



Aerial surveying of grey seal breeding colonies on the Blasket Islands, Co. Kerry, the Inishkea Group, Co. Mayo and the Donegal Coast, Ireland

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Summary

The status of Ireland's grey seal population and its relationship with that of Britain and Western Europe, are poorly understood. The existing population estimate for grey seals in Ireland is outdated and urgency exists to establish a reliable national population estimate for this species, listed as an Annex II species under the EU Habitats Directive. Prior to the initiation of a survey on a national scale, the success or otherwise of aerial techniques in surveying grey seal breeding habitat on the Irish coastline first needs to be established. Previously, surveys were boat-based and were susceptible to adverse weather conditions frequently encountered during the autumn breeding season. The feasibility of using aerial techniques to survey grey seal breeding colonies in Ireland was tested during the breeding season of 2003.

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Introduction

Ireland's most recent minimum population estimate for grey seals (*Halichoerus grypus*) dates back to boat-based ground counts conducted by the Forestry and Wildlife Service in the late 1970s and early 1980s (see Summers, 1983). The figure derived from ground counting during this period (2000–2500 seals of all ages) is, without doubt, an

inadequate indicator of today's population size. Between 1994 and 2003, a number of surveys were conducted at breeding and haul-out colonies of recognised national importance. The most recent of these surveys was of the Inishkea Island group, in County Mayo (Ó Cadhla & Strong, 2003). Results from these local or regional population surveys indicate that the national grey seal population size is considerably greater today than was estimated in 1983 (Ó Cadhla & Mackey, 2002). Due to limitations of the data upon which historic estimates are based and the absence of a national census in the last 20

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years, it is not possible to determine trends in the grey seal population size at present.

The only component of grey seal populations to provide reliable population estimates when counted, are pups during the first few weeks of life, when they spend most of their time ashore at the breeding colonies. Boat-based surveys present operational difficulties, particularly during the annual breeding season (September–December) when site-visits may be prone to cancellation due to rough sea conditions. While boat-based surveys are adequate for assessing local populations, they would be exceedingly difficult to implement effectively on a national basis in a reasonable time-scale. Due to similar difficulties in the UK the standard method used for determining population size since the 1960s has been the use of aerial photography from fixed-wing aircraft. The surveys use a large format aerial camera mounted in a vibration-damped motion-compensating cradle. Counts of pups are made directly from the photographs on a microfiche reader, which magnifies photos by 22 times (Hiby, Thompson, & Ward, 1988). Furthermore, grey seal populations have been surveyed by aerial means throughout most part of their geographical range in the North Atlantic and the Baltic Sea; in Canada, the US, Iceland, Sweden, Finland and Norway (Bowen, McMillan, & Mohn, 2003; Corkeron, Nilssen, & Haug, 2003; Hammill, Gosselin, & Stenson, 2003; Harding & Härkönen, 1999; Hauksson, 2003; Wood & Brault, 2003). Aerial survey had not been tried in Ireland before, as it was previously thought that a significant proportion of the population could be missed, due to seals breeding in caves or narrow gullies where aerial photography would be very difficult. However, developments in digital technology and familiarity of researchers with a large proportion of the grey seal breeding habitat in Ireland, indicated that aerial survey methods might be used to survey large areas of the coastline and offshore islands during the grey seal breeding season. This would include many sites that are difficult to access either by land or by boat.

The feasibility of using aerial methods to survey grey seal populations along large areas of the Irish coastline and offshore islands during the breeding season first needed to be tested before the technique can be considered for a national census. The following surveys were carried out: a series of successive aerial surveys at the Blasket Islands, Co. Kerry with a view to determining local pup production and an estimate of the size of the associated population; one aerial survey of key breeding colonies among the Inishkea Group, Co. Mayo in order to cross-reference with ground

counts carried out at these sites in 2002; and one aerial survey of the Donegal coastline, a section of the Irish coastline from which little data are presently available (Fig. 1). We could then examine the success of the aerial survey method to be incorporated into the development of an appropriate national census technique.

Methodology

Surveys were conducted from a high-winged single-engine Cessna 172 aircraft. Oblique photographs were taken out of an opened window on the left side of the aircraft using a Canon EOS 1DS digital camera with a Sigma 70–210 mm lens. Efforts were made to obtain near-vertical images by tightly circling the breeding colonies at an altitude of approximately 200 m.

Five surveys were carried out at the Blasket Islands, Co. Kerry during September, October and November 2003. The survey method was based on that used by the Sea Mammal Research Unit (SMRU) at the University of St. Andrews, Scotland, to census the British grey seal population (Hiby et al., 1988). Each colony is surveyed between four and six times through the breeding season at intervals of 10–12 days. Known breeding sites used in 1995 and 1996 (Kiely & Myers, 1998) and potential breeding sites were surveyed. Potential breeding sites were identified based on the availability of suitable habitat for pupping.

Additional surveys were carried out at the Inishkea Group, Co. Mayo and along the coast of Donegal in October and November, respectively. These were single surveys, primarily to determine the feasibility of surveying these locations by air. Known and potential breeding sites were surveyed. Recent information on existing breeding sites was available for the Inishkea Group (Ó Cadhla & Strong, 2003). Efforts were made to collate information on breeding sites in Co. Donegal using historical records, unpublished reports and local knowledge.

Adobe Photoshop software was used to view the images. Pups were counted from colour photographs and classified into three determinable stages: whitecoats, moulted and dead. Dead pups appeared thin and flaccid compared to live pups (Fig. 2(ii)).

Pup production estimates and associated population size

The duration of the pupping season exceeds the minimum length of stay of a pup and therefore only a fraction of the total pup production at a colony is

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