

Southern Seawall Renewal Project

Southern Seawall Renewal Project: Marine Mammal Management Plan

for: Wellington International Airport Limited



DOCUMENT CONTROL AND REVISION RECORD

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Cover Illustration: Southern seawall in April 2024 looking west towards Lyall Bay breakwater

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1 INTRODUCTION

1.1 Purpose of the MMMP

Bioresearches (Babbage Consultants Limited) was engaged by Wellington International Airport Limited (WIAL, the Airport) to prepare a marine ecological impact assessment for the Southern Seawall Renewal Project (the Project) in eastern Lyall Bay.

The Project will replace and extend the existing southern seawall (Southern Seawall). The placement of new concrete blocks requires the creation of a toe in the natural rock through rock milling. According to the noise assessment conducted for the Project (T & T 2025), rock milling will be the only significant noise activity.

Rock Milling involves breaking down rock during excavation using a ‘rock miller’ mounted on an excavator, which operates in short bursts rather than continuously. It will generate noise underwater, which could potentially affect marine mammals.

This Marine Mammal Management Plan (MMMP) has been prepared to detail the appropriate management responses to ensure any adverse effects on marine mammals are minimised. It is in support of an application under the Fast-track Approvals Act 2024 (FTAA).

1.2 Scope of the MMMP

The Marine Ecological Impact Assessment prepared for the Project (Bioresearches 2025) (EclA) assessed the marine mammal species that could be affected by rock milling activities. They are:

- Common dolphin *Delphinus delphis*
- Orca *Orcinus orca*
- New Zealand fur seal *Arctocephalus forsteri*

with common occurrence in Lyall Bay;

- Bottlenose dolphin *Tursiops truncatus*
- Leopard seal *Hydrurga leptonyx*
- Humpback whale *Megaptera novaeangliae australis*

with occasional occurrence in Lyall Bay;

- Hector’s dolphin *Cephalorhynchus hectori hectori*
- Southern right whale *Eubalaena australis*

with rare occurrence in Lyall Bay.

The MMMP describes the monitoring and mitigation measures, when necessary, to minimise the effects of rock milling on these species.

1.3 Role and responsibilities

Table 1 summarises the key project staff. The WIAL Project Manager is ultimately responsible for implementing the MMMP, and to ensure the Lead Contractor understands and can implement the requirements of the MMMP. The contractor is responsible for training the staff.

Table 1 *Summary of key contacts*

Name	Role/responsibility	Organisation	Contact details
Trent Kleinsman	Project Manager	WIAL	[Redacted]
Craig Campbell	Lead Contractor	McConnell Dowell	[Redacted]
Laureline Meynier	Project Marine Mammal Specialist	Bioresearches	[Redacted]
Darran Humpheson	Project Underwater Noise specialist	Tonkin and Taylor	[Redacted]

2 OCCURRENCE OF MARINE MAMMAL SPECIES

A full desktop survey and site investigations were carried out as part of the marine EclA (Bioresearches, 2025). A summary of the species detected, or likely present is found in Table 2.¹ More details are provided for species that are common in the Lyall Bay.

Records of marine mammal sightings in the Wellington Harbour and southern coast were compiled from different sources including the Department of Conservation database, INaturalist NZ, news articles, social media, consultant reports and research articles. The Department of Conservation database was acquired in May 2025. The sightings records were however updated to December 2023. The Facebook group “Marine mammal sightings in the Wellington region” was searched for sighting events in Lyall Bay.

Table 2 List of marine mammals present in the Wellington region¹ with their threatened status

Common name	Species name	IUCN classification	NZ classification	Wellington region ¹ occurrence	Hearing Group ²
Common dolphin	<i>Delphinus delphis</i>	Least Concern	Not Threatened	Seasonal to year-round resident along coast	High frequency HF
Orca (killer whale)	<i>Orcinus orca</i>	Data deficient	Threatened - Nationally Critical	Regular visitor	High frequency HF
NZ fur seal	<i>Arctocephalus forsteri</i>	Least Concern	Not Threatened	Regular Visitor	Otariid in water OW
Bottlenose dolphin	<i>Tursiops truncatus</i>	Least Concern	Threatened Nationally Vulnerable	Seasonal to year-round resident along coast	High frequency HF
Leopard seal	<i>Hydrurga leptonyx</i>	Least Concern	Non-resident Native Migrant	Visitor	Phocid in water PW
Humpback whale	<i>Megaptera novaeangliae australis</i>	Endangered (Oceania population only)	Non-resident Native Migrant	Seasonal migrant in Cook Strait	Low frequency LF
Hector’s dolphins	<i>Cephalorhynchus hectori hectori</i>	Endangered	Threatened - Nationally Vulnerable	Year-round resident in Cook Strait, mostly south of Tory channel	Very-High frequency VHF
Southern right whale	<i>Eubalaena australis</i>	Least Concern	Threatened – Nationally increasing	Seasonal migrant in Cook Strait	Low frequency LF

Notes: IUCN classification from IUCN redlist website (2019); NZ classification from Lundquist *et al.* (2025); Species with rare encounters such as beaked whales were not listed; the first three species are regularly seen in Lyall Bay; the following three species are occasionally seen in Lyall Bay; the last two species are rarely seen in Lyall Bay.

¹The Wellington region comprises waters up to 12 nautical miles, which includes part of the Cook Strait.

²Hearing groups follow the NMFS (2024)

The Department of Conservation database has recorded sightings in Lyall Bay of baleen whales (**humpback whales** and **southern right whales**), toothed whales (**orca**, **common dolphins** and **bottlenose dolphins**), and **leopard seals** (Table 2, Figure 1). **Fur seals** were not recorded in the database but the occurrence of individuals hauling out on the southern coast is common. Recently, social media

¹ Table 2’s hearing groups have been updated since the initial draft of the MMMP was lodged to reflect latest information. This update does not affect the contents of the MMMP or EclA.

has become an important tool to record sightings of marine mammals. Review of social media posts indicated that among these cetaceans, common dolphins and orca were the most common species reported in Lyall Bay (Appendix 1). Common dolphins were seen in large pods including mother-calf pairs in the middle of the Bay. Hector's dolphins were only rarely reported. Most of the sightings of Hector's dolphins in the Cook Strait are concentrated in the Marine Mammal Sanctuary south of Marlborough Sounds (MacKenzie and Clement 2014), approximately 40km south-west from Lyall Bay.

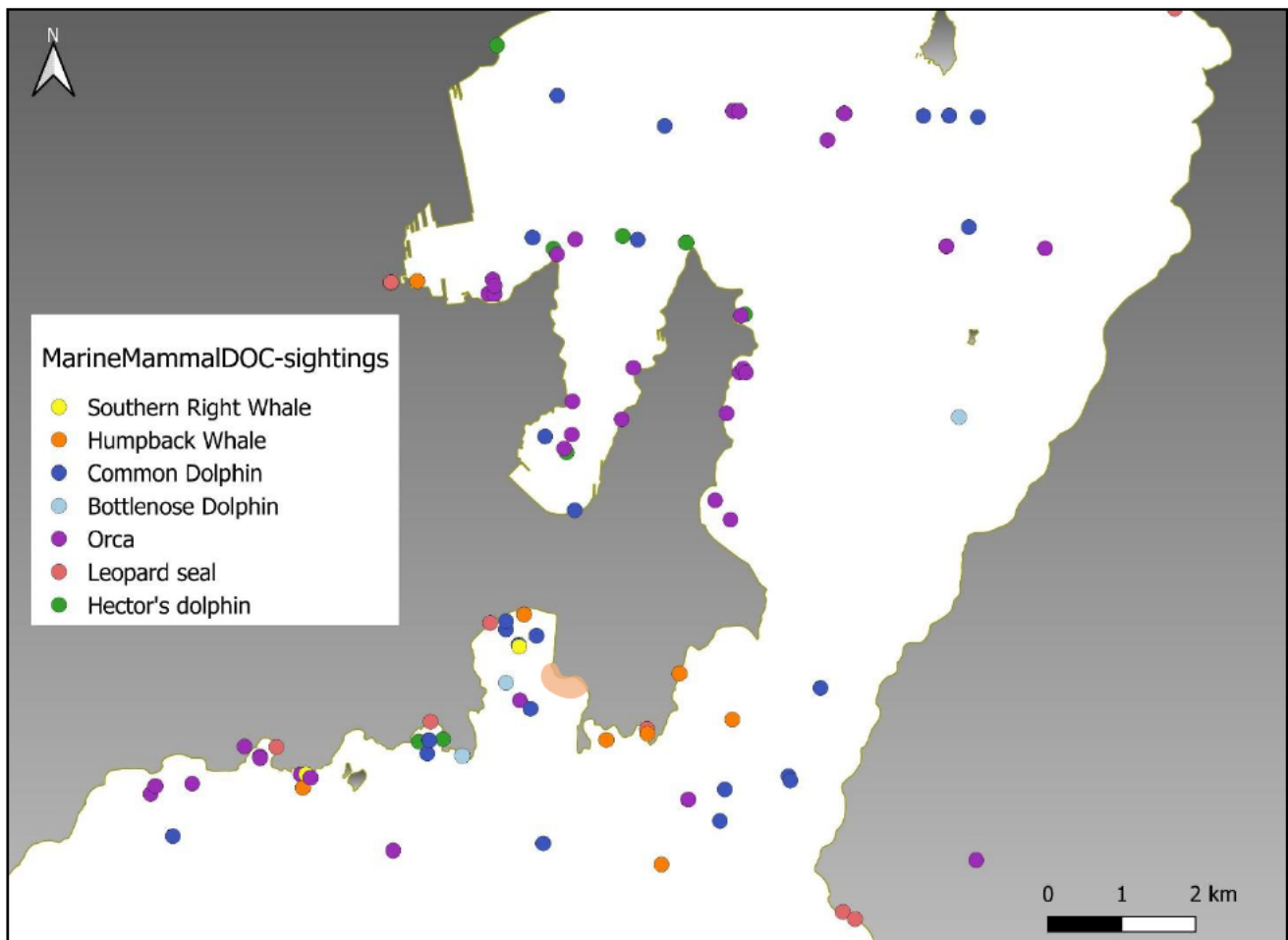


Figure 1 Marine Mammal sightings recorded in the Department of Conservation database from 2000 to 2023. Pink area = zone of influence for the Seawall Project.

2.1 Common dolphins in Lyall Bay

Common dolphins (*Delphinus delphis*) are regular visitors to the southern coast of Wellington, especially Lyall Bay, although they are typically more abundant offshore and around the Cook Strait. Sightings in Lyall Bay are documented year-round with notable pods observed feeding and socializing.

- Multiple documented sightings in Lyall Bay and adjacent areas (e.g., Houghton Bay) often include groups ranging from 10 to 40 individuals.
- Feeding is a common activity seen in Lyall Bay, with dolphins noted circling in groups and engaging in cooperative hunting behaviours.

- Reports also note occasional mother-calf pairs among these visiting pods, although most sightings are of mixed-age groupings.

2.2 Orca in Lyall Bay

Orca (*Orcinus orca*) are frequent seasonal visitors to Lyall Bay and other coastal waters in the Wellington region. They are sighted several times each year, close to shore, typically during their search for rays.

- Orca pods, sometimes including calves, have been documented along the Wellington south coast. Sightings range from solitary individuals to family groups.
- Observed behaviours include patrolling near reefs and beaches (presumably hunting for sting-rays, a preferred prey), surfacing, tail slapping, “spy hopping” (raising their heads from the water).
- The pattern of visits is opportunistic, governed by prey abundance and movement.

2.3 New Zealand fur seals in Lyall Bay

In the Wellington region, New Zealand fur seals (*Arctocephalus forsteri*) are found on suitable rocky coast habitats along the coastline, occasionally establishing haulout sites, like in Lyall Bay.

- They prefer habitats such as rock platforms, ledges, boulder beaches, and shoreline cliffs with easy access to the sea.
- While Lyall Bay itself does not have a fur seal colony, seals do use the area intermittently for resting or hauling out. The nearest regular fur seal haul-out sites are at Red Rocks Reserve and Sinclair Head on the south side of Wellington.

2.4 Summary of occurrence

Marine mammal species occurring regularly, such as fur seals, common dolphins and orcas, are likely using Lyall Bay for foraging and resting, and are transitory. Eastern Lyall Bay, where the replacement of the southern seawall will take place, does not represent a significant foraging area for marine mammals.

3 EFFECTS OF NOISE ON MARINE MAMMALS

3.1 Underwater noise levels

The construction methodology of the seawall renewal includes excavating the seawall toe trench to a depth of up to 3 m to bedrock, utilising an excavator mounted rock milling. During rock-milling, the rotating drum of the rock-miller grinds and chips away at the rock surface, turning it into smaller fragments for easy removal. Unlike percussive breaking with a chipper, rock milling is a controlled process that produces relatively low vibration, like a steady construction machine. Milling is typically done in short bursts rather than continuously, with about 5-minute grinding periods followed by brief pauses for repositioning and clearing material (T & T 2025).

Rock milling will be however limited to water depths < 5 m, and therefore the excavation will occur only on each end of the seawall. In the central section where water depths are > 5 m and can reach 10 m, a natural rock toe will be placed on the seabed.

Tonkin and Taylor (T & T 2025) presented an underwater noise assessment based on noise propagation modelling (sBSea software). Rock milling sound was not measured in-situ and levels were not available in the literature for similar situations. Therefore, T & T estimated the sound levels from on-land measurements of an excavator mounted rock miller milling basalt rock. The underwater source level at 1 m was estimated at 190 dB re 1 μ Pa rms when rock milling occurs. At 20 m and when weighted to take into account the most noise sensitive group (VHF = Hector's dolphins), the sound level was estimated at 140 dB re 1 μ Pa.

3.2 Zone of impact for marine mammals

The zones of impact define the likely environmental footprint of a noise source and indicate how far away a noise source is expected to have an impact on a marine mammal species, either behaviourally or physiologically. In general, the assessment of potential noise impact on marine mammals relies on the zone of hearing injury (Temporary Thresholds Shift distance) to determine the management of effects.

The most sensitive hearing group, VHF, comprises Hector's dolphins. This species occurs only rarely in the southern coast of Wellington, but the application of the VHF thresholds to the rest of marine mammal groups allows a conservative approach covering potential errors in noise estimation.

According to the estimation by T & T, the sound level was estimated at 140 dB re 1 μ Pa at 20m for VHF, which corresponds to the TTS for VHF with cumulative noise from impact, but is still under the TTS for VHF when continuous noise occurs (161 dB). This estimation represents the worse case noise scenario as it implies a continuous noise, while rock milling produces noise bursts of several minutes and pauses.

Lyall Bay does not constitute a critical habitat for marine mammals and most of the cetacean sightings report a foraging behaviour. If the availability of prey is impacted by the drilling noise, marine mammals are likely to move away and forage where prey are available. Orca, common dolphins and fur seals are known to be opportunistic feeders (Visser *et al.* 2000, Meynier *et al.* 2008, Meynier and Baird 2019).

New Zealand fur seals may occasionally haul out on the seawall but, once construction activities start on land, the zone is unlikely to be favoured as a resting place due to associated disturbance. Moreover,

otariids (fur seals and sea lions) are not as sensitive to underwater noise as cetaceans and phocids (true seals) as they have small ear flaps and a cartilage valve along the external ear canal that functions to close the ear canal to water (Southall *et al.*, 2007); hence they are expected to tolerate underwater anthropogenic noise more readily than other species.

Taking into account the above considerations (more details provided in the EclA, Bioresearches 2025), the magnitude of effects on marine mammals was considered negligible. However, due to the indirect measurements of noise (no actual rock milling noise measurements available), it is considered best practise to implement some management measures to ensure the effects will be no more than negligible if marine mammals are using waters close to the seawall during rock milling works.

4 MARINE MAMMAL MANAGEMENT

The T & T Construction Noise and Vibration Assessment (2025) estimated the TTS impact zone for the highest sensitive marine mammal group to be a 20 m distance from the noise source.

Despite the unavailability of *in situ* underwater rock milling measures replaced by a noise estimation from land-based works, the noise propagation model took a conservative approach to calculate the TTS zone by assuming the presence of the most sensitive marine mammals (VHF), and by assuming that rock milling is continuous with an accumulative effect over time. To further reduce the risk of marine mammals entering the impact zone during rock milling, a buffer zone is proposed, which doubles the distance originally estimated for the establishment of the Marine Mammal Observation Zone (MMOZ), i.e. 20 m has been increased to a 40 m distance.

The management measures detailed below aim at ensuring no disturbance to marine mammals during construction activities, and are intended solely for the duration of the Project.

4.1 Initial noise measurement and confirmation of the MMOZ

The underwater noise levels will be measured during the initial phase of construction when rock milling will occur for the first time. Measurements will be recorded by an experienced acoustician from Tonkin and Taylor to validate the estimated noise levels. The 40 m zone will be adjusted if appropriate / necessary considering the new noise propagation model outputs.

The MMOZ will be identified with marks on land to aid the observers in estimating the distance. The default distance is 40 m from the seawall, which will be adjusted, if necessary, following the initial noise measurement and validation process referred to above.

4.2 Standard operation procedures for the MMOZ

Standard operation procedures (SOP) include pre-start, soft start, normal operation, shut-down procedures and post-work observation. Each of the stages are detailed below. The MMOZ will involve a trained marine mammal observer (MMO) scanning the MMOZ for any presence of cetaceans prior to and during rock-milling works. The presence of any cetacean within the zone will result in the stop of rock milling until the animal leaves the MMOZ. The MMO will be familiar with the SOP and will document the process. A record is to be kept of sightings, delayed start-ups and shut-downs.

4.2.1 Observation methodology

The construction works will mostly occur at night, therefore the MMO will use a combination of torches and infra-red (IR) binoculars/scope to observe the MMOZ. IR imaging technologies have been deployed on vessels and coastal platforms to complement visual marine mammal observer surveys and enable monitoring on a 24-hour basis (Zitterbart et al. 2013; Smith et al. 2020).

Observations should be made from the crest wall. If the readjusted MMOZ is larger than 40 m, other options than direct observations will be considered, including Passive Acoustic Monitoring.

4.2.2 Pre-start observation procedure

Potential cetacean presence will be visually monitored by the MMO(s) for 20 mins within the MMOZ (the default distance being 40 m from the rock milling site, as noted above). If the MMOZ needs to be adjusted, following the initial noise monitoring and validation process referred to above in section 4.1, the length of the visual monitoring will be reconsidered and, if necessary, increased in duration.

4.2.3 Soft start procedure

Once 20 mins of pre-start observations have been completed, and no cetacean is seen within the MMOZ, a soft start procedure will commence with the milling head at the prescribed operating Revolutions Per Minute (RPM). The operator will apply 'soft pressure' for the first 30 seconds, followed by lifting the milling head from the rock and reducing the milling RPMs to idle speed for 30 seconds. This process will be followed by a 'medium pressure' sequence and 'hard pressure' sequence over a total period of three minutes. On completion of the soft, medium and hard pressure cycles, the operator will then commence rock milling as required for the remaining shift.

The soft-start procedure will alert marine mammals in a larger zone than the MMOZ to the presence of construction activities and enable animals to move away.

4.2.4 Normal operation procedure

During rock milling's normal operation, the MMO will undertake regular visual observations of the MMOZ. If the rock milling stops for longer than 30 minutes, the pre-start observation procedure and soft start procedure outlined above in sections 4.2.2 and 4.2.3 must be completed again.

4.2.5 Shut-down procedure

If a cetacean is seen in the MMOZ or near the MMOZ, the rock milling activity will be stopped immediately. The MMO will maintain a watch of the cetacean's movement until it is out of the MMOZ.

4.3 MMO training and duties

The two duties of the Marine Mammal Observer (MMO) are:

- to detect and record marine mammals
- to ensure the management measures are enforced following the MMMP.

Marine mammal sightings should be reported using a standardised Marine Mammal Sightings Form. A Marine Mammal Sighting form will include date and time of observation, species, number, estimated distance from the seawall, the shutdown procedure if inside the MMOZ, and the weather conditions during sighting. An annual summary report of sightings and mitigation measures must be submitted to the Greater Wellington Regional Council (GWRC) and the Department of Conservation (DOC).

Training of the MMO(s) will be provided during inductions and meetings by a marine mammal specialist from Bioresearches. The inductions should include providing basic information of the marine mammal species of interest, search and scanning protocols, reporting requirements, an understanding of the MMO's responsibilities, and Health and Safety requirements specific to undertaking observations at night in/close to a construction site.

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Appendix 1 Marine Mammal Sightings in Lyall Bay

Table A1.1 DOC database Marine Mammal sightings in Lyall Bay

Sighting-Number	Source	DDayDMonthDYear	VernacularName	Location = "Lyall Bay"	LatitudeDecimal	LongitudeDecimal
32	212685	22/12/2005	Unknown cetacean	Lyall Bay, Wellington	-41.331	174.797
46	212685	11/03/2006	Unknown cetacean	Lyall Bay, Wellington	-41.331	174.797
47	212685	14/03/2006	Unknown cetacean	Lyall Bay, Wellington	-41.331	174.797
161	936819	11/05/2010	Orca	Lyall Bay	-41.33964	174.79952
169	936819	2/12/2009	Common Dolphin	Lyall Bay - Te Ra Kahaupt	-41.34063	174.80124
170	936819	14/01/2010	Common Dolphin	Lyall Bay - Middle bay	-41.34063	174.80124
185	936819	19/08/2010	Leopard seal	Lyall Bay	-41.33026	174.79441
187	936819	20/03/2011	Common Dolphin	Lyall Bay	-41.33287	174.79913
188	936819	27/07/2010	Southern Right Whale	Lyall Bay	-41.33309	174.79922
189	936819	28/02/2011	Common Dolphin	Lyall Bay	-41.33287	174.79913
392	212685	19/10/2004	Common Dolphin	East of Wellington airport, Lyall Bay	-41.801	174.801
393	212685	26/12/2004	Common Dolphin	Lyall Bay, Wellington	-41.330	174.797
473	212685	3/12/2005	Common Dolphin	Lyall Bay, Wellington	-41.331	174.797
474	212685	17/11/2005	Common Dolphin	Lyall Bay, Wellington	-41.331	174.797
649	212685	19/12/2006	Unknown dolphin	Lyall Bay, Wellington	-41.330	174.797
651	212685	11/05/2007	Unknown dolphin	Lyall Bay, Wellington	-41.330	174.797
1068	212685	26/05/1999	Humpback Whale	East of Lyall Bay	-41.350	174.800
1298	212685	8/11/2004	Orca	East of Wellington airport, Lyall Bay	-41.801	174.801
2130	936819	11/02/2013	Unknown dolphin	Lyall Bay, on airport side	-41.334609	174.803508
2989	936819	20/01/2014	Orca	Lyall Bay Wellington		
2990	936819	20/01/2014	Orca	Lyall Bay, south of wellington airport		
3093	936819	1/09/2014	Humpback Whale	Lyall Bay	-41.329131	174.799905
3094	936819	1/09/2014	Humpback Whale	Lyall Bay	-41.329131	174.799905
3355	936819	30/03/2015	Common Dolphin	Lyall Bay, Wellington	-41.331709	174.801965
4029	212685	20/03/2009	Unknown dolphin	Lyall Bay	-41.334	174.798

4091	212685	11/12/2007	Common Dolphin	Lyall Bay	-41.335	174.802
4095	212685	6/01/2008	Unknown dolphin	Lyall Bay	-41.332	174.803
4556	936819	19/09/2015	Leopard seal	Wellington, Lyall Bay near the seawall at the airport		
4588	936819	17/11/2015	Bottlenose Dolphin	Lyall Bay, Wellington	-41.3375	174.7972
5356	212685	26/09/2000	Leopard Seal	Lyall Bay	-41.329	174.795
5402	212685	19/08/2010	Unknown Pinniped	Lyall Bay, Wellington	-41.330	174.794
6237	212685	19/03/2009	Common Dolphin	Moa Pt/Lyall Bay	-41.339	174.804
6243	212685	16/04/2009	Common Dolphin	Lyall Bay	-41.335	174.799
6621	936819	12/01/2019	Unknown	Lyall bay	-41.33081	174.797242
7022	212685	20/03/2011	Bottle-Nose Dolphin	Lyall Bay	-41.334	174.802
8927	936819	18/02/2021	Orca	Waitaha Cove, between Lyall Bay and Princess Bay,	-41.34158	174.79205
9503	936819	15/12/2022	Unknown dolphin	Lyall bay west of the airport	-41.33841212	174.8080707

Note: DOC DB up to May 2023. Sightings from Hector's dolphins are in a different database.

Table A1.2 Facebook group “Marine mammals in Wellington region” sightings recorded at Lyall Bay until mid year 2025.

post_datetime	reported_date_text	species_common_name	notes
2025-01-28	Jan-29	dolphin	Dolphins Lyall bay 8:16
2025-01-26	Jan-27	dolphin	Dolphins in Lyall Bay
2024-11-16	Nov-17	dolphin	Dolphins in Lyall Bay
2024-11-09	Nov-09	orca	Looks like an orca out in the middle of Lyall Bay 6:45pm
2024-04-04	Apr-05	dolphin	Small pod Lyall Bay heading in 8:38
2024-03-05	Mar-06	dolphin	It looks like there are some dolphins in Lyall Bay and they are slowly heading West towards the airport
2024-03-03	Mar-04	dolphin	Small pod dolphins Lyall Bay 8am
2024-02-20	21/02/2024	dolphin	21/2/24 sighting of dolphins in Lyall Bay
2023-05-08	May-08	dolphin	At least 100 dolphins now in Lyall Bay
2023-01-30	Jan-31	dolphin	Lyall Bay now. Common Dolphin pod heading towards airport breakwater

2023-01-20	Jan-21	dolphin	Small pod Lyall Bay 12.15
2022-11-16	Nov-17	dolphin	Pod between Maranui and the Botanist
2022-05-04	May-05	whale	Whale possibly two moving past Houghton Bay towards lyall bay 11:32 (Thursday 5th May)
2022-02-02	Feb-03	dolphin	Airport side of Lyall Bay at 12:45
2022-02-02	Feb-03	dolphin	Soooo many dolphins 8.25 in Lyall bay
2022-01-30	Jan-31	dolphin	Dolphins back in Lyall Bay this morning
2022-01-29	Jan-30	dolphin	A shot from the Lyall Bay this morning! large pod
2021-04-23	Apr-24	dolphin	Dolphins Lyall Bay near the breakwater 7am
2021-03-01	Mar-02	dolphin	Still Lyall Bay 1008
2021-02-17	Feb-17	dolphin	8.38pm Lyall bay close to Maranui
2019-11-26	Nov-27	dolphin	Dolphin pod in Lyall bay, airport end
2019-09-05	Sept-06	seal	This little guy is at Lyall Bay this morning
2019-06-16	Jun-16	humpback whale	Small humpback off Lyall bay
2019-01-03	Jan-04	dolphin	Dolphins in lyall bay!
2014-02-19	Feb-20	dolphin	About 117 dolphins right in the middle of Lyall bay
2014-02-15	Feb-16	dolphin	Lyall Bay Dolphins noon. Looked like they were feeding

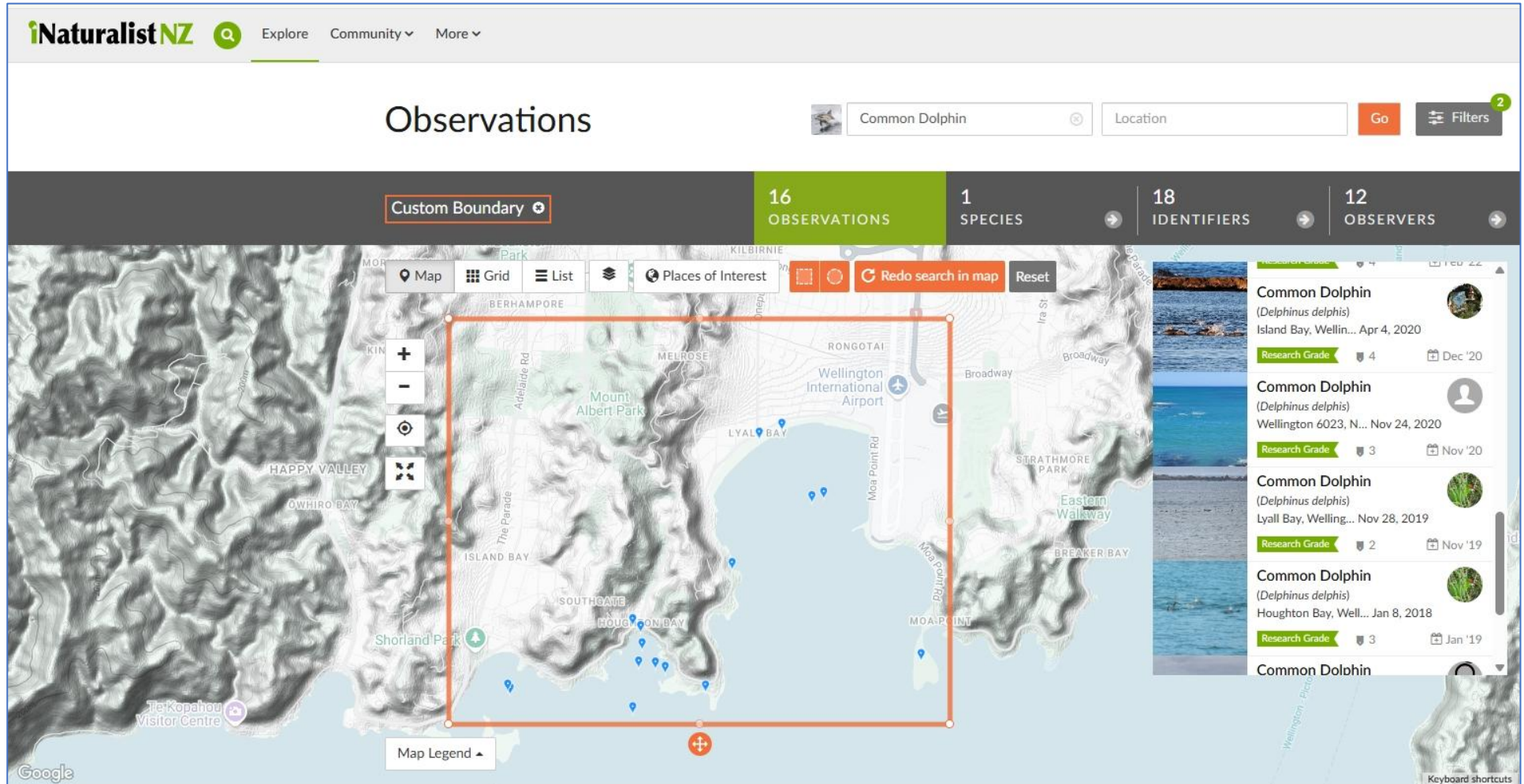


Figure A 1.1 iNaturalist “verified” observations of common dolphins in Lyall Bay and west

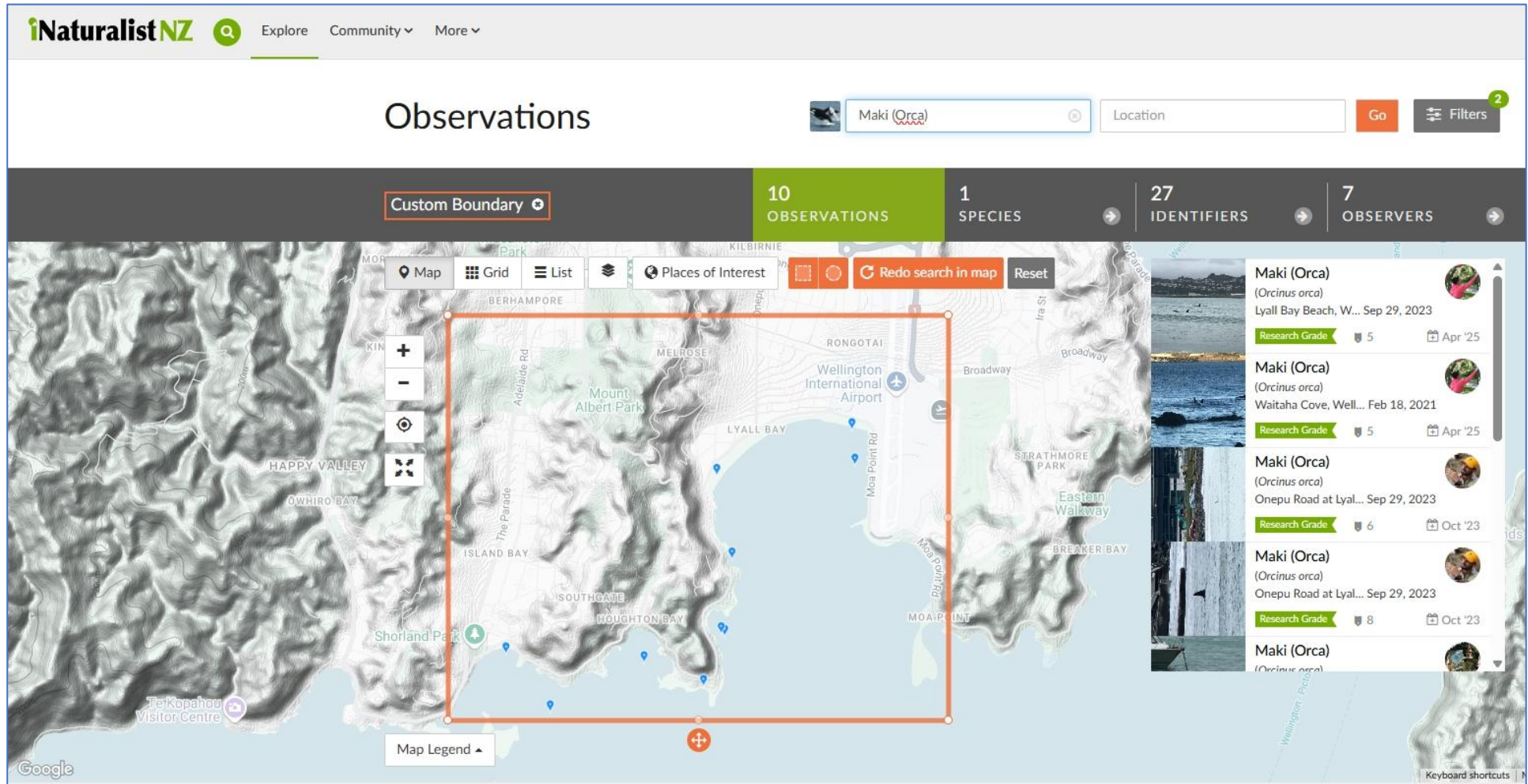


Figure A 1.2 iNaturalist “verified” observations of orca in Lyall Bay and west

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