

**Faculty of Science Course Syllabus
Department of Biology
MARI 3626
Field Studies of Marine Mammals
July – August, 2016**

Instructor(s): Nina Hamacher; NHamacher@dal.ca; room TBA

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Demonstrator(s): TBA

Field demonstrator(s): TBA

Classroom at Dalhousie: July 25-29, August 4-10, 9:00 - 17:00, LSC 240

Field trip to Digby Neck: July 30-August 3

Course Description

Hands-on introduction to research on marine mammals. Lectures provide an overview of marine mammal adaptations, evolution, population biology, social organization, conservation, and management. Labs include a necropsy and techniques of photographic identification of individuals. On a several-day camping trip, students observe marine mammals from whale-watch boats and conduct research projects.

Course Prerequisites

BIOL 2060.03, BIOL 3062.03 (or BIOL 3630.03 or PSYO 2160.03), STATS 1060.03 (or equivalent)
CROSS-LISTING: BIOL 3626.03

Course Objectives/Learning Outcomes

By the end of the course students will be able to:

- Describe characteristics of the different groups of marine mammals.
- Describe examples of marine mammal distribution and habitat use, and explain how they are studied.
- Describe marine mammal population dynamics and explain how it is studied.
- Discuss issues relating to marine mammal conservation, and identify structures in place for the conservation and management of marine mammal populations.
- Name and identify a variety of local marine mammal and seabird species, including in the field and through photo ID.
- Explain various anatomical, physiological, and behavioural adaptations of marine mammals to the marine environment.
- Identify elements of marine mammal anatomy during a necropsy.



- Describe examples of foraging and reproductive ecology in marine mammals, and explain how they are studied.
- Describe examples of marine mammal social structures and techniques used to study them.
- Conduct literature and online searches of primary and secondary sources using electronic data bases and online search tools
- Develop and carry out a field study, from initial proposal stage to final data analysis and interpretation, on some aspect of the biology of marine mammals in the Bay of Fundy.
- Participate constructively in a field camp setting (e.g. cooking, cleaning, shared living in tents).
- Produce a scientific report based on the field study.
- Deliver an oral presentation relating the field study findings.

Course Materials

There is no textbook for the course but there are many books at the Killam Library. PDFs or PPTs will be available for each lecture on brightspace.

Key books in the Dalhousie Library:

Gaskin, DE. The ecology of whales and dolphins. QL 737 C4 G24 1982

Reeves, RR et al. The Sierra Club Handbook of seals and sirenians. QL 737 P6 R44 1992

King, JE. Seals of the World. QL 737 P6 K5 1983

Ridgeway, SH and Harrison, R. Hand book of marine mammals (volumes 1 – 6). QL 713.2 H354 v. 1-6.

Riedman, M. The pinnipeds: Seals, sea lions and walruses. QL 737 P6 R54 1990

Evans, PGH. The natural history of whales and dolphins. QL 737 C4 E93 1987

Berta, Annalisa. Marine Mammals: evolutionary biology QL 713.2 B47 1999

Evans, Peter G.H. and Raga, J.A. (eds) Marine Mammals Biology and Conservation. QL 713.2 M354 2001

Boyd, I. (ed) Marine mammals: advances in behavioural and population biology QL 128 1992

Perrin, W.F., Wursig, B., Thewissen, J.G.M. (eds) Encyclopedia of Marine Mammals. QL 701.2 E3 2002

Hoelzel, R. (ed). Marine Mammal Biology: an evolutionary approach, QL 713.2 M37 2002

Key Journals to use as references:

Marine Mammal Science, Canadian Journal of Zoology, Canadian Field Naturalist (especially COSEWIC status reports), Reports of the International Whaling Commission, Aquatic Mammals
Marine Ecology Progress Series, Ecology, Oikos, Oecologia, Proceedings of the Royal Society of London, Polar Biology, Journal of Zoology, Journal of Animal Ecology, Polar Biology, Behavioral Ecology, Behavioural Ecology and Sociobiology

Article Searches via Dalhousie Online Databases:

Do not use Google or Google Scholar and expect a thorough return of published material.

Please use the following:

ASFA – Aquatic Sciences and Fisheries Abstract is decent for marine mammal research although few behavioural studies

Web of Science – Abstracts from many relevant journals

Biological Abstracts: A good place to start, though fewer direct journal links.

Course Assessment

Component	Value (%)	Date due
Hypothesis and data protocol	10	Friday Jul 29, 9AM
Midterm exam	15	Friday Jul 29, 11AM – 12:15PM
Necropsy lab report	5	Saturday Jul 30, 9AM
Field book	10	Friday Aug 5, 9AM
Final exam	20	Monday Aug 8, 9AM -12PM
Oral presentation	10	Tuesday Aug 9, 9:00 – 13:00PM
Final report	30	Wednesday Aug 10, 5PM

Conversion of numerical grades to Final Letter Grades follows the Dalhousie Common Grade Scale

A+ (90-100)	B+ (77-79)	C+ (65-69)	D (50-54)
A (85-89)	B (73-76)	C (60-64)	F (<50)
A- (80-84)	B- (70-72)	C- (55-59)	

Course Policies

(1) It is important to keep up with work. Unexcused late assignments will be deducted at a rate of 10% per day. Valid excuses include those for sickness or emergencies.

(2) You are expected to attend and participate in all course activities.

(3) Safety precautions. You **MUST** adhere to all safety guidelines including those that will be discussed in the first week of classes. While on the field trip, if you plan to leave the group, you must use the buddy system--stay in groups of 2 or more--AND inform the instructors of where you are going and when you will return. For everyone's safety, **consumption of alcoholic beverages is NOT permitted** on the field trip.

Course Content
Tentative Lecture Schedule BIOL/MARI 3626 01, Summer 2016

When		What	Who
Mon July 25th	9:00 - 10:00AM	Intro to course	NH
	10:15 - 11:00AM	Intro to marine mammals	NH
	11:00AM - 12:00PM	Distribution and habitat use	NH
	1:00 - 3:00PM	Population dynamics	MC
	3:00 - 5:00PM	Project Proposals	NH, MC
Tues July 26th	9:00 - 10:30AM	Conservation and management	MC
	10:30AM - 12:00PM	Marine mammal identification	NH
	1:00 - 4:00PM	Photo ID	NH, MC
Wed July 27th	9:00 - 10:30AM	Acoustics	GL: Julien Delarue
	10:30AM - 12:00PM	Telemetry	GL: TBA
	1:00 - 4:00PM	Anatomy and Physiology	NH, MC
Thurs July 28th	9:00 - 10:15AM	Strandings	GL: TBA
	10:30AM - 1:00PM	Necropsy	TBA
	1:00 - 5:00PM	Independent work	
Fri July 29th	9:00AM HAND IN PROJECT PROPOSALS & DATA SHEETS VIA EMAIL OR IN PERSON		
	9:00 - 11:00AM	Study time	
	11:00AM - 12:15PM	MIDTERM EXAM	NH
	1:30 - 2:30PM	Project proposal briefing	NH, MC
	2:30 - 5PM	FREE	
Sat July 30th	9AM HAND IN NECROPSY REPORT		
	9:00AM	Meet in LSC parking lot	
	1:00PM	Arrive in Whale Cove campground, Digby Neck	
	5:00 - 8:30PM	Set up camp and lunch On water	
Sun July 31st	7:45AM - 12:45PM	On water	
Mon Aug 1st	7:45AM - 12:45PM	On water	
Tues Aug 2nd	9:00AM - 12:00PM	Lecture: TBA	TBA
	5:00 - 8:30PM	On water	
Wed Aug 3rd	7:45AM - 12:45PM	On water	
	1:00 - 3:00PM	Optional: lunch at nearby café	
	3:00 - 7:00PM	Drive home and unload	
Thurs Aug 4th	9:00AM - 1:00PM	FREE	
	1:00 - 2:15PM	Genetics	GL: TBA
	2:30 - 4:30PM	Studying marine mammal diets	MC
Fri Aug 5th	9:00 AM HAND IN FIELD BOOKS		
	9:00 - 10:15AM	Reproductive ecology of marine mammals	GL: DL
	10:30 - 11:45AM	Long term Sable Island grey seal project	GL: DL
	1:00 - 2:30PM	Final project expectations, How to design a presentation, Informal exam review	NH
	2:30 - 5PM	Independent work	
Sat Aug 6th	9:00-10:15AM	Social structure of sperm whales	GL: TBA
	10:30 - 11:45AM	Pilot whales	GL: TBA
	1:00 - 3:45PM	Research paper discussion	NH, MC
Sun Aug 7th	FREE		
Mon Aug 8th	9:00AM - 12:00PM	FINAL EXAM	NH, MC
Tues Aug 9th	9:00AM - 1:00PM	Oral presentations	NH, MC
Wed Aug 10th	5:00PM	HAND IN FINAL REPORT	

ACCOMMODATION POLICY FOR STUDENTS

Students may request accommodation as a result of barriers related to disability, religious obligation, or any characteristic protected under Canadian Human Rights legislation. The full text of Dalhousie's Student Accommodation Policy can be accessed here:

http://www.dal.ca/dept/university_secretariat/policies/academic/student-accommodation-policy-wef-sep--1--2014.html

Students who require accommodation for classroom participation or the writing of tests and exams should make their request to the **Advising and Access Services Centre (AASC)** prior to or at the outset of the regular academic year. More information and the **Request for Accommodation** form are available at www.dal.ca/access.

ACADEMIC INTEGRITY

Academic integrity, with its embodied values, is seen as a foundation of Dalhousie University. It is the responsibility of all students to be familiar with behaviours and practices associated with academic integrity. Instructors are required to forward any suspected cases of plagiarism or other forms of academic cheating to the Academic Integrity Officer for their Faculty.

The Academic Integrity website (<http://academicintegrity.dal.ca>) provides students and faculty with information on plagiarism and other forms of academic dishonesty, and has resources to help students succeed honestly. The full text of Dalhousie's **Policy on Intellectual Honesty** and **Faculty Discipline Procedures** is available here:

http://www.dal.ca/dept/university_secretariat/academic-integrity/academic-policies.html

STUDENT CODE OF CONDUCT

Dalhousie University has a student code of conduct, and it is expected that students will adhere to the code during their participation in lectures and other activities associated with this course. In general:

"The University treats students as adults free to organize their own personal lives, behaviour and associations subject only to the law, and to University regulations that are necessary to protect

- the integrity and proper functioning of the academic and non – academic programs and activities of the University or its faculties, schools or departments;
- the peaceful and safe enjoyment of University facilities by other members of the University and the public;
- the freedom of members of the University to participate reasonably in the programs of the University and in activities on the University's premises;
- the property of the University or its members."

The full text of the code can be found here:

http://www.dal.ca/dept/university_secretariat/policies/student-life/code-of-student-conduct.html

SERVICES AVAILABLE TO STUDENTS

The following campus services are available to help students develop skills in library research, scientific writing, and effective study habits. The services are available to all Dalhousie students and, unless noted otherwise, are free.

Service	Support Provided	Location	Contact
General Academic Advising	Help with <ul style="list-style-type: none"> - understanding degree requirements and academic regulations - choosing your major - achieving your educational or career goals - dealing with academic or other difficulties 	Killam Library Ground floor Rm G28 Bissett Centre for Academic Success	In person: Killam Library Rm G28 By appointment: <ul style="list-style-type: none"> - e-mail: advising@dal.ca - Phone: (902) 494-3077 - Book online through MyDal
Dalhousie Libraries	Help to find books and articles for assignments Help with citing sources in the text of your paper and preparation of bibliography	Killam Library Ground floor Librarian offices	In person: Service Point (Ground floor) By appointment: Identify your subject librarian (URL below) and contact by email or phone to arrange a time: http://dal.beta.libguides.com/sb.php?subject_id=34328
Studying for Success (SFS)	Help to develop essential study skills through small group workshops or one-on-one coaching sessions Match to a tutor for help in course-specific content (for a reasonable fee)	Killam Library 3rd floor Coordinator Rm 3104 Study Coaches Rm 3103	To make an appointment: <ul style="list-style-type: none"> - Visit main office (Killam Library main floor, Rm G28) - Call (902) 494-3077 - email Coordinator at: sfs@dal.ca or - Simply drop in to see us during posted office hours All information can be found on our website: www.dal.ca/sfs
Writing Centre	Meet with coach/tutor to discuss writing assignments (e.g., lab report, research paper, thesis, poster) <ul style="list-style-type: none"> - Learn to integrate source material into your own work appropriately - Learn about disciplinary writing from a peer or staff member in your field 	Killam Library Ground floor Learning Commons & Rm G25	To make an appointment: <ul style="list-style-type: none"> - Visit the Centre (Rm G25) and book an appointment - Call (902) 494-1963 - email writingcentre@dal.ca - Book online through MyDal We are open six days a week See our website: writingcentre.dal.ca

BRIEF DESCRIPTION OF ASSIGNMENTS

Project Proposal and Justification (10%): Provide a clearly formulated one or two sentence hypothesis, indicating the question you intend to examine. Give a brief synopsis of previous studies that have examined similar questions, and based on your reading and a theoretical understanding of your subject, state WHY your question is important. Further, given the existing published information on your subject, tell me why you expect certain results. Your data collection protocol should outline what data you will collect, when it will be collected and how it will be collected. Include a full list of methods and materials required, sufficient such that anyone could follow your methods and collect the data. Datasheets should also be submitted to indicate how you will record the data in the field.

AN IMPORTANT DETAIL: do not make the spaces for recording data on your datasheet too small, give yourself a row height of at least 25 points. Depending on overall class size, projects will be done in groups of four or five. Only one project outline per group is required (**however, project reports will be done individually**).

Midterm Exam (15%): Short answer, true/false and/or multiple choice.

Necropsy lab report (5%): You will be expected to answer short questions about the necropsy.

Field book (10%): Everyone will be given a weatherproof field book.

There are two separate tasks that you are required to enter into your field book (see example at end of this doc):

- 1) **BACK OF THE BOOK, GIVE SPECIES DESCRIPTIONS:** For each **new species** of marine mammal and seabird encountered, you must provide a detailed description of their physical appearance and behavioural observations. For example: note the body parts observed (head, fin, etc), note the direction they are swimming, numbers in a group, etc. Well-labelled sketches should be used to make note of physical appearances and are a useful tool and exercise. You can update this description with any other observations about this species throughout the rest of the field trip. The end result should be a detailed description of each species encountered in the field, one that you could read in the future to help you identify a marine mammal in the field. Remember, you can update your original entry with any other important observations you may have missed the first time - sometimes these animals give you only very small glimpses!
- 2) **FRONT OF THE BOOK, GIVE A DETAILED TIME LOG:** Each time you encounter a marine mammal or seabird, the time, species and number of individuals should be recorded. Based on these observations, you should update your description of the species. Any notes relating to your project (that don't fit on your data sheets) should also be recorded in your field book in this section.

The key here is that you must remain vigilant at all times while on the boat – always be scanning for sightings of marine mammals and seabirds, even if this is not relevant to your project area. Marks will be rewarded according to presentation, neatness and legible recordings. Always date each page and provide a synopsis of prevailing weather conditions and any other comments relevant to that study day. Be thorough!

Final exam (20%): Short answer and essay questions.

Oral presentation (10%): As a group, give a short (10-15 minute) presentation on your research project using Power Point. Outline your hypothesis or question, the background to the questions asked (rationale), how you conducted your research (methods), what you found and what your results indicate about marine mammals in the Bay of Fundy area. Done as a group project, and your group will receive a single mark. You will be marked on presentation and content.

Final report (30%): Written report in journal style. Follow EXPLICITLY the guidelines for Canadian Journal of Zoology (<http://www.nrcresearchpress.com/page/cjz/authors>). Prepare your report as if you were planning on submitting your manuscript to Canadian Journal of Zoology using *Canadian English* throughout. Look at past articles for ideas on what information should be included. Must have abstract, introduction, materials and methods, results and discussion sections as well as literature cited (see handout on Canadian Journal of Zoology format for more details). Report must be typed, double-spaced, written individually (each group member is responsible for producing their own report, emphasis on OWN) although there will be collaboration on data collection and results. Figures/Tables can be shared amongst the group, as long as all members have participated in their design.

FIELD WORK AND FIELD PROJECTS

The main focus of the course is to conduct your own research project on marine mammals in the Bay of Fundy, including such key steps as: formulating your hypothesis, collecting data, analysis of data, writing a scientific paper and providing a scientific presentation. There will be five groups, each with four to five people, and each group will take on one of the projects outlined below. Each project idea listed below can only be assigned to one group. Data should be collected jointly in the group. Note, you will be observed in the field and in the lab to ensure that the work is shared EQUALLY amongst all group members.

Groups and project ideas (no two groups can do the same topic) must be chosen and approved by 1 PM on Tuesday July 26th. Then decide what data you should collect and how you should collect it (see Proposal above for more details).

Project ideas

From one of the project ideas below, each of which addresses a particular question, formulate a hypothesis that you want to test.

- 1) Distribution of marine mammals in the Bay of Fundy: Marine mammals in the Bay tend to be observed in particular areas. What characterizes these locations (i.e. depth, tide, temperature) and why are marine mammals likely to be observed in these areas?
- 2) Associations between seabirds and cetaceans: Seabirds are sometimes observed in association with cetaceans. Investigate which species associates with each other and why they might be associating (i.e., what common resource or habitat might they both share?).
- 3) Photo-identification of cetaceans and seals: Can you use photographic-id techniques to individually identify marine mammals in the Bay of Fundy? Are all species suitable for this technique? Can you match individuals with those from existing photo- id databases (e.g. humpbacks, right and pilot whales), and from those identified in previous years of the course?
- 4) Marine mammals and ecotourism: Do whale watching boats influence the behaviour of marine mammals in the Bay of Fundy? Which behaviours can be observed from the boat? Which factors might influence the behaviour of marine mammals while in the presence of a boat? Do whale watching boats induce stress on marine mammals? How would you determine whether an animal is stressed?
- 5) Marine mammal diving behaviour: What are the surfacing intervals and dive patterns of the different marine mammals observed in the Bay of Fundy? Do they differ between individuals and species and what factors may drive these similarities or differences?
- 6) Student project ideas: Be brave and creative and come up with your own idea. Feel free to discuss your thoughts with us.

You will be required to hand in your hypothesis and datasheets by 9:00 AM on Friday July 29th via e-mail or in person. These will be marked and given back to you by the end of the day so you can make any necessary changes before leaving for the field. After the field trip, you will be required to analyze the data (only simple statistics are expected), give a brief (15 minute) oral presentation on your project for the class and write up your project as a scientific paper following the format required by *Canadian Journal of Zoology*. Formulating the proposal/hypothesis, data collection and analysis and oral presentation will be done in groups, however the write up must be done individually and each person will be marked individually.

The final report is due by 5 PM on Wednesday August 10th.

Equipment available

Boat, with ship-board depth sounder, fish finder, thermometer and GPS
Limited number of GPS units
Limited number of timers
Tide time-tables
SLR cameras*
Binoculars
Charts of area

* SLR cameras are not always available so if you have a digital SLR with a telephoto lens of > 200mm you are likely to be encouraged to pursue the photo-id project.

Field Conditions

Field-work will be conducted off a chartered whale watching boat in the Bay of Fundy, leaving each day from Tiverton, Long Island. Right and humpback whales will be commonly observed and trips will be tailored to sight these two species, however we will watch for all marine mammals, including harbour and grey seals, minke and fin whales and harbour porpoises. Keep in mind, however, that there are no guarantees that marine mammals will be seen with every outing; such is the risk with any field work. You will also be expected to identify and log each seabird sighting. There will be a lecture on marine mammal and marine bird identification before you go into the field.

During the field trips we will be camping on Digby Neck at a local campground. You will be sharing tents and cooking facilities. We will be in “field conditions”, although there are showers at the campground. Please bring your own sleeping bag and sleeping pad, or borrow one if you do not own one, and warm clothing for camping. We will be getting up early every morning (6:00 am), therefore it is imperative that everyone is able to sleep by a decent hour, so noise should be kept at a minimum.

Cooking: All meals will be provided. Snacks on the boat between meals are your own responsibility. Please let us know about ANY DIETARY REQUIREMENTS (vegetarian etc.) well in advance. We will rotate through project groups to help with all meals and all dishes throughout the trip. After you have cooked a meal, the following day you will be responsible for washing the dishes. Meals are planned in advance, and the ingredients bought, so each group will simply have to prepare the meal with the help of instructions.

NOTE: Alcoholic beverages will not be permitted during the field trip.

Field Trip Details

Charter: Petit Passage, <http://www.ppww.ca/>, (902) 834-2226

Campsite: Whale cove camp ground, <http://www.whalecovecampground.com/>, (902) 834-2025

Schedule (subject to change, dependent on weather)

Saturday Jul 30:	depart Halifax 9am, arrive Whale Cove 1pm, lunch, evening charter 5 – 8:30 pm
Sunday Jul 31:	morning charter 7:45am – 12:45 pm
Monday Aug 1:	morning charter 7:45am – 12:45 pm
Tuesday Aug 2:	evening charter 5:00pm – 8:30 pm
Wednesday Aug 3:	morning charter 7:45am – 12:45 pm, optional lunch at a nearby Café, return to Halifax between 5 & 7pm

Required Field Gear

We will not have much room in the vehicles so PLEASE DO NOT OVER PACK. However, you should ensure that you have sufficiently warm clothing and bedding. The weather in the Bay of Fundy can change rapidly, and can be very cool and damp even in the middle of summer. Fog is common in the evenings, so please, bring lots of warm clothing and good raingear. Even when it's not raining (and it WILL rain), the boat can get somewhat wet, so a pair of rain pants makes you a lot more comfortable when sitting out for hours at a time.

- Water bottle to take on boat
- Sleeping bag, sleeping pad and pillow
- Appropriate clothing for the field: - warm clothes, ie. fleece, wool, gore-tex, toques, gloves; good rain gear; appropriate footwear (not flip-flops): well-soled sandals/hiking boots/running shoes/rubber boots
- Sunscreen/hat/sunglasses
- Bug repellent
- Pencils/pens/clipboard
- We will need a few people to bring tents that they are willing to share with others!

Please inform us if you own a tent, and then we will organize people into tents.

Recommended Field Gear

Binoculars

Camera

Flashlight or headlamp

Travel alarm or watch alarm

Provided Field Gear

We will provide food, stoves, propane, cooking pots and dishes. Field books will also be provided. People are welcome to bring laptops if they wish for data entry, but we cannot be responsible for any items lost or stolen. There is free Wi-Fi available at the campground.

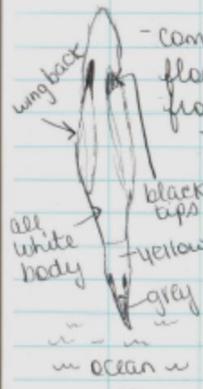
APPENDIX

A1. Example: Back of book: Species Identification

A2. Example: Front of book: Log Entry

A1: Example: Back of book: Species Identification

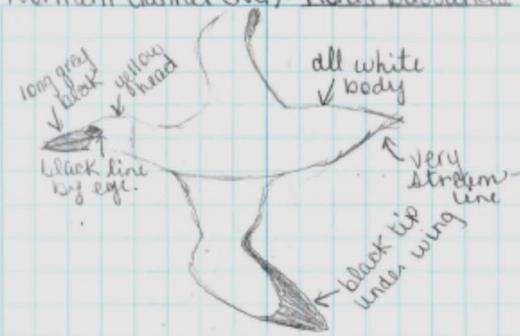
50 Northern Gannet (NG) → *Morus bassanus*



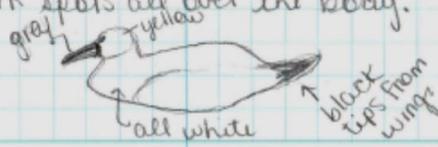
- commonly seen flying or floating on open water far from shore.
- usually seen in groups of 2-3. (unless diving as pictured left); at which time many are seen (5+).
- fly very high then pull wings back & fall in a bullet shape into the water.
- diving behaviours only seen from far off.
- from far away it can be confused with a gull. Flying pattern is slightly different but black tips are most important.
- ↳ see difference, gulls found on page 60-61.

ocean

51 Northern Gannet (NG) → *Morus bassanus*



- extremely stream line bird.
- very large, with very distinctive features.
- ↳ i.e. yellow head, black tip wings, and over all shape.
- have lots of black lining around eyes.
- young are same sleek shape but with black wings and dark spots all over the body.



Kit in the Rain

A2: Example: Front of book: Log Entry

TIME	SIGHTING
5:50	→ 1 Humpback flipper slapping, ~10 times!
5:52	→ Second Humpback joined, traveled alongside boat, more directed and faster travel than last pod
5:56	→ ~30 white-sided dolphins travelling in different directions, all around boat
6:06	→ passed Greater Shearwater floating
6:08	→ passed another Greater Shearwater floating
6:11	→ Greater Shearwater flew bow → stern
6:27	→ 2 Northern Gannets flew on starboard side, bow to stern ~100m away
6:31	→ 2 Humpbacks, tail lobbed >30 times, then flipping over, slapping fins, became too distant to see
6:49	→ 1-3 harbour porpoises, maybe more? surfacing briefly around a Herring Gull, ~10-20m from the boat
6:52	→ Northern Gannet, circling a spot ~10 m from boat. Second gannet on other side of boat, flew over head, bow → stern
6:53	→ 4 more Gannets flying starboard side
6:56	→ 1 Black-backed gull on rocks as we approached the dock
7:00	→ arrived back at the harbour

TIME	SIGHTING
9:01	→ 1 Northern Gannet off starboard flying, then plunged for prey
9:03	→ 1 Northern Gannet off starboard, flew toward boat but then over stern and away, port side
9:10	→ Greater Shearwater flew around stern
9:16	→ Greater Shearwaters (5) flew by starboard side of boat, bow to stern
9:17	→ Herring Gull flying stern to bow, ~20m from starboard side
9:22	→ 1 Greater Shearwater flew across bow, port to starboard
9:23	→ 1 Herring gull juvenile flew from starboard to port across bow
9:24	→ 1 Greater Shearwater floating off starboard side
9:29	→ 2 Northern Gannet floating off starboard
9:34	→ 1 Herring Gull flew past port side, bow to stern, fairly low (~10m)
9:35	→ ~20 Phalaropes sitting on water in front of bow, flew away all together as we approached
9:40	→ 2 Greater Shearwater flew starboard side, bow → stern
9:45	→ 2 Greater Shearwater floating port side

DATE: Aug. '22
 Left the Dock: 8:50am
 Weather: very thick fog, slight wind, fog cleared overnight