Population status, fisheries and trade of sea cucumbers in temperate areas of the Northern Hemisphere

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Precautionary management of *Cucumaria frondosa* in Newfoundland and Labrador, Canada

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Hamel, J.-F.; Mercier, A. 2008. Population status, fisheries and trade of sea cucumbers in temperate areas of the Northern Hemisphere. In V. Toral-Granda, A. Lovatelli and M. Vasconcellos (eds). Sea cucumbers. A global review of fisheries and trade. *FAO Fisheries and Aquaculture Technical Paper*. No. 516. Rome, FAO. pp. 257-291.

SUMMARY

Data on sea cucumber fisheries in the temperate northern hemisphere are mainly available for four countries (Canada, United States of America, Russian Federation and Iceland), and commercial harvests are centered on four species (*Parastichopus californicus*, *P. parvimensis*, *Cucumaria frondosa* and *C. japonica*). Both *Parastichopus* species are primarly exploited by divers at a scale that is similar to what occurs elsewhere (e.g. tropical Indo-Pacific regions). However, harvests of the *Cucumaria* species typically involve industrialized processes (i.e. fishing boats, specialized trawls and processing plants). While *Parastichopus* fisheries date back to the early 1970s, most fisheries of *Cucumaria* are fairly new, and most of them are still in the exploratory phase, especially in Canada. The present document outlines the biological and population status, the current catches, the management measures in place, the socio-economic importance of the sea cucumber resources, the current research associated with these fisheries and the threats they may be facing.

1. INTRODUCTION

Compared to the sea cucumber trade in Asia and the Indo-Pacific, which is considered to date back some 1 000 years (Conand, 2001), the commercial harvesting of holothurians in North America is fairly new, having started in the 1970s on the west coast of the United States of America (hereinafter abbreviated to USA) and in the 1980s on the west coast of Canada (Conand and Sloan, 1989; Bruckner, 2005, 2006a,b; Therkildsen and Petersen, 2006). It spread to the east coast of Maine (USA) and to the Atlantic provinces of Canada a little over a decade ago (Therkildsen and Petersen, 2006). However, sea cucumbers have been fished for subsistence by native people for

centuries along the west coast of North America (Mathews, Kookesh and Bosworth, 1990) and in Arctic Canada (Wein, Freeman and Markus, 1996).

In response to a growing demand for sea cucumber products and owing to the depletion of traditionally fished stocks, new species have been sought (Conand, 2004), including temperate and polar ones, which are slowly gaining popularity on the market. Hence, despite the abundance of some of these temperate and polar sea cucumbers, they have only recently entered the world trade for bêche-de-mer and other products. The present document covers four different species and four countries for which data are available. Some species/regions have been well studied and are therefore associated with good biological data, landing statistics and management protocols, whereas others are not well documented, leading to an unequal treatment in the following pages.

2. REGION UNDER STUDY

Although most of this chapter is dedicated to North American sea cucumber fisheries, it will also provide data for adjacent countries, which are harvesting sea cucumbers in the temperate-polar waters of the North Atlantic and North Pacific (Figure 1). On the Pacific side, this review will include the Russian Federation, the USA (including Alaska) and Canada. On the Atlantic side, it will focus on Canada, USA, Iceland and the Western Russian Federation coast along the Barents Sea. There are probably small scale fisheries occurring elsewhere, especially in Scandinavia (Norway and Sweden) (Therkildsen and Petersen, 2006), however, no reliable information pertaining to landings has been found and consequently they will not be discussed in the present document. A developmental fishery for the sea cucumber *Stichopus tremulus* has reportedly started in Norway in 2007, however it is still too early to obtain any tangible data on this initiative. Moreover, data for the Russian Federation and Iceland remain scarce.

FIGURE 1

Region under study and countries covered in this review (highlighted in yellow). The map shows the confirmed distribution of the sea cucumber species under study. The region encompasses the FAO Statistical Areas 18 (Artic Sea), 21 (Northwest Atlantic), 27 (Northeast Atlantic), 61 (Northwest Pacific), 67 (Northeast Pacific) and 77 (Pacific Eastern Central)