

**Validity of the June 2001 Environmental  
Impact Assessment of Exploratory Wells  
in Lower Musquodoboit, Huckleberry and  
Southampton and the November 2002  
Environmental Impact Assessment of  
Exploratory Wells in Margaree, Grand-  
Pré and Cohasset**

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**APPENDIX 1: ENCAN A 2005 CODES OF PRACTICE FOR THE GULLY MPA AND SABLE  
ISLAND**



## 1 INTRODUCTION

CEF Consultants Ltd. prepared an environmental impact assessment (EIA) of proposed exploratory wells in Lower Musquodoboit, Huckleberry and Southampton (CEF Consultants 2001) and an EIA of proposed exploratory wells in Margaree, Grand-Pré and Cohasset (CEF Consultants 2002). These environmental assessments described the regional environment, in particular those issues related to fisheries, and identified the major features in the project areas that could potentially be affected by the proposed drilling program.

This addendum examines the validity of the 2001 and 2002 EIA reports to accurately identify potential impacts in relation to the proposed EnCana Corporation (EnCana) exploratory drilling program proposed to commence in Fall of 2005. As the offshore leases for both EIAs are in the same area and the issues are identical, one addendum has been prepared for the validity assessment.

Relevant studies, including but not limited to the following, have been reviewed and considered in this assessment: Eastern Scotian Shelf Integrated Ocean Management Plan (Department of Fisheries and Oceans (DFO) 2005a); various Environmental Studies Research Funds reports, such as Environmental Effects Monitoring for Exploration Drilling (Buchanan et al, 2003); other EIA reports, such as for Cohasset Decommissioning; Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and Species at Risk reports, and Department of Fisheries and Oceans habitat assessments and stock status reports. This report, however, focuses on the validity of the conclusions of the two previous assessments and does not summarize these studies.

## 2 PROPOSED DRILLING PROGRAM

EnCana is applying for Drilling Program Approval for two to six exploration wells with an additional one to two appraisal wells for each successful exploratory well on the Scotian Shelf in water depths ranging from 22 - 65 m. The wells will be drilled within the leases of Lower Musquodoboit (EL 2360), Margaree (EL 2387), Huckleberry (EL 2389), Grand Pre (EL 2357), and Cohasset (PL 2901) with the jack-up rig Rowan Gorilla VI. Figure 2-1 illustrates the five licenses and the locations of the proposed wells as compared to those illustrated in the 2001 and 2002 EIA reports. While the proposed locations are modified slightly, the general location and distribution are comparable.



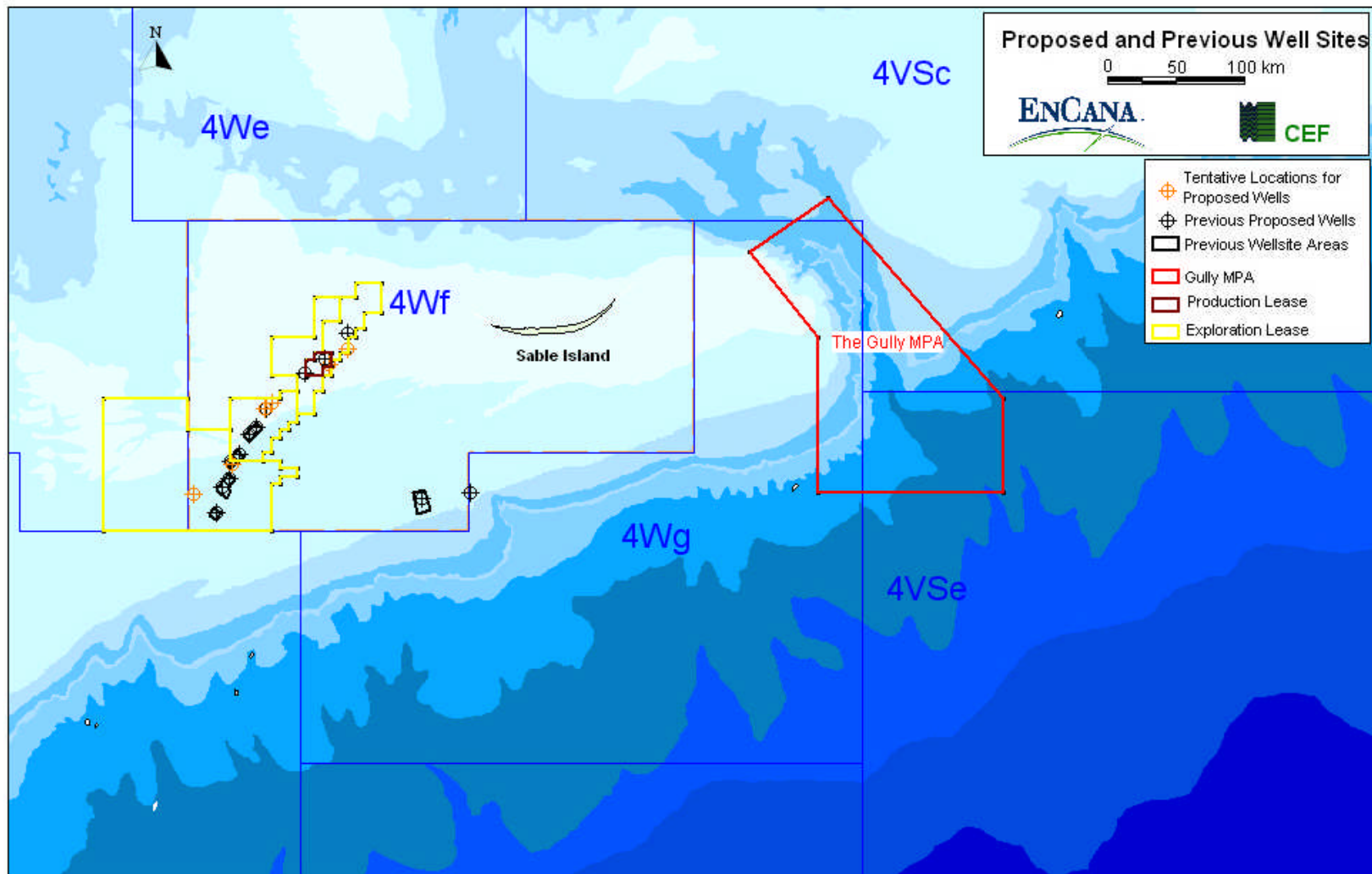


Figure 2-1: Five Leases and Proposed Well Locations



The intended spud date for the first well is mid to late October, 2005. The other wells will be drilled between 2005 and the end of 2007, i.e. one year later than the original timeframe from the prior EIAs. The duration of each well is estimated at approximately 55 days (not including testing).

There is no significant change to the proposed drilling program. The overall net change in well schedule and locations is minor and equivalent with respect to potential environmental impact. The following sections describe environmental and regulatory components that have changed since the original EIAs were approved.

### **3 SPECIES AT RISK**

#### **3.1 Species at Risk Act**

The *Species at Risk Act (SARA)* was passed in December 2002, proclaimed in June 2003, and the last sections of the Act (prohibition and enforcement) came into force on June 1, 2004. The purposes of *SARA* is to prevent Canadian wildlife species from becoming extinct or extirpated, by providing for the recovery of endangered or threatened species, and encouraging the management of species of special concern. When Parliament passed *SARA* in 2002, Schedule 1 included 233 species, which COSEWIC had already reassessed using new assessment criteria and current data. Since this time, a total of 345 new species have been protected under *SARA* (Environment Canada 2005).

*SARA* establishes Schedule 1 as the official list of wildlife and plant species at risk. It classifies those species as extirpated, endangered, threatened, or of special concern. The process of listing a species under the Act begins with a species assessment conducted by COSEWIC. COSEWIC has assigned national status to species at risk in Canada for over 25 years. Under *SARA*, COSEWIC continues to provide scientific assessments of species status, and submits them to the Minister of the Environment. New species can be added to the List by the Governor in Council (on recommendation from the Minister), based on species Status Reports compiled by COSEWIC, and public consultation. The Minister of Fisheries and Oceans is responsible for aquatic species at risk, and the Ministers of Canadian Heritage and Environment are responsible for terrestrial species at risk. Species that had been assessed by COSEWIC prior to October 1999 when Parliament passed the *SARA* in December 2002 were included in Schedule 2 (endangered or threatened) and Schedule 3 (special concern); they need to be reassessed using revised criteria.

Recovery planning and implementation for listed *SARA* species will be developed and implemented through the collaborative National Recovery Program (RENEW 2004).



Under *SARA*, it is an offence to kill, harm, harass, capture or take, and to damage the residence of a listed endangered, threatened or extirpated species (see Section 4). A permit can be granted for an activity that would otherwise be a *SARA* offence, as long as measures are taken to minimize the impact, and the activity does not jeopardize the survival or recovery of the species. No clear definition has yet been provided for what constitutes "harassment" or "take" of an animal.

Effects of the project on all marine species (including species now designated "at risk") were assessed during the original environmental assessments in 2001 and 2002. Updated species at risk information is provided in Table 3-1. Included in this table are those marine species which may occur in the study area and which have COSEWIC/*SARA* designations in categories other than not at risk or data deficient. The biology and distribution of the designated species listed in Table 3-1 were discussed in section 4.2 of the 2001 EIA and section 6.10 of the 2002 EIA with the exception of the winter skate, cusk, and porbeagle shark. These are included in this addendum.

Changes in species at risk, in comparison to the tables of COSEWIC-designated species from the 2002 EIA (Table 6-18) and the 2001 EIA (Table 14) include the addition of new species, changes in species risk status, and changes in species population designation.



Table 3-1: Species with COSEWIC/SARA Designations in the Study Area

Common name (relevant populations)	Latin name	SARA Schedule #	Risk category SARA Schedule 1 (listing year)	Last COSEWIC designation (year assessed)
<b>FISH</b>				
Atlantic salmon* (Inner Bay of Fundy)	<i>Salmo salar</i>	1	Endangered (2002)	Endangered (2001)
Atlantic whitefish (North Atlantic)	<i>Anarhichas lupus</i>	1	Endangered (2002)	Endangered (2000)
Northern wolfish (Atlantic)	<i>Anarhichas denticulatus</i>	1	Threatened (2002)	Threatened (2001)
Spotted wolfish (Atlantic)	<i>Anarhichas minor</i>	1	Threatened (2002)	Threatened (2001)
Atlantic wolfish (North Atlantic)	<i>Anarhichas lupus</i>	1	Special Concern (2002)	Special Concern (2000)
Atlantic cod (Maritimes)	<i>Gadus morhua</i>	3, under consideration for 1	N/A	Special Concern (2003)
Cusk (Atlantic)	<i>Brosme brosme</i>	Under consideration for 1	N/A	Threatened (2003)
Porbeagle shark (Atlantic)	<i>Lamna nasus</i>	Under consideration for 1	N/A	Endangered (2004)
Winter skate (Southern Gulf)	<i>Leucoraja ocellata</i>	None	N/A	Endangered (2005)
Winter skate (Eastern Scotian Shelf)	<i>Leucoraja ocellata</i>	None	N/A	Threatened (2005)
<b>MAMMALS</b>				
Blue whale* (Atlantic)	<i>Balaenoptera musculus</i>	1	Endangered (2005)	Endangered (2002)
Fin whale* (Atlantic)	<i>Balaenoptera physalus</i>	3	N/A	Special Concern (2005)
Harbour porpoise (Northwest Atlantic)	<i>Phocoena phocoena</i>	2; under consideration for 1	N/A	Special Concern (2003)
Northern bottlenose whale (Scotian Shelf)	<i>Hyperoodon ampullatus</i>	3; under consideration for 1	N/A	Endangered (2002)
North Atlantic right whale* (Atlantic)	<i>Eubalaena glacialis</i>	1	Endangered (2005)	Endangered (2003)
<b>REPTILES</b>				
Leatherback sea turtle* (Atlantic)	<i>Dermochelys coriacea</i>	1	Endangered (2002)	Endangered (2001)
<b>BIRDS</b>				
Barrow's goldeneye (Eastern)	<i>Bucephala silandica</i>	1	Special Concern (2002)	Special Concern (2000)
Harlequin duck (Eastern)	<i>Histrionicus histrionicus</i>	1	Special Concern (2002)	Special Concern (2001)
Ipswich sparrow (Nova Scotia - Sable Island)	<i>Passerculus sandwichensis princeps</i>	1	Special Concern (2002)	Special Concern (2000)
Roseate tern (Atlantic)	<i>Sterna dougallis</i>	1	Endangered (2002)	Endangered (1999)

Source: COSEWIC 2005a; SARA 2005; US FWS, 2004. \* = also listed as endangered by the United States



### 3.2 New Species at Risk

The porbeagle shark, cusk, and winter skate have been designated new species at risk, while the humpback whale, *Megaptera novaeangliae*, was downgraded from special concern to not at risk in 2003.

COSEWIC designated the porbeagle shark, *Lamna nasus*, endangered in 2004; consultations were initiated in October of 2004 by DFO regarding its possible inclusion under *SARA* Schedule 1. The porbeagle could be found anywhere in the study area from May to December. Mating occurs in the early fall off southern Newfoundland (COSEWIC 2004).

The porbeagle's late maturity and low fecundity render it highly vulnerable to overexploitation (COSEWIC 2004). Abundance has declined severely since Canada began a directed fishery in 1992 and is now at a record low. A sharp quota cut to a current annual directed Total Allowable Catch of 200 tonnes, with an expected maximum by-catch of 50 tonnes, was imposed for 2002 – 2007 (DFO 2002). Porbeagle sharks have been fished commercially along the edge of the Laurentian Channel (DFO 2001), and are common within the drilling area. Any potential for the proposed drilling to affect porbeagle is insignificant in comparison to the continued commercial fishery.

Cusk, *Brosme brosme*, was designated threatened by COSEWIC in 2003; it is currently under consideration for inclusion under *SARA* Schedule 1. Cusk now has a restricted core distribution centered on the Gulf of Maine and the southern Scotian Shelf (COSEWIC 2003e). Cusk has not been commercially fished since 1999, when a cap of 1,000 tonnes was also placed on its bycatch in other commercial fisheries. The cap was reduced to 750 tonnes in 2003 and 2004 (DFO 2004). It is likely to be present in the drilling area, however the impact on this species is negligible.

The COSEWIC 2005 species assessment designated each of the four populations of winter skate, *Leucoraja ocellata*, in Canada. Of interest to this project, are the Southern Gulf population, designated as Endangered, and the Eastern Scotian Shelf population, designated as Threatened. The amount of skate captured as bycatch in fisheries directed at other groundfish species is noted as the probable cause of decline (COSEWIC 2005b).

Very little is known about the biology of the winter skate. They are a slowly maturing species that reach sexual maturity between seven and thirteen years. Each year winter skate deposit a small number of eggs and in combination with their slow sexual maturity, they have a slow population growth rate. Mating probably occurs throughout the year with eggs being deposited from summer to autumn off Nova Scotia (COSEWIC 2005b).



Winter skate is likely to be present in the study area, as they inhabit cold waters (Scott and Scott 1988). However, the effects on the species are anticipated to be negligible.

### 3.3 Changes in Species at Risk Status

In 2003, COSEWIC downlisted the harbour porpoise, *Phocoena phocoena*, from threatened to special concern (COSEWIC 2003b, c).

In 2002, COSEWIC upgraded the northern bottlenose whale to endangered from special concern.

### 3.4 Changes in Species at Risk Population

The endangered northern bottlenose whale population was redefined in November of 2002 as 'Scotian Shelf' population, broadening from the earlier 'Gully', to reflect its frequent use of two other submarine canyons (COSEWIC 2002). However, its known distribution remains unchanged from its assessment in the 2002 EIA – it remains unlikely to occur in the study area.

An updated 2003 status report on the right whale split the Canadian populations into two separate species, allowing a separate endangered designation of the North Atlantic right whale, *Eubalaena glacialis* (COSEWIC 2003a).

Fin whale, *Balaenoptera physalus*, was reassessed by COSEWIC in 2005 and split into two populations. The designation remains special concern for the Atlantic population; however, the designation was changed to threatened in the Pacific Ocean (COSEWIC 2005c). It is noted in the COSEWIC update and status report that while current risk exists (e.g., ship strikes and entanglement in fishing gear), the population is not believed to be seriously threatened. Fin whales are often seen in the winter, along the Atlantic coast of Nova Scotia, and appear frequently on the Scotian Shelf during the summer (COSEWIC 2005c; CEF Consultants 2002).

The Atlantic cod, *Gadus morhua*, was designated special concern in April 1998 by COSEWIC. In May 2003, the species was split into four populations and the original designation was deactivated. The Maritimes population was designated special concern (COSEWIC, 2003d). Based on the *SARA* Public Registry, Atlantic cod is under consideration for addition to Schedule 1. The Maritimes population is very likely to be within the study area.



## 4 MITIGATION

### 4.1 Species at Risk

In order to assess compliance of the proposed project with *SARA*, the potential impact of the project on the *SARA* listed species (Schedule 1) must be assessed. Under sections 32 and 33 of *SARA*, it is an offense to:

- kill, harm, harass, capture or take an individual of a listed species that is extirpated, endangered or threatened;
- possess, collect, buy, sell or trade an individual of a listed species that is extirpated, endangered or threatened, or its part or derivative;
- damage or destroy the residence of one or more individuals of a listed endangered or threatened species or of a listed extirpated species if a recovery strategy has recommended its reintroduction (Environment Canada, 2003)

Consideration for protected wildlife in the environmental assessment was undertaken by reviewing an environmental assessment best practice guide for wildlife at risk (Environment Canada 2004c).

The potential interactions of COSEWIC/*SARA* designated species with the proposed 2005-2007 drilling project are depicted in Table 4-1. For the purpose of this assessment, all species designated at risk by COSEWIC are considered, not just species regulated by *SARA* (Schedule 1). The expected presence of the species in the project area was assessed for each species as very unlikely, unlikely, likely or very likely. Atlantic cod (Maritimes population), porbeagle shark (Atlantic Ocean) and skate (Eastern Scotian Shelf) were identified as very likely to be within the project area, whereas wolfish, fin whale and harbour porpoise were assessed as likely.

Similarly, the potential impact of the proposed drilling is assessed for each species and identified as negligible, minor, moderate or significant. A minor impact is one that has a low probability of occurrence but the effect is generally localized and involves a relatively few individuals. A negligible impact is one that is highly unlikely to exist in reality and unlikely to be discernible in the natural environment. Where potential impact to a designated species at risk is considered not to be negligible, mitigation measures are required to comply with *SARA*.



**Table 4-1: Potential Interactions with COSEWIC/SARA Designated Species**

Common name	Range/Population	Presence in project area	Potential Impact	Mitigation
<b>FISH</b>				
Atlantic salmon	Inner Bay of Fundy	Very unlikely	Negligible	None required
Northern wolffish	Atlantic Ocean	Likely	Negligible	None required
Spotted wolffish	Atlantic Ocean	Likely	Negligible	None required
Atlantic wolffish	North Atlantic Ocean	Likely	Negligible	None required
Atlantic cod	Maritimes population	Very likely	Negligible	None required
Cusk	Atlantic Ocean	Likely	Negligible	None required
Porbeagle shark	Atlantic Ocean	Very likely	Negligible	None required
Winter skate	Southern Gulf	Very likely	Negligible	None required
Winter skate	Eastern Scotian Shelf	Very likely	Negligible	None required
<b>MAMMALS</b>				
Blue Whale	Atlantic Ocean	Very unlikely	Negligible	Monitoring and collision avoidance
Fin Whale	Atlantic Ocean	Likely	Minor	Monitoring and collision avoidance
Harbour Porpoise	Northwest Atlantic Ocean	Likely	Minor	Monitoring and collision avoidance
Northern Bottlenose Whale	Scotian Shelf population	Unlikely	Minor	Monitoring and collision avoidance
North Atlantic Right Whale	Atlantic Ocean	Unlikely	Minor	Monitoring and collision avoidance
<b>REPTILES</b>				
Leatherback sea turtle	Atlantic Ocean	Unlikely	Minor	Monitoring and collision avoidance
<b>BIRDS</b>				
Barrow's goldeneye	Eastern population	Very unlikely	Negligible	Monitoring
Harlequin duck	Eastern population	Very unlikely	Negligible	Monitoring
Ipswich sparrow	Nova Scotia – Sable Island	Very unlikely	Negligible	Monitoring
Roseate tern	Atlantic Ocean	Very unlikely	Negligible	Monitoring

No potential significant impacts were identified. However, several potential minor impacts were identified, i.e., risk of vessel collision and noise disturbance on marine mammals and the leatherback sea turtle. In terms of the leatherback turtle and designated marine mammals, mitigation will be in keeping with measures outlined in the 2002 EA, including collision avoidance from the project vessels, and regular monitoring of marine mammals and turtles (as well as marine birds) by a trained offshore observer. With regard to noise disturbance, the designated species of mammals in the project area are considered transitory species and if an individual occurs in the project area during drilling, the animal would easily avoid the area.



## 4.2 Special Areas

Since the EIAs were completed in 2001 and 2002, management of Sable Island (access and activities on the island) has gone back to the Government of Canada in 2005, and is now administered by the Canadian Coast Guard.

In addition, the Gully has been designated by DFO as a marine protected area (MPA) under the Oceans Act in 2004. The Gully MPA comprises an area of 2,364 km<sup>2</sup> and is located approximately 40 km east of Sable Island on the edge of the Scotian Shelf. The Gully MPA Regulations divide the MPA into three management zones, which have different levels of protection. An MPA Management Plan is being developed to provide guidelines for the implementation of the regulations. In the summer of 2003, a research program was conducted around two 3D seismic surveys acquired in the vicinity of the Gully MPA. Research included studies of near-field and far-field seismic sound propagation, marine mammal visual surveys and marine mammal acoustic monitoring. The Gully Seismic Research program was coordinated by COOGER (Canadian Oil and Gas Environmental Research) and involved participation from DFO (East Coast and Quebec) as well as the 3D survey operators and their acoustic and environmental contractors. The project was largely funded by ESRF, and a final report on all the studies will be released through ESRF.

Although not required by regulation, EnCana has developed Codes of Practice to protect the uniqueness and integrity of the Gully MPA and Sable Island. These Codes were updated in 2005, although the protection measures remain the same:

- No drilling / seismic operations will be conducted within 2 km (1 nm) of Sable Island.
  - Vessels and aircrafts are not permitted within 2 km (1 nm) of Sable Island.
  - No drilling / seismic operations will be conducted inside the Gully MPA.
  - No vessels are permitted within the Gully MPA and aircraft in regular transit to and from any vessels, drilling units, or facilities are restricted to flying at a height >500 m.
- These restrictions apply unless it is required for safety or emergency purposes or as part of an approved Environmental Monitoring Program.

A copy of the Codes of Practice is attached to this addendum (Appendix 1).



## 5 FISHERIES

### 5.1 Catch Data

The project area is entirely contained within NAFO management area 4Wf. Recent catch data was compared to the catch data from the prior EIA reports (Table 15 in the 2001 report and Table 6.19 in the 2002 report). Table 5-1 shows catch averaged by month for each major species from 2000 to 2004. Data was only preliminary for 2005, and as such, it was not used for this assessment. Table 5-2 shows the annual catch by major species between 2000 and 2004 to verify if there was a general decrease or increase trend.

**Table 5-1: Average Monthly Catch (metric tonnes) for Species or Species Group for Unit Area 4Wf, 2000-2004**

Species or Species Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Groundfish	0.0	0.2	0.4	0.2	0.0	0.8	0.6	0.4	0.2	0.2	0.0	0.4
Crab	0.0	0.0	0.0	0.0	0.8	179	368.8	208.2	83.6	25.4	4.2	2.4
Scallops	0.0	0.0	0.0	0.0	8.2	32.6	69.4	55.4	53.4	23.6	0.0	0.0
Sea Cucumber	0.0	0.0	0.0	0.0	0.0	0.0	14.4	15	3.2	0.0	2.4	9.8
Shrimp	0.0	0.0	0.0	0.0	2.8	0.0	0.0	1	0.0	0.0	0.0	0.0
Shark	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	3.4	0.4	0.0	0.0
Swordfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.6	0.0	0.0	0.0
Tuna	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other Pelagics	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: DFO Catch and Effort Database



**Table 5-2: Annual Catch (metric tonnes) of Major Species in 4Wf, 2000 – 2004**

Species or Species Group	2000	2001	2002	2003	2004
Snow Crab	780	1023	892	701	963
Scallops	543	52	141	185	292
Swordfish	0	1	7	6	0
Groundfish	1	2	7	5	2
Sea Cucumber	0	0	0	0	223
Sharks	2	0	10	0	0
Shrimp	5	0	0	12	2

Source: DFO Catch and Effort Database

No significant change is noted in the catch and effort data as provided by DFO (DFO Catch and Effort Database) with the exception of the sea cucumber commercial fishery. The sea cucumber fishery is a growing fishery, still in exploratory stages. Modified scallop drags are used to harvest the sea cucumbers.

Scallop remains the primary fishery in 4Wf. The distribution of scallop catches in 4Wf is presented in Figure 5-1. Comparison of the locations and amounts indicates that there has been no significant change in scallop catches since the 2001 and 2002 EIA reports.



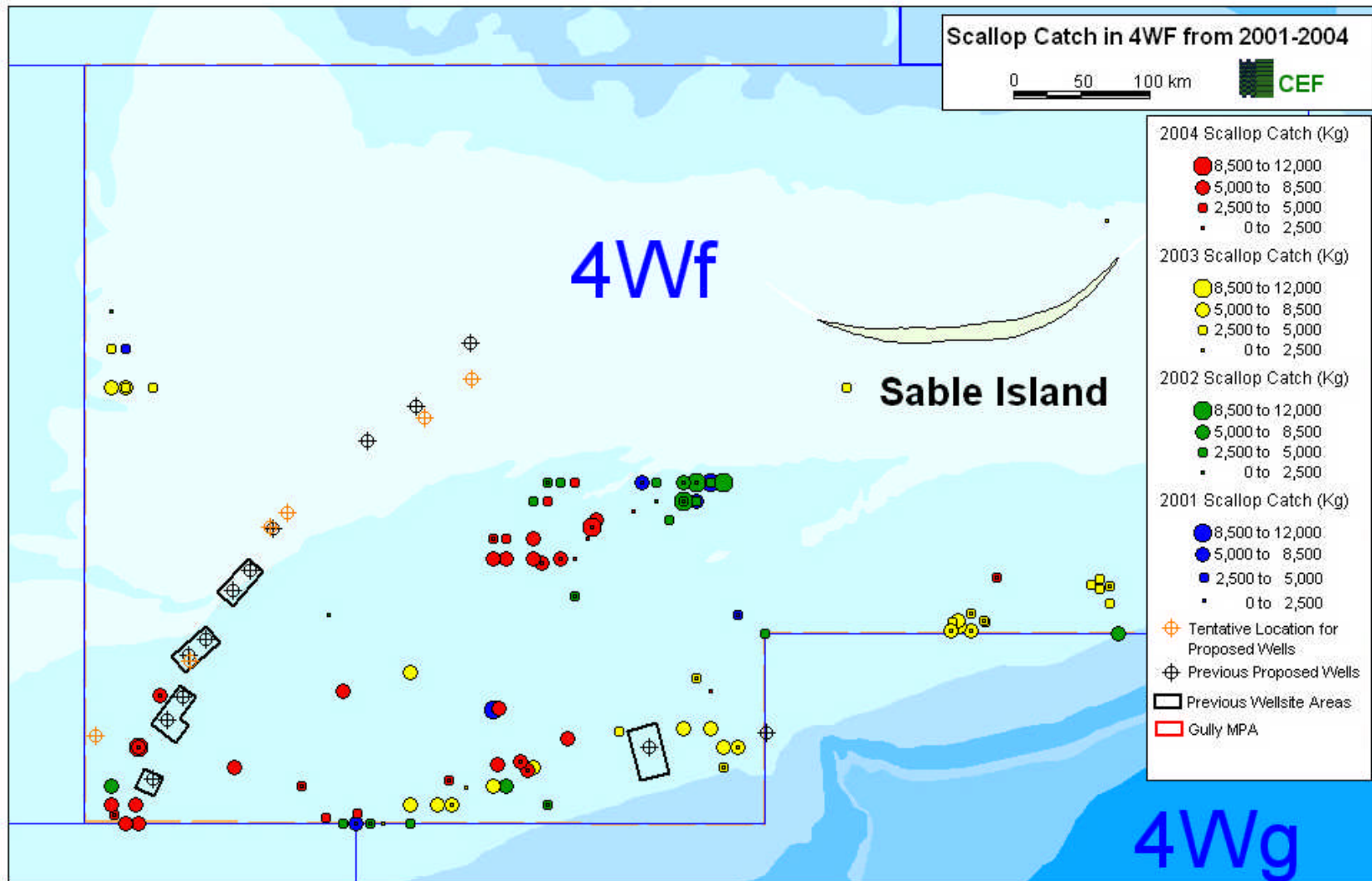


Figure 5-1 Scallop Catch and Well Locations



## 5.2 Stock Status Data

Recent stock status reports published by DFO were used to assess whether significant changes have occurred in the fisheries since the EIA reports were completed.

A 2003 DFO research survey on Ocean Quahog identified commercial quantities of Ocean Quahog on Sable Island Bank. A license for Ocean quahog has been given out for 4Wf and fishing will commence next year. Currently, three vessels are fishing off Banquereau Bank, which is east of Sable Island. A stock status report on Ocean quahog is hoped to be completed next year (Roddick, D., pers. comm. 2005).

The groundfish fishery is still in moratorium due to low abundance, and no short-term stock recovery is foreseen. Data for cod from 2004 indicate that stock status has not improved. Spawning stock biomass and recruitment are near the lowest levels recorded (DFO 2005b).

Overall, the conclusions from the 2001 and 2002 EIA reports remain unchanged; i.e. potential impacts from drilling activities on fisheries and fish populations are not expected to be significant.

## 6 CUMULATIVE EFFECTS

Cumulative effects assessments were completed as part of the EIAs approved in 2001 and 2002 for these six lease areas. Since this time, oil and gas exploration activity has decreased, and expectations are that it may remain at a lower level of activity in the foreseeable future. Table 6-1 shows the number of EIAs considered by the Canada-Nova Scotia Offshore Petroleum Board (CNSOPB) in the past five years.

Table 6-1: Number of EIAs Considered by the CNSOPB, 2001-2005

Activity	Seismic Surveys	Other Geophysical Surveys	Drilling Program
2004-2005	2	3	7
2003-2004	13	4	29
2002-2003	7	4	21
2001-2002	8	7	18

Source: Strategic Environmental Assessment for the Misaine Bank Area, CEF 2005



## 7 CONCLUSIONS

The potential impacts associated with the drilling operations proposed by EnCana Corporation for 2005 – 2007 on the Scotian Shelf remain as described in the 2001 and 2002 EIA reports approved by the Board. Some regulatory changes have occurred since 2002 (e.g. enactment of *SARA*, designation of Gully MPA), however, the environmental effects from the project remain unchanged. In addition, the proposed drilling program has been reduced in the number of proposed wells, and is covering a slightly smaller area. This addendum confirms that the proposed drilling program is unlikely to have significant impact on the environment. In accordance with the new *SARA*, the potential interactions of the project with designated species at risk have been assessed. As such, the project has been demonstrated to comply with the General Prohibitions (*SARA* Sections 32, 33) and other relevant sections of *SARA*.

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