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Insights From Whaling Logbooks on Whales, Dolphins, and Whaling in the Gulf of Mexico

RANDALL R. REEVES, JUDITH N. LUND, TIM D. SMITH, AND ELIZABETH A. JOSEPHSON

Whaling voyage logbooks provide a unique window into historical marine animal distribution and relative numbers. The Gulf of Mexico was among the regions visited by American commercial whalers beginning in the late 1700s, and possibly as early as the 1760s. For more than a century, they hunted sperm whales (Physeter macrocephalus) and blackfish (usually probably short-finned pilot whales; Globicephala macrorhynchus) in the Gulf. An ongoing study of global whaling history has allowed us to offer some insights on characteristics and trends of the Gulf fishery and on cetacean populations in the Gulf. We examined 53 voyage logbooks that included some whaling in the Gulf. Using the information from those logbooks and other sources, we identified 204 different voyages that included one or more "vessel-seasons" of whaling in the Gulf (total of 214 vesselseasons) between 1788 and 1877. More than three-quarters (76%) of the 186 voyages for which the rig type is known were by brigs or schooners; they sailed primarily from the Massachusetts ports of New Bedford and Nantucket initially and Provincetown in later years. The whaling took place mainly in deep portions of the Gulf and in the first 7 mo of the calendar year (i.e., from Jan. through July). The sperm whales hunted in the Gulf tended to be small and were usually taken from schools, suggesting that they were mostly juveniles and females. Observations (and occasionally catches) of other cetaceans besides sperm whales and blackfish are mentioned in the logbooks-mainly "finbacks" (Balaenoptera sp.), killer whales (Orcinus orca), and "porpoises" (various small delphinids).

INTRODUCTION

"ownsend's (1935) classic whale charts, which show where American open-boat (premodern) whalers took sperm whales (Physeter macrocephalus), humpback whales (Megaptera novaeangliae), right whales (Eubalaena spp.), and bowhead whales (Balaena mysticetus) offer little more than a hint that the Gulf of Mexico was a significant whaling ground, and then only for sperm whales. In his text (p. 13), Townsend states that sperm whales were hunted in the Gulf "to a very limited extent during the season from February to May only." Clark (1887a), whose intelligence came mainly from the literature and conversations with whalemen, identifies the Gulf of Mexico, "particularly in latitude 28° to 29° north, longitude 89° to 90° west," as one of a number of "profitable" sperm whaling grounds in the North Atlantic Ocean.¹ Also, in his "Map Illustrative of the Currents and Whaling Grounds," Wilkes (1856) indicates the northwestern quarter of the Gulf to be a whaling ground.

Commercial whaling in the Gulf of Mexico has been mentioned only in passing by most modern cetacean biologists, with little or no discussion of its consequences or implications, or of the insights that might come from exploring the subject in more depth. As a notable exception, Jefferson and Schiro (1997) acknowledged the utility of whaling logbooks, including those examined by Townsend (1935) as well as others available in libraries and archives, as repositories of information on Gulf cetaceans:

other large whales [in addition to the sperm whale] that were too quick to be primary targets of Yankee whalers (rorquals) and other species of small cetaceans were often mentioned in old whalers' logbooks. Although species identification would be very difficult to verify for many of these records, there may be a number of records of highly distinctive species (such as Killer Whales) that could be extracted. Thus, these whaling logbooks represent a potentially valuable untapped source of data.

It was for exactly such a purpose—to begin mining this untapped source of data—that we undertook the present study.

This is an initial foray into the subject of American whaling in the Gulf of Mexico, with a focus on the sperm whale because it was the chief

¹ In Clark's text (1887a:15–16) and a chart accompanying it (his Plate 183), the Gulf of Mexico and Caribbean Sea are indicated as also being right whaling areas, but we have found no evidence to support this. Scammon (1874:214), a generally authoritative source on American 19th century whaling, claimed that the range of right whales in the western North Atlantic stretched from Newfoundland to the Bahamas. Again, we have found no evidence of their regular occurrence in the Bahamas.

target. We have attempted to estimate the scale of removals (catches and hunting loss) and the spatial and temporal distribution of observations of sperm whales as recorded in voyage logbooks. By mapping the cruise tracks of such voyages, we have obtained an idea of when and where sperm whales were and were not found. In addition to data on sperm whales, we have extracted information on other species observed by the whalers and recorded in the voyage logbooks. Together, these findings provide a historical context for the recent proliferation of studies of cetaceans in the Gulf involving primarily ship and aerial surveys in the northern (U.S.) portion (O'Sullivan and Mullin, 1997; Baumgartner et al., 2001; Fulling et al., 2003; Mullin and Fulling, 2004; Maze-Foley and Mullin, 2006) and satellitelinked radio telemetry (Jochens et al., 2008).

MATERIALS AND METHODS

In addition to a search of the literature, we read 53 logbooks² of voyages that whaled in the Gulf of Mexico. Eleven of those voyages included two "vessel-seasons" of whaling in the Gulf (see below for definition). From the read logbooks, we judged the information for 43 vessel-seasons to be sufficient for determining numbers of cetaceans taken (Appendix). The logbooks examined are held primarily by the Research Library of the New Bedford Whaling Museum in New Bedford, MA; the Nicholson Collection of the Providence Public Library in Providence, RI; and the Houghton Library of Harvard University and the Baker Library of Harvard Business School, both in Cambridge, MA (see "Unpublished materials" for a complete list).

To identify voyages that went to the Gulf of Mexico (often called Bay of Mexico; Fig. 1), we used library finding aids, the published literature (e.g., Starbuck, 1878; Clark, 1887a; Sherman et al., 1986), and references in logbooks to other vessels sighted or "spoken" on the grounds.³ In some instances, particularly in the early years, we know of a voyage's existence only by the captain's name, since it, but not the vessel's name, was recorded in another vessel's logbook. A "Gulf of Mexico vessel-season" was defined, for the purposes of this study, as any Dec.–July portion of a voyage in which at least one full day was devoted to searching for whales in the Gulf (usually based on logbook information). This



Fig. 1. Advertisement in *Columbian Courier*, 13 Feb. 1801. Courtesy of New Bedford Whaling Museum Research Library.

means that voyages such as those of the Provincetown schooners *George W. Lewis* (1864–65) and *J. Taylor* (1867–69), which simply transited the eastern end of the Gulf while moving between the Caribbean Sea and the Atlantic Ocean, were not counted as Gulf voyages (or vessel-seasons).

Data from the logbooks, including date, position, details on whale observations, and other vessels spoken, were entered into an Access database and plotted using ArcMap. Frequently, the exact location of a sighting or kill was not noted in the logbook, and therefore most of the plotted positions are approximate. Whalers generally recorded only one position in the logbook daily, and they noted their position even less frequently when within sight of land or when weather was unfavorable. Therefore, we estimated some of the positions by linear interpolation between reports.

Catch data, including animals struck but not secured and processed, were tabulated separately for sperm whales and blackfish (Appendix).⁴ Using numbers from the 43 vessel-seasons for which logbook coverage was considered complete, we estimated average catches per vesselseason and then applied those averages to vesselseasons for which we had only partial data or no data. We did not attempt to account for unidentified voyages or vessel-seasons that might have whaled in the Gulf. Therefore, the total catches are almost certainly underestimated. We

 $[\]frac{1}{2}$ The term logbook encompasses both the official logbooks kept on board as company records of voyage activities and private journals kept by individual whalers.

³ In the parlance of the whalemen, a vessel was "spoken" if it was seen and the crews exchanged information, i.e., "spoke" to each other.

⁴ The term "blackfish" usually meant pilot whales (Scammon, 1874), which in the Gulf would be short-finned pilot whales (*Globicephala macrorhynchus*). However, several other species that occur regularly in the Gulf may have been included under this term: false killer whale (*Pseudorca crassidens*), pygmy killer whale (*Feresa attenuata*), and melon-headed whale (*Peponocephala electra*). In a few instances, the logbook records refer to "sharp-finned blackfish," implying that the whalers recognized that there were different kinds of blackfish even though their nomenclature may not have been standardized or consistent.

estimated loss rates for both species (sperm whale and blackfish) from this regional data set, and we used those rates to estimate total removals from the data on secured catches.

For species other than sperm whales and blackfish, the data were too sparse (or in the case of "porpoises," too ambiguous) for meaningful catch estimation. We therefore only summarize what was reported in the logbooks and make no attempt to estimate catches or removals for those other species.

Although it is frequently impossible to establish the species identity of cetaceans mentioned in logbooks, sperm whales in the Gulf of Mexico were usually mentioned as such, or as "whales" but in a context where their identity could be inferred with confidence. In estimating catches, we assumed that all of the animals recorded in the logbooks in the Gulf of Mexico as "whales" were sperm whales, except in those rare instances where the context clearly indicated otherwise. "Finbacks" can be assumed to mean Balaenoptera spp., and probably specifically Bryde's whales (Balaenoptera edeni/brydei) in most instances in the Gulf.⁵ Killer whales (Orcinus orca) and humpback whales generally were denoted as such in logbooks (although we found no references to the latter in the Gulf).

The boundaries of the study area were defined as encompassing the entire Gulf of Mexico (Fig. 2). With regard to the Straits of Florida and the Yucatan Channel, we included in our analyses of animal distributions and catches any observations recorded to the west of Key Largo, FL, U.S.A., and to the north of Cape (Cabo) San Antonio, Cuba.

RESULTS AND DISCUSSION

Nature and scale of whaling effort.—Exactly when American whalers began whaling in the Gulf of Mexico is uncertain, but some vessels were whaling in nearby Caribbean waters by the early 1760s. A Nantucket whaling sloop was seized by a privateer from the French West Indies while cruising near the Leeward Islands in 1762 (Starbuck 1878:41), and a decade later three Dartmouth (MA) whaling vessels and another from Martha's Vineyard were taken by the Spanish coast guard off the south side of Hispaniola (Starbuck, 1878:53). The first vessels that we know visited the Gulf were there in 1788. These were the sloops *Rainbow* of Dartmouth and *Keziah* of Boston, plus a third vessel about which we know only that its captain's name was Kersey. The last whaling vessel known to have visited the Gulf was the schooner *Edward Lee* of Provincetown in 1877. Thus, the entire period of American whaling in the Gulf spanned nearly a century.

We identified a total of 204 whaling voyages to the Gulf, one or more in every decade between the 1780s and 1870s (Appendix). On 10 of the 204 voyages, two separate visits were made to the Gulf; thus we identified a total of 214 vesselseasons of whaling. Most, if not all, of the voyages also involved some whaling in the Caribbean Sea (at least along the Greater Antilles) en route to or from the Gulf. In other studies (e.g., Mitchell and Reeves, 1983; Reeves et al., 2001; Lund et al., 2010), we have identified more than 370 whaling voyages to the Caribbean region between 1786 (Ranger of Wellfleet) and 1923 (John R. Manta of New Bedford). The number of vessel-seasons of whaling in the Gulf of Mexico reached a strong peak in the middle of the 19th century (Fig. 3).

This fishery was dominated by small whaling vessels—sloops in the late 18th century and brigs and schooners in the 19th. A few barks and ships also ventured into the Gulf during the middle of the 19th century. The most frequent port of registry (for which this could be identified) was Provincetown, MA (58); followed by Nantucket, MA (27); New Bedford, MA (23); and Westport, MA (19).

Seasonality.—Nearly all voyages to the Gulf of Mexico for which we have good information whaled there in the first 7 mo of the calendar year, i.e., between Jan. and July. Figure 4 shows the distribution of daily logbook locations in the Gulf, by quarter. The Jan.–July predominance is consistent with Townsend's (1935) charts, which show sperm whale catches in the Gulf for the months of March, April, May, June, and July. Townsend's text (p. 13) states, however, that sperm whaling in the Gulf of Mexico and West Indies "was practiced to a very limited extent during the season from February to May only."

It is unclear whether this strong seasonality should be interpreted to imply that sperm whales migrated into the Gulf and were more accessible then, or instead the timing had more to do with other factors such as weather, sailing conditions, or strategic positioning within the context of a longer voyage. For example, Wilkes (1856:491) stated that the Gulf of Mexico was visited regularly as part of a seasonally defined, clockwise circuit around the North Atlantic made by small American whaling vessels (see the Voyage itineraries section). It is relevant to note that

⁵ The taxonomy of Bryde's whales is unresolved. At least two species in the *B. edenilbrydei* complex are known to exist, but their nomenclature has not been agreed. Moreover, it is uncertain which of the two species inhabits the Gulf of Mexico.



Fig. 2. Study area, with 100-m and 1,000-m isobaths.

Keziah in 1791 and 1792 was still having success hunting sperm whales north of the Yucatan through the entire month of July, and it appears that the vessel quit and left the Gulf for reasons other than the lack of whales. Also, recent



Fig. 3. Number of visits (vessel-seasons) to the Gulf of Mexico by American whaling vessels from 1780 to 1880, showing the midpoints of the 10-year intervals.

sightings (Maze-Foley and Mullin, 2006) and satellite-tracking data (Jochens et al., 2008) indicate that sperm whales (and other odontocetes, including pilot whales) are present in the northern Gulf year-round.

Voyage itineraries.—The few voyages to the Gulf in the 18th century for which logbooks are available suggest a fairly simple pattern. In at least four voyages (1788-89, 1789-90, 1790-91, 1792), Keziah appears to have arrived in the northern Antilles in Nov., Dec., or Jan., then moved more or less directly into the Gulf of Mexico and remained there through at least May, if not into June or July. It seems clear that in these instances, the Gulf was the principal destination. Keziah made a second short voyage in 1789, leaving sometime in the summer (having returned to Boston on 20 June from its 1788-89 voyage) and returning on 20 Sept. Although the destination for this short voyage, as recorded in the logbook, was "Bay of Mexico," it appears from the sparse positions noted that Keziah did not travel that far south on this voyage.

Wilkes (1856:491) described a typical itinerary for an Atlantic voyage (nominally in 1840, "about the time of the greatest prosperity of



Fig. 4. Daily positions of American whaling vessels in the Gulf of Mexico. Dotted lines indicate the 100-m and 1,000-m isobaths. Circles are Jan.–March positions, crosses are April–June, triangles are July–Sept., and squares are Oct.–Dec.

this [the sperm whale] fishery'') as involving clockwise cruising around the North Atlantic, sometimes also exploring the South Atlantic, with eventual movement northward along the South American coast to the Windward Islands. Some vessels then "frequent[ed] the Caribbean Sea in the months of January and February, and farther to the westward off the peninsula of Yucatan and Cuba in April; after which time they proceed[ed] through the Gulf of Mexico to cruise off the Bahama Banks and Cape Hatteras in May." Examples of that general pattern are the voyages of the brigs *Meridian* of Wareham (1839–40) and *Quito* of Sippican (1842–43) (Figs. 5a,b).

Other voyages of that period, however, took a much more direct approach, resembling that of *Keziah* in the previous century. For example, the brig *Imogene* of Provincetown (1838) headed straight south upon leaving port in early Jan. 1838 (Fig. 5c). Whaling for humpback whales began in early Feb. in the Gulf of Paria between Venezuela and Trinidad, and the brig then worked its way northward along the eastern Caribbean island chain to Hispaniola, hunting both humpback whales and sperm whales. In mid-April it was steered westward, passing Cuba and the Cayman Islands, and finally entered the Gulf of Mexico by the last week of April. The entire months of May and June were spent sperm whaling in the Gulf, and Imogene then went straight back to Provincetown, MA, arriving there on 22 July. In the following year (1839), Imogene followed an almost identical itinerary except that instead of heading straight back to Provincetown in July, it went to the Western Islands (Azores) for an additional month of sperm whaling before returning to home port (Fig. 5c). Judging by a report from Captain A. E. Atwood (in Clark, 1887a:144–145), these voyages by *Imogene* may have been typical of several by the Provincetown fleet in the 1830s as well as some by small vessels from other ports (e.g., the brig Annawan of Rochester, MA, 1836-37).

Spatial aspects.—The whaling grounds in the Gulf of Mexico are well defined from the positions where sperm whales were observed, struck, and taken (Fig. 6a). Three of the most profitable areas were (1) the northern Gulf off the mouth Gulf of Mexico Science, Vol. 29 [2011], No. 1, Art. 4 GULF OF MEXICO SCIENCE, 2011, VOL. 29(1)



Fig. 5. (a) Voyage track of the brig *Meridian* in 1839–40. (b) Voyage track of the brig *Quito* in 1842–43. (c) Two voyage tracks of the brig *Imogene* in 1838 (gray) and 1839 (black).

Isle of Pines (Isla de Piños), Cuba (regularly used for wooding and watering by *Keziah* in the late 18th century, also by *Theophilus Chase* in 1842– 44), on islands off Hispaniola (*Leonidas*, 1841), in Venezuela (*Quito*, 1842–43), or in Central America (e.g., Bonacca; *E.H. Hatfield*, 1876). *Sarah Louisa* (1840–42) came to anchor off Seybaplaya (eastern shore of the Bay of Campeche) on 28 Feb. 1841 and weighed anchor on 6 March. The logbook provides no clue concerning activities, but visits to shore were allowed throughout that week. *LaGrange* (1843–45) landed for wood and water in early April 1844, but no positions were given in the logbook for that part of the voyage. Because the positions immediately before and after the provisioning were south of New Orleans and the crew was given liberty while on land, we infer that the landing was made at or near New Orleans. We are certain that in April 1842 the brig *Mattapoisett* (1841–42) visited New Orleans, where the crew took on wood and water while the captain went into the city. In our logbook reading, these are the only references we found to American whalemen coming ashore *inside* the Gulf of Mexico.

Another interpretation of why so few visits were made to continental ports is that there was nothing to be gained by going far onto the mostly broad continental shelf along the northern rim of the Gulf (except off the Mississippi River delta). Sperm whales (as well as pilot whales) presumably were uncommon, as they are today, in waters shallower than 100 m and would have been common only along and offshore of the 1,000-m contour (Jefferson and Schiro, 1997; Würsig et al., 2000; Mullin and Fulling, 2004; Maze-Foley and Mullin, 2006). Unlike the Spanish Main (Venezuela) and many of the islands in the West Indies (e.g., the Windwards from Guadeloupe south, Trinidad), where humpback whales drew the whalers close to shore (Reeves et al., 2001), Gulf coastal waters apparently had no concentrations of commercially valuable whales, other than the concentration of sperm whales off the Mississippi delta where the shelf is narrow (Jefferson and Schiro, 1997; Würsig et al., 2000; Mullin and Fulling, 2004; Maze-Foley and Mullin, 2006). Only two cetacean species, the common bottlenose dolphin (Tursiops truncatus) and the Atlantic spotted dolphin (Stenella frontalis), are common in shelf waters (<200 m depth) of the U.S. Gulf of Mexico (Fulling et al., 2003), and neither of them would have been of any commercial interest to the whalers.

Yet another possibility is that the political situation or strategic considerations influenced the sailing pattern at times. For example, within days after the firing on Fort Sumter (the military start of the American Civil War), word reached New Orleans that the president of the Confederacy had authorized privateering, thus putting any vessel from New England at risk when sailing in the Gulf (Robinson, 1928). On its second cruise into the Gulf (in May 1861), *Calhoun*, a fast and powerful towboat that had been employed towing sailing vessels up the Mississippi River to the New Orleans wharves, succeeded in capturing three whaling vessels, *Mermaid*,

sperm whales.

of the Mississippi River, (2) the eastern Gulf

seaward of the 1,000-m depth contour, and (3)

the Bay of Campeche. The first two of these concentration areas can be compared with the

recent distribution of sperm whales as inferred

from sightings during systematic surveys of the

U.S. Exclusive Economic Zone (Waring et al.,

2009; Fig. 6b). One possible conclusion from

such a comparison is that the whaling fleet

focused its effort on only relatively small portions

of the sperm whale's total range in the Gulf.

Indeed, one might have expected an even

greater concentration of catches than indicated

in Figure 6a in the zone of abundant marine life created by the nutrient-rich freshwater plume of

the Mississippi River, especially in the spring,

over the steep upper continental slope offshore

of Louisiana and Mississippi (Baumgartner et al.,

2001). Occasional hints at good whaling areas

are found in the logbooks. For example, in the

logbook of George W. Lewis (1861-62), the entry

for 23 May 1862 indicates that Antarctic had

obtained 50 barrels (bbl) [of sperm oil] at

27°10'N, 90°20'W. Further, Lewis itself had taken

a "small" sperm whale on 21 May at 27°13'N,

91°08'W, and the next day was in company with

seven other whaleships at 27°08′N, 91°34′W—six

of them chasing (sperm) whales and at least one

of them (Montezuma) succeeding in taking one.

It can be inferred that the area centered at

approximately 27°10'N, 91°W was a "hotspot"

for sperm whales, at least in the second half of

May that year. In another example, the 29 April

1844 entry in the log of the brig LaGrange (1843-

44) states, "trying to get on the edge of the

bank." The ship's position on that date was

23°12'N, 89°40'W, so we interpret the statement

to mean that they were working toward the edge

of Campeche Bank, where they expected to find

fishery is that vessels generally stayed well away

from the mainland and rarely visited U.S. or

Mexican ports. One interpretation is that wood-

ing and watering were more easily or efficiently

accomplished elsewhere, e.g., just outside the

A striking feature of the Gulf of Mexico whale

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Fig. 6. (a) Daily positions on days when sperm whales were caught or sighted. Dotted lines indicate the 100-m and 1,000-m isobaths. (b) Distribution of sperm whale sightings in the northern Gulf of Mexico from vessel surveys in spring 1996–2001 and 2004 and summer 2003 conducted by the Southeast Fisheries Science Center, NOAA Fisheries. Solid lines indicate the 100-m and 1,000-m isobaths and the offshore extent of the U.S. Exclusive Economic Zone. Reprinted with permission from Waring et al. (2009).

John Adams, and *Panama*, all out of Provincetown with a total of 65 crew members and 160 bbl of oil onboard. The crew was ultimately released, and the vessels (presumably along with their oil) were sold for the benefit of the privateers.

Sperm whale catches.—Regardless of the suggestion by Clark (1887a, see footnote 1) that right whales were hunted in the Gulf of Mexico, the whale fishery there was unquestionably centered on sperm whales, with blackfish as secondary targets (see the Blackfish section). The sperm whale catches for the 43 vessel-seasons covered by read logbooks consisted of 215 whales that were harpooned and tried out (t in Appendix), plus six that were found dead and tried out (f). The numbers secured per vessel-season ranged from zero to 23, with an average of 5.0 (SE = 0.94). We estimated the total number of sperm whales secured in the fishery by multiplying the mean number secured per vessel-season (5.0) in our read sample of logbooks by the total number of vesselseasons known to have involved whaling in the Gulf (214), resulting in 1,070 whales (SE = 202).

Some of the read logbooks contained information on sperm whales that were harpooned but not secured. These included 11 whales known killed (kl in Appendix), 20 lost but not known to have died (sl), and two where the fate was unclear (a). Loss rate factors were calculated from these data assuming that half of the animals in the latter two categories died of their wounds. The proportion of struck animals that were lost was 0.093 (SE = 0.0188), which results in a loss rate factor of 1.10 (SE = 0.023). Applying the loss rate factor of 1.10 gives an estimate of 1,179 (SE = 224) sperm whales removed over the entire period of the fishery (1780s–1870s).

Some catch information could be inferred from reports of oil aboard "spoken" vessels, i.e., those seen and communicated with on the whaling grounds by the vessel whose activities are recorded in a read logbook. For example, in the logbook of Keziah (1790-91), reference is made to oil aboard four other whalers in the Gulf at various times during the season, totaling 203 bbl. Keziah had 230 bbl all told at the end of its season (ca. 27 Feb.-25 July 1791), having taken 21 sperm whales (plus at least one before entering the Gulf). In the following season (ca. end of March to start of Aug. 1792) the Keziah logbook recorded 19 sperm whales taken, plus two by another vessel (Captain Taber), and at least 725 bbl of oil obtained by seven other vessels. Using 16 bbl as a rough average yield (see next paragraph), it can be inferred that more than 100 sperm whales were killed and processed by whalers in the Gulf in those two seasons combined. In another example, *S.R. Soper* (1860) killed and processed five sperm whales in the Gulf in 1860 (63 bbl all told), but an additional nine catches by two other vessels (*Varnum H. Hill* and *Bruce*) were reported in the *Soper* logbook. Also, by comparing amounts of sperm oil reported aboard at different times, it can be inferred that at least one of those vessels (*Hill*) took more sperm whales in the Gulf that season than the five specifically reported in the *Soper* logbook. Therefore, for this year relatively late in the history of the Gulf whale fishery, there is no doubt that at least 15 sperm whales were taken.

All of the data on oil yield indicate that the sperm whales taken in the Gulf were relatively small. For example, Imogene killed and processed 23 whales in May-June 1838 but made only 365 bbl of oil (average ~ 16 bbl/whale). These whales were taken mainly from schools-singleday catches ranged from one (from "a large shoal") to eight whales-and there is no mention in the logbook of large bulls (which are generally solitary) or of female-calf pairs. In 1860, S.R. Soper landed five sperm whales and obtained 63 bbl (average ~ 12.5 bbl/whale). One, referred to as "little," produced 17 bbl and 20 gallons (where one barrel is 31.5 gallons). The Soper logbook also mentions an occasion on which Bruce landed four whales, producing only 25 bbl in total. Overall, oil yield from 63 whales where it is possible to relate a specific quantity of oil to a specific whale or number of whales tried out averaged 16.6 bbl (SE = 1.44). There were few very large single-whale yields (Fig. 7). All of the data in the logbooks are consistent with the statement by Capt. H. W. Seabury of New Bedford (in Clark, 1887a:72), "In the Caribbean Sea, Gulf of Mexico, and along the Gulf Stream through the Atlantic, they [sperm whales] run small, and full-grown cows will not average over 15 barrels." The historical data corroborate the findings of Jacquet (2006) and Jochens et al. (2008), who also found evidence to indicate that sperm whales in the Gulf of Mexico are smaller than those found elsewhere.

Throughout the logbook dataset, there is little evidence to suggest large male sperm whales were encountered regularly in the Gulf of Mexico. However, some were seen and taken, as indicated by occasional references in the logbooks to "large" whales being chased and struck. Also, specifically, *Mattapoisett* (1841–42) took a 69 bbl whale on 30 March 1842 at 27°56'N, 88°20'W; *Ocean* (1852–53) took a 40 bbl whale on 17 May 1852 at 26°26'N, 86°40'W; and *Walter Irving* (1856–58) "lost a large whale, it would have made 120 bbl" on 13 May 1857 at 26°30'N, 86°31'W (note that claims



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Fig. 7. The distribution of the number of barrels of oil obtained from individual sperm whales.

like this concerning exceptionally high yields of whales that were lost are common in whaling logbooks and literature). Oil yields of 40 bbl and larger are at or above the maximum yield for adult female sperm whales (Best, 1983), and therefore it is reasonable to infer that the whales in these instances were adult males.

All available evidence—body size, group size, satellite-tracked movement patterns, photo-identification, genetic differentiation, and acoustics indicates that the sperm whale population in the Gulf of Mexico is resident to this region (Jochens et al., 2008; Waring et al., 2009). It is therefore assessed and managed today by U.S. government agencies as a separate and discrete stock.

Blackfish .-- Pursuit of blackfish on an opportunistic basis was a typical feature of whaling for sperm whales in the Gulf, as it was for the American whaling fleet worldwide (Scammon, 1874; Clark, 1887b). Pilot whales, which yielded an average of about 40 gallons (U.S.) of oil according to Clark (1887b) and could produce anywhere from 10 gallons to 10 bbl (315 gallons) according to Scammon (1874:87), were hunted only when more lucrative prey were unavailable, although voyages from Provincetown to the North Atlantic were sometimes dedicated to blackfishing and returned with 50 to 200 bbl of blackfish oil (Clark, 1887b). In most cases, blackfish oil was either sold as part of the regular cargo of whale oil or used to pay for provisions during the voyage. The whalemen also took blackfish (and other small cetaceans) "for fresh meat and oil to be utilized aboard ship" (Clark, 1887b; also see Scammon, 1874:87).

Blackfish were observed by the whalers in many parts of the Gulf (Fig. 8), although recent evidence suggests that they are more common in the western than the eastern portion of the oceanic northern Gulf (Maze-Foley and Mullin, 2006). Two observations were described in the logbooks as involving "sharp-finned blackfish," one in the eastern Gulf and one in the southern Bay of Campeche. The total blackfish catch reported in the logbooks examined was only 71 secured (t in Appendix) plus six struck but lost (sl) or fate uncertain (a). The proportion lost was 0.078 (SE 0.248), implying a loss rate factor of 1.085 (SE 0.036). The average number of blackfish landed per vessel-season was 1.65 (SE = 0.357). Taken together, these values suggest a total of 347 (SE = 71) blackfish landed, and a total of 383 (SE = 84) removed.

For several reasons, we consider the numbers of blackfish to be underreported. In some instances, no exact number caught is given (e.g., the entry simply refers to "some" as having been taken); in others, the entry indicates only that blackfish were chased but the outcome is not reported. The logbook notes on verbal exchanges between whaleships rarely mention catches of these animals specifically, although some blackfish oil can be assumed to be mixed in the aggregate amounts of whale oil reported onboard at least some of the "spoken" vessels.

Other species .- As was the case elsewhere, American whalers in the Gulf of Mexico sometimes tried to take "finbacks" (most likely Bryde's whales in this region; Mead, 1977; and see next two paragraphs) when they were unable to find more promising prey. For example, the logbook of Imogene reported "plenty of finbacks" in the north-central Gulf (27°51'W, 89°52'N) on 10 May 1838. The boats were lowered and one finback was struck but the line had to be cut. Within several days after that event, sperm whales were found, and there is no further sign in this logbook of interest in secondary target species. In the Bay of Campeche, the crew of Keziah lowered for and chased a finback on 13 Feb. 1790 and killer whales on 12 March 1791.

No focused, systematic study of historical whaling documents for information on "finback" whales has been attempted previously. This is despite the fact that many logbooks contain references to observations, and occasionally to strikes or kills, of these whales. Five species of *Balaenoptera* whales have been documented in the Gulf—blue whale (*Balaenoptera musculus*), fin whale (*Balaenoptera physalus*), sei whale (*Balaenoptera borealis*), Bryde's whale, and common minke whale (*Balaenoptera acutorostrata;*



Fig. 8. Daily positions on days when blackfish, grampuses, and cowfish were caught or sighted. Gray dots are blackfish (including "sharp-finned" blackfish), black dots are grampuses, and crosses are cowfish. Dotted lines indicate the 100-m and 1,000-m isobaths.

Jefferson and Schiro, 1997)—but all except the Bryde's whale are regarded as "extralimital, strays from migration, or occasional migrants" (Mullin and Fulling, 2004:798).

The consensus among scientists working in the Gulf of Mexico (as well as the Caribbean Sea) is that Bryde's whales are the most common Balaenoptera whales in the region and that they may be present year-round (Jefferson and Schiro, 1997; Würsig et al., 2000). Sightings in U.S. waters in recent years have been concentrated in what Mullin and Fulling (2004) defined as the northeast continental slope, consisting of waters 200-2,000-m deep between 83°55'W and 88°30'W (Fig. 9a). Reports of finbacks in the logbooks examined for this study suggest a much broader distribution, at least historically, encompassing much of the north-central and southern Gulf (Fig. 9b). This apparent difference deserves further investigation.

American whalers consistently referred to blue whales as "sulphurbottoms," so we would not expect them to have been recorded as "finbacks" in the logbooks. In any event, no references to sulphurbottoms were found in those logbooks read for this study. It is possible that some of the references in the logbooks to "finbacks" were fin whales or sei whales, but Jefferson and Schiro (1997) found only seven reliable records of fin whales and four of sei whales in the literature, and Mullin and Fulling (2004) reported that there had been no sightings of these species in ship surveys between 1996 and 2001.

With regard to minke whales, of which they found only 10 reliable records, Jefferson and Schiro (1997; following Mitchell, 1991) concluded that any minke whales in the Gulf probably represent "strays from low-latitude breeding grounds elsewhere in the western North Atlantic." The lack of reports in whaling logbooks is difficult to interpret. The name "minke" is of Norwegian origin and apparently was not applied to the species until some time late in the 19th century, so we would not expect to find that term used in logbooks from the American openboat whaling fleet. Scammon (1874:49) referred to the minke whale as the "sharp-headed finner whale" but acknowledged that most American whalers of his time considered it a "young

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Fig. 9. (a) Distribution of Bryde's whale sightings in the northern Gulf of Mexico from vessel surveys in spring 1996–2001 and 2004 and summer 2003 conducted by the Southeast Fisheries Science Center, NOAA Fisheries. Solid lines indicate the 100-m and 1,000-m isobaths and the offshore extent of the U.S. Exclusive Economic Zone. Reprinted with permission from Waring et al. (2009). (b) Daily positions on days when finbacks were caught or sighted. Dotted lines indicate the 100-m and 1,000-m isobaths.

finback" or a "finback's calf." Therefore, it is possible that some logbook references to "finbacks" meant minke whales.

As suggested by Jefferson and Schiro (1997), some useful insights on the occurrence of small and medium-sized toothed whales (in addition to pilot whales) can be gained from whaling logbooks. However, the problem of nomenclature is even more serious for them than it is for "finbacks." "Porpoises" (this could only mean dolphins in the Gulf, where true porpoises [Phocoenidae] are completely absent) were taken occasionally by the whalemen for food (e.g., the crew onboard Keziah "had a fine dinner out of a porpoise" on 9 May 1791), but there is rarely any way to determine the species. All that can be inferred is that the animals were likely taken while bow-riding, which would probably mean that they were either Stenella spp. (striped, spinner, Clymene, Atlantic spotted, or pantropical spotted dolphins), T. truncatus (common bottlenose dolphins), Lagenodelphis hosei (Fraser's dolphins), or Steno bredanensis (rough-toothed dolphins).

Killer whales were often chased when encountered by the 19th century whalers, and they were caught and tried out occasionally. For example, Imogene took one on 8 June 1839 somewhere in the Gulf (approximately a week's sail from Tortuga Bank), and George W. Lewis took one on 17 April 1863 at approx. 23°55'N, 86°16'W. O'Sullivan and Mullin (1997) noted the "paucity" of killer whale sighting and stranding records prior to the recent surge in surveys of oceanic waters of the northern Gulf and concluded that the species is rare on the continental shelf but a "regular inhabitant" of the slope and offshore. Had whaling logbooks been examined previously for data on killer whales, this finding would have come as no surprise (e.g., compare Figs. 10a,b).

Scammon (1874), the most literate of American 19th century whalemen, provided a glossary of whaler names for dolphins of the North Pacific that only partially coheres with modern taxonomy and nomenclature. He attributed the names blackfish, killer, white-headed or mottled grampus, and bay porpoise to the same genera that a modern biologist would, namely, Globicephala, Orcinus, Grampus, and Phocoena, respectively. In addition, however, he assigned the term "cowfish" to Tursiops, and referred to such things as "bottle-nosed grampus," "squareheaded grampus," and "brown-sided dolphin" without giving much information that would help guide us to their modern names. In the logbooks read for the present study, there were relatively numerous references to "grampuses" and a few to "cowfish" (Fig. 8). A simple assumption would be that the whalers meant the Risso's dolphin or grampus, *Grampus griseus*, when they wrote "grampus." Indeed, the present-day occurrence of this species in the northern Gulf of Mexico (and probably elsewhere) overlaps that of the sperm whale (Baumgartner et al., 2001), so presumably the whalers observed Risso's dolphins fairly often. On 16 April 1791 *Keziah* "struck a grampus he sunk," and on 9 April 1842 *Elizabeth* sighted "grampuses and cow fish" and caught two (of which species is not made clear) at 24°11′N, 88°06′W.

CONCLUSIONS

The duration, scale, species targeted, and other aspects of the Gulf of Mexico whale fishery have not previously been investigated in any detail. Given its relatively small scale and singlespecies focus, it is understandable that the fishery's existence has escaped the notice of most contemporary marine scientists. In contrast, entrepreneurs connected to the whaling industry in the late 1780s and 1790s were well aware of the area and regarded the Gulf as a promising source of profit. For instance, in a Jan. 1791 letter to his uncle, Francis Rotch (Bullard, 1947), William Rotch, Jr., claimed that "so long as the sperm fishery lasts we have a prospect of doing well." He further noted that in the course of the previous year, some 600 tons of spermaceti oil had been landed in New Bedford, "much of which was taken in the bay of Mexico where our small vessels have been remarkably fortunate." The Gulf fishery persisted and remained profitable through much of the 19th century, with its pattern of growth and decline roughly paralleling that of the American fleet as a whole (see Lund et al., 2010).

The findings of the present study with regard to species occurrence and general distribution are largely consistent with what modern researchers have found in surveys of the northern Gulf, but observations by the whalemen help broaden our baseline understanding of species distributions. The American whalers encountered (and hunted) sperm whales (and blackfish) not only in the productive waters off the mouth of the Mississippi River, but also in the Bay of Campeche and in the central Gulf north of the Yucatan Peninsula where the information on recent occurrence is much more limited (see Waring et al., 2009). The nearly exclusive focus on sperm whales by the Gulf whale fishery lends support to the idea that right whales and humpback whales were essentially absent in the Gulf in the 18th and 19th centuries, as they are



Fig. 10. (a) Daily positions of whalers on days when killer whales were caught or sighted. Dotted lines indicate the 100-m and 1,000-m isobaths. (b) Distribution of killer whale sightings in the northern Gulf of Mexico from vessel surveys in spring 1996–2001 and 2004 and summer 2003 conducted by the Southeast Fisheries Science Center, NOAA Fisheries. Solid lines indicate the 100-m and 1,000-m isobaths and the offshore extent of the U.S. Exclusive Economic Zone. Reprinted with permission from Waring et al. (2009).

today (notwithstanding occasional sightings and strandings of both species; Würsig et al., 2000).

The logbook observations of "finbacks" suggest a much wider historical distribution of Bryde's whales (and/or fin whales) in the Gulf than is indicated by the results of recent surveys (Waring et al., 2009; Fig. 9a,b). This difference points to an interesting and potentially important question for conservation. The small and apparently local population of Bryde's whales in the northeastern Gulf is essentially unstudied even though it may be highly vulnerable to oil pollution and other forms of habitat degradation in the region.

It is reasonable to assume that some vesselseasons of whaling in the Gulf were overlooked in our search, and therefore, as mentioned earlier, our estimate of about 1,200 sperm whales killed is probably negatively biased. Nonetheless, we are confident that the magnitude of this bias is not large and that when viewed in a global context, the scale of the Gulf whale fishery was modest. After all, the American fishery as a whole apparently killed well in excess of a quarter of a million sperm whales in the 18th and 19th centuries (Lund et al., 2010). It is difficult to assess the population-level impact of sperm whaling in the Gulf, particularly given that it was spread over approximately a century. The current best estimate of sperm whale abundance in the northern Gulf is 1,665 (coefficient of variation = 0.20) (Waring et al., 2009), and this may not account for the entire population because it is based on surveys in approximately only 40% of the Gulf.

The whalers who came to the Gulf in the late 1700s were likely exploiting an essentially pristine sperm whale population. Moreover, once they stopped visiting the Gulf, apparently by the 1870s, the whale population was again left in peace: this is one of the few parts of the world's oceans where shore-based whaling never took root and where modern factory ships never visited. At least some individuals from the population, i.e., those that moved seasonally or periodically out of the Gulf,⁶ were at risk of being hunted by American ship whalers in Caribbean and western Atlantic waters for a few more decades. It should also be mentioned that shore-based whalers in some of the Caribbean Windward Islands occasionally killed sperm whales beginning in the 1870s (Rathjen and Sullivan, 1970; Price, 1985; Reeves, 1988, 2002).

In summary, it seems that apart from the substantial removals of sperm whales by American whaling between the 1780s and 1870s, the large cetaceans of the Gulf of Mexico have been mostly spared from the effects of deliberate, direct exploitation. In that respect, they are somewhat exceptional in global terms. Only in the last few decades, with the rapid expansion of oil and gas development on the continental shelf, have serious conservation concerns for the Gulf's large cetaceans arisen, founded on the potential effects of noise and toxic contamination. The massive oil spill at British Petroleum's Macondo well, which began after a blowout on 20 April and continued until mid July 2010, brought unprecedented global attention to the region's living resources and their particular vulnerability not only to further catastrophic events of this sort, but also to the chronic degradation of the Gulf environment by industrialization and urbanization.

Acknowledgments

Library staff at the New Bedford Whaling Museum (specifically Laura Pereira and Michael Dyer), the Nicholson Collection of the Providence Public Library (Richard Ring), and the Harvard University Libraries provided much assistance by helping us identify and gain access to relevant materials. Comments provided by the two reviewers were extremely helpful, and we appreciate their contributions.

⁶Of 39 satellite-tagged sperm whales tracked for up to 607 d, only one (a male) left the Gulf, and it returned after an absence of about 2 mo (Jochens et al. 2008).

ling vessel name and identification number (VID) (from Lund et al., 2010), repository where \hat{c} sperm taken (Sperm.t), sperm killed but lost (Sperm.kl), sperm struck but lost (Sperm.sl),	ten (Pilot.t), blackfish struck but lost (Pilot.sl), and blackfish fate uncertain (Pilot.a). database (Lund et al., 2010); BL, Baker Library, Harvard University, Cambridge, MA; CCC,	ghton Library, Harvard University, Cambridge, MA; KWM, Kendall Collection, New Bedford National Archives and Records Administration. Washinston, DC: MVH. Martha's Vineward	y, New Bedford, MA; PEM, Peabody Essex Museum, Salem, MA; PPL, Nicholson Collection,	y Library, New Haven, CT; Inward Foreign Manifest: U.S. Customs document filed on return	U.S. from foreign waters.
APPENDIX. Logbook and other data on vessel-seasons in the Gulf of Mexico, including vessel name and identification number (VID) (from Lund et al., 20 a logbook is held, whether the logbook was read, season in the Gulf, numbers of sperm taken (Sperm.t), sperm killed but lost (Sperm.kl), sperm struct	sperm fate uncertain (Sperm.a), sperm found dead (Sperm.f), blackfish taken (Pilot.t), blackfish struck but lost (Pilot.sl), and blackfish fate Kev to abbreviations in Appendix: AOWV, American Offshore Whaling Voyages database (Lund et al., 2010); BL, Baker Library, Harvard University, C	Commander Chr. Christensen's Whaling Museum, Sandefjord, Norway, HH, Houghton Library, Harvard University, Cambridge, MA; KWM, Kendall Col Whaling Museum Research Library. New Bedford, MA: MAU: Maury Abstracts. National Archives and Records Administration. Washington, DC: MVF	Museum, Edgartown, MA; NBW, New Bedford Whaling Museum Research Library, New Bedford, MA; PEM, Peabody Essex Museum, Salem, MA; PPL, N	Providence Public Library, Providence, RI; PR, Privately owned; YU, Yale University Library, New Haven, CT; Inward Foreign Manifest: U.S. Customs docu	of a vessel to U.S. from foreign waters.

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	VID	Repository	Log read	Season	Sperm.t	Sperm.kl	Sperm.sl	Sperm.a	Sperm.f	Pilot.t	Pilot.sl	Pilot.a	Source
	340			1844									Spoken by <i>LaGrange</i>
	677			c. 1822									Declared destination AOWV
	679			1824									Spoken by Industry
	681			1827									Spoken by Industry
	775	KWM	Yes	1877	1	0	0	0	0	1	0	0	Logbook
	807			1827									Spoken by Charleston Packet
	838			1842									Spoken by Leonidas,
													Mattapoisett, Popmunett,
	830	KWM	Ves	1843	C	C	0	0	0	0	0	C	I vontas waisuu I oahook
	839	KWM	Yes	1844	1	0	0	0	0	0	0	0	Logbook
n	1044	KWM	Yes	1837									Logbook
c	1108			1860									Spoken by S. R. Soper
5	1109			1862									Spoken by George W. Lewis
	1587	KWM, NBW	Yes	1850	0	0	0	0	0	0	0	0	Logbook
	1588	NBW	Yes	1851									Logbook
	1588	NBW	Yes	1852	1	0	0	0	0	0	0	0	Logbook
	1589		Yes	1854									Townsend (unpubl.)
	1652			1842									Spoken by Thomas Winslow
	1653			1843									Spoken by America, Theophilus
													Chase, John B. Dods
	1654			1844									Spoken by LaGrange,
													Theophilus Chase
	1725			1822									Declared destination AOWV
	2098			1841									Spoken by Mattapoisett, Sarah
													Louisa
	2098			1842									Spoken by Mattapoisett, Sarah
													Louisa

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Vessel	VID	Repository	Log read	Season	Sperm.t	Sperm.kl	Sperm.sl	Sperm.a	Sperm.f	Pilot.t	Pilot.sl	Pilot.a	Source
Carter Braxton	2436			c. 1842									Declared destination on crew
Carter Braxton	2437			1844									ust Spoken by Fairy, America,
Charleston Packet	2763	BL	Yes	1827	17	2	-	-	0	0	0	0	LaGrange Lorhook
Charleston Packet	2764	BL	Yes	1829	6	0	0	0	0	0	0	0	Logbook
Chase	2786	HVH	Yes	1842									Townsend (unpubl.)
Chase	2787	НН	Yes	1843	ŋ	0	2	0	0	12	0	0	Logbook
Columbus	3108			c. 1823									Declared destination AOWV
Columbus	3109			1824									Spoken by Industry
Creole	3487			1842									Spoken by Elizabeth, Sarah
D(x) = Erraubling	3545	KAANA	Vac	1843	0	0	0	0	0	0	0	0	Louisa, 1 nomas Winstow I ochoob
Delight	3672		100	1837	>	þ	>	>	>	þ	>	>	Cuffe (1839)
Dolphin	3786			1802									Spoken in Gulf Columbian
1													Courier, 9 July 1802
Dove	3808			1818									Reported boarding in Gulf
													(Starbuck 1878)
Dove	3809			1822									Declared destination AOWV
Dove	3810			1823									Declared destination AOWV
Dove	3811			1823									Declared destination AOWV
Dromo	3860			1836									Declared destination AOWV
Dromo	3863			1841									Spoken by Sarah Louisa
E. H. Hatfield	3931	PPL	Yes	1876	10	0	0	0	0	0	0	0	Logbook
Edward Lee	4043			1877									Spoken by Amelia
Elbridge Gerry	4057			1862									Spoken by George W. Lewis
Eleanor B. Conwell	4088			1862									Spoken by George W. Lewis
Eleanor B. Conwell	4096	KWM	Yes	1870	0	0	0	0	0	0	0	0	Logbook
Eliza Barker	4188			1822									Declared destination AOWV
Elizabeth	4248	KWM, NBW	Yes	1842	60	0	0	0	0	0	0	0	Logbook
Ellen Rodman	4327	KWM	Yes	1868	0	0	0	0	0	0	0	0	Logbook
Emigrant	4384			1842									Spoken by Leonidas, Elizabeth,
													Sarah Louisa, Popmunett
Emma	4413			1841									Spoken by Elizabeth, Sarah
													Louisa, Thomas Winslow

APPENDIX. Continued.

Vessel	VID	Repository	Log read	Season	Sperm.t	Sperm.kl	Sperm.sl	Sperm.a	Sperm.f	Pilot.t	Pilot.sl	Pilot.a	Source
Emma	4413			1842									Spoken by Elizabeth, Sarah
													Louisa, Thomas Winslow
Esquimaux	4609			1844									Spoken by Fairy, Theophilus
													Chase
Essex	4619			1841									Spoken by Sarah Louisa
F. H. Moore	4770	CCC, YU	Yes	1873	8	0	0	0	0	0	0	0	Logbook
F. H. Moore	4770	CCC, YU	Yes	1874									Logbook
F. H. Moore	4771	CCC		1876									Spoken by E. H. Hatfield
Fairy	4813			1842									Spoken by Mattapoisett, John
													B. Dods
Fairy	4814	HH, KWM	Yes	1844	60	0	0	0	0	9	0	0	Logbook
Fanny	4885			c. 1828									Declared destination AOWV
Flora	4974			c. 1836									Clark (1887a:144–145)
Franklin	5202			1822									Declared destination AOWV
Franklin	5271			1852									Spoken by Ocean, Lewis Bruce
Gem	5452			1844									Spoken by Fairy
George W. Lewis	5718	KWM	Yes	1862	1	0	0	0	0	0	0	0	Logbook
George W. Lewis	5719	KWM	Yes	1863	0	0	0	0	0	4	0	0	Logbook
Golden City	5845	PPL	Yes	1876	1	0	5	0	1	0	0	0	Logbook
Governor Hopkins	5932			1837									Wood (unpubl.)
Governor Hopkins	5937			1841									Declaration of whaling
×													ground, Inward Foreign
													Manifest
Governor Hopkins	5939			1843									Spoken by Theophilus Chase,
													D(r). Franklin, America,
													Chase
H. W. Williams	6053			1852									Spoken by Ocean, Lewis Bruce
Harmony	6195			1834									Declared destination AOWV
Harmony	6196			1835									Declared destination AOWV
Harmony	6198			1837									Declared destination AOWV
Hazard	6275			1833									Declared destination AOWV
Hazard	6277			1834									Declared destination AOWV
Imogene	6953			1841									Spoken by Elizabeth, Sarah
													Louisa, Popmunett

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essel		tropositor)	100 1000	00000	sperm.t	sperm.ki	Sperm.sl	operm.a	opernu	THORY		THORS	00m.cc
e	6953			1842									Spoken by Elizabeth, Sarah
													Louisa, Popmunett
	6957			1835									Clark (1887a)
	0969	HH	Yes	1838	23	4	3	0	1	0	0	0	Logbook
	6961	HH	Yes	1839	6	0	5	0	0	60	0	0	Logbook
v	7072	NBW	Yes	1824	15	0	ъ	0	0	4	0	0	Logbook
~	7073	NBW	Yes	1827	2	0	0	1	0	6	1	0	Logbook
~	7074	NBW	Yes	1828	6	1	0	0	0	0	0	0	Logbook
~	7082			1836									Vessel fate AOWV
r	7222	KWM	Yes	1867	0	0	0	0	0	1	1	0	Logbook
lams	7628			1861									Robinson (1928)
Dods	7694	KWM	Yes	1843									Logbook
Dods	7695			1844									Spoken by Theophilus Chase
Brown	7919			c. 1843									Declared destination on crew
													list
	7986			c. 1820									Declared destination AOWV
	7998	NBW	Yes	1839	12	0	0	0	0	1	0	0	Logbook
	8060	НН	Yes	1789	1	0	0	0	0	1	0	0	Logbook
	8063	NBW	Yes	1790	14	1	5	0	1	4	0	1	Logbook
	8064	NBW	Yes	1791	22	0	1	0	0	4	0	0	Logbook
	8065	NBW	Yes	1792									Logbook
aBi	8181	NBW	Yes	1842									Logbook
aBu	8182	KWM	Yes	1844									Logbook
aBe	8182	KWM	Yes	1845									Logbook
r	8281	MAU		1844									Spoken by Fairy
SZ	8324	PPL	Yes	1841	0	0	1	0	0	0	0	0	Logbook
375	8324	PPL	Yes	1842									Logbook
375	8342	PPL	Yes	1842									Logbook
as	8343			1843									Spoken by <i>Theophilus Chase</i> , D(r.) Franklin
22	8344			1844									Spoken by Fairy
ruce	8408			1860									Spoken by S. R. Soper
sruce	8412	KWM	Yes	1851	1	0	0	0	0	6	0	0	Logbook
smce	8413	KWM	Yes	1852	0	0	0	0	0	9	0	0	Logbook
ton	8416			1835									Declared destination AOWV

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APPENDIX. Continued.

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Continued.
APPENDIX.

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Vessel	VID	Repository	Log read	Season	Sperm.t	Sperm.kl	Sperm.sl	Sperm.a	Sperm.f	Pilot.t	Pilot.sl	Pilot.a	Source
			I										
Lexington	8417			c. 1836									Declared destination AOWV
Louisa	8590			1836									Clark (1887a)
Louisa	8595			1844									Spoken by Fairy
Lvdia	8714			1801									Declared destination
,													Cohumbian, Courier.
													13 February 1801
Manacambo	0031			1949									Condron by Dhum with
Maracayoo	1000			C+01									Spoken by <i>rymouin</i>
Mary Ann	9279			1791									Spoken by <i>Keziah</i>
Mattapoisett	9441	KWM, NBW	Yes	1842	ñ	0	0	0	3	1	0	0	Logbook
Meridian	9614	KWM, NBW	Yes	1840									Logbook
Meridian	9615			1841									Spoken by Sarah Louisa
Mexico	6026			1842									Spoken by Sarah Louisa,
													Popmunett
Mexico	9710			1843									Spoken by Theophilus Chase
Montezuma	9985			1862									Spoken by George W. Lewis
Montezuma	10024			1843									Spoken by Theophilus Chase
Montgomery	10034			1843									Spoken by $D(r)$. Franklin
Ocean	10710	PPL, KWM,	Yes	1852	67	0	0	0	0	0	0	0	Logbook
		PEM											0
Olive Clark	10832	NBW	Yes	1855	0	0	0	0	0	6	0	0	Logbook
Oliver H. Perry	10850			1821									Declared destination AOWV
Oread	10950			1862									Spoken by George W. Lewis
Oread	10951			1863									Spoken by George W. Lewis
Osceola	11032	MAU, PPL	Yes	1852									Logbook
Osceola	11032	MAU, PPL	Yes	1853									Logbook
Oxford	11075			1792									Spoken by Keziah
Pacific	11172			1843									Spoken by Quito
Panama	11235			1861									Robinson (1928)
Pavilion	11327			1862									Spoken by George W. Lewis
Pearl	11344			1841									Spoken by Sarah Louisa
Phoenix	11632			1840									Clark (1887a:144–145)
Phoenix	11637			1844									Spoken by Fairy, Theophilus
													Chase
Pilgrim	11646			1842									Spoken by Thomas Winslow
Pilgrim	11647	KWM	Yes	1843									Logbook

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Vessel	ΜΝ	Renository	I og read	Seacon	Snerm t	Snerm bl	Snerm cl	Sperm a	Snerm f	Pilot t	Pilot el	Pilot a	Source
V C55C1	CTTA	repository	rog icau	1106936	made	opennuk	16-1111-2de	operma	rmiade	rnorr	r nousi	r mora	201106
Pilgrim	11649			1844									Spoken by Fairy, Theophilus
nl	00411			101									$C_{III}ase$
<i>Pocanontas</i>	66/TT			1641									Spoken by Sarah Louisa
Popmunett	11848			1837									Wood (unpubl.)
Popmunett	11855	KWM	Yes	1842									Logbook
Primrose	11976			1834									Declared destination AOWV
Primrose	11979			1837									Declared destination AOWV
Primrose	11980			1838									Declared destination AOWV
Quickstep	12010			1862									Spoken by George W. Lewis
Quickstep	12020			1876									Spoken by E. H. Hatfield
Quito	12040	KWM	Yes	1843	10	0	0	0	0	1	0	0	Logbook
R. E. Cook	12060			1862									Spoken by George W. Lewis
Rainbow	12075			1788									Stackpole (1953)
Regulator	12217			1829									Spoken by Charleston Packet
Richard Henry	12284			1842									Spoken by Popmunett
Rienzi	12322			1844									Spoken by Fairy
Rienzi	12325			1844									Wood (unpubl.)
Rising Sun	12355			1862									Spoken by George W. Lewis
S. R. Soper	12690			1852									Spoken by <i>Lewis Bruce</i>
S. R. Soper	12694	NBW		1855									Spoken by Olive Clark
S. R. Soper	12696			1857									Spoken by Walter Irving
S. R. Soper	12700	KWM	Yes	1860	ъ	5	1	0	0	5	0	0	Logbook
S. R. Soper	12701			1862									Spoken by George W. Lewis
Samuel and	12784			1842									Spoken by Leonidas
Thomas													
Sarah	12842			1842									Spoken by Mattapoisett
Sarah E. Lewis	12905			1876									Spoken by Union
Sarah Louisa	12935	KWM	Yes	1841	13	0	0	0	0	60	0	0	Logbook
Sarah Louisa	12935	KWM	Yes	1842	1	0	0	0	0	1	3	0	Logbook
Sea Bird	12984			1842									Spoken by Elizabeth,
													Mattapoisett, Popmunett,
													Thomas Winslow
Solon	13221			1842									Spoken by Popmunett, Thomas
													Winslow

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x 7	CLUX N	-	1	c	c	-		c			1.1.1	1.0	
Vessel	A1D	kepository	Log read	Season	sperm.t	sperm.ki	sperm.si	sperm.a	sperm.r	1.10114	FIIOUSI	P110La	Source
heophilus Chase	13784			1842									Spoken by Mattapoisett, Pohmunett. Thomas Winslow
heophilus Chase	13785	NBW, PR	Yes	1843	7	0	0	0	0	6	0	0	Logbook
iomas Winslow	13875	NBW	Yes	1842	4	0	0	0	0	0	0	0	Logbook
ial (Tryall)	14025			1790									Spoken by Keziah
roy	14142	KWM	Yes	1837	0	0	0	0	0	6	0	0	Logbook
roy	14144			1840									Declaration of whaling
×.													ground, Inward Foreign
													Manifest
roy	14146			1842									Spoken by Mattapoisett
leston	14218			1841									Spoken by Sarah Louisa
nion	14278	NBW	Yes	1876	0	0	0	0	0	2	0	0	Logbook
nknown	16675			1789									Spoken by Keziah
nknown	16681			1790									Spoken by Keziah
nknown	16683			1790									Spoken by Keziah
nknown	16688			1790									Spoken by Keziah
nknown	16689			1792									Spoken by Keziah
nknown	16710			1789									Spoken by Keziah
ıknown	16724			1790									Spoken by <i>Keziah</i>
ıknown	16725			1791									Spoken by Keziah
ıknown	16726			1791									Spoken by Keziah
ıknown	16733			1792									Spoken by Keziah
ıknown	16748			1792									Spoken by Keziah
ıknown	16750			1790									Spoken by Keziah
ıknown	16751			1792									Spoken by <i>Keziah</i>
ıknown	16752			1792									Spoken by Keziah
ıknown	16759			1792									Spoken by Keziah
ıknown	16762			1792									Spoken by Keziah
ıknown	16764			1792									Spoken by Keziah
nknown	16766			1791									Spoken by Keziah
nknown	16770			1791									Spoken by Keziah
ıknown	16771			1790									Spoken by Keziah
ıknown	16890			1790									Spoken by Keziah
ıknown	16911			1791									Spoken by Keziah
nknown	16914			1792									Spoken by Keziah

APPENDIX. Continued.

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APPENDIX. Continued

Source	Spoken by Keziah	Spoken by S. R. Soper	Spoken by George W. Lewis	Spoken by George W. Lewis	Spoken by S. R. Soper	Logbook	Spoken by Ocean	Spoken by Popmunett	Spoken by George W. Lewis	Spoken by Quito, Pilgrim	Spoken by Theophilus Chase				
Pilot.a										0					
Pilot.sl										0					
Pilot.t										5					
Sperm.f										0					
Sperm.a										0					
Sperm.sl										0					
Sperm.kl										1					
Sperm.t										9					
Season	1790	1791	1789	1790	1790	1860	1862	1862	1860	1857	1852	1842	1862	1843	1844
Log read										Yes					
Repository										KWM, PPL					
VID	16926	16939	17063	17064	17065	15099	15100	15212	15232	15261	15273	15348	15433	15662	15663
Vessel	Unknown	Unknown	Unknown	Unknown	Unknown	Varnum H. Hill	Varnum H. Hill	W[illiam] Martin	W[illiam] Martin	Walter Irving	Walter K.	Warwick	Watchman	William Henry	William Henry

UNPUBLISHED MATERIALS

- Amelia 1876–77. Journal kept by Loring Braley aboard the schooner Amelia of New Bedford, MA; Loring Braley, Master; 27 Dec. 1876 to 26 July 1877. Research Library, New Bedford Whaling Museum, New Bedford, MA. KWM 591.
- America 1842–44. Logbook kept by George Olney, Jr. aboard the brig America of Wareham, MA; Quartus Bellows and William Parsons, Masters; 16 Nov. 1842 to 20 May 1844.
 Research Library, New Bedford Whaling Museum, New Bedford, MA. KWM 683.
- Annawan 1836–37. Journal kept by Charles B. Hammond aboard the brig Annawan of Rochester, MA; Charles B. Hammond, Master; 16 Dec. 1836 to 18 June 1837. Research Library, New Bedford Whaling Museum, New Bedford, MA. KWM 15.
- Barclay 1849–50. Journal kept by Alexander P. Cornell, aboard the bark Barclay of Westport, MA; James King, Master; 1 June 1849 to 1 Sept. 1850. Research Library, New Bedford Whaling Museum, New Bedford, MA. 718.
- *Barclay* 1850–52. Logbook kept aboard the bark *Barclay* of Westport, MA; Weston Smith Tripp, Master; 2 Dec. 1850 to 26 May 1852. Research Library, New Bedford Whaling Museum, New Bedford, MA. 719.
- Bureau of Customs A. Barnstable, MA; crew lists 1839–46. RG 36. National Archives and Records Administration, Washington, DC.
- Bureau of Customs B. Bristol-Warren, RI, Mss 28. Manuscripts Collection, Rhode Island Historical Society Library, Providence, RI.
- *Charleston Packet* 1826–28. Logbook kept aboard the brig *Charleston Packet* of Fairhaven, MA; Jabez Delano, Jr., Master; 5 Jan. 1827 (voyage already underway) to 20 June 1828. Baker Library, Harvard Business School, Cambridge, MA.
- *Charleston Packet* 1828–29. Logbook kept aboard the brig *Charleston Packet* of Fairhaven, MA; George Tobey, Master; 29 Aug. 1828 to 24 Aug. 1829. Baker Library, Harvard Business School, Cambridge, MA.
- *Chase* 1842–44. Journal kept by Edmund Phillips aboard the bark *Chase* of New Bedford, MA; Abner West, Master; 1 Jan. 1843 to 7 July 1844. Houghton Library, Harvard University, Cambridge, MA. Ms F6870.14F.
- D(r). Franklin 1842–43. Journal kept (probably by George Macomber) aboard the bark D(r). Franklin of Westport, MA; Hiram Francis, Master; 18 July 1842 to 21 July 1843. Research Library, New Bedford Whaling Museum, New Bedford, MA. KWM 799.

- *E. H. Hatfield* 1876. Logbook kept aboard the schooner *E.H. Hatfield* of Provincetown, MA; William Kirkconnell, Master; 22 Jan. 1876 to 29 Aug. 1876. Nicholson Collection, Providence Public Library, Providence, RI. Wh E114 1876L.
- Eleanor B. Conwell 1869–71. Journal kept aboard the schooner Eleanor B. Conwell of Provincetown, MA; George H. Cannon, Master; 12 Dec. 1869 to 14 Oct. 1870 (voyage still underway). Research Library, New Bedford Whaling Museum, New Bedford, MA. KWM 782.
- *Elizabeth* 1841–42. Journal kept probably by Pardon Cook aboard the brig *Elizabeth* of Westport, MA; Pardon Cook, Master; 18 May 1841 to 5 May 1842. Research Library, New Bedford Whaling Museum, New Bedford, MA. KWM 598.
- *Ellen Rodman* 1867–68. Logbook kept by B. F. Robinson aboard the schooner *Ellen Rodman* of Fairhaven, MA; Thomas F. Lambert, Master; 12 April 1867 to 18 Sept. 1868. Research Library, New Bedford Whaling Museum, New Bedford, MA. KWM 782.
- *F.H. Moore* 1873–75. Journal kept by Mr. Tucker aboard the brig *F.H. Moore* of Boston, MA; Robert Soper, Master; 12 May 1873 to 29 May 1874 (voyage still underway). Research Library, New Bedford Whaling Museum, New Bedford, MA. IMA 527.
- Fairy 1843–44. Journal kept by Hiram Holmes aboard the bark Fairy of Provincetown, MA; Ebenezer Cook, Master; 9 Sept. 1843 to 22 Oct. 1844. Research Library, New Bedford Whaling Museum, New Bedford, MA. KWM 578.
- George W. Lewis 1861–62. Journal kept by Hiram Holmes aboard the schooner George W. Lewis of Provincetown, MA; Hiram Holmes, Master; 22 May 1861 to 31 July 1862. Research Library, New Bedford Whaling Museum, New Bedford, MA. KWM 581.
- George W. Lewis 1862–63. Journal kept by Hiram Holmes aboard the schooner *George W. Lewis* of Provincetown, MA; Hiram Holmes, Master; 24 Oct. 1862 to 22 Aug. 1863. Research Library, New Bedford Whaling Museum, New Bedford, MA. KWM 581.
- George W. Lewis 1864–1865. Journal kept by Hiram Holmes aboard the schooner George W. Lewis of Provincetown, MA; Hiram Holmes, Master; 25 February 1864 to 6 July 1865. Research Library, New Bedford Whaling Museum, New Bedford, MA. KWM 581.
- *Golden City* 1875–76. Logbook kept by James F. Avery aboard the schooner *Golden City* of New Bedford, MA; Henry Clay, Master; 9 Dec. 1875 to 29 Sept. 1876. Nicholson Collection, Prov-

idence Public Library, Providence, RI. Wh G618 1875L.

- *Imogene* 1838. Logbook kept by Ebenezer Cook aboard the brig *Imogene* of Provincetown, MA; James Smalley, Master; 9 Jan. 1838 to 24 July 1838. Houghton Library, Harvard University, Cambridge, MA. F6870, 41F.
- Imogene 1839. Journal kept by Ebenezer Cook aboard the brig Imogene of Provincetown, MA; James Smalley, Master; 19 Jan. 1839 to 1 Sept. 1839. Houghton Library, Harvard University, Cambridge, MA. F6870, 41F.
- *Industry* 1823–24. Logbook kept aboard the brig *Industry* of Westport, MA; Owen Wilbour, Master; 16 Nov. 1823 to 9 Aug. 1824. Research Library, New Bedford Whaling Museum, New Bedford, MA. 744.
- *Industry* 1827. Logbook or journal kept aboard the brig *Industry* of Westport, MA; Owen Wilbour, Master; 20 Jan. 1827 to 11 Sept. 1827. Research Library, New Bedford Whaling Museum, New Bedford, MA. 747A.
- *Industry* 1828. Logbook kept aboard the brig *Industry* of Westport, MA; Matthew Mayhew, Master; 16 Jan. 1828 to 10 Aug. 1828. Research Library, New Bedford Whaling Museum, New Bedford, MA. 747B.
- J. Taylor 1866–67. Logbook kept aboard the schooner J. Taylor of Provincetown, MA; Atkins Smith, Master; 26 Feb. 1866 to 27 June 1867. Research Library, New Bedford Whaling Museum, New Bedford, MA. KWM 397.
- *J. Taylor* 1867–1869. Logbook kept by William F. Snow aboard the schooner *J. Taylor* of Provincetown, MA; Atkins Smith, Master; 29 August 1867 to 9 August 1868. Research Library, New Bedford Whaling Museum, New Bedford, MA. KWM 397.
- John B. Dods 1842–43. Journal kept by Hiram Prior aboard the brig John B. Dods of Provincetown, MA; Hiram Prior, Master; 24 Feb. 1842 to 28 July 1843. Research Library, New Bedford Whaling Museum, New Bedford, MA. KWM 524.
- Juno 1838–39. Journal kept by Allen Brownell aboard the brig Juno of New Bedford, MA; Allen Brownell, Master; 14 April 1838 to 27 May 1839. Research Library, New Bedford Whaling Museum, New Bedford, MA. 335.
- Keziah 1788–89. Journal kept by Shubel Hammett aboard the sloop *Keziah* of Boston, MA; Daniel Bennett, Master; 8 July 1788 to 20 June 1789. Houghton Library, Harvard University, Cambridge, MA. Ms AM460.1F.
- *Keziah* 1789. Journal kept by Shubel Hammett aboard the sloop *Keziah* of Boston, MA; Daniel Bennett, Master; 25 Aug. 1789 to 20 Sept. 1789.

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Research Library, New Bedford Whaling Museum, New Bedford, MA. 459A.

- Keziah 1789–90. Journal kept by Shubel Hammett aboard the sloop Keziah of Boston, MA; Daniel Bennett, Master; 5 Nov. 1789 to 27 July 1790. Research Library, New Bedford Whaling Museum, New Bedford, MA. 459B.
- Keziah 1790–91. Journal kept by Shubel Hammett aboard the sloop *Keziah* of Boston, MA; Daniel Bennett, Master; 25 Nov. 1790 to 10 Aug. 1791.
 Research Library, New Bedford Whaling Museum, New Bedford, MA. 459C.
- *Keziah* 1792. Journal kept by Shubel Hammett aboard the sloop *Keziah* of Boston, MA; Daniel Bennett, Master; 4 Jan. 1792 to 6 Sept. 1792. Research Library, New Bedford Whaling Museum, New Bedford, MA. 459D.
- LaGrange 1841–42. Journal kept by James Lawrence Lincoln aboard the brig LaGrange of Mattapoisett, MA; Leonard S. Dexter, Master; 12 June 1841 to 20 Aug. 1841 (voyage still underway). Research Library, New Bedford Whaling Museum, New Bedford, MA. 1011B.
- LaGrange 1843–45. Journal kept by Thomas A. Lambert aboard the brig LaGrange of Mattapoisett, MA; Thomas F. Lambert, Master; 1 Nov. 1843 to 29 June 1845. Research Library, New Bedford Whaling Museum, New Bedford, MA. KWM 794.
- Leonidas 1841–42. Logbook kept aboard the brig Leonidas of Fall River, MA; Ensign Baker, Master; 4 May 1841 to 2 May 1842. Nicholson Collection, Providence Public Library, Providence, RI. Wh L5853 1841L.
- Leonidas 1841–43. Journal kept by Godfrey King aboard the ship *Leonidas* of Bristol, MA; Godfrey King, Master; 4 March 1841 to 14 Jan. 1843. Nicholson Collection, Providence Public Library, Providence, RI. Microfilm 324.
- Lewis Bruce 1851. Journal kept by Nathan D. Young II aboard the brig Lewis Bruce of Provincetown, MA; Nathan D. Young II, Master; 1 March 1851 to 29 Sept. 1851. Research Library, New Bedford Whaling Museum, New Bedford, MA. KWM 19.
- *Lewis Bruce* 1852. Journal kept by Nathan D. Young II aboard the brig *Lewis Bruce* of Provincetown, MA; Nathan D. Young II, Master; 31 March 1852 to 2 Nov. 1852. Research Library, New Bedford Whaling Museum, New Bedford, MA. KWM 19.
- Mattapoisett 1841–42. Logbook kept by Horace Thomas aboard the brig Mattapoisett of Mattapoisett, MA; Henry A. Brightman, Master; 26 March 1841 to 5 Sept. 1842. Research Library, New Bedford Whaling Museum, New Bedford, MA. 32.

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- Olive Clark 1855–56. Journal kept by Joseph W. Tuck aboard the schooner Olive Clark of Provincetown, MA; Joseph W. Tuck, Master; 25 April 1855 to 12 April 1856. Research Library, New Bedford Whaling Museum, New Bedford, MA. 1294.
- Ocean 1852–53. Logbook kept by Jesse H. Allen aboard the brig Ocean of Sandwich, MA; Joshua T. Chadwick, Master; 25 Feb. 1852 to 5 Feb. 1853. Research Library, New Bedford Whaling Museum, New Bedford, MA. KWM 312.
- Pilgrim 1842–43. Logbook kept by John Marble aboard the bark Pilgrim of Somerset, MA; Joseph Read and Job Collins, Masters; 7 July 1842 to 12 July 1843. Research Library, New Bedford Whaling Museum, New Bedford, MA. KWM 516.
- Popmunett 1842–43. Journal kept by William Flanders aboard the bark Popmunett of Sippican, MA; William Flanders, Master; 16 Feb. 1842 to 23 Sept. 1843. Kendall Collection, Research Library, New Bedford Whaling Museum, New Bedford, MA. KWM 762.
- Quito 1842–43. Journal kept by Edward A. Sherman aboard the brig Quito of Sippican, MA; Tristram L. Chase, Master; 16 May 1842 to 27 May 1843. Research Library, New Bedford Whaling Museum, New Bedford, MA. KWM 322.
- S.R. Soper 1860. Journal kept by Hiram Holmes aboard the schooner S.R. Soper of Provincetown, MA; Hiram Holmes, Master; 2 April 1860 to 11 Nov. 1860. Research Library, New Bedford Whaling Museum, New Bedford, MA. KWM 581.
- Sarah Louisa 1840–42. Logbook kept aboard the brig Sarah Louisa of New Bedford, MA; Ray Green Sanford and Ebenezer Slocum, Masters; 30 Sept. 1840 to 29 April 1842. Research Library, New Bedford Whaling Museum, New Bedford, MA. KWM 323.
- *Theophilus Chase* 1842–44. Logbook kept aboard the bark *Theophilus Chase* of Westport, MA; Daniel Baker, Master; 1 Dec. 1842 to 26 Aug. 1844. Research Library, New Bedford Whaling Museum, New Bedford, MA. 735.
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 Feb. 1837 to 25 Nov. 1837. Research Library, New Bedford Whaling Museum, New Bedford, MA. KWM 342.
- Union 1875–76. Logbook kept by Valentine C. Long and James Black, Jr., aboard the schooner Union of New Bedford, MA; John Milk Allen, Charles Blackmer, and Valentine C. Long, Masters; 8 June 1875 to 30 June 1876. Research Library, New Bedford Whaling Museum, New Bedford, MA. 250A.
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