

PHOTOGRAPHIC IDENTIFICATION OF FIN WHALES  
(*BALAENOPTERA PHYSALUS*) OFF THE ATLANTIC  
COAST OF NOVA SCOTIA, CANADA

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Although fin whales (*Balaenoptera physalus*) are commonly encountered throughout most of the North Atlantic, little is known about their movement patterns and stock structure. In the summer, Northwest Atlantic fin whales are commonly sighted in the Gulf of Maine, the Bay of Fundy (Aglar *et al.* 1990), the Gulf of St. Lawrence and Estuary (Sears and Williamson 1982, Kingsley and Reeves 1998), and offshore areas of Nova Scotia (Hooker *et al.* 1999). Fin whales are occasional visitors to the coastal waters near Halifax, Nova Scotia, during the summer (zero to four sightings per season, 1996, 1998–2004, unpublished data) however in 1997 an unusually high number of fin whales were encountered (110 sightings).

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Fin whales were photographed between 6 June and 14 October 1997 from a 14-m commercial whale-watching vessel near Halifax, Nova Scotia (44°30'N–45°N and 63°W–64°10'W). Whales were encountered opportunistically during three daily 3-h tours.

Photographs were taken and individuals were identified following the methods of Agler *et al.* (1990). Separate catalogs were maintained of left and right side photographs although some individuals could be identified by photographs of both sides based on markings and field notes. Individuals sighted in the Halifax area in 1997 were compared with individuals in several western North Atlantic catalogs: the North Atlantic Finback Whale Catalogue (NAFWC, Gulf of Maine), Briar Island Ocean Studies (BIOS, Bay of Fundy), Mingan Island Cetacean Studies Inc. (MICS, inner Gulf of St. Lawrence), and Le Group de Recherché et d'Éducation sur les Mammifères Marins (GREMM, St. Lawrence Estuary). Matches between catalogs were verified by at least two researchers.

Fin whales were photographed on 32 of the 56 d spent in the field in 1997. Groups ranged in size from 1–20 ( $\bar{x}$  = 6.5, SE 0.49,  $n$  = 80). Of the 880 photographs taken of fin whales (consisting of 354 suites, each consisting of a series of consecutive photographs of a single individual), 686 were of sufficient quality for the individual to be identified (486 right-side identifications, 200 left-side). As pigmentation patterns are more conspicuous on the right side of fin whales, field effort concentrated on capturing the right side, resulting in more photographs of the right.

Based on photographs from the right side, 36 individuals were identified. Additionally, 21 individuals were identified from left-side photographs, although many of these individuals were likely also included in the right-side catalog as only two individuals could be identified by both the left and right sides. Nine individuals identified off Halifax had been photographed in the northern Gulf of Maine and the Bay of Fundy. Three individuals photographed off Halifax had been photographed in the inner Gulf of St. Lawrence by MICS, one of which had also been photographed by GREMM in the St. Lawrence Estuary. One individual was matched to photographs in both the Gulf of Maine catalogs and the MICS Gulf of St. Lawrence catalog.

In 1997 fin whales were unusually abundant in the Halifax area. Fin whales were not sighted in 1996, 1999–2001, or 2004, and sighted only infrequently in 1998, 2002, and 2003, although field effort varied between years (unpublished data). Many studies have correlated the distribution and abundance of fin whales with prey abundance (*e.g.*, Hain *et al.* 1992, Woodley and Gaskin 1996), therefore it is reasonable to suggest that the abundance of fin whales near Halifax in 1997 was due to an abundance of prey. Commercial catches of herring (*Clupea harengus*) near Halifax were up to 6.8 times higher in 1997 than in the following two years,<sup>2</sup> when only one sighting of fin whales occurred. Additionally, commercial fisherman in the area noted higher levels of both sandlance (*Ammodytes americanus*) and euphausiids in 1997 than in other years.<sup>3</sup> Although the specific diet of the Halifax fin whales is

<sup>2</sup> Fisheries Catch Database, Department of Fisheries and Oceans, Bedford Institute of Oceanography, P. O. 1006, Dartmouth, Nova Scotia B2Y 4A2, Canada, August 2003.

<sup>3</sup> Personal communication from C. Morash, West Dover, Nova Scotia B3Z 3S9, Canada, August 2003.

unknown, herring, sandlance, and euphausiids are known to be fin whale prey species (Woodley and Gaskin 1996). In the St. Lawrence Estuary, there were fewer sightings of fin whales in 1997 even though no apparent difference in euphausiid concentrations was detected (Giard *et al.* 2001). This suggests some fin whales migrating into the St. Lawrence Estuary in the summer of 1997 found an unusually good food source near Halifax and stayed in the area, rather than continuing to move into the St. Lawrence Estuary.

This study indicates that fin whales from the Gulf of Maine and the Gulf of St. Lawrence intermingle, at least occasionally, during the summer. On three out of the four days that fin whales from different regions were photographed, they were in the same group. This demonstrates fin whales from different areas are associating over small spatial scales. These results indicate fin whale movements in the North Atlantic may be more variable than previously thought. Continued studies in areas adjacent to known summering grounds may help elucidate the long-term pattern of movements.

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