



Whelk (*Buccinum undatum* L.) stocks around the Island of Jersey, Channel Islands: Reassessment and implications for sustainable management



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ABSTRACT

The exploitation of the common whelk (*Buccinum undatum* L.) has become an integral part of commercial fisheries in both Jersey and French waters. Since 2004 declining catches have been reported, and it has been suggested that existing management measures may not be effective. This study reports a further 8 years of annual monitoring of whelk catches from 2003 to 2011, using identical methodology and analysis as previous work. Jersey commercial whelk fishermen's logbook returns from 2007 to 2011, were also analysed for changes in effort and catch. Average catch per unit effort (CPUE) dropped by 36.7% from 3.3 kg per pot to 2.09 kg per pot. Since 2007, Fishermen's reported landings per unit effort for whelks, also dropped from 2.12 kg per pot to 1.75 kg per pot. Whilst a decline in catch rates of whelks greater than 44 mm shell length was reported earlier, this study also found catch rates for smaller whelks (<44 mm shell length) had declined by 54.5% from 0.44 kg per pot to 0.2 kg per pot, suggesting the start of possible recruitment overfishing. We found no statistical significance (repeated measures ANOVA) between the sample station grouping of 'fished' and 'non-fished', as reported previously, for either the small fraction or large fraction of the catch, both of which showed declines in CPUE. Analysis of fishermen's logbook returns showed that effort had varied over time and between statistical reporting areas. It is suggested that, given changes in fishing effort, an earlier grouping of fishing intensity is no longer relevant and we discuss the pitfalls of using such classifications and other arbitrary boundaries for spatial analyses which are then relied upon in making spatial planning and fisheries management decisions. More detailed spatial observations on fishing effort and trans-national sharing of data, along with relevant choices in joint management measures are required for the future sustainability of local whelk stocks.

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1. Introduction

Although a fishery previously existed in France, the increased exploitation of the common whelk (*Buccinum undatum* L.) in Jersey in the early 1990s was fuelled by markets in the Far East. Whilst these markets may have declined in recent years, the common whelk has become an integral part of commercial fisheries in both Jersey and French waters within the Bay of Granville area (Morel and Bossy, 2004). Landings in Jersey have increased from 1 ton in the early 1990s to a peak of over 600 tonnes by 2006, decreasing to 217 tonnes in 2012 (States of Jersey Marine Resources Annual Status Report, 2012). Between 2000 and 2009, France was,

on average the largest producer of whelks in Europe (mean of 12,161 tonnes S.D. ± 859.83 tonnes), and responsible for 42.48% of all European whelk production. In 2010, French total annual landings rose to 13,852 tonnes,¹ (Eurostat Catch Data) with the Bay of Granville estimated to produce around 75–80% of all French whelk landings, predominantly for European Markets at point of first sale (Normandie Fraicheur Mer, 2011).

The common whelk, *Buccinum undatum*, is a neogastropod mollusc and is a common subtidal species in the northern Atlantic (Golikov, 1968). Whelks lack a dispersed, planktonic stage to their life cycle (Martel et al., 1986; Kideys et al., 1993). Female whelks deposit their eggs on rocks and solid surfaces, with juvenile whelks hatching out after 3–5 months and immediately starting out life

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¹ <http://ec.europa.eu/eurostat/web/fisheries/data/database>.

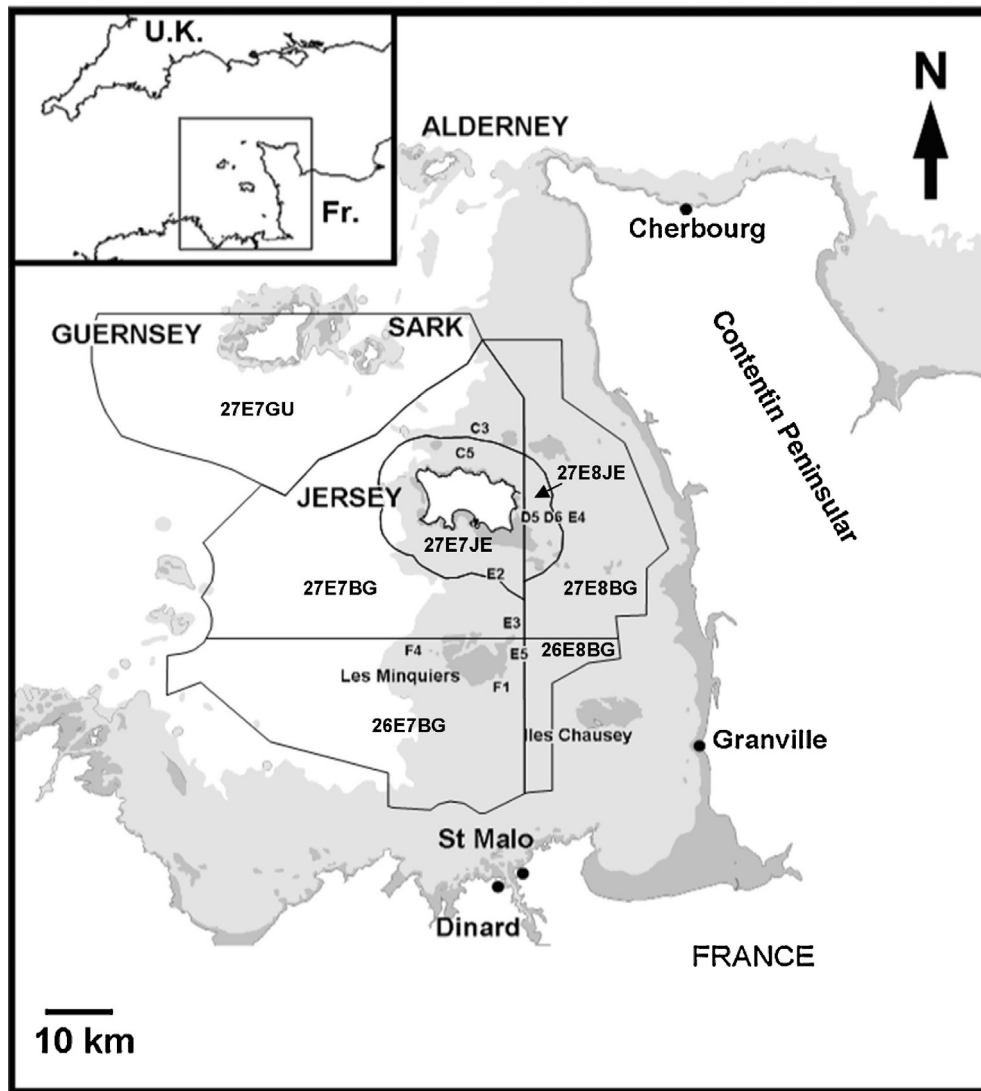


Fig. 1. Map of area with ten sample stations (e.g. C3 or F1) (after Morel and Bossy, 2004) and seven Granville Bay Statistical Reporting Areas (e.g. 27E7JE).

on the sea bed, scavenging and feeding on shellfish and worms (Nielsen, 1975; Taylor, 1978; Martel et al., 1986; Kideys et al., 1993). In addition to the lack of planktonic larvae, observation and tagging have shown adults to be relatively sedentary (Hancock, 1963; Himmelman and Hamel, 1993). As such, whelk populations are fairly clumped and un-evenly distributed, with little mixing between communities in enclosed or physically isolated areas (Weetman et al., 2006), such as Jersey and the Bay of Granville area (Fig. 1). Heude-Berthelin et al. (2011), studying common whelks in the Bay of Granville area, calculated the shell length to 50% maturity as 49 mm for males, at approximately 3 years old and 52 mm for females, at approximately 4 years old. To date there has been no studies around Jersey or the Bay of Granville to study ontogenetic segregation in the area. However, studies in other regions around the UK and Europe have shown that once an area has been 'fished-out' it can take a relatively long time for the population to recover, if at all, as there is little inward migration of other whelks (Hancock, 1963; Himmelman and Hamel, 1993; Valentinsson et al., 1999). A recent study by Pálsson et al. (2014) suggests that genetically different populations of common whelks can occur within small coastal areas, yet are independent of geographical or shortest distances on sea.

In response to increased commercial interest in the whelk fishery, an annual monitoring programme was initiated by the States of Jersey (SoJ), using standardised catches in 10 sample stations within Jersey's territorial sea. A previous study, conducted from 1996 to 2002, looked at changes in standardised whelk catches using data from the annual monitoring programme (Morel and Bossy, 2004). Though the authors found that whelk catches were decreasing, they concluded that the stocks were above the levels required to support the commercial fishery. However since 2004, the SoJ annual monitoring programme has reported an overall trend of decline in whelk catches per unit effort (CPUE) (States of Jersey Marine Resources Annual Status Report, 2012).

The only significant study on whelk maturity in the region around Jersey was conducted by Heude-Berthelin et al. (2011), who also raised some concerns over current management measures for the whelk commercial fishery in the region. One of the principal measures for controlling over-exploitation is the European Union (EU) legal minimum landing size (MLS) of 45 mm shell length. Heude-Berthelin et al. reported that the shell length which corresponded to 50% of animals having mature gonads, was 49 mm and 52 mm for males and females, respectively. Maturity for females dropped to 20% at a shell length of 49 mm. Heude-Berthelin et al.

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