

The Department recommends that you contact us to discuss the proposed activity prior to completing the application forms:

Permissions Advisor (Support)

Phone: +64 3 371 3700

Email: [permissionschristchurch@doc.govt.nz](mailto:permissionschristchurch@doc.govt.nz)

Please provide all information requested in as much detail as possible. Applicants will be advised if further information is required before this application can be processed by the Department.

This form must be completed when applying for permits to hold, take, import, export marine mammals for research purposes ONLY. If you wish to hold, take, import, export marine mammals for reasons other than research please fill in [Form 12b](#), available on the DOC website.

Please note that simple research permit applications should be lodged at least 30 working days prior to a permit being required. Complex applications may require longer.

Once you have filled in your application form, please complete this checklist to ensure that all components of your application are complete. This will help prevent any possible delays in the processing of your application.

- Legal status (company/trust/inc society) registration number (if not an individual)
- All appropriate application forms
- Written consultations (if applicable)
- Supporting information and detail including maps as required in activity forms
- Have you read and accept the section regarding the liability of the applicant for payment of fees.
- If Animal Ethics Committee Approval has been obtained, provide details and attach copies.
- Have you signed your application?**

**All efforts in putting together a detailed application are greatly appreciated and will allow the Department to effectively and efficiently process your application.**

## A. Applicant Details

<b>Applicant Name</b> (full name of registered company or individual, student or university)	University of Otago				
<b>Legal Status of applicant (tick)</b>	<input type="checkbox"/> Individual	<input checked="" type="checkbox"/> Registered Company	<input type="checkbox"/> Trust	<input type="checkbox"/> Incorporated Society	<input type="checkbox"/>
<b>Other (please specify full details)</b>	University				
<b>Please supply the company, trust or incorporated society registration number:</b>					
<b>If an individual please supply your date of birth (this is a unique identifier for you):</b>					
<b>Trading Name</b> (if different from Applicant name)	University of Otago				
<b>Postal Address (of Applicant)</b>	Marine Science Department, University of Otago, PO Box 56, Dunedin 9016				
<b>Street Address (if different from Postal Address)</b>	Marine Science Department, University of Otago, 310 Castle Street, Dunedin 9016				
<b>Phone</b>		<b>Website</b>	www.otago.ac.nz/marinescience		
<b>Contact Person and role</b>	Dr Marta Guerra, Assistant Research Fellow				
<b>Phone</b>	03 4797468	<b>Phone</b>	0226784245		
<b>Email</b>	marta.guerra@otago.ac.nz				
<b>Contact Person and role</b>	Dr Will Rayment, Senior Lecturer				
<b>Phone</b>	03 4798304	<b>Cell Phone</b>	021 488961		
<b>Email</b>	will.rayment@otago.ac.nz				

## B. Title of Research Project

- Comparative studies of sperm whales across Aotearoa New Zealand
- Species identification, biology and behaviour of beaked whales and other oceanic whales

## C. Details of Proposed Activity

\* Take       Hold       Import       Export

**NB** please tick all applicable activities

*\* Use of unmanned aerial vehicle systems (UAV/'drones') for taking photographs and videos*

## D. Applicants/Key Researchers

List the names and institutional affiliations of all the key individuals involved with the research. List any convictions or offences, of any of the applicants or key researchers, against the MMPA 1978 or any other Act involving the mistreatment of animals.

Key researchers:

Associate Professor Will Rayment (University of Otago)  
Dr Marta Guerra (University of Otago, Far Out Ocean Research Collective)

Other individuals involved with the research:

Tom Brough (NIWA, Far Out Ocean Research Collective)  
Jochen Zaeschmar (Far Out Ocean Research Collective)  
Sarah Dwyer (Department of Conservation, Far Out Ocean Research Collective)  
Emeritus Professor Steve Dawson (University of Otago)  
Emeritus Professor Liz Slooten (University of Otago)  
Leah Crowe (University of Otago)  
David Johnston (University of Otago)  
Will Carome (University of Otago)  
Steph Bennington (University of Otago)

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## E. Description of Proposed Research

- Abstract

Provide an abstract of the proposed research project, emphasising the research objectives and the manner in which such activity involves the taking, import or export of marine mammals.

Aotearoa New Zealand has an exceptionally high diversity of cetaceans, however very little is known about many of the species. This is particularly true for deep-diving cetaceans and species inhabiting offshore waters, the great majority of which are classified as Data Deficient by the Department of Conservation. We aim to use unmanned aerial vehicles (UAVs, commonly referred to as 'drones') to support our research on sperm whales and other whale species found in deep-water habitats.

Most of what is known about sperm whales (parāoa) in Aotearoa is derived from research at Kaikōura, an area where only males are found. Long-term studies undertaken by the Otago Marine Mammal Research Group show that the number of sperm whales visiting Kaikōura in summer has declined significantly, although the factors driving this decline are unknown. To place the local decline within a wider context and investigate connectivity between regions, we are extending our research to other areas where sperm whales are consistently found, including the Otago Canyons and the east coast of Northland. Surveys off Northland will allow the first at-sea studies of female sperm whales in Aotearoa. Photographs and videos of sperm whales collected via UAVs will be used for: i) gathering photogrammetric data to estimate body size, allowing comparisons of size structure across all three regions; and ii) collecting information about the group size, composition (i.e., age/size classes) and behaviour of female groups in Northland.

At-sea surveys are invaluable for gaining information on the presence, distribution and behaviour of poorly known whale species found in Aotearoa's deep waters. We aim to use UAVs to assist with at-sea species identification and recording of group size, group composition and behaviour of whales encountered during targeted surveys of oceanic megafauna, and opportunistically during sperm whale surveys. Surveys will take place off the coast of Northland (in collaboration with the Far Out Ocean Research Trust), Kaikōura and Otago, providing a wide range of latitude over NZ waters. This research offers the potential to address knowledge gaps of poorly known and Data Deficient species such as beaked whales.

- Duration of Proposed Research

Provide a detailed description of the overall duration of the proposed research.

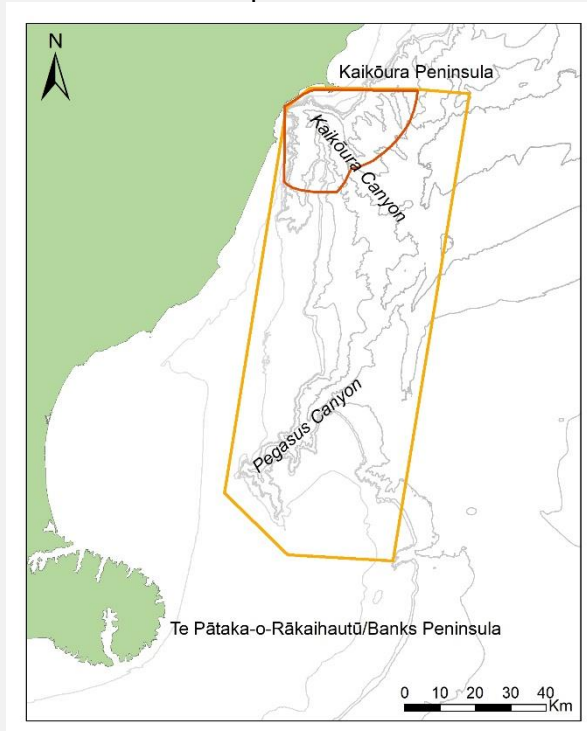
Fieldwork for the proposed research will be carried out seasonally at Kaikōura (typically in June-July and November-January), Otago (typically in June and January-February) and Northland (typically in May-June and November-January) with variable dates from year to year. The duration of the project will be initially for 3 years, and likely be extended further.

We ask that the permit be granted for 10 years.

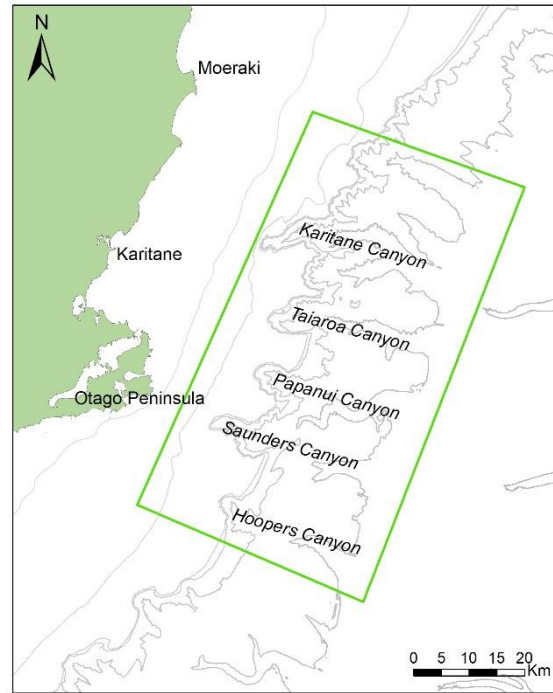
- Location of Proposed Research

Provide a detailed description of the overall location of the proposed research. Supply a map detailing the location if appropriate.

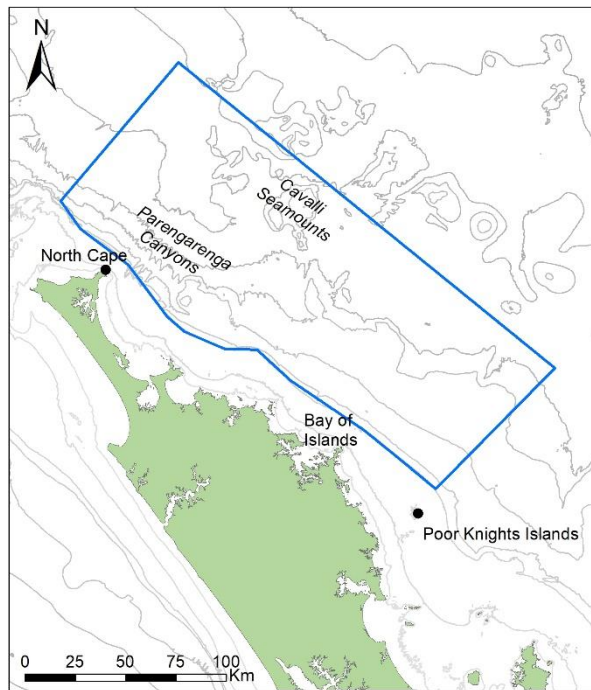
*Kaikōura*: the proposed research is part of our long-term research programme, which started in 1990. UAV flights will generally take place within our standard area of operation centred around the Kaikōura Canyon (see below, marked in red), and occasionally within a wider area further South and offshore (marked in orange) The inshore boundary of our standard survey area approximates the 100m depth contour, and the outside boundary is the 12 nmi navigational limit. The extended area includes the Pegasus Canyon and is approximately centred over the 1000m depth contour.



*Otago*: the proposed research is part of our new research over the Otago Canyons. The area is centred over the Hoopers, Saunders, Papanui, Taiaroa and Karitane Canyons (see below, marked in green). The inside boundary approximates the 100m depth contour, and the outside boundary is approximately 30 nmi offshore.



**Northland:** the proposed research is part of our ongoing research in collaboration with the Far Out Ocean Research Collective. The area is centred along the shelf break to the Northeast of the Northland coast, extending between North Cape and offshore of the Poor Knights Islands (see below). The inside boundary approximates the 200m depth contour, and the outside boundary is approximately 60 nmi offshore.



- **Species Name and Status**

Provide a list of all the species (common and scientific names) involved in the research activities. Describe the status and factors that affect the species i.e., incidental bycatch, pollution etc.

**Physeteridae & Kogiidae:**

sperm whale (*Physeter macrocephalus*). NZ Status: Data Deficient. Potential impacts: climate change, entanglement in fishing gear, tourism, pollution, noise.

pygmy sperm whale (*Kogia breviceps*). NZ Status: Data Deficient. Unknown impacts.

dwarf sperm whale (*Kogia sima*). NZ Status: Data Deficient. Unknown impacts.

#### **Balaenopteridae:**

sei whale (*Balaenoptera borealis*). NZ Status: Data Deficient. Potential impacts: ship strike.

dwarf minke whale (*Balaenoptera acutorostrata*). NZ Status: Data Deficient. Unknown impacts.

Antarctic minke whale (*Balaenoptera bonaerensis*). NZ Status: Data Deficient. Unknown impacts.

pygmy blue whale (*Balaenoptera musculus brevicauda*). NZ Status: Data Deficient. Potential impacts: ship strike, entanglement in fishing gear, noise.

Antarctic blue whale (*Balaenoptera musculus intermedia*). NZ Status: Data Deficient. Unknown impacts.

fin whale (*Balaenoptera physalus*). NZ Status: Data Deficient. Unknown impacts.

Bryde's whale (*Balaenoptera edeni brydei*). NZ Status: Threatened – Nationally Endangered. Known impacts: ship strike.

#### **Ziphiidae:**

Arnoux's beaked whale (*Berardius arnuxii*). NZ Status: Data Deficient. Unknown impacts.

southern bottlenose whale (*Hyperoodon planifrons*). NZ Status: Data Deficient. Unknown impacts.

Andrews' beaked whale (*Mesoplodon bowdoini*). NZ Status: Data Deficient. Unknown impacts.

dense-beaked whale (*Mesoplodon densirostris*). NZ Status: Data Deficient. Unknown impacts.

ginkgo-toothed beaked whale (*Mesoplodon ginkgodens*). NZ Status: Data Deficient. Unknown impacts.

Hector's beaked whale (*Mesoplodon hectori*). NZ Status: Data Deficient. Unknown impacts.

strap-toothed whale (*Mesoplodon layardii*). NZ Status: Data Deficient. Unknown impacts.

True's beaked whale (*Mesoplodon mirus*). NZ Status: Data Deficient. Unknown impacts.

pygmy beaked whale (*Mesoplodon peruvianus*). NZ Status: Data Deficient. Unknown impacts.

spade-toothed whale (*Mesoplodon traversii*). NZ Status: Data Deficient. Unknown impacts.

Shepherd's beaked whale (*Tasmacetus shepherdi*). NZ Status: Data Deficient. Unknown impacts.

goose-beaked whale (*Ziphius cavirostris*). NZ Status: Data Deficient. Unknown impacts.

Gray's beaked whale (*Mesoplodon grayi*). NZ Status: Not Threatened. Unknown impacts.

#### **'Blackfish':**

false killer whale (*Pseudorca crassidens*). NZ Status: At risk, naturally uncommon. Unknown impacts.

pygmy killer whale (*Feresa attenuata*). NZ Status: Vagrant. Unknown impacts.

short-finned pilot whale (*Globicephala macrorhynchus*). NZ Status: Data Deficient. Unknown impacts.

long-finned pilot whale (*Globicephala melas*). NZ Status: Not threatened. Unknown impacts.

melon-headed whale (*Peponocephala electra*). NZ Status: Vagrant. Unknown impacts.

- **Sample Size**

Provide sample size for each species, method of sampling and location.

Sample size will depend on the species and location:

**Sperm whales – Kaikōura.** This area is a foraging ground for males, which are typically solitary. Individuals have been sampled in recent photogrammetric studies employing UAVs (Dickson et al. 2021), however we aim to increase our sample size of whales measured both acoustically (based on the pulse structure of echolocation clicks) and via drone photogrammetry. This will help improve the accuracy and precision of the equation used to estimate full body size from acoustic recordings. Flights will therefore take place during sightings of whales that have not been previously measured using aerial photogrammetry. The sample size will depend on the number of new whales seen. Previous targeted work with UAVs on sperm whales by our research group at Kaikōura resulted in a total of 69 flights over 27 days spanning 2 years, with a total of 21 individuals measured by UAV photogrammetry in that time.

**Sperm whales – Otago.** The Otago Canyons are a foraging area for males, which are typically solitary. We will attempt to obtain multiple flights over the same individual within each field season of targeted UAV work (up to 5 per individual whale per season, based on previous work at Kaikōura), allowing for precise estimates of the whales' length. The sample size will depend on the number of whales seen, which we cannot predict because the abundance of whales off Otago is unknown.

**Sperm whales – Northland.** Sperm whales in this area are typically found in small and tight social units containing females and juveniles (~5-15 individuals), or in larger groups (~20-50) of several units. We will attempt to fly an UAV once over each cluster we encounter, in order to obtain size measurements of as many individuals as possible, and to collect information on group size, composition (i.e., number of calves, juveniles and adults; presence of mature males) and surface behaviour. The sample size will depend on the number of whales seen. Based on previous sighting rates in the area, we anticipate 1-4 days of potential UAV work per field season.

**Beaked whales, 'blackfish' and dwarf/pygmy sperm whale – all locations.** We will attempt to fly over each whale (or pod) encountered. Based on the scarcity of sightings of these species and their deep-diving behaviour, we anticipate a maximum of 1-2 UAV flights per species per field season per location, with most species unlikely to be encountered.

**Rorqual species (minke, sei, fin, blue, Bryde's) – all locations.** We will attempt to fly over each whale (or whale pod) encountered. Based on prior sighting rates and the known range of Bryde's whales, we anticipate between 2 and 10 UAV flights per season in Northland and unlikely sightings in Otago and Kaikōura. Based on prior sighting rates for other rorqual species (e.g., minke, sei, fin, blue), we anticipate a maximum of 1-2 UAV flights per species per season for each location.

For all species and locations, sample size will be limited by weather, due to image quality being severely compromised in conditions over 10 knots. This means that UAV flights will not be carried out for every sighting.

- **Proposed Methodology**

Provide a detailed description of the methodology proposed ie aerial/boat/drone surveys, photo-identification, biopsy sampling, etc. Include a brief description of any statistical modelling used to justify sample size. Clearly indicate the actual or estimated age (i.e., neonate, pup/calf, juvenile, adult), size, sex and reproductive condition of the animals at the time of taking.

Our research group has been conducting non-invasive field research on sperm whales at Kaikōura since 1990. The cornerstone field methods of this project are acoustic tracking via a custom-built directional hydrophone (Dawson 2004), photo-ID to record the identity of individuals (Childerhouse et al. 1995; Somerford et al. 2021), and acoustic recordings and boat-based visual surveys to study behaviour and

habitat use (Jaquet et al 2000; Guerra et al. 2021a). Because we approach no closer than any member of the public can (50m), we have been advised by DOC that no research permit is required for these activities. We have a research permit (48740-MAR) to hold samples for teaching and research, allowing for collection of sloughed skin samples for stable-isotope analysis (Guerra et al. 2020a, b) and genetic analyses. We have applied the same field methods to our more recent research projects on sperm whales over the Otago Canyons and off the Northland coast (the latter in collaboration with the Far Out Ocean Research Collective).

Sperm whales will be tracked acoustically from a research vessel using a directional hydrophone, or visually spotted. All other species will be located through visual spotting. We will then approach from behind the whale (or pod) at slow speed to a range of 50-100m. Following the same UAV methodology as during our research on sperm whales at Kaikōura in 2018-2021 (UAV permit number 70854-MAR), we will operate an UAV to take photographs of whales from above. While the whale/pod is at the surface, we will launch the UAV from the vessel and fly to a position directly above the whale/pod, at an altitude of 20-40 m (usually ~30 m). We will take images to enable reliable measurements of total body length and body shape, and additional video and images to record group size, group composition and surface behaviour. Our horizontal flight speed is normally less than 10m/s; the final approach to directly above the whale is done very slowly. The UAV will then return to the research vessel and land. The method of sampling will be a DJI Inspire PRO quadcopter or a DJI Mavic modified for photogrammetry, as described by Dawson et al. (2017) and Dickson et al. (2021). We aim to fly for a maximum of 10 minutes per individual encounter, with only one drone used at any one time.

Additional data will be collected during the encounter from the research vessel, including photographs for species identification, photographs for individual identification (i.e., sperm whale flukes, baleen whale dorsal fins), and information on group size, group composition and behaviour. In the case of sperm whales, we will also deploy a hydrophone array to make an acoustic recording, and collect samples of sloughed skin. All of these activities will take place at distances further than 50m from the whales.

The age, size, sex and reproductive condition of the animals will often be unknown, except for sperm whales off Kaikōura and Otago, which are all adult or sub-adult males. For all other species (and for sperm whales off Northland), we may encounter individuals of any age, size, sex and condition.

- **Justification of Proposed Research**

Describe why this work is necessary, clarify if it has been done before and if so why it needs to be repeated. It is especially important to identify and justify all procedures, which have the potential to cause pain or distress to the animal(s), and details of the steps to be taken to avoid or minimise the pain or distress.

Most of what is known about sperm whales in Aotearoa comes from studies of males off Kaikōura or from strandings. Other than catch location records from the whaling era (Gaskin 1973, Torres et al. 2011), there are no data on the at-sea distribution, abundance, population structure, movements, behaviour or sociality of Aotearoa's female sperm whales. Consistent sightings of female groups off the Northland coast (Guerra et al. 2021b) provide a unique opportunity to address this knowledge gap through systematic surveys. Incorporating UAVs into our methodology would allow gathering photogrammetric images to measure body size and condition, in turn providing data on group composition, health and size structure of the population, and allowing observations of behaviour and sociality. This would be the first study using UAV methods on female sperm whales in Aotearoa. A better



understanding of the health, movements and connectivity of sperm whales in Aotearoa is particularly important given the decline in the number of sperm whales visiting Kaikōura (Sommerford et al. 2021).

Due to the challenges of surveying in offshore waters, most species of oceanic and deep-water cetaceans in NZ are poorly known and classified as Data Deficient by the Department of Conservation, with very little or no data on abundance, population trends, distribution and impact from anthropogenic activities, and often limited data on behaviour and sociality. With the proposed research, we aim to maximise the potential to gain information from the infrequent at-sea sightings of poorly known species encountered during offshore surveys for oceanic megafauna, or opportunistically during surveys for sperm whales. The use of UAV images and footage will facilitate species identification, obtaining size measurements and recording at-sea behaviour and group size/composition. UAVs have the further advantage of being minimally invasive, with no evidence of causing distress, and have less potential for disturbance than close boat approaches (Christiansen et al. 2016, Torres et al. 2018). This is of particular benefit during encounters with boat-shy species (e.g., most beaked whales), or to confirm species identification in the case of species that can look very similar from a horizontal perspective but different from above (e.g., Bryde's and sei whales can be more easily distinguished through the presence or absence of a central ridge on the dorsal side of the rostrum, which is more evident from a dorsal view).

Finally, observations taken during boat-based surveys of cetaceans are typically limited to records of animal surfacings obtained from a horizontal perspective. The use of small UAVs provides a stable and relatively quiet platform that enables photogrammetric measurements and replicate observations from an aerial perspective for prolonged periods with minimal disturbance (Christiansen et al. 2016), adding value to behavioural, ecological and population studies of marine megafauna (Torres et al. 2018).

- **Risk Mitigation**

Outline what steps you will take to limit or mitigate any potential adverse impacts the proposed research may have. Impacts include any aspect that may affect the health and safety to the animal, or to members of the public; adverse effects on public relations, or any loss or destruction of cultural or historic resources.

**Safety for whales:** There will be no physical contact with whales at any stage, no physical samples taken from the whales, and no boat approaches closer than 50m. Overall, the physical risk to whales posed by the proposed research is negligible. To minimise disturbance from the boat approach to whales, our research group uses a standard practice involving slow approaches from behind at a safe distance (> 50m) and maintaining a stable no-wake speed to match the movement of the whales. Disturbance from UAV noise is only a concern when UAVs are flown very close to the water surface (Christiansen et al. 2016). To minimise any possible disturbance from UAV noise to whales, we will always fly at a minimum altitude of 10m (usually at ~30 m). If individuals show any signs of disturbance while being approached by the research vessel or the UAVs (e.g. turning, tail slapping), we will stop the encounter. Observations of any apparent reactions to the research will be recorded.

Our research group has conducted more than 1000 flights over southern right whales and 69 flights over sperm whales using the UAV platform proposed for this work. We have never observed any reaction by the whales to the presence of the UAV, and we have no evidence that the whales know it is present.

**Safety for vessels, aircraft and UAV operators:** After consultation with all aircraft and vessel-based whale-watching operators at Kaikōura (initially in 2018 during the application of UAV permit 70854-MAR, and again in 2022 during the current application), we have developed an updated standard operating procedure in response to their suggestions (see below for SOP). This SOP will be followed rigorously.

The most important means of avoiding any possibility of collision with manned aircraft is via setting a maximum altitude of 40m in the UAV flight software. This means that no matter what the UAV pilot does, the UAV will not exceed that altitude. Given that manned aircraft in the vicinity of whales must be at a minimum altitude of 150m, there will be a minimum of 110m vertical clearance.

No piloting qualifications or special authorisation are required by NZ's Civil Aviation Authority (CAA) for UAVs weighing less than 25 kg, providing that all operations are within the rules outlined in Advisory circular AC101. All flights will be conducted within these rules. We have liaised with CAA throughout the development of this project, their approval is attached. All flights will be conducted under the supervision of pilots with extensive experience with this system. All flights will be conducted following the appropriate safety precautions, including the wearing of safety gear.

Personnel engaged in boat operations will be required to adhere to the Otago University boating code of practice. A University of Otago Safety Plan will be completed before each field trip and adhered to.

**Public perception:** We are aware that there are risks associated with members of the public seeing our UAV flying over whales – not because we have anything to hide but because we'd like to avoid members of the public trying this themselves. In mitigation of this we propose two actions: (i) we will avoid flying the UAV when whale-watching (or other) vessels or aircraft are present (this is only likely at Kaikōura, as there are no tour operations in our study areas off Otago or Northland); and (ii) we have communicated with all tour operators at Kaikōura, who, in the event of whale-watching vessels or aircraft arriving during a UAV flight, will explain to their passengers that this is a research operation conducted under permit from the Department of Conservation.

## **SOP:**

### *Use of UAVs for research on whales at Kaikōura*

Purpose of research: photogrammetry and behavioural observations of sperm whales and other whale species at Kaikōura by Otago University Marine Mammal Research Group.

1. The UAV (Unmanned Aerial Vehicle system, or 'drone) to be used will be a DJI Inspire 1 PRO or DJI Mavic, modified for photogrammetry as described in Dawson et al. (2017) .
2. The visibility of the UAV to aircraft will be improved by adding bright colours to the body.
3. A maximum altitude of 40m will be set in the flight software.
4. We will not fly the UAV when whale-watching vessels or aircraft are already present at a whale's location.
5. In the event of vessels or aircraft arriving during an UAV flight, operators are advised to explain to their passengers that this is a research operation conducted under permit from the Department of Conservation.
6. We will notify all whale-watching operators (i.e., Whale Watch Kaikoura, Air Kaikoura Aeroclub, South Pacific Helicopters, Wings over Whales, Kaikoura Helicopters, Dolphin Encounter) at the start and end of our field season, so that they are aware that drone flights may take place during this time. Messages will be sent via text to agreed cellphone numbers or email addresses.
7. Before each UAV flight, a call stating intention to fly will be made on Marine VHF channel 64. The message will include the latitude and longitude of the take-off point, the expected flight duration (no more than 10 minutes), and maximum altitude (40m). Any whale-watching operator has the right to ask that we do not fly at that time. This request will be respected.

8. If a flight is made, a follow-up VHF call will be made when the UAV is back on board.
9. Aerial images of sperm whales, taken from the UAV, will be made available to all operators. Results from the research will be presented back to all operators who wish this to happen, in addition to the Kaikōura Rūnaka.

All operations will be in accordance with CAA regulations, and under research permit from Department of Conservation.

Dr Will Rayment

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Dr Marta Guerra

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## F. Other

Is there any further information you wish to supply in support of your application?

### References:

- Childerhouse SJ, Dawson SM, Slooten E (1995) Abundance and seasonal residence of sperm whales at Kaikōura, New Zealand. *Canadian Journal of Zoology* 73:723-731.
- Christiansen F, Rojano-Doñate L, Madsen PT, Bejder L (2016) Noise levels of multi-rotor unmanned aerial vehicles with implications for potential underwater impacts on marine mammals. *Frontiers in Marine Science* 3:277.
- Dawson SM (2004) Building the “CETOS” directional hydrophone. Available at: <http://whaledolphintrust.org.nz/wp-content/uploads/Building-Directional-HPs.pdf>. Dickson T, Rayment W, Dawson S (2021) Drone photogrammetry allows refinement of acoustically derived length estimation for male sperm whales. *Marine Mammal Science* 37(3):1150-8.
- Dawson, S., Bowman, M. H., Leunissen, E., & Sirguy, P. (2017). Inexpensive Aerial Photogrammetry for Studies of Whales and Large Marine Animals. *Frontiers in Marine Science*, 4, e01468–7.
- Dickson T, Rayment W, Dawson S (2021) Drone photogrammetry allows refinement of acoustically derived length estimation for male sperm whales. *Marine Mammal Science* 37(3):1150-8.
- Gaskin DE (1973) Sperm whales in the western South Pacific. *New Zealand Journal of Marine and Freshwater Research* 7(1-2):1-20.
- Guerra M, Brough T, Kozmian-Ledward L, Dwyer S, Daudt N, Zaeschmar J (2021a) Offshore surveys reveal a hotspot for oceanic megafauna off the Northland Coast. Poster presented at the NZ Marine Sciences Society Conference, Tauranga.
- Guerra M, Dawson S, Sabadel A, Slooten E, Somerford T, Williams R, Wing L, Rayment W (2020) Changes in habitat use by a deep-diving predator in response to a coastal earthquake. *Deep Sea Research Part I: Oceanographic Research Papers* 158:103226.

Guerra M, Dawson SM, Somerford TR, Slooten E, Rayment WJ (2021a) Fine-scale habitat use of foraging sperm whales is driven by seafloor topography and water column structure. *Marine Mammal Science* 2021 Oct 6.

Guerra M, Wing L, Dawson S, Rayment W (2020) Stable isotope analyses reveal seasonal and inter-individual variation in the foraging ecology of sperm whales. *Marine Ecology Progress Series* 638:207-19.

Jaquet N, Dawson S and Slooten E (2000) Seasonal distribution and diving behaviour of male sperm whales off Kaikōura: foraging implications. *Canadian Journal of Zoology* 78:407-419.

Somerford TR, Dawson SM, Slooten E, Guerra M, Childerhouse SJ, Richter CF, van Der Linde ML, Rayment WJ (2021) Long-term decline in abundance of male sperm whales visiting Kaikōura, New Zealand. *Marine Mammal Science*.

Torres LG, Nieukirk SL, Lemos L, Chandler TE (2018) Drone up! Quantifying whale behavior from a new perspective improves observational capacity. *Frontiers in Marine Science* 2018:319.

Torres L, Smith T, Sutton P, MacDiarmid A, Bannister J (2011) Habitat use and distribution patterns of southern right whales and sperm whales discerned from spatial analyses of 19th century whaling records. Report prepared for Australian Marine Mammal Centre. NIWA Client Report No. WLG2011-52

## **Intellectual property management plan**

This project will compile images and footage of cetacean species at sea, in areas that are the rohe of several iwi and hapū. Images and footage, as well as any derived information, will be carefully managed to meet the requirements and wishes of the relevant rūnanga or governing board for storage, data sovereignty and any use or distribution of such data. Such requirements have already been established with some groups. For example, the IP plan for any images or data that take place in Northland within the rohe of Ngāti Kurī (Northland) is established within the Puu Kaiiao (cultural safety agreement) developed between Ngāti Kurī and the Far Out Ocean Research Collective, which leads the collaboration with the University of Otago in Northland. Similarly, the use of any images and footage collected within Te Tai o Marokura, off the coast of Kaikōura, will be discussed with Te Rūnanga o Kaikōura in advance, to honour the wishes of Ngāti Kuri (Kaikōura), highlighting that no images or footage will be shared or distributed without prior agreement from Te Rūnanga o Kaikōura.

New knowledge generated through the course of this research will be made available to interested parties and stakeholders, with the first instance being the communities with which we are engaging with. As this information may be directly relevant to the current understanding and management of taonga species, the emphasis will be on sharing this information for public good. Information will be shared in a number of ways including public meetings, hui, direct presentations, reports and scientific publications.

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## **G. Consultation Undertaken**

Some applications require consultation with whānau/hapū/iwi (local Māori), and other interested parties. Please contact the nearest Department of Conservation office to discuss what is required. Written expert views, advice or opinions concerning your proposal may also be attached to support the application. Attach any proof of consultation to the application.

In order to assist consultation please discuss how you believe the research may have an impact on cultural values and measures you will take to mitigate their effects. An example is discussing the research with local Maori.

**Kaikōura:**

We have consulted with tour operators and with Te Rūnanga o Kaikōura. We have a close ongoing relationship with Whale Watch Kaikoura, who strongly support our research on the sperm whales of Kaikōura. This relationship includes regular updates and meetings, and day to day liaison on the water. For our previous UAV permit at Kaikōura (70854-MAR), Dr Will Rayment and Prof Steve Dawson talked with all commercial whale-watching operators in 2018 in consultation for the permit application. As a result of those meetings, we developed a standard operation procedure. Results from the ensuing study, which took place between 2018 and 2021, were reported back to whale watching operators. With reference to the current proposal, Dr Marta Guerra has already communicated with all commercial whale-watching operators and with Te Rūnanga o Kaikōura in consultation for the current permit application, who have expressed support for the proposed research. The SOP has been reviewed (see above) and we have so far had approval from all consulted operators, including Whale Watch Kaikoura, Air Kaikoura Aeroclub, South Pacific Helicopters, Wings over Whales, Kaikoura Helicopters and Dolphin Encounter.

**Northland:**

There are no whale-watching or other tourism ventures operating within our study area. We have ongoing consultation and partnerships with hapu representatives from Ngāti Kurī, Patuharakeke and Ngāti Wai through the Far Out Ocean Research Collective. A Puu Kaiao (cultural safety agreement) is being developed between Ngāti Kurī and the Far Out Ocean Research Collective, including our collaborators from the University of Otago. The Puu Kaiao sets out the terms and conditions for the research being undertaken, including fieldwork, data collection, subsequent analyses, research development, dissemination, and educational/outreach outputs, as well as an Intellectual Property agreement.

**Otago:**

There are no whale-watching or other tourism ventures operating within our study area. We have ongoing consultation with hapu representatives from Kati Huirapa Runaka ki Puketeraki to ensure that research activities are in alignment with their wishes and requirements, and have initiated consultation with hapu representatives from Te Rūnanga o Ōtākou.

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**H. Fees**

This section only applies to applications with a commercial focus – which will include applications from registered companies. The Department does not charge fees for domestic non-commercial Marine Mammals Protection Act permits.

Section 60B of the Conservation Act enables the Department to recover all direct and indirect costs from an Applicant to process an application regardless of whether the application is approved or declined. If at any stage an application is withdrawn the Department will invoice the Applicant for the costs incurred by the Department up to that point. Applicants are required to pay the processing fees within 28 days of receiving an invoice. The Director-General is entitled to recover any unpaid fees as a debt.

The estimated standard application fee is **\$450 +GST**. This covers most applications.

However if your application is likely to have significant effects, is novel, or spans multiple DOC regions, it will require more careful consideration and may take longer to process and cost approximately **\$800 +GST**.

Particularly complex applications may incur further costs – you will be sent an estimate of costs in this situation. We will contact you to advise if the fee is more than the estimated standard cost. Applicants are also entitled to request an estimate of costs at any point, but the Department may impose a charge for preparing such an estimate. Estimates are not binding.

You may also be required to pay a fee to cover the cost of the Department monitoring the effects of your activity. Please contact the Permissions team to discuss whether these fees apply.

### **Waiving or Reducing Fees:**

The Director-General of Conservation has discretion to reduce or waive processing fees.

You may apply for a fee waiver or reduction if you provide information to the permissions team about how your application meets at least one of these criteria:

- The activity will make a direct contribution to management
- The activity will support or contribute to the Department's priority outcomes – which are stated in the Department's 2013-2017 Statement of Intent ([available on the DOC website](#))
- There will be other non-commercial public benefits from the permission (if approved)
- Activity covered by the authorisation (other than research, collection or educational activities) will make a contribution to the management of, or the public interest in, the lands that are covered by the permit

### **Paying fees:**

The Department will ordinarily invoice the applicant for processing fees after a decision has been made on the application, but in some cases interim invoices will be issued.

Please select your method of payment below:

- I have attached a cheque
- I have direct credited the DOC account (please use Applicant name and MMRP as references)  
Department of Conservation  
Westpac Bank  
Account number: 03 0049 0002808 00

- I have a purchase order/number from an organisation registered with DOC

Order number/purchase number:

- I do not intend to pay the fees at the time of applying and/or I require an invoice for payment – I have filled in the Terms and Conditions for an Account with the Department of Conservation (following) with my own information.

## Terms and Conditions for an Account with the Department of Conservation:

Have you held an account with the Department before? (Please tick)

Yes

No


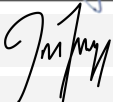
If yes, under what name:

1. I/We agree that the Department of Conservation can provide my details to the Department's Credit Checking Agency to enable it to conduct a full credit check.
2. I/We agree that any change which affects the trading address, legal entity, structure of management or control of the applicant's company (as detailed in this application) will be notified in writing to the Department of Conservation within 7 days of that change becoming effective.
3. I/We agree to notify the Department of Conservation of any disputed charges within 14 days of the date of the invoice.
4. I/We agree to fully pay the Department of Conservation for any invoice received on or before the due date.
5. I/We agree to pay all costs incurred (including interest, legal costs and debt recovery fees) to recover any money owing on this account.
6. I/We agree that the credit account provided by the Department of Conservation may be withdrawn by the Department of Conservation, if any terms and conditions of the credit account are not met.
7. I/We agree that the Department of Conservation can provide my details to the Department's Debt Collection Agency in the event of non-payment of payable fees.

## Declaration

I certify that the information provided on this application form and all attached additional forms and information is to the best of my knowledge true and correct.

**Note: The Director-General may vary any permit granted if the information given in this application contains inaccuracies.**

Signature (Applicant)		Date	25/5/2023
Signature (Witness)		Date	25/5/2023
Witness Name	Isla Twigg		
Witness Address	404 Bayview Road, Saint Clair, Dunedin		

This application is made pursuant to the Marine Mammals Protection Act 1978.

Applicants should familiarise themselves with the relevant sections of the Marine Mammals Protection Act 1978.

NOTE: Further information may be sought from you for this assessment if this application is not completed fully as required. The purpose of collecting this information is to enable the Department to process your application. The Department will not use this information for any reason not related to that purpose.

Applicants should be aware that provisions of the Official Information Act might require that some or all information in this application be publicly released.

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### For Departmental use only

<b>Credit check undertaken</b>			
<b>Comments :</b>			
<b>Signed</b>		<b>Name</b>	
<b>Approved (tier 4 manager or above)</b>		<b>Name</b>	