

Gray Whale Distribution and Catch by Alaskan Eskimos: A Replacement for the Bowhead Whale?

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ABSTRACT. The catch of gray whales, *Eschrichtius robustus*, by Alaskan Eskimos from 1925 to 1980 has been documented to the extent possible by a search of the literature and personal communications with knowledgeable sources. During the period 1950-1980, 47 gray whales were landed by hunters at 12 villages. During this same period, 505 bowhead whales, *Balaena mysticetus*, were landed at nine coastal whaling villages. Alaskan Eskimos traditionally have been bowhead whalers, principally because of the predictive nature of the bowheads' migration. Gray whaling has never been an important subsistence activity. Because the bowhead population is thought to be depleted, gray whales have been suggested as a possible substitute for subsistence. The distribution of gray whales in Alaskan coastal waters is such that reliable annual whaling for this species is possible only at villages on the shores of the northern Bering Sea; it is unlikely for villages north of Bering Strait to Cape Lisburne, and more unlikely for villages north of Cape Lisburne and east of Point Barrow. Based on cultural and biological grounds, substituting gray whales for bowheads does not appear to be a reliable alternative for the residents of four to six of the nine Eskimo villages that currently participate in bowhead whaling.

Key words: gray whale, *Eschrichtius robustus*; bowhead whale, *Balaena mysticetus*; Eskimos; subsistence whaling; Alaska

RÉSUMÉ. La prise de baleines grises de Californie, *Eschrichtius robustus*, par les Esquimaux de l'Alaska entre 1925 et 1980 a été documentée comme l'ont permis une recherche de la littérature et des communications personnelles avec des personnes-ressources. Entre 1950 et 1980, 47 baleines grises de Californie ont été prises par des chasseurs dans 12 villages. Durant cette même période, 505 baleines boréales, *Balaena mysticetus*, ont été tuées dans neuf villages baleiniers sur la côte. Les Esquimaux de l'Alaska ont traditionnellement été des chasseurs de baleines boréales, surtout en raison des migrations prévisibles de ces dernières. La chasse aux baleines grises de Californie n'a jamais figuré de façon importante dans les activités de subsistance. Puisque certains croient que le nombre de baleines boréales est à la baisse, les baleines grises de Californie ont été suggérées en guise de substitut possible pour la subsistance. La distribution des baleines grises de Californie dans les eaux côtières de l'Alaska est telle que la sûreté d'une chasse annuelle de cette espèce ne serait possible que dans les villages sur la côte nord de la mer de Béring. Une bonne chasse serait peu certaine pour les villages au nord du détroit de Béring jusqu'au cap Lisburne, et encore moins probable pour les villages au nord du cap Lisburne et à l'est de la pointe Barrow. Suivant les données biologiques et culturelles, la substitution de la baleine boréale par la baleine grise de Californie ne semble pas être un choix pratique pour les habitants de quatre à six des neuf villages Esquimaux qui participent à la chasse à la baleine boréale.

Mots clés: baleine grise de Californie, *Eschrichtius robustus*; baleine boréale, *Balaena mysticetus*; Esquimaux, chasse à la baleine comme activité de subsistance, Alaska

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INTRODUCTION

In 1846 commercial whalers discovered the wintering ground of the Pacific gray whale (*Eschrichtius robustus*) in Baja California, Mexico (Scammon, 1874; Rice and Wolman, 1971). Whaling expanded into the Bering Sea and Arctic Ocean resulting in near-extirpation of this species by the 1880s. Following a hiatus, modern gray whaling began along the west coast of North America in 1905 (Wolman and Rice, 1979) from Canada to Baja California. Most whaling occurred between 1925 and 1929. From 1933 to 1946, an average of 52 gray whales per year were taken in the Bering Sea. In 1946 commercial whaling for gray whales was banned by international agreement and the population has since made a dramatic recovery. Eskimo whaling continued, however, as provided in the Schedule of Regulations of the International Convention for the Regulation of Whaling and implemented by the International Whaling Commission (IWC).

Alaskan Eskimos have hunted whales for centuries (Hughes and Hughes, 1960). The principal species taken for subsistence and cultural purposes has been the bowhead whale (*Balaena mysticetus*). Other cetaceans occasionally taken include the gray, minke (*Balaenoptera acutorostrata*),

fin (*Balaenoptera physalus*), and belukha (*Delphinapterus leucas*) whales.

Considerable concern has been expressed over the status of the bowhead whale, which was nearly exterminated by commercial whalers during the last half of the 19th century (IWC, 1979; Braham *et al.*, 1980c). After commercial whaling for bowheads ceased in 1910, the Eskimo harvest continued at a relatively constant low level through 1969.

The available records indicate that during this 60-year period an average of about 12 whales were landed annually. Beginning in 1970, however, the catch increased dramatically to an annual average of 32 whales landed from 1970 through 1977. Furthermore, since 1970 whaling effort during the spring season has increased by more than 50% over the level during the 1960s at St. Lawrence Island and Barrow, and significant increases have occurred at other whaling villages (Marquette and Bockstoce, 1980). Although bowhead whales have been fully protected from commercial exploitation since the formation of the IWC in 1947, a native exemption allowed a subsistence harvest to continue. Since 1978, however, the hunt has been on an annual quota basis established by the IWC to promote conserva-

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tion of the species while taking into account other considerations such as subsistence and cultural needs (Tillman, 1980).

Searching for a solution as to whether the continued take of bowheads should be recommended, the IWC convened a meeting of experts to study aboriginal subsistence whaling. One of the solutions suggested was for the Eskimos to take gray whales as an alternative to bowheads (IWC, 1979). Subsequently, Mitchell and Reeves (1980) and Storro-Patterson (1980) presented detailed reviews of the bowhead whale problem for the purpose of exploring the possibility of substituting gray whales for bowheads in the Eskimo whale fishery. Although the reviews examined the problem in considerable detail, both were limited by a lack of published data on the take of gray whales by Alaskan Eskimos. Clearly, better information on the gray whale catch and distribution is required for development of a complete perspective to this problem.

The historical catch of gray whales by Alaskan Eskimos is not well documented, largely because the event is less important than the taking of bowhead whales. An occasional gray whale either landed by hunters or found stranded is utilized for food. Although all Alaskan Eskimos prize the meat and *muktuk* (skin and equal thickness of blubber) of bowheads, their opinions vary on the acceptability of these products from the gray whale.

The purpose of our paper is to present the known data on the catch of gray whales by Alaskan Eskimos together with a brief discussion of the spatial and temporal distribution of this species relative to the coastal bowhead whaling villages in Alaska. Our objective is to evaluate these factors to determine if further consideration is warranted on whether this species should be considered as a subsistence replacement or supplement for the bowhead whale. An earlier version of this paper titled "The Take and Distribution of Gray Whales in Northern Alaskan Waters" was submitted to the International Whaling Commission at its 32nd annual meeting in Cambridge, England, June-July 1980, as IWC Document SC/32/PS12.

WHALING HISTORY FOR GRAY WHALES

A traditional hunt for gray whales apparently has never been practiced by Alaskan Eskimos. These whales are sometimes pursued and occasionally killed during the hunt for other marine mammals. Although skin boats (*umiaks*) may be used, boats of modern construction are more apt to be employed at times when gray whales are available. Furthermore, bowhead whales are taken with whaling implements such as darting and shoulder guns, bombs, and harpoons with attached line and floats, whereas gray whales are generally shot with high-powered rifles. Because floats and lines are not used, wounded gray whales are often lost and, as they usually sink when dead, most are not recovered. Unfortunately, few data are available on the number of gray whales struck and lost.

Data on the catch of gray whales by Alaskan Eskimos have been difficult to obtain for three reasons: 1) Eskimos normally do not keep a written record of their catches, not even for the highly valued bowhead; 2) there is little cultural significance associated with taking a gray whale; and 3) the use of various colloquial names for the gray whale makes it difficult to ascertain which species of whale was taken (Table 1). Catch data compiled to date on gray whales are presented in Table 2, and aspects of the hunt are discussed below for various Alaskan villages.

TABLE 1. Common English names for the gray whale used locally by residents of Eskimo whaling villages in Alaska

Common name	Village	Source
"Blue whale"	Barrow	Durham ¹
"Devil-fish"	Wales	Bailey and Hendee (1926); Bailey (1948)
"Finback"	Wainwright	Maher and Wilimovsky (1963), Durham ¹ , Milan ²
	Barrow	Hurley and Mohr (1957)
"Humpback"	Barrow	Hurley and Mohr (1957), Okakok (1959)
	Wainwright	Richards (1949)
"Summer whale"	Gambell	Hughes and Hughes (1960), Durham (1979), Slwooko (1979), Fay ³ , Oozeva ⁴
	Savoonga	Fay ³ , Gifford ⁵ , Iya ⁶
	Wales	Tevuk (1964), Durham ¹
	Little Diomed I.	Millingrook ⁷

¹Durham, F.E. 1972. Variation and the *ingutuk* problem in the bowhead whale. Unpublished manuscript, University of California, Los Angeles.

²Milan, F.A., University of Alaska, Fairbanks. Personal communication to WMM.

³Fay, F.J., University of Alaska, Fairbanks. Personal communication to WMM.

⁴Oozeva, C., Gambell, Saint Lawrence Island, Alaska. Personal communication to HWB.

⁵Gifford, A., National Marine Fisheries Service, Sitka, Alaska. Personal communication to WMM.

⁶Iya, J., Savoonga, Saint Lawrence Island, Alaska. Personal communication to HWB.

⁷Millingrook, D., Little Diomed Island. Personal communication to HWB.

St. Lawrence Island

There are two villages on St. Lawrence Island, Gambell and Savoonga (Fig. 1). Gambell, known by the natives as Sevuokuk, is an old village that has been continuously inhabited for centuries (Geist and Rainey, 1936). Savoonga is a relatively new village that was established in 1917 (Hughes and Hughes, 1960) by people from Gambell to herd the approximately 10 000 reindeer on the island at that time (Geist and Rainey, 1936). Murie (1936), in discussing sea mammals taken by the islanders, made no mention of gray whales but did acknowledge the take of

TABLE 2. Documented landings of gray whales by Alaskan Eskimos since 1925

Year	Village					Miscellaneous		Yearly total	Source
	Gambell	Savoonga	Wales	Wainwright	Barrow	Location	No.		
1925	—	—	—	1	—	—	—	1	Richards (1949)
1933	—	—	—	—	—	Cross Island	1	1	Maher (1960)
1934	—	—	—	2	—	—	—	2	Maher (1960)
1950	—	—	—	1	—	—	—	1	Milan ¹
1951	—	—	—	1	—	—	—	1	Maher and Wilimovsky (1963)
1952	0	—	—	2	—	—	—	2	Fay ² ; Milan ¹
1953	1	—	—	—	—	—	—	1	Hughes and Hughes (1960)
1954	1	—	—	1	1	—	—	3	Hughes and Hughes (1960); Maher (1960)
1955	—	—	—	—	—	—	—	—	—
1956	1	—	—	—	—	—	—	1	Fay ²
1957	0	—	—	1	—	—	—	1	Fay ² ; Milan ¹
1958	1	—	—	—	2	—	—	3	Fay ² ; Maher (1960)
1959	0	—	—	—	6	—	—	6	Fay ² ; Maher (1960)
1960	0	—	—	—	—	—	—	—	Fay ²
1961	0	—	—	—	1	—	—	1	Fay ² ; NARL staff (1972)
1962	0	—	—	—	—	—	—	—	Fay ²
1963	0	—	—	—	1	—	—	1	Fay ² ; Killitokti (1963)
1964	1	—	—	—	1	—	—	2	Rausch and Fay (1966); NARL staff (1972)
1965	0	—	—	—	1	—	—	1	Fay ² ; NARL staff (1972)
1966	0	—	—	—	—	—	—	—	Fay ²
1967	0	—	—	—	—	—	—	—	Fay ²
1968	0	—	—	—	—	—	—	—	Fay ²
1969	0	—	1	—	—	—	—	1	Fay ² ; Stoker ³
1970	0	2	1	—	—	Unknown	2	5	Fay ² ; Burns ⁴
1971	—	—	—	—	—	Norton Sound	1	3	Burns ⁴
						Bering Strait	1		
						Unknown	1		
1972	1	—	—	—	—	—	—	1	U.S. Dep. Int. (1975)
1973	—	—	—	—	—	—	—	—	—
1974	3	—	—	—	—	—	—	3	U.S. Dep. Int. (1975)
1975	—	—	—	—	—	—	—	—	—
1976	—	—	—	—	—	—	—	—	—
1977	1	—	—	—	—	—	—	1	Seaman ⁵
1978	1	—	—	—	—	Little Diomede	1	2	Balcomb ⁶ ; Millingrook ⁷
1979	2	1	—	—	—	St. Michael	1	4	Hazard ⁸ ; Gifford ⁹ ; Tremaine ¹⁰
1980	0	1	—	—	—	Toksook Bay	1	3	Nelson ¹¹
						Sheshalik	1		Marquette <i>et al.</i> (1982)
Totals	13	4	2	9	13		10	51	

Data obtained from various sources by personal communication:

¹Milan, F.A., University of Alaska, Fairbanks

²Fay, F.H., University of Alaska, Fairbanks

³Stoker, S.W., University of Alaska, Fairbanks

⁴Burns, J.J., Alaska Department of Fish and Game, Fairbanks

⁵Seaman, G.A., Alaska Department of Fish and Game, Fairbanks

⁶Balcomb, K., National Marine Fisheries Service, Seattle, Washington

⁷Millingrook, D., Little Diomede Island, Alaska

⁸Hazard, K., National Marine Fisheries Service, Seattle, Washington

⁹Gifford, A., National Marine Fisheries Service, Sitka, Alaska

¹⁰Tremaine, R.L., Alaska Department of Fish and Game, Fairbanks

¹¹Nelson, R., Alaska Department of Fish and Game, Nome

“finback” whales, stating that “the finback is not hunted much now, but was much sought after in earlier times.” It is possible that Murie was referring to the gray whale, which by this time had been nearly extirpated by commercial whaling. However, according to F. Fay (pers. comm.), use of the term “finback” by St. Lawrence Island Eskimos is in reference to minke whales; it occasionally means fin whale but apparently is never applied to gray whales. At St. Lawrence Island the gray whale is known as the “summer whale.” “Finback” was, however, a name used for gray whales by Eskimos in at least two other villages (Table 1).

Gambell

Over the past 29 years, 13 gray whales have been landed at Gambell (Table 2). During this same period, 28 bowheads were taken (Table 3). This accounts for 28% and 5.5% of the known gray and bowhead catches, respectively, by all Alaskan Eskimos since 1950. The number of grays reported taken at Gambell has been increasing in recent years and two-thirds of all grays taken there have been landed since 1972. From 1950 to 1971 only five grays were reported landed at Gambell. Since 1972 the catch has increased, with a total of eight landed there in the past nine years.

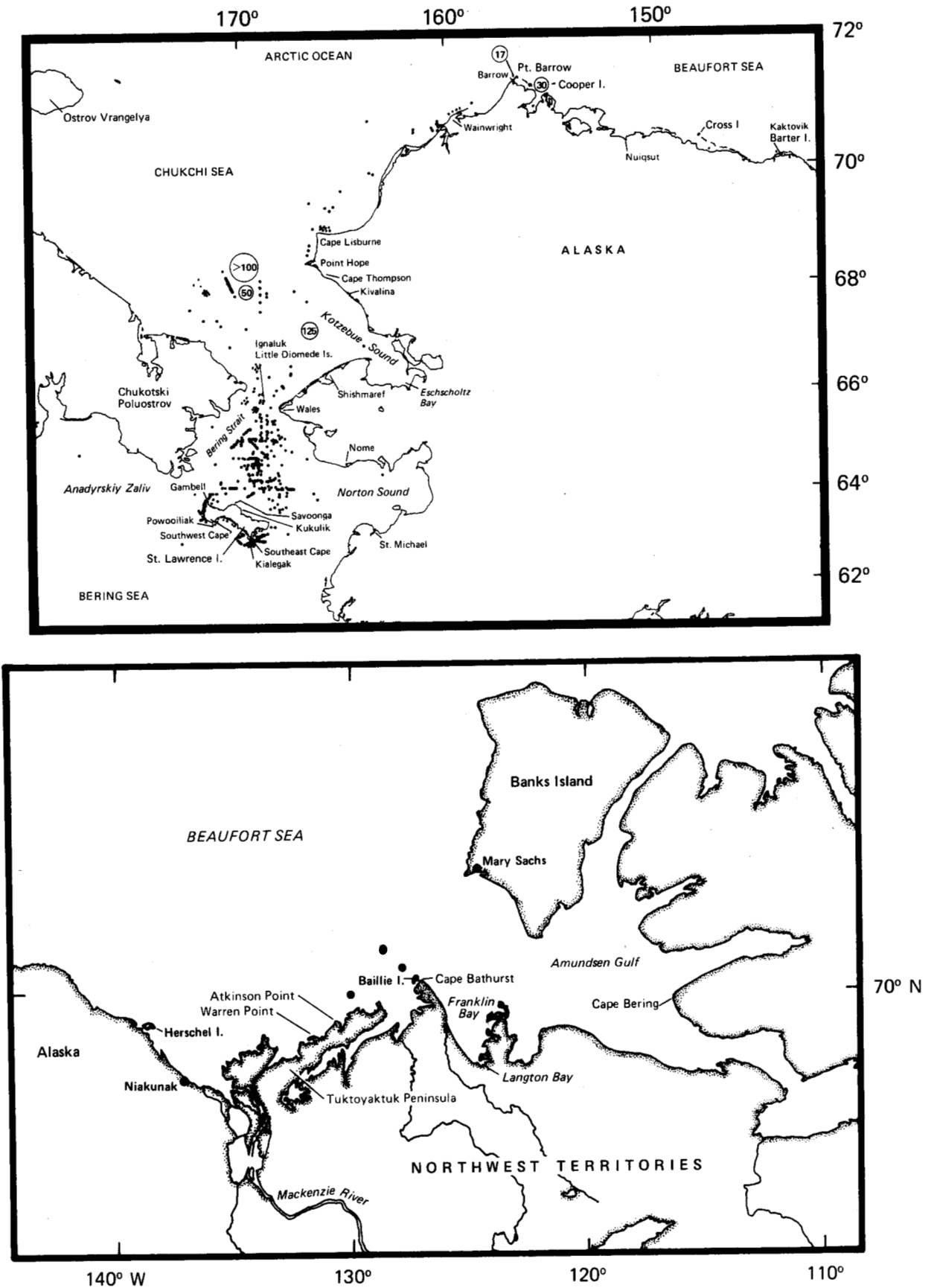


FIG. 1. Gray whale sightings in the northern Bering, Chukchi, and Beaufort seas since 1958 (from NMFS unpublished data, scientists, Eskimos, and the literature). Actual sighting data for the western Chukchi Sea were not available.

TABLE 3. Comparison between numbers of gray and bowhead whales landed by Alaskan Eskimo whaling villages, 1950-1980

Village	First year a gray whale was reported taken (1950-1980)	Number of whales landed	
		Gray	Bowhead ¹
Gambell	1953	13	28
Savoonga	1970	4	15
Wales	1969	2	4
Kivalina	-- ²	0	5
Point Hope	--	0	118
Wainwright	1950	6	39
Barrow	1954	13	273
Nuiqsut	-- ³	0	1
Kaktovik	-- ⁴	0	20
Other	1950	9 ⁵	2 ⁶
		47	505

¹Catch data for bowheads is from Braham *et al.* (1979, 1980a, 1980b); Johnson *et al.* (1981); Marquette and Bockstoce (1980); Marquette *et al.* (1982).

²Bowhead whaling revived in 1960.

³Bowhead whaling revived in 1973.

⁴Bowhead whaling revived in 1964.

⁵See Table 2.

⁶Cape Lisburne (1 - in 1950), Shaktolik (1 - in 1980).

Eskimos here do not regularly hunt gray whales, but rather taken them opportunistically only after the late spring-early summer walrus (*Odobenus rosmarus*) hunting season. Hughes and Hughes (1960), reporting on their work at Gambell in 1940 and again in 1954-55, stated that grays were taken there only occasionally. This conclusion is substantiated by Fay (pers. comm.) who has observed hunting at Gambell since 1952, and reinforced by Klineburger (1962) who reported that when a gray whale surfaced near their boat off Gambell in late May the Eskimos paid no attention as they value only the "bullhead" or "black" whale (names formerly commonly used for bowheads). Although gray whales have been occasionally taken at Gambell, the villagers state that bowheads are their traditional and preferred whale.

Savoonga

Available data show that Savoonga hunters have taken only four gray whales in recent years (Table 2), compared to the 15 bowheads landed there since 1972 (Table 3).

From the early 1950s to 1971, a few hunters from Savoonga traveled to Gambell each year to participate in bowhead whaling and to hunt walrus. In the spring of 1972 they began to hunt bowheads annually near Southwest Cape at the abandoned village site of Powoiliak. At no time in their brief history of bowhead whaling have they hunted gray whales at Powoiliak, preferring instead to hunt walrus on the northern side of the island after the spring

migration of bowhead whales. During the summer gray whales occur principally in the embayments to the east and west of Savoonga, at some distance from the village, which probably accounts in part for the small numbers taken.

Large numbers of bleached whale skulls recently examined by Braham near Gambell and Kialegak (an old Eskimo village site near Southeast Cape) on St. Lawrence Island are evidence of a historical hunt or salvage of stranded gray and bowhead whales. At Savoonga, however, few gray whale skulls (or parts) are present. At Kukulik (an old Eskimo village site just east of Savoonga) whale skulls identified by local Eskimos as those of "finback" whales were found (Murie, 1936). Scientific study and identification of these skulls at Kukulik is planned in order to understand further the historical subsistence use patterns on St. Lawrence Island. Available data, however, indicate that gray whales are not taken near Savoonga, perhaps because they are less numerous there than near Gambell.

Wales

Published accounts of the catch of gray whales at Wales are scarce. The only known records indicate that one gray was landed at Wales in 1969 and one in 1970 (Table 2). One bowhead was also landed during each of those years and a third was taken in 1971 (Table 3), the first bowhead catches since 1938 (Marquette and Bockstoce, 1980). A small bowhead was also landed at Wales during the spring of 1980. Stranded gray whales have been utilized for food by the villagers, one in 1954 and one in 1963 (Alaska Sportsman, 1955; Tevuk, 1964).

Little Diomed Island

Whaling apparently is not a traditional activity for residents of the village of Ignaluk on Little Diomed Island, where the principal marine mammal hunted is walrus (Carson, 1966). Whales occur there, but they are rarely pursued (Bruemmer, 1977). Essentially no catch data on whales are available for the village; one dead gray stranded there in 1954 was utilized for food (J. Brooks, pers. comm.). One gray was landed in 1978 (Table 2), and the last known capture of a bowhead occurred in 1916 (Marquette and Bockstoce, 1980). During the spring of 1980 one bowhead was struck but lost by hunters at Little Diomed Island (Johnson *et al.*, 1981). Recent information provided by two regular visitors to the island (C. Grauvogel and M. Zahn, pers. comm.), however, suggests that hunters there may have killed but failed to recover a minimum of one gray whale each year for at least the past 10 years.

Wainwright

One gray whale was taken by villagers at Wainwright in 1925 and two were landed in 1934 (Table 2). The only records thereafter were from 1950 to 1957 when six grays were landed. During this same period (1950-57), eight bowheads were reported taken (Marquette and Bockstoce,

1980). This nearly equal ratio of gray to bowhead whales suggests that: 1) the grays taken were required to supplement the annual catch of bowheads during a period of food shortage; 2) gray whales were more readily available than usual during this eight-year period; and/or 3) a group of Eskimos hunting at Wainwright at that time may have desired to take gray whales for reasons that are not obvious today. Whether these possibilities are correct or whether the nearly equal ratio was merely random chance is not known, but a similar series of gray whale catches occurred at Barrow a few years later.

Barrow

During 1954-65, 13 gray whales were landed at Barrow (Table 2). This accounts for 28% of the known gray whale catch by Alaskan Eskimos since 1950, the same as at Gambell. During five of those 12 years only one whale was taken annually. Of the total of 13 grays landed at Barrow, eight were taken during 1957-59, a three-year period when whalers there failed to capture a single bowhead (Maher and Wilimovsky, 1963). A possible explanation is that the grays were taken to compensate for the lack of bowheads during this period. It is unclear whether this gray whale catch was fortuitous or related to the success of hunters at Wainwright in taking gray whales during the previous few years. Maher (1960), in reporting the catch of gray whales at Barrow during 1954-59, noted that the Eskimos there reported they had been taking an average of one gray whale every five or six years. No records were found, however, of grays being landed at Barrow before or after 1954-65 (Table 2). The very large proportion of bowhead to gray whales taken at Barrow indicates the relative unimportance or unavailability of gray whales to the hunters there (Table 3).

Other Villages and Locations

Gray whales have also been landed at various other sites along the western and northern coasts of Alaska from the village of Toksook Bay on Nelson Island, to Cross Island off the central Beaufort Sea coast (Fig. 1). These scattered landings have no discernible pattern (Table 2). It is noteworthy that no records have been discovered to indicate that residents of Point Hope or Kivalina, long known as traditional bowhead whalers, have ever landed a gray whale. Furthermore, even though three gray whales were apparently killed by killer whales (*Orcinus orca*) and their carcasses subsequently beached near Point Hope in 1979, no attempt was made by the villagers to salvage the *muktuk*, meat, or other parts. The common answer given to us by village residents at Point Hope regarding the catch or use of gray whales is that they prefer only bowheads and belukhas.

DISTRIBUTION OF GRAY WHALES

Besides cultural and individual preferences, the use of marine mammals by Eskimos for subsistence depends on

the predictable temporal and spatial appearance of animals within a reasonable distance from shore.

Eastern Bering, Chukchi, and Southern Beaufort Seas

Essentially all of the estimated 15 000-17 000 gray whales in the California stock enter the Bering and Chukchi seas each year from April through July to feed (Pike, 1962; Rice and Wolman, 1971; Braham *et al.*, 1977) and leave by the end of December (Rugh and Braham, 1979). They predominantly occur in shallow (<50 m) continental shelf waters from St. Lawrence Island in the Bering Sea to just north of Cape Lisburne in the Chukchi Sea (Braham *et al.*, 1977; Fig. 1). During this nine-month period, they disperse to those areas which support high standing stocks of benthic invertebrates. Their most common prey are tube-forming gammarid amphipods, of which a substantial proportion consists of the genus *Ampelisca* (Pike, 1962; Zimushko and Lenskaya, 1970; Rice and Wolman, 1971). Gray whales apparently are dependent on these feeding areas (Berzin and Rovnin, 1966), since in no other place in the Arctic and Subarctic are such large concentrations of benthic amphipods found (Makarov, 1937; Neyman, 1960; Stoker, 1978).

From May through July, during years of average ice formation, gray whales feed intensively around St. Lawrence Island and north to the Bering Strait (Ichihara, 1958; Braham *et al.*, 1977); some remain there feeding throughout summer. They feed all around St. Lawrence Island, often in larger numbers offshore than nearshore except near the eastern and western shores, but seldom directly off the northern coast of the island.

As summer progresses, many gray whales move through the Bering Strait into the central Chukchi Sea to forage. Although some whales frequent nearshore waters, most have been sighted offshore (Maher, 1960; Wilke and Fiscus, 1961; Fig. 1). One exception to this pattern is near Cape Lisburne, where they have been seen east of the cape nearshore in August and September.

From July through September they appear regularly in low numbers near Wainwright and Barrow. In July and August 1978, for example, 16 gray whales were observed during a 40-day period near Barrow (B. McCaffery, pers. comm.). On 5 October 1972, 30 gray whales were observed heading westward near Cooper Island (Naval Arctic Research Laboratory Staff, 1972). Other sightings indicate that a few gray whales occasionally occur a considerable distance east of Barrow (Maher, 1960; A. Brower, Sr., pers. comm.). One was recently seen just west of Barter Island in September 1979 (Johnson *et al.*, 1980), and three were sighted off Tuktoyaktuk, Northwest Territories, Canada, in August 1980 (Rugh and Fraker, 1981; Fig. 1).

Western Bering and Chukchi Seas

Data on the distribution of gray whales in waters of the Soviet Union come primarily from reports of Soviet catcherboat operations. The Soviet government is allowed by the IWC to take up to 190 gray whales (1980 quota) for

use by the Chukchi Eskimos. During summer and autumn, gray whales are observed from outer Anadyrskiy Zaliv (Gulf of Anadyr) north to the west-central Chukchi Sea (Kuz'min and Berzin, 1975; Votrogov and Bogoslovskaya, 1980). They occur nearshore along the eastern and northern coast of Chukotski Poluostrov (Chukchi Peninsula) and as far west and north as Ostrov Vrangelya (Wrangel Island) (Nikulin, 1946; Nasu, 1960; Votrogov and Bogoslovskaya, 1980), although numbers and locations apparently vary among years (Sleptsov, 1961; Zimushko, 1970). Johnson *et al.* (1981) reported that in October 1979 gray whales were observed in the south-central Chukchi Sea (approximately at 168°-172° W long.) but not farther west. In September 1980, however, eight sightings of gray whales were made west and south of Wrangel Island in the eastern East Siberian Sea (Marquette *et al.*, 1982). Data from sightings in Soviet waters and from the literature indicate that the majority of gray whales occur from the central part of the Chukchi Sea to the west and south rather than to the east and north, although this distribution apparently varies among years.

DISCUSSION

Bowhead whales are seasonally available and hunted annually at Alaskan Eskimo villages from St. Lawrence Island to Barter Island (Braham *et al.*, 1980; Marquette and Bockstoce, 1980). Gray whales also are taken occasionally by the hunters. During the past 30 years, at least 47 gray whales were landed by Alaskan Eskimos, an average of 1.6 whales per year. In recent years, however, only the whalers at Gambell have taken gray whales with consistency. During the same 30-year period, 505 bowhead whales were taken by the whalers of all villages, an average of 16.8 yearly. The catch of gray whales is small when compared to the catch of bowheads.

The available data on sightings of gray whales in Alaskan and Soviet waters generally corroborate the catch data. That is, gray whales are readily available near some, but not all Alaskan Eskimo villages from which bowheads are hunted (Fig. 1; Table 4). This conclusion is based on three distributional patterns of gray whales: 1) areas of high concentration restricted to offshore waters in the northern Bering and south-central and west-central Chukchi seas, except near St. Lawrence Island where concentrations can occur nearshore along the east and west coasts of the island; 2) lower densities in outer Norton Sound, Kotzebue Sound, and northern Chukchi Sea above 69°N lat.; and 3) rare or irregular occurrence in eastern Norton Sound, Eschscholtz Bay (Kotzebue Sound), and east of Point Barrow in the Beaufort Sea (Fig. 1).

A correlation appears to exist between the interest and effort extended by Eskimos to hunting gray whales and the temporal distribution and abundance (availability) of these whales in relation to the villages. Factors such as traditional cultural and individual preferences also undoubt-

TABLE 4. Availability and abundance of gray whales near Alaskan Eskimo whaling villages where bowhead whaling traditionally occurs

Rank ¹	Village	Occurrence	Relative abundance	Availability
1	Gambell	predictable	high	nearshore
2	Little Diomede	predictable	high	variable
3	Wales	frequent	moderate	variable
4	Savoonga	frequent	moderate	offshore
5	Point Hope	frequent	low	offshore
6	Wainwright	occasional	low	nearshore
7	Barrow	occasional	low	nearshore
8	Kivalina	infrequent	low	unclear
9	Nuiqsut	rare	—	unknown
10	Kaktovik	rare	—	unknown

¹Villages are ranked according to likelihood that gray whales can be taken.

edly influence the level of their desire to take gray whales. For example, gray whales are often feared by the hunters. Bailey and Hendee (1926) noted that the Eskimos at Wales reported that grays had a reputation for attacking and overturning Eskimo boats. Additional factors affecting the hunt are timing of the gray whale migration, which may conflict with other subsistence and economic activities, and environmental conditions such as ice, fog or wind that frequently make the sea too dangerous for whalers to hunt in small open boats away from shore.

Based on cultural and biological considerations, the proposed substitution of gray whales for bowheads, or their use to supplement the traditional subsistence catch of bowheads, does not appear to be a viable option at this time for Alaskan Eskimos. Few gray whales regularly occur in inner Kotzebue Sound and north of approximately 69°N lat. along the northwestern and northern coasts of Alaska at times of the year compatible with other present Eskimo subsistence practices. Of the nine active bowhead whaling villages today, only Gambell, Savoonga and Wales, and perhaps to a limited extent Point Hope, Wainwright and Barrow, can expect sufficient numbers of grays each year to support a significant village whaling activity. We have documented a total catch of only 51 gray whales by Alaskan Eskimos since 1925. We therefore see no evidence to suggest that gray whales are at present of any particular interest to the Eskimos. Because they are not as available as bowheads to all whaling villages we doubt that they can either support a sustained subsistence hunt or provide a dependable annual supplement to the bowhead hunt.

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