## NORTHWEST ATLANTIC FISHERIES ORGANIZATION



### Scientific Council Studies Number 29

#### Selected Studies Related to Assessment of Cod in NAFO Divisions 2J +3KL

The presentation of material in this publication does not imply the expression of any opinion on the part of the Secretariat of the Northwest Atlantic Fisheries Organization (NAFO) concerning the legal national or international issues of any Contracting Party of NAFO or any country mentioned in this publication.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying or otherwise, without the prior permission of the NAFO Secretariat. Applications for such permission, with a statement of the purpose and extent of the reproduction, should be addressed to the Executive Secretary, Northwest Atlantic Fisheries Organization.

> Northwest Atlantic Fisheries Organization 2 Morris Drive, P. O. Box 638 Dartmouth, Nova Scotia, Canada B2Y 3Y9 Tel.: (902) 468-5590 • Fax: (902) 468-5538 E-mail: nafo@fox.nstn.ca • Website: www.nafo.ca

# NORTHWEST ATLANTIC FISHERIES ORGANIZATION



## Scientific Council Studies Number 29

### Selected Studies Related to Assessment of Cod in NAFO Divisions 2J+3KL

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

May 1997

### Foreword

In accordance with its mandate to disseminate information on fisheries research to the scientific community, the Scientific Council of NAFO publishes the *Journal of Northwest Atlantic Fishery Science*, which contains peer-reviewed primary papers and notes on original research, and *NAFO Scientific Council Studies*, which contains review papers of topical interest and importance.

At its meeting during 5–19 June 1996, the Standing Committee on Publications (STACPUB) noted that the extensive scientific review of the Cod Stock in NAFO Div. 2J and 3KL conducted by the Scientific Council consisted of a group of papers suitable for a single publication of *NAFO Scientific Council Studies*. At its meeting during 7–13 September 1996, STACPUB invited J. Morgan, Northwest Atlantic Fisheries Centre, Newfoundland, Canada, to undertake the coordination of the papers for this publication.

This issue of *NAFO Scientific Council Studies* contains miscellaneous contributions nominated for publication from research documents presented to the Scientific Council June 1996 Meeting. The 28 previous issues of *NAFO Scientific Council Studies* are listed on the inside back cover of this volume.

May 1997

T. Amaratunga, Editor NAFO Scientific Council Studies Northwest Atlantic Fisheries Organization P. O. Box 638 Dartmouth, Nova Scotia Canada B2Y 3Y9

### Contents

MORGAN, M. J. Introduction	1
GREGORY, R. S., J. T. ANDERSON, and E. L. DALLEY. Distribution of Juvenile Atlantic Cod ( <i>Gadus morhua</i> ) Relative to Available Habitat in Placentia Bay, Newfoundland	3
SCHNEIDER, D. C., P. HENNEBURY, D. METHVEN, D. INGS, and D. PINSENT. Fleming Survey of Demersal Juvenile Cod in Coastal Areas of Eastern Newfoundland	13
SCHNEIDER, D. C., E. L. DALLEY, and J. T. ANDERSON. A Combined Recruitment Index for Demersal Juvenile Cod in NAFO Divisions 3K and 3L	23
BRATTEY, J. Biological Characteristics of Atlantic Cod ( <i>Gadus morhua</i> ) from Three Inshore Areas of Northeastern Newfoundland	31
KROHN, M., and S. KERR. Declining Weight-at-age in Northern Cod and the Potential Importance of the Early Years and Size-selective Fishing Mortality	43
TAGGART, C. T. Bank-Scale Migration Patterns in Northern Cod	51
MORGAN, M. J., and J. BRATTEY. Maturity of Female Cod in Divisions 2J+3KL with a Comparison of Fish from Inshore and Offshore Division 3L	61
KULKA, D. W. Discarding of Cod ( <i>Gadus morhua</i> ) in the Northern Cod and Northern Shrimp Directed Trawl Fisheries, 1980–94	67
WARREN, W. G. Report on the Comparative Fishing Trial Between the Gadus Atlantica and Teleost	81
McCALLUM, B. R., and S. J. WALSH. Groundfish Survey Trawls Used at the Northwest Atlantic Fisheries Centre, 1971 to Present	93
WALSH, S. J., and B. R. McCALLUM. Performance of the Campelen 1800 Shrimp Trawl During the 1995 Northwest Atlantic Fisheries Centre Autumn Groundfish Survey	105
NOTICES	117
Information for Authors	121
Scientific Publications of NAFO	123

