

# **The Origins and Development of Shore-Based Commercial Whaling at Spitsbergen during the 17<sup>th</sup> Century: A Resource Utilization Assessment**

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*On s'entend généralement pour dire qu 'au cours du 12<sup>e</sup> siècle, c 'étaient les Basques habitant sur la côte espagnole et la côte française de la Baie de Biscaye qui furent les premiers Européens à pratiquer la pêche à la baleine à grande échelle. Selon la documentation, la surexploitation de la baleine franche du Groenland constitue la principale raison du déclin de la troisième phase de la pêche à la baleine à des fins commerciales (après le Labrador au 16<sup>e</sup> siècle), l'opération côtière du 17<sup>e</sup> siècle à Spitzberg. Cet article démontre que la baleine franche noire était bel et bien une cible secondaire importante. Le fait que l'on pêchait deux différentes espèces de baleines franche à Spitzberg réfute l'hypothèse fréquemment soutenue que la surexploitation des provisions de baleines noires de la région à l'est de l'Atlantique nord dans la Baie de Biscaye entre le 12<sup>e</sup> et le 16<sup>e</sup> siècle est la raison pour laquelle les Basques pratiquèrent plus fréquemment la chasse à la baleine au Labrador.*

Although the origins of whale hunting are lost in antiquity, the very first Europeans generally credited with whaling on a large-scale, commercial basis were the Basque inhabitants of the French and Spanish Bay of Biscay coasts during the 12<sup>th</sup> century (Fig. 1 : Phase 1 ).<sup>1</sup> They subsequently expanded their operations overseas to the Labrador side of the

<sup>1</sup> For a full description of the likely origins of European-based commercial whaling see Sanger, C. W., "The Origins of the Scottish Northern Whale Fishery," unpublished Ph.D Thesis, Department of Geography, University of Dundee, 1985, 47-59. A partial list of Basque sources providing information includes: Ciriquián-Gaiztarro, M., *Los Vascos en la Pesca de la Ballena*, (San Sebastian, 1961); Garcia De Cortazar, J. A., *Vizcaya en el Siglo-XV*, (Bilbao, 1966); and Agirreazkuenaga Zigorraga, J., *et. al, Historia de Euskal Herria*, (San Sebastian, 1980). In English, the best treatments are provided by Douglass, W. A. and Bilbao, i., *Amerikamuak: Basques in the New World*, (Reno, Nevada, 1975), 51-7; Markham, C., "On the Whale-Fishery of the Basque

Strait of Belle Isle (Phase 2) in the first half of the 16<sup>th</sup> century.<sup>2</sup> This whaling stage was in turn superseded in the early 1600s when the English Muscovy Company, with the assistance of Basque whaling experts, initiated a shore-based industry at Spitsbergen (Phase 3).<sup>3</sup> Quickly falling under the control of the Dutch, and to a lesser extent other European nations, the Spitsbergen "bay fishery" gave way to offshore, ice-edge<sup>4</sup> Greenland Sea whaling (East Greenland: Phase 4) towards the end of the 17<sup>th</sup> century (Fig. 2).<sup>5</sup>

The principal reason provided in the literature for the decline of the initial phases of commercial whaling (Bay of Biscay, Labrador, Spitsbergen, and Greenland Sea) is the over exploitation of stocks of two closely related species of whales<sup>6</sup> - the Black Right<sup>7</sup> and Greenland Right.<sup>8</sup> It is generally accepted that the former was the target species of Bay of Biscay whaling, while the latter supported the land-based fishery at Spitsbergen and the offshore Greenland Sea operation. Archaeological investigations show that both were hunted in the Strait of Belle Isle (Fig. 1).<sup>9</sup> A close examination of historical documents, however, suggests that the resource base of the Spitsbergen fishery was more complex than

Provinces of Spain," *Proceedings of the Zoological Society of London*, 1881, 969-76; and Harmer, S.F., "History of Whaling," *Proceedings of the Linnean Society of London*, 1928, 51-95.

<sup>2</sup> Until the late 1970s this phase received either brief and often erroneous reference or, most commonly, was not referred to at all. See, for example, de Jong, C, *A Short History of Old Dutch Whaling*, (Pretoria, South Africa, 1978); and Gad, F., *The History of Greenland*, Vols. 1 and 2, (Montreal, 1973). Recent publications by S. Barkham, based on original Basque 16<sup>th</sup> century manuscripts, have increased awareness of the Labrador whaling enterprise: "The Basques: Filling a Gap in our History Between Jacques Cartier and Champlain," *Canadian Geographical Journal*, Vol. 96, No. 1, 1978, 8-19; "First Will and Testament on the Labrador Coast," *Geographical Magazine*, Vol. 49, No. 9, 1977, 574-81; and "The Identification of Labrador Ports in Spanish 16<sup>th</sup> Century Documents," *The Canadian Cartographer*, Vol. 14, No. 1, 1977, 1-9.

<sup>3</sup> For a full discussion based upon both primary and secondary sources, see Sanger, "The Origins of the Scottish Northern Whale Fishery," 72-99.

<sup>4</sup> *Sea ice* glossary: *heavy ice year* (a season when sea ice covers a larger surface area than normal; the ice-pack is also usually composed of a larger proportion of multi-year, or Polar, ice); *ice-pack* (free floating concentrations of first- and/or multi-year ice; can be tightly or loosely packed, depending primarily upon currents and winds - direction, duration, and strength); and *land-fast ice* (usually first-year ice attached firmly to shore, often sheltered).

<sup>5</sup> Sanger, "The Origins of the Scottish Northern Whale Fishery," 99-113.

<sup>6</sup> The two major species of "right whales" were so called because they were timid, slow moving, floated when killed, and provided large quantities of meat, blubber, and baleen (whalebone). All other species of whales "were considered too fast, too small, too dangerous, or too rare to interest the whalers." Flayderman, E. N., *Scrimshaw and Scrimshanders: Whales and Whalers*, (New Milford, Conn.), 1972, 18.

<sup>7</sup> *B. glacialis*. Other common names: Southern Right whale, Biscayan Right whale, North Atlantic Right whale, Nordcaper, Sarda, Sletbag, and Smoothback.

<sup>8</sup> *B. mysticetus*. While referred to as the Greenland Right whale by Europeans hunters, it was more commonly called the Bowhead by American whalers. Other common names: Arctic Right whale, Bearded whale, Common whale, Great Polar whale, "The Whale," and Whalebone whale.

<sup>9</sup> Cumbaa, S., "Preliminary Analysis of Bones from a 16<sup>th</sup> Century Spanish Basque Shipwreck and Whaling Station in Red Bay Labrador," in Watts, G. P. (ed.), *Underwater Archaeology: The Challenge Before Us, The Proceedings of the Twelfth Conference on Underwater Archaeology*, (San Marion, Calif: Fathom Eight Special Publications, No. 2, 1981), 22-3; and Cumbaa, S., personal correspondence, 1982.

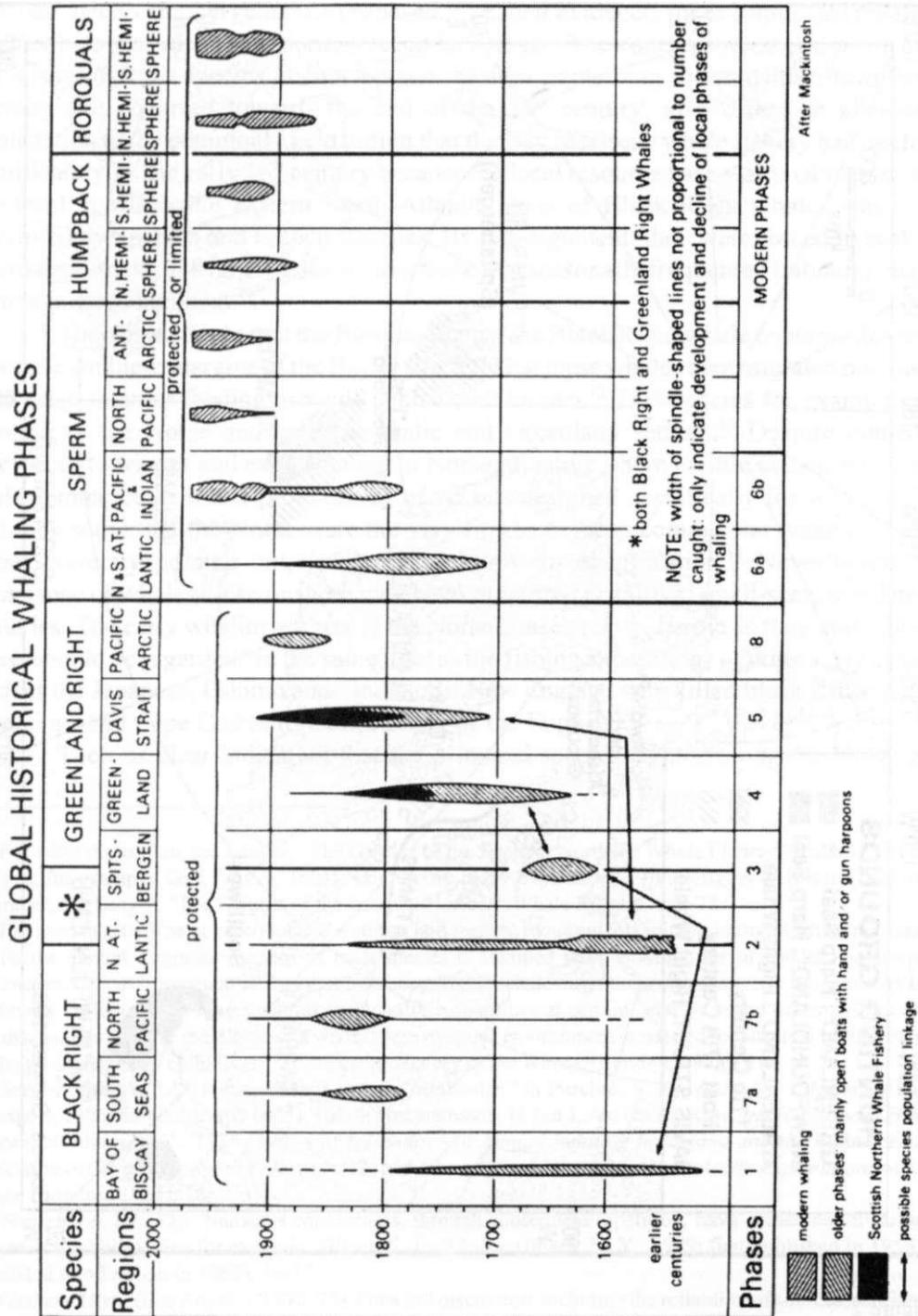


Figure 1

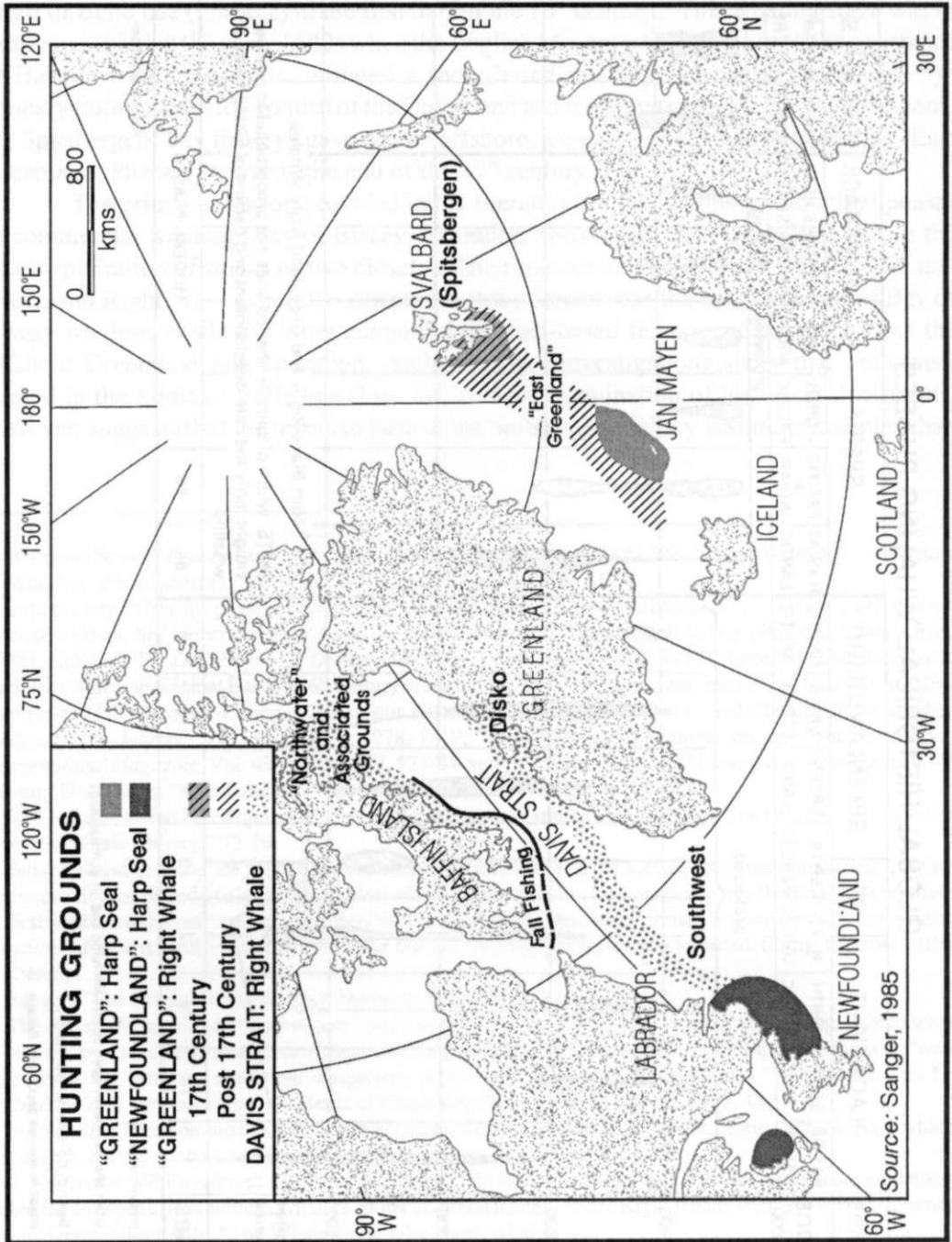


Figure 2

the "one species" model generally proposed.<sup>10</sup> There is evidence, for example, that the Black Right whale was also an important secondary target. The concurrent, or complementary harvesting of both species at Spitsbergen, besides explaining the transition to offshore hunting that occurred towards the end of the 17<sup>th</sup> century, also offers an alternative explanation to the commonly held notion that the Bay of Biscay whale fishery had declined significantly by the early 16<sup>th</sup> century because the local resource base was unable to sustain the level at which the eastern North Atlantic stock of Black Right whales was being harvested by Spanish and French Basques. By this argument, they were forced to seek out alternative stocks of Right whales such as those that seasonally frequented Labrador coastal waters in large numbers."

There is no doubt that the Basques hunted the Black Right whale on its winter range along the southern margins of the Bay of Biscay. That these whales then migrated northward onto their summer feeding grounds is also well known.<sup>12</sup> This species for example, was familiar to the Norse and early Icelandic and Greenland settlers.<sup>13</sup> Despite numerous references to whales and even whaling in Norse literature, there is little evidence of large-scale commerce in whale products, or of vessels designed specifically for whaling. The claim by some that the Norse were the very first to develop commercial whaling,<sup>14</sup> as C. Sauer correctly pointed out, is almost certainly an exaggeration.<sup>15</sup> Nevertheless, the abundance of whales close onshore may have supported primitive, small-scale subsistence fisheries. The early whaling efforts of the Norse consequently, heroic as they undoubtedly were, should be regarded "in the same light as the fishing expeditions of other early peoples such as the Japanese, Eskimo and...Indians of New England who killed black fish and right whales around Cape Cod before the coming of the English."<sup>16</sup>

There is clear indication that the principal species sighted along the Norwegian

<sup>10</sup> For a full discussion, see Sanger, "The Origins of the Scottish Northern Whale Fishery," 628-37.

<sup>11</sup> See, for example, Gad, Vol. 1, 160-1. For a more likely explanation of the origins of Basque whaling at Labrador, see Sanger, "The Origins of the Scottish Northern Whale Fishery," 59-72.

<sup>12</sup> The need to satisfy basic reproductive instincts and feeding requirements initiate seasonal whale migrations. While the annual migration pattern of each species is stamped with a unique set of spatial and temporal parameters, the environmental factors that influence "right" whale migrations are essentially the same. As L. H. Matthews explained, the food "swarms in incredible quantities at certain seasons in the colder waters of the oceans, and because for most species a warmer less rigorous environment is needed for survival of the young at birth and during early childhood." *The Natural History of the Whale*, (London, 1978), 117.

<sup>13</sup> See for example, "A Treatise of Ivor Boty a Gronlander," in Purchas, S., *Purchas: His Pilgrims*, Vol. 13, (Glasgow, 1906; first published 1605), 163-4; Hermannsson, H. (ed.), *Jon Gudmunson and His Natural History of Iceland*, Ithaca, N. Y., 1924 (Vol. 4 of *Icelandia: An Annual Relating to Iceland and the Fiske Icelandic Collection in Cornell University Library*), 12; and Nansen, F., *In Northern Mists: Arctic Explorations in Early Times*, (London, 1911), 158.

<sup>14</sup> Nansen, *op. cit.*, 155. Nansen's conclusions, through subsequent repetition, have gained an unwarranted degree of credibility. See for example, Slijper, E. J., *Whales*, (Ithaca, N. Y., 1979; first published in 1958 and translated into English in 1962), 16-17.

<sup>15</sup> *Northern Mists*, (Los Angeles, 1970, 75). For a full discussion, including the reliability of sources, see Sanger, "The Origins of the Scottish Northern Whale," 50-5.

<sup>16</sup> Robotti, F. D., *Whaling and Old Salem: A Chronicle of the Sea*, (Salem, Mass., 1950), 1-2.

coast by Muscovy Company vessels trading with Russia during the late 16<sup>th</sup> century were Black Right whales.<sup>17</sup> This whale, in fact, appears to have been sighted so often in these northern waters that it was commonly referred to by its Norse name - Nordcaper. It is quite probable, therefore, that the eastern North Atlantic stock of Black Right whales would have frequented rich, inshore summer feeding grounds at Spitsbergen in the pre-exploitation period.

If this was in fact the case, the populations of both of the larger species of Right whales would have been seriously depleted by large-scale, commercial exploitation at Spitsbergen during the 17<sup>th</sup> century. This in turn would have reduced the respective territories encompassed on their annual migrations and caused the very highest concentration densities to occur only on the most favoured portions of their ranges. Because the Greenland Right is essentially an ice-edge whale, Spitsbergen inshore waters would probably have been marginal ground - an area required to sustain pre-exploitation stock levels. Although somewhat speculative, acceptance of the preferred, optimum, ice-edge environmental niche postulation, lends support to the suggestion that the remaining Greenland Right whales, following the early slaughter at Spitsbergen, would only have occasion to visit these inshore waters towards the end of winter before sea- and land-fast ice had cleared out of the bays and/or later in the spring during particularly heavy ice years.

That the Spitsbergen shore-based operation is generally credited with having been based upon the exploitation of just one species may be partially due to the fact that the Northern "offshore" traditional fisheries which replaced the Bay of Biscay, Labrador and Spitsbergen operations were based exclusively upon the harvesting of Greenland Right whales.<sup>18</sup> (Fig. 1: Phases 4, 5 and 8). By association, therefore, it appears that subsequent commentators "assumed" that the very first Northern whale fishery, the early 17<sup>th</sup> century Spitsbergen inshore operation, was also based upon the exploitation of that one species. The fact that Greenland and Black Right whales are similar in appearance and habit would have

<sup>17</sup> See for example, accounts of voyages commanded by Stephen Burrough in Hakluyt, R., *The Principal Navigations, Traffiques and Discoveries of the English Nation*, (2<sup>nd</sup> Ed., London, Vol. 2, 1599), 336; Anthony Jenkinson (*Ibid.*, 413-25), and Thomas Randolph. *Ibid.* Vol. 3, 1600, 102-7.

<sup>18</sup> The principal 17<sup>th</sup>, 18<sup>th</sup> and 19<sup>th</sup> century traditional North Atlantic whale fisheries (Northern whaling) include: Greenland Sea, Davis Strait, and Baffin Bay (the latter two usually referred to collectively as "Davis Strait": Fig. 1 - Phase 5). For details, see Sanger, C. W., "'We are Now in a Splendid Position for Whales': Environmental Factors Affecting 19<sup>th</sup> Century Whaling in Baffin Bay," *The Mariner's Mirror*, Vol. 80, No. 2, 1994, 159-77; "'Dodging in the Bight, A Good Place for a Whale': Environmental Factors Affecting Eighteenth and Nineteenth Century Whaling in Davis Strait," *The Northern Mariner/Le Marin du Nord*, Vol. 4, No. 1, 1994, 17-33; "Environmental Factors Affecting 17-19th Century Whaling in the Greenland Sea," *Polar Record*, Vol. 27, No. 161, 1991, 77-86; "'On Good Fishing Ground, But too Early for Whales I Think': The Impact of Greenland Right Whale Migration Patterns on Hunting Strategies in the Northern Whale Fishery, 1600-1900," *The American Neptune*, Vol. 51, No. 4, 1991, 221-40; and "'Saw Several Finners, But no Whales': The Greenland Right Whale (Bowhead) - An Assessment of the Biological Basis of the Northern Whale Fishery during the Seventeenth, Eighteenth and Nineteenth Centuries," *International Journal of Maritime History*, Vol. 3, No. 1, 1991, 127-54. North Atlantic stocks of Greenland Right whales also supported a land-based industry in Hudson Bay. This enterprise is described in detail by W. G. Ross. *Whaling and Eskimos: Hudson Bay*, (Ottawa, 1975).

helped convey this impression. Even Captain William Scoresby, Jr., for example, perhaps the most famous of all British Northern whaling masters, found it difficult to distinguish between the two. He wrote in 1820 that the "*mysticetus* occurs most abundantly in the frozen seas of Greenland and Davis Strait, - in the bays of Baffin and Hudson, - in the sea to the northward of Behring's Strait, and along some parts of the northern shores of Asia, and probably America...along the coasts of Africa and South America, it is met with, periodically, in considerable numbers."<sup>19</sup>

This description obviously refers to both the Greenland Right whale, found only in the higher latitudes of the Northern Hemisphere, and the much more widely distributed Black Right. Scoresby, however, did add the following qualification: "Whether this whale [Black Right] is precisely of the same kind as that of Spitsbergen and Greenland, is uncertain, though it is evidently a *mysticetus*."<sup>20</sup> The six Basque engaged by the English to help them establish a whaling enterprise at Spitsbergen in 1611,<sup>21</sup> given their previous experience in the Labrador and Bay of Biscay fisheries, could have been referring to both Black and Greenland Right whales when, according to Jonas Poole, master of one of the Company's two vessels, they reported seeing "divers, which as they said were of the best kinds of whales."<sup>22</sup>

There is more direct evidence that these two species were harvested concurrently at Spitsbergen during the first quarter of the 17<sup>th</sup> century. As early as 1611, for example, the Muscovy Company's commission to Thomas Edge, expedition commander, stated that the "first sort of Whales, is called the Bearded Whale [Greenland Right], which is black in colour, with a smooth skinne, and white under the chops; which Whales is the best of all the rest: ...The second sort of Whale is called Sarda [Black Right], of the same colour and fashion as the former, but somewhat lesse."<sup>23</sup>

While these early 17<sup>th</sup> century whaling instructions would undoubtedly have been at least partially derived from the knowledge and experience brought to the new venture by their Basque employees, they would also have been based upon information gathered by Muscovy Company masters trading into Russia, Henry Hudson's expedition to Spitsbergen in 1607,<sup>24</sup> the Company's annual harvesting of walrus at Bear Island after 1603,<sup>25</sup> and, as well, Jonas Poole's exploration of the western shores of the northern archipelago during the summer of 1610.<sup>26</sup> Of even greater significance, however, is the fact that in 1622 Edge, following more than a decade's involvement in the early Spitsbergen whale fishery, specifically referred to the fact that both Black and Greenland Right whales could be

<sup>18</sup> Scoresby, W., Jr., *An Account of the Arctic Regions with a History and Description of the Northern Whale-Fishery*, Vol. 1, (Edinburgh, 1820, reprinted by David and Charles Reprints, Newton Abbot, Devon, 1969), 473.

<sup>19</sup> *Loc. cit.*

<sup>20</sup> Purchas, *op. cit.*, Vol. 14, 30-1.

<sup>21</sup> *Ibid.*, 35.

<sup>22</sup> *Ibid.*, 31.

<sup>23</sup> See, for example, Powys, L., *Henry Hudson*, London, 1927, 24; and Purchas, *op. cit.*, Vol. 13, 303-7.

<sup>24</sup> Purchas, *op. cit.*, Vol. 13, 11.

<sup>25</sup> For full details, see Poole's account reproduced in Purchas, *op. cit.*, Vol. 13, 1-23.

harvested on the Spitsbergen inshore hunting grounds.<sup>27</sup>

Although the bulk of information available on the early English whale fishery at Spitsbergen is derived from Muscovy Company records, there is additional evidence that both species were taken at Spitsbergen. An Icelandic seaman onboard one of four Danish vessels engaged in the Northern whale fishery in 1618, for example, in explaining the treacherous nature of certain ocean currents at Spitsbergen, wrote that in the "year previous to our stay it chanced that the Englishmen had caught a smoothback whale and were towing it with three rowing-boats."<sup>28</sup> "Smoothback" was a commonly used descriptive term for the Black Right whale. Similarly, in 1664, towards the end of the Spitsbergen shore-based fishery, Johann Dietz, sailing as surgeon on a Dutch whaler, recorded at the end of the season that they had "killed nine whales and a Nordcaper, which was a remarkable success."<sup>29</sup> This indicates that while the Greenland Right whale - *the whale* - had become the principal target species, Black Right whales (Nordcapers) were still being taken, at least on an occasional basis, at this relatively late date.

The migrations of the Greenland Right whale are determined primarily by the seasonal advance and retreat of sea ice (Fig. 3). In most years, therefore, Spitsbergen would have been visited at a fairly early date while individual animals were forced to wait for an opportunity to proceed northward onto their summer feeding grounds. While the extreme northern range of the eastern North Atlantic stock of Black Right whale also appears to have included the coastal waters of Spitsbergen, their appearance would normally have occurred at a much later date - in most years following the offshore relocation of the Greenland Right whale to the seaward margins of the retreating Greenland Sea ice-pack (Figs. 2 and 3).<sup>30</sup>

These different temporal characteristics would help explain the apparent discrepancy between the first whale sightings at Spitsbergen provided by early Muscovy Company expeditions and the arrival information recorded by a Dutch wintering party in the spring of 1634. A journal kept by Jacob Segersz noted that on 27 April, "in the evening, the

<sup>27</sup> Purchas, *op. cit.*, Vol. 13, 30.

<sup>28</sup> Olafsson, J., *The Life of the Icelander Jon Olafsson: Traveller to India*, Vols. 1 and 2, (London, 1923, compiled in MSS, c.1661, trans. B. S. Phillpotts), 157.

<sup>29</sup> Dietz, J., *Master Johann Dietz: Surgeon in the Army of the Great Elector and Barber to the Royal Court*, (London, 1923, trans. B. Miall), 122.

<sup>30</sup> For a full discussion (including maps) of the influence the annual advance and retreat of sea ice between Greenland and Norway had on the "normal" annual and seasonal temporal and spatial characteristics of Northern whaling, see Sanger, "The Origins of the Scottish Northern Whale Fishery," 272-302; "Environmental Factors Affecting 17- 19th Century Whaling in the Greenland Sea," *Polar Record*, Vol. 27, No. 161, 1991; "'On Good Fishing Ground, But too Early for Whales I Think': The Impact of Greenland Right Whale Migration Patterns on Hunting Strategies in the Northern Whale Fishery, 1600-1900," *The American Neptune*, Vol. 51, No. 4, 1991, and "'Saw Several Finners, But no Whales': The Greenland Right Whale (Bowhead) - An Assessment of the Biological Basis of the Northern Whale Fishery during the Seventeenth, Eighteenth and Nineteenth Centuries," *International Journal of Maritime History*, Vol. 3, No. 1, 1991.

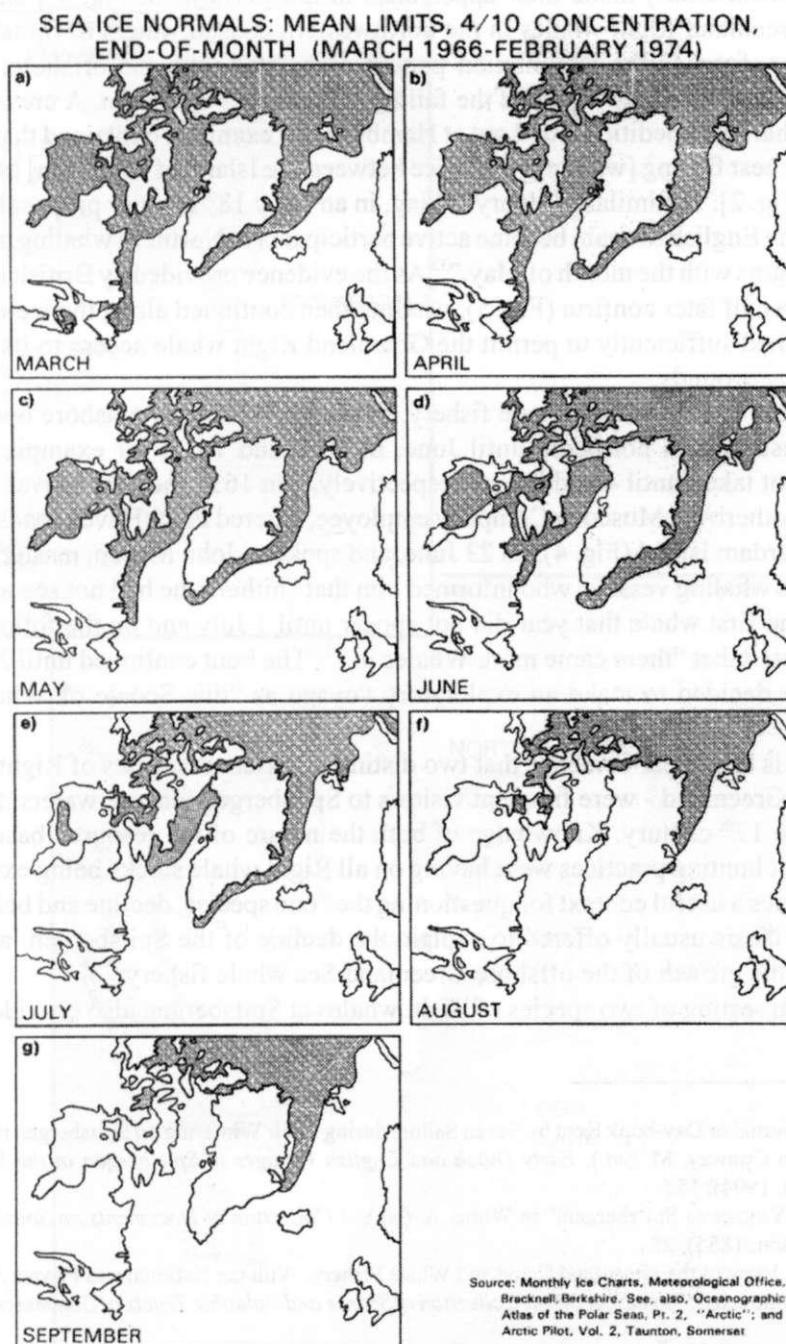


Figure 3

first whales (thank God!) made their appearance in the [Mauritius: Fig. 4 ] bay."<sup>31</sup> The presence of Greenland Right whales in the northwestern coastal waters of Spitsbergen in April would conform to the exploitation pattern associated with the offshore, ice-edge Greenland Sea fishery which replaced the failing shore-based operation. A crewman on a 17<sup>th</sup> century whaling expedition fitted out at Hamburg, for example, explained that in "May and June is the best fishing [whaling] in the ice between the Island of John [Jan] Mayen and Spitzbergen [Fig. 2]."<sup>32</sup> Similarly, Henry Elking, in an early 18<sup>th</sup> century proposal intended to encourage the English to again become active participants in Northern whaling, noted that "the fishery begins with the month of May."<sup>33</sup> As the evidence provided by British log-books a century and a half later confirm (Fig. 5), whaling then continued along the ice-edge until the pack loosened sufficiently to permit the Greenland Right whale access to its northern summer feeding grounds.

The very first Northern whale fishery, the early 17<sup>th</sup> century inshore operation at Spitsbergen, usually did not begin until June. In 1612 and 1613, for example, the first whales were not taken until 4 and 9 June respectively.<sup>34</sup> In 1614 the first arrival was even later. Robert Fotherby, a Muscovy Company employee, entered Faire Haven roadstead, just south of Amsterdam Island (Fig. 4), on 23 June, and spoke to John Mason, master of one of the Company's whaling vessels, who informed him that "hitherto he had not seene a Whale come in."<sup>35</sup> The first whale that year did not appear until 1 July and on the following day Fotherby reported that "there came more Whales in."<sup>36</sup> The hunt continued until 25 July, at which date he decided to make an exploratory voyage as "this Scoale of Whales were past."<sup>37</sup>

There is thus clear evidence that two distinctly different species of Right whales - the Black and Greenland - were frequent visitors to Spitsbergen inshore waters during the first half of the 17<sup>th</sup> century. Knowledge of both the nature of the resource base and the negative impact hunting practices were having on all Right whale stocks being exploited at that date provides a useful context for questioning the "one species, decline and behavioural modification" thesis usually offered to explain the decline of the Spitsbergen land-based operation and the growth of the offshore Greenland Sea whale fishery.

The harvesting of two species of Right whales at Spitsbergen also provides a more

<sup>31</sup> Segerze, J., "Journal or Day-book Kept by Seven Sailors during Their Wintering on Spitsbergen in Mauritius Bay, 1633-34," in Conway, M. (ed.), *Early Dutch and English Voyages to Spitsbergen in the Seventeenth Century*, (London, 1904), 157.

<sup>32</sup> Martens, F., "Voyage to Spitzbergen," in White, A. (éd.), *A Collection of Documents on Spitzbergen and Greenland*, (London, 1855), 25.

<sup>33</sup> Elking, H., "A View of the Greenland Trade and Whale Fishery, With the National and Private Advantages Thereof," in McCullouch, J. R. (éd.), *A Select Collection of Scarce and Valuable Tracts of Commerce*, (London, 1859), 74.

<sup>34</sup> 4 June: Purchas, *op. cit.*, Vol. 14, 44; 9 June: *Ibid.*, 49.

<sup>35</sup> *Ibid.*, 66.

<sup>36</sup> *Ibid.*, 66.

<sup>37</sup> *Ibid.*, 71.

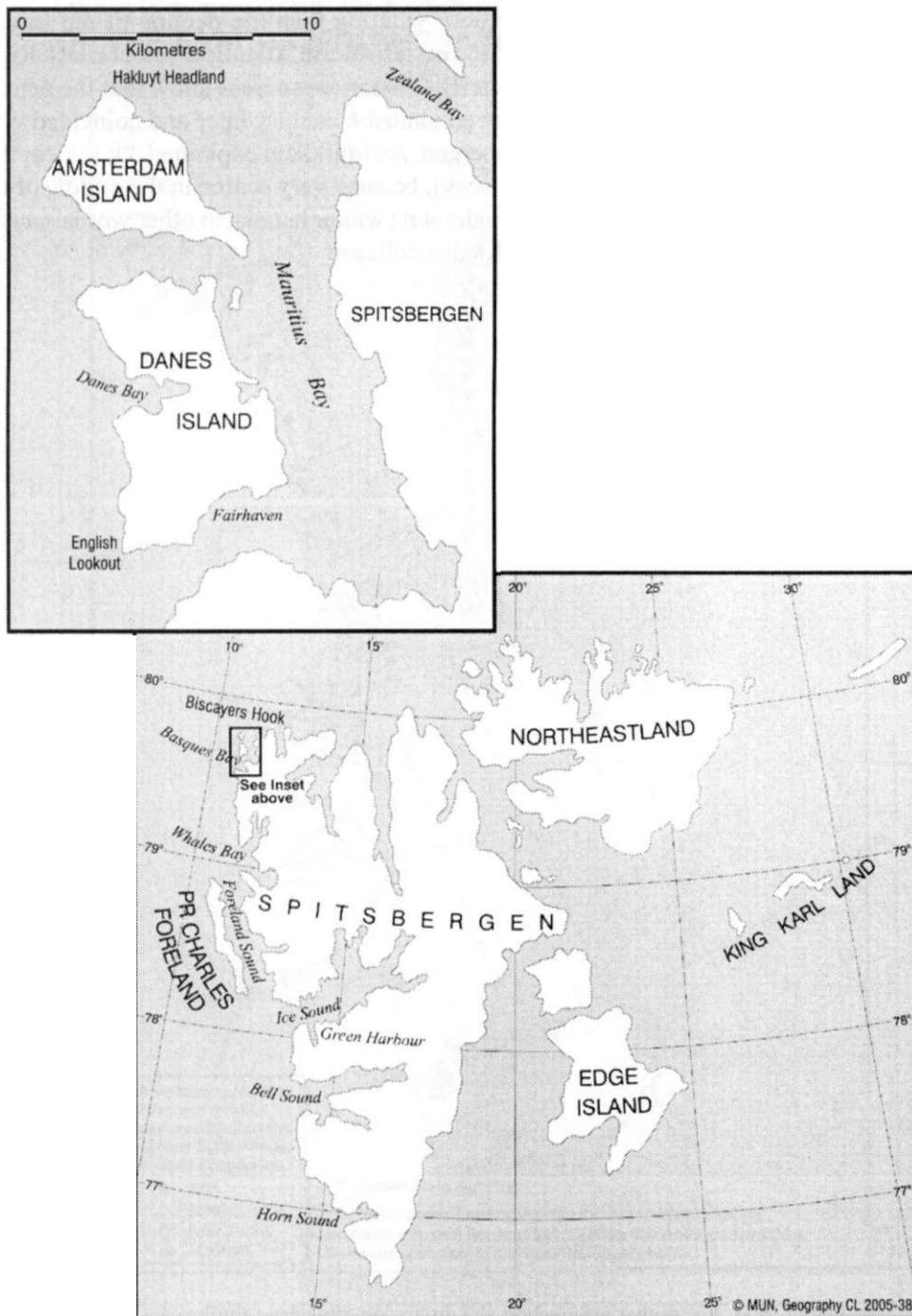
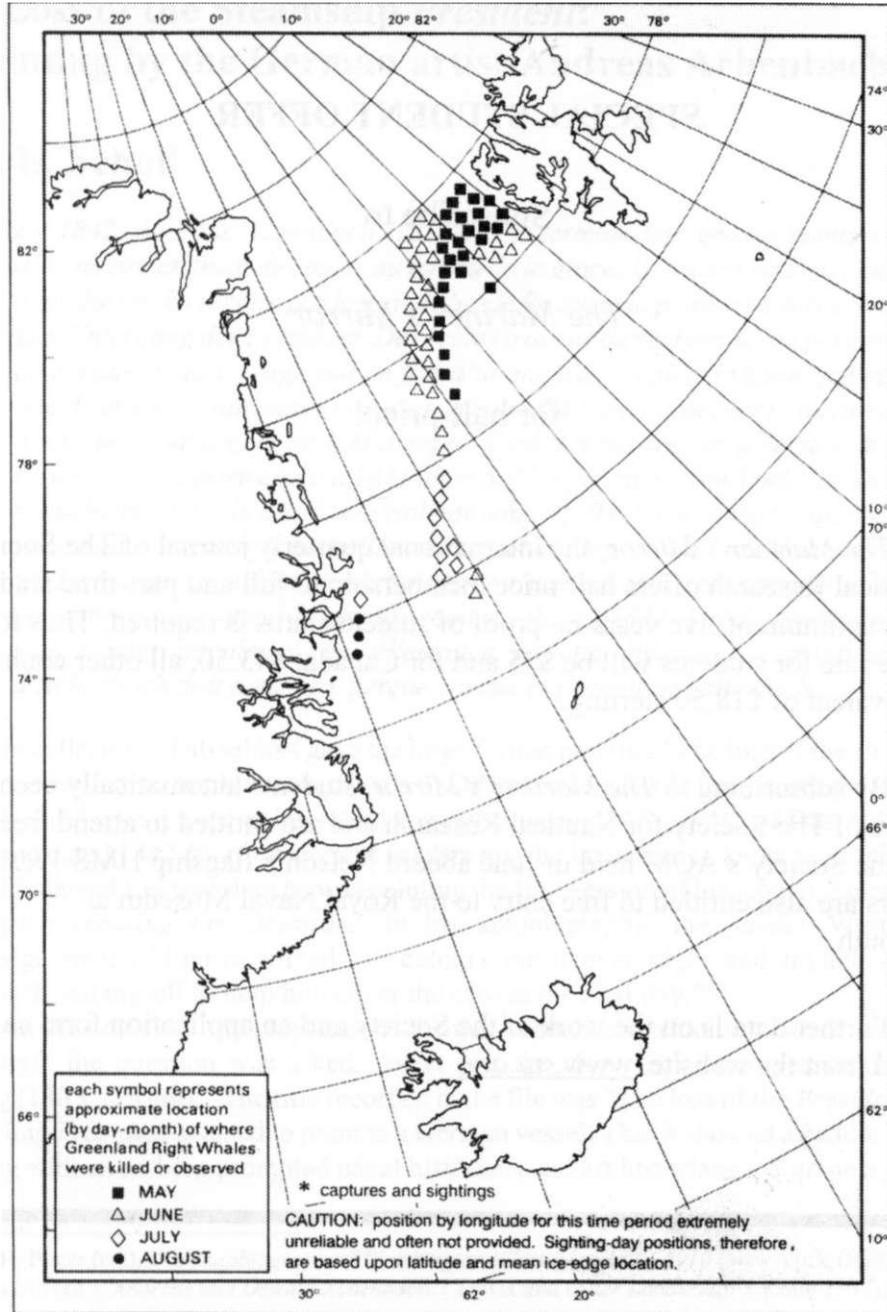


Figure 4

reasonable explanation for the rise of Labrador whaling than the decline of the Bay of Biscay fishery due to the overexploitation of the eastern North Atlantic stock of Black Right whales between the 12<sup>th</sup> and 16<sup>th</sup> centuries. In fact, historical sources show that the demise of the Bay of Biscay industry actually occurred almost a century later and coincided with the decline of shore-station whaling at Spitsbergen. As Markham explained, "it is clear that the whales, close along the coast [Bay of Biscay], became very scarce in the middle of the of the 17<sup>th</sup> century."<sup>38</sup> Overexploitation throughout its winter haunts, in other words, caused Black Right numbers on its summer range to also collapse.

<sup>38</sup> Markham, *op. cit.*, 973. For further information and discussion, see, also, Aquilar, A., "The Black Right Whale, *Eubalaena glacialis*, in the Cantabrian Sea." in *The Thirty-First Report of the International Whaling Commission*, (Cambridge, 1981), 457-59; Harmer, *op. cit.* 54; and Sanger, "The Origins of the Scottish Northern Whale Fishery," 42-130, 628-36.

**WHALING RESULTS OF 9 BRITISH SAILING VESSEL VOYAGES ON THE EAST GREENLAND HUNTING GROUNDS , 1822-1866**



Sources: Log-books; and Monthly Ice Charts, Meteorological Office, Bracknell, Berkshire.

Figure 5