spill*, 7 U. ST. THOMAS L.J. 95, 122–23 (2009).

260. *Id.* at 122 (citing Clean Air Act Amendments of 1977, Pub. L. No. 95-95, § 401(e), 91 Stat. 685 (1977) (codified at 42 U.S.C. § 7545(c)(1)(A) (2006))) (emphasis added).

261. *Id.* at 122 (emphasis added).

Air Act.²⁶² The court endorsed the precautionary approach of the Act and explained that “[r]egulatory action may be taken before the threatened harm occurs; indeed the very existence of . . . precautionary legislation would seem to demand that regulatory action precede, and, optimally, prevent, the perceived threat.”²⁶³

B. Application of the Precautionary Principle to Proposed Oil Development in ANWR

Oil development in ANWR has a high potential for causing significant, irreparable, and permanent harm to a region that supports a unique ecosystem and valuable fish and wildlife resources, as well as to the Native people who rely on these resources for subsistence.²⁶⁴ As previously discussed, there is intense discord among the public, governmental entities, pertinent industry participants, and other stakeholders over the ability to explore and develop oil safely, the environmental consequences of oil development, and how to implement impact prevention and mitigation plans.²⁶⁵ Presently, available science cannot adequately show the long-term effects of oil development in ANWR.

The precautionary principle upholds the purpose and statutory intent of the compatibility requirement as administered by the FWS compatibility test. The basic premise of the precautionary principle is to take cost effective measures to minimize or avoid harm in the face of scientific uncertainty.²⁶⁶ But, not all formulations of the precautionary principle are appropriate. The proper formulation of the precautionary approach that should be employed here is the balanced, risk-based, 1992 Rio de Janeiro Summit approach. Although a preemptive precautionary approach may achieve complete environmental protection in ANWR, such a path veers away from the express legislative decision not to ban all oil development in the 1002 Area. Such an extreme approach indeed takes away the potentially great benefits of energy

262. *Ethyl Corp. v. Env'tl. Prot. Agency*, 541 F.2d 1 (D.C. Cir. 1976).

263. Knudsen, *supra* note 259, at 122 (citing *Ethyl Corp. v. Env'tl. Prot. Agency*, 541 F.2d 1 (D.C. Cir. 1976)).

264. CRS PRIMER, *supra* note 2, at 16–18.

265. U.S. GEOLOGICAL SURVEY, *supra* note 1, at 2.

266. Kannan, *supra* note 253, at 420.

harvest from the Arctic. The balanced application of the precautionary principle tailors the response to the situation at issue. For example, in the European Union's application of this approach "[the] response . . . developed [should] reflect[] 'proportionality between the measures taken and the chosen level of protection; non-discrimination in application . . . ; consistency . . . with . . . similar situations; examination of the benefits and costs . . . ; review of the measures in the light of scientific developments; [and] the burden of proof.' [It] . . . stresses science and requires judgments based on individual risks."²⁶⁷

Three elements comprise the precautionary principle: "[1] fully assessing possible impacts of an action; [2] shifting the burden of proof to those whose activities pose a threat to the environment; and [3] not acting if there is significant uncertainty or risk of irreversible harm. The first two elements are procedural, and the third is substantive."²⁶⁸ Applying these three elements, the FWS can make informed decisions about oil development in ANWR and fulfill both its overarching purpose of environmental protection and ANWR's conservation mission.

1. *The FWS Should Evaluate the Full Suite of Potential Impacts From Oil Development in ANWR*

The first element of the precautionary principle requires evaluation of environmental impacts.²⁶⁹ This element promotes attentiveness to environmental consequences.²⁷⁰ The FWS compatibility test is an actual application of this element. In its Refuge Manual, the FWS requires its refuge managers to identify and describe all reasonably anticipated impacts of the proposed use.²⁷¹ They are directed to consider and use "available sources of information, including planning

267. *Id.* at 419 (citing *Activities of the European Union: The Precautionary Principle*, EUROPA, http://europa.eu/legislation_summaries/consumers/consumer_safety/l32042_en.htm (last visited Nov. 14, 2012) (summarizing a February 2000 communication from the Commission of the European Communities on the precautionary principle)).

268. Kannan, *supra* note 253, at 422–23.

269. *Id.*

270. *Id.*

271. FWS MANUAL, *supra* note 17, at 9–10.

documents, environmental assessments, environmental impact statements, annual narrative reports, information from previously conducted or ongoing research, data from refuge inventories or studies, published literature on related biological studies, state conservation management plans, field management experience and consultation with wildlife research professionals, state wildlife resource managers and industry professionals, etc.”²⁷²

Moreover, refuge managers have to evaluate long-term and short-term impacts from the proposed use.²⁷³ The Refuge Manual cautions that a use may be expected to result in minor effects at the beginning, but over time these effects may turn into substantial adversities.²⁷⁴ Impacts may also be short in duration but highly damaging to the environment, or conversely, long in duration but with very minor effects.²⁷⁵

There is a lack of large-scale synthesis of data addressing quantitative and cumulative effects of changes from oil development in the Arctic environment.²⁷⁶ As discussed above, the USGS team pinpointed several crucial elements that must be achieved prior to making decisions about oil development in the Arctic.²⁷⁷ The FWS, by law and its own regulations, is required to assess the full suite of impacts when considering a proposed use. If the FWS follows a precautionary model when there is insufficient information, as is the case with ANWR’s 1002 Area, the FWS should direct its refuge managers to deny oil development as a proposed use.²⁷⁸

2. *The FWS Should Demand Proof of Compatibility from Proposers of Oil Development*

The second element of the precautionary principle deals with who has the burden of proof and what level of proof is required.²⁷⁹ A balanced precautionary principle accommodates the goals of compatibility; consideration of the action within

272. *Id.* at 10.

273. *Id.*

274. *Id.*

275. *Id.*

276. U.S. GEOLOGICAL SURVEY, *supra* note 1, *passim*.

277. *Id.* at 3.

278. FWS MANUAL, *supra* note 17, at 7.

279. Kannan, *supra* note 253, at 424.

the actual context should guide how the second element is to be applied.

Oil development in ANWR has the potential for irretrievable, materially adverse consequences to the environment on a large scale.²⁸⁰ Oil spill risk and response strategies in the harsh, yet fragile Arctic setting lack evidence of proven success acceptable by a majority of stakeholders.²⁸¹ Because of the potential for extreme environmental injury and uncertainties in adaptive management, a correspondingly high level of proof showing adequate environmental protections should be demanded. The burden of proof to show expected environmental impacts from oil development should be on the proponent's shoulders. This showing must be supported by evidence of reasonable scientific certainty accepted by the general stakeholders' community. Adaptive management plans, including accountability for oil spill risk and response, must also be confirmed by evidence of scientific certainty when enacted in the real life conditions of ANWR.

Consistent with the precautionary principle, the FWS's compatibility test places the burden of proof on the proposer of the action:²⁸²

[C]ompatibility . . . is a threshold issue, and the proponent(s) of any use or combination of uses must demonstrate to the satisfaction of the refuge manager that the proposed use(s) pass this threshold test. The burden of proof is on the proponent to show that they pass; not on the refuge manager to show they surpass.²⁸³

The compatibility test also addresses the potential for significant environmental damage from oil development by requiring refuge-specific analysis.²⁸⁴ Like the precautionary principle's reasonable scientific certainty requirement, FWS refuge managers are required to base their evaluations on reasonably anticipated impacts on refuge resources.²⁸⁵

For proposed oil development in the 1002 Area, refuge

280. CRS PRIMER, *supra* note 2, at 16–18.

281. U.S. GEOLOGICAL SURVEY, *supra* note 1, at 109.

282. FWS MANUAL, *supra* note 17, at 8.

283. *Id.*

284. *Id.* at 9.

285. *Id.* at 13.

managers should consider impacts to all of ANWR's ecological resources, including, for example, the porcupine caribou herd. FWS refuge managers may look at planning documents, environmental assessments, and other previously conducted or ongoing research and studies²⁸⁶ from comparable locations, such as the USGS report²⁸⁷ or the biological studies of the central caribou herd condition in light of its migration through the Prudhoe Bay oil fields.²⁸⁸ The 1987 FLEIS findings, though from many years ago, and the FWS's own documented knowledge also provide a pertinent basis for the refuge manager's examination. In the porcupine caribou case, although these sources of information may be reasonable, they provide opposing viewpoints on oil development's impacts to this species and cannot be said to be generally accepted by the stakeholder community. Therefore, to begin the compatibility test, proposers of oil development in the 1002 Area must make available comprehensive and cumulative information on potential environmental impacts from oil development. This includes, for instance, the possible impact on the porcupine caribou if oil pipelines, roads and structures are built on the herd's calving grounds, as drawn from reasonable, generally accepted scientific data. The refuge manager needs this type and level of information to properly administer ANWR's ecological resources and implement its mission of conservation. Without this information, FWS refuge managers cannot make an affirmative finding of compatibility and must not permit oil development in ANWR.²⁸⁹

3. *The FWS Must Prohibit Oil Development in ANWR if Faced with Insufficient Scientific Information*

The third element of the precautionary principle bars the proposed action from occurring when there is substantial uncertainty or risk of irretrievable harm.²⁹⁰ Elasticity is built into interpretations of "substantial uncertainty," "substantial risk," and "irretrievable harm."²⁹¹ For this present case, much

286. *Id.*

287. U.S. GEOLOGICAL SURVEY, *supra* note 1, *passim*.

288. See Deborah Jacobs, *The Caribou Question*, PERC REPORTS, June 2001, at 3, available at <http://perc.org/perc-reports/volume-19-no2-summer-2001>.

289. See FWS MANUAL, *supra* note 17, at 9, 13.

290. Kannan, *supra* note 253, at 426.

291. *Id.*

can be argued as to the whether the oil development in ANWR meets the threshold of any or all of these categories. The USGS report that consulted over 400 sources of information readily admitted difficulty in “determining what is a ‘science gap’ or what is ‘sufficient science.’”²⁹² Tasked with summarizing existing information, the USGS team identified many major gaps in scientific knowledge, including insufficient information for “effective oil-spill risk assessment, preparedness, and response” despite the “significant advances in spill-risk evaluation and response knowledge.”²⁹³

Technological innovations have arguably lessened the footprints of oil development.²⁹⁴ Oil companies continue to act preemptively in their research efforts to meet their legislatively and self-imposed missions to act carefully and responsibly.²⁹⁵ Therefore, the risk of catastrophic disaster may be slight. However, given the history of injuries from oil development, little argument can reasonably be offered to assert that damages from oil development are only temporary or easily repairable. The grounding of the Exxon Valdez supertanker on March 24, 1989 released eleven million gallons of crude oil into one of this world’s most fragile and amazing marine environments, causing an oil slick of over 500 miles and damaging 1300 miles of shoreline.²⁹⁶ The cleanup cost over two billion dollars, while the livelihood, social, and cultural fabrics of fishing and Native communities were torn apart.²⁹⁷ Twenty years after the spill, the Pacific herring and the Pigeon Guillemot are identified as species that have “not recovered,” meaning they show little or no signs of improvement.²⁹⁸ As a result of the BP Deepwater Horizon spill in the Gulf of Mexico on April 20, 2010, BP paid out an additional \$7.8 billion on top

292. U.S. GEOLOGICAL SURVEY, *supra* note 1, at 2.

293. *Id.*

294. CRS PRIMER, *supra* note 2, at 13–14.

295. *Id.*

296. Knudsen, *supra* note 259, at 95 (citing EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL, 2009 STATUS REPORT 4 (2009), *available at* [http://docs.lib.noaa.gov/noaa_documents/NOAA_related_docs/oil_spills/2009%20Status%20Report%20\(Low-Res\).pdf](http://docs.lib.noaa.gov/noaa_documents/NOAA_related_docs/oil_spills/2009%20Status%20Report%20(Low-Res).pdf)) [hereinafter TRUSTEE COUNCIL, 2009 REPORT]; *see also Questions and Answers*, EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL, <http://www.evostc.state.ak.us/facts/qanda.cfm> (last visited Feb. 11, 2010).

297. Knudsen, *supra* note 259, at 96.

298. *Id.*

of the \$7.5 billion it already spent to further compensate the thousands of people injured and damage to the environment.²⁹⁹ An oil spill in the 1002 Area would likely devastate ANWR's delicate ecosystem richly filled with wildlife and migratory birds, including the porcupine caribou herd, polar bears, musk oxen, eagles, snow geese, and many others, and which supports Native people's subsistence uses.

Even without an oil spill, oil development has significant impacts on the environment. According to the USGS, oil reserves in the 1002 Area may be located in small accumulations throughout the 1002 Area, in contrast to Prudhoe Bay's single large oil field.³⁰⁰ The nearest pipeline would be more than 30 miles away and the nearest gravel road and oil support facilities more than 50 miles away, requiring many production sites connected by even greater number of infrastructure build-outs.³⁰¹ The FWS expects adverse cumulative impacts on biological life in the refuge as the result of oil development.³⁰² For the porcupine caribou, oil development will potentially reduce the quality and quantity of food and habitat available during the herd's calving season.³⁰³ The FWS predicts that a reduction in annual calf survival of just five percent would cause a decline in the porcupine caribou population.³⁰⁴

When evaluating proposed oil development in ANWR, the FWS should recognize the precautionary principle within its own statute and regulations. The FWS is tasked to consider complex factors of environmental risks while understandably distracted by economic, political, and Native concerns. The FWS must demand sufficient information to perform a true compatibility test. Accordingly, given the current state of scientific knowledge and consistent with the precautionary principle, the FWS should deny a proposal to initiate oil development in ANWR.

299. John McDonnell, *BP Agrees £4.9 Billion Settlement Over Gulf of Mexico Oil Spill*, METRO, Mar. 3, 2012, <http://www.metro.co.uk/news/892043-bp-agrees-4-9billion-settlement-over-gulf-of-mexico-oil-spill-disaster#ixzz1xBAGHQb9>.

300. FWS POTENTIAL IMPACTS, *supra* note 8, at 7.

301. *Id.* at 8.

302. *Id.* at 7–8.

303. *Id.* at 14.

304. *Id.*

VIII. CONCLUSION

When evaluating proposed oil development in ANWR's 1002 Area, the FWS should follow the precautionary principle in order to conform to the stated and implied goals of the management of ANWR, the conservation purpose of the System, and the agency's own mission to protect human health and the environment. The precautionary principle, already embedded in FWS compatibility statute and regulations, assists the decision makers by demanding the requisite amount of time and assignment of efforts to obtain the appropriate level of certainty and knowledge. In addition, the precautionary principle obligates the proposer of the actions to be responsible for disproving the action's harm or potential harm on the environment. Until sufficient information demonstrates oil development's compatibility with ecological conservation, as its own regulations require,³⁰⁵ the FWS must proceed with caution and prohibit oil development in ANWR's 1002 Area.

305. *Id.* at 8.