

**REPORT ON WEAPONS, TECHNIQUES, AND
OBSERVATIONS IN THE
ALASKAN BOWHEAD WHALE SUBSISTENCE HARVEST**

Prepared by the Alaska Eskimo Whaling Commission

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INTRODUCTION

This report, submitted to the 67th meeting of the International Whaling Commission, is the 21st in the Alaska Eskimo Whaling Commission's (AEWC's) series of reports to the IWC on its Weapons Improvement Program (WIP), comprising updates and upgrades to the weapons used in the bowhead whale subsistence harvest and other measures employed to improve the efficiency and welfare of the harvest. Prior reports on this program can be found at:

- 1993: *A new penthrite grenade for the subsistence hunt of bowhead whales by Alaskan Eskimo – developmental work and field trials in 1988*, Øen, E.O., (IWC/44/HKW/6).
- 1994: *Hunting efficiency and recovery methods developed and employed by native Alaskans in the subsistence hunt of the bowhead whale*, (IWC/46/HK/3).
- 1995a: *Killing methods for minke and bowhead whales*, Øen, E.O., (IWC/47/WK/8)
- 1995b: *Hunting efficiency and recovery methods developed and employed by native Alaskans in the subsistence hunt of the bowhead whale*, Alaska Eskimo Whaling Commission, (IWC/47/WK/15).
- 1996: *Determination of the muzzle velocity of the black powder and penthrite projectiles fired from a bench-mounted darting gun of the type used by Alaskan Eskimo in the subsistence hunt of the bowhead whale, as influenced by the propellant charge and other factors*, Ingling, Allen, as submitted to the North Slope Borough.
- 1999: *Hunting efficiency and recovery methods developed and employed by native Alaskans in the subsistence hunt of the Bowhead whale*, (IWC/51/WK/4).
- 2000: *Update on use of the penthrite projectile in the bowhead whale subsistence harvest at Barrow, Alaska*, Dr. Todd O'Hara, (IWC/52/WKM&AWI/7).
- 2001: *Report on the use of the penthrite grenade in the 2000 bowhead whale subsistence hunt in Barrow, Alaska*, submitted by the U.S.A., (IWC/53/WKM & AWI/8).
- 2002: *Report on the use of the penthrite projectile in the 2000 and 2001 bowhead whale subsistence hunts in Barrow, Alaska*, submitted by the U.S.A., (IWC/54/WKM&AWI/9).
- 2003: *Report on weapons, techniques and observations in the Alaskan bowhead whale subsistence hunt*, submitted by the U.S.A., (IWC/58/WKM&AWI/22).
- 2004: *Report of the Alaska Eskimo Whaling Commission Progress Concerning Improvement of Whale Killing Methods*, submitted by U.S.A., (ref, Annual Report of the International Whaling Commission 2004, Annex G, p. 98).
- 2006: *Report on Weapons, Techniques, and Observations in the Alaskan Bowhead Whale Subsistence Hunt*, submitted by U.S.A. (IWC/58/WKM&AWI/22).
- 2007: *Report on Weapons, Techniques, and Observations in the Alaskan Bowhead Whale Subsistence Hunt*, submitted by U.S.A. (IWC/59/WKM&AWI/4).
- 2008: *Report on Weapons, Techniques, and Observations in the Alaskan Bowhead Whale Subsistence Hunt*, submitted by U.S.A. (IWC/60/21)
- 2009: *Report on Weapons, Techniques, and Observations in the Alaskan Bowhead Whale Subsistence Hunt*, submitted by U.S.A. (IWC/61/WKM&AWI/4).
- 2010: *Report on Weapons, Techniques, and Observations in the Alaskan Bowhead Whale Subsistence Hunt*, submitted by U.S.A. (IWC/62/13).
- 2011: *Report by Harry Brower, AEWC Chair*, (Ref, IWC/63/Rep6).
- 2012: *Report on Weapons, Techniques, and Observations in the Alaskan Bowhead Whale Subsistence Hunt*, submitted by U.S.A. (IWC/64/WKM&AWI/08).

- 2014: *Report on Weapons, Techniques, and Observations in the Alaskan Bowhead Whale Subsistence Hunt*, submitted by U.S.A. (IWC/65/WKM&AWI/08).
- 2016: *Report on Weapons, Techniques, and Observations in the Alaskan Bowhead Whale Subsistence Hunt*, submitted by U.S.A. (IWC/66/WKM&AWI/06).

THE ALASKA ESKIMO WHALING COMMISSION (AEWC)

The AEWK is a not-for-profit organization whose members are the bowhead subsistence whaling captains of the eleven coastal villages in the Alaskan Arctic: Savoonga, Gambell, Little Diomede, Wales, Kivalina, Pt. Hope, Pt. Lay, Wainwright, Utqiagvik (Barrow), Nuiqsut, Kaktovik. The geographic territory of these villages stretches from Savoonga and Gambell on St. Lawrence Island in the northern Bering Sea, through the Bering Strait, and then east across the Chukchi and Beaufort Seas to Kaktovik on Barter Island at the eastern boundary of Alaska.

The Siberian Yupik and Inupiat communities of this vast region rely, as they have for millennia, on the traditional subsistence harvest of the Bering-Chukchi-Beaufort Seas (BCB) stock of bowhead whales. In these villages, the subsistence hunt of the bowhead whale provides up to 63% of the total subsistence foods harvested by individual North Slope villages (MMS, 2008). The year-round schedule of activities required to prepare for a hunt, the hunt itself, and the sharing of meat and muktuk, directly and through celebrations that follow, reinforce social relations and transmit practical skills and cultural values central to life in these isolated and remote communities. Thus the bowhead whale harvest is critical to both the nutritional and cultural health of the AEWK's communities. In addition, as discussed below, the bowhead whale subsistence harvest is shared, free of charge, throughout northern Alaska, as a key component of the mixed subsistence/cash economy that supports the communities of this region.

The subsistence whaling captains from the AEWK's villages came together to form the AEWK in 1978 for the purpose of protecting the bowhead whale, its habitat, and the subsistence hunt, following the 1977 action by the IWC to ban the subsistence harvest. The Board of Commissioners of the AEWK consists of one member from each of the eleven constituent villages. Since 1980, the AEWK has co-managed the bowhead whale subsistence harvest pursuant to a Cooperative Agreement with the United States Department of Commerce/National Oceanic and Atmospheric Administration.

The AEWK works closely with the scientists in the North Slope Borough Department of Wildlife Management to collect data on the bowhead whale, to track the status of the stock, and to understand and manage potential threats to the whale and its habitat. These efforts, which bring together the direct knowledge of the whaling captains with the scientific expertise of the Department's highly regarded wildlife biologists and consulting subject-matter experts, produce state-of-the-art information on the status of the bowhead whale population and the sustainability of the subsistence harvest. Through these efforts, scientists have confirmed the reliability of the direct knowledge of the AEWK's whaling captains on the health of the bowhead whale stock, the behavioral traits of the bowhead whale, and methods for managing potential adverse impacts to whales and conflicts with the subsistence harvest from other anthropogenic activities in the marine environment.

BERING-CHUKCHI-BEAUFORT SEAS BOWHEAD WHALE POPULATION DYNAMICS

As reported during the 2016 meeting of the IWC Scientific Committee (IWC/66/Rep01(2016)), the 2011 abundance estimate for the Bering-Chukchi-Beaufort Sea bowhead whale stock is 16,820 with a 95% confidence interval of 15,176-18,632 (Givens *et al.*, 2016). The current estimate for the rate of increase for this stock is 3.7% with a 95% confidence level of 2.9%-4.6%. These abundance and trend estimates are consistent with the results of the previous census, which were discussed in reports provided to the IWC in 2014. At its 2018 meeting, the Scientific Committee also reviewed the analysis of photo-identification survey data collected from a 2011 aerial survey of Bering-Chukchi-Beaufort Sea bowhead whales that yielded an abundance estimate of 27,133 with a 95% confidence interval of 17,809-41,337. The Scientific Committee's Aboriginal Whaling Management Procedure Working Group concluded that this estimate was suitable for providing management advice and use with the Bowhead SLA, which means it's an acceptable estimate (SC/67B/AWMP/01/Rev1, IWC/67/Rep01(2018), at 3.1.1.1). The Scientific Committee also discussed reasons why the photo-identification estimate could be biased upwards and the ice-based estimate (16,820) could be biased low. So, the true population size may lie between these two estimates. However, for the 2018 Implementation Review, it was agreed to use the more precise ice-based estimate of 16,820 (CV 5%), (IWC/66/Rep01(2016), Annex E).

THE ALASKAN BOWHEAD WHALE SUBSISTENCE HARVEST AND SHARING OF SUBSISTENCE FOODS

The aboriginal subsistence hunt of bowhead whales in Northern Alaska is carried out by Inupiat and Siberian Y'upik communities by traditional means, from small boats with small crews utilizing hand-held weapons. The hunt is extremely dangerous, because the crews must often navigate hazardous sea and ice conditions far from shore and must approach at very close range to strike the whale.

The timing and location of the hunting activities for each of the eleven villages represented by the AEWC corresponds with the annual migration of the whale. The success of the hunting activities can depend on ice conditions, weather, sea state, and the extent of vessel traffic and other offshore activities that can interfere with the hunt and/or alter the behavior of migrating whales.

Nine of AEWC's eleven subsistence whaling villages, historically, hunted whales in the spring as bowheads migrate north and east from the Bering Sea, through the Bering Strait, and then east through the spring ice leads along the Chukchi Sea coast. During the spring, whaling crews stage from the edge of the shore-fast ice and typically hunt from wood-framed boats, called *umiaqs*, which are made by hand using the skins of bearded seal or walrus, sewn with thread made from caribou sinew. With the continuing disappearance of spring sea ice and reduced staging opportunities, however, motorized skiffs are also becoming necessary during periods in the spring.

Two Beaufort Sea villages, Kaktovik and Nuiqsut, hunt only in the fall as the bowheads reverse their migration and move west through coastal waters towards Point Barrow. During the fall season, with open water, whaling captains and their crews operate in small skiffs with small, outboard motors, which are launched from shore. Crews must often travel great distances in the fall during the open water period, having to cope with variable and unpredictable weather, heavy seas, periodic ice, and potential conflicts with vessels associated with scientific research, oil and gas, tourism and other sectors.

The village of Utquiagvik (Barrow), located at the junction of the Beaufort and Chukchi Seas, hunts in both the spring and fall. As discussed in prior reports, Chukchi Sea villages including Wainwright, Pt. Lay, and Point Hope are increasingly looking to the fall hunt as ice and weather conditions continue to deteriorate during the spring. To date, Wainwright is the only Chukchi Sea village to have taken whales during fall open water. In addition, the timing, extent, and quality of sea ice formation and presence in the northern Bering Sea has changed dramatically. Sea ice now forms later in the autumn, there is less sea ice coverage, and it is of thinner, weaker quality. In the late 1990s, Savoonga and Gambell, formerly spring hunting villages, began to more regularly harvest whales in December and January. Savoonga landed a whale on January 9, 2017, in unprecedented ice-free conditions reflecting the presence of open water and accessible whales (Suydam and George, 2012 and Noongwook *et al.*, 2007, cited in Suydam *et al.*, 2017).

The bowhead whale subsistence harvest not only provides essential food for the coastal villages in Northern Alaska, but these subsistence foods are also shared extensively throughout Alaska and are key components of the subsistence/cash economy that supports northern communities. Sharing is one of the core values of Inupiat and Yupik culture and society, helping to strengthen social ties within villages and across communities. Research in recent years has looked at the social networks of sharing and cooperation that make up the subsistence component of the economies of the Native communities of northern Alaska (Kofinas *et al.*, 2016, Burnsilver *et al.*, 2016). The bowhead whale component of these sharing networks will be reported on separately to the IWC.

The bowhead whale subsistence hunt is a cooperative effort that requires participation of the entire community in some way. Different people in the community must contribute to the effort in different ways in order to ensure a successful hunt. Thus, the entire bowhead whale hunt is centered on sharing, not only of the subsistence foods but also of the effort, time, materials, and personal commitment that goes into the hunt.

In short, the bowhead whale subsistence hunt continues to be the focus of the culture, economy, and food security systems of North Slope communities.

Hunter Safety and Traditional Means Utilized in the Bowhead Whale Subsistence Harvest

To conduct the spring hunt, whaling captains and crews spend weeks using axes, picks, and shovels to break a smooth trail through the shore-fast ice to make a path for snow machines from their villages to the edge of the ice, which can be several miles from shore, where the captains and crews stage for the hunt. Utilizing this path, hunters use snow machines and sleds to carry

the *umiaqs* and other whaling equipment to the ice edge. With ice camps established at the ice-edge, the crews must constantly be aware of shifts in the wind and currents that can destabilize the ice, creating cracks that lead the ice platform to break away from the shore and float free, or crumble and sink. Equally dangerous, the current can carry pack-ice into the shore-fast ice, crushing it – and everything on it – toward the shore. Crews must be constantly ready to decamp and flee to shore in the face of one of these deadly events.

An additional hazard is the presence of polar bears. Human-polar bear interactions can be lethal, so hunters must always be aware of the presence of bears and guard against threats to their crews from these large predators, who are also on the ice to hunt.

The primary weapon used to conduct the bowhead whale harvest is a hand-held darting gun, with the gun itself, as well as a harpoon with line and float attached, mounted on the end of a nine-foot wooden shaft.¹ The crew maneuvers the small boat into the path of the whale's swim route, ideally arriving virtually on top of the whale as it sounds. The whaling captain and their crews must be vigilant to reduce the amount of sound in the water column, which can spook the whale and cause erratic and dangerous behavior that could lead to the swamping of a boat or worse.

When the whale sounds, the harpooner aims the darting gun just behind the skull and throws it by hand. The harpoon strikes the whale first, attaching the float. Immediately after, the trigger rod of the darting gun strikes and fires the explosive projectile into the whale, typically with the crew within feet of the whale and the explosive device.

Soon after the whale is struck, the crew attaches a rope between the boat of the crew that struck first and the tail flukes, to begin the journey back to shore.

However, the captain and crew first must wait to ensure that the whale's cessation of movement is permanent. It is not unheard for a whale that appears to have lost consciousness and died instantaneously, even one that has turned "belly-up," to suddenly right itself and begin moving again, due to non-conscious reflex movements of the tail. If the crew attached its boat to a moving whale, boat and crew could be dragged under the water.

Once the captain has determined that it is safe, the whale is attached to the boat and a prayer of thanksgiving is offered for the whale. Then the captain and crew begin the task of towing the whale back to the ice edge or the shore, typically assisted by other boats that also tie on to help with the towing. This is a time of great risk for the crew, because weather, ice conditions, and sea state can change very quickly in the Arctic. In the past, crews have been lost towing a whale through harsh Arctic conditions.

Because of these risks, which are associated with using small vessels and traditional hunting methods, whaling captains and their crews attempt to take whales as close to the ice edge or the shore as possible. Any activities that occur in the water that can interfere with the hunt or deflect whales further seaward place the captains and their crews at greater risk by forcing them to spend

¹ It is standard practice in the bowhead whale subsistence hunt to deliver a follow-up shot from the "shoulder gun," a large caliber gun armed with a black powder projectile, immediately following the darting gun shot.

more time further from the ice edge or shore. Similarly, every effort is made to dispatch the whale as rapidly as possible, to ensure a humane death for the animal and to reduce the amount of time crews must be on the water.

During the spring hunt, whales are brought to the ice edge and, using a block and tackle, are pulled by hand onto the shore-fast ice. Here again, changing ice conditions can threaten hunter safety and the success of the hunt. If the ice edge is too thin and too weak to support the whale, crews can have a very difficult time landing the whale. When the ice is strong enough to support the whale, it still takes dozens of people several hours to land a 20-50 ton whale by hand in this traditional manner. During the fall hunt, the whales are landed on the beach, where manpower alone may not be sufficient for a quick landing and flensing, and other equipment may be used to assist in the process. Once they are landed, the whales are then butchered by hand and distributed according to customs that vary by village.

Changing Ice Conditions Lead to Greater Risk and Force Adaptations

As we reported in recent years, changing ice conditions associated with climate change have presented increasing challenges to the success of the spring hunt and dangers to the whaling captains and their crews. AEWK's villages continued to experience similar variable conditions over the past two years. Our villages have continued to adapt their practices to these changing conditions, but they are often forced to contend with new dangers and challenges as they do so.

In recent years, Gamble and Savoonga on St. Lawrence in the Bering Sea have faced very poor weather and record low ice cover, which has caused heavy seas and dangerous conditions. They also report increased bowhead whale abundance near the island during late fall and winter months. As a result, whaling captains and their crews have been hunting from late November into December, beginning again in the early spring. In addition, decreasing ice cover has interfered with the ability of these communities to collect other subsistence foods, like walrus, ice seals, fish and birds, placing an even greater dependence on the subsistence hunt of bowhead whales.

Our whaling captains, who have borne witness to these changes, predict that their communities will continue to face serious risks as a result of a changing climate. While the traditional hunt of the bowhead whale may grow more dangerous over time, it also is likely to become even more important to the well-being of these isolated communities as access to other subsistence resources grows more challenging over time with the retreat in sea ice and changing conditions.

For a review of harvest results and hunting conditions from 1974 to 2016, see Suydam and George (2016).

Efficiency in the Bowhead Whale Subsistence Harvest

The subsistence hunters in Northern Alaska have adapted their traditional methods over time, often in response to requests from the IWC, to ensure that the harvest is humane and to increase the efficiency (# landed / # struck) of the subsistence hunt. In 1978, the AEWK committed to the IWC that it would achieve an efficiency rate of 75%.

During 2016, 59 whales were struck; of those, 47 were landed and 12 were lost. The total number of whales struck and the total number landed in 2016 were higher than the average number of whales struck and the average number landed over the previous 10 years (2006-2015) during which the average struck was 54 and the average landed was 40. Harvest efficiency in 2016 was 79.7%, with an average over the 10 previous years of 74.1%.

During 2017, 57 whales were struck; of those, 50 were landed and seven were lost. The total number landed was higher than the average for the previous 10 years (2007-2016), during which the average landed was 42, with an average of 56 struck. Harvest efficiency in 2017 was 87.7%, with an average over the previous 10 years of 75%.

USE OF THE PENTHRITE PROJECTILE IN THE BOWHEAD WHALE SUBSISTENCE HUNT

The AEWEC, through its Weapons Improvement Program Committee (WIP Committee), continues to work with Dr. Egil Oen, its hunters, and agencies of the United States Government on measures to facilitate and promote use of the penthrite projectile in the bowhead whale subsistence hunt. Here, we provide an update on the AEWEC's progress in those efforts.

Development of the Penthrite Projectile

As previously reported, since 1977, the AEWEC has pursued technical research and development designed to improve the safety and efficiency of the weapons used in the Alaskan Eskimo subsistence hunt of the bowhead whale. The most important guiding principle of the AEWEC's Weapons Improvement Program is the need to ensure human safety. With the introduction of penthrite, caution is imperative due to its extraordinary explosive power and thus the potential for extreme danger in the hunt, where the crews are only feet from the whale when the darting gun is fired. Thus, the penthrite projectile is equipped with a fuse head that serves as a "safe and arming mechanism" (SAM). The SAM is designed to ensure that the projectile detonates only after entering the whale to a safe depth. Redundant safety measures are included to prevent detonations if the projectile is dropped. For added safety, the projectile body and fuse head are delivered separately and are not joined until the crew is prepared to hunt.

In past reports, the AEWEC described efforts to modify the gun barrel, develop standardized pusher shells, and upgrade the hand-held darting gun. These ongoing efforts are costly and time consuming, but they continue to improve the performance of the penthrite projectile in the whale harvest. The AEWEC continues to work with its whaling captains to ensure that older equipment is phased out and replaced with updated components to ensure hunter safety and efficiency.

Use of the Penthrite Projectile in the 2016 and 2017 Bowhead Whale Subsistence Harvests

Of the 47 bowhead whales landed in 2016, the penthrite projectile was utilized as the sole method in 26 (55%) cases and was used as the primary method with black powder as the secondary method, in 17 (36%) cases, for a total of 43 out of 47 whales (91.5%) landed with penthrite.

Of the 50 bowhead whales landed in 2017, the penthrite projectile was utilized as the sole method in three cases and was used as the primary method with black powder as the secondary method in 27 cases. Thus in 2017, penthrite was the sole or primary method used in 60% of landed animals. As noted, the 2017 harvest also resulted in an efficiency rate of 87.7%, evidence of the beneficial effect in this harvest of having the penthrite projectile available to hunters.

Annual Training

Village training is an ongoing part of the AEW C's Weapons Improvement Program. Members of the AEW C's Weapons Improvement Committee conduct training workshops on the use of the penthrite projectiles, on a rotating annual basis, for whaling captains and crew members in its 11 villages. These workshops help to ensure that the whaling captains employ best practices in the use and handling of the penthrite projectile and associated equipment.

During 2016, workshops were held in Pt. Hope, Nuiqsut, Barrow, Kivalina, and Wales. The AEW C took a delivery of 20 new darting gun barrels for distribution to hunters needing equipment upgrades. Plans were initiated to order new pusher shells for the penthrite projectiles and new penthrite projectiles.

During 2017, workshops were held in Pt. Hope, Pt. Lay, and Wainwright. Whaling captains and harpooners received training and refresher demonstrations in the use of the penthrite projectiles, as well as new darting gun barrels and barrel fitting for hunters needing equipment upgrades.

In addition to village-based training workshops, members of the Weapons Improvement Committee also conduct a training session for all whaling captains attending the AEW C's Annual Meeting, held in Utqiagvik. Dr. Øen often attends these annual discussions, during which AEW C Commissioners and representatives of village whaling captains' associations have the opportunity to provide feedback on their whaling captains' experiences with the newer weapons and to raise questions and comments with the WIP Committee, including Dr. Øen.

These meetings and workshops are an important opportunity for information exchange and have contributed to the growing understanding and acceptance, among hunters and the public of the necessity and importance of the Weapons Improvement Program.

Challenges in the Continued Use of the Penthrite Projectile

Legal Challenges

When AEW C began importing penthrite projectiles from Norway in the late 1980s, U.S. federal regulators agreed to include the projectiles under a classification covering "antique" weapons, given the antique design, and in many cases the age, of the darting guns. This legal classification relieved the AEW C and its hunters of the very rigorous regulations imposed on the use of high-powered explosives in modern equipment.

However, the regulatory environment in the U.S. has changed in response to incidents of international and domestic terrorism, and the AEWG is working very closely with the U.S. Bureau of Alcohol, Tobacco, and Firearms (ATF) to ensure that the AEWG and its whaling captains are able to continue the use of the penthrate projectile.

As a part of these efforts and as required by the ATF, the AEWG has secured and installed storage magazines and locked connex storage units for each of its eleven villages. The AEWG has also designed and implemented a life-cycle tracking system that will account for each penthrate body and fuse head. These efforts have required significant financial resources and commitments of time over the last two years.

Financial Challenges

The penthrate projectiles used by the AEWG's hunters are manufactured in Norway. The cost of the projectiles is approximately \$1,000 apiece, if the AEWG orders in 200-unit lots. The per-piece price increases for smaller lots. At the current rate of usage, 200-unit lots must be ordered approximately every five years. Subsistence hunters, who distribute their catch free of charge, do not have the resources to purchase a single-use piece of equipment for \$1,000. Therefore, the AEWG must purchase the equipment on its members' behalf and provide the equipment to its whaling captains for free. However, there is no secure funding source for this equipment. As a result, continued use of the penthrate projectile is uncertain.

REFERENCES

- BurnSilver, S., Magdanz, J., Stotts, R., Berman, M. and Kofinas, G. (2016), Are Mixed Economies Persistent or Transitional? Evidence Using Social Networks from Arctic Alaska. *American Anthropologist*, 118: 121–129. doi:10.1111/aman.12447
- Givens, G.H., Edmondson, S.L., George, J.C., Suydam, R., Charif, R.A., Rahaman, A., Hawthorne, D., Tudor, B., DeLong, R.A. and Clark, C.W. 2016. Horvitz–Thompson whale abundance estimation adjusting for uncertain recapture, temporal availability variation, and intermittent effort. *Environmetrics* 27(3): 134-46. May 2016.
- Kofinas, Gary, Shauna B. BurnSilver, James Magdanz, Rhian Stotts, and Marcy Okada (2016), Subsistence Sharing Networks and Cooperation: Kaktovik, Wainwright, and Venetie, Alaska. BOEM Report 2015-023DOI;AFES Report MP 2015-02. School of Natural Resources and Extension, University of Alaska Fairbanks.
- Minerals Management Service, Beaufort Sea and Chukchi Sea Planning Areas Oil and Gas Lease Sales 209, 212, 217, and 221 Draft Environmental Impact Statement (2008), OCS EIS/EA MMS 2008-0055.
- Suydam, R.S. and John C. George, (2016), Subsistence harvest of bowhead whales (*Balaena mysticetus*) taken by Alaskan Natives, 1974 to 2016, SC/67b/AWMP.
- Suydam, R.S., John C. George, Brian Person, Raphaela Stimmelmayer, Todd Sformo, Leslie Peirce, Andrew Von Duyke, Leandra de Sousa, and Gay Sheffield (2017), Subsistence harvest of bowhead whales (*Balaena mysticetus*) by Alaskan Natives during 2017, SC/67b/AWMP.