

Journal  
of  
Northwest Atlantic  
Fishery Science



Volume 12  
January 1992

Northwest Atlantic Fisheries Organization  
Dartmouth, Canada



# Journal of Northwest Atlantic Fishery Science



Volume 12

Printed and Distributed by:  
Northwest Atlantic Fisheries Organization  
P. O. Box 638, Dartmouth, Nova Scotia  
Canada B2Y 3Y9

January 1992



# Journal of Northwest Atlantic Fishery Science

Scientific publications by ICNAF and NAFO have been in existence since ICNAF began in 1949 with the *ICNAF Special Publication Series* dealing with Proceedings of scientific symposia. The *ICNAF Research Bulletin* was started in 1964 to provide a means of publishing results of scientific research relevant to the Commission. The *ICNAF Research Bulletin* was terminated in September 1979 after the issue of Number 14. The primary scientific publication of NAFO began with the first issue of the *Journal of Northwest Atlantic Fishery Science* in December 1980.

## Editorial Policy

The Journal provides an international forum for the primary publication of original research papers on fisheries science in the Northwest Atlantic, with emphasis on environmental, biological, ecological and fishery aspects of the living marine resources and ecosystems. While the Journal is intended to be regional in scope, papers of general applicability, and methodological and review papers, irrespective of region, are considered. Space is available for notes and letters to the editor to facilitate scientific discussion of published papers. All papers are peer-reviewed to determine their suitability for primary publication. Associate Editors arrange for the peer-reviews and ensure that the papers accepted for publication meet the high standards required for the Journal. Manuscripts approved for publication are accepted with the understanding that they are not copyrighted, published or submitted elsewhere except in abstract form. There are no page charges.

## Editorial Board

### Associate Editors

- W. R. Bowering, Department of Fisheries and Oceans, Northwest Atlantic Fisheries Centre, St. John's, Newfoundland, Canada (*Vertebrate Fisheries Biology*)
- G. P. Ennis, Department of Fisheries and Oceans, Northwest Atlantic Fisheries Centre, St. John's, Newfoundland, Canada (*Invertebrate Fisheries Biology*)
- R. G. Halliday, Department of Fisheries and Oceans, Bedford Institute of Oceanography, Dartmouth, Nova Scotia, Canada (*Vertebrate Fisheries Biology*)
- Sv. Aa. Horsted, Grønlands Fiskeri Undersogelser, Tagensvej 135, 1, DK-2200 Kobenhavn N, Denmark (*Vertebrate Fisheries Biology*)
- G. Krause, Alfred Wegener Institut für Polar und Meeresforschung, Republic of Germany (*Biological Oceanography*)
- R. Misra, Department of Fisheries and Oceans, 1707 Lower Water Street, Halifax, Nova Scotia, Canada (*Biomathematics*)

### Technical Editor

- T. Amaratunga, Assistant Executive Secretary, NAFO, Dartmouth, Nova Scotia, Canada



# Contents

RIGET, F., J. BOJE, and V. SIMONSEN. Analysis of Meristic Characters and Genetic Differentiation in Greenland Halibut ( <i>Reinhardtius hippoglossoides</i> ) in the Northwest Atlantic .....	7
BURNETT, J., M. R. ROSS, and S. H. CLARK. Several Biological Aspects of the Witch Flounder ( <i>Glyptocephalus cynoglossus</i> (L.)) in the Gulf of Maine-Georges Bank Region .....	15
STOBO, W. T., G. M. FOWLER, and A. F. SINCLAIR. Short-term Tagging Mortality of Laboratory Held Juvenile Atlantic Herring ( <i>Clupea h. harengus</i> ) .....	27
GRISWOLD, C. A., and M. J. SILVERMAN. Fecundity of the Atlantic Mackerel ( <i>Scomber scombrus</i> ) in the Northwest Atlantic in 1987 .....	35
BRÊTHES, J. C., R. SAINT-PIERRE, and G. DESROSIERS. Growth and Sexual Maturation of the American Sand Lance ( <i>Ammodytes americanus</i> Dekay) off the North Shore of the Gulf of St. Lawrence .....	41
LANGE, A. M., and G. T. WARING. Fishery Interactions Between Long-finned Squid ( <i>Loligo pealei</i> ) and Butterfish ( <i>Peprilus triacanthus</i> ) off the Northeast USA .....	49
ARKHIPKIN, A. I. Reproductive System Structure, Development and Function in Cephalopods with a New General Scale for Maturity Stages .....	63
OBITUARY: Richard C. Hennemuth .....	75
NOTICES .....	77
Information for Authors .....	81
Scientific Publications of NAFO .....	83

MAP ILLUSTRATING NAFO'S CONVENTION AREA AND 200-MILE FISHING ZONE BOUNDARIES

