

Newfoundland  
and Labrador  
Refinery Project



**Response to Comments on  
Component Study**

**MIGRATORY BIRDS COMPONENT STUDY ADDENDUM**

Prepared For:

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**Newfoundland and Labrador Refinery Project EIS**  
**Migratory Birds Component Study**  
**Response to Comments**

**HUMAN RESOURCES LABOUR & EMPLOYMENT**

*General Technical Points:*

There is a short section on page vii of the Executive Summary and on page 47 (section 3.6.5) which deals with the incidence of mammals in the region. It is not clear why this section has been inserted into a component study devoted to migratory birds. This section should either be removed or a short section added to clarify the relevance or importance of this data to the migratory birds study.

**NLRC Response:**

*The rationale for including mammal observations in the Executive Summary and later in the report (on page 47) was to provide the reader with information on incidental sightings of mammals made during bird surveys as additional ecological context. No specific data report was required for terrestrial mammals.*

*General Editorial Points and Errors:*

On several pages throughout the study document, the font for certain sentences is noticeably larger. It is not clear whether this was an oversight or whether this was done by design to emphasize certain text. If it is a typo, it should be corrected throughout the document. If it is purposely done, some note should be placed at the beginning of the report to explain what this means. Alternatively, the larger font could be switched to bold or italics which would make the emphasis much clearer.

**NLRC Response:**

*The difference in font size is an editorial oversight.*

**WILDLIFE DIVISION**

This Component Study provides some valuable information however, there are some additional information gaps that need to be addressed.

Page 1. Section 1.1. Why were surveys not carried out during the breeding season? Additional rationale is needed for not including more detailed information on summer bird activity in the project area.

**NLRC Response:**

*The year-long program of migratory bird studies was initiated in August 2006. Surveys continued after the submission of the Migratory Bird Component Study in order to complete data collection over a year-long period, including a portion of the breeding season. Additional surveys were completed in June, August and September of 2007. The data is presented in Table A and Table G in this addendum.*

Page 18 Section 2.5. The survey effort for landbirds and species at risk is insufficient. One survey by a trained individual walking through the area between 8:30 am and 3:30 pm is insufficient to detect rare species. Also, the methodology employed provides presence/absence information only and is insufficient to determine densities of bird species in the area.

**NLRC Response:**

*The survey provides a relative abundance of the common breeding species and a general impression of the habitat and corresponding songbird breeding community in the project area. The habitat is typical of eastern Newfoundland and thus no unusual concentrations of any birds considered at risk are expected. A follow up survey using established protocols to confirm presence/absence of species, including Species at Risk, and for determining breeding bird densities will be conducted on the proposed refinery site during the peak singing period for songbirds between 5 June and 5 July 2008.*

Page 29. Section 3.2 Maps depicting the locations of detected groups of coastal birds would facilitate review of the material. The tables (3.2-3.5) are difficult to interpret and information provided in the titles is insufficient to get a good understanding of what information is being presented. Maps showing location of observed birds of prey must be provided for all survey types.

**NLRC Response:**

*Fig 2.3 shows the locations where the data summarized in Tables 3.2-3.5 were collected.*

*Maps (Figures A-D) showing the locations of birds of prey (and their nests) sighted during Harlequin Duck and river otter surveys in support of the component study and EIS, respectively, are provided below. Note that we have not provided a map of birds of prey sighted during coastal surveys as the locations of survey areas (and hence sightings—see Table 3.4) are depicted in Figure 2.3 of the Component Study.*

The titles of Table 3.2-3.5 should be changed to:

Table 3.2. Mean numbers (maximum numbers<sup>a</sup>) of waterfowl commonly observed in inner Placentia Bay by LGL Limited during coastal surveys, August 2006-April 2006. [n= the number of surveys in a given season.]

Table 3.3. Mean numbers (maximum numbers<sup>a</sup>) of Gulls and Terns commonly observed in inner Placentia Bay by LGL Limited during coastal surveys, August 2006-April 2006. [n= the number of surveys in a given season.]

Table 3.4. Mean numbers (maximum numbers<sup>a</sup>) of birds of prey commonly observed in inner Placentia Bay by LGL Limited during coastal surveys, August 2006-April 2006. [n= the number of surveys in a given season.]

Table 3.5. Mean numbers (maximum numbers<sup>a</sup>) of shorebirds commonly observed in inner Placentia Bay by LGL Limited during coastal surveys, August 2006-April 2006. [n= the number of surveys in a given season.]

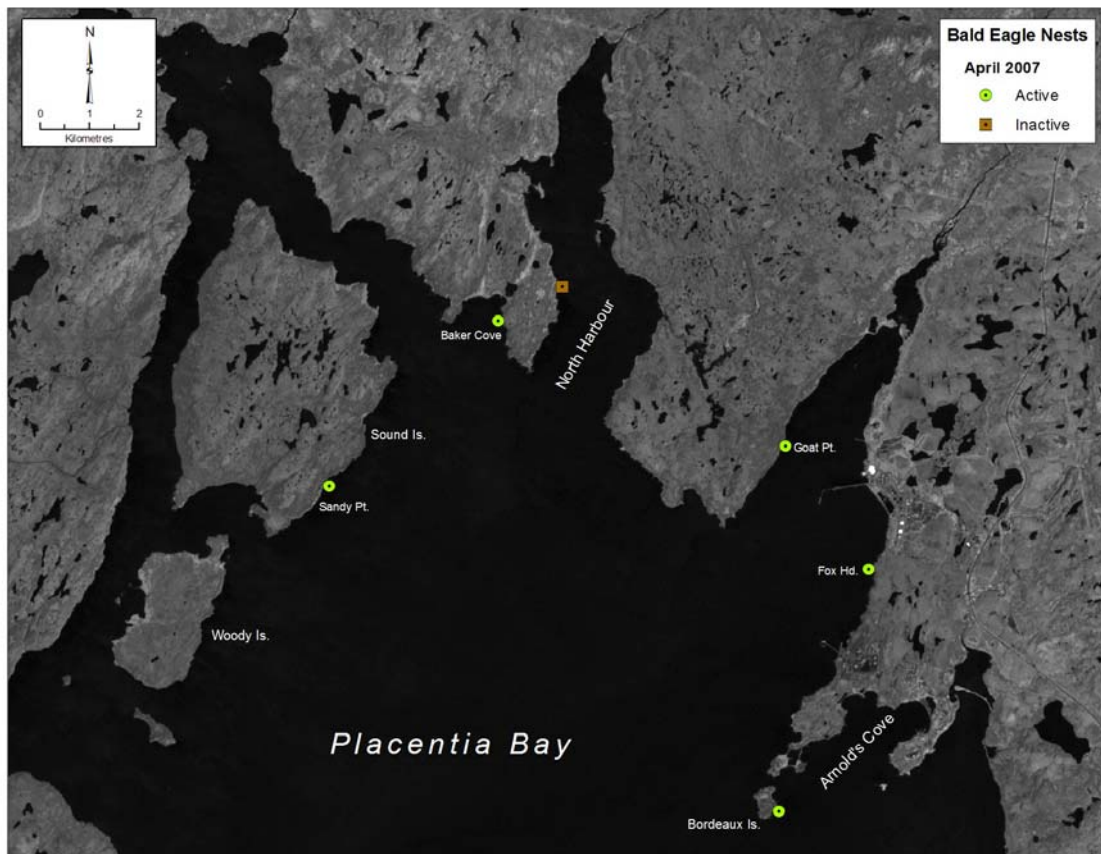


Figure A: Locations of Bald Eagle nests (active and inactive) sighted by LGL Limited during river otter surveys of inner Placentia Bay in mid- to late-April 2007.

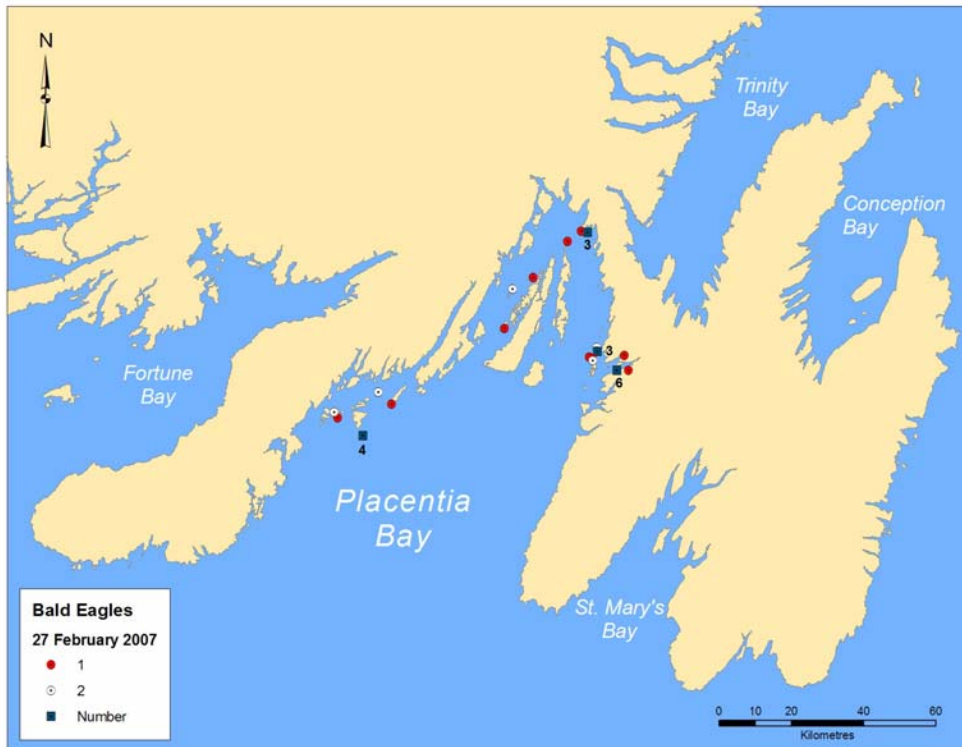


Figure B: Locations of Bald Eagle Sightings by LGL Limited during Harlequin Duck surveys on 27 February 2007.

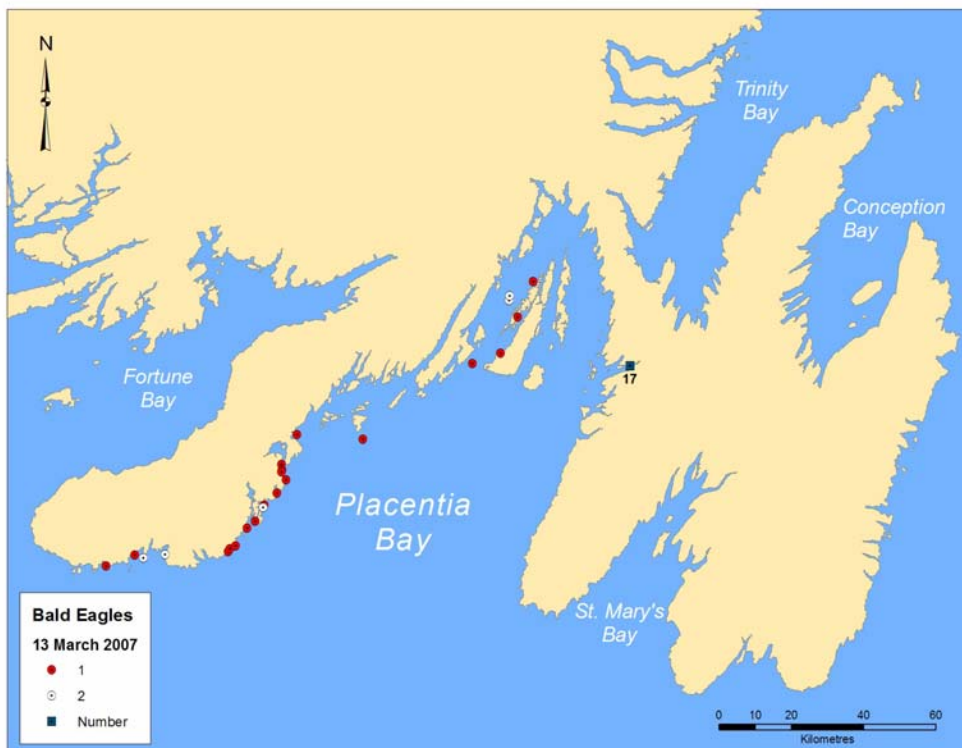


Figure C: Locations of Bald Eagle Sightings by LGL Limited during Harlequin Duck surveys on 13 March 2007.

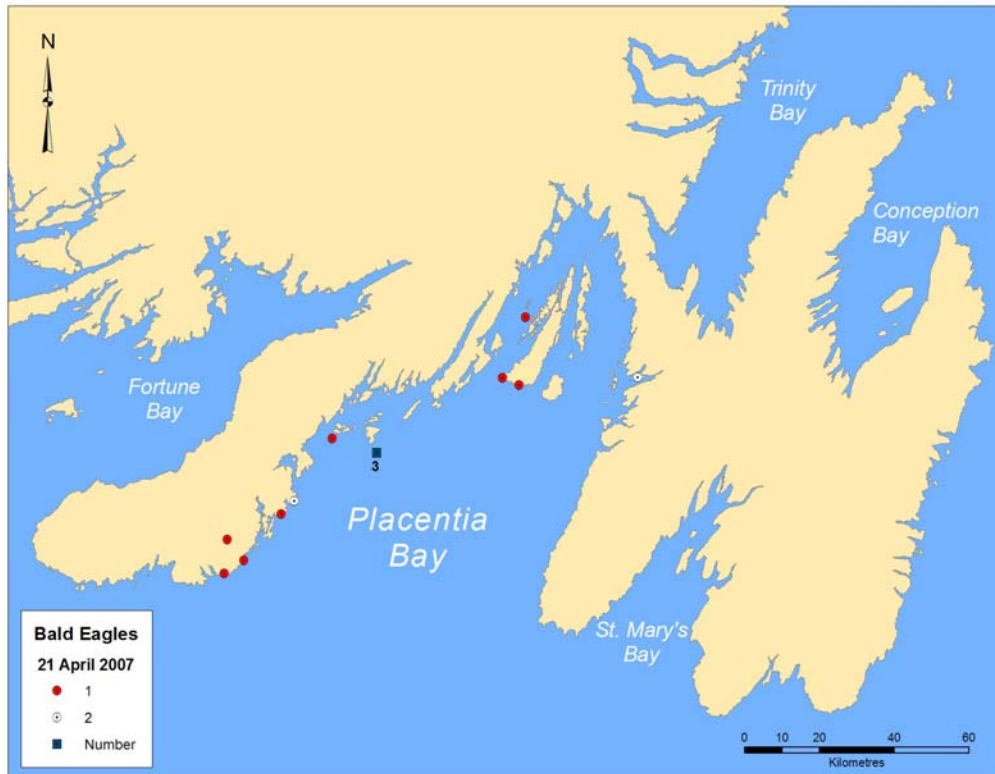


Figure D: Locations of Bald Eagle Sightings by LGL Limited during Harlequin Duck surveys on 21 April 2007.

Page 42. Section 3.5. The surveys were insufficient to conclude that the area does not support any of the species at risk. Additional survey effort is required.

**NLRC Response:**

*Follow up survey(s) during the breeding season using established protocols will confirm the presence/absence of species and determine densities of breeding birds on the project site. A study using established protocols for determining breeding bird densities will be conducted on the proposed refinery site during the peak singing period for songbirds between 5 June and 5 July 2008.*

## **PARKS & NATURAL AREAS**

The bulk of the concerns from Parks and Natural Areas deal with Cape St. Mary's and so this review concentrates on the "Migratory Birds Component Study".

### **Objectives of component study:**

The report should provide a general summary of the data that has regularly been collected by various managing agencies, CWS in particular, and outline what past surveys have shown about marine-associated birds in Placentia Bay. The reader may gather from section 1.3 that the reason the studies focused on the fall and winter time period is that this is a general data gap for information on pelagic and coastal birds in the area. It should be clear in the report how the component studies were designed to address data gaps.

### **NLRC Response:**

*Please replace Section 1.3 of the Migratory Bird Component Study with the following text, to read as follows:*

*"The Migratory Bird Component Study reported on new seabird data collected specifically to augment existing information and support the assessment of the proposed refinery project at Southern Head. Research to date on marine-associated birds in Placentia Bay has focused primarily on breeding biology and census work at the Cape St. Mary's seabird breeding colony. As well, CWS has done aerial surveys for nesting colonies of terns and gulls and wintering concentrations for eiders. There has also been research directed toward the potential effects on seabirds from oil on the water. However, published information on seabirds in the open Placentia Bay is lacking. The monthly pelagic surveys initiated by this study were an attempt to address this lack of knowledge and support the environmental assessment of the project."*

### **Ongoing surveys:**

The component study reflects a very limited study period, but indicates that surveys are "ongoing" (section 1.3). The document should describe what surveys are ongoing, the frequency of surveys, and the intended duration of the study period. The surveys in 2006 present only a year snapshot of marine-associated bird activity, and then only in a portion of the EIS study area. Studies, particularly of pelagic birds and sea-ducks, may need to continue over a number of years to detect yearly and seasonal variations which would be very relevant to assessing the potential impact of activities associated with refinery operation.

### **NLRC Response:**

*The Migratory Birds Component Study was submitted before the program of surveys was completed: this was acknowledged in the last two sentences of Section 1.3.*

*A year-long program of boat-based surveys for marine-associated seabirds was initiated in August 2006 and continued as possible until the end of August 2007. The surveys were precluded by weather (high winds) during the winter months. One survey (June 18 2007) was completed during the June – July breeding season. Data collected since*

*preparation and submission of the Component Study in June and July respectively is presented in Table A and Table G of this addendum. NLRC and regulatory agencies will determine follow-up studies.*

*Time of year for surveys:*

The surveys of marine-associated birds concentrates on the non-breeding time period between August 2006 and April 2007. Surveys which do not include the breeding period are likely to greatly underestimate the full use of Placentia Bay by these birds, and underestimate the possible impact of the Southern Head Refinery and associated developments. The fact that surveys do not include the breeding period, therefore, is a significant omission of this component study.

**NLRC Response:**

*The surveys undertaken for NLRC were designed to augment existing information about seabirds in Placentia Bay: the wider literature on seabirds, including in Placentia Bay, was available and accessed for the assessment presented in the Newfoundland and Labrador Refinery Project Environmental Impact Statement, Volume 3 Biophysical Assessment. As well, as mentioned in the Component Study, surveys for marine-associated birds continued after the Component Study was submitted. The results of those surveys are included in Table A and Table G of this addendum.*

*Large concentrations of Greater Shearwaters and other birds (plus marine mammals) are known to be in Placentia Bay during capelin spawning season in June and July. In July 2007, bird watcher tourist groups traveling on the Marine Atlantic ferry reported many hundreds of shearwaters in Placentia Bay on the approaches to Argentia (B. Mactavish, LGL, pers. comm.). During January and February, windy weather precluded surveys. The local 'turr' hunt (Common and Thick-billed Murres) was underway during January and February and the numbers of murres in the survey area had decreased by the time March surveys commenced according to local hunters and operators of the survey boat. Follow-up programs will be developed by NLRC and regulatory agencies.*

**Extent of study area:**

The surveys for pelagic birds took place only in the inner portion of Placentia Bay (Figure 2.1), which is a very limited portion of the overall biophysical study area for the Environmental Impact Statement. As pelagic birds are generally found further offshore during the winter months, surveys to determine possible impacts of the Refinery and associated operations should include data collection throughout Placentia Bay. This is particularly relevant to assessing the potential impacts of birds resident in or using Cape St. Mary's Ecological Reserve, which lies at the very outer edge of Placentia Bay.

Similarly, the extent of the surveys for coastal birds was concentrated entirely along the Burin peninsula and inner Placentia Bay (Figures 2.5 and 2.6), and did not approach the outer section of the east coast of Placentia Bay, where Cape St. Mary's is located. The reason for focusing the survey in the western area was not explained in the component study but should be. If data exist for the eastern coast, it should be documented in the report; if this is a data gap, then additional surveying should be done in this area.



**NLRC Response:**

*The Migratory Bird Component Study reported on new seabird data collected specifically to augment existing information in support of the assessment of the proposed refinery project at Southern Head at the north end of Placentia Bay. The EIS presents information on the wider geographic area considered in the assessment.*

*Research to date on marine-associated birds in Placentia Bay has focused primarily on breeding biology and census work at the Cape St. Mary's seabird breeding colony. As well, CWS has done aerial surveys for nesting colonies of terns and gulls and wintering concentrations for eiders. However, published information on seabirds in the open Placentia Bay was lacking. The monthly pelagic surveys initiated by this study were an attempt to address this particular gap in information as information for the environmental assessment of the Southern Head refinery.*

*In addition to the surveys of marine-associated birds (pelagic and coastal) to directly support the environmental assessment of the proposed refinery, NLRC collaborated with CWS on a research survey to identify if historic over-wintering areas on the east coast of the Burin Peninsula were being re-inhabited by Harlequin Duck. The east coast of the Burin Peninsula (west coast of Placentia Bay) was surveyed by helicopter for Harlequin Ducks. Unlike the west coast of the Avalon Peninsula, the east coast of the Burin Peninsula has not been well surveyed for Harlequin Ducks, partly because most of the coastline is inaccessible by road. All birds observed during the survey were recorded, thus adding to the information on seabirds and ducks for Placentia Bay. NLRC also supported shore-based surveys for Harlequin Duck on the east coast of Placentia Bay as shown in Figure 2.4 to augment information collected during the Christmas Bird Count. The protocol for these surveys, instituted part way through the series, also included recording of other species observed.*

## **ENVIRONMENT CANADA**

As indicated in the Executive Summary, the MBCS did produce some interesting findings (e.g., the Morgan's Island Harlequin Duck site, Purple Sandpipers, Black Ducks, Black-headed Gulls). In terms of land bird Species at Risk, Harlequin Ducks and pelagic seabirds, it is important that the survey work be continued so as to acquire information and data "sufficient to adequately predict the effects on the valued ecosystem component" and to facilitate identification of appropriate mitigation and monitoring measures.

The following comments have been divided by bird group and are numbered.

MBCS: Table 1.1 and Table 1.2

### **ENVIRONMENT CANADA - CANADIAN WILDLIFE SERVICE (CWS) COMMENT:**

1. Contrary to table legend, relative monthly abundance is not shown. Rather only presence or absence is indicated. Monthly or seasonal abundance would be more useful, as many species vary in abundance over the course of the year.

#### **NLRC Response:**

*The title of the Table 1.1 should be changed to:*

*Table 1.1. List of marine-associated bird species known to occur in the Placentia Bay Area, including the areas where they occur and their relative abundance.*

*We are aware there is monthly variation in the abundance of birds. It is tempting to add abundances by month based on available knowledge and personal experience but such tables draw the criticism that the table is not valid without published information to back up the monthly abundance estimates.*

#### **Pelagic Birds**

MBCS: 1.3 Pelagic Birds "To fill some information gaps, monthly surveys for seabirds at sea...". "This report presents data for August 2006 to April 2007."

2. Monthly seabird surveys were planned, however, referring to "monthly" surveys throughout the study is misleading. A total of 15 surveys were conducted on 3 routes over a 9 month period. Surveys were conducted in 5 months of the 9 month period (August, September, October, December and March/April).

#### **NLRC Response:**

*The surveys were termed monthly surveys because the three survey routes were scheduled to be conducted each month during the year-long survey period (August 2006 – August 2007). However, as the reviewer notes, surveys were not conducted every month, primarily because of poor weather conditions that did not meet survey protocol standards.*

3. The data in this study was collected to “fill some information gaps”. It should be stressed and clarified throughout the study that these data represent predominantly non-breeding or wintering birds.

**NLRC Response:**

*The surveys were an attempt to fill the identified information gap for the open waters of Placentia Bay. Please note that the planned year-long survey program was completed in August 2007 and the data from surveys carried out after preparation of the Component Study are presented in Table A and Table G of this addendum.*

4. Surveys are characterized as “on-going”. CWS would welcome an opportunity to review the data collected from May 2007 to present when it becomes available.

**NLRC Response:**

*Additional pelagic bird surveys were conducted in June and August 2007 (Table A), following preparation and submission of the Component Study. The densities of seven species of seabirds (Northern Fulmar, Greater Shearwater, Sooty Shearwater, Manx Shearwater, Northern Gannet, Black-legged Kittiwake and Black Guillemot) were higher during the 18 June survey than any of the other surveys conducted from August 2006 to August 2007. These relatively high densities are likely related to the presence of prey, most notably, schools of capelin. During the capelin spawning season, which typically occurs sometime in the June to July period, seabirds traditionally concentrate near shore to feed on the capelin. The Northern Gannets and Black-legged Kittiwakes observed in June probably originated from the breeding colony at Cape St. Mary's. Very low densities of seabirds were observed during the August 2007 surveys (Table A) and these densities were similar to the results obtained during the August and September 2006 surveys (see Table 3.1 in the Component Study for the 2006 results). As noted earlier, NLRC and regulatory agencies will determine follow-up programs as part of the assessment process. NLRC is pleased to make data collected available to CWS and other regulatory agencies.*

**Table A: Average densities of marine-associated birds (per km<sup>2</sup>) during 10-minute counts in Placentia Bay, June and August 2007 [*n* = the number of 10-minute counts conducted along the survey route].**

Species	Survey Route A	Survey Route A	Survey Route B	Survey Route C
	( <i>n</i> = 25 counts)	( <i>n</i> = 42 counts)	( <i>n</i> = 40 counts)	( <i>n</i> = 37 counts)
	18-Jun-07	24-Aug-07	23-Aug-07	28-Aug-07
Common Loon	0	0	0	X
Northern Fulmar	0.03	0	0	0
Greater Shearwater	0.96	0	0	0
Sooty Shearwater	0.64	0	0	0
Manx Shearwater	0.13	0	0	0
unidentified shearwater	1.76	0	0	0
Northern Gannet	3.78	0.47	0.1	X
Double-crested Cormorant	0.03	0	0.02	0.03
Great Cormorant	0.10	X	0.26	X
unidentified cormorant	0.74	X	0	0.27
Bald Eagle	0	0	0	X
Semipalmated Plover	0	0	X	0
Ring-billed Gull	0.13	0	0	X
Herring Gull	0.77	2.37	1.86	3.7

	Survey Route A (n = 25 counts)	Survey Route A (n = 42 counts)	Survey Route B (n = 40 counts)	Survey Route C (n = 37 counts)
Great Black-backed Gull	0.06	0.08	0.1	0.1
Black-legged Kittiwake	0.61	0.02	0.02	0
Common Tern	0.03	X	0	X
unidentified tern	0	0	X	0
South Polar Skua	X	0	0	0
Dovekie	0	0	X	0
Common Murre	0.06	X	X	0
Thick-billed Murre	0.22	0	0	0
unidentified murre	0.58	0	0	0
Razorbill	0	0	0	0.03
Black Guillemot	0.29	0	0	X
Atlantic Puffin	0	X	0	0

**Notes:** X = recorded off transect only.

MBCS: 2.0 Methodology; 2.1 Pelagic Birds: “Overall, 15 survey routes....”

5. Misleading....3 survey routes.

**NLRC Response:**

*In Section 2.1, paragraph 3, please change the first line in the paragraph after Table 2.1 to:*

*“Overall, 15 one-day surveys, totaling 1,548 km were surveyed between 3 August 2006 and 13 April 2007.”*

6. Need to clarify and justify why only the inner bay was surveyed. The biophysical Study Area for the EIS is all of Placentia Bay (EIS 2.7.2 Spatial). The EIS/MBCS Guidelines state that the “Information and data generated will be sufficient to adequately predict the effects on the valued ecosystem component.” In the EIS, section 6.11.3 Coastal and Pelagic Birds: The conclusion of the EIS is that the consequence of a major oil spill on the populations of coastal and pelagic seabirds in Placentia Bay would be significant.

Given that the Objective and Rationale in the MBCS states that “It is important to document the occurrence, distribution, and abundance of migratory bird species....in and near the proposed refinery site...” it should be clarified in the MBCS that the data for pelagic birds was collected in the inner bay and do not represent what may be present in Placentia Bay. Pelagic seabirds avoid inner bays and coastlines during the non-breeding season when the surveys were conducted. The abundance of pelagic seabirds is expected to be higher in the outer areas of the bay during the winter. This is supported by the surveys conducted: 4.0 Discussion “seabirds were, as a group, observed in greater numbers on Survey Route B covering the middle of Placentia Bay.” As with Comment 2, it needs to be stressed in the MBCS that the data for pelagic birds represents non-breeding/wintering birds in inner Placentia Bay. Surveys for this Component Study were very limited in temporal and spatial scope. In order to “fill some information gaps”, surveys for wintering pelagic birds would need to include the outer bay (i.e. the biophysical study area as defined in the EIS Figure 2.1).

**NLRC Response:**

*The surveys were designed to address an identified information gap re marine-associated birds in the open waters of Placentia Bay. The northeastern half of the bay was surveyed through boat-based and coastal surveys. Information was also collected on the outer, west side of the Bay during aerial (and shore-based) surveys for Harlequin Duck but with other species recorded..*

*Existing information and the scientific literature concerning seabirds on the Grand Banks and Placentia Bay was accessed for the assessment as outlined in Volume 3 of the EIS. Follow-up programs to confirm predictions associated with the refinery project will be determined by NLRC and regulatory agencies as part of the assessment process.*

## MBCS: 3.0 Study Output

7. Gulls: Columbian Island is a known kittiwake colony in Cairns *et al.* 1989 (500 pairs in 1970s). There is also evidence of breeding common murre at this site.

**NLRC Response:**

*So noted. NLRC is aware of this reference.*

8. Common Murre: EC does not agree that common murres are scarce in non-breeding season. Although outnumbered by Thick-billed Murres, they are taken all winter long in the hunt in Placentia Bay, certainly as abundant as puffins, especially in outer parts of the bay.

**NLRC Response:**

*Our surveys found both species of murres were scarce in the non-breeding season. Common Murre was indeed out-numbered by Thick-billed Murre but both were relatively scarce. 'Turr' hunters indicated that there had been more murres in the bay in February than during the early March surveys (N. Fowler, Mount Arlington Heights, pers. comm.).*

**Coastal Birds**

## MBCS: 3.2 Coastal Birds: "Weekly or bi-monthly surveys..."

9. The schedule of the coastal bird surveys should be included in the MBCS (i.e. what sites were visited on what days). There were 14 sites and based on the methods described, it appears that each site was visited on each date surveyed.

**NLRC Response:**

*The number of visits to each site during each of the four seasons is included in Table 3.3.*

*The following is a new table (Table B) showing the dates of visits to the four general sites: Arnolds Cove, Come By Chance, North Harbour and Southern Harbour.*

**Table B: Dates of coastal bird surveys conducted from August 2006 to April 2007 in inner Placentia Bay.**

Survey Date	Arnold's Cove	Come By Chance	North Harbour	Southern Harbour
3 August 2006	X	X	X	X
14-15 August 2006	X	X	X	X
23-24 August 2006	X	X	X	X
7-8 September 2006	X	X	X	X
17 September 2006	X	X	X	X
24 September 2006	X	X	X	X
4-6 October 2006	X	X	X	X
25-27 October 2006	X	X	X	X
22 November 2006	X	X		X
4 December 2006	X	X	X	X
11 December 2006	X	X		X
31 January 2007	X	X	X	X
8 February 2007	X	X	X	X
14 March 2007	X	X	X	X
23 March 2007	X	X	X	X
29-30 March 2007	X	X	X	
11 April 2007	X	X	X	X
20 April 2007	X	X	X	X

10. Weekly surveys at one site may be too frequent for shorebirds. The Atlantic Canada Shorebird survey suggests surveys be conducted no more than once every 10 days to avoid double counting.

**NLRC Response:**

*The survey design for the year-long program was focused on peak numbers and dates, not total numbers, so double counting was not an issue.*

MBCS: Table 3.2

11. Table 3.2, as with all similar tables, is not labeled well. For example, under 'Site/Season', what is the number in brackets (n = 16)? It is assumed that this is the number of surveys conducted. The schedule of surveys would also help with interpretation of the information presented.

**NLRC Response:**

*The schedule of surveys is provided above in Table B.*

*As noted in an earlier response, the titles of Table 3.2-3.5 should be changed to:*

*Table 3.2. Mean numbers (maximum numbers<sup>a</sup>) of waterfowl commonly observed in inner Placentia Bay by LGL Limited during coastal surveys, August 2006-April 2006. [n= the number of surveys in a given season.]*

*Table 3.3. Mean numbers (maximum numbers<sup>a</sup>) of Gulls and Terns commonly observed in inner Placentia Bay by LGL Limited during coastal surveys, August 2006-April 2006. [n= the number of surveys in a given season.]*

*Table 3.4. Mean numbers (maximum numbers<sup>a</sup>) of birds of prey commonly observed in inner Placentia Bay by LGL Limited during coastal surveys, August 2006-April 2006. [n= the number of surveys in a given season.]*

*Table 3.5. Mean numbers (maximum numbers<sup>a</sup>) of shorebirds commonly observed in inner Placentia Bay by LGL Limited during coastal surveys, August 2006-April 2006. [n= the number of surveys in a given season.]*

12. An indication of variance should be included with mean numbers. The “All Seasons” number is meaningless.

**NLRC Response:**

*Additional tables (Tables C-F) have been prepared for the coastal bird survey results, which present the mean number of birds and standard deviation for each survey period and season. Tables C-F correspond to Tables 3.2-3.5 in the Migratory Birds Component Study.*

**Table C: Mean numbers ( $\pm$  standard deviation) of waterfowl observed in inner Placentia Bay by LGL Limited during coastal surveys in August 2006-April 2007 [n = the number of surveys in a given season].**

Site / Season	Canada Goose	American Black Duck	Mallard	Green-winged Teal	Red-breasted Merganser	Domestic Duck	Common Loon
<b>Arnold's Cove</b>							
Summer (n = 16)	0 $\pm$ 0	37.6 $\pm$ 52.8	0.5 $\pm$ 1.5	0.1 $\pm$ 0.3	0 $\pm$ 0	9.2 $\pm$ 12.3	0.2 $\pm$ 0.4
Fall (n = 15)	0 $\pm$ 0	83.7 $\pm$ 83.1	0.5 $\pm$ 0.9	0.7 $\pm$ 2.3	0 $\pm$ 0	12.1 $\pm$ 21.6	0.1 $\pm$ 0.3
Winter (n = 15)	0 $\pm$ 0	57.2 $\pm$ 85.3	0.5 $\pm$ 0.7	0.2 $\pm$ 0.6	2.2 $\pm$ 4.2	15.9 $\pm$ 23.5	0 $\pm$ 0
Spring (n = 9)	0 $\pm$ 0	11.1 $\pm$ 15.6	0.3 $\pm$ 1.0	0 $\pm$ 0	6.2 $\pm$ 9.9	11.8 $\pm$ 17.8	0 $\pm$ 0
<b>All Seasons</b>	<b>0 <math>\pm</math> 0</b>	<b>51.2 <math>\pm</math> 71.5</b>	<b>0.5 <math>\pm</math> 1.1</b>	<b>0.3 <math>\pm</math> 1.3</b>	<b>1.6 <math>\pm</math> 4.9</b>	<b>12.2 <math>\pm</math> 19.0</b>	<b>0.1 <math>\pm</math> 0.3</b>
<b>Come By Chance</b>							
Summer (n = 18)	0 $\pm$ 0	0.1 $\pm$ 0.5	0 $\pm$ 0	0.2 $\pm$ 0.9	0 $\pm$ 0	0 $\pm$ 0	0.4 $\pm$ 1.1
Fall (n = 15)	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0.1 $\pm$ 0.5	0 $\pm$ 0	0 $\pm$ 0
Winter (n = 15)	4.5 $\pm$ 17.3	54.7 $\pm$ 94.8	0.1 $\pm$ 0.3	0 $\pm$ 0	1.5 $\pm$ 3.7	0 $\pm$ 0	0 $\pm$ 0
Spring (n = 9)	45.6 $\pm$ 131.9	9.8 $\pm$ 19.6	0 $\pm$ 0	0 $\pm$ 0	2.7 $\pm$ 5.7	0 $\pm$ 0	0 $\pm$ 0
<b>All Seasons</b>	<b>8.4 <math>\pm</math> 53.2</b>	<b>16.0 <math>\pm</math> 53.5</b>	<b>0.0 <math>\pm</math> 0.1</b>	<b>0.1 <math>\pm</math> 0.5</b>	<b>0.9 <math>\pm</math> 3.0</b>	<b>0 <math>\pm</math> 0</b>	<b>0.1 <math>\pm</math> 0.7</b>
<b>North Harbour</b>							
Summer (n = 6)	1.7 $\pm$ 2.6	0.3 $\pm$ 0.8	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0
Fall (n = 3)	0 $\pm$ 0	1.7 $\pm$ 2.9	0 $\pm$ 0	0 $\pm$ 0	0.3 $\pm$ 0.6	0 $\pm$ 0	0 $\pm$ 0
Winter (n = 11)	0 $\pm$ 0	2.3 $\pm$ 4.1	0 $\pm$ 0	0 $\pm$ 0	8.8 $\pm$ 13.2	0 $\pm$ 0	0.1 $\pm$ 0.3
Spring (n = 12)	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	1.4 $\pm$ 2.8	0 $\pm$ 0	0 $\pm$ 0
<b>All Seasons</b>	<b>0.3 <math>\pm</math> 1.2</b>	<b>1.0 <math>\pm</math> 2.7</b>	<b>0 <math>\pm</math> 0</b>	<b>0 <math>\pm</math> 0</b>	<b>3.6 <math>\pm</math> 8.6</b>	<b>0 <math>\pm</math> 0</b>	<b>0.0 <math>\pm</math> 0.2</b>
<b>Southern Harbour</b>							
Summer (n = 12)	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0
Fall (n = 16)	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0.1 $\pm$ 0.3
Winter (n = 15)	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0.5 $\pm$ 1.8	0 $\pm$ 0	0 $\pm$ 0
Spring (n = 12)	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0.2 $\pm$ 0.6	0 $\pm$ 0	0 $\pm$ 0
<b>All Seasons</b>	<b>0 <math>\pm</math> 0</b>	<b>0 <math>\pm</math> 0</b>	<b>0 <math>\pm</math> 0</b>	<b>0 <math>\pm</math> 0</b>	<b>0.2 <math>\pm</math> 1.0</b>	<b>0 <math>\pm</math> 0</b>	<b>0.0 <math>\pm</math> 0.1</b>



**Table D: Mean numbers ( $\pm$  standard deviation) of gulls and terns observed in inner Placentia Bay by LGL Limited during coastal surveys in August 2006-April 2007 [n = the number of surveys in a given season].**

Site / Season	Black-headed Gull	Ring-billed Gull	Herring Gull	Iceland Gull	Glaucous Gull	Great Black-backed Gull	Black-legged Kittiwake	Caspian Tern	Arctic Tern	Common Tern	Tern spp.
<b>Arnold's Cove</b>											
Summer (n = 16)	0 $\pm$ 0	3.8 $\pm$ 4.0	56.9 $\pm$ 89.9	0 $\pm$ 0	0 $\pm$ 0	17.9 $\pm$ 22.6	0 $\pm$ 0	0.1 $\pm$ 0.3	0.1 $\pm$ 0.3	3.8 $\pm$ 9.2	1.9 $\pm$ 4.1
Fall (n = 15)	4.9 $\pm$ 13.2	0.6 $\pm$ 2.3	136.5 $\pm$ 208.8	0 $\pm$ 0	0 $\pm$ 0	28.7 $\pm$ 30.5	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0
Winter (n = 15)	3.3 $\pm$ 5.1	0.3 $\pm$ 0.8	24.2 $\pm$ 23.4	7.9 $\pm$ 16.4	0.1 $\pm$ 0.4	11.9 $\pm$ 17.2	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0
Spring (n = 9)	3.4 $\pm$ 4.5	27.3 $\pm$ 39.2	41.0 $\pm$ 34.9	1.3 $\pm$ 1.9	0 $\pm$ 0	3.9 $\pm$ 3.7	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0
<b>All Seasons</b>	<b>2.8 <math>\pm</math> 7.7</b>	<b>5.8 <math>\pm</math> 18.1</b>	<b>67.1 <math>\pm</math> 124.2</b>	<b>2.4 <math>\pm</math> 9.1</b>	<b>0.0 <math>\pm</math> 0.2</b>	<b>16.9 <math>\pm</math> 23.2</b>	<b>0 <math>\pm</math> 0</b>	<b>0.0 <math>\pm</math> 0.1</b>	<b>0.0 <math>\pm</math> 0.1</b>	<b>1.1 <math>\pm</math> 5.2</b>	<b>0.5 <math>\pm</math> 2.3</b>
<b>Come By Chance</b>											
Summer (n = 18)	0.1 $\pm$ 0.5	2.5 $\pm$ 5.0	4.4 $\pm$ 10.6	0 $\pm$ 0	0 $\pm$ 0	0.4 $\pm$ 1.0	0 $\pm$ 0	0 $\pm$ 0	1.0 $\pm$ 2.6	2.3 $\pm$ 2.7	5.4 $\pm$ 9.9
Fall (n = 15)	0.3 $\pm$ 1.0	0.1 $\pm$ 0.3	4.9 $\pm$ 11.1	0 $\pm$ 0	0 $\pm$ 0	0.7 $\pm$ 1.9	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0
Winter (n = 15)	5.4 $\pm$ 11.4	0.4 $\pm$ 1.1	1.5 $\pm$ 1.9	0.2 $\pm$ 0.6	0 $\pm$ 0	0.1 $\pm$ 0.3	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0
Spring (n = 9)	9.4 $\pm$ 13.9	17.6 $\pm$ 41.6	10.0 $\pm$ 15.5	0 $\pm$ 0	0 $\pm$ 0	0.3 $\pm$ 0.5	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0
<b>All Seasons</b>	<b>3.0 <math>\pm</math> 8.6</b>	<b>3.7 <math>\pm</math> 17.1</b>	<b>4.6 <math>\pm</math> 10.4</b>	<b>0.1 <math>\pm</math> 0.3</b>	<b>0 <math>\pm</math> 0</b>	<b>0.4 <math>\pm</math> 1.2</b>	<b>0 <math>\pm</math> 0</b>	<b>0 <math>\pm</math> 0</b>	<b>0.3 <math>\pm</math> 1.5</b>	<b>0.7 <math>\pm</math> 1.8</b>	<b>1.7 <math>\pm</math> 6</b>
<b>North Harbour</b>											
Summer (n = 6)	0 $\pm$ 0	1.2 $\pm$ 1.8	39.7 $\pm$ 56.0	0 $\pm$ 0	0.3 $\pm$ 0.5	9.0 $\pm$ 15.8	0 $\pm$ 0	0 $\pm$ 0	0.2 $\pm$ 0.4	1.0 $\pm$ 2.0	0 $\pm$ 0
Fall (n = 3)	0 $\pm$ 0	0 $\pm$ 0	86.7 $\pm$ 106.8	0 $\pm$ 0	0.3 $\pm$ 0.6	21.7 $\pm$ 22.3	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0
Winter (n = 11)	0 $\pm$ 0	0.6 $\pm$ 1.6	27.8 $\pm$ 47.3	3.5 $\pm$ 7.7	0.1 $\pm$ 0.3	5.2 $\pm$ 8.3	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0
Spring (n = 12)	0 $\pm$ 0	4.3 $\pm$ 7.3	35.3 $\pm$ 46.7	0.1 $\pm$ 0.3	0 $\pm$ 0	2.2 $\pm$ 3.6	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0
<b>All Seasons</b>	<b>0 <math>\pm</math> 0</b>	<b>2.0 <math>\pm</math> 4.8</b>	<b>38.4 <math>\pm</math> 54.8</b>	<b>1.3 <math>\pm</math> 4.7</b>	<b>0.1 <math>\pm</math> 0.3</b>	<b>6.3 <math>\pm</math> 11.4</b>	<b>0 <math>\pm</math> 0</b>	<b>0 <math>\pm</math> 0</b>	<b>0.0 <math>\pm</math> 0.2</b>	<b>0.2 <math>\pm</math> 0.9</b>	<b>0 <math>\pm</math> 0</b>
<b>Southern Harbour</b>											
Summer (n = 12)	0 $\pm$ 0	5.4 $\pm$ 15.6	10.9 $\pm$ 11.5	0 $\pm$ 0	0.3 $\pm$ 0.9	1.0 $\pm$ 2.3	0.1 $\pm$ 0.3	0.1 $\pm$ 0.3	0.2 $\pm$ 0.6	2.3 $\pm$ 5.4	1.5 $\pm$ 3.5
Fall (n = 16)	0.1 $\pm$ 0.3	0 $\pm$ 0	42.8 $\pm$ 122.6	0.6 $\pm$ 2.5	0 $\pm$ 0	12.0 $\pm$ 36.9	5.9 $\pm$ 16.1	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0
Winter (n = 15)	1.1 $\pm$ 1.3	0 $\pm$ 0	17.3 $\pm$ 16.9	6.0 $\pm$ 9.3	0.5 $\pm$ 1.1	4.1 $\pm$ 5	0.1 $\pm$ 0.3	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0
Spring (n = 12)	0.2 $\pm$ 0.4	2.3 $\pm$ 3.9	14.8 $\pm$ 13.4	0.5 $\pm$ 1.0	0.2 $\pm$ 0.4	2.4 $\pm$ 2.2	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0
<b>All Seasons</b>	<b>0.3 <math>\pm</math> 0.8</b>	<b>1.7 <math>\pm</math> 7.6</b>	<b>22.8 <math>\pm</math> 67</b>	<b>1.9 <math>\pm</math> 5.6</b>	<b>0.2 <math>\pm</math> 0.7</b>	<b>5.3 <math>\pm</math> 20.2</b>	<b>1.7 <math>\pm</math> 8.9</b>	<b>0.0 <math>\pm</math> 0.1</b>	<b>0.0 <math>\pm</math> 0.3</b>	<b>0.5 <math>\pm</math> 2.6</b>	<b>0.3 <math>\pm</math> 1.7</b>

**Table E: Mean numbers ( $\pm$  standard deviation) of birds of prey observed in inner Placentia Bay by LGL Limited during coastal surveys in August 2006-April 2007 [n = the number of surveys in a given season].**

Site/ Season	Osprey	Bald Eagle	Sharp-shinned Hawk	Northern Goshawk	Merlin
<b><i>Arnold's Cove</i></b>					
Summer (n = 16)	0.1 $\pm$ 0.3	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0
Fall (n = 15)	0 $\pm$ 0	0.2 $\pm$ 0.4	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0
Winter (n = 15)	0 $\pm$ 0	0.1 $\pm$ 0.4	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0
Spring (n = 9)	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0
<b>All Seasons</b>	<b>0.0 <math>\pm</math> 0.2</b>	<b>0.1 <math>\pm</math> 0.3</b>	<b>0 <math>\pm</math> 0</b>	<b>0 <math>\pm</math> 0</b>	<b>0 <math>\pm</math> 0</b>
<b><i>Come By Chance</i></b>					
Summer (n = 18)	0.4 $\pm$ 1.0	0.4 $\pm$ 0.7	0 $\pm$ 0	0 $\pm$ 0	0.1 $\pm$ 0.3
Fall (n = 15)	0 $\pm$ 0	1.1 $\pm$ 2.6	0.1 $\pm$ 0.3	0 $\pm$ 0	0 $\pm$ 0
Winter (n = 15)	0 $\pm$ 0	0.4 $\pm$ 0.5	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0
Spring (n = 9)	0.1 $\pm$ 0.3	0.7 $\pm$ 0.9	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0
<b>All Seasons</b>	<b>0.2 <math>\pm</math> 0.6</b>	<b>0.6 <math>\pm</math> 1.4</b>	<b>0.0 <math>\pm</math> 0.1</b>	<b>0 <math>\pm</math> 0</b>	<b>0.0 <math>\pm</math> 0.2</b>
<b><i>North Harbour</i></b>					
Summer (n = 6)	0.2 $\pm$ 0.4	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0
Fall (n = 3)	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0
Winter (n = 11)	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0
Spring (n = 12)	0 $\pm$ 0	0.3 $\pm$ 0.5	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0
<b>All Seasons</b>	<b>0.0 <math>\pm</math> 0.2</b>	<b>0.1 <math>\pm</math> 0.3</b>	<b>0 <math>\pm</math> 0</b>	<b>0 <math>\pm</math> 0</b>	<b>0 <math>\pm</math> 0</b>
<b><i>Southern Harbour</i></b>					
Summer (n = 12)	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0
Fall (n = 16)	0 $\pm$ 0	0.4 $\pm$ 0.7	0 $\pm$ 0	0.1 $\pm$ 0.3	0.1 $\pm$ 0.3
Winter (n = 15)	0 $\pm$ 0	0.7 $\pm$ 1.0	0.1 $\pm$ 0.3	0 $\pm$ 0	0 $\pm$ 0
Spring (n = 12)	0 $\pm$ 0	0.2 $\pm$ 0.6	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0
<b>All Seasons</b>	<b>0 <math>\pm</math> 0</b>	<b>0.3 <math>\pm</math> 0.8</b>	<b>0.0 <math>\pm</math> 0.1</b>	<b>0.0 <math>\pm</math> 0.1</b>	<b>0.0 <math>\pm</math> 0.1</b>

**Table F: Mean numbers ( $\pm$  standard deviation) of shorebirds observed in inner Placentia Bay by LGL Limited during coastal surveys in August 2006-April 2007 [ $n$  = the number of surveys in a given season].**

Site/ Season	Black-bellied Plover	American Golden-Plover	Semipalmated Plover	Spotted Sandpiper	Greater Yellowlegs	Lesser Yellowlegs	Yellowlegs sp.	Ruddy Turnstone	Red Knot	Sanderling
<b><i>Arnold's Cove</i></b>										
Summer ( $n = 16$ )	0.4 $\pm$ 0.7	0 $\pm$ 0	5.8 $\pm$ 10.7	0.1 $\pm$ 0.3	8.6 $\pm$ 12.2	0.1 $\pm$ 0.5	1.4 $\pm$ 5.5	0.1 $\pm$ 0.5	0 $\pm$ 0	0.1 $\pm$ 0.3
Fall ( $n = 15$ )	0.1 $\pm$ 0.4	0 $\pm$ 0	0.9 $\pm$ 3.6	0 $\pm$ 0	1.3 $\pm$ 3.6	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0.1 $\pm$ 0.5
Winter ( $n = 15$ )	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0
Spring ( $n = 9$ )	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0
<b>All Seasons</b>	<b>0.2 <math>\pm</math> 0.4</b>	<b>0 <math>\pm</math> 0</b>	<b>1.9 <math>\pm</math> 6.4</b>	<b>0.0 <math>\pm</math> 0.1</b>	<b>2.9 <math>\pm</math> 7.7</b>	<b>0.0 <math>\pm</math> 0.3</b>	<b>0.4 <math>\pm</math> 3.0</b>	<b>0.0 <math>\pm</math> 0.3</b>	<b>0 <math>\pm</math> 0</b>	<b>0.1 <math>\pm</math> 0.3</b>
<b><i>Come By Chance</i></b>										
Summer ( $n = 18$ )	3.8 $\pm$ 11.4	0.2 $\pm$ 0.9	0.3 $\pm$ 1.0	0.1 $\pm$ 0.2	9.8 $\pm$ 16.9	0.1 $\pm$ 0.2	1.1 $\pm$ 4.7	0.9 $\pm$ 2.9	0.2 $\pm$ 0.9	0.1 $\pm$ 0.2
Fall ( $n = 15$ )	0.8 $\pm$ 2.2	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	2.2 $\pm$ 8.0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0
Winter ( $n = 15$ )	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0
Spring ( $n = 9$ )	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0.1 $\pm$ 0.3	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0
<b>All Seasons</b>	<b>1.4 <math>\pm</math> 6.6</b>	<b>0.1 <math>\pm</math> 0.5</b>	<b>0.1 <math>\pm</math> 0.5</b>	<b>0.0 <math>\pm</math> 0.1</b>	<b>3.7 <math>\pm</math> 11.0</b>	<b>0.0 <math>\pm</math> 0.1</b>	<b>0.4 <math>\pm</math> 2.6</b>	<b>0.3 <math>\pm</math> 1.6</b>	<b>0.1 <math>\pm</math> 0.5</b>	<b>0.0 <math>\pm</math> 0.1</b>
<b><i>North Harbour</i></b>										
Summer ( $n = 6$ )	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	3.5 $\pm$ 3.2	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0
Fall ( $n = 3$ )	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	1.0 $\pm$ 1.7	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0
Winter ( $n = 11$ )	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0
Spring ( $n = 12$ )	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0.2 $\pm$ 0.6	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0
<b>All Seasons</b>	<b>0 <math>\pm</math> 0</b>	<b>0 <math>\pm</math> 0</b>	<b>0 <math>\pm</math> 0</b>	<b>0 <math>\pm</math> 0</b>	<b>0.8 <math>\pm</math> 1.9</b>	<b>0 <math>\pm</math> 0</b>	<b>0 <math>\pm</math> 0</b>	<b>0 <math>\pm</math> 0</b>	<b>0 <math>\pm</math> 0</b>	<b>0 <math>\pm</math> 0</b>
<b><i>Southern Harbour</i></b>										
Summer ( $n = 12$ )	0 $\pm$ 0	0 $\pm$ 0	3.8 $\pm$ 8.6	0.4 $\pm$ 0.8	1.3 $\pm$ 3.2	0.3 $\pm$ 1.2	0 $\pm$ 0	0.6 $\pm$ 2	0.2 $\pm$ 0.6	0 $\pm$ 0
Fall ( $n = 16$ )	0 $\pm$ 0	0 $\pm$ 0	0.3 $\pm$ 1.3	0 $\pm$ 0	0.1 $\pm$ 0.5	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0
Winter ( $n = 15$ )	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0
Spring ( $n = 12$ )	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0	0 $\pm$ 0
<b>All Seasons</b>	<b>0 <math>\pm</math> 0</b>	<b>0 <math>\pm</math> 0</b>	<b>0.9 <math>\pm</math> 4.2</b>	<b>0.1 <math>\pm</math> 0.4</b>	<b>0.3 <math>\pm</math> 1.6</b>	<b>0.1 <math>\pm</math> 0.5</b>	<b>0 <math>\pm</math> 0</b>	<b>0.1 <math>\pm</math> 0.9</b>	<b>0.0 <math>\pm</math> 0.3</b>	<b>0 <math>\pm</math> 0</b>

Table F. Continued.

Site / Season	Least Sandpiper	Semipalmated Sandpiper	White-rumped Sandpiper	Baird's Sandpiper	Dunlin	Short-billed Dowitcher	Wilson's Snipe	Shorebird sp.	Red Phalarope
<b>Arnold's Cove</b>									
Summer ( <i>n</i> = 16)	0.3 ± 0.6	3.9 ± 10.4	0.1 ± 0.5	0.3 ± 1.3	0.2 ± 0.8	0.5 ± 1.2	0 ± 0	0 ± 0	0 ± 0
Fall ( <i>n</i> = 15)	0 ± 0	0 ± 0	0.1 ± 0.3	0 ± 0	0.2 ± 0.6	0 ± 0	0 ± 0	0 ± 0	0 ± 0
Winter ( <i>n</i> = 15)	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0
Spring ( <i>n</i> = 9)	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0
<b>All Seasons</b>	<b>0.1 ± 0.3</b>	<b>1.1 ± 5.8</b>	<b>0.1 ± 0.3</b>	<b>0.1 ± 0.7</b>	<b>0.1 ± 0.5</b>	<b>0.1 ± 0.7</b>	<b>0 ± 0</b>	<b>0 ± 0</b>	<b>0 ± 0</b>
<b>Come By Chance</b>									
Summer ( <i>n</i> = 18)	0.2 ± 0.9	0.3 ± 1.4	0 ± 0	0 ± 0	0 ± 0	0.1 ± 0.3	0 ± 0	0.1 ± 0.2	0 ± 0
Fall ( <i>n</i> = 15)	0.1 ± 0.3	0 ± 0	0.4 ± 1.3	0 ± 0	0.8 ± 2.2	0 ± 0	0 ± 0	0 ± 0	0 ± 0
Winter ( <i>n</i> = 15)	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0
Spring ( <i>n</i> = 9)	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0
<b>All Seasons</b>	<b>0.1 ± 0.5</b>	<b>0.1 ± 0.8</b>	<b>0.1 ± 0.7</b>	<b>0 ± 0</b>	<b>0.2 ± 1.2</b>	<b>0.0 ± 0.2</b>	<b>0 ± 0</b>	<b>0.0 ± 0.1</b>	<b>0 ± 0</b>
<b>North Harbour</b>									
Summer ( <i>n</i> = 6)	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0
Fall ( <i>n</i> = 3)	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0
Winter ( <i>n</i> = 11)	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0
Spring ( <i>n</i> = 12)	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0
<b>All Seasons</b>	<b>0 ± 0</b>	<b>0 ± 0</b>	<b>0 ± 0</b>	<b>0 ± 0</b>	<b>0 ± 0</b>	<b>0 ± 0</b>	<b>0 ± 0</b>	<b>0 ± 0</b>	<b>0 ± 0</b>
<b>Southern Harbour</b>									
Summer ( <i>n</i> = 12)	0.1 ± 0.3	1.1 ± 3.4	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0.2 ± 0.6
Fall ( <i>n</i> = 16)	0 ± 0	0 ± 0	0.1 ± 0.3	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0
Winter ( <i>n</i> = 15)	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0
Spring ( <i>n</i> = 12)	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0
<b>All Seasons</b>	<b>0.0 ± 0.1</b>	<b>0.2 ± 1.6</b>	<b>0.0 ± 0.1</b>	<b>0 ± 0</b>	<b>0 ± 0</b>	<b>0 ± 0</b>	<b>0 ± 0</b>	<b>0 ± 0</b>	<b>0.0 ± 0.3</b>

*Coastal bird surveys were continued after April 2007 and surveys were conducted at each of the four sampling sites (Arnold's Cove, Southern Harbour, North Harbour, and Come By Chance) on 30 August and 14 September 2007. The results are presented in Table G).*

**Table G: Numbers of birds observed in inner Placentia Bay by LGL Limited during coastal Surveys on 30 August and 14 September 2007.**

Group/Species	30-Aug-07					14-Sep-07				
	Southern Harbour	Arnold's Cove	Come By Chance	North Harbour	Totals	Southern Harbour	Arnold's Cove	Come By Chance	North Harbour	Totals
<b>Waterfowl<sup>a</sup></b>										
Canada Goose	0	0	0	0	0	0	0	12	0	12
American Black Duck	0	76	0	0	76	0	60	0	0	60
Common Loon	0	0	2	0	2	0	0	0	0	0
<b>Birds of Prey<sup>b</sup></b>										
Osprey	0	0	2	0	2	0	1	1	0	2
Bald Eagle	1	0	0	0	1	1	0	0	0	1
Sharp-shinned Hawk	0	1	0	0	1	0	0	0	0	0
Merlin	0	0	1	0	1	0	0	0	0	0
<b>Shorebirds<sup>c</sup></b>										
Black-bellied Plover	0	0	29	0	29	0	3	12	0	15
American Golden-Plover	0	0	1	0	1	0	0	0	0	0
Semipalmated Plover	0	36	138	0	174	0	84	10	17	111
Spotted Sandpiper	0	0	0	0	0	1	0	0	0	1
Greater Yellowlegs	0	40	39	2	81	0	7	29	2	38
Lesser Yellowlegs	0	5	5	0	10	0	0	1	0	1
Whimbrel	0	0	1	0	1	0	0	0	0	0
Ruddy Turnstone	0	2	5	0	7	0	9	0	0	9
Red Knot	0	1	4	0	5	0	0	8	0	8
Sanderling	0	1	8	0	9	0	0	1	0	1
Least Sandpiper	0	2	7	0	9	0	0	0	0	0
Semipalmated Sandpiper	0	6	43	0	49	0	2	0	3	5
White-rumped Sandpiper	0	0	12	0	12	0	1	1	0	2
Baird's Sandpiper	0	1	0	0	1	0	0	0	0	0
Pectoral Sandpiper	0	0	0	0	0	0	1	0	0	1
Dunlin	0	0	0	0	0	0	0	0	0	0
Short-billed Dowitcher	0	7	0	0	7	0	2	2	0	4
<b>Gulls and Terns<sup>d</sup></b>										
Black-headed Gull	0	2	0	0	2	0	1	0	0	1
Bonaparte's Gull	0	0	0	0	0	0	1	0	0	1
Ring-billed Gull	0	22	18	0	40	0	8	17	0	25
Herring Gull	12	54	5	3	74	11	598	8	3	620
Great-black Backed Gull	15	30	2	0	47	1	70	3	5	79
Common Tern	1	29	14	0	44	0	1	0	0	1
<b>Other</b>										
Black Guillemot	2	3	0	0	5	0	3	0	0	3
Belted Kingfisher	0	0	0	0	0	1	0	0	0	1
American Pipit	0	0	0	0	0	0	2	0	0	2
<b>Totals</b>	31	318	336	5	690	15	854	105	30	1004

See Tables 3.2a, 3.3d, 3.4b, and 3.5c of the Migratory Birds Component Study for August 2006-April 2007 results.

*Information gained from these surveys reinforces observations made during the August and September 2006 period; the barrier beaches and associated lagoons at Arnold's Cove and Come By Chance are important feeding areas for migratory shorebirds. A total of 17 species of shorebird were observed at these locations during the August and September 2007 surveys. Two species, Whimbrel and Pectoral Sandpiper, were recorded during the August/September 2007 surveys but not in 2006. Semipalmated Plover was the only species recorded in August/September 2007 in numbers significantly different from the 2006 surveys. There were high counts of 138 at Come By Chance and 84 at Arnold's Cove in 2007 versus 4 and 39, respectively, in the same time period in 2006.*

*The Red Knot, which is listed as Endangered by COSEWIC, was observed at Come By Chance and Arnold's Cove during the recent coastal bird surveys (Table H). This species was also observed at Southern Harbour in August 2006 and Come By Chance in September 2006. Based on surveys conducted in support of the EIS, the Come By Chance location stands out as the most important site for Red Knot in the Study Area and this site may be important staging habitat on a provincial scale.*

**Table H: Number and location of all Red Knots observed during coastal surveys conducted during August and September 2006/2007.**

Location	Date	Number
Southern Harbour	23 Aug 06	2
Arnold's Cove	30 Aug 07	1
Come By Chance	24 Sept 06	4
Come By Chance	30 Aug 07	4
Come By Chance	14 Sep 07	8

MBCS: 4.0 Discussion p. 51 paragraph 2

“The aerial survey resulted in valuable data on Purple Sandpipers with 515 recorded on 21 April 2007. This species is thought to be in long-term decline and has been proposed for status review under the *Species at Risk Act* (P. Thomas, CWS, pers. comm.)”

13. Misquoted. The text should be revised to read as “This species is of interest and are being closely monitored in the NE United States due to noted declines of the Hudson Bay breeding population (*C. m. belcheri*) that is currently considered a ‘Species of High Concern’ in the U.S. Shorebird Conservation Plan.”

**NLRC Response:**

*Please change wording to: “This species is of interest and is being closely monitored in the NE United States due to noted declines of the Hudson Bay breeding population (*C. m. belcheri*) that is currently considered ‘Species of High Concern’ in the U.S. Shorebird Conservation Plan.”*

MBCS: 1.6 Harlequin Ducks

14. A CWS survey at Cape St. Mary's in 2005 counted ~242 individuals. The words “from over-hunting” should be removed as this has not been scientifically demonstrated.

**NLRC Response:**

*The reference supporting the statement regarding over-hunting should have been included. Please replace text as shown below.*

*Over-hunting is considered the main cause of the historic decline of Harlequin Ducks in eastern North America (Robertson and Goudie 1999), and numbers of birds have apparently increased in response to prohibition of hunting ([www.seaduckjv.org](http://www.seaduckjv.org)).*

*Robertson, G.J. and R.I. Goudie. 1999. Harlequin Duck (*Histrionicus histrionicus*). In *The Birds of North America*, No. 466 (A. Poole and F. Gill, eds.). *The Birds of North America, Inc., Philadelphia, PA.**

## MBCS: 2.5 Landbirds

15. The methods used for the landbird survey were not appropriate to “acquire a list of species that breed in the refinery footprint area.” The protocols used for determining the breeding status of birds were correct. However, the protocols are a component of a survey method that was not used. Walking a random line through the area on one day between 8:30 and 15:30 is an inappropriate method. The data collected cannot be considered “systematic data”. These data are neither qualitative nor quantitative. As indicated in the Ontario Breeding Bird Atlas, point count surveys can be done “anytime between dawn and 5 hours after dawn”. That would have been between 5:00 and 10:00. No conclusions regarding breeding bird absence can be made from this survey.

**NLRC Response:**

*The NLRC survey has provided a list of the common breeding species and their relative abundances at the project site and a general picture of the breeding bird community. Further field study during the 2008 breeding season (5 June to 5 July) using approved protocols will confirm the presence, or not, of Species at Risk and obtain accurate densities of breeding species.*