

A Pioneering Effort in the Design of Process and Law Supporting Integrated Arctic Ocean Management

by Jessica S. Lefevre

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Summary

Offshore oil and gas development in arctic Alaska carries a high risk of interference with nutritionally and culturally critical bowhead whale (*Balaena mysticetus*) subsistence hunting. Since the mid-1980s, the Alaska Eskimo Whaling Commission has engaged offshore oil and gas exploration and development companies, including oil majors, in an annual process of collaboration and negotiation to create mitigation measures capable of avoiding adverse impacts to bowhead whales, habitat, and hunting opportunities. The process, founded on local ecological knowledge and western science, has become a staple of offshore oil and gas development in arctic Alaska. In addition to avoiding adverse impacts to subsistence uses that are protected under federal law, this highly efficient process also reduces conflicts that might otherwise slow offshore permitting.

Ocean management experts, along with development experts in other fields, increasingly recognize the need for mechanisms to reduce user conflict and address trade offs among competing uses of coastal zones. This perspective is becoming increasingly prevalent as energy development and commercial activities expand in our coastal waters and the oceans beyond. The system of collaboration between oil and gas developers and Alaskan Eskimo bowhead whale subsistence¹ hunters in the U.S. Arctic provides useful insights into how conflicts and the need for trade offs among competing uses in the Arctic and beyond might be addressed, while maintaining a priority for habitat protection. Eskimo people in coastal communities of arctic Alaska have depended on marine life, including bowhead whales (*Balaena mysticetus*), one of the great whales of the Arctic, for millennia.² This dependence continues today, with the coastal villages of northern and northwestern Alaska (Barrow, Nuiqsut, Kaktovik, Wainwright, Pt. Lay, Pt. Hope, Kivalina, Wales, Little Diomed, Gambell, and Savoonga) continuing to rely on annual whale harvests from the Bering-Chukchi-Beaufort Seas (BCBS) stock of bowhead whales, also referred to as the “western Arctic” stock of bowhead whales.³ The subsistence

Author's Note: The accomplishments documented in this Article owe their success to the efforts of many talented and hard-working people, too numerous to name. Two remarkable individuals require special mention, however: Thomas Napageak, without whose vision and determination the Conflict Avoidance Agreement (CAA) Process would never have been born; and Dr. Tom Albert, without whose unparalleled skill at seeing the Traditional Knowledge of arctic hunters through the lens of the western scientific process the scientific foundations of the CAA would never have been laid.

1. In general, “subsistence” is best understood as a way of life in which cultural and economic pursuits combine around the central activity of “food production for local distribution and use.” Robert J. Wolfe, *An Overview of Subsistence in Alaska*, in SYNTHESIS: THREE DECADES OF RESEARCH ON SOCIOECONOMIC EFFECTS RELATED TO OFFSHORE PETROLEUM DEVELOPMENT IN COASTAL ALASKA 163, 164 (Stephen R. Braund & Jack Kruse eds., 2009). Eskimo subsistence whaling captains bear all costs associated with the whale harvest, for the privilege of sharing the whale with the other residents of the village, free of charge.
2. REPORTS OF THE INTERNATIONAL WHALING COMMISSION, SPECIAL ISSUE 4, ABORIGINAL SUBSISTENCE WHALING (with special reference to the Alaska and Greenland Fisheries) (G.P. Donovan ed., 1982).
3. A Native Alaskan subsistence whaling crew typically consists of approximately 10 Native hunters who cooperate in the preparations for and conduct of the whale hunt. The captain is responsible for organizing, outfitting, and equipping the crew, and for feeding crew members during the weeks spent hunting. The successful captain and crew members share the whale, with the size and makeup of shares defined by custom. The captain also shares the take with other community members who might contribute to the crew's support, such as by donating food or equipment. In addition to caring for and sharing with the crew and those supporting the crew, the captain also is responsible for offering to share the whale as part of a meal prepared for all members of the community, immediately following a successful hunt. For spring hunts, a successful captain repeats this community-wide sharing practice during the early summer festival of *Nalukataq*, or “blanket toss.” For both spring and fall hunts, successful captains again offer

hunt of bowhead whales by these Eskimo people is sanctioned under U.S. law.⁴ The hunt also is highly regulated at the international, national, and local levels, with major aspects of regulation found in the U.S. Marine Mammal Protection Act (MMPA),⁵ Endangered Species Act (ESA),⁶ and Whaling Convention Act.⁷ With the apparent increase in seasonal retreat of the arctic ice pack in recent decades, interest in offshore oil and gas development in the Beaufort and Chukchi Seas has increased. Oil and gas experts believe that these areas of the Arctic Ocean may hold some of the world's few remaining large plays of oil recoverable with traditional technologies. Ice retreat also raises the likelihood of commercial uses in this area of the Arctic, including shipping routes and commercial fishing.

Since the mid-1980s, the Eskimo bowhead whale subsistence hunters, through their representative organization, the Alaska Eskimo Whaling Commission (AEWC), and offshore oil and gas operators have worked together to address the challenge of managing offshore industrial development in a setting dominated by nutritionally and culturally vital bowhead whale subsistence hunting. For the Eskimo hunters, direct collaboration with offshore operators is completely natural. Successful hunters are innately intelligent and inventive individuals. This is especially true of Alaskan Native subsistence whale hunters, who continue to use hand-held weapons and hand-made six-to-eight man "skin boats" in their ocean-going hunt for whales that range up to 60 feet in length. The whaling captains, who organize, outfit, and manage these crews, also are felt by their communities to be the most knowledgeable about the tolerances for anthropogenic disturbance of the whales they hunt, and thus the best-equipped to advise on the timing, location, and levels of industrial activities relative to migrating whales and hunting areas. Moreover, as community leaders, the whaling captains of the AEWC are equally responsible for bringing both whales and jobs into their villages. Therefore, they are motivated to seek management solutions that optimize the uses of the ocean for both sets of stakeholders.

Collaboration between the subsistence hunters and offshore oil and gas operators is centered on an agreement, revised annually in face-to-face meetings, that has come to be known as the "Open Water Season Conflict Avoidance Agreement (CAA)."⁸ The process of annual discussions and revisions is referred to as the "CAA Process." As industrial and commercial activities increase in the Arctic and other marginal areas, developers, local residents, and regulators, both within and beyond the Arctic, may

benefit from an understanding of this stakeholder-driven approach to multi-use management. Adding dimension to this discussion, and implicit in the CAA Process, is the recognition that in situations where conflicts are localized and relatively unique: (a) immediate stakeholders may be the most-qualified candidates for identifying effective solutions; (b) well-crafted and appropriately peer-reviewed scientific research is a key element underlying decision-making; and (c) formally recognizing local residents as stakeholders in the decision process provides a sense of control in a setting where the outside forces of change can appear overwhelming.⁹

I. The Open-Water Season CAA and Process Today

Each year, as the February winds sweep through the Inupiat Eskimo village of Barrow, Alaska, representatives of some of the largest corporations on earth gather in the local high-school auditorium to meet with Inupiat hunters. The hunters are the captains of subsistence whale hunting crews from 11 northern and northwestern Alaskan coastal villages where the millennia-old bowhead whale subsistence hunt continues. Most of the corporate representatives are from subsidiaries of international oil and gas majors, including BP (operating as BP Exploration (Alaska) Inc.), Royal Dutch Shell (operating as Shell Offshore Inc.), ExxonMobil Corporation, ConocoPhillips, Statoil, Eni (operating as ENI U.S. Operating Company Inc.); smaller companies, including Pioneer Natural Resources, and various geophysical operators, also participate in the meetings.¹⁰ Researchers undertaking various projects on the arctic marine ecosystem, as well as U.S. federal regulators, attend as observers. The oil industry participants are at the meeting to discuss their companies' plans for the year's open-water season offshore oil and gas exploration and development work in the Beaufort and Chukchi Seas of the Arctic Ocean.

Considered remote by most of the world's population, and certainly by offshore developers, the coastal areas of the Alaskan Arctic¹¹ are home to an ancient culture that, for thousands of years, has survived largely off the marine life of these waters.¹² The area around Barrow, itself, has been

to feed the entire community at Thanksgiving and Christmas. Telephone Interview with Johnny Aiken, Executive Director of the Alaska Eskimo Whaling Commission (Apr. 17, 2012).

4. Marine Mammal Protection Act, §101(a)(5)(A), (D), (b), 16 U.S.C. §1371(a)(5)(A), (D), (b) (2006).
 5. 16 U.S.C. §§1361-1421h, ELR STAT. MMPA §§2-410.
 6. 16 U.S.C. §§1531-1544, ELR STAT. ESA §§2-18.
 7. 16 U.S.C. §§916-916l (2006).
 8. The "Open Water Season" in the Alaskan Arctic generally refers to the summer and early fall months, usually mid-July through mid-October, when the near-shore areas of the Arctic Ocean in this region are relatively ice-free.

9. See Sverre Pedersen et al., *Chapter 7: Subsistence Harvest Patterns and Oil Development on Alaska's North Slope*, in SYNTHESIS, *supra* note 1, at 208, discussing the 1983 regional report prepared by John Kruse et al., *A Description of the Socioeconomics of the North Slope Borough*, Institute of Social and Economic Research, Univ. of Alaska, Contract No. AA851-CTZ-37 (A19/PB 87-189338).
 10. 2012 Open Water Season Conflict Avoidance Agreement Meetings (Feb. 16-17, 2012), *available at* <http://www.nmfs.noaa.gov/pr/pdfs/permits/openwater/aewc2012.pdf>.
 11. For purposes of this Article, "Alaskan Arctic" refers to the region of northern Alaska from St. Lawrence Island in the northern Bering Sea, north through the Chukchi and Beaufort Seas coastal areas and outer continental shelf, and east along the coastal areas and outer continental shelf to the Canadian border.
 12. Stephen R. Braund et al., North Slope Subsistence Study, Barrow, 1987, 1988, and 1989, MMS OCS Study No. 91-0086, 17-24 (1993).

inhabited for approximately 6,000 years.¹³ In the Arctic, however, ancient does not spell static in cultural terms. The ancestors of the subsistence whaling captains who gather at these meetings survived extended periods of social change brought on by various outside forces, including the introduction of cash economies based on now-defunct Yankee commercial whaling, the fur trade, missionary activity, the establishment of trading posts, and government intervention in the form of modern military operations and federal social programs.¹⁴ With each successive external influence, they found ways to take what they could use and adapt it to their needs, while maintaining the core cultural identity that continues to define them today.¹⁵ At the same time, their tenacity carried them through starvation and population decline as outsider trade in walrus ivory and commercial whaling on the bowhead stock, combined with low caribou populations, decimated critical food supplies in the late 19th and early 20th centuries, while outside contact brought devastating disease.¹⁶

Appearing to be “hard-wired” for survival through adaptation, the modern-day descendants of those hardy men and women move seamlessly from hand-made skin boats used for spring subsistence whaling to corporate boardrooms and the halls of government, where their natural leadership skills engender high regard. Through the AEWC, the subsistence whaling community commands respect at the International Whaling Commission (IWC), where their subsistence hunting practices are scrutinized by delegates from former commercial whaling nations, whose past exploitations are responsible for the depletion of many of the earth’s whale populations, including bowhead whale stocks.¹⁷ When oil and gas development moved into Alaska’s Arctic waters in the 1980s, it was axiomatic that the whaling captains of these villages, whose ranks continue to give rise to the leaders of their communities, would step forward to define a role for themselves and their constituents in addressing the effects of this activity.¹⁸ After all, subsistence whaling, as it has throughout their history, continues to serve as the single most important culturally defining activity for these communities, and oil and gas development is only the latest in a long line of agents of social change.¹⁹

Now, gathered in the auditorium of Barrow’s state-of-the-art high school, paid for with tax revenues from the Prudhoe Bay oil fields, the whaling captains contemplate how the year’s exploration and development work, as planned by the offshore companies, can be coordinated and carried out so as not to interfere with the fall bowhead whale migration and their critical fall whale harvest.²⁰ The discussions between developers and hunters draw on the hunters’ ecosystem knowledge gained through generations devoted to observing the arctic environment and whale behavior.

For those not familiar with these meetings and their history, some see “oil-whaler collusion” to monetize the Arctic Ocean with no regard for environmental effects. Others see “environmentalist-whaler collusion” to create legal and regulatory barriers to development in a world hungry for petroleum. The whaling captains of the AEWC see only the latest exercise in pragmatism and adaptation, traditions as ancient to their culture as whaling.

As with past incursions from the outside, the hunters look for opportunities to bring benefit to their communities while maintaining their core identity and traditions. Offshore oil and gas development brings the opportunity for jobs, tickets into the modern world for residents of a rural economy. However, much of the development work is taking place in the fall migratory path of the BCBS bowhead whale stock. Along with a door into the international cash economy, the industrial work brings noise and water pollution, both of which the subsistence whale hunters know, and research confirms, will drive the fall migrating bowhead whales away from their normal migratory route where they are accessible to the hunters.²¹ These seemingly localized impacts can reverberate throughout northern Alaska’s subsistence economy. The 11 subsistence whaling villages that rely on this nutritionally and culturally central subsistence resource constitute one-third of the communi-

TC/35/AS3 (1983), at 6. Note that oil and gas exploration and development work is currently limited to the relatively ice-free “Open Water” period from late July to late October. As discussed *infra*, this is when fall whaling occurs, principally in the Beaufort Sea, but increasingly in the Chukchi Sea as well. To date, spring whale hunting, which begins in March in the Bering Straits region and concludes in June at Barrow, remains relatively free of industrial disturbance.

13. Sverre Pedersen et al., *Chapter 7: Subsistence Harvest Patterns and Oil Development on Alaska’s North Slope*, in SYNTHESIS, *supra* note 1, at 193.

14. See, e.g., John A. Kruse, *Subsistence and the North Slope Inupiat: The Effects of Energy Development*, *Man in the Arctic Program*, Monograph No. 4, Inst. of Social and Economic Research, Univ. of Alaska (1982), at 11.

15. Int’l Whaling Comm’n, *Report on Nutritional, Subsistence, and Cultural Needs Relating to the Catch of Bowhead Whales by Alaskan Natives*, IWC/TC/40/AS2 (1988), at 43-44.

16. Int’l Whaling Comm’n, *Report on Nutritional, Subsistence, and Cultural Needs Relating to the Catch of Bowhead Whales by Alaskan Natives*, IWC/TC/35/AS3 (1983), at 46. Int’l Whaling Comm’n, *Report on Nutritional, Subsistence, and Cultural Needs Relating to the Catch of Bowhead Whales by Alaskan Natives* (1988).

17. See <http://www.iwcoffice.org>, for membership, annual reports, and other relevant information.

18. Kruse, *Subsistence and the North Slope Inupiat: The Effects of Energy Development*, *supra* note 14, at 11, 43.

19. Int’l Whaling Comm’n, *Report on Nutritional, Subsistence, and Cultural Needs Relating to the Catch of Bowhead Whales by Alaskan Natives*, IWC/

20. This research definitively confirmed the hunters’ reported observations of bowhead whale migratory behavior displayed as the whales pass the census station at Pt. Barrow. Thomas F. Albert, *The Influence of Harry Brower, Sr., An Inupiaq Eskimo Hunter, on the Bowhead Whale Research Program Conducted at the UIC-NARL Facility by the North Slope Borough*, in FIFTY MORE YEARS BELOW ZERO: TRIBUTES AND MEDITATIONS FOR THE NAVAL ARCTIC RESEARCH LABORATORY’S FIRST HALF CENTURY AT BARROW, ALASKA 273-86 (David W. Norton ed., 2001). Given this validation of the hunters’ observations through well-designed, western science studies, when senior hunters, in later years, began to talk repeatedly about the changes they were seeing in whale behavior in the presence of industrial activities, it was reasonable to take their claims seriously and to develop studies capable of determining the veracity of these reports. See the discussion below in Section IV.B. “The Central Roles of Local Knowledge and Western Science.”

21. NAT’L RESEARCH COUNCIL, CUMULATIVE ENVIRONMENTAL EFFECTS OF OIL AND GAS ACTIVITIES ON ALASKA’S NORTH SLOPE, 100 (2003). Alaskan Native marine mammal subsistence harvests are federally authorized under §101(b) of the MMPA, 16 U.S.C. §1371(b), and protected from industrial interference pursuant to Sub-Sections 101(a)(5)(A) and (D) of that statute, 16 U.S.C. §1371(a)(5)(A), (D).

ties in northern Alaska's three census districts.²² Through the subsistence economy's established sharing networks, the bowhead whale's importance extends, as well, to other northern Alaskan villages, the populations of which are overwhelmingly Native.²³ Therefore, the business of the annual whaler-industry meetings is to evaluate the location and timing of planned oil and gas activities in relation to the route of the fall whale migration and the fall subsistence whale hunting areas. The challenge for the participants is to devise measures that mitigate adverse impacts of the industrial work—i.e., to tweak developers' plans enough to greatly reduce industrial disturbances to migrating whales and key areas of habitat and hunting, while ensuring that the oil and gas work remains operationally and economically feasible.



A bowhead whale migrating in an opening in the spring ice-cover. Openings of this type, that extend over distance, are referred to as "ice leads" or "leads in the ice." Photo by Gennady Zelensky.

Agreed mitigation measures are recorded in the document referred to as the CAA. The CAA is reviewed and revised annually to reflect changing needs. The spirit of cooperation and collaborative management reflected in this process is memorialized in the signatures of representatives of the companies and the AEWC and its affected constituent villages.

Over the years, certain mitigation measures have come to be used consistently and as a result have become permanent features of the CAA. In any given year, additional measures may be agreed to on an as-needed basis to address issues unique to a specific operation. Together, these measures, and the process used to develop them, provide a multi-pronged approach to managing potential conflicts through application of mutually acceptable trade offs among the competing uses of subsistence hunting and industrial development. As described in further detail below, the core mitigation measures currently

include communications strategies to allow for real-time decisionmaking, time-area closures that align with the whale migration to minimize disruption to hunters as well as oil and gas operators, pollution discharge protocols, restrictions on vessel movements, and scientific research requirements.

II. Context and History

A. *The Bowhead Whale Migration and the Subsistence Hunt by Alaskan Eskimos*

The coastal villages of Alaska's northern shores constitute some of our planet's most remote outposts of human civilization. Hundreds of miles removed from highway systems and power grids, the majority of these villages are accessible only by air or seasonal barge transport, and some can be reached only at certain times of the year. The annual bowhead whale migration provides the largest subsistence resource available in these distant villages, with a single bowhead whale, on average, yielding between 6 and 25 tons of food.²⁴

The BCBS bowhead whale stock winters in the northern Bering Sea, migrating north through the Bering Strait, into the Chukchi Sea and ultimately the Beaufort Sea, where the majority of its members appear to summer in the Amundsen Gulf region of the Canadian Beaufort Sea, north of the McKenzie River delta.²⁵ The spring migration takes place typically from late March into early June.²⁶ During this time, the villages of Gambell and Savoonga, on St. Lawrence Island in the northern Bering Sea; Wales and Little Diomedé, in the Bering Straits Region; Kivalina, Pt. Hope, Pt. Lay, and Wainwright, along the Chukchi Sea coast; and Barrow, at the junction of the Chukchi and Beaufort Seas, all conduct their spring hunt for bowhead whales.

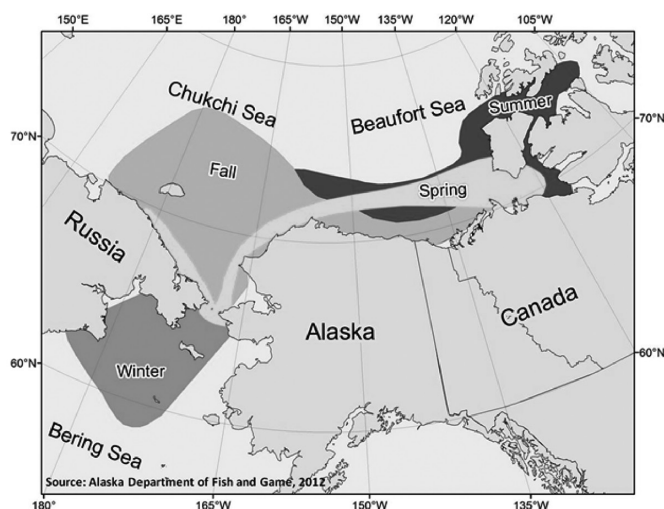
22. Research and Analysis Section, Alaska Department of Labor and Workforce Development, 2010 Census, <http://labor.alaska.gov/research/index.htm> (last visited Aug. 19, 2013).

23. Kruse, *supra* note 14, at 44. Int'l Whaling Commission, *supra* note 15, at 6.

24. Interview with Dr. John Craighead George, Research Biologist, North Slope Borough Department of Wildlife Management (June 27, 2012).

25. Sue E. Moore & Randall R. Reeves, *Distribution and Movement*, in THE BOWHEAD WHALE SPECIAL PUBLICATION NO. 2: THE SOCIETY FOR MARINE MAMMALOGY, 313-86, at 313-56 (Burns et al. eds., 1993). LORI QUAKENBUSH ET AL., SATELLITE TRACKING OF WESTERN ARCTIC BOWHEAD WHALES OCS STUDY BOEMRE 2010-33 74 (2010). This recent research also has revealed that some whales remain in the Chukchi and Alaskan Beaufort Seas throughout the summer. LORI QUAKENBUSH ET AL., at 32 and fig. 25.

26. Moore & Reeves, *supra* note 25, at 336-39; QUAKENBUSH ET AL., *supra* note 25, at 74.



Bering-Chukchi-Beaufort Seas Bowhead Whale Range Map, Alaska Department of Fish and Game, 2012.

The spring hunt takes place primarily from hand-made skin boats, or *umiaks*, fashioned from walrus or bearded seal skin stretched over a wood frame and sewn with threaded sinew taken from caribou tendons.²⁷

The whales summering in the Canadian Beaufort Sea begin their return migration to the northern Bering Sea in early September.²⁸ The migration proceeds through the nearshore waters of the Alaskan Beaufort Sea, with a majority of the whales appearing to continue westward toward Wrangel Island and the Russian coast of Chukotka before turning south toward the Bering Sea.²⁹ This “open-water season” migration typically continues through November.³⁰ During this return migration, the Beaufort Sea villages of Kaktovik, on Barter Island near the Canadian border; Nuiqsut, hunting from Cross Island to the east of Prudhoe Bay; and Barrow conduct the fall bowhead whale subsistence hunt using outboard skiffs.

In recent years, the spring “shore-fast” ice (near-shore ice that is grounded into the sea floor at the coast line) has been thinner and less stable than in the past. Historically used as the platform from which spring whaling is conducted, the ice now presents a less stable and less safe structure from which to hunt.³¹ As a result, the Chukchi Sea villages of Wainwright, Pt. Lay, and Pt. Hope have begun to hunt for bowhead whales in the fall, as well, with Wainwright taking a fall whale for the first time in memory in 2010, and then taking a second fall whale in 2011.³² Gambell and Savoonga, on St. Lawrence Island in the northern Bering

Sea, now hunt and take whales regularly in late November and early December.³³



An *umiak* on the spring ice with the harpoon mounted on the darting gun laying in the front of the boat, ready for use. Photo by Bill Hess.

B. Alaskan Arctic Offshore Oil and Gas Development

The U.S. Department of the Interior’s (DOI’s) Bureau of Land Management (BLM) held the first federal sale of offshore leases in the U.S. Beaufort Sea outer continental shelf (OCS), along the northern coast of Alaska, in 1979.³⁴ By that time, the creation of the infrastructure necessary to support the expansion of oil and gas development in the Beaufort and Chukchi Seas of the Alaskan Arctic was under way. Two years previously, on June 20, 1977, onshore oil production began at the North Slope’s giant Prudhoe Bay oil field, the largest in North America and 18th largest worldwide.³⁵ From the 46 lease-sale tracts offered in 1979, 24 leases, covering 85,776 acres (134.025 square miles (sq. mi.)), were issued.³⁶ In 1982, the year the U.S. Congress created DOI’s Minerals Management Service,³⁷ to take over federal responsibility for oil and gas leasing in federal waters, another 338 tracts of the Beaufort Sea, covering 1.826 million acres (2,853.125 sq. mi.), were

are available through the AEWG or the U.S. Department of Commerce, National Marine Fisheries Service, Anchorage Regional Office.

33. Interview with George Noongwook, AEWG Chairman, whaling captain from the village of Savoonga on St. Lawrence Island (July 24, 2012); Interview with Merlin Koonooka, AEWG Secretary, whaling captain from the village of Gambell on St. Lawrence Island (July 24, 2012).

34. See Lease Sales, Alaska OCS Region, BUREAU OF OCEAN ENERGY MANAGEMENT, http://www.boem.gov/uploadedFiles/BOEM/About_BOEM/BOEM_Regions/Alaska_Region/Leasing_and_Plans/Leasing/Alaska%20Region%20Lease%20Sales%20To%20Date.pdf (last visited Aug. 19, 2013).

35. The Prudhoe Bay field was originally discovered by Atlantic Richfield (ARCO) and Exxon in 1968. Prudhoe Bay Fact Sheet, BP (Aug. 2006), available at http://www.bp.com/assets/bp_internet/us/bp_us_english/STAGING/local_assets/downloads/a/A03_prudhoe_bay_fact_sheet.pdf.

36. Two of these leases remain active today. See Lease Sales, *supra* note 34. See also Detailed Active Leases, Alaska OCS Region, BUREAU OF OCEAN ENERGY MANAGEMENT, available at http://www.boem.gov/uploadedFiles/BOEM/Oil_and_Gas_Energy_Program/Leasing/Regional_Leasing/Alaska_Region/detailed_active_leases.pdf.

37. History of Interior, U.S. Department of the Interior, <http://www.doi.gov/howeare/history.cfm> (last visited Aug. 19, 2013).

27. The animal skin enables the boat to glide quietly through the water, reducing the risk of disturbance to the migrating whales. The caribou sinew, both tough and elastic, expands and contracts with the skin as it is subjected to the freezing conditions of ice-based spring subsistence whale hunting.

28. Moore & Reeves, *supra* note 25, at 339-44; QUAKENBUSH ET AL., *supra* note 25, at 15-16.

29. Moore & Reeves, *supra* note 25, at 339-44.

30. *Id.* at 344; QUAKENBUSH ET AL., *supra* note 25, at 16.

31. Int’l Whaling Comm’n, *Report on Weapons, Techniques, and Observations in the Alaskan Bowhead Whale Subsistence Hunt*, IWC/64/WKM&AW1 8 (2012), at 2.

32. ALASKA ESKIMO WHALING COMM’N, FALL HARVEST REPORT (2010); ALASKA ESKIMO WHALING COMM’N, FALL HARVEST REPORT (2011). Both reports

offered for development, with 662,860 acres (1,035.72 sq. mi.) purchased through 121 leases.³⁸ The next Beaufort Sea federal lease sale came in 1984, with 1,419 tracts covering 7.773 million acres (12,145.3 sq. mi.) offered for sale, and 96 leases covering 1.2 million acres (1,875 sq. mi.) purchased.³⁹ Hard on the heels of the 1984 lease sale, the first continuously producing offshore field in the Arctic, BP's Endicott Unit, located three miles from the Beaufort Sea coast and connected to shore by a solid-fill, breached causeway, was brought online in 1987.⁴⁰

In 2001, the first production unit in the Alaskan Arctic that is connected to shore only by a subsea pipeline, BP's Northstar Unit in the central Beaufort Sea, came online.⁴¹ By September 1, 2011, the Alaskan Beaufort Sea contained 183 active federal oil and gas leases, with 487 active leases in the Chukchi Sea, for a total of more than 1,506,835 hectares (5,817.9 sq. mi.) of the Alaskan Arctic's OCS under active federal lease for oil and gas development.⁴²

C. The AEWG

As fate would have it, in 1977, two years before BLM's first arctic offshore lease sale, the IWC expressed serious concern over the status of the western arctic bowhead whale stock, including "potential habitat pollution and destruction by [pre-lease sale] oil exploration and development."⁴³ At the time, research efforts indicated that there were approximately 600-2,000 animals left in a stock, decimated by commercial whaling, that was thought to have originally numbered between 11,700 and 18,000 animals.⁴⁴ The current population estimate for this stock is 16,892 (95% confidence interval of 15,704 to 18,928).⁴⁵

With its concern over the status of the whale stock, based on the early research efforts, the IWC voted to assume direct jurisdiction over the Alaskan Native bowhead whale subsistence hunt. The IWC expressed this decision by amending its Schedule, containing the organization's regu-

lations, to delete the exemption under which the Alaskan hunt had been conducted since the United States adhered to the International Convention for the Regulation of Whaling (ICRW) on December 2, 1946.⁴⁶ The IWC's only mechanism for protecting whale stocks is the setting of hunting quotas. Therefore, while the organization was motivated in part by concerns over offshore development, its only recourse for addressing its concerns was to act to prohibit the Alaska Native bowhead whale subsistence hunt.⁴⁷ This action devastated local communities, creating immediate and severe food shortages.⁴⁸ Native subsistence hunters, who learned of the IWC's initial action only after the fact, were shocked to be informed that their millennia-old subsistence whale hunt had been banned without their input or prior knowledge.⁴⁹ Under the ICRW, the United States could have enabled the subsistence hunt to continue uninterrupted by lodging an "objection" to the IWC's decision.⁵⁰ The United States chose not to object to the decision, and it was only after legal action by the subsistence whale hunters that the United States approached the IWC to set a quota greater than zero.⁵¹

At the time of the IWC's action to limit the bowhead whale subsistence hunt, the whaling villages required a total of approximately 26 whales per year to meet nutritional and cultural needs in those communities.⁵² The IWC quota initially reduced this take to no more than 18 struck and 12 landed whales per year.⁵³ The quota did not reach a level necessary for all of the AEWG's villages to have the opportunity to take an adequate supply of whales for almost 15 years.⁵⁴ Resourceful and fiercely independent, community leaders from the principal whale-hunting vil-

38. Lease Sales, *supra* note 34.

39. *Id.*

40. BP, Verified Site Report Alaska 5 (2007), available at www.bp.com/livesasets/bp_internet/globalbp/STAGING/global_assets/downloads/V/verified_site_reports/N_America/Alaska_2007.pdf.

41. *Id.*

42. Lease Sales, *supra* note 34.

43. Int'l Whaling Comm'n, *Report of the International Whaling Commission, Special Issue 4, Aboriginal/Subsistence Whaling* (with special reference to the Alaska and Greenland fisheries) (1982), at 2. Other factors driving this decision were physical and methodological challenges confronting researchers attempting to conduct a census of the BCBS bowhead whale stock that led to very significant underestimates of population size, and an increase in Native Alaskan takes of bowhead whales. See discussion in Judith E. Zeh et al., *Current Population Size and Dynamics*, in *THE BOWHEAD WHALE SPECIAL PUBLICATION No. 2: THE SOCIETY FOR MARINE MAMMALOGY*, *supra* note 25, at 410-21.

44. Int'l Whaling Comm'n, *Report of the International Whaling Commission, Special Issue 4*, *supra* note 43.

45. Int'l Whaling Comm'n, Geoffrey H. Givens et al., *Estimate of 2011 Abundance of the Bering-Chukchi-Beaufort Seas Bowhead Whale Population*, SC/65a/BRG01 (2013), at 1. Significantly, in 1977 and 1978, the Eskimo hunters informed the United States and the IWC that the BCBS bowhead whale stock was healthy and growing, a fact now born out by more than 30 years of research on BCBS bowhead whale biology. Interview with Eugene Brower and Harry Brower Jr. (June 27, 2012).

46. Int'l Whaling Comm'n, Geoffrey H. Givens et al., *Estimate of 2011 Abundance of the Bering-Chukchi-Beaufort Seas Bowhead Whale Population*, *supra* note 45; Int'l Whaling Comm'n, *28th Report of the International Whaling Commission* (1978) at 22.

47. Int'l Whaling Comm'n, *28th Report of the International Whaling Commission* (1978), *supra* note 46, at 22. See generally INTERNATIONAL CONVENTION FOR THE REGULATION OF WHALING, Dec. 2, 1946, 62 Stat. 1716, 161 U.N.T.S. 72.

48. NOAA, A SPECIAL REPORT TO THE INTERNATIONAL WHALING COMMISSION ON BOWHEAD WHALES 56-57 (1978), available at docs.lib.noaa.gov/noaa_documents/NOS/CZIC/89FF36.pdf. Interview with Eugene Brower and Harry Brower Jr., *supra* note 45.

49. Interview with Eugene Brower and Harry Brower Jr., *supra* note 45.

50. INTERNATIONAL CONVENTION, *supra* note 47, art. V, 3(a).

51. *Adams v. Vance*, 570 F.2d 950, 8 ELR 20160 (D.C. Cir. 1977). In recognition of the fact that the circumstances of the bowhead whale subsistence hunt, including the use of hand-held weapons, hunting large animals from small boats, and the influence of sea state, sea ice, and weather, can cause some whales to be lost after being struck, the IWC sets the quota for bowhead whales on both struck and landed whales. INTERNATIONAL CONVENTION FOR THE REGULATION OF WHALING, SCHEDULE (2012) ¶ 13(b)(1), available at <http://iwc.int/cache/downloads/1lv6fvjz06f48wc44w4s4w8gs/Schedule-February-2013.pdf>.

52. Int'l Whaling Comm'n, *Report on Nutritional, Subsistence, and Cultural Needs Relating to the Catch of Bowhead Whales by Alaskan Natives*, IWC/TC/35/AS3 (1983), at 59.

53. Int'l Whaling Comm'n, *Report of the International Whaling Commission, Special Issue 4*, *supra* note 43.

54. 48TH REPORT OF THE INTERNATIONAL WHALING COMMISSION 28 (1998), at 51, available at <http://iwc.int/annual-reports>. For documentation of subsistence need to support the level of quota set in 1997, see Int'l Whaling Comm'n, *Alaska Eskimo Subsistence Need for Bowhead Whales, Submitted by the United States Under Agenda Item 10 IWC/46/37* (Technical Committee, 1994), at 7.

lages joined together quickly to form the AEWC, tasking the organization with responsibility for representing their whaling interests.⁵⁵ The governing body of the AEWC is a Board of Commissioners composed of one whaling captain from each constituent village, elected to a three-year term by the whaling captains of the village.⁵⁶ The whaling captains of each village organize themselves into village “Whaling Captains’ Associations.”

Following formal incorporation of the AEWC in January of 1981, the new organization entered into a Cooperative Agreement, under §112 of the MMPA, with the National Oceanic and Atmospheric Administration (NOAA) within the U.S. Department of Commerce.⁵⁷ By the terms of this agreement, unique at the time and remaining in force today, NOAA delegates to the AEWC principal local authority for co-management of the bowhead whale subsistence hunt. Under this delegation, the federal government vests the AEWC with responsibility for ensuring that local hunters follow the IWC’s quota limits and other regulatory measures. In return, the Cooperative Agreement binds NOAA to “consult with the AEWC on any action undertaken or any action proposed to be undertaken by any agency or department of the Federal Government that may affect the bowhead whale and/or subsistence whaling”⁵⁸

III. Managed Development: The Need and Challenge

A. Triggering Events: Industrial Development and Threats to Subsistence Livelihood

Forced by the IWC’s actions into an international legal fray, the bowhead whale hunters and their new organization were immediately confronted with added threats to their food security and cultural survival from offshore industrial development. By 1985, the bowhead subsistence hunters of the AEWC’s villages along the Beaufort Sea coast, particu-

larly the fall open-water season hunters of Kaktovik and Nuiqsut (who conduct their annual whale hunt from Cross Island, in the Beaufort Sea to the east of Prudhoe Bay), found their whale hunting opportunities threatened and their small craft imperiled by enormous, ocean-going oil and gas industry exploration vessels, including drill ships and seismic exploration vessels.⁵⁹

The bowhead subsistence hunters knew from generations of observation that bowhead whales are extremely shy and reactive in the presence of even minor anthropogenic noise, movements, or smells.⁶⁰ Therefore, they were not surprised, although they were extremely distressed, to observe that the large-vessel traffic, seismic blasts, and drilling operations suddenly being introduced into the fall open-water areas of the Beaufort Sea were causing the fall migrating bowhead whales to deflect miles offshore, beyond the reach of the small six-to-eight man skiffs used by fall hunters.⁶¹ Whales that continued to migrate through the areas of industrial disturbance became “skittish,” changing swimming patterns and speeds in a way that made them effectively unavailable to the hunters, who continue to use traditional hand-thrown harpoons.⁶²

In the area of the Alaskan mid-Beaufort Sea where much of the industrial activity was concentrated, efforts to hunt the whales, already a risky business with the potential for loss of human life, were resulting in near catastrophes. Crews found themselves being forced to travel as far as 35 miles, and in some cases farther, from shore into the Arctic Ocean, with the normal travel distance being no more than 10-12 miles from shore.⁶³ Rapidly changing fall weather

55. Inupiat Community of the Arctic Slope, Resolution 78-14, “Delegation of Authority to the Alaska Eskimo Whaling Commission on Whaling Matters,” Feb. 15, 1978. Concurrent Resolution of the Native Villages of Gambell, Kivalina, Savoonga, Wales, and the Inupiat Community of the Arctic Slope, Mar. 20, 1978. State of Alaska, Department of Commerce and Economic Development, Certificate of Incorporation of the Alaska Eskimo Whaling Commission and Articles of Incorporation of the Alaska Eskimo Whaling Commission, a Nonprofit Corporation, Jan. 8, 1981. The nine original villages forming the AEWC are: Kaktovik, Nuiqsut, and Barrow on the Beaufort Sea coast; Wainwright and Pt. Hope, on the Chukchi Sea coast; and Kivalina, Wales, Gambell, and Savoonga in the Bering Straits region. Those villages since have been joined by Little Diomed, in the Bering Straits region, and Pt. Lay on the Chukchi Sea coast, bringing the AEWC’s membership to 11 villages. (Documents available through the Alaska Eskimo Whaling Commission, P.O. Box 570 Barrow, Alaska 99723. Tel. 907-852-2392.)

56. RESTATED BYLAWS OF THE ALASKA ESKIMO WHALING COMMISSION, art. V. (Dec. 9, 2009).

57. NAT’L OCEANIC AND ATMOSPHERIC ADMIN. & ALASKA ESKIMO WHALING COMM’N, COOPERATIVE AGREEMENT (2013), *available at* http://www.nmfs.noaa.gov/ia/species/marine_mammals/inter_whaling/awec_cooperative.pdf; MMPA §112(c), 16 U.S.C. §1382(c) (2006).

58. NAT’L OCEANIC AND ATMOSPHERIC ADMIN. & ALASKA ESKIMO WHALING COMM’N, COOPERATIVE AGREEMENT (2013), *supra* note 57, ¶ 8.

59. Interview with Thomas Napageak, former Chairman AEWC (deceased) and Nolan Solomon, former Vice Chairman of the AEWC (deceased) (Nov. 1985).

60. Interview with Archie Ahkiviana, AEWC Commissioner from the village of Nuiqsut (February 1995, July 2008). Interview with Harry Brower Jr., AEWC Vice Chairman from the village of Barrow (June 27, 2013).

61. Affidavit of Herman Aishanna, exh. 1, Affidavit of Frank Long Jr., exh. 6, Alaska Eskimo Whaling Comm’n et al. v. Foster (1993), Plaintiff’s Motion for Preliminary Injunction, United States District Court for the District of Columbia (Civil Action No. 93 1629 HHG). *See also* NAT’L RESEARCH COUNCIL, *supra* note 21, at 100.

At the 1992 Kuvlum site the approaching fall-migrating whales began to deflect to the north at a distance of 32 km (19 mi.) east of the drilling platform and bowhead calling rates peaked at about the same distance . . . At the 1993 Kuvlum #3 site the whales were nearly excluded from an area within 20 km (12 mi.) of the drilling platform . . . During the 1986 open-water drilling operations at the Hammerhead site, no whales were detected closer than 9.5 km (6 mi.) from the drillship, few were seen closer than 15 km (9 mi.), and one whale was observed for 6.8 hours as it swam in an arc of about 25 km (15 mi.) around the drillship . . . The zone of avoidance therefore seemed to extend 15-25 km (9-15 mi.) from the drillship. Acoustic studies done at the same time provided received levels of drillship noise that can be related to the zone of avoidance. At 15 km (9 mi.) from the 1986 Corona site, received sound was generally 105-125 dB . . . at 11 km (6 mi.) from Hammerhead, received sound was generally 105-130 dB.

62. Affidavit of Frank Long Jr., exh. 6, Alaska Eskimo Whaling Comm’n et al. v. Foster (1993), *supra* note 61. The harpoon is mounted on a wooden shaft, which is approximately six feet in length. Also mounted on the wooden shaft is a device called a “darting gun,” which is designed to fire an explosive projectile when the darting gun, activated by a protruding trigger rod, hits the whale.

63. Affidavit of Burton “Atqaan” Rexford, exh. 10, Affidavit of Thomas Napageak, exh. 8, Alaska Eskimo Whaling Comm’n et al. v. Foster (1993),

and seas almost cost crews their lives as small skiffs were swamped and men struggled to survive in frigid waters until neighboring crews could reach them and pull them to safety.⁶⁴ On a few occasions, whales that could be found and struck, after days of searching, had to be cut loose in high seas or took so long to bring to shore for butchering that the meat became rotten.⁶⁵ These “struck but lost” whales were counted against the hunters under the draconian IWC quota regime and further contributed to the food shortages and the social and psychological damage caused by the newly imposed IWC quota system.⁶⁶ The hunters’ appeals to federal regulators for help in addressing these impacts met with little success, despite the consultation requirements of the newly minted NOAA-AEWC Cooperative Agreement.

With the AEWC established, hunters facing threats from offshore oil and gas activities turned to the young organization, still trying to find its way in the international legal and political arena of the IWC, for assistance in seeking avenues to mitigate this industrial interference with their hunting. In this case, however, the task put to the AEWC’s Board of Commissioners was less clearly defined than the task of addressing quota levels at the IWC. The hunters welcomed the promise of employment opportunities that accompany development, but wanted that development undertaken in a way that would not interfere with subsistence hunting resources or opportunities.⁶⁷

Unfortunately, there was no precedent in practice or in literature that seemed to offer a good model for balancing conflicting uses in a situation where one activity was capable of effectively eliminating the other. Similarly, legal and regulatory standards pertaining to the two sets of activities did not provide adequate guidance on steps that might be taken to balance the uses.

B. *Response: A Practical Approach to Addressing Adverse Development Impacts*

With federal regulators apparently willing to remain on the sidelines, the only option was for the AEWC to approach the developers directly. Fortunately, strong support from the Alaska Delegation to Congress enabled the AEWC’s Board of Commissioners to bring corporate representatives to the table. Thus began the now decades-old task of designing operational measures that enable modern industrial development to coexist with ancient subsistence hunting practices. The first such arctic offshore stakeholder meeting was held in the fall of 1985, in preparation for the 1986 Open Water Season.

To address the immediate threats to human life posed by the industry’s large vessels transiting waters occupied

by small hunting skiffs, the stakeholders initially worked through the details of an Open Water Season communications scheme.⁶⁸ This communication scheme, an expanded version of which is still in use today, became the foundation for today’s CAA, known in those early days as the “Oil/Whaler Agreement.”

With the communications scheme in place, direct threats to the hunters’ safety from industry vessels were reduced. The AEWC and industry stakeholders then turned to the work of understanding and addressing indirect interference with hunting activities, resulting from behavioral changes in fall migrating bowhead whales as they react to the noise and other pollutants accompanying oil and gas work. To this end, the AEWC-industry stakeholder group began to meet on an annual basis.

With this early initiative, direct collaboration with local hunters, specifically the whaling captains and their representative organization, the AEWC, became a critical element of offshore industrial development planning and management in the Alaskan Arctic.

C. *Constructing the Legal and Regulatory Framework: The 1986 MMPA Reauthorization*

I. *Starting Point: The Preexisting Statutory Structure*

The MMPA of 1972 instituted a moratorium on the “taking” of marine mammals by any U.S. citizen, with the sole exemption allowing intentional subsistence-use “takes” of marine mammals by Alaskan Natives.⁶⁹ In addition to the subsistence-use exemption, and other exemptions added after original passage, the MMPA contains a limited number of defined exceptions to the moratorium, allowing takes incidental to other actions, one of which allows for small takes by harassment incidental to specified and geographically localized activities.⁷⁰ This exception is used in allowing offshore oil and gas exploration and development

⁶⁴ *supra* note 61.

⁶⁵ Affidavit of Frank Long Jr., exh. 6, Alaska Eskimo Whaling Comm’n et al. v. Foster (1993), *supra* note 61.

⁶⁶ *Id.*

⁶⁷ Declaration of Stephen R. Braund, exh. 3, Alaska Eskimo Whaling Comm’n v. Foster (1993) (Civil Action No. 93 1629 HHG), *supra* note 61.

⁶⁸ Interview with Thomas Napageak, *supra* note 59.

⁶⁹ COOPERATIVE PROGRAMS FOR THE BEAUFORT SEA, OIL/WHALERS WORKING GROUP (July 9, 1986). Signatories include Pete Woodson, Shell Western E&P Inc., Wayne Smith, Amoco Production Company, Frank Locascio, Geophysical Services, Inc., L.E. Bratos, Western Geophysical, Arnold Brower Jr., Chairman, Alaska Eskimo Whaling Commission, Darrel Kava, Secretary, Alaska Eskimo Whaling Commission, Nolan Solomon, Treasurer, Alaska Eskimo Whaling Commission, Thomas Napageak, Alaska Eskimo Whaling Commission. (A copy of this document is available from the AEWC or from Jessica Lefevre.)

⁷⁰ MMPA §101(a)-(b), 16 U.S.C. §1371(a)-(b) (2006). Other exemptions were added in later years. “Take” under the MMPA means “to harass, hunt, capture, or kill, or [to] attempt to harass, hunt, capture, or kill any marine mammal.” MMPA §3(13), 16 U.S.C. §1362(13) (2006).

⁷¹ “Harassment” is defined in the MMPA to mean

(i) any act that injures or has the significant potential to injure a marine mammal or marine mammal stock in the wild; or (ii) any act that disturbs or is likely to disturb a marine mammal or marine mammal stock in the wild by causing disruption of natural behavioral patterns, including, but not limited to, migration, surfacing, nursing, breeding, feeding, or sheltering, to a point where such behavioral patterns are abandoned or significantly altered.

MMPA §2(18)(A), 16 U.S.C. §1362(18)(A) (2006). *See also* 50 C.F.R. §216.3 (defining “Level A Harassment” and “Level B Harassment,” consistent with the statutory definition cited here).

and is subject to the limitation that it can cause no more than a “negligible impact” on a species or stock.⁷¹ As originally passed, this exception also was subject to the limitation that it could cause no more than a “negligible impact” to Native Alaskan subsistence uses of marine mammals.⁷² Because the exception is for “small takes” as defined under the MMPA, the statute also requires that operators working under “small-take authorizations” issued pursuant to this exception, conduct site-specific monitoring and research to provide a basis for estimating actual levels of take.⁷³

The dual “negligible-impact” standards of the MMPA were consistent with the hunters’ desire to balance the development and subsistence uses on the ocean. However, the statutory language was vague. Arguably, the impacts they were experiencing might be considered “negligible” by regulators or even a court, despite the fact that the oil and gas work was creating serious threats to hunters’ safety and communities’ food supplies.

2. Modifying Law to Reflect Practice “On the Ground”

With its members following the unfolding events in the new hydrocarbon frontier of the Alaskan Arctic, Congress quickly recognized the effectiveness of the collaborative, stakeholder-driven approach to avoiding potential conflicts between development and subsistence—both physical and legal—recently embarked upon by the AEWC and offshore oil and gas operators. To ensure continued reliance on this process, Congress decided to codify the practice in its 1986 Amendments to the MMPA. Bringing together representatives of the AEWC and the principal arctic offshore operators of the time, including ARCO, Amoco, and Shell Oil, congressional representatives sought agreement on legislative language that would memorialize the collaborative development planning process in which the stakeholders already were engaged.

The language would have to address the multiple objectives of: (1) allowing oil and gas exploration and development to go forward; (2) ensuring that the industrial activity would not reduce the availability of bowhead whales and other marine resources for subsistence uses; and (3) promoting continued collaboration between developers and hunters on measures needed to address the first two goals. Consensus ultimately was reached to replace the second “negligible-impact” standard of MMPA §101(a)(5)(A) with the more descriptive, albeit inelegantly phrased, standard of “no unmitigable adverse impact” to the availability of marine mammal subsistence resources for taking for sub-

sistence uses.⁷⁴ The standard was first codified in 1986 and enacted again when §101(a)(5)(D) was added to the MMPA in 1994.⁷⁵

3. Regulatory Language to Implement Congressional Intent

The National Marine Fisheries Service (NMFS) has jurisdiction over the industry-subsistence whaling interactions, and consistent with congressional intent, instituted the practice of looking to the CAA as a means of ensuring that the statutory finding of “no unmitigable adverse impact” to the availability of subsistence resources for subsistence uses is met in each instance. Tasked with elaborating this statutory standard in a regulatory context, NMFS chose the phrase “Plan of Cooperation (POC)” to refer to the collaborative process already underway.⁷⁶

IV. The Management Regime

A. A Concrete and Adaptive Approach to the Management of Offshore Industrial Activities

There is a dawning recognition in policy and regulatory circles of the need to tailor natural resource development and commercialization to the tolerances of affected ecosystems, to avoid further impoverishing our natural environment. Similarly, the livelihoods of local communities must be preserved to avoid situations where resource extraction to meet national and international demands impoverishes

74. MMPA §101(a)(5)(A), (D), 16 U.S.C. §1371(a)(5)(A), (D). An “unmitigable adverse impact” is defined to be an impact resulting from a “specified activity:” (1) That is likely to reduce the availability of the species to a level insufficient for a harvest to meet subsistence needs by: (i) Causing the marine mammals to abandon or avoid hunting areas; (ii) Directly displacing subsistence users; or (iii) Placing physical barriers between the marine mammals and the subsistence hunters; and (2) That cannot be sufficiently mitigated by other measures to increase the availability of marine mammals to allow subsistence needs to be met.

A “specified activity” is defined to mean “any activity, other than commercial fishing, that takes place in a geographical region [having biogeographic characteristics], that potentially involves the taking of small numbers of marine mammals.” 50 C.F.R. §216.103 (2011).

75. MMPA §101(a)(5)(A), (D), 16 U.S.C. §1371(a)(5)(A), (D) (2006). See the discussion of the 1994 MMPA reauthorization below.

76. 50 C.F.R. §216.104(a)(12) (2011).

Where the proposed activity would take place in or near a traditional Arctic subsistence hunting area and/or may affect the availability of a species or stock of marine mammal for Arctic subsistence uses, the applicant must submit either a plan of cooperation or information that identifies what measures have been taken and/or will be taken to minimize any adverse effects on the availability of marine mammals for subsistence uses. A plan must include the following: (i) A statement that the applicant has notified and provided the affected subsistence community with a draft plan of cooperation; (ii) A schedule for meeting with the affected subsistence communities to discuss proposed activities and to resolve potential conflicts regarding any aspects of either the operation or the plan of cooperation; (iii) A description of what measures the applicant has taken and/or will take to ensure that proposed activities will not interfere with subsistence whaling or sealing; and (iv) What plans the applicant has to continue to meet with the affected communities, both prior to and while conducting the activity, to resolve conflicts and to notify the communities of any changes in the operation.

71. MMPA §101(a)(5)(A), (D), 16 U.S.C. §1371(a) (2006). “Negligible impact is an impact . . . that cannot be reasonably expected to, and is not reasonably likely to, adversely affect [a] species or stock through effects on annual rates of recruitment or survival.” 50 C.F.R. §216.103 (2011).

72. *Id.* (1984).

73. MMPA §§101(a)(5)(A)(ii)(III)(bb), (D)(ii)(III), 16 U.S.C. §§1371(a)(5)(A)(i)(II)(bb), (D)(ii)(III) (2006).

local populations. Management in this context means finding a balance among competing uses. Ideally, management tools also should be adaptive to meet shifting needs and demands, including altered ecosystems resulting from climate change.

An effective technique for achieving balance is to identify opportunities for trade offs among the competing uses and then to establish processes and rules that govern implementation of the trade offs. The contemporary initiatives referred to as “ecosystem-based management” and “marine spatial planning” express the awareness that we are in an age where decisionmakers need tools to help them balance development demands against adverse impacts to local ecosystems and economies.⁷⁷ Unfortunately, these proposed approaches to mitigating development impacts and integrating multiple uses are currently articulated primarily at a very general, even theoretical, level, leading to an understandable wariness on the part of developers and some in the policy world. For close to 30 years, however, the Open Water Season CAA has provided a real-world application of many of the ideas embodied in these recent policy initiatives. Thus, it offers insights into how, at least in certain contexts, decisions can be made in a way that balances development with ecosystem and local economic needs.

In addition to offering insights into the real-world “nuts and bolts” of decisionmaking in a context where local impacts must be taken into account, the CAA Process offers an adaptive approach to management that is especially critical in the rapidly changing natural and economic policy environment of the Arctic. In any management setting, adaptive management requires regular and periodic review. Through the CAA Process, hunters and operators meet before each open-water season and typically meet again in the fall or winter following the end of operations, providing an opportunity to review experiences from the season just ended. This annual process allows the stakeholders to refine management techniques over time, based on experience, so that they provide the necessary mitigation of impacts with the least disruption to planned activities. Proven mitigation measures are retained from year to year, providing structure and predictability for participants. Measures that are no longer necessary or have not worked are dropped, and new measures needed to address changing circumstances are added.⁷⁸

Thus, consistent with general principles of ecosystem-based management, the CAA is an adaptive management tool that: (1) minimizes user conflicts by (2) establishing optimal trade offs among competing uses. As it has evolved, the CAA Process also has fostered an understanding of the need for carefully designed and implemented scientific studies on the impacts of development to marine mammals and habitat to ensure that proper care is given to maintaining the health of both. As a result, and again consistent with principles of ecosystem-based management, the CAA Process achieves the twin goals of minimizing cumulative impacts to living resources and habitats while facilitating development activities.

B. The Central Roles of Local Knowledge and Western Science

As noted, the CAA rests on the bowhead whale subsistence hunters’ traditional ecosystem knowledge of the Arctic. Through IWC-related research collaboration with the North Slope Borough’s wildlife biologists, the hunters have gained a keen understanding of the scientific process and a significant level of comfort cooperating with scientists on the design of research proposals and the interpretation of results.⁷⁹ This cooperation first began in the early 1980s as scientists struggled to design a research program for counting the BCBS bowhead whale stock. Early whale census efforts met with criticism, especially from prominent whaling captains in the village of Barrow, who said the counts were too low. The captains subsequently helped the scientists understand how to locate whales that were not being counted because they were swimming under the ice cover.⁸⁰ The reliability of this “traditional knowledge” has been further verified through peer-reviewed western science studies.⁸¹ The collaboration between hunters and scientists related to the IWC work has greatly benefitted the CAA Process because researchers already have had experience with the quality and veracity of the hunters’ observations.

I. The Proposal for a New Collaborative Process: Independent -Stakeholder Peer Review

As offshore development activity first began to impinge on subsistence whaling activities in the 1980s, discrepancies arose between the whaling captains’ observations of bowhead whale reactions to offshore oil and gas exploration work and the reported results of scientific research into bowhead whale reactions to seismic noise. In particular,

77. See, e.g., CHARLES EHLE & FANNY DOUVRE, INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION AND MAN AND THE BIOSPHERE PROGRAMME, MARINE SPATIAL PLANNING: A STEP-BY-STEP APPROACH TOWARD ECOSYSTEM-BASED MANAGEMENT, IOC MANUAL AND GUIDES NO. 53 (2009), available at <http://www.unesco-ioc-marinesp.be/uploads/documentenbank/3368f5bca7792e8da75ed70c9d8dd63.pdf>.

78. The evolution of mitigation measures in the CAA can be observed through a review of the terms agreed to, beginning with the first agreement, ALASKA ESKIMO WHALING COMM’N & OIL/WHALERS WORKING GRP., COOPERATIVE PROGRAMS FOR THE BEAUFORT SEA (1986), available from the AEWC or from Jessica Lefevre) through the 2012 OPEN WATER SEASON PROGRAMMATIC CONFLICT AVOIDANCE AGREEMENT: FINAL FOR SIGNATURE (2012), available at http://www.nmfs.noaa.gov/pr/pdfs/permits/bp_openwater-caa2012.pdf.

79. Alaska’s North Slope is home to the municipality of the North Slope Borough and its Department of Wildlife Management, which conducts an internationally recognized wildlife research program focusing on the bowhead whale.

80. Albert, *supra* note 20, at 265-78.

81. See GEORGE NOONGWOK ET AL., *Traditional Knowledge of the Bowhead Whale (Balaena mysticetus) Around St. Lawrence Island, Alaska*, 60 ARCTIC, No. 1, 47-54 (Mar. 2007).

Eskimo whale hunters reported strong and long-term reactions of bowhead whales to active seismic testing.⁸² Data published in 1985 and 1988, from an earlier study, however, indicated that the whales' reactions were less dramatic and shorter term.⁸³

The hunters appealed to their consulting scientists, with whom they were collaborating on the IWC issues, and also engaged federal regulators and industry scientists in an effort to understand the source of the discrepancies. With this began a multi-year push to establish a requirement and procedure for the independent peer review of the industry monitoring plans required under the MMPA, and of other research efforts undertaken on the effects of industrial activities on bowhead whales. The population studies required by the IWC to support continuation of the bowhead whale subsistence hunt were—and are—subjected to intense independent peer review by the IWC's Scientific Committee. So, the hunters reasoned, research on industrial impacts to this critical food resource and studies designed to gather that research should be subject to a similarly rigorous review process. In this case, however, the hunters advocated that their traditional knowledge of bowhead whale behavior be recognized as an expertise qualifying their representatives to join the scientific peer reviewers.

Scientists working with the hunters focused the drive for independent peer review on the design of research studies and the interpretation of data resulting from the studies. Given their experience with the high quality of the hunters' traditional knowledge, observed through the work on bowhead whale population studies, these scientists strongly endorsed the inclusion of this traditional knowledge in an independent peer review process. In particular, they argued, consulting the hunters' traditional knowledge of bowhead whale behavior during the review of a study's design (the process of structuring questions to elucidate the nature of the phenomena being observed) would greatly enhance the quality of research in this area. Similarly, they argued that

this body of traditional knowledge should be consulted during the interpretation of study results. This ensures that the findings attributed to these studies are consistent with practical experience and local observation.

With time, the initiative to establish a procedure for independent-stakeholder peer review that would enable the hunters to participate in the review process began to gain traction. The effort was aided in 1989, when the Arctic Research Commission issued recommendations on the importance of and the appropriate structure for independent review during the environmental review process.⁸⁴ However, neither operators nor regulators were willing at that time (the late 1980s) to fully embrace the notion of "independent-stakeholder peer review." The result was a legal confrontation that arose following the AEWC's and North Slope Borough's request that the marine mammal monitoring study proposed by ARCO for its 1992 planned drilling operations at the Kuvlum prospect in the central Beaufort Sea be subject to an independent-stakeholder peer review. ARCO refused to agree with the request, and the Office of Protected Resources of NMFS issued the small-take authorization allowing ARCO to operate, without subjecting ARCO's monitoring plan to the requested peer review.⁸⁵ The Native plaintiffs, armed only with affidavits attesting to their observations of impacts, lost the court challenge.⁸⁶

2. A Second Codification in Law: The 1994 MMPA Reauthorization

Given the positive track record of stakeholder collaboration in the development of mitigation measures to reduce conflicts between developers and subsistence whale hunters, Congress, when approached by the AEWC to intervene on the peer review question, was favorably disposed to consider another request for a collaborative approach to dispute resolution. This time, the collaborative process would involve a larger group: offshore operators; whaling captains; scientists for both sets of stakeholders; and federal regulators. Rather than the mitigation measures of the Open Water Season CAA, the subject of collaboration this time would be study design and interpretation for monitoring plans required for small-take authorizations. Thus, in 1994, Congress amended the MMPA to impose the new requirement for "independent peer review" of industry monitoring plans when offshore oil and gas activities might affect the availability of marine mammal subsistence resources.⁸⁷

With this second amendment, Congress reaffirmed the "no unmitigable adverse impact" standard, and the bill's sponsors stated their intent "that the Secretary will encourage extensive consultation between affected parties on

82. See Affidavit of Burton "Atgaan" Rexford, *supra* note 63; Affidavit of Eugene Brower, *exh. 4 supra* note 61.

83. See, e.g., DONALD K. LJUNGBLAD ET AL., OBSERVATIONS ON THE BEHAVIOR OF BOWHEAD WHALES (*BALAENA MYSTICETUS*) IN THE PRESENCE OF OPERATING SEISMIC EXPLORATION VESSELS IN THE ALASKAN BEAUFORT SEA, REPORT TO MINERALS MANAGEMENT SERVICE, ALASKA OCS REGION 78 (1985) SEACO Inc.; DONALD K. LJUNGBLAD ET AL., *Observations on Behavioral Responses of Bowhead Whales (*Balaena mysticetus*) to Active Geophysical Vessels in the Alaskan Beaufort Sea*, 41 ARCTIC 41183-94 (1988) (providing the often cited results showing that bowhead whales did not react strongly to the approaching seismic vessel until it was 7.5 km (4 mi.) from the animals). This result and accompanying data were cited repeatedly for a number of years in Draft Environmental Impact Statements. E.g., MINERALS MGMT. SERV., OCS EIS/EA MMS 97-0011 BEAUFORT SEA PLANNING AREA OIL AND GAS LEASE SALE 170, DRAFT ENVIRONMENTAL IMPACT STATEMENT IV-B-19 (1997). This information was also cited in review documents. E.g., W. John Richardson & Charles I. Malme, *Man-Made Noise and Behavioral Responses*, in THE BOWHEAD WHALE SPECIAL PUBLICATION NO. 2: THE SOCIETY FOR MARINE MAMMALOGY, *supra* note 25, at 671, 674; W. John Richardson, *Documented Disturbance Reactions*, in MARINE MAMMALS AND NOISE 241, 298 (W. John Richardson et al. eds., 1995); W. John Richardson, *Acoustic Effects on Bowhead Whales: Overview*, in PROCEEDINGS OF THE 1995 ARCTIC SYNTHESIS MEETING OCS STUDY MMS 95-0065 107, 109 (1996).

84. See U.S. Arctic Research Comm'n, *Improvements to the Scientific Content of the Environmental Impact Statement Process*, Issue No. 4 (1989).

85. NAT'L MARINE FISHERIES, LETTER OF AUTHORIZATION FOR ARCO ALASKA, INC. (1993).

86. Alaska Eskimo Whaling Comm'n v. Foster (1993), *supra* note 61.

87. 16 U.S.C. §1371(a)(5)(D) (2006).

appropriate monitoring, reporting and mitigation measures in granting authorizations under [§ 101(a)(5)].⁸⁸ Speaking in 1994, Sen. Ted Stevens (R-Alaska) clearly articulated the congressional intent that “the bill codifies the arrangement that has been worked out between Native subsistence harvesters, the oil industry and executive branch agencies regarding the authorization of activities—such as oil exploration—which disturb, or incidentally harass . . . marine mammals.”⁸⁹ Thus, in adopting the new requirement for independent peer review and reaffirming the “no unmitigable adverse impact” standard, Congress explicitly directed that the balance of trade offs between modern offshore industrial activities and northern Alaska’s long-standing coastal subsistence culture be struck through collaboration between offshore operators and subsistence hunters.

3. Federal Regulatory Response

NMFS, whose jurisdiction includes the review of industry monitoring plans required under the MMPA,⁹⁰ took responsibility, on behalf of the U.S. government, for sponsorship of the collaborative independent-stakeholder peer review that emerged from the 1994 MMPA Amendments. Known as the annual “Open Water Season Peer Review Meeting,” this independent-stakeholder review joined the CAA Process as a central feature of the arctic development planning process.⁹¹

C. Development of the Key Tools for the Management of Offshore Industrial Activities in Marine Mammal Subsistence Hunting Areas

As this overview indicates, the five key management tools that have emerged from the CAA Process and the Open Water Season Peer Review Meetings to date are the following. First, it is essential to provide for regular and ongoing radio contact among hunters and industry or commercial vessel traffic, using shore-based communications centers. Specific traffic management guidelines can help to reduce the possibility of unexpected interactions between small hunting skiffs and larger vessels. These guidelines can also help to reduce disturbances to marine mammals and to opportunities for subsistence takes of marine mammals.

Second, a set of time-area closures corresponding to the movement of the migration and the timing of the hunt reduce impacts to the migration and help to ensure an undisturbed subsistence harvest. Third, restrictions on levels of pollution in marine mammal habitat are important. The goal here is not only habitat preservation and guarding human health, but also the reduction of the potential

for disturbance to marine mammals. Hunter observations indicate that bowhead whales react to anthropogenic smells or substances in the water, and those reactions can cause behavior changes in the whales, resulting in a reduction in availability for subsistence takes.⁹² Fourth, it is important to establish restrictions on vessel movement in the presence of bowhead whales, for the safety of the whales and to reduce the likelihood of disturbance.

Finally, providing for independent-stakeholder peer review of the drafts of the design and interpretation of research proposals and results can greatly increase the reliability of data-gathering. In the case of monitoring plans required for small-take authorizations in the Arctic Ocean, independent peer review that includes hunters on the review panel can enhance the scientific process by making the traditional knowledge and ongoing hunter observations available to researchers.⁹³

I. The Communications Scheme: Keeping Industry Operators and Eskimo Hunters in Touch While on the Water⁹⁴

With receding sea ice and increasing interest in the Arctic Ocean, the transit of both small and large ocean-going craft and their impacts to hunters and marine mammals increasingly are becoming sources of concern. The communications provisions of the CAA were developed for the purpose of managing the interactions between small fall bowhead whale subsistence hunting boats and oil and gas industry vessels, and continue to serve that purpose. Companies participating in the CAA agree to fund radio-based communications centers (Com Centers), primarily at Deadhorse⁹⁵ and in Kaktovik, Barrow, Wainwright, and Pt. Hope.⁹⁶ As development activity ramps up in the Chukchi Sea, Com Centers are being added to villages in the southern Chukchi Sea and the Bering Straits region.⁹⁷ The Com Centers are staffed by local residents. The companies also agree, under the terms of the CAA, to hire local residents and place them on vessels operated by or

88. See CONGRESSIONAL RECORD, *Marine Mammal Protection Act Amendments of 1993*: Section-by-Section Analysis of S. 1636, p. S. 3294 (Mar. 21, 1994) (discussion of §4(d)).

89. *Floor Debate on S. 1636, S. 3297* (1994) (discussion of Alaska Provisions, statement of Senator Ted Stevens).

90. 50 C.F.R. §218.108 (2001); 50 C.F.R. §216.206 (2011).

91. See <http://www.nmfs.noaa.gov/pr/permits/openwater.htm>, for details of the 2013 meeting.

92. Interviews with Archie Ahkiviana and Harry Brower Jr., *supra* note 60. These observations are supported by recent research findings indicating that bowhead whales have the capacity for olfactory perception. See J.G.M. Hans Thewissen et al., *Olfaction and Brain Size in the Bowhead Whale (Balaena mysticetus)*, 27 MARINE MAMMAL SCI. 2:282-94 (2011).

93. See discussion in this Article *supra* at Part IV.B.1. Small-take authorizations are governed by MMPA §§101(a)(5)(A) and (D), 16 U.S.C. §1371(a)(5)(A) and (D).

94. See 2012 OPEN WATER SEASON PROGRAMMATIC CONFLICT AVOIDANCE AGREEMENT: FINAL FOR SIGNATURE tit. II, *available at* http://www.nmfs.noaa.gov/pr/pdfs/permits/bp_openwater_caa2012.pdf.

95. Deadhorse is a community on the North Slope of Alaska, primarily comprising facilities for companies and workers operating the Prudhoe Bay oil fields located nearby.

96. See 2012 OPEN WATER SEASON PROGRAMMATIC CONFLICT AVOIDANCE AGREEMENT, *supra* note 94, at §203(a) and (b).

97. Com Centers for Kivalina, Wales, and St. Lawrence Island were added by Shell for the 2012 operating season. See REVISED CHUKCHI SEA EXPLORATION PLAN ERRATA FOR SHELL GULF OF MEXICO, INC. BUREAU OF OCEAN ENERGY MGMT. (2011), *available at* http://www.boem.gov/uploadedFiles/BOEM/Oil_and_Gas_Energy_Program/Plans/Regional_Plans/Alaska_Exploration_Plans/2012_Shell_Chukchi_EP/ChukchiErratadocumentOct28RFAI.pdf.

for the companies, to serve as marine mammal observers and to handle vessel-Com Center communications.⁹⁸ The CAA contains communications protocols for industry vessels and hunting boats to follow, enabling the Com Center operators to track and report on vessel movements, so that industry vessels do not interfere with whale hunting activities.⁹⁹

The communications scheme serves as an important “traffic management” tool, helping to ensure against the threats posed to small hunting boats by larger ocean-going craft. Radio contact also lends itself to real-time cooperation between operators and hunters, enabling stakeholders to “fine-tune,” on a real-time basis, the broader mitigation measures. Since the communications system is open and available on agreed VHF channels, it is available for use by any vessels transiting the area, whether or not they are affiliated with an offshore oil and gas operator.

2. The Time-Area Closures: Using Space and Time to Separate Industrial Activity From Subsistence Hunting¹⁰⁰

To enhance the research opportunities, in some years, especially the late 1980s and the 1990s, the hunters agreed to accept limited adverse impacts to their hunting opportunities in exchange for heavy investments by operators in collaboratively designed monitoring plans aimed at studying whale reactions to specific industrial operations. This approach was used, most notably, for the collection of data from acoustic and aerial survey monitoring of seismic exploration undertaken for BP in the mid-Beaufort Sea during the 1996 and 1997 open-water seasons. The results of this study show that bowhead whale-call rates changed at least 45 kilometers (km) (27 mi.) from an active seismic vessel.¹⁰¹ These and additional data collected in 1998 showed that nearly all fall-migrating bowhead whales stayed 20 km (12 mi.) away from an operating seismic vessel.¹⁰² The findings supported the observations of whaling captains and crews from the villages of Nuiqsut and Kaktovik, who hunt in the mid-Beaufort Sea region. Whales that do not deflect are reported to become “skittish,” changing their migratory behavior such that swimming and breathing patterns are unpredictable.¹⁰³ More aggressive behavior also has been reported in these disturbed whales.¹⁰⁴

These findings clearly show the value of independent-stakeholder peer review. The study design and draft report for the 1996 through 1998 BP work were among the first subjects of the early Open Water Season independent-stakeholder Peer Review Meetings. Not surprisingly, the results of these carefully designed and implemented studies were consistent with the local observation of hunters from the affected villages.

Early efforts at mitigation of these behavioral impacts to fall migrating bowhead whales involved establishing an “avoidance” radius around active whaling crews, with the intent of excluding active seismic operations and support and supply vessels, so that the hunters could pursue whales they had spotted.¹⁰⁵ This technique did not eliminate disputes, however, as the hunters found the radii too small and the operators argued that the radii were not necessary at all.¹⁰⁶ This issue led to the deletion of reference to the radii and to seismic operations from the 1991 CAA as the two sets of parties attempted to work together to resolve the dispute.¹⁰⁷ By 1997, the structure of the present Beaufort Sea time-area closures was emerging as the AEWc worked with BP and ARCO on measures for their mid-Beaufort Sea operations at Northstar and Warthog.¹⁰⁸ The title of the annual agreement was also updated to the “Open Water Season CAA.”¹⁰⁹

When offshore oil and gas exploration in the Beaufort and Chukchi Seas began to pick back up in 2006, the time-area closure for Barrow was established and the annual agreement became the “Open Water Season Programmatic CAA.”¹¹⁰ In earlier iterations, the mitigation measures set forth in the agreement were tailored, on an annual basis, to address specific operations. The change in title reflects the parties’ recognition that, with the present increases in offshore activity, mitigation measures designed to protect the hunt generally provide predictability for all stakeholders and facility cooperation. In 2007, the stakeholders reached agreement on the need for a temporary cessation, each season, of industrial activity in the vicinity of the whaling areas along the Beaufort Sea coast.¹¹¹

By 2008, the present structure of the Beaufort Sea time-area closures, including details for operations within and beyond the mid-Beaufort Sea barrier islands, were in

98. See 2012 OPEN WATER SEASON PROGRAMMATIC CONFLICT AVOIDANCE AGREEMENT, *supra* note 94, at §201.

99. *Id.* at §202.

100. See 2012 OPEN WATER SEASON PROGRAMMATIC CONFLICT AVOIDANCE AGREEMENT, *supra* note 94, at §502.

101. MARINE MAMMAL AND ACOUSTICAL MONITORING OF BPXA’S SEISMIC PROGRAM IN THE ALASKAN BEAUFORT SEA, 1997 318 (W. John Richardson ed., 1998) (cited in Nat’l RESEARCH COUNCIL, *supra* note 21, at 136).

102. *Id.*

103. Interview with Thomas Napageak, Nuiqsut Whaling Captain, former Chairman, AEWc, *supra* note 59.

104. *Id.* See also *Documented Disturbance Reactions*, *supra* note 83, at 268-70.

105. 1989 OIL/WHALERS COOPERATIVE PROGRAM FOR THE BEAUFORT SEA, ¶ 8.B.1. (Sept. 8, 1989); 1990 OIL/WHALERS COOPERATIVE PROGRAM FOR THE BEAUFORT SEA, ¶ 8.B.1. (Sept. 8, 1990). (Documents available from the AEWc or from Jessica Lefevre.)

106. 1989 OIL/WHALERS COOPERATIVE PROGRAM FOR THE BEAUFORT SEA, at 12, n.1. (Sept. 8, 1989); 1990 OIL/WHALERS COOPERATIVE PROGRAM FOR THE BEAUFORT SEA, at 13-14 n.1. (Sept. 8, 1990).

107. FALL COMMUNICATIONS AND AVOIDANCE PROCEDURES FOR THE ARCTIC AND BEAUFORT SEA OCS, at 11, n.3 (1991). (Available from the AEWc or from Jessica Lefevre.)

108. 1997 OPEN WATER SEASON CONFLICT AVOIDANCE AGREEMENT, tit. III (July 29, 1997). (Available from the AEWc or from Jessica Lefevre.)

109. *Id.*

110. 2006 OPEN WATER SEASON PROGRAMMATIC CONFLICT AVOIDANCE AGREEMENT (May 12, 2006). (Available from the AEWc or from Jessica Lefevre.)

111. 2007 OPEN WATER SEASON PROGRAMMATIC CONFLICT AVOIDANCE AGREEMENT, at 22-23 (Feb. 27, 2007). (Available from the AEWc or from Jessica Lefevre.)

place.¹¹² Moving from east to west with the fall bowhead whale migration, these temporary “quiet zones” allow the whales to travel through the Beaufort Sea relatively undisturbed, and each of the three Beaufort Sea villages to take their fall whales with little or no interference as the migration reached their hunting areas, in succession. The quiet period for each village ends with the cessation of hunting. Throughout this time, the stakeholders also have worked to develop a similar structure for the Chukchi Sea. This effort continues as the offshore operators refine their plans for that area and hunters from the Chukchi Sea villages work to adapt to rapidly changing climate and hunting conditions.

While ongoing communications through the AEWIC have enabled operators to request slight modifications to initiation and termination of the closures, on an as-needed basis, establishment of the dates and areas for closure has created a relatively predictable, annual schedule by which the stakeholders alternate their respective uses of the selected areas of the marine environment.

3. The Pollution Limits: Minimizing the Pollution Footprint in Key Habitat and Hunting Areas¹¹³

While laying the groundwork for mitigation measures developed to reduce impacts from future operations, the hunters’ traditional knowledge observations also serve other useful purposes. They provide direct and ongoing observations of arctic marine mammal reactions to offshore development and other anthropogenic impacts. Additionally, they have set the stage for our current understanding that bowhead whales react differently to certain anthropogenic impacts depending upon the activities in which the whales are engaged, observations that have been corroborated by scientific research.

The observations of changes in whale behavior in response to industrial disturbance also have led to a deeper understanding of bowhead whale biology. For example, bowhead whales have long been assumed, by “western” scientists and regulators to have no olfactory sense, similar to other marine organisms known not to be equipped with this sense. However, insistence by hunters that bowhead whales can “smell” led to research recently that disclosed that in fact these animals have a well-developed olfactory anatomy and associated gene structures consistent with an active sense of smell.¹¹⁴ These anatomical findings give support to the often-expressed view by Eskimo hunters that bowhead whales do respond to odors, such as those that can be given off by ice-edge camp sites or engine exhaust from drilling platforms. This could help to explain behavioral changes not easily correlated with noise levels, such as those observed in

the vicinity of exploratory drilling operations where ice management is not in use, but drilling and operational wastes are discharged.

4. The Vessel Transit Guidelines and Restrictions on Vessel Movement: Keeping Bowhead Whales Safe in Areas of Ship Traffic¹¹⁵

Relative to other marine mammal species and stocks, the BCBS bowhead whale stock would seem to be extremely fortunate in that it has a group of humans—the coastal communities of northern and northwestern Alaska—whose well-being is intimately tied to the well-being of the whale.¹¹⁶ This relationship gives rise to the Eskimo hunters’ deep knowledge of the whales’ behavior and biological characteristics, as well as the communities’ strong advocacy regarding the need to protect the whales and their habitat.¹¹⁷ Thus, as the hunters and scientists have increased their understanding regarding the threats posed to whales and other marine mammals from the industrialization and coming commercialization of the Arctic, protections specific to feeding and migrating whales themselves have become integral features of the CAA.

Importantly, CAA restrictions on vessel movements and speeds in the vicinity of fall migrating bowhead whales and whale aggregations reduce the probability of ship strikes on whales from oil and gas industry vessels, even in the absence of any such regulatory requirement in place from federal agencies. The CAA provisions set limitations on vessel speeds and specify avoidance measures to help reduce the risk of whale-ship collisions.¹¹⁸

In fact, while the BCBS bowhead whales have enjoyed the protections placed on vessel movements through the CAA for decades, it was not until 2008 that NOAA began to institute similar restrictions on commercial ship traffic transiting the migratory corridor of the highly endangered North Atlantic right whale (*Eubalaena glacialis*).¹¹⁹ Despite the long-standing recognition that significant mortality from ship strikes was preventing recovery of these right whales, federal agencies took many years to institute protections for this whale stock. The CAA Process provides an excellent starting point for the development of a management regime for protecting the BCBS bowhead whale stock from commercial ship traffic before it becomes a significant danger to the whales.

112. 2008 OPEN WATER SEASON PROGRAMMATIC CONFLICT AVOIDANCE AGREEMENT, at 21-22 (May 30, 2008). (Available from the AEWIC or from Jessica Lefevre.)

113. 2012 OPEN WATER SEASON PROGRAMMATIC CONFLICT AVOIDANCE AGREEMENT, *supra* note 94, at §503.

114. See Thewissen et al., *supra* note 92.

115. 2012 OPEN WATER SEASON PROGRAMMATIC CONFLICT AVOIDANCE AGREEMENT, *supra* note 94, tit. 3.

116. It is not unusual for hunters to take a leading role in wildlife and habitat protection. See, e.g., *About Ducks Unlimited*, DUCKS UNLIMITED, <http://www.ducksunlimited.org/about-du?poe=hometxt> (last visited Aug. 19, 2013).

117. See, e.g., George N. Ahmaogak, *Protecting the Habitat of the Bowhead Whale*, in PROCEEDINGS OF THE SIXTH CONFERENCE OF THE COMITÉ ARCTIQUE INTERNATIONAL (May 13-15, 1985), at 93, 594 (Louis Rey & Vera Alexander eds., 1989).

118. 2012 OPEN WATER SEASON PROGRAMMATIC CONFLICT AVOIDANCE AGREEMENT, *supra* note 94, at 36.

119. 50 C.F.R. §224.105 (2011).

V. Other Opportunities for Application of Multi-Use Management Techniques Similar to the CAA and the CAA Process

Development over most of our planet has occurred without the benefit of either long-term or geographically comprehensive planning. Without adequate planning, environmental degradation and conflicts over resource uses are obvious and with predictable consequences. The Open Water Season CAA Process, described here, presents an example of a rational approach to development, with the potential for reduced levels of ecosystem impacts and increased opportunities for local participation in decision-making. In Arctic Alaska, this stakeholder approach also offers the opportunity for preservation of the culturally and nutritionally important mixed subsistence-cash economy of the local Native community. With the success of the CAA Process, interest in expanding the collaborative model to encompass a broader range of Arctic marine subsistence resources and impacts is emerging.

A. Commercial Shipping

With Arctic ice retreat, commercial ship traffic through the Bering Strait has begun to increase and projections are for both of these trends to continue.¹²⁰ These projections portend a future for the Arctic that includes a large annual volume of ship traffic. According to the Arctic Council, the most significant environmental threats from this increased activity are expected to be oil spills, the introduction of alien species, the disruption of migratory patterns of marine mammals, increased anthropogenic noise, and ship strikes on marine mammals.¹²¹

Obviously, adverse environmental impacts of increased ship traffic will affect arctic coastal communities and their opportunities to maintain their subsistence livelihood. Recent bowhead whale-tagging research reveals that fall migrating bowhead whales tend to congregate along the Russian coast north of the Bering Strait, creating the potential for habitat loss and large numbers of ship strikes if ships traverse this route at the same time the whales are

leading the southern ice edge into the Bering Strait and northern Bering Sea.¹²² On the southern side of the Bering Strait, in the western north Pacific and on the path of Asia-bound vessel traffic, is important habitat for the western gray whale stock thought to be critically endangered.¹²³ Addressing these threats will require proper and careful traffic regulation. Perhaps even more pressing should be the concern for human safety, as the U.S. Coast Guard station at Dutch Harbor in the Aleutian chain, the station nearest to Arctic Alaska, is more than 1,000 miles and approximately five days' ocean transit from Pt. Barrow at the intersection of the Beaufort and Chukchi Seas.¹²⁴

To begin the work of building a regime for protecting arctic marine mammal species from impacts of the projected increases in ship traffic, five Arctic Alaska Native organizations, having federal co-management responsibilities for marine mammal species taken for subsistence, have joined in a coalition effort focused on shipping. The AEW, the Alaska Beluga Whale Committee, the Eskimo Walrus Commission, the Ice Seal Committee, and the Alaska Nanuq Commission decided in September 2012 to work together on these issues under the umbrella of the Arctic Marine Mammal Coalition. This coalition effort is directed specifically at representing Arctic marine mammal hunters' interests related to the potential adverse impacts from commercial ship traffic on marine mammals and their availability for subsistence takes.¹²⁵

B. Commercial Fishing

In August 2009, the North Pacific Fisheries Management Council imposed a moratorium on all commercial fisheries north of the Bering Straits.¹²⁶ The stated goal of the moratorium is to allow time for research on fish and the Arctic marine ecosystem to enable managers to regulate Arctic commercial fish harvests.¹²⁷ The Council's decision offers an excellent example of how regulators can approach planning and management in a step-wise fashion. However, the fact that a temporary moratorium was deemed necessary serves to underscore the significant likelihood that the future of the western Arctic Ocean includes commercial fishing and possibly crabbing as well. In light of this likely future, one would hope that the Fisheries Management Council would look to the success of the collaborative stakeholder initiative underlying the CAA Process as a starting point for future fisheries regulation in the Arctic.

120. ARCTIC COUNSEL, ARCTIC MARINE SHIPPING ASSESSMENT 2009 REPORT 70-91 (2009), available at http://www.arctic.noaa.gov/detect/documents/AMSA_2009_Report_2nd_print.pdf. See also U.S. COAST GUARD ARCTIC STRATEGY at "The Arctic Region" (summary insert following Commandant Papp's introductory letter, citing an arctic warming trend of twice the U.S. average over the past 60 years and a 118% increase in maritime transit through the Bering Strait from 2008 to 2012) (2013), available at http://www.uscg.mil/seniorleadership/DOCS/CG_Arctic_Strategy.pdf. For evidence of interest in tourism, see, e.g., *How Wildlife Cruises to Kamchatka, Chukotka and Wrangel Island, Russia Makes a Difference*, RESPONSIBLE TRAVEL, <http://www.responsibletravel.com/holiday/5753/wildlife-cruises-to-kamchatka-chukotka-and-wrangel-island-russia> (last visited Aug. 19, 2013).

121. ARCTIC COUNSEL, ARCTIC MARINE SHIPPING ASSESSMENT 2009 REPORT, *supra* at 120. For some surprising research findings on the impacts of anthropogenic noise to large whales, see Rosalind M. Rolland et al., *Evidence That Ship Noise Increases Stress in Right Whales*, 279 PROC. ROYAL SOC'Y BIOLOGICAL SCI. 1737:2363-68 (2012), available at <http://rspsb.royalsocietypublishing.org/content/279/1737/2363.short>.

122. QUAKENBUSH ET AL., *supra* note 25, at 16 and fig. 2.

123. *Western Gray Whale Fact Sheet*, INT'L UNION FOR THE CONSERVATION OF NATURE (Dec. 2, 2010), available at http://cmsdata.iucn.org/downloads/western_gray_whale_fact_sheet.pdf.

124. See <http://ports.com/sea-route/port-of-dutch-harbor,united-states/barrow-harbor,united-states/> (last visited Aug. 19, 2013).

125. See letter from the above-named groups dated September 20, 2012, to the U.S. Coast Guard on Docket Nos. USCG-2012-0720 and USCG-2010-0833.

126. N. PAC. FISHERIES MGMT. COUNCIL, FISHERY MANAGEMENT PLAN FOR FISH RESOURCES OF THE ARCTIC MANAGEMENT AREA 5 (2009), available at <https://alaskafisheries.noaa.gov/npfmc/PDFdocuments/fmp/Arctic/ArcticFMP.pdf>.

127. *Id.* at 2.2.2.

VI. Conclusion

Presented here is a real-world example of a scheme for the ecosystem-based multi-use management of a coastal area. For close to 30 years, the CAA Process has enabled offshore oil and gas development to proceed in a setting dominated both by important marine mammal habitat and federally protected bowhead whale subsistence hunting. By facilitating the creation of a negotiated mitigation regime, through the collaborative effort of stakeholders pursuing potentially conflicting uses of the marine environment, the CAA Process offers an efficient and highly effective means of reaching a successful outcome for all participants.

The prospect of expanding industrial and commercial uses in the Arctic marine environment means that the potential for conflicts between subsistence and non-subsistence uses, as well as impacts to resource habitat, are likely to increase. These potential conflicts are not insignificant, since adverse impacts to subsistence resources can affect the social and nutritional health of the thousands of indigenous people residing in Arctic Alaska. At the same time, resolving these kinds of conflicts is not a simple matter. Industrial and commercial development promise economic opportunity and improved living conditions for Arctic peoples. However, the cultural and nutritional livelihood of these remote coastal communities remain tightly woven into the seasonal and migratory characteristics of the Arctic ecosystem, especially its marine mammals. If resources are not harvested when their migratory routines make them available, significant nutritional opportunities will be lost. At the same time, signs of psychological and social stress could appear quickly within the Native community if outside forces threaten a long-term reduction in these opportunities. Yet, energy development is an imperative of our times and the OCS of the Alaskan Arctic Ocean contains what are thought to be significant reserves. Commercial shipping and fishing appear to be fast on the heels of energy development in the Arctic. As a backdrop to all of this, the Arctic environment itself is changing, introducing heightened uncertainty for all who, now or in the future, may find life and livelihood in this harsh environment.

With so much at stake for all involved, conflicts in this dynamic and multifaceted setting carry an urgency

and immediacy to which traditional regulatory measures, built on long lead times and layered decision processes, are not easily adapted. The CAA and the procedures built around it grew out of the need for an adaptable process that allows those directly affected by conflicting uses and requirements to craft specific, and if need be immediate, solutions to problems as they are identified. The opportunity for local residents to formally participate in these decisions will not alleviate all of the social and psychological stresses and attendant social ills that accompany rapid, externally imposed social change. However, local residents and their leaders instinctively recognize the importance of this opportunity and have long sought to participate in the development decisions that are transforming their lives. Recognition of the importance of their participation and their very important contributions is emerging.¹²⁸ The CAA Process is one mechanism for addressing this need, and the hope is that local involvement in decisionmaking through this process will make a positive contribution to the ability of these communities to keep a sense of equilibrium as they live through this period of change.

The CAA Process has grown up in the relatively unique setting of seasonal bowhead whale subsistence hunting and Arctic offshore oil and gas exploration. However, there is no reason the model it provides should be limited to this specific application. Certainly, in the arctic marine context, some of the industrial and commercial activities being introduced have the potential to affect the other key marine mammal resources: beluga whales; walrus; ice seals; and polar bears. If commercial or industrial activities begin to impinge on the availability of these resources, the CAA Process might be looked to as an example of how to address needs in that context.

More broadly, in an era where humans must think increasingly in terms of the sustainable use of resources and integrated management, direct stakeholder involvement such as this seems quite appropriate for addressing certain user conflicts. The next challenge, of course, is to find the means by which the outcomes of these stakeholder-driven processes, which occur outside the traditional legal and regulatory context, can be incorporated into traditional legal and regulatory decisionmaking.¹²⁹

128. See President Obama's NATIONAL STRATEGY FOR THE ARCTIC REGION (2013), at 8, available at http://www.whitehouse.gov/sites/default/files/docs/nat_arctic_strategy.pdf; MANAGING FOR THE FUTURE IN A RAPIDLY CHANGING ARCTIC, A REPORT TO THE PRESIDENT (2013), at 14-15 (noting the importance of traditional knowledge, including "for sustainable management of natural resources"), 41-42 and inset at 42 (referencing the CAA and the Arctic Marine Mammal Coalition), available at http://www.afsc.noaa.gov/Publications/misc_pdf/IAMreport.pdf.

129. For a discussion of relevant recommendations, see Christopher G. Winter, *Collaborative Decisionmaking in the Arctic Under the Marine Mammal Protection Act and a Proposal for Enhanced Support From the Federal Government*, 43 ELR 10938 (Oct. 2013).