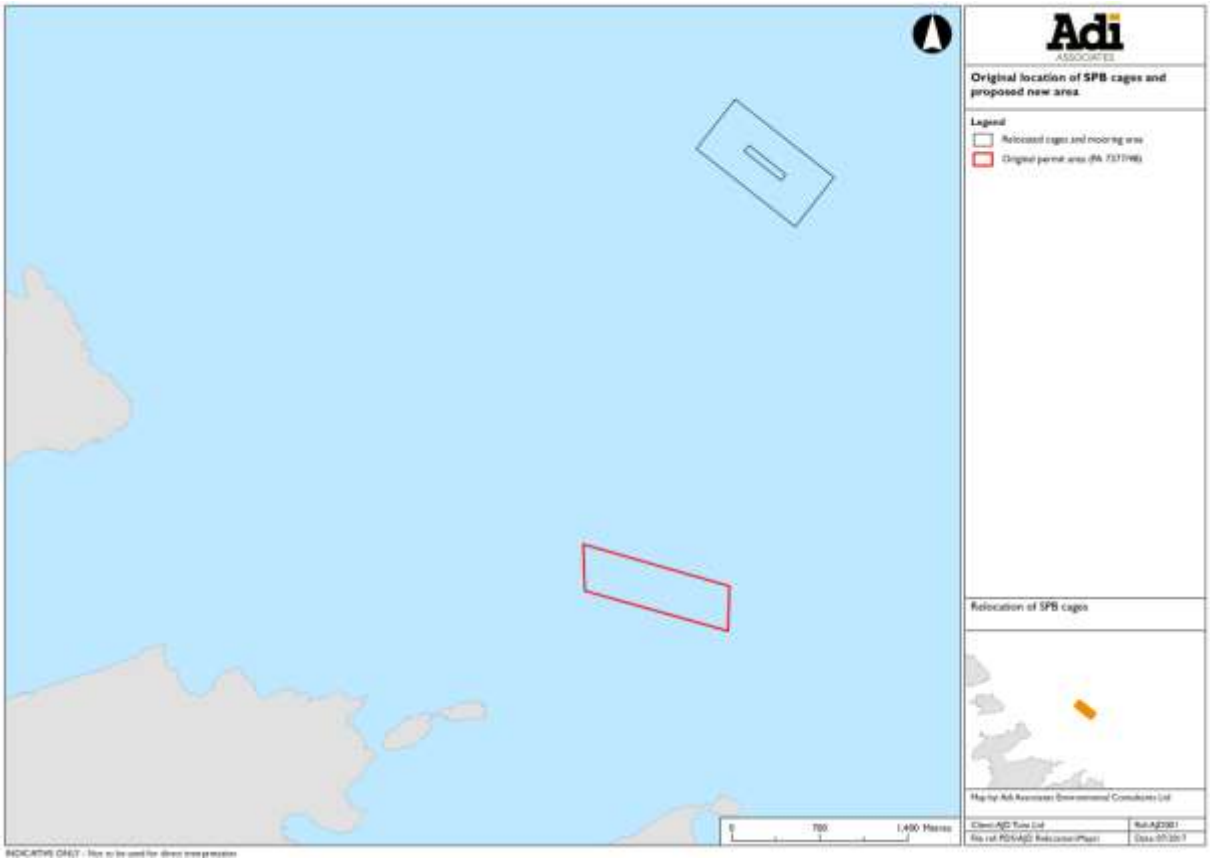
TO TEMPORARILY RELOCATE TUNA CAGES FROM ST PAUL'S BAY TO A NEW SITE OFFSHORE IS-SIKKA L-BAJDA, NORTH OF MALTA

PROJECT DESCRIPTION STATEMENT



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Quality Assurance

To temporarily relocate tuna cages from St Pauls Bay to a new site offshore Is-Sikka l-Bajda, North of Malta
Project Description Statement
August 2017

Report for: **Malta Mariculture Ltd**

Revision Schedule

Rev	Date	Details	Written by:	Checked by:	Approved by:
00	Aug 2017	Submission to ERA	**Adrian Mallia** Director	**Krista Farrugia** Senior Environmental Officer	**Rachel Xuereb** Director

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1. INTRODUCTION

1.1. This document describes a proposal to relocate an existing tuna penning farm from its former permitted location off St Paul's Bay to a temporary site offshore is-Sikka l-Bajda, north of Malta. This is in response to a decision of the Planning Authority (PA) that all fish farms must relocate further offshore by May 2017 in order to mitigate the impacts that have been reported over the past years, and in particular in summer 2016, on the marine environment, including social impacts related to amenity and nuisance from odour and water quality at affected areas of the coast. This document presents a description of the proposal, which involves the downsizing of the Malta Mariculture Ltd farm (in terms of sea area occupied), from eight[1] cages to six. The cages will occupy an area just under 2 ha and will be located over 2 km from the shore and hence fall below the threshold indicated in the Environmental Impact Assessment Regulations, S.L. 549.46.

1.2. The current farm was permitted in 1998 under development permit PA 07377/98. This permit covered the operation of the site for tuna penning activities (**Figure 1.1**).

1.3. When, in September 2016, the PA revoked all tuna farm permits, it also revoked this one.

1.4. Following the PA decision to revoke all tuna farm permits and its request for all farms to move further offshore in approved aquaculture zones, AJD Tuna Ltd[2] submitted an application to relocate its cages and the ones of Malta Mariculture Limited at the time located off Comino and at St Paul's Bay (PA 07377/98) to a new site off is-Sikka l-Bajda. A PDS for this proposal was submitted but the application was stalled since, in accordance with the National Aquaculture Strategy, the application for an Aquaculture Zone must be made by the Department of Fisheries and Aquaculture and not by individual aquaculture operators. The Department subsequently submitted a new PDS which has since been accepted by the ERA and Terms of Reference for an Environmental Impact Assessment issued. However, the timeframes linked to the processing of the development permit application for the establishment of a new Aquaculture Zone did not meet the strict timeframes set by the Planning Authority when it revoked the permits of the Applicant to relocate to this new area (as opposed to the existing south Aquaculture Zone). For this reason, Malta Mariculture Ltd submitted this new application for the relocation of the cages off St Paul's Bay to this new site temporarily until the new Aquaculture Zone in the north of the island is set up.

1.5. In the meantime AJD Tuna Ltd had also submitted a development permit application

[1] Originally eight cages were permitted and a ninth one allowed to keep tuna from one season to the next; in view of changes to ICCAT regulations, the number of cages was increased to a total of 17 although the biomass contained in the cages remained the same (this is controlled by the ICCAT license).
[2] Malta Mariculture Ltd is a sister company to AJD Tuna Ltd.

to temporarily relocate its other cages from the South Comino Channel to an area off Is-Sikka l-Bajda (**Figure 1.2**). This application (PA 03072/17) was approved on 26 June 2017. The permit so approved is for a temporary period of two years, within which time the Department of Fisheries is expected to have undertaken the necessary environmental studies for the identification and establishment of a North Aquaculture Zone, following which the temporary tuna farm approved under PA 03072/17 will be relocated to the new Zone. The same approach would apply to the current application for the relocation of the cages formerly off St Paul's Bay.

1.6. **Figure 1.3** illustrates the location of the original permit for the St Paul's Bay farm and the proposed location of the new site (including an indication of the mooring area on the sea bed).

1.7. The project is proposed by Malta Mariculture Ltd, who is hereinafter referred to as 'the Applicant'; the project is hereinafter referred to as 'the Scheme'.

1.8. In view that the relocation area being proposed is close to the site approved for the relocation of the former Comino farm, guidance received from ERA in July 2017 was that although individually the St Paul's Bay farm relocation would fall under the threshold for EIA under S.L. 549.46, the potential impacts from the operation of the farm at this site should be considered cumulatively together with the relocated former Comino farm approved in June 2017, also in view of the provisions of Section 12 of Schedule 1A of the Regulations, which deals with Cumulative Effects of Projects and states:

> *CUMULATIVE EFFECTS OF PROJECTS*
>
> *Projects not included in Category I and II and which normally do not require an assessment of environmental impacts but, due to cumulation with other projects can produce significant environmental or social effects, may be required to undertake an environmental impact statement or an environmental planning statement if the Director of Environment Protection is of the opinion that significant impacts are likely to occur, taking into consideration the criteria in Schedule IB.*

1.9. This Report is a detailed Project Description Statement for the proposed relocation of the former St Paul's Bay tuna farm to a site further offshore, but also includes a consideration of Cumulative Effects in view of its proximity to the other approved farm relocated from Comino. Apart from describing the proposed relocation, this PDS includes data from detailed remote sensing and benthic video surveys undertaken in the relocation area and the wider seabed where the north aquaculture zone is being proposed, hence basing the analysis on past experience, data form monitoring reports from the former farms, as well as new survey data at the project location.

BACKGROUND

1.10. In 2006 the Aquaculture Zone off the south-east coast of Malta was established, some 6 km from the coast of Marsaskala (**Figure 1.4**).

1.11. In 2011 a site selection exercise (SSE) was carried out to identify a similar Aquaculture Zone in the north of the islands. Part of the aim of this SSE was to allow for the relocation of certain fish farming units in the north of Malta to a site that would result in fewer conflicts with other users and potentially fewer environmental impacts. This project was being pursued by the then Veterinary Affairs and Fisheries Regulation Division (VAFRD) of the then Ministry for Resources and Rural Affairs (MRRA).

1.12. Based on site selection criteria that considered technical, planning, environmental, and social criteria, the only area that was identified as potentially suitable for further consideration for the development of the Aquaculture Zone at the time was the area east of Comino and Qala Point and just north of the Sikka l-Bajda (between 50 m and 100 m depth of water) (see **Figure 1.5**). The SSE also identified at the time that there may be scope to consider areas further to the east, overlapping with the current bunkering zone at Is-Sikka l-Bajda, if this latter activity were to be relocated (or curtailed) from this location. It must be noted that in the first stage of the SSE undertaken in 2011, the area north of the bunkering zone was identified as being technically suitable; however, it was subsequently eliminated from further consideration in view of the Government's plans at the time to establish an offshore wind farm in this area. This project has since been abandoned.

Figure 1.1: Location of tuna farm subject of permit PA 07377/98

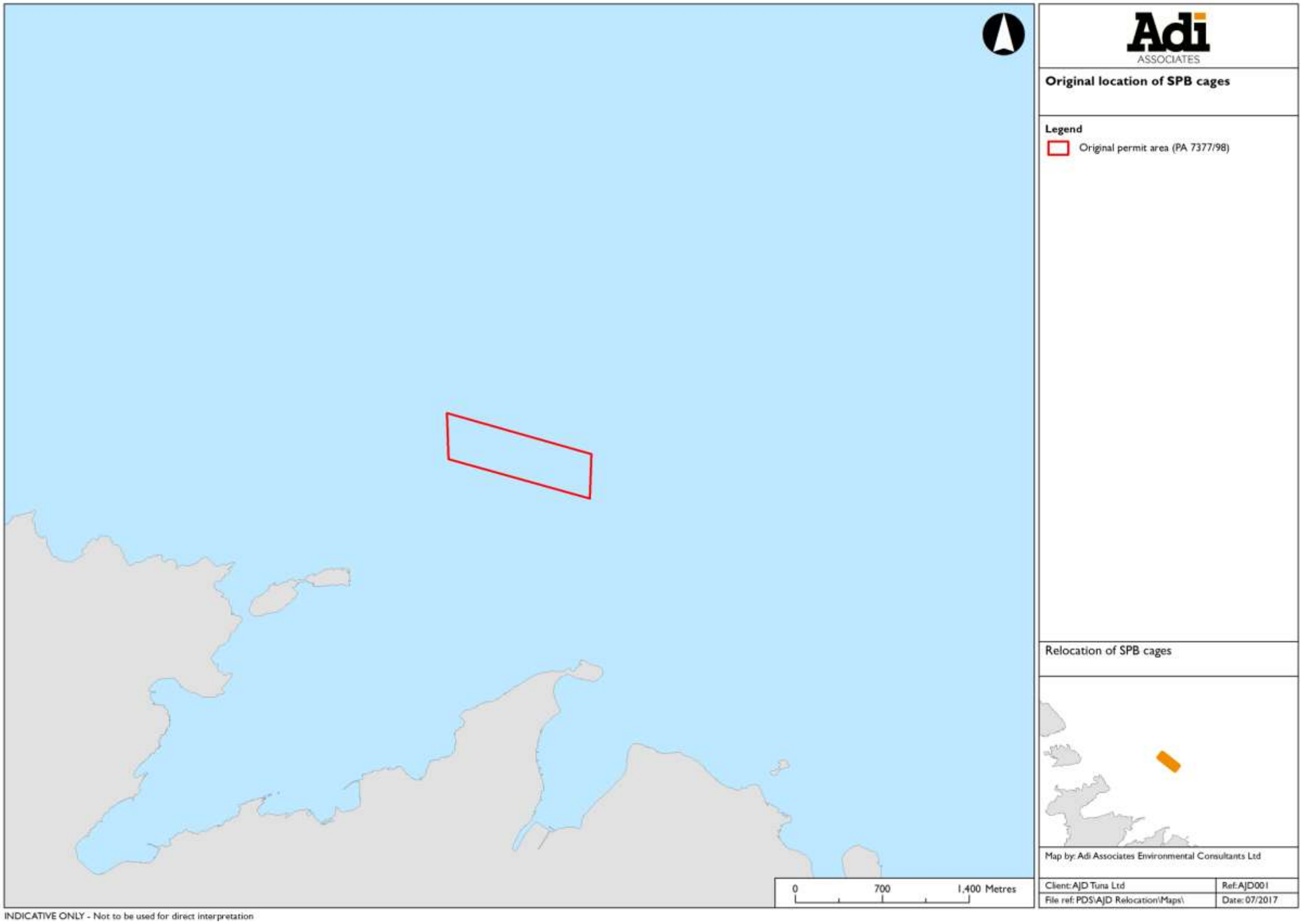


Figure 1.2: Site approved for the temporary relocation of the former AJD Tuna Ltd tuna cages from the south Comino Channel

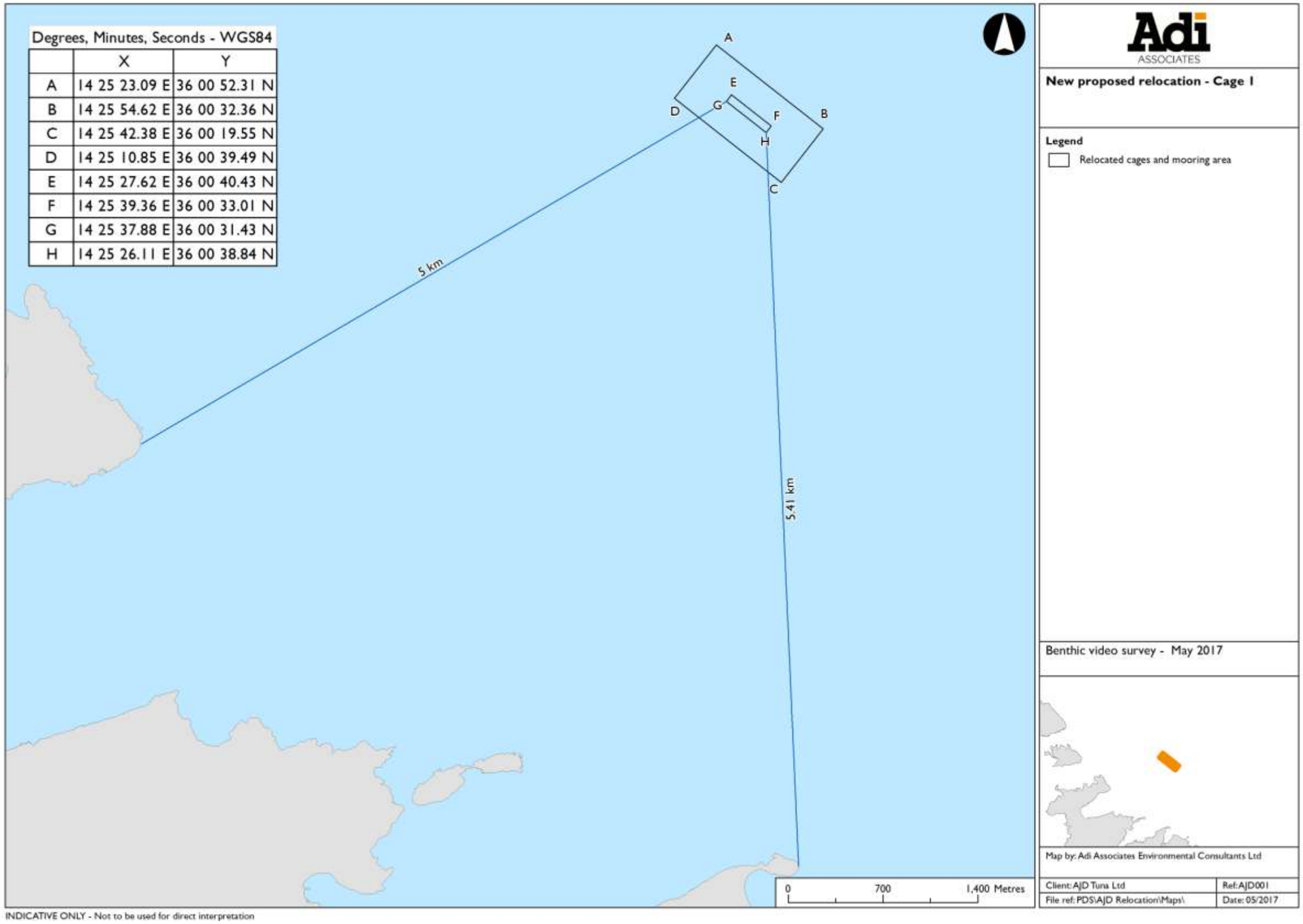


Figure 1.3: Original location of St Paul's Bay tuna farm (PA 07377/98) and proposed temporary relocation site (PA 05858/17)

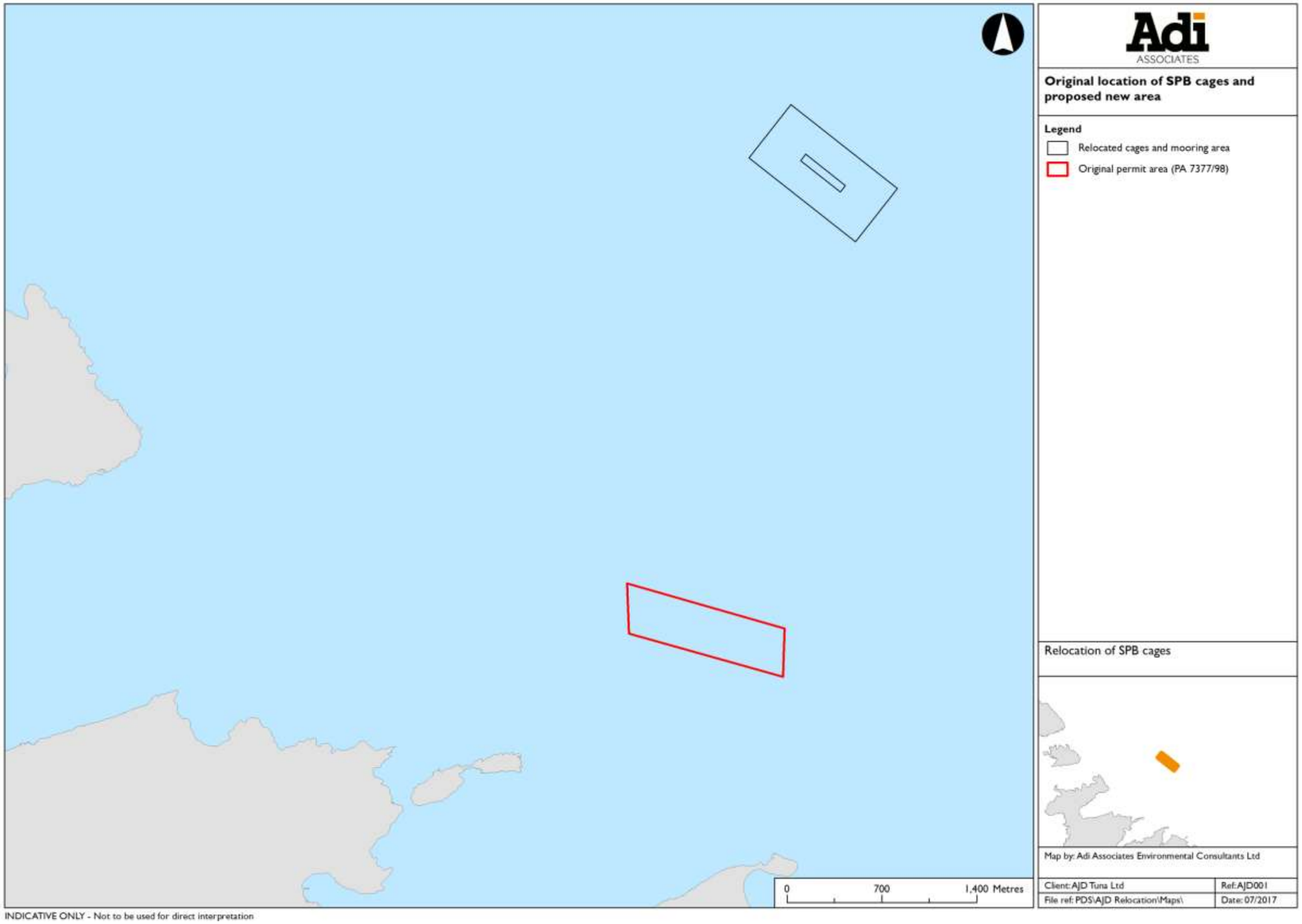
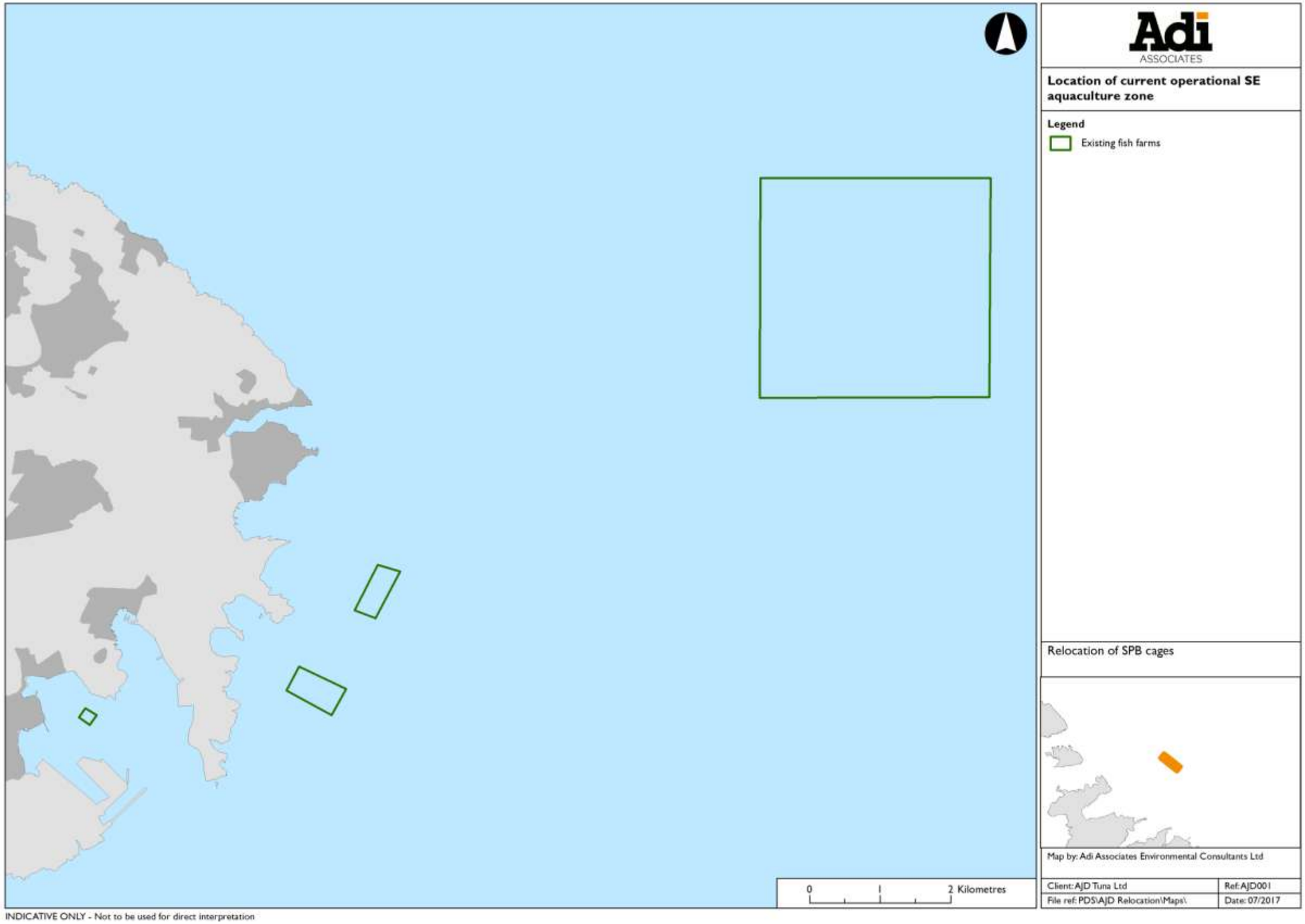


Figure 1.4: Location of south east Aquaculture Zone (large outer area) and the other fish farm locations off Marsaxlokk and Marsaskala (inner polygons)



1.13. The site proposed for the establishment of a north Aquaculture Zone in 2011 lies within the marine Special Area of Conservation (SAC) extending from Reqqa Point off the north coast of Gozo and St Julians in Malta and also overlaps with the Special Protection Area (SPA) of Il-Bahar ta' Madwar Ghawdex as shown in **Figure 1.5**.

1.14. However, the development of this area into a north Aquaculture Zone never proceeded beyond the site selection and PDS stage.

1.15. In November 2016, AJD Tuna Ltd, in consultation with the Department of Fisheries, pursued the concept of an Aquaculture Zone in the north of the island and commissioned bathymetric surveys of the area north of is-Sikka l-Bajda and also obtained video footage of the area. The report from this survey is attached as **Appendix 1**. Following ERA's instructions that development applications for new Aquaculture Zones must be made by the Department of Fisheries and Aquaculture, in line with the National Aquaculture Strategy, as mentioned previously, this application by AJD Tuna Ltd was suspended.

Current state of play

1.16. The south Aquaculture Zone is currently operational. In addition to the two farms that have been operating from this zone for the past years, the Department of Fisheries has approved the relocation of two other tuna farms that formerly operated off Marsaskala and off Marsaxlokk and which had development permit conditions to relocate to the Aquaculture Zone when this was set up. This relocation is now happening as a result of the revocation of the permits by the PA last September. In a Notice to Mariners issued by Transport Malta (TM) on 6th March 2017 (No. 12 of 2017), a southward extension to this existing Aquaculture Zone was announced and the new coordinates are declared. A plan indicating the extension is also included. The Notice to Mariners is included in **Appendix 2**.

1.17. The Applicant has explained that the companies that provide insurance to the local fish farm operators have informed Malta Mariculture Ltd that they cannot provide the current insurance cover if their operation is also moved to the south Aquaculture Zone as the risks would be too high. The concentration of all tuna farms in one location could also jeopardise the entire industry in the event of accidents or disease outbreaks. As a result, Malta Mariculture Ltd is seeking to move to a new location as was being pursued by the Fisheries Department in 2011. However, until the new Aquaculture Zone is set up, Malta Mariculture Ltd is seeking to obtain a temporary permit to relocate the cages from the St Paul's Bay farm to a site approximately 5 km from the shore, as described in this report. The site will be adjacent to the one already approved by the Planning Authority last month for the temporary relocation of AJD Tuna Ltd's cages formally located at the South Comino Channel. **Figure 1.6** shows the location of the two sets of cages. If approved, this would allow AJD Tuna Ltd and Malta Mariculture Ltd to also honour their unilateral agreement with the authorities to relocate the pens to a new location further offshore.

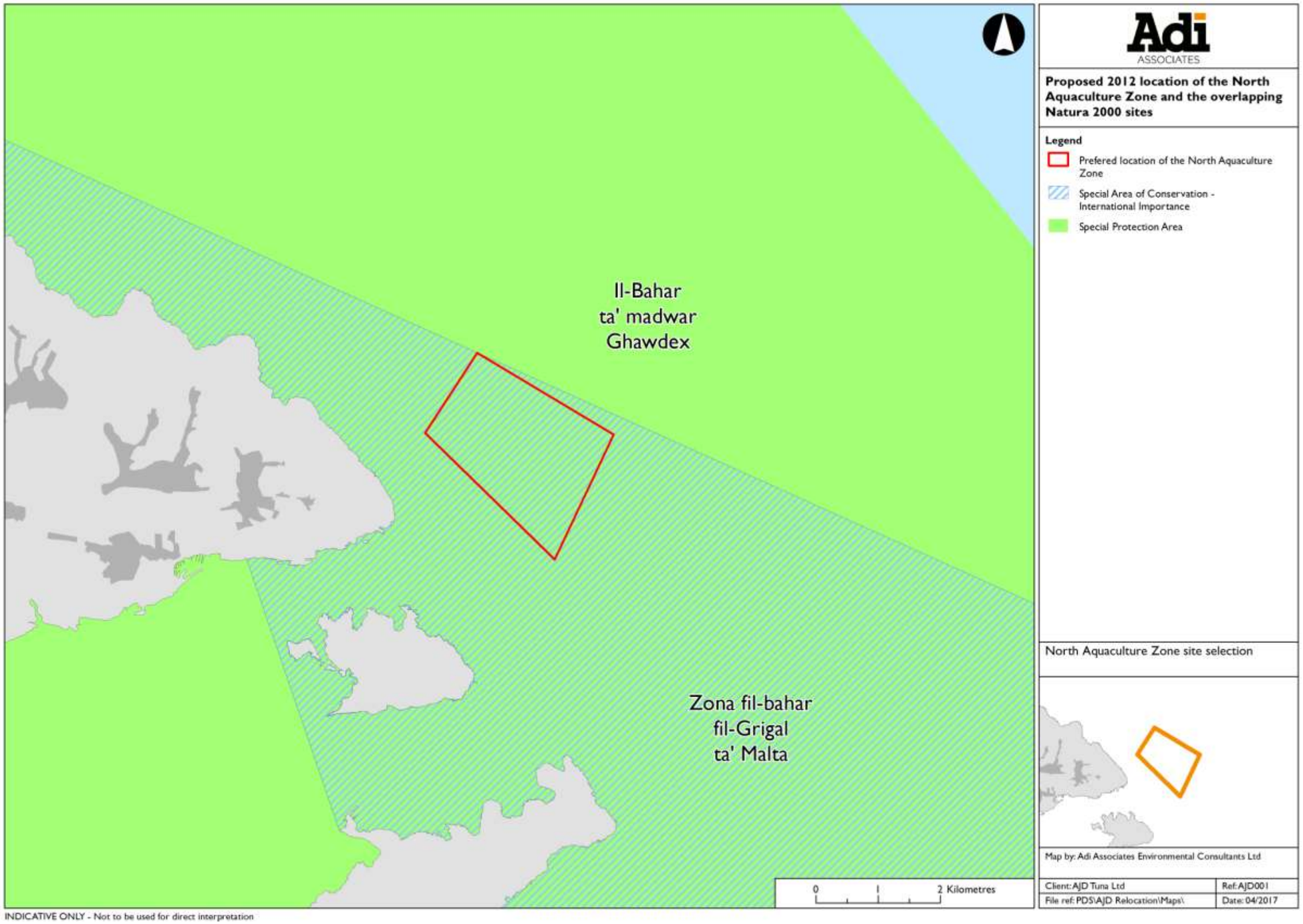
1.18. The relocation will include the removal of all associated structures and apparatus including mooring blocks, chains, and ropes from the current site off St Paul's Bay. At

the time of writing of this Report, all the cages have been removed from the original site off St Paul's Bay and the site cleared of all the associated paraphernalia in accordance with the unilateral agreement with the Planning Authority.

1.19. Since tuna are caught on the high seasons around May, AJD Tuna Limited (and Malta Mariculture Limited) has since purchased the tuna from its suppliers. The tuna destined for the cages relocated from Comino have since been transferred to the growing cages, whereas those destined for the cages to be relocated from St Paul's Bay are still in the transport cages and held on tow around 10 km from the shore in the area of sea between Gozo and Sliema. If the planning permit for application PA 05858/17 is approved, the tuna will be transferred to six new on-growing cages. This operation has to take place by 15 August 2017 to conform to caging operations provisions in ICCAT Regulation 14-04[3], unless special permission is obtained.

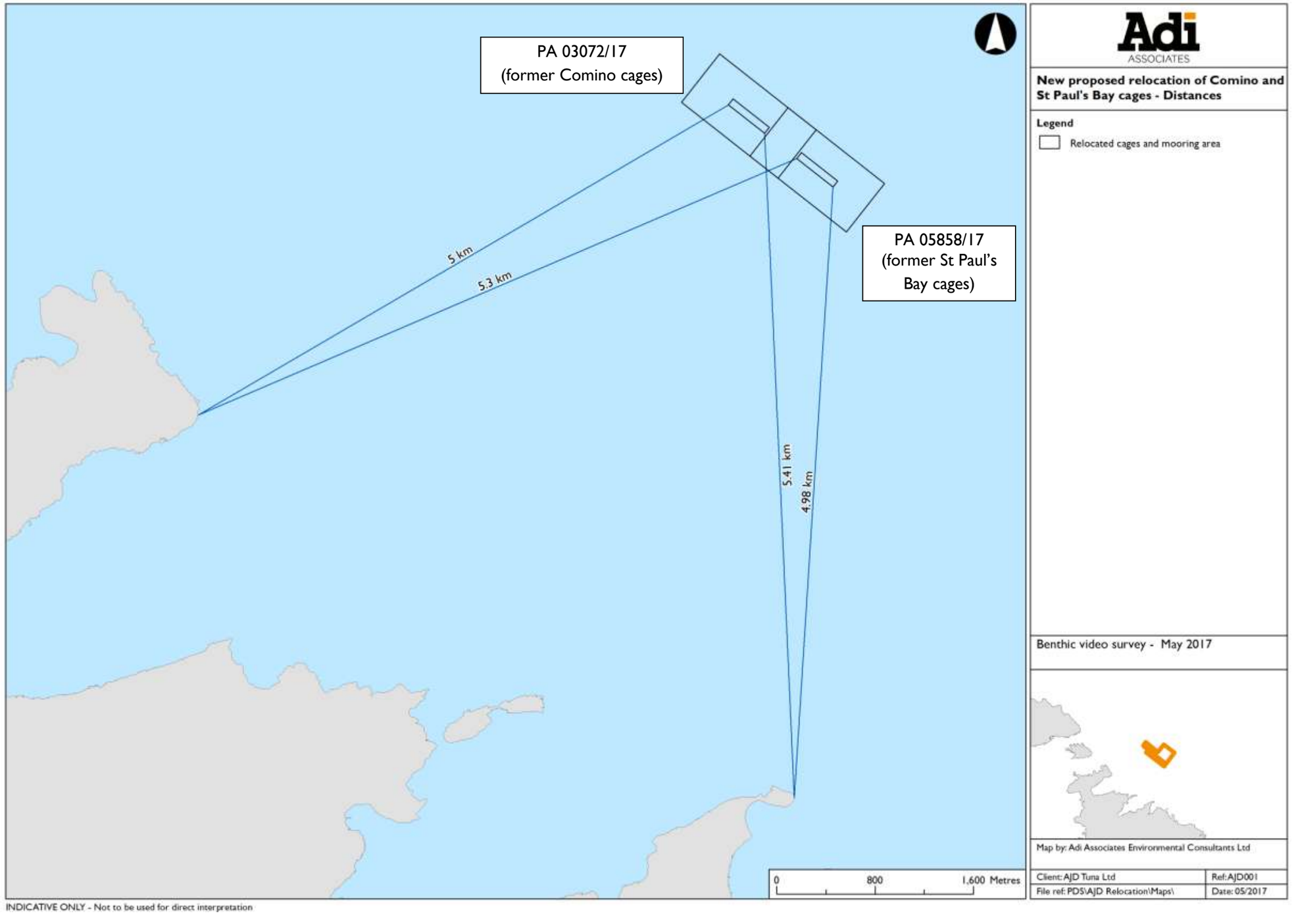
[3] Recommendation 14-04 by ICCAT amending the Recommendation 13-07 by ICCAT to establish a multi-annual recovery plan for Bluefin Tuna in the Eastern Atlantic and Mediterranean.

Figure 1.5: Location of previously proposed north Aquaculture Zone overlapping with Natura 2000 sites



INDICATIVE ONLY - Not to be used for direct interpretation

Figure 1.6: Location of approved temporary cage site for AJD Tuna Ltd (PA 03072/17) and proposed relocation area for former St Paul's Bay farm (PA 05858/17)



Operations – the Tuna Penning Process

Tuna capture and transfer to farm

1.20. Tuna are caught by purse seining on the high seas. This activity is allowed under ICCAT[4] rules for a restricted time during the year as the fish are migrating through the Mediterranean Sea. No Maltese purse seiners exist and therefore the fish are caught by foreign vessels from whom Malta Mariculture Ltd purchases its stock.

1.21. The tuna caught in the purse seines normally range in size from 50 to 300 kgs, with the vast majority of the fish being between 100 and 200 kgs.

1.22. Once the tuna are caught in the purse seines and the required amounts are purchased, they are led through openings in the purse seine into the farm's fattening cages. Once the cages are filled with the required stock, they are slowly towed to the on-growing site[5], where they are anchored in position to the mooring system that would have already been deployed.

1.23. The entire operation is overseen by ICCAT international observers.

Penning

1.24. Once on the farm, the tuna are fed and fattened, largely a process of conditioning, through which the fat-to-protein ratio is adjusted through a high fat diet. The tuna are kept in the pens for between 3 and 7 months, after which they are harvested and sold to the Japanese market.

1.25. The transhipment of tuna to fattening pens is considered to be a landing operation and the catches involved must comply with regulations in force[6] as well as ICCAT requirements.

Feeding and feed management techniques

1.26. The tuna are fed small pelagic fish, usually, herring, mackerel, and sardines. It is estimated that it takes 10 - 25 kgs of baitfish to produce 1 kg of tuna (EC, 2004)[7].

1.27. The feed is ordered from a number of suppliers and five reefer containers with feed arrive on a daily basis. These are stored at the Freeport. Every day a number of containers (usually between 1 and 4, depending on the stock) are transferred to the Kordin land base facility operated by AJD Tuna Ltd (**Figure 1.7**). The fish are transferred from their transportation packing and placed in apposite jumbo bags

[4] ICCAT is the International Convention for the Conservation of Atlantic Tunas.

[5] Towing speeds rarely exceed 1 knot, with the transfer taking a number of weeks (depending on the distance between the catch area and the farm).

[6] Council Regulation (EU) 2016/72 of 22 January 2016 fixing for 2016 the fishing opportunities for certain fish stocks and groups of fish stocks, applicable in Union waters and, for Union fishing vessels, in certain non-Union waters, and amending Regulation (EU) 2015/104.

[7] European Communities, 2004. Tuna: a global fishing activity. Fishing in Europe No. 23. Directorate-General for Fisheries, European Commission, September 2004.

(**Figure 1.8**). The bags are then placed in crates and stored on flat bed trailers, where they are allowed to partially thaw overnight (**Figure 1.9**). Early next day (around 4 am), the fish are transferred to the Grand Harbour where they are loaded on feeder vessels (**Figure 1.10**). Once loaded, the vessel sets sail towards the farm.

1.28. The tuna are fed once a day, at dawn. Semi-frozen blocks of baitfish are normally placed in a small feeding cage floated at the centre of the pen (**Figure 1.11**), and once they have been thawed enough, the central cage is opened by divers and the fish dispensed into the pen. The divers monitor the tuna and control the amount of feed released into the pen to minimise wastage. Once the tuna are satiated, the diver stops feeding. The process might be repeated two hours later. If the tuna are satiated, the uneaten baitfish can be lifted from the pen and transferred to other cages to feed the tuna there.

1.29. In order to ensure maximum efficiency it is necessary to ensure that when fed to the tuna the baitfish are not completely defrosted so that the high calorific oils are also ingested and not lost from the feed. Nonetheless, the process does involve the development of an oily slick originating from the semi-frozen feed. In an attempt to reduce the volume of the oily slick, Malta Mariculture Limited intends to deploy a permanent oil boom inside each cage (see **Figure 1.12**) in an attempt to retain any released oils inside the cage from where as much of it as possible is collected by means of skimmers deployed from a cleaning vessel (see **Figure 1.13**). This method is already being used successfully by AJD Tuna Ltd in the adjacent farm.

Harvesting and processing

1.30. Harvesting of fresh tuna is largely on demand, although the vast proportion of the tuna is today being harvested for the frozen fish market.

1.31. When harvesting occurs, the bottom of the net is raised to a degree, forcing the fish closer to the surface. Slaughtering is particularly delicate as the amount of stress the fish are subjected to must be kept low since if the fish are stressed their body temperature rises sharply, which would compromise the quality of the meat[8]. Slaughtering is carried out by divers who enter the cage and harvest the tuna one by one by shooting them in the head.

1.32. The tuna are transferred to a service vessel by crane (**Figure 1.14**) from where they are then quickly transported by service boats (**Figure 1.15**) to a waiting processing vessel anchored further out at sea (**Figure 1.16**). Onboard the ship, the tuna are weighed and their heads and tails cut off and the guts removed. Currently, the head, tails and guts are a waste by-product. These are currently being deposited at a site

[8] Tuna maintain body temperatures between 15 and 20 degrees centigrade above surrounding water. However stress will lead to an alarm reaction and secretion of hormones in preparation for emergency action. As part of the process, the body temperature can rise up to 40 degrees centigrade above the surrounding water, compromising the redness of the flesh once the fish has been slaughtered (See http://www.niri.co.jp/agroup/maguro3.pdf).

approximately 10 km offshore[9] as directed by the Director of Fisheries[10]. The dumping site is the same one used by the Armed Forces of Malta to dispose of unexploded ordinance, fireworks, and similar material. The dumping of this waste at sea, though possible as it is a type of waste that is exempted from the provisions of Regulation (EC) No 1069/2009 of the European Parliament and of the Council of 3 October 2002 laying down health rules concerning animal by-products and derived products not intended for human consumption, (See Article 2 (h) of the Regulation), is not as desirable from an environmental point of view. The potential for alternative means of disposal (whether through incineration, biological treatment, ensilage, etc) should therefore be actively considered and if a feasible alternative is found, this waste should ideally be brought on land for further processing instead of disposed of at sea. To this end, ERA is currently processing a request for an environmental permit for the proposed cage farm and draft conditions include provisions for the identification of such alternative disposal solutions.

1.33. The operations that used to take place off St Paul's Bay over the past 17 years used to generate approximately 8 - 10 tonnes of offal per day during the peak fattening period. Malta Mariculture Ltd is pursuing the possibility of selling the by-product to foreign companies for the generation of fish meal to be used for feeding pets.

1.34. If the fish are to be sold to the fresh fish market, they are normally processed onboard the service boats (not the freezer ships) and at the land based facility in Marfa (**Figure 1.17**). In this case, processing has to take place in a short time interval in order to minimise the length of time that the fish remain at ambient temperatures. The fish are processed in the same manner as described above, except that rather than blast frozen, the fish are cooled in an ice and salt mixture to the desired temperature and packed in purposely designed carton boxes for export.

1.35. The fresh fish produce is air freighted to its final destination, whereas the fish intended for the frozen fish market are transferred to a reefer vessel or exported on the same factory vessel on which they were processed.

Stocking Density

1.36. The stocking density of the fish in the cages is a crucial factor in aquaculture that has an important bearing on mortality and the quality of the fish produced. The current maximum stocking density recommended for a 50 m diameter cage is 200 tonnes of biomass. However, ICCAT requires that Bluefin Tuna are partitioned in cages on the basis of Joint Fishing Operation (JFO) in line with Para. 5 of ICCAT Rec. 11-20. JFO

[9] Occasionally these wastes are incinerated at the Marsa Thermal Treatment Facility, but the amount of wastes produced daily is too high for the incinerator to process and hence offshore dumping is currently preferred. The possibility of incinerating this waste (or parts of it) or to process it in an alternative manner (e.g. through a biological treatment facility), will be further explored and if a feasible alternative to dumping at sea is found, this waste can easily be diverted to land for onward processing.

[10] The entire tuna farming operation (and including the disposal of waste) will now require an environmental permit; an application to this effect (EP/024/17/A) is currently being processed by ERA.

is a group of vessels of the same or of a different flag that share quota and fishing effort. JFO groups are duly authorised by ICCAT. The Department of Fisheries and Aquaculture follows ICCAT's recommendation such that mixing of fish in the same cage that originate from separate JFOs is not authorised[11]. This often affects the stocking density of a single cage as well as the number of cages deployed at a farm[12].

Antifouling and net cleaning

1.37. No anti-fouling or other chemicals are used on tuna nets, since unlike the nets of traditional finfish aquaculture units, which remain in the water for an extended time period, the tuna nets are removed at the end of each season for drying.

Feed supplements, chemicals, and antibiotics

1.38. As explained earlier tuna are only fed baitfish. No feed supplements or other chemicals or vitamins are used to date. Equally, since the tuna are effectively only kept on site for fattening and are not actually 'farmed'[13], no chemicals or antibiotics are used[14]. Mortalities are more effectively controlled by lowering stocking densities and monitoring the fish for any signs of stress.

Storage of feed and packing materials

1.39. Malta Mariculture Ltd (through AJD Tuna Ltd) operates three land bases (see **Figure 1.18**). One land base is situated in Marfa and was used in the past for packing and processing of fresh fish for export by air freight. The site was also used temporarily as an experimental hatchery for Bluefin Tuna. The second land base is located at the Kordin industrial estate and is used to receive and prepare the bait fish as well as for the washing and storage of crates. A third land base is located at Maghtab and is used for storage of equipment and frozen bait fish (in freezers).

OBJECTIVES OF THE SCHEME

1.40. As mentioned, the aim of the Scheme is to relocate the cages and the entire tuna farming operation from the site off St Paul's Bay that was permitted for tuna farming operations until last September and was vacated by the end of May 2017 to a new site further offshore from is-Sikka l-Bajda in the north of Malta. The new site will only be a temporary solution until the new north Aquaculture Zone being planned by the Department of Fisheries is set up. In addition, due to the time constraints with the processing of this application for the farm relocation, the proposal is to establish

[11] Gatt Mark, Department of Fisheries and Aquaculture, personal communication; 28 October 2016.
[12] Note that the approach taken by the former MEPA in the development permit for the setting up of the South-East Aquaculture Zone was to approve a maximum tonnage of production but not to specify the number of cages that could be deployed in order to allow for such flexibility. Single operations at the Aquaculture Zone are then regulated through an aquaculture permit issued by the Department of Fisheries and Aquaculture.
[13] The process is more appropriately called tuna ranching than tuna farming.
[14] Had these to be used, they would be similar to those already in use in the other finfish aquaculture operations.

six cages (four 50 m diameter cages and two 60 m diameter cages) in an area just under 2 hectares and located approximately 5 km from the nearest landfall (see **Figure 1.2**).

1.41. This relocation would ensure the farm's continued operation while honouring Malta Mariculture Ltd's unilateral agreement following the revocation of the permits.

Figure 1.7: Kordin land-based facility

Figure 1.8: Frozen feed transferred to jumbo bags

Figure 1.9: Flat-bed trailer with feed in jumbo bags left to partially defrost

Figure 1.10: Feed being loaded onto a feeder vessel

Figure 1.11: Loading of semi-frozen baitfish into feeding cage

Figure 1.12: Oil booms in cages

Figure 1.13: Oil skimmer

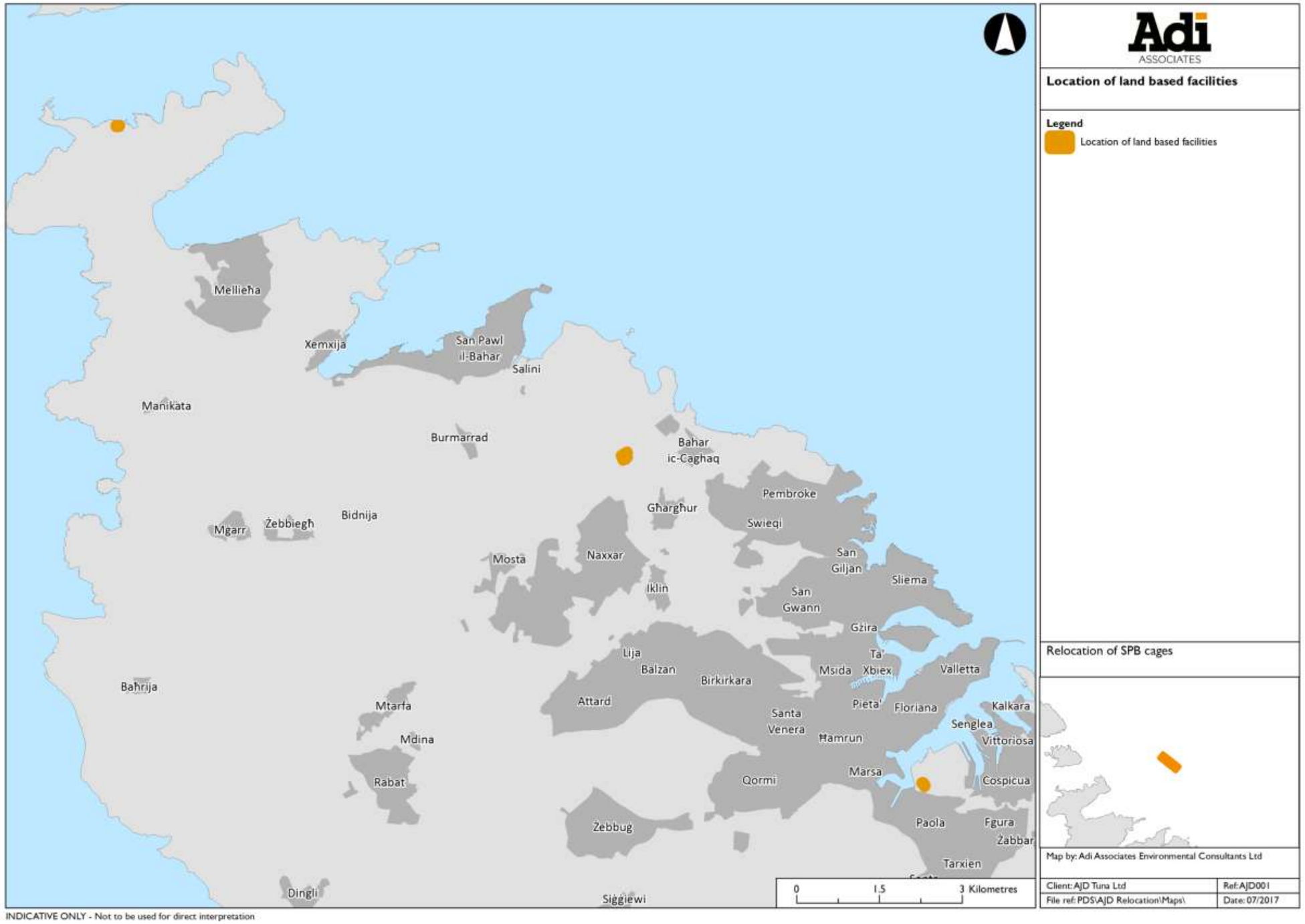
Figure 1.14: Tuna harvesting

Figure 1.15: Service boat transferring tuna to processing vessel

Figure 1.16: Processing ship

Figure 1.17: Marfa land-based facility

Figure 1.18: Map indicating location of land-based facilities in Marfa, Maghtab, and Kordin



2. DEVELOPMENT OF A NORTH AQUACULTURE ZONE

2.1. As mentioned, the objective of the Scheme is the relocation of the tuna farming operation from the site off St Paul's Bay to a site north of is-Sikka l-Bajda that would allow the tuna farming operation of Malta Mariculture Ltd to continue throughout this and possibly next summer until the new north Aquaculture Zone being planned by the Department of Fisheries is set up, following which, the cages will again be relocated to the new site.

POLICY & PLANNING CONTEXT

ICCAT

2.2. ICCAT was set up in 1966 to coordinate international research and management of highly migratory tunas and billfish in the north Atlantic. The Commission adopts Recommendations and Resolutions aimed at maintaining the populations of ICCAT species, including Bluefin Tuna, at levels which will permit maximum sustainable catch. The Compendium on Management Recommendations and Resolutions adopted by ICCAT for the Conservation of Tunas and Tuna-like Species 2016 provides a complete set of currently active ICCAT Recommendations and Resolutions.

2.3. ICCAT's regulations are binding; however, enforcement is under the remit of the individual country members. If a member does not comply, ICCAT may enact quota reductions for overages or, as a last resort, authorize trade restrictive measures.

2.4. The activities of Malta Mariculture Ltd are regulated within this framework.

Aquaculture Strategy for the Maltese Islands: Towards Sustainability 2014-2025

2.5. Malta's National Aquaculture Strategy requires that all aquaculture activities must be carried out within designated Aquaculture Zones and declares all existing cage locations as Aquaculture Zones (subject to adherence with the carrying capacity limits established through regulatory and environmental monitoring measures). All Aquaculture Zones are the property of the Department of Fisheries and Aquaculture and fish farming operations require a license / permit from the Department to be able to operate.

2.6. The Strategy addresses sustainable growth of aquaculture with specific mention to the identification of new search areas. It requires that future farms for capture based species will need to be sited at water depths of 50 metres or more within areas identified as Aquaculture Zones.

Fisheries Conservation and Management Act (Cap. 425)

2.7. The Fisheries Conservation and Management Act (Cap. 425) makes provisions for the regulation, conservation, and management of fisheries and aquaculture in Malta. It

defines, among other things, the fishing waters of Malta, and aquaculture, and provides for the:

- Conservation of naturally occurring fish stocks;
- Protection of fish stocks from pollution;
- Assessment of fish stocks and collection of appropriate fisheries statistics (including catches and fishing fleet);
- Monitoring, control, and surveillance of fishing operations (including aquaculture);
- Issue and management of permits and licences; and
- Safeguarding of protected species.

2.8. All aquaculture operations require a permit from the Department of Fisheries and Aquaculture in accordance with this Act.

Aquaculture Regulations, S.L. 36.24

2.9. Legal Notice 73 of 1990 was published as subsidiary legislation to the Prevention of Disease Ordinance (Cap. 36) and covered by the Veterinary Services Act (Cap. 437), and the Animal Welfare Act (Cap. 439). These Regulations establish the licence requirements for any aquaculture operation (including importation of live fish or live fish products for aquaculture purposes) and establishes a minimum distance of 1 km between fish farms.

Development Planning Act (Cap. 552)

2.10. This 2016 Act regulates and controls the use of land and the sea. In accordance with the Act, any changes of use and development of land or sea is subject to permission granted by the Planning Authority; such permissions may be subject to conditions.

Environment Protection Act (Cap. 549)

2.11. The Environment Protection Act 2016(Cap. 549) includes a number of regulations aimed at environmental protection, establishing the duty of the Government to protect the environment and establishes the Competent Authority, known as the Environment and Resources Authority (ERA). The Act identifies the functions of ERA under regulation 8 which includes:

> *...(g) To permit, assess, investigate, audit, monitor, and take action on, any activity, intervention, project, operation or land use that may have an effect on the environment.*
>
> *...(j) to carry out, review or request others to carry out environmental assessments, environmental audits and environmental monitoring of activities and works having an impact on the environment*

2.12. In addition to administering the environmental impact assessment procedures and issuing environmental permits, ERA regulate according to specific legislation as

already noted. This includes S.L. 549.47 (Legal Notice 152 of 2007) European Pollutant Release and Transfer Register (EPRTR) Reporting Regulations the implementation of which aim to fulfil reporting obligations under the EC Regulation No 166/2006 of the European Parliament and of the Council of 18 January 2006 concerning the establishment of a European Pollutant Release and Transfer Register for which the potential production volumes of the relocated farm will ensure that this operation lies within the remit of reporting requirements in accordance with this legislation.

2.13. The proposed operation, which involves the relocation of the former tuna farm off St Paul's Bay, is the subject of an environment permit application (EP/0024/17/A) that is currently being processed by ERA.

IDENTIFICATION OF A SEARCH AREA FOR A NORTH AQUACULTURE ZONE

2.14. On review of the site previously identified for the north Aquaculture Zone (for which planning approval had not been concluded; see **Figure 1.5**), this was no longer considered to be suitable for consideration as a search area for the Scheme. This is mainly due to the fact that the proposed site also lies relatively close to the coast thereby potentially not fulfilling the spirit of the permit revocation and the PA conditions (apart from also being within the greater concentration of rafting area used by seabirds in the Rdum tal-Madonna / Comino sites; see below). Discussions with ERA and the Department of Fisheries and Aquaculture have indicated that a minimum distance of 4.5 – 5 km from the shore is expected for all relocated farms[15].

2.15. To this end, in late summer 2016, the Department of Fisheries and Aquaculture, in conjunction with AJD Tuna Ltd and Malta Mariculture Ltd as the only tuna operators in the north of Malta, embarked on a process to try to identify a suitable location for a new north Aquaculture Zone to accommodate the farms of these two entities. **Figure 2.1** identifies the search area that was studied as part of this exercise. This is located north of Qawra Point, St Paul's Bay. This search area was chosen based on (i) technical requirements for operation as identified by the operators and the Department, e.g. the cages should ideally be deployed in water that varies between 50 m and 100 m depth since it would be difficult for divers to work in deeper waters (without significantly altering the method of cage mooring and maintenance / working); (ii) a desk-top analysis using GIS overlays to identify the various marine uses off the north and east coast of the islands; (iii) any constraints associated with the relocation as specifically directed by relevant Authorities or entities. Notably, with respect to the latter, Transport Malta's Harbour Master directed that the search area should be located at least 300 m from the bunkering zone. **Figure 2.2** identifies the various other uses and constraints around the search area.

2.16. Following identification of the search area, the following studies were carried out

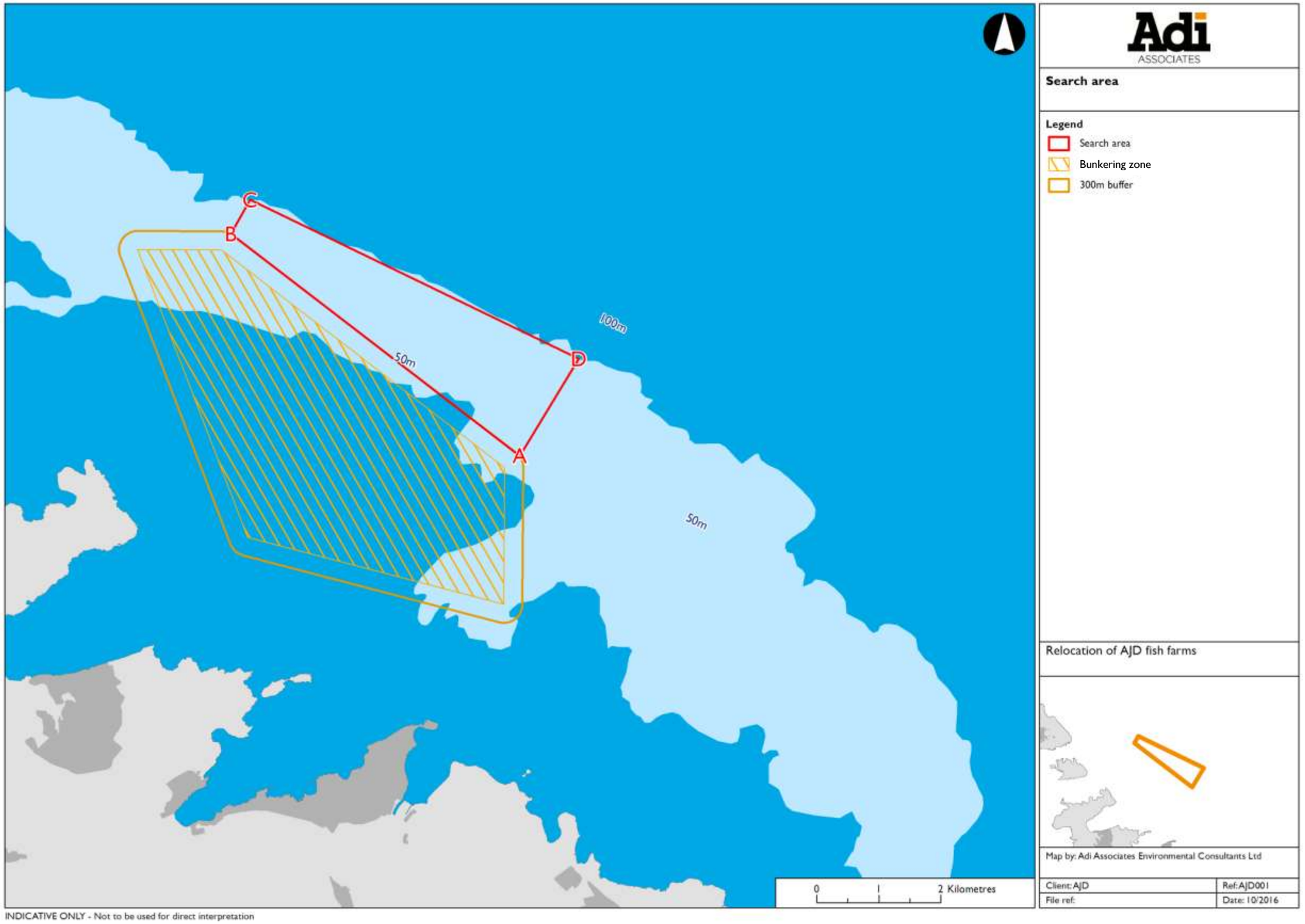
[15] Meeting Adi Associates, ERA and Department of Fisheries and Aquaculture; October 2016

under licence from the Continental Shelf Department of the Ministry for Transport and Infrastructure:

- Multibeam echo sounder and back scatter survey within the search area; and
- Initial video surveys of the benthic environment to identify benthic habitats in the area.

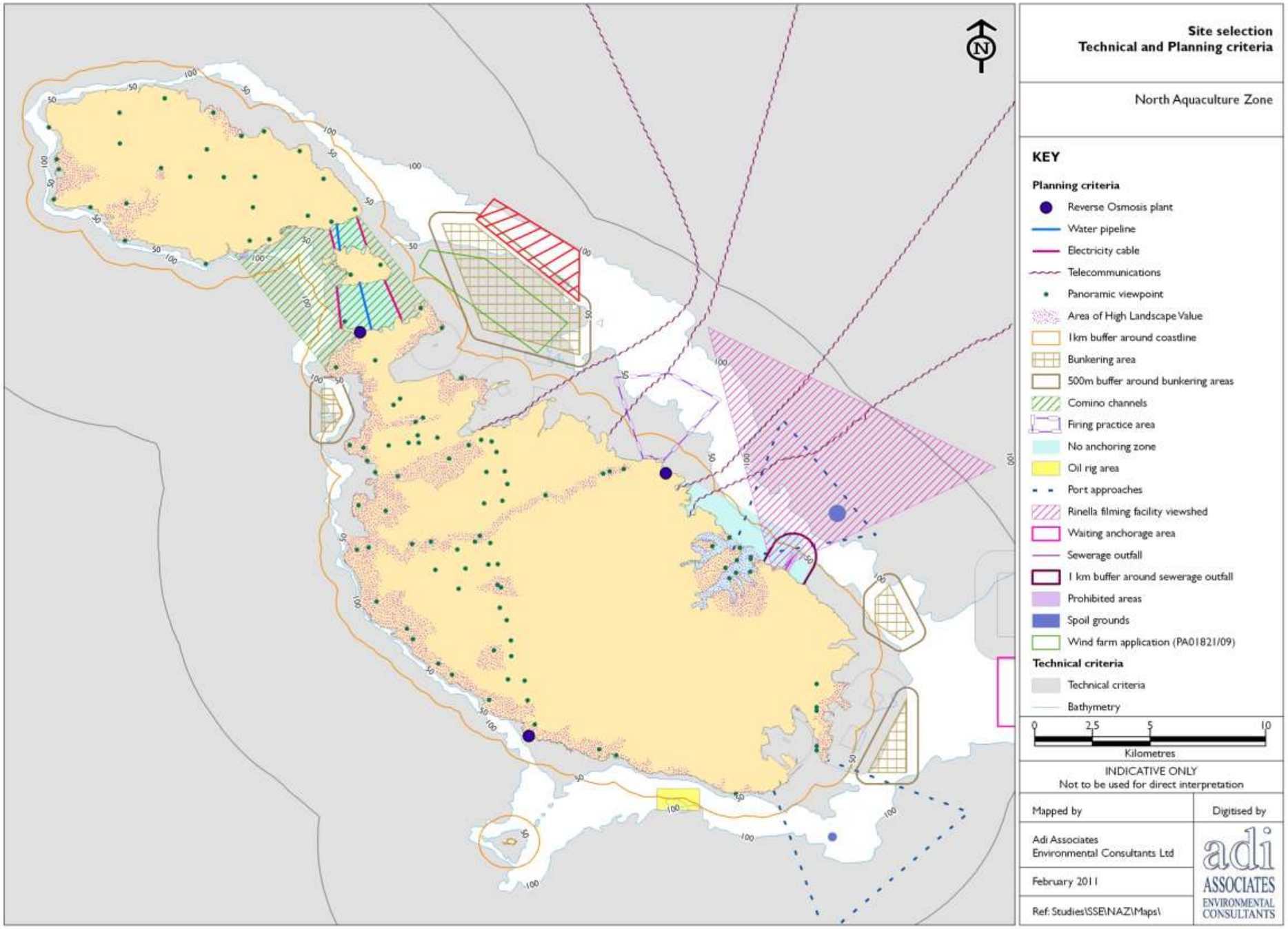
2.17. The report for the above surveys is attached as **Appendix 1**.

Figure 2.1: Search area for north Aquaculture Zone



INDICATIVE ONLY - Not to be used for direct interpretation

Figure 2.2: Search area and other marine uses in the vicinity



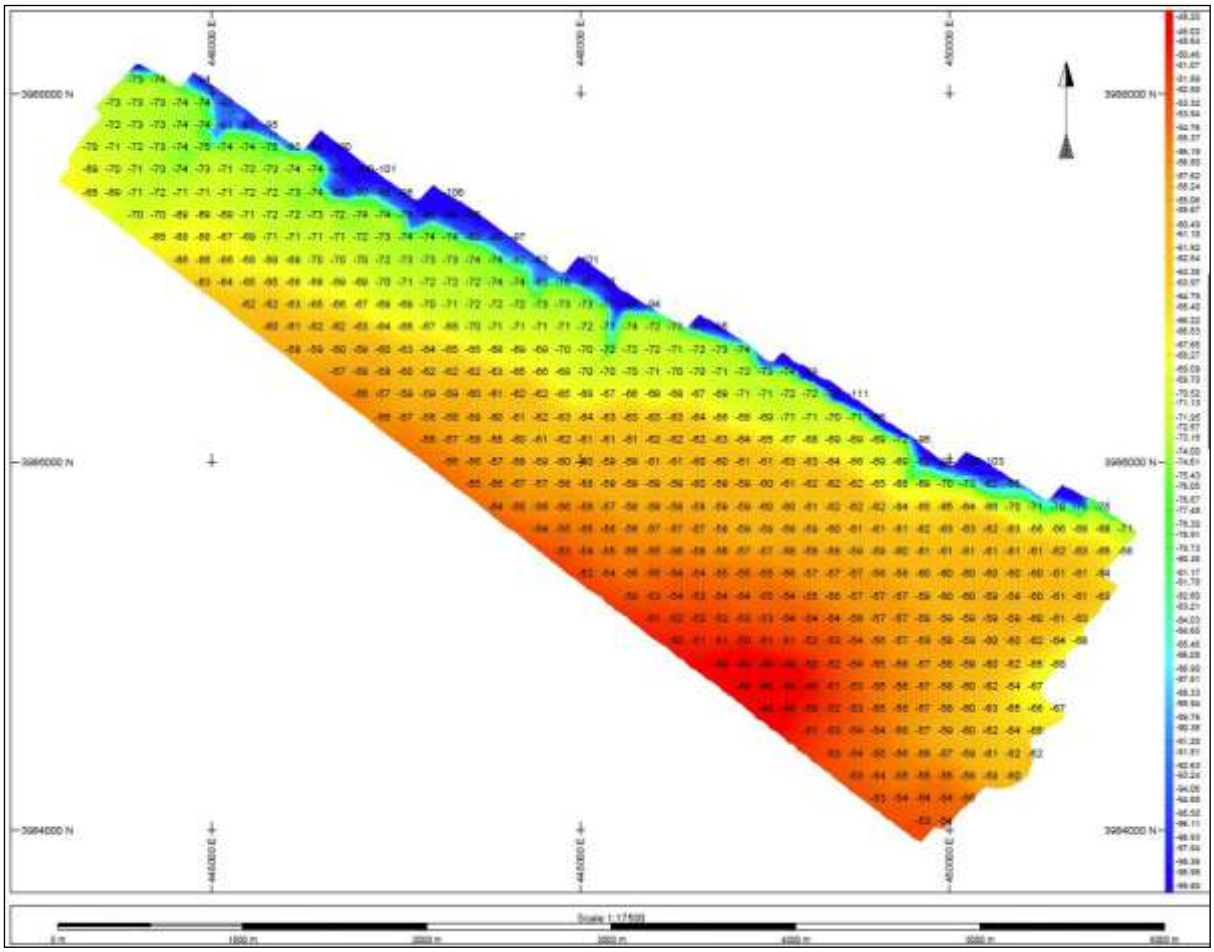
Overview of Survey Results

Multibeam echo sounder survey

2.18. The studies on the seabed in the search area indicated that water depths in the surveyed area ranged from 48.2 m to 110 m, with the mean depth value being around 63 m (**Figure 2.3**). Overall, the survey area appeared to have a northwards facing slope. The shallowest area was a small ridge, located at the south east of the survey area. From there the seafloor descended gradually northward until it reached the submarine cliff which bounded the northern edge of the survey area.

2.19. The deepest parts of the survey area were recorded off the submarine cliff, which ran along the northern boundary of the site in a northwest – southeast direction. At the edge of the cliff, water depth increases from around 74 m to more than 100 m (**Figure 2.4**).

Figure 2.3: Water depth (in metres) recorded from the survey area

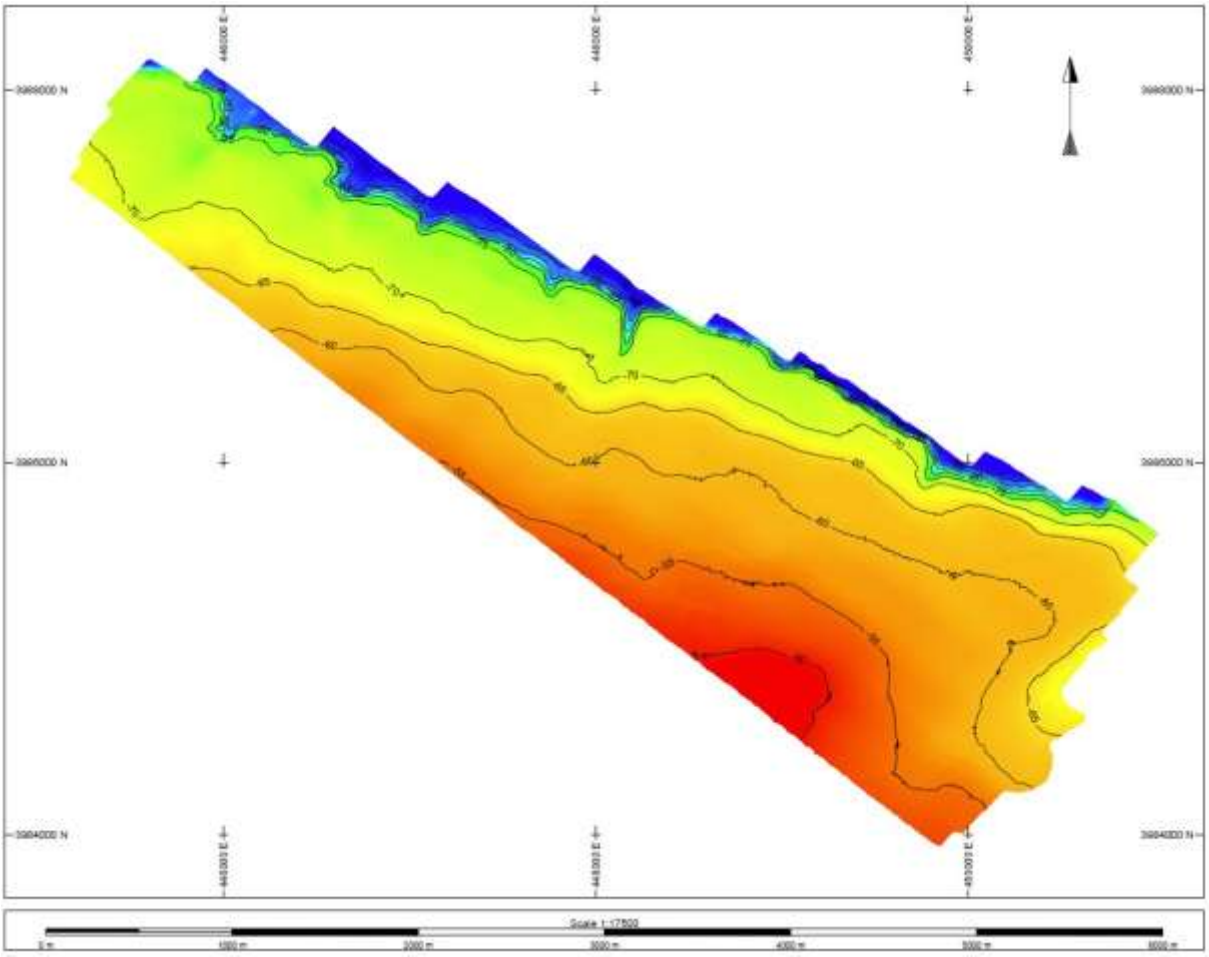


Backscatter survey

2.20. The backscatter data indicated very little variation in bottom type (**Figure 2.5**). The acoustic backscatter indicated that the central survey area was homogenous with

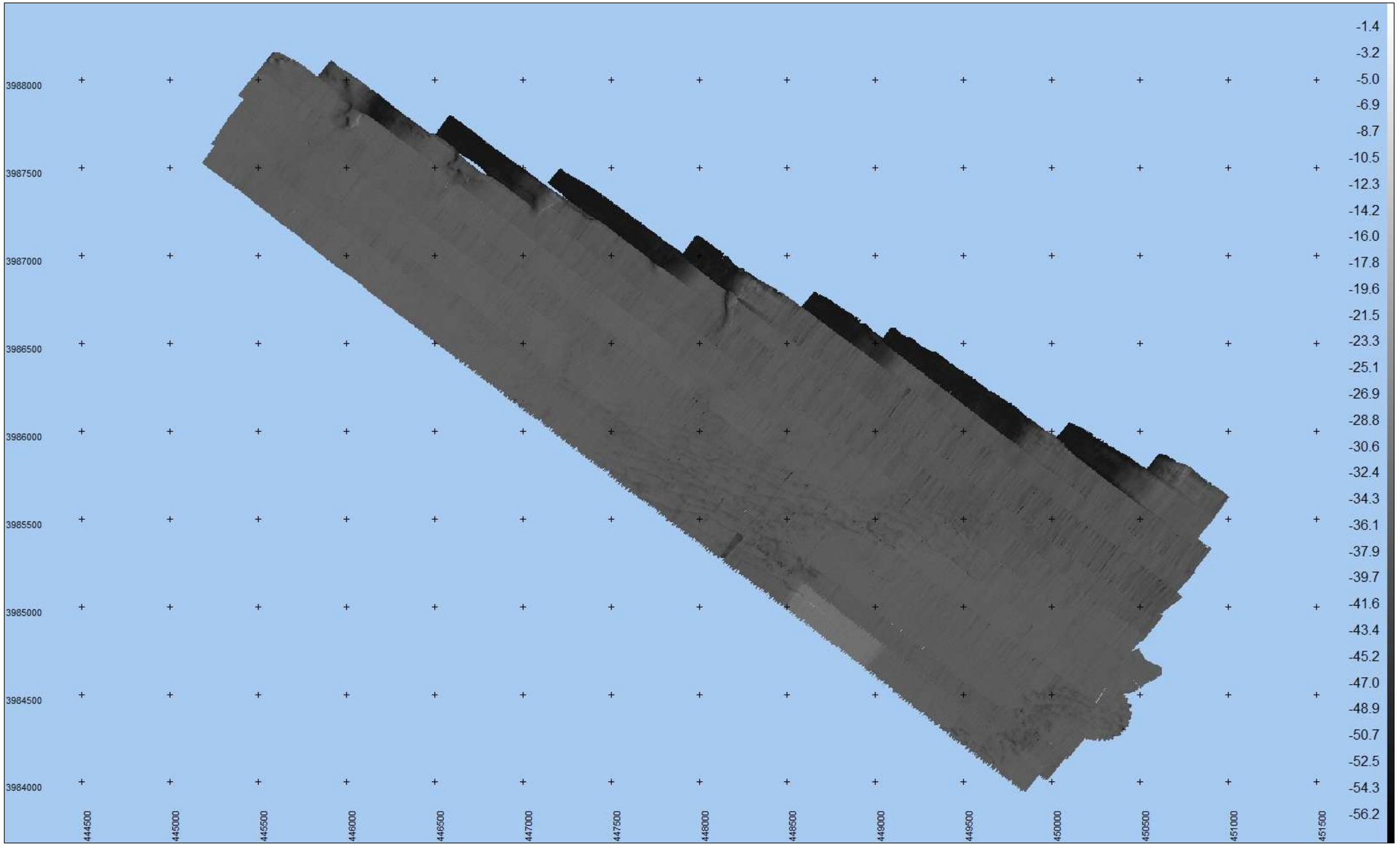
little variation in the bedform intensity. A number of very low seafloor contours were noted in the shallow central and southeastern parts of the survey area. These radiated in a northerly direction from the southern edge of the survey area, and are visible in the backscatter as slightly darker patches; however, they do not indicate pronounced differences in seabed surface relief, as is often seen with reef and cliff edges. Thus, bedform intensity difference in this area was very low, indicating that the variation is slight.

Figure 2.4: Depth contours (in metres)



2.21. The break in slope due to the steep submarine cliff along the northern boundary of the survey area was particularly noticeable. Six small gorge-like indentations are evident. These small indentations were aligned along a roughly north – south axis with a penetration into the cliff of 10 - 20 m, although the backscatter indicated that two shallow depressions associated with these gorges continued for a greater distance.

Figure 2.5: Backscatter image for survey area



2.22. Overall, data from the acoustic backscatter indicate minimal variation in seabed hardness within the survey area (**Figure 2.6**). Areas of high reflectivity, such as sand and rock are represented as light shades and areas of low reflectivity are darker. **Figure 2.6**, produced from the recorded backscatter, indicates a bottom hardness that ranges between 0.7 and 8.3, where 8.3 represents low reflectivity and 0.7 represents high reflectivity.

2.23. Reflectivity data for the area where the submarine cliff is located shows an area of low reflectivity at the base, indicating that the substratum there is most likely comprised of muddy sands. In the rest of the survey area, the acoustic backscatter data indicates that the seabed is comprised of uniform coarse low reflectivity unconsolidated coarse sediments, which the imagery from the video survey study (see below and **Annex 1**) indicates to be rhodolith beds and maerl. A small blue area in the south of the survey area indicates the presence of more consolidated material and possibly represents a rocky outcrop.

Biological characteristics of search area

2.24. To survey the biological characteristics of the seabed within the survey area, a drop down camera was deployed at 13 stations that were distributed over the study area. The geographical locations of the 13 drop down camera stations are indicated in **Table 2.1**.

Table 2.1: Coordinates of drop-down camera stations (see Figure 2.7)

Station	Latitude / Longitude (Projection: WGS 84)	Depth (m)
1	36° 0.377'N / 14° 26.258'E	51.19
2	36° 0.514'N / 14° 25.996'E	51.37
3	36° 1.100'N / 14° 25.017'E	58.69
4	36° 1.780'N / 14° 23.964'E	70.1
5	36° 2.059'N / 14° 24.003'E	75.67
6	36° 1.794'N / 14° 24.505'E	77.94
7	36° 1.548'N / 14° 25.083'E	68.78
8	36° 1.540'N / 14° 25.083'E	73.71
9	36° 1.236'N / 14° 25.903'E	70.96
10	36° 1.260'N / 14° 25.178'E	63.79
11	36° 0.858'N / 14° 25.754'E	57.41
12	36° 0.960'N / 14° 26.624'E	68.99
13	36° 0.472'N / 14° 26.554'E	57.33

2.25. Following the field surveys, the video footage was analysed in the laboratory. Grab images from the video footage were taken and used to describe the benthic assemblages recorded from the study area, which were named according to the nomenclatural scheme adapted by Borg *et al.* (2013) for local use from the RAC/SPA classification system of Mediterranean marine benthic habitats.

Figure 2.6: Sediment hardness image of the survey area

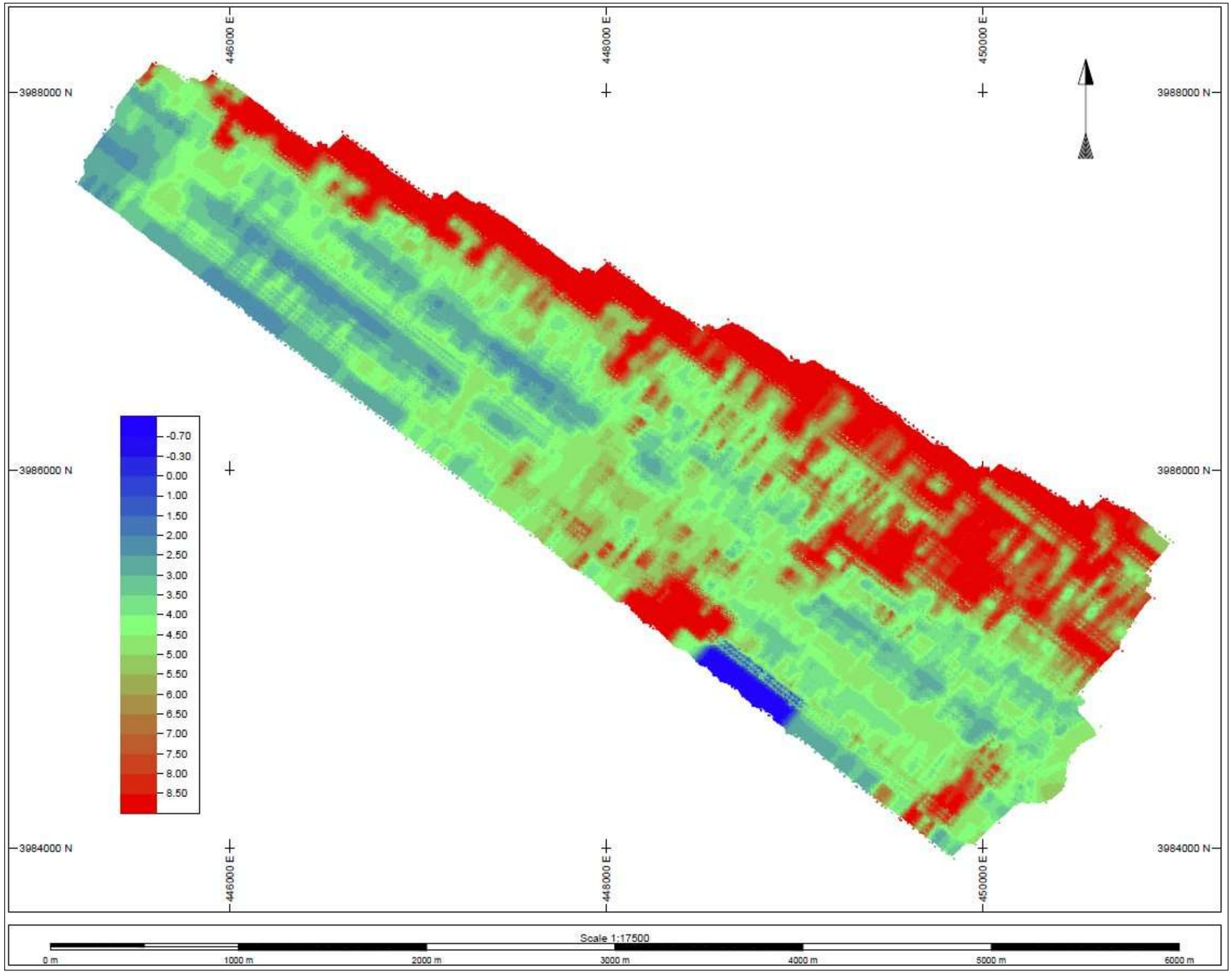
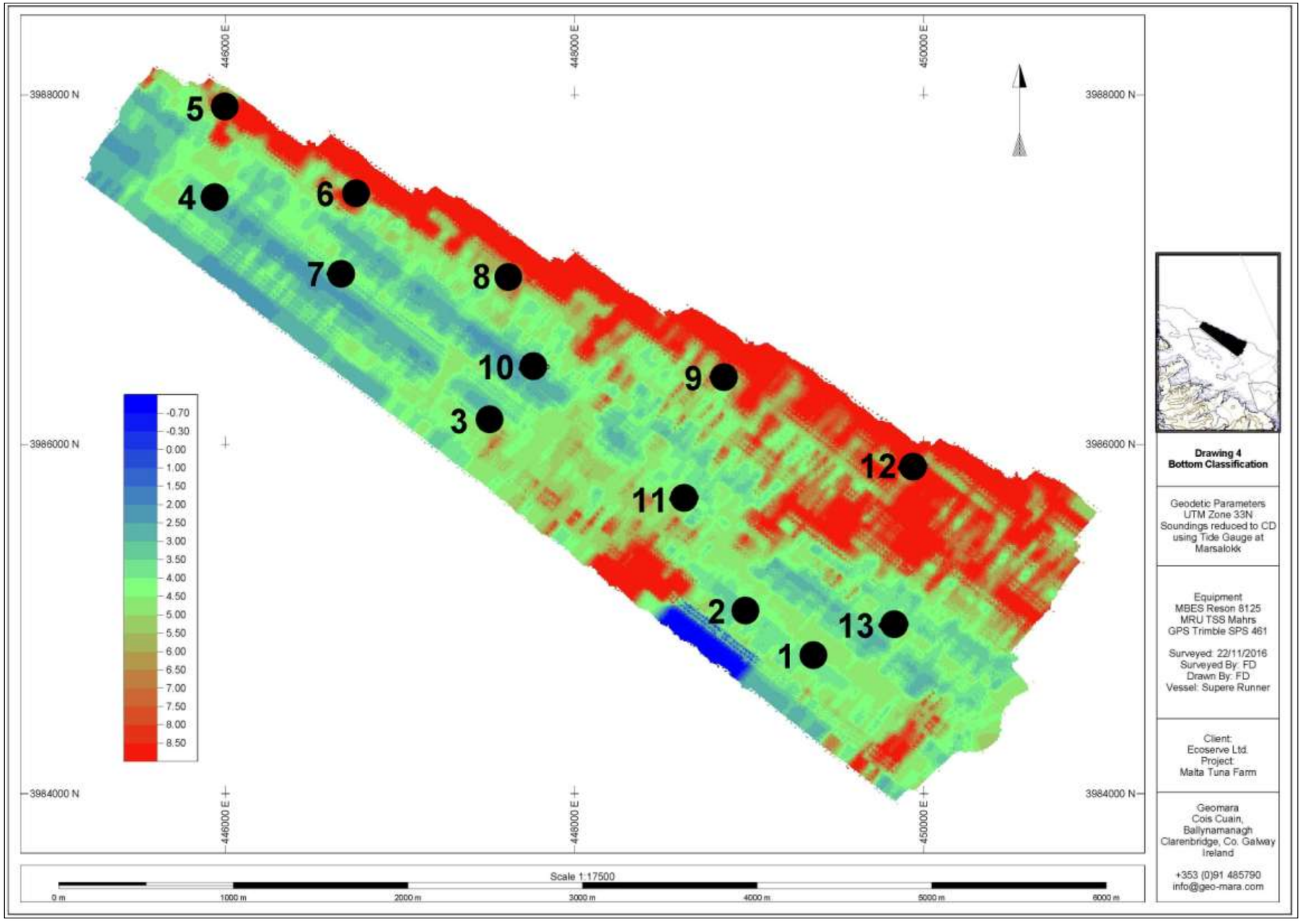


Figure 2.7: Drop-down camera stations superimposed on the backscatter map



2.26. The main biotic assemblage type recorded from the study area was a biocoenosis of coarse sands and fine gravels under the influence of bottom currents. This biocoenosis was characterised by the following two associations:

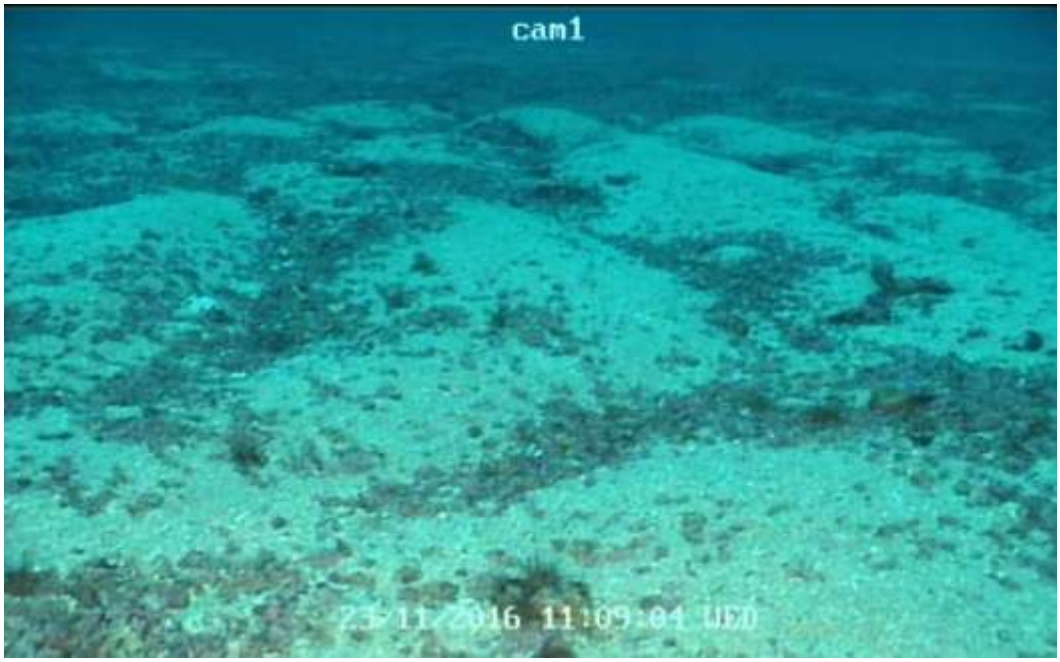
- **Association with maerl**. This association was present in a large part of the survey area and consisted of maerl, which is abundant off the northeastern coast of the Maltese Islands (Sciberras *et al*., 2009[16]). The maerl beds appeared to comprise a pseudo-hard substratum that supported macroalgae (**Figure 2.8**); the predominant alga was *Flabellia petiolata*, which in places was accompanied by the brown alga *Zonaria tournefortii*. The main megafaunal species that was recorded from this association is the cidariid sea urchin *Stylocidaris affinis*. In places, the maerl beds were discontinuous and the two aforementioned algal associations were absent, giving the seabed a different structure from that of continuous maerl beds;

- **Association with rhodoliths**. This association occurred as patches interspersed with the maerl beds in places (**Figure 2.9**). Apart from the coralline algae forming the rhodoliths themselves, no other macroalgae were recorded from this assemblage type. The associated megafauna was similar to that of the maerl beds as described above, with the most abundant fauna being the cidariid sea urchin *Stylocidaris affinis* (red circle in **Figure 2.8** below). An individual of the seastar *Luidia ciliaris* was visible in the video footage.

Figure 2.8: Association with maerl

[16] Sciberras M., Rizzo M., Mifsud J. R., Camilleri K., Borg J. A., Lanfranco E. & Schembri P. J., 2009. Habitat structure and biological characteristics of a maerl bed off the northeastern coast of the Maltese Islands (central Mediterranean). Marine Biodiversity 39: 251 - 264.

Figure 2.9: Association with rhodoliths



2.27. From these surveys, it was preliminarily concluded that the sea bottom in the area surveyed consists predominantly of coarse mobile sediments - while large parts of the study area appeared to have a seabed comprised of coarse sediments with varying degree of sediment compactness, other parts indicated a seabed having less compact coarse sediment; the former would represent areas with maerl and the latter areas with coarse sediments and rhodoliths, however, both these overlie or are intermixed with coarse sands and fine gravels. Other parts of the survey area (coloured red in **Figure 2.6**) appear to have a seabed comprised of less coarse/compact sediments; probably muddy gravelly sand and hence, subject to a site reconnaissance to confirm this conclusion, would be the preferred location for the location of a fish farm in the surveyed area.

Benthic Video Survey

2.28. Following the initial surveys described above and following various discussions with the Environment and Resources Authority, in April 2017, the applicant decided to proceed with further site investigations within the eastern portion of the original Search Area in order to better characterise it and determine which specific site within the area of search would be most suitable to locate the cages in.

2.29. A benthic video survey was carried out in May 2017 under license from the Continental Shelf Department. The survey was concentrated on the eastern part of the original Search Area, as shown in **Figure 2.10**.

2.30. The survey mapped the benthic assemblages along a set of parallel transects (see **Figure 2.11**). The footage indicates that the outermost part of the survey area consists predominantly of maerl, whereas the inner portions consist of associations with rhodoliths. A patch of predominantly sandy bottom was however identified

towards the southern boundary of the search area. On the basis of these results, it was decided to extend the survey area towards the Sikka l-Bajda bunkering area to investigate the extent of this sandy bottom (see **Figure 2.12**).

2.31. The result of this survey is reproduced in the benthic habitats map shown in **Figure 2.13**. This indicates the presence of three assemblage types, as follows:

- Biocoenosis of coarse sands and fine gravels under the influence of bottom currents (predominantly Association with Maerl) – pink colour in **Figure 2.13**;
- Biocoenosis of coarse sands and fine gravels under the influence of bottom currents (predominantly Association with Rhodoliths) – orange colour in **Figure 2.13**; and
- Predominantly Biocenosis of coarse sands and muddy heterogeneous sediment – yellow colour in **Figure 2.13**.

2.32. On the basis of this result, Malta Mariculture Ltd submitted a development permit application (PA 05858/17) to relocate its cages of St Paul's Bay to within the patch of sandy sea bed identified in the benthic video survey and shown in **Figure 2.13** and **Figure 2.14**. The proposed location is adjacent to that approved in June 2017 by the Planning Authority for the temporary relocation of the AJD Tuna Ltd cages formerly located at the South Comino Channel (PA 03072/17). This proposed temporary location complies with the guidance provided by the Planning Authority since it is located just over 5 km from the nearest land fall. Environmentally it is also the only acceptable position for the temporary location of the cages, since all other areas surveyed consist either of protected maerl habitat or consist of associations with rhodoliths, which themselves include protected species.

2.33. The proposed relocation site as well as that already approved for the relocation of the cages formerly located in the South Comino Channel are located within the marine Special Area of Conservation: Żona fil-Baħar fil-Grigal ta' Malta that stretches from Reqqa Point in Gozo to Portomaso in St Julian's, Malta and the Special Protection Area: Il-Baħar ta' madwar Għawdex (see **Figure 2.15**). It should be noted; however, that even the former cages off St Paul's Bay were located in these same protected areas, as are several other maritime uses.

Avifauna

2.34. The location of an aquaculture zone in the north of the island will also need to consider possible impacts on seabird populations.

2.35. In 2013, a proposal for a Marine International Bird Area (IBA) in the north of Malta was accepted by BirdLife International in recognition of its international importance for two globally and one regionally threatened bird species. The species in question are the Yelkouan Shearwater (*Puffinus yelkouan*) and the Scopoli's Shearwater

(*Calonectris diomedea*) at Rdum tal-Madonna, in Malta, and Ta' Cenc, in Gozo and the migratory Ferruginous Duck (*Aythya nyroca*). (The Malta Independent, 2013[17]).

2.36. One of the aims of the European IBA designation is to help identify sites for inclusion in the EU's Natura 2000 Network of protected sites. The area designated as an IBA was eventually also identified as a marine SPA under the Birds Directive as part of a wider exercise aimed at protecting waters around the Maltese Islands for their importance for avifauna.

2.37. The Malta-Gozo Channel Marine IBA is an area of open water extending from Ta' Cenc in Gozo to the sea 7 km off l-Irdum tal-Madonna in Mellieha and encompassing the Malta-Gozo Channel (Raine, A.F., 2011[18]).

2.38. The ornithological importance of this area is three-fold (Raine, 2011):

- It is an important rafting site for both *Puffinus yelkouan* and *Calonectris diomedea*, with concentrations of the former off Rdum tal-Madonna to the east and the latter off Ta' Cenc to the west;
- Both species also use the channel itself (often in large numbers) before returning to their breeding colonies; and
- The channel is also important for migratory ducks, forming a bottleneck through which they pass in the thousands during spring and (to a lesser extent) autumn migrations.

2.39. Rafting birds can be disturbed by boats and offshore developments, illegal hunting, light and noise pollution from pleasure craft.

2.40. Important rafting sites were identified as part of a long-term study by BirdLife and on which the marine IBA proposal was based. Logger and observation data were used to determine the extent of the seaward extension of the colonies' range for feeding, moulting, and rafting, which were set at 7 km for *Puffinus yelkouan* and 5 km for *Calonectris diomedea,* as buffers from the respective colonies on land (see **Figures 2.16** and **2.17**, respectively).

2.41. As regards *Aythya nyroca*, the western and central sections of the Malta-Gozo channel were identified as being the most important for the species for rafting (see **Figure 2.18**), where they can often spend several hours before continuing their migration through the channel.

2.42. When the species-specific areas were combined, a single marine IBA under the

[17] The Malta Independent, 2013. 'Malta's Galapagos': Gozo Channel Malta's first marine important bird area. Published30 August 2013; www.independent.com.mt.
[18] Raine, A.F., 2011. Proposal for the creation of the Malta-Gozo Channel Marine Important Bird Area. Birdlife Malta; 11p.

criteria of BirdLife International was created. The extent of this IBA is shown in **Figure 2.19**.

2.43. The proposed relocation of the tuna cages from the original location some 1.8 km from St Paul's Bay to the application 5 km offshore, means that the cages will be moved from an area that was outside the IBA to one that is inside. The proposed cage site is located towards the edge of the buffer for the *Puffinus yelkouan* colonies at Rdum tal-Madonna.

2.44. According to Raine *et al.*, 2010[19], the majority of the rafting sites were situated in a band of sea directly opposite the colony across the waters off the eastern end of the Malta-Gozo Channel and up to the south-eastern tip of Gozo. The average distance to the colony of these locations was 3.1 ±0.2 km, with a median of 2.8 km (minimum 0.7 km and maximum 7 km). In addition, the vast majority of individual birds (80%) for which a location was identified, were found to raft in the waters adjacent to the colony up to 4.5 km offshore. In this case, the average distance of a rafting site to the breeding colony was 3.7 km ± 1.2 km, with a median of 2.0 km (minimum 0.2 km and maximum 16.6 km).

2.45. Although the majority of the rafting takes place closer to the cliffs (Meirinho & Ramirez, 2010[20]) (see **Figure 2.20**), the use of the entire area (and beyond) by the seabirds cannot be discounted. However, in terms of marine uses, it must also be considered that the bunkering zone at is-Sikka l-Bajda (which regularly attracts large vessels and their associated operations) is located closer to shore and intermediate between the colonies and the proposed cage site.

2.46. Another consideration is that the breeding season for *Puffinus yelkouan* is February to July (Raine, 2011), whereas the tuna are caught in May/June and transported to Malta in June/July, with caging taking place at the very latest by mid-August. This means that in the peak of the breeding season, the offshore site is not utilised and by the time the cages are re-established and the tuna are caged, the breeding season would be over or nearing the end, potentially minimising the effects on the rafting population. Nonetheless, monitoring of the situation would be warranted.

[19] Raine, A.F., Raine, H., Meirinho, A., Borg, J.J., 2010. Rafting behaviour of Yelkouan Shearwater *Puffinus yelkouan* breeding at Rdum tal-Madonna, Malta. Il-Merill, 32: 26-30.

[20] Meirinho, A. and Ramirez, I., 2010. Marine IBAs in Malta. Preliminary results. Project LIFE 06NAT/MT/000097. Sociedade Portuguesa para o Estudo das Aves, Lisboa; 33pp + 1 Appendix.

Figure 2.10: Benthic video survey area

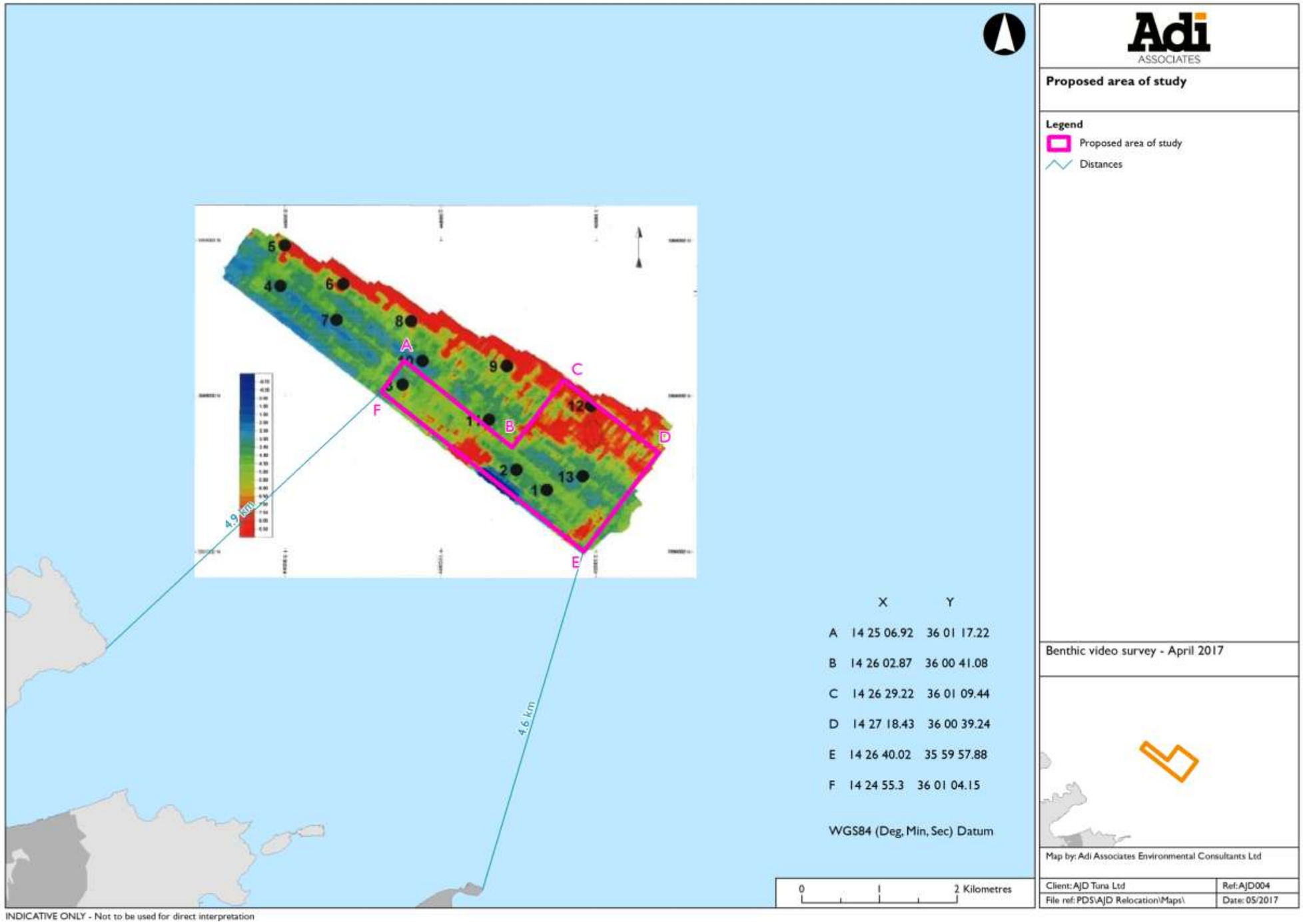


Figure 2.11: Video survey transects

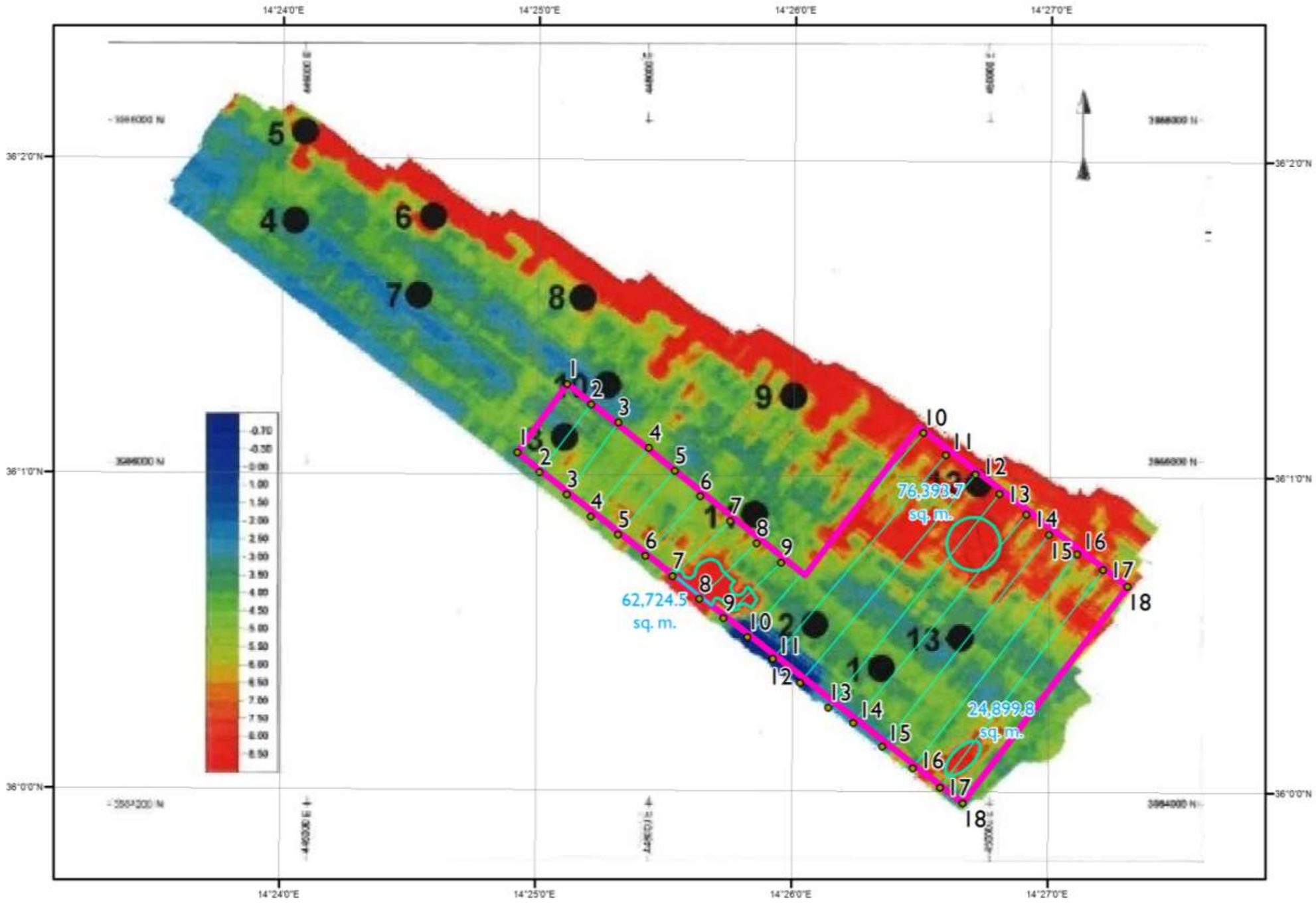


Figure 2.12: Extended area of survey

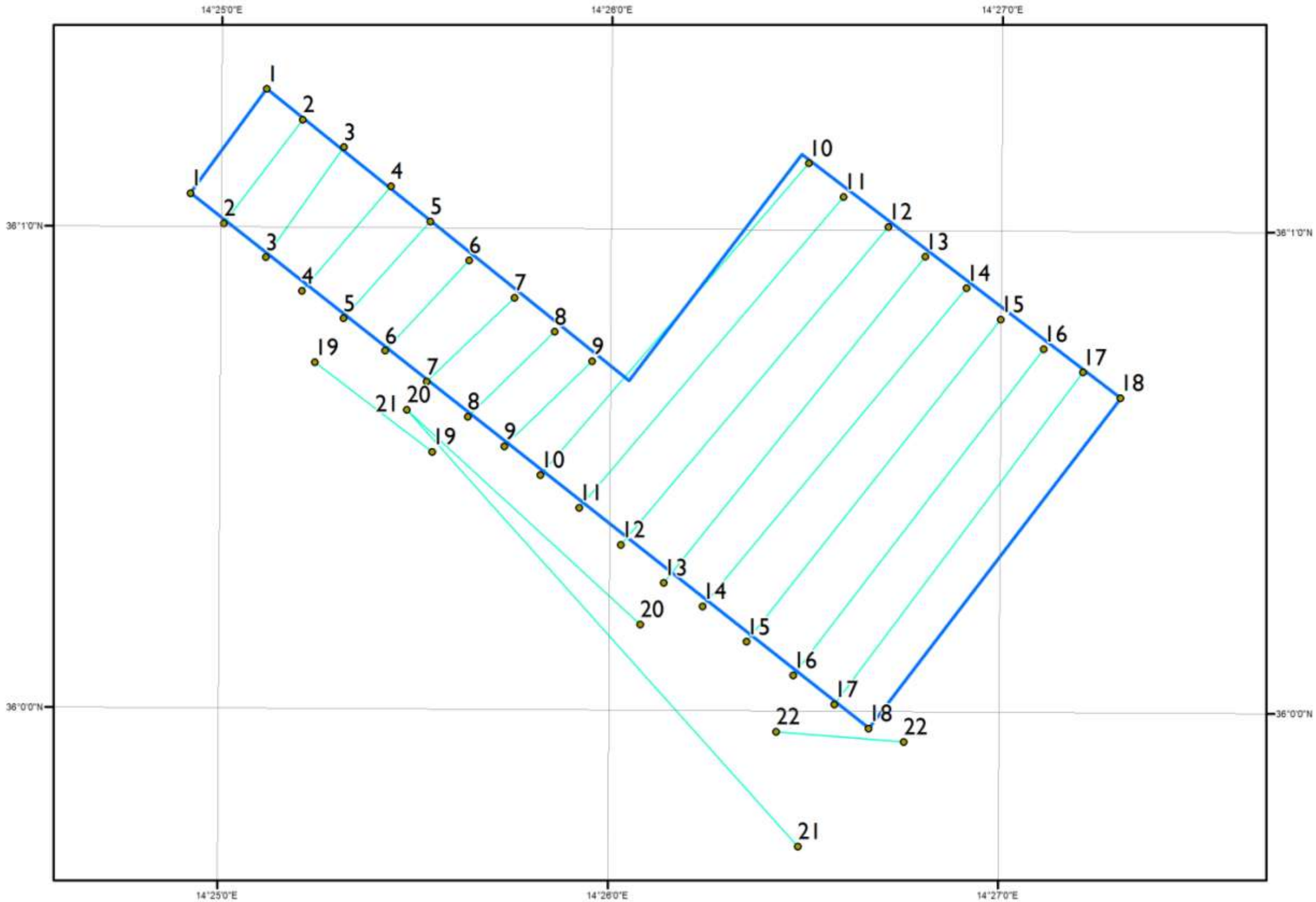


Figure 2.13: Benthic assemblages map

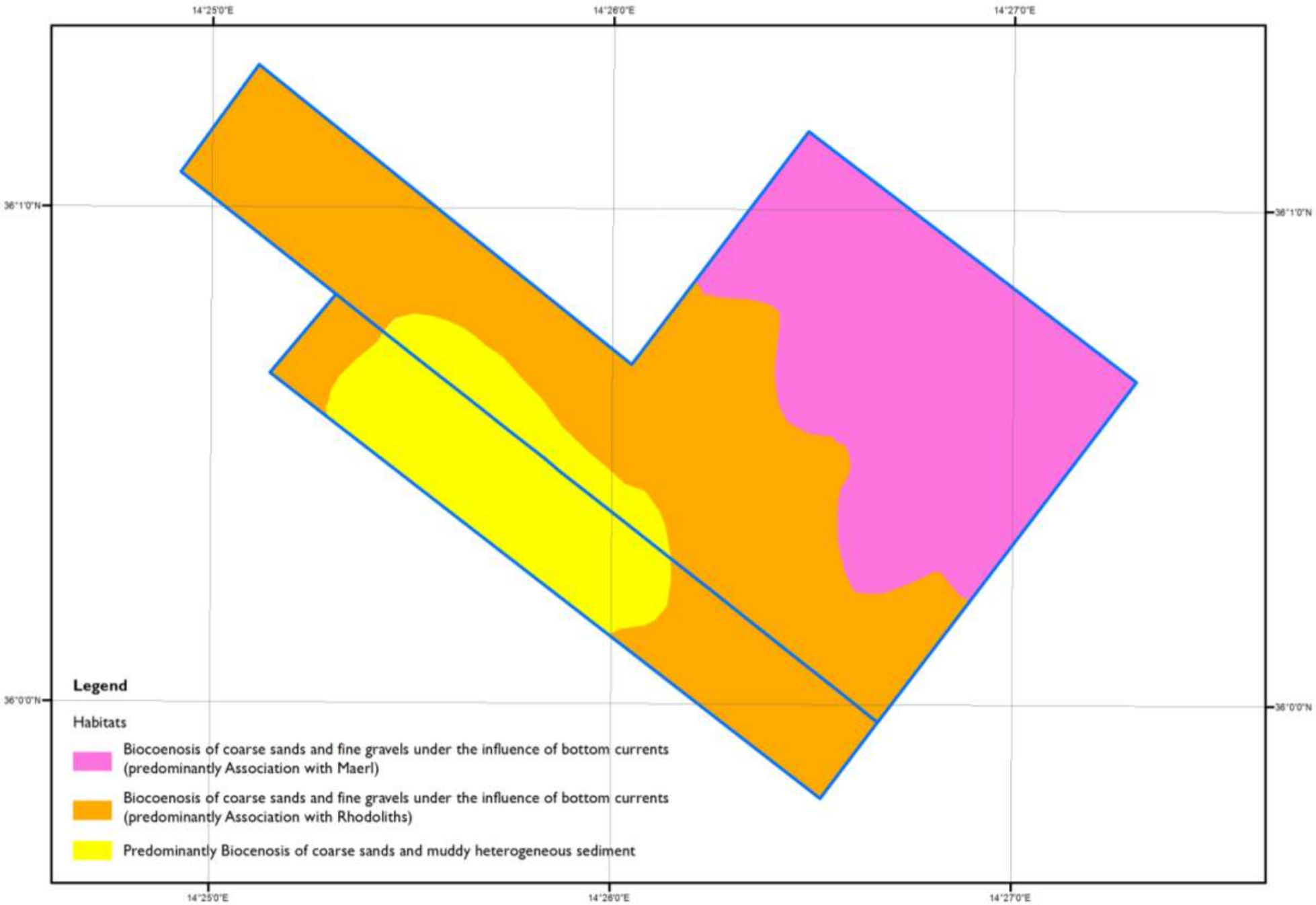


Figure 2.14: Proposed new location of cage site following results of benthic survey

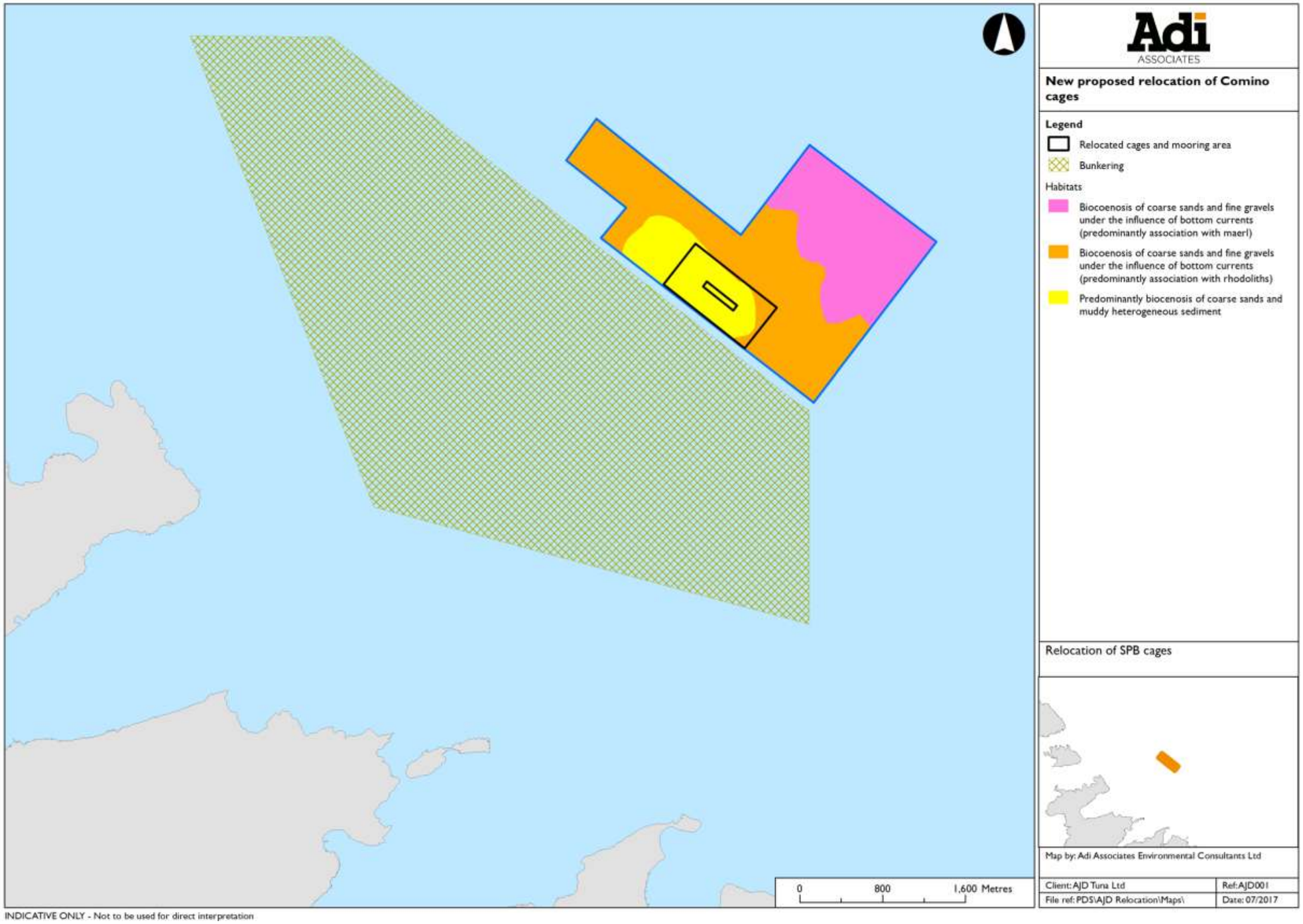


Figure 2.15: Location of approved and proposed cage sets within the marine protected areas in the north of Malta

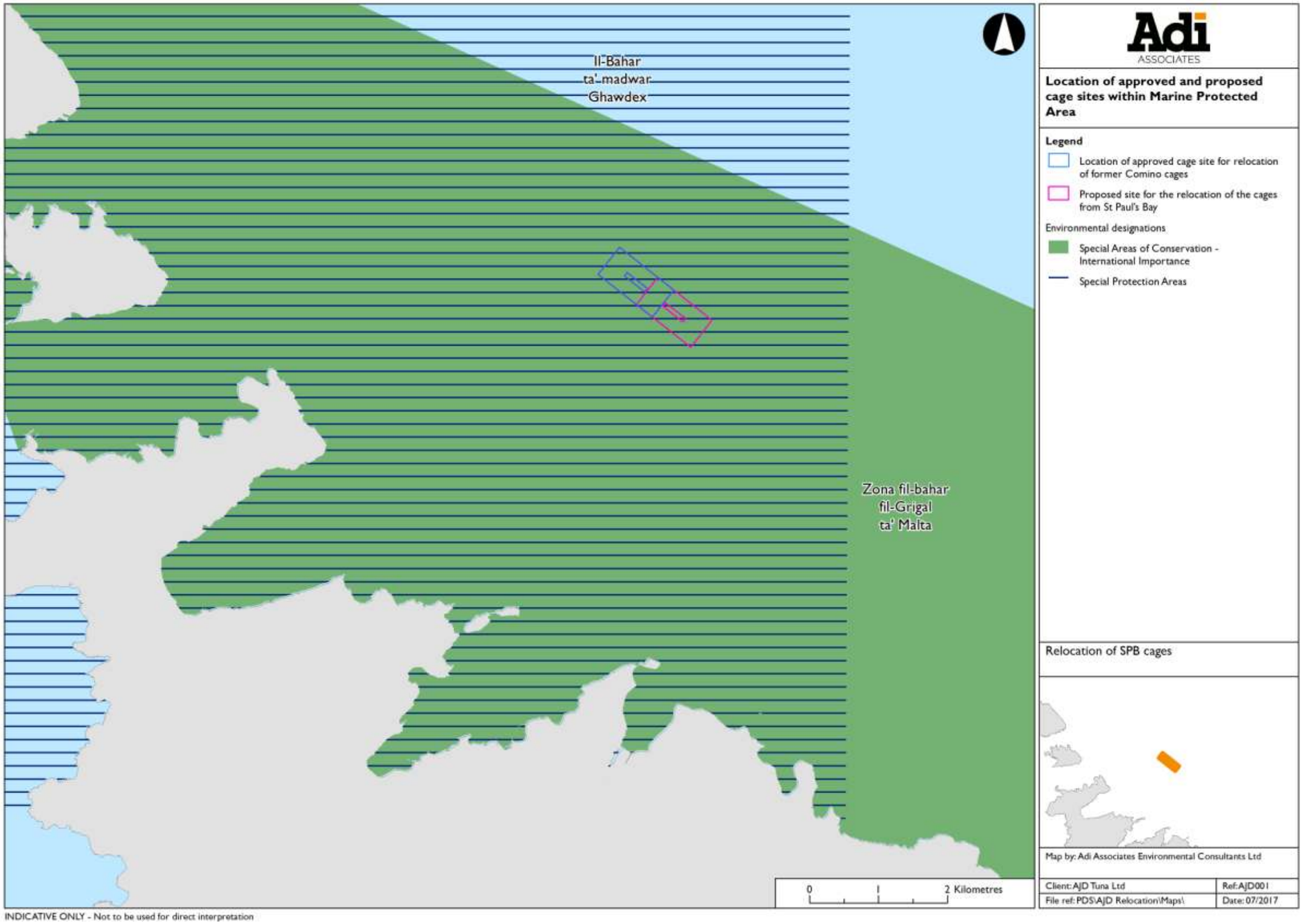


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Figure 2.16: Critical rafting area for *Puffinus yelkouan* breeding at Rdum tal-Madonna (Raine, 2011)

(NOTE: The white box gives the approximate location of the proposed relocation site)

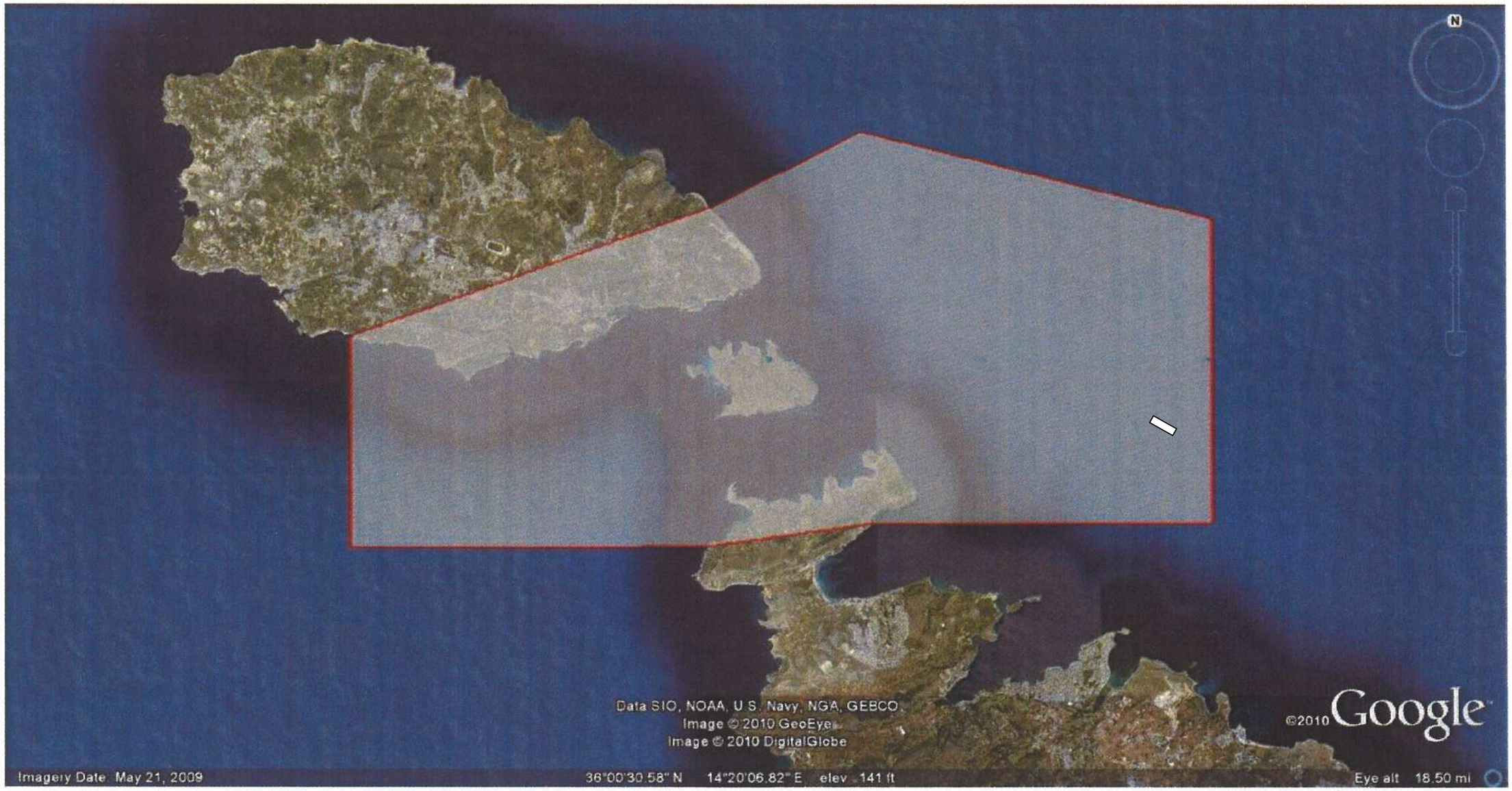
Figure 2.17: Critical rafting area for *Calonectis diomedea* breeding at Ta' Cenc (Raine, 2011)

(NOTE: The white box gives the approximate location of the proposed relocation site)

Figure 2.18: Concentration area for *Aythya nyroca* and other migratory ducks during the migration period (especially spring) (Raine, 2011)

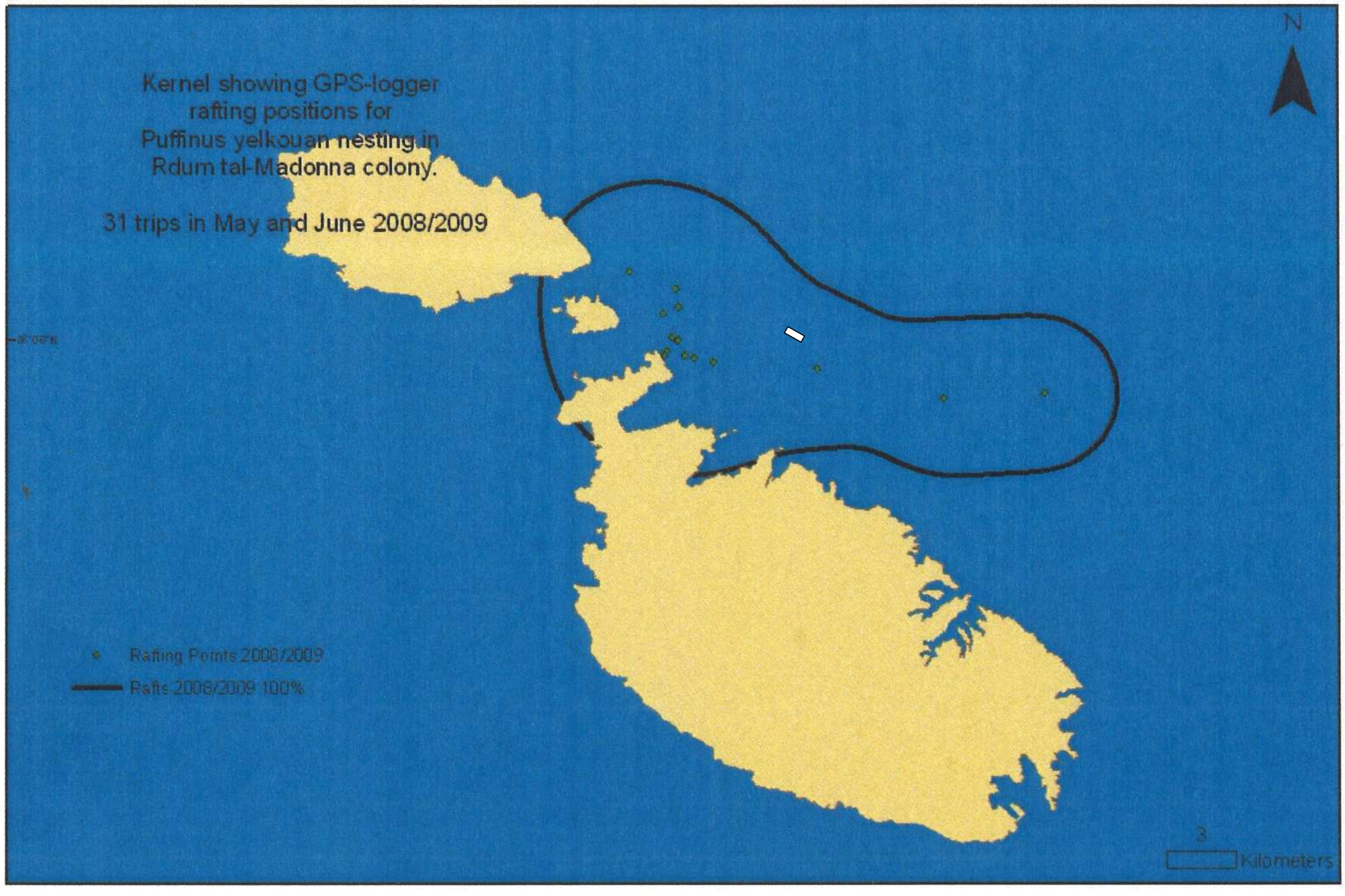
(NOTE: The white box gives the approximate location of the proposed relocation site)

Figure 2.19: The Malta-Gozo Channel Marine Important Bird Area (Raine, 2011)



(NOTE: The white box gives the approximate location of the proposed relocation site)

Figure 2.20: Map showing GPS-logger rafting positions for *Puffinus yelkouan* nesting at Rdum tal-Madonna colony (Meirinho & Ramirez, 2010)



(NOTE: The white box gives the approximate location of the proposed relocation site)

3. DESCRIPTION OF THE SCHEME

3.1. As mentioned in **Chapter 1**, the Scheme subject of this application is for the temporary relocation of the cages from the former St Paul's Bay tuna farm to a site further offshore from Is-Sikka l-Bajda that would allow the tuna operations to continue while honouring the unilateral agreement by Malta Mariculture Ltd / AJD Tuna Ltd in favour of the Planning Authority that required the original tuna farm to be removed by the end of May 2017. This would be a temporary situation until such time that the new north Aquaculture Zone (being pursued by the Department of Fisheries and Aquaculture) is formally set up.

3.2. Following the surveys described above, the preferred location is that shown on **Figure 3.1**. This is part of the site identified through the benthic video survey as consisting predominantly of a biocoenosis of coarse sands and muddy heterogeneous sediments. Other sites previously identified as possible locations for the relocation of the cages prior to the conduct of the benthic video survey have been subsequently shown to be rich in maerl and/or rhodoliths such that they are not deemed to be suitable to locate tuna farming operations in view of significant environmental impacts on the structure and function of this important habitat.

3.3. From a benthos point of view, the site shown in **Figure 2.14** and **Figure 3.1** is considered to be suitable for the temporary deployment of the Scheme. Six cages are proposed to be deployed at this temporary site; four cages will have a diameter of 50 m and a net depth of 35 m and two larger cages with a diameter of 60 m and a depth of 38 m. **Figure 3.2** illustrates the proposed cage layout. Malta Mariculture Ltd and AJD Tuna Ltd together currently have ICCAT permission to stock 3,300 tonnes of tuna between the St Paul's Bay and Comino Farm licenses (see **Appendix 3**). The Scheme aims to stock approximately 200 tonnes of biomass per 50 m diameter cage and 350 tonnes of biomass per 60 m diameter cage for a total of 1,500 tonnes of fish. This, together with that already approved for AJD Tuna Ltd, would equate to a total biomass of 3,000 tonnes.

Vessels

3.4. The Scheme will essentially operate in the same way that Malta Mariculture Ltd has operated its tuna farm over the past 17 years. The following lists the types of vessels used in the operations, all of which are registered with ICCAT, as per requirements:

- One feeding vessel used to transport the feed to the cages;
- One crew service ship;
- One service boat;
- Two other feeding vessels are leased as required;
- Cleaning vessel (leased); and
- Vessel for transportation of offal waste offshore (see below).

3.5. Malta Mariculture Ltd's main client sends over the processing ship where the fish are transferred and processed following harvesting.

Figure 3.1: Proposed location for temporary relocation of cages (including coordinates)

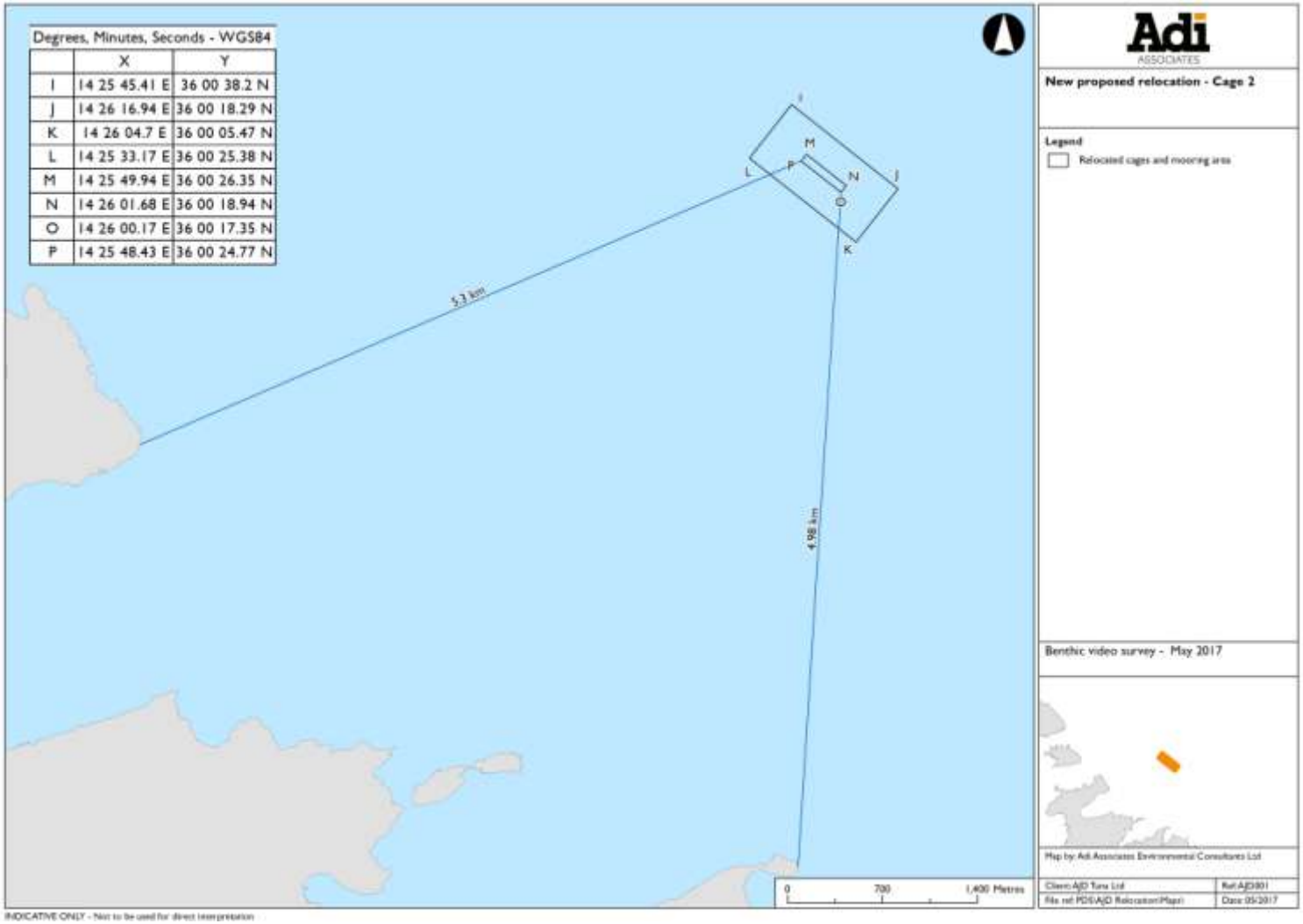
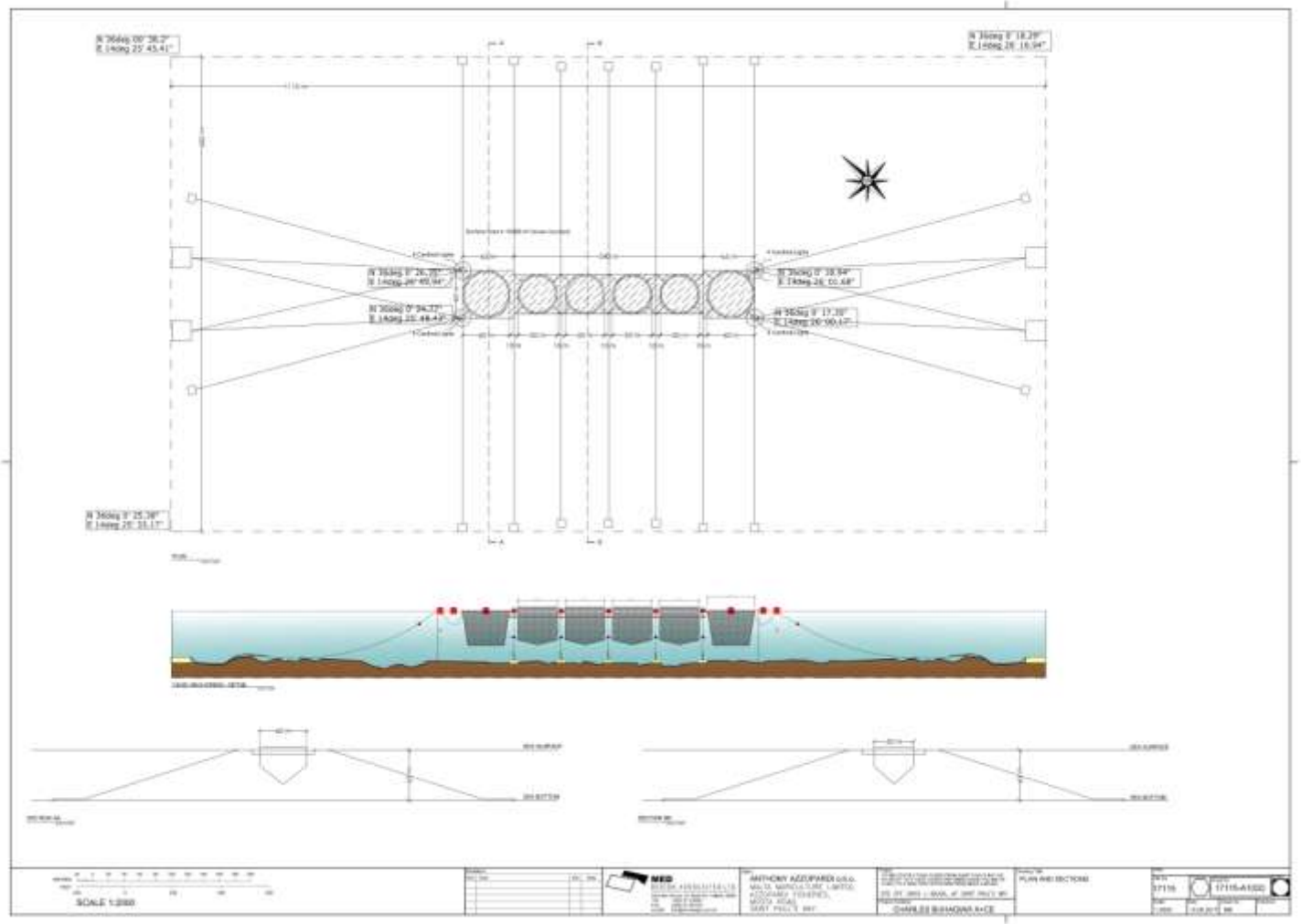


Figure 3.2: Proposed cage layout at new site



WASTE MANAGEMENT

3.6. Wastes generated by the Scheme are likely to include:

- Packaging waste from importation of baitfish;
- Thaw water from baitfish preparation;
- Oily slick (from baitfish);
- Uneaten feed;
- Fish excreta;
- Dead tuna;
- Blood (during slaughtering);
- Wastewater from onboard processing of fish (mixture of blood, water, and offal);
- Offal (gutted heads, tails, and internal organs);
- Algal and other net fouling marine growth; and
- Marine litter.

Packaging waste and thaw water

3.7. This waste stream is generated as a result of the importation of baitfish. AJD Tuna Ltd / Malta Mariculture Ltd has a contract with a third party who takes the packaging waste away for reuse. Once on the flat bed trailer, the thaw water is collected in a specially installed container retrofitted on the flat bed trailer (see **Figure 3.3**). The discharge of the thaw water will be regulated by the environmental permit.

Oily slick

3.8. The oily slick generated at the farm is essentially a combination of fish oils, melting ice, body fluids, and fish mucus released from the baitfish as it thaws in the feeding cage. The slick is made up of mercaptan organic compounds; the presence of sulphur is responsible for the nuisance odours. These compounds are labile and within 4 days decompose into natural compounds and elements to re-enter the natural reserve of element resources in the marine environment.

3.9. Although this oily slick can extend over a considerable area as it is carried on the surface of the water by surface currents, in reality it is restricted to the immediate surface of the sea and does not dissolve into the rest of the water column, until it is dispersed or evaporates. In summer 2016, there were particularly vociferous complaints from other marine users (especially bathers, divers, and boaters) who made specific reference to the amount and consistency of the oily slick. According to AJD Tuna Ltd / Malta Mariculture Ltd, the main reason for this was the purchase of baitfish from a different supplier (in Morocco), which turned out to be of inferior

quality. The baitfish supplier has since been changed and the fish are being imported from the Netherlands.

3.10. Nonetheless, Malta Mariculture Ltd has undertaken to deploy oil booms inside each tuna cage to contain any oil releases inside the cages (see **Figure 1.12**). Following this, it will also deploy oil skimmers from a cleaning vessel to attempt to collect as much of this oily slick as possible after feeding (see **Figure 1.13**). The skimmer is operated by a diver who collects the floating oil, which is then transferred to an IBC on board the vessel. Once full, the IBC is transferred to land where the collected materials are allowed to separate and the water phase decanted. The oily phase is collected for disposal. Malta Mariculture Ltd is exploring options for selling these fish oils; in the meantime, the collected oil will be managed via a waste oils recycling company.

3.11. Relocation further offshore will help to reduce the impact of this discharge on inshore locations and uses. This has already been seen at the south Aquaculture Zone; although under unfavourable sea current conditions, the slick can still reach the shore if not collected. It is therefore recommended that the deployment of oil booms inside the cages and the use of skimmers, even if not 100% effective, should be enforced, possibly through the environmental permit.

Uneaten feed

3.12. In addition to increasing the costs of the fish farming operation, uneaten feed (especially the baitfish used in tuna penning operations) passes through the net and settles on the seabed, which, depending on the amounts lost in unit time, can result in overloading of the scavenging community and an accumulation of organic carbon and nitrogen in the sediment beneath the cages or in the direction of the prevailing currents. This would lead to an impoverished benthic community compared to the *status quo* prior to the deployment of the farms, a situation that would be more of concern when farms are placed above important seabed habitats such as maerl grounds or *Posidonia* meadows. It is for this reason that the location of tuna farms on bare sand bottoms has been preferred.

3.13. The capacity of the environment to assimilate the pollutants settling on the seabed depends largely on the amount of settlement of material and the capability of seabed bacteria and scavengers to utilise this material.

3.14. Malta Mariculture Ltd and AJD Tuna Ltd have been carrying out monitoring of the seabed, sediment, and water quality as per permit conditions for several years. In the early years of farm operation (between 2001 and 2004) towards the end of each penning season, significant amounts of dead fish were recorded littering the seabed in the area lying directly below the pens. As summarised by Borg (2014)[21], this resulted in changes to the physical and biological characteristics of the seabed. By the end of

[21] Borg, J.A. 2014. Azzopardi Fisheries Tuna Penning Project: Report on a video survey of the seabed in the vicinity of the tuna-pens made in April-July 2014. Ecoserv Ltd.

the penning season little of the uneaten dead fish remained although thick layers of fish bones and decomposing organic material were recorded by Borg (2014). Borg (2014) observed that once the source of the impact was removed, i.e. following harvesting, the benthic environment eventually largely returned to its original state, as attested to by the shift in species that dominate the benthic environment, i.e. during feeding the area is dominated by scavenger and detritus feeders, once the uneaten fish is gone, the site returns to its previous ecology and species typical of a bare sand habitat are again noted.

3.15. In 2005, the monitoring surveys recorded a significantly lower amount of uneaten fish under the cages indicating an improvement in feed management. This trend continued up to 2007 although the benthic ecology was noted to have altered and species typical of bare habitat were absent from the area.

3.16. In 2008, large amounts of uneaten feed were again noted and high populations of detritus feeders and scavengers were recorded. Borg (2014) emphasised that when the amount of uneaten feed overwhelms the scavenger feeders, the feed decomposes slowly resulting in a significant adverse effect on the benthic habitat. Eventually, anoxic conditions persist such that the environment is no longer favourable for scavengers. This means that it is left to the physical environment, waves and currents, to disperse the decomposing material.

3.17. The situation with feed management improved again in 2009 although the changes to the seabed ecology remained.

3.18. The previous improved situation with feed management appeared to have reversed again in 2010. The surveyors noted significant differences between the amounts of uneaten feed beneath different cages. Similar observations were recorded in 2012. AJD Tuna Ltd assigns specific divers to specific cages and therefore they can pinpoint who may need additional training with regards to feeding management.

3.19. Also in the 2012 survey large whole dead tunas and decomposing parts were recorded on the seabed. The site foreman for AJD Tuna Ltd and Malta Mariculture Ltd claimed that the source of this tuna was not the tuna farm. Amateur fishermen that angle around or in the vicinity of the fish farms often capture then release (accidentally or deliberately) wild tuna that may be attracted to the area. This claim could not be confirmed, however.

3.20. In 2014, uneaten fish was only recorded underneath one of the nine pens. The reason for this was attributed to the fact that the survey was carried out during the fallow period. Dead specimens of other organisms such as sea urchins and bivalves, that form part of the fouling community on the nets, were also recorded in places under the cages. During the survey, the scientific divers removed the first few centimetres of the surface sediment, which uncovered black anoxic layers. Particulate organic matter was released from the sediment into the water column when the sediment was disturbed.

3.21. The 2014 survey also recorded the alien alga *Caulerpa cylindracea* in places under most of the cages. A pink filamentous alga, possibly *Lophocladia* sp. was also present. Both species were located in patches of coarse sediment. The survey again confirmed the alteration of the benthic ecology in the area.

3.22. With respect to sediment analysis, except for the initial year, the results indicate that the parameters tested for, i.e. sediment grain size, organic carbon content, organic nitrogen content and, recently, organic phosphorus content, as well as heavy metals and organic compounds were not altered as a result of the tuna penning activities (Borg *et al*, 2013)[22].

3.23. With regards to water quality, Borg & Evans (2016)[23] concluded that overall, the AJD Tuna Ltd's penning activities do not appear to have affected the water quality in the vicinity of the farms in terms of the parameters tested for; however, a fishy odour was recorded and a film of fish oil and residues at the water surface were recorded at two of the five monitoring stations.

Fish excreta

3.24. Like uneaten feed, fish excreta contain or release ammonia, nitrates, and phosphate in soluble form. These nutrients can enhance the growth of marine plants and algae (including phytoplankton). Some of these nutrients are taken up by algae and net-fouling assemblages and also by benthic dwellers and scavengers. Faeces are nitrogen depleted and phosphorus enriched compared to the feed (Fernandes *et al*., 2007)[24]. Fernandes *et al* (2007) studying dissolved nutrient release from solid wastes of Southern Bluefin Tuna (*Thunnus maccoyii*) identified that the phosphorus available for leaching from baitfish and faeces of baitfish-fed tuna was around 17-21% whereas the proportion of soluble nitrogen was 35-43%. They concluded that more than 90% of nitrogen loads and approximately 50% of phosphorus are likely to be released into seawater before the solid wastes reach the seafloor.

Dead tuna

3.25. Tuna deaths are mainly a result of stress or panic, especially when the nets billow under strong currents. The number of deaths is limited as far as possible by closely monitoring the tuna and culling any fish that shows signs of stress or are moribund. Hence, few deaths actually occur.

Blood

3.26. As explained, the tuna have to be killed within a short time interval so as to avoid a sudden increase in body temperature that would negatively affect the quality of the

[22] Borg, J.A., Debono, S., Evans, J. 2013. Azzopardi Fisheries Tuna Penning Project: Environmental Monitoring Programme (Sediments) – Report on analyses of sediment samples collected in October 2012 from Azzopardi Fisheries' tuna penning site and control sites, off the St Paul's Bay/Qawra coast. Ecoserv.

[23] Borg, J.A., Evans, J. 2016. Azzopardi Fisheries Ltd Tuna Penning Activities: Report of a water quality survey at Azzopardi Fisheries Ltd's tuna penning site off the St. Paul's Bay/Qawra area, made in July 2016. Ecoserv.

[24] Fernandes, M., Angove, M., Sedawie, T., Cheshire, A. 2007. Dissolved nutrient release from solid wastes of southern bluefin tuna (*Thunnus maccoyii*, Castelnau) aquaculture. Vol 36 (4). Aquaculture Research.

meat. Some blood is released into the sea when the fish are killed and handled prior to being transported to the processing vessel.

3.27. The presence of blood also often raises questions on potential predator attraction. Whereas this possibility cannot be discounted, to date there has been no evidence that this activity attracts sharks or other predators. Indeed, no such occurrences have been reported in the 17 years since the first tuna farm was set up locally.

Wastewater from onboard processing of fish (tuna)

3.28. The further processing of the tuna onboard the service vessels invariably results in the generation of wastewaters mixed with blood and possibly some offal. The vessels have holding tanks where wastewater is collected (Azzopardi, C., pers. comm.; Nov 2016).

Offal

3.29. Tuna processing creates a substantial amount of offal, which is composed of the internal organs, the tails, and the heads of the tuna. As identified earlier, during harvesting, the farm generates between 8 and 10 tonnes of offal per day. Despite an initial policy and regulatory direction to transport this waste back to land for incineration, the incinerator at the abattoir does not have the capacity to process the amount of waste generated during this period and thus no longer accepts this waste except possibly in small amounts. In view of this, the accepted practice over the past years has returned to offshore offal disposal but as discussed earlier, if alternative disposal options are identified, offshore disposal will be stopped. Currently, a VMS-equipped vessel[25] takes the waste from the processing vessel and transports it further offshore to a dumping site as agreed with the Competent Authorities. The vessels are closely monitored by the Department of Fisheries and Aquaculture to ensure that the offal is dumped at the designated sites. As mentioned, it appears that ERA is looking towards curtailing this practice.

Net fouling marine growth

3.30. Marine growth on tuna nets is removed through air drying on the collars and later by scraping on land. The growth that is removed on land is disposed of as organic waste (see earlier).

[25] VMS (Vessel Monitoring System) is a satellite surveillance system primarily used to monitor the location and movement of commercial fishing vessels and other craft. The system uses satellite-based communications from on-board transceiver units, which certain vessels are required to carry. The transceiver units send position reports that include vessel identification, time, date, and location, and are mapped and displayed on the end user's computer screen. Each vessel typically sends position reports once an hour, but these can be increased when the vessel is approaching an environmentally sensitive area. Alerts can be sent to the VMS technicians and other personnel when a particular vessel location might require additional inquiry or contact with the vessel operator. VMS allows enforcement to use advanced technologies to monitor compliance, track violators, and provide substantial evidence for prosecution. (see www.nmfs.noaaa.gov)

Marine litter

3.31. Other wastes generated by the farms could include anthropogenic material such as rope, boxes, and municipal-type wastes from the service vessels that may occasionally find their way overboard. The monitoring reports for this site have repeatedly made reference to the presence of anthropogenic waste associated with the fish farm operations on the sea bed.

EMPLOYMENT

3.32. AJD Tuna Ltd / Malta Mariculture Ltd currently employ 40-45 full-timers and 40 part-timers. Employees include divers, boatmen, handymen, and drivers. The number of employees is expected to remain the same following relocation of operations.

Figure 3.3: Collection of thaw water from trailer

4. POTENTIAL ENVIRONMENTAL IMPACTS

4.1. Environmental impacts can be both negative as well as positive, and their assessment is important so as to better define the effects that a proposal may have on its receiving environment. This section of the Project Description Statement identifies a preliminary list of the potential environmental impacts of the Scheme; the list identifies only those impacts that may be potentially significant.

- **Impacts on the benthic environment during deployment of moorings;**
    - The moorings will have a direct impact on the area of seabed they are placed on. While the moorings are not large, the impact would depend on the type and sensitivity of the seabed in the application site. The location of the cage site on a seabed that predominantly consists of a biocoenosis of coarse sands and muddy heterogeneous sediments greatly minimises the impact as opposed to the nearby maerl beds and rhodolith-rich sands. It is important that while the farm will be located on the sandy seabed, as much as possible, the mooring blocks that will anchor the cages will also be located on the sandy seabed. Should any mooring blocks not be able to be placed within the sandy seabed area (due to the mooring configuration and water depths combination), their deployment should avoid completely the maerl beds.

- **Impacts on the benthic environment during operation;**
    - The main impact on the benthic environment during the farming operations is from the loss of materials, the settlement of uneaten baitfish on the seafloor, and settlement of fish faeces. The settlement of organic matter on the seabed would typically attract benthic scavengers to the area, which could affect the natural environment of the seabed. Locating the cages on the sandy seabed minimises the effect of the farming operations compared to a farm located on the adjacent maerl beds or rhodolith sands. Notwithstanding, impacts on the seabed are still anticipated. These are mostly a function of the operational effort at the farm and impacts can be limited if good operational practices are maintained at all times. Impacts are expected to be similar to those recorded through the monitoring reports at the former cage site off St Paul's Bay. Efforts should be made to improve the operational procedures to minimise loss of baitfish and other materials.

- **Impacts on sediments and water quality during operation;**
    - The main impacts on the sediments and the water column will be from waste releases (faeces from the fish and oily scum from the baitfish).

- **Impacts from waste generated during operation;**
    - The main waste stream from the tuna farming operations is the offal from the harvested fish. Other waste streams include carton boxes and plastic

bags from the importation of baitfish. Each farm should properly manage its waste. As part of the Environmental Permit, Malta Mariculture Ltd will need to establish an Environmental Management System for its entire operation and will follow the waste management provisions of the environment permit and keep detailed waste records.

- **Other impacts from farm operations;**
    - Other concerns have been raised by ERA with regards to noise and light pollution and potential scour around mooring blocks. These impacts are not considered to be significant since tuna farms are not noisy operations and minimal lighting is used, largely restricted to navigational lights around the farm's perimeter, which are required for safety of navigation. Support vessels would occasionally use onboard lights when approaching the farms or when activities are undertaken at night or early morning (e.g. delivery of baitfish to the cages early in the morning), but such light is limited and of short duration. Scour around mooring blocks is likewise not considered to be significant. In the event of scour, this would likely be restricted to the immediate vicinity of each individual block in a similar situation to that often observed around scuttled vessels.
- **Impacts on seabird populations; and**
    - The location of the proposed cage site will be further offshore than the site occupied by the tuna farm since 2000. This area in the northern part of Malta is used for rafting and foraging purposes by the Yelkouan shearwaters (*Puffinus* yelkouan) nesting in the Rdum tal-Madonna colony in Mellieha. The rafting behaviour of these seabirds was studied by BirdLife Malta as part of an EU-funded LIFE project and they showed that the vast majority of the rafting takes place in an area of sea directly opposite the colony and within 4.5 km of the shore. The location of the cages beyond 5 km from the Rdum tal-Madonna colony serves to minimise the impact on the rafting birds. In addition, as explained above, the large bunkering area of Is-Sikka l-Bajda, with its large vessels and lights / noise, is located in between the Rdum tal-Madonna colonies and the proposed relocation site. As reported in various studies on the area, over 80% of the birds raft in close proximity to the nesting colonies and significantly closer to the shore than the proposed cage site; however, the range for rafting exceeds this and therefore, the potential of some minor impact on the seabirds from the farm operations is still possible.
- **Indirect impacts on the population of Atlantic Bluefin Tuna and subsequent secondary effects on the food chain.**
    - The tuna farming operations have their toll on the wider fish populations. The tuna population is regulated very closely by ICCAT, which adjusts fishing quotas regularly to maintain the population levels. On the other hand, there are no such regulations on the capture of the baitfish species,

and the impact of this fishery can be substantial on the fish stocks in question.

CUMULATIVE EFFECTS

4.2. In their letter dated 6 July 2017, ERA requested an assessment of the cumulative effects of this proposal together with the nearby fish farm/s in order for ERA to determine requirements in terms of the EIA Regulations and the Flora, Fauna and Natural Habitats Regulations. This especially in view of the provisions of Section 12 of Schedule 1A of the EIA Regulations, which deal with the Cumulative Effects of Projects. Such an assessment can only be a qualitative one since development permit application PA 03072/17 was approved without a detailed assessment in view that the proposal fell below the thresholds set in the EIA Regulations for aquaculture operations; also, it did not require an Appropriate Assessment under the Habitats Directive as screened by ERA. Hence, the following sections consider the potential cumulative effects of relocating the St Paul's Bay cages to this site further offshore and in close proximity to the relocated cages from Comino at a qualitative level based in part on the findings from past monitoring reports and the experience from tuna penning operations over the past 17 years.

4.3. The main considerations in this respect are that the location of these two sets of cages beyond 5 km from the shore frees up two sites located much closer to shore. In terms of **water quality / social effects** from the release of oily scum (as has been reported in recent years), locating the farms further offshore is positive as it serves to minimise the inconvenience. However, this alone might not suffice and therefore additional "at source" mitigation measures are required, as is the case with the proposed deployment of oil booms inside the cages and the collection of the oily material by means of skimmers. Locating the two sets of cages in close proximity does not affect this conclusion as long as all the cages are equipped with the oil booms and the two operations deploy the said skimmers. Indeed, the main mitigation remains the adoption and implementation of good operational techniques, which is not affected by cumulative issues.

4.4. The relocation of the cages, apart from consolidating the cages in one site instead of two, has also resulted in the use of a smaller area of sea.

4.5. As regards **benthic** effects, the proposed relocation site, adjacent to the approved cage site for the former Comino cages, is located on a sizeable patch of sandy seabed. The location of the farming operations on such a seabed greatly reduces the impacts on the benthic ecology and the biodiversity compared to the previous proposal to locate the cages further offshore (c. 7 km) but on maerl / rhodoliths. The seabed at the current location is actually similar to that at the original location further inshore and monitoring data over several years at the original site at St Paul's Bay has not

shown any long term appreciable change. As summarised by Borg (2014)[26], (see also a more detail explanation in Chapter 3 above) the initial years of tuna penning had resulted in loss of fish and accumulation of dead fish beneath the cages, which resulted in changes to the physical and biological characteristics of the seabed. By the end of the penning season little of the uneaten dead fish remained although thick layers of fish bones and decomposing organic material were recorded by Borg (2014). Borg (2014) observed that once the source of the impact was removed, i.e. following harvesting, the benthic environment eventually largely returned to its original state, as attested to by the shift in species that dominate the benthic environment, i.e. during feeding the area is dominated by scavenger and detritus feeders, once the uneaten fish is gone, the site returns to its previous ecology and species typical of a bare sand habitat are again noted. The seasonal nature of tuna penning (with operations taking place between July and November/December, allows the site to fallow for the rest of the year, giving it time to recover. In subsequent years, as the farming operations improved, significantly lower amounts of uneaten fish were recorded; however, the benthic ecology was noted to have altered and species typical of bare habitat were absent from the area (as the uneaten feed provided a source of nutrients). Borg (2014) emphasised that when the amount of uneaten feed overwhelms the scavenger feeders, the feed decomposes slowly resulting in a significant adverse effect on the benthic habitat. Conversely, if the farm operations are cautious and the amount of uneaten food does not overwhelm the scavenger community, the uneaten feed is removed from the system by the scavengers and detritivores. Eventually, if uneaten feed accumulates, anoxic conditions persist such that the environment is no longer favourable for scavengers. This means that it is left to the physical environment, waves and currents, to disperse the decomposing material. The settling faeces and uneaten feed can also affect the sediment characteristics beneath the tuna pens. Data from the monitoring reports shows that, with respect to **sediment** analysis, except for the initial year, the parameters tested for, i.e. sediment grain size, organic carbon content, organic nitrogen content and recently organic phosphorus content, as well as heavy metals and organic compounds were not altered as a result of the tuna penning activities (Borg et al, 2013)[27]. With regards to **water quality**, Borg & Evans (2016)[28] concluded that overall, the AJD Tuna Ltd's penning activities do not appear to have affected the water quality in the vicinity of the farms in terms of the parameters tested for.

4.6. As for the impacts on **avifauna**, although the relocation site is still located within the marine SPA / marine IBA, it is located beyond the area where the vast majority (80%) of the birds have been recorded to raft (4.5 km with a median of 2.0 km). The

[26] Borg, J.A. 2014. Azzopardi Fisheries Tuna Penning Project: Report on a video survey of the seabed in the vicinity of the tuna-pens made in April-July 2014. Ecoserv.

[27] Borg, J.A., Debono, S., Evans, J. 2013. Azzopardi Fisheries Tuna Penning Project: Environmental Monitoring Programme (Sediments) – Report on analyses of sediment samples collected in October 2012 from Azzopardi Fisheries' tuna penning site and control sites, off the St Paul's Bay/Qawra coast. Ecoserv.

[28] Borg, J.A., Evans, J. 2016. Azzopardi Fisheries Ltd Tuna Penning Activities: Report of a water quality survey at Azzopardi Fisheries Ltd's tuna penning site off the St. Paul's Bay/Qawra area, made in July 2016. Ecoserv.

location of the two sets of cages in close proximity to each other and occupying a smaller area of sea surface, in this case, is likely to be preferable rather than having two sites affecting two colonies. The removal of the cages from the Comino site, in particular, is expected to have a positive effect on the rafting of the *Calonectris diomedea* and the migratory ducks.

MITIGATION PROPOSALS

4.7. The main approach to mitigation lies in a two-pronged approach:

- Minimising the impact at source (e.g. by reducing the amount and nature of the discharges at a single location); and
- Ensuring that any impacts caused are remedied (e.g. recovery of tuna carcasses and cleaning of baitfish from the sea bed, collection of oily material released from baitfish, collection of anthropogenic materials, etc).

Both the above are mostly achievable through good farming practices and increased environmental awareness by employees. The requirement under the environment permit, for the tuna farming operations to follow an environmental management system is an important step to ensure that the impacts from the farm operations are minimised.

4.8. Based on the potential impacts identified above, the following mitigation measures would be appropriate:

- The deployment of the moorings to be properly planned and supervised by divers or video cameras to ensure that, as much as possible, they are placed on the sand and, if some have to be placed on the adjacent rhodolith sands to the north of the cage site, these are kept to a minimum and completely avoid the maerl beds;
- Farm operations to follow the provisions of the environment permit (to be issued by ERA) to very closely manage the creation of waste materials;
- Materials lost overboard should be kept to a minimum and attempts to immediately retrieve any materials that may be lost should be made;
- Feeding to be monitored closely by divers or video cameras to stop feeding when the tuna are satiated in order to minimise loss of uneaten baitfish and hence reduce impacts from feed settlement on the seabed and the concomitant organic enrichment;
- Ensure deployment of oil booms inside each cage to contain as much of the oily scum inside the cages. The oily scum is then to be scooped up by means of skimming equipment and collected in apposite containers for transfer to land for onward processing, treatment, or disposal;
- Implementation of a waste management plan for farm operations;

- Ensure that all offal resulting from the processing operations is collected and duly managed in accordance with the relevant permits (if the accepted method of disposal is through facilities on land, the offal is to be contained and transferred ashore for inward processing at licensed facilities; if the accepted method of disposal is through offshore dumping, then the offal needs to be properly managed, including through the supervision of the disposal boats through VMS and proper reporting measures);
- Follow a fallowing regime for the site following the annual harvest;
- Ensure that all farm operations observe ICCAT Regulations on the Bluefin Tuna fishery;
- Ensure that the cages are deployed a minimum of 5 km from the shore to minimise impact on seabird rafting;
- Include seabird monitoring as part of the environmental monitoring programme for the tuna farm. Any records of bird strikes or deaths inside the farm to be documented throughout the temporary operation of the farm from this location;
- Formulate and implement an environmental management plan and oil spill contingency plan for the farm.

4.9. In addition to the mitigation measures identified, greater vigilance by the regulatory authorities, improved monitoring regimes (especially monitoring of operations), and *ad hoc* inspections would also be advisable to improve the environmental performance of the industry in general.

4.10. It might also be opportune to re-visit the environmental monitoring regimes of the various aquaculture units in order that these are updated to reflect current realities and the experience of the past years.

Appendix I

Bathymetric & Seabed Survey Report

Report on a baseline survey of bathymetry, and of the physical and biological characteristics of the seabed, in an area off the northeastern coast of Malta, proposed for designation as an offshore tuna penning site, made in November 2016

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1. INTRODUCTION

1. Adi Associates Environmental Consultants Ltd, acting on behalf of their client AJD Tuna Ltd, have commissioned Ecoserv Ltd to undertake a baseline survey of the seabed in an area located off the northeastern coast of Malta, which has been identified for potential designation as an aquaculture zone. The main aims of the baseline survey within the identified offshore area are to collect data on bathymetry and on the main physical and biological characteristics of the site. The survey area, which is delineated by points A – D in Figure 1, is located off Mellieha Bay, further offshore from Is-Sikka Il-Bajda, off the northeastern coast of Malta. Admiralty charts indicate that water depth within the study area varies between 46 m and 100 m[1]. The survey area measures 5.86km along its longest NW – SE axis and 1.826 km along its longest SW – NE axis.

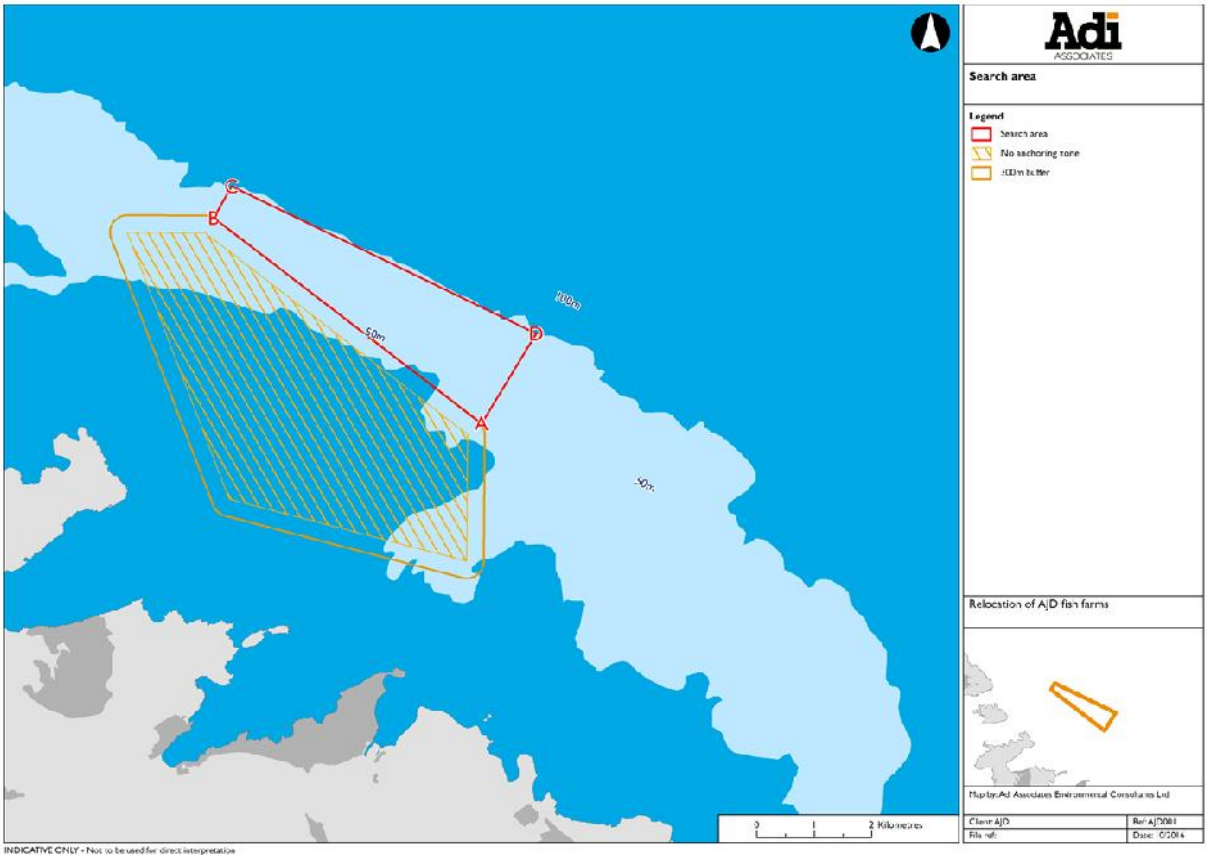

Figure 1. Map showing the survey area bounded by points A – D. Source: Adi Associates Environmental Consultants Ltd.

2. The present submission comprises the report of a baseline survey of bathymetry and of the main physical and biological characteristics of the seabed within the study area, made in November 2016.

[1] All water depth values stated in the present report are referenced to chart datum.

2. METHODOLOGY

Survey of bathymetry and physical characteristics of the seabed

3. Fieldwork in relation to the survey, made on 22 November 2016, was undertaken by a team of scientists from Geomara Ltd. The survey design ensured that all of the study area that could be accessed was ensonified to a high level. In general, the survey transect lines were orientated northwest – southeast, hence mostly parallel to the seafloor depth contours. Transect lines were planned and implemented in order to obtain 10% – 15% overlap (Figure 2).

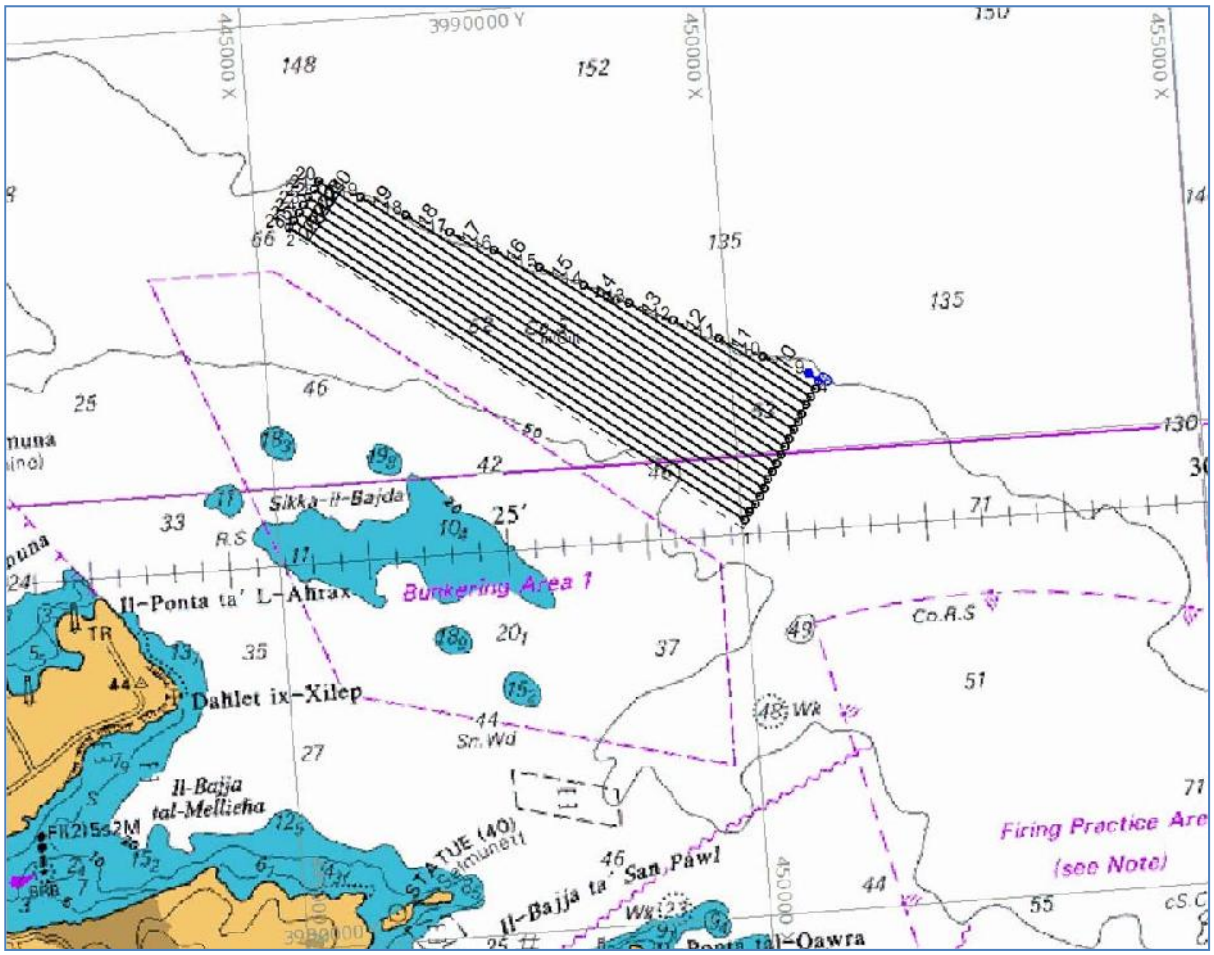

Figure 2. Map showing the survey transect lines superimposed on the study area. Base map: Admiralty charts. Source: Geomara Ltd.

4. In general the planned transect lines was followed in the field; however, in places where a large depth variation was encountered, a variation to the line spacing was required in order to obtain a 10% - 15% overlap. Nevertheless, 100% ensonification was achieved throughout the surveyed area.

5. The 10.7 m vessel used for the survey was equipped with a Trimble SPS 461 Global Positioning System (GPS) to provide positioning. The Trimble SPS 461 is a dual frequency receiver which provides DGPS accuracy position from SBAS, OmniSTAR VBS, and or an external RTCM DGPS correction. The SPS461 computes the precise vector between the two antennas to provide a highly accurate heading and positioning values. The positional antenna was placed at a height with clear views of the sky, directly over the sonar transducer. The vertical offset height from the positional antenna to the transducer was measured and inputted in the acquisition software. A second antenna, the heading reference antenna, was placed 2.1 m from the positional antenna. This separation was required to ensure accurate heading referencing throughout the survey. The mounting of the GPS antenna and offset calculations ensured the most accurate heading and position.

6. Vessel navigation was provided by the Trimble SPS461 receivers through the PDS 2000 software. A helmsman's display monitor provided the vessel skipper with navigation information and a coverage map. This allowed the vessel to stay on course throughout the duration of the survey and provided the required accuracy of coverage.

7. The Multibeam Echo Sounder (MBES) system used for the survey was the Reson Seabat 8125. This system is renowned for its high resolution and variety of applications, including general hydrographic surveys. This system uses a frequency of 455 kHz and measures a 120° swath across the seafloor. It is highly accurate and delivers a depth resolution of 6 mm, which is well inside IHO Special Order and the U.S Army Corps of Engineers Special Order requirements. The Reson Seabat 8125 system has the capacity to acquire both bathymetric and backscatter data and both these functions were used during the survey. The system uses its own processor system, which is interfaced with a high performance desktop computer. Data acquisition is carried out via the processor system using PDS 2000 software. The MBES was mounted on the side of the survey vessel using a purpose built bracket mount. The GPS system was mounted in line with the sonar head and the motion reference unit was offset to the central axis point of the vessel.

8. To ensure accurate bathymetric data, heave, pitch and roll values were integrated into the survey setup. To provide heave, pitch and roll, a Teledyne TSS MAHRS Motion Reference Unit (MRU) and gyrocompass were used. This system provides real time data, which is integrated directly with the multibeam system and the PDS 2000 acquisition software. The MRU was located along the centreline of the vessel and close to the waterline. The MRU was fully aided by the Trimble SPS461, which again improves the accuracy of the system and, subsequently, accurate collection of the bathymetric data set.

9. To ensure the accuracy of the acquired data and correction for differing water column densities, sound velocity profiles were taken at various stages throughout the survey. These were then applied to the multibeam data. A Valeport mini Sound Velocity Probe (SVP) was mounted alongside the MBES sonar head. This provided real time sound velocity data at the head to the PDS 2000 acquisition software. At the beginning, middle and end of the survey, sound velocity profiles were taken using a Valeport SIFT SVP. This provided the survey with full profile measurements from the surface to the deepest sections of the survey area. These profiles are subsequently imported into PDS 2000 computer software to assist in the calibration of the MBES system. PDS 2000 is the proprietary software of Teledyne Reson. It allows for seamless integration of all systems throughout the survey including MBES, Backscatter, GPS and MRU, and is a powerful software with a wide variety of applications and is ideally suited to marine bathymetric surveys. PDS 2000 allows for real

time data interrogation, which ensures good quality data at all times throughout the survey. PDS 2000 also assists vessel navigation as it allows the surveyor to send a helmsman's display screen to a Visual Display Unit (VDU) located adjacent to the vessel skipper. This screen provides the vessel skipper with real time updates on critical data such as position, speed, heading and data coverage. The provision of the helmsman's display to the vessel skipper ensures that the required area is surveyed to the highest level of accuracy possible. Prior to any data acquisition, the MBES system was calibrated. The calibration procedure requires the survey vessel to travel across a patch of seafloor in overlapping opposing directions over both flat and sloping ground. This allows the software to calculate the equipment heave, pitch and roll offsets and apply calibration values to correct for these. The following calibration values were used: Heading correction: 2.63; roll correction: -1.41 ^{o}PU+; pitch correction: -3.72 ^{o}BU+.

10. The acquired multibeam and backscatter data were processed using PDS 2000 and involved applying a number of external data sources and filters. These included equipment offsets and calibration values. Tidal values from the Transport Malta and the Tide Gauge at Marsaxlokk were used to correct for tidal variations.

11. Once the survey was completed, the data were reviewed to identify any outlying erroneous acoustic artefacts. Where encountered, these erroneous artefacts were then removed and the resultant data gridded to the required density. For backscatter applications, the data was gridded using intensity values. The quality of the MBES data collected from the survey area was high and the statistical filter removed most outlying points. Consequently, only a minimal amount of 'cleaning' was necessary. All processed water depth data presented in the present document relate to Chart Datum.

Survey of biological characteristics

12. To survey the biological characteristics of the seabed within the survey area, a drop down camera was deployed at 13 stations (see Table 1 and Figure 7) that were distributed over the study area. The geographical locations of the 13 drop down camera stations are indicated in Table 1. During the survey, a heavy swell hindered steady deployment of the camera such that the operators had to lower the latter onto the seabed to achieve appropriate focussing of the viewed object.

13. The same positioning system used in the MBES survey was used for the video survey. The camera and light system was housed in an aluminium subsea frame; the lighting systems comprised 4 LED underwater lights that were moveable. For the purpose of the survey, the lights were mounted forward and slightly downward pointing. Each of the four underwater lights was controlled individually via a surface survey laptop and Seatronics lamp control software V 1.0.0. The colour zoom camera was mounted towards the top of the light frame, and positioned forward and slightly downward pointing. The camera was controlled via a surface survey laptop with Insite control software V 3.2.5. This software allowed the operator to zoom the camera.

14. The Drop down camera subsea positioning was recorded using an Applied Acoustics Easytrak USBL system, which was integrated with Hypack survey software. A transponder was placed on the camera frame and a topside transducer mounted on the starboard side of the survey vessel, which provided real time positioning of the camera when underwater. All camera

and light commands, as well as video imagery, were relayed via a 200m multifunction umbilical. This allowed two way communication between the surface and subsea unit at all times. All relayed video imagery was recorded using a Digital Edge Subsea, Edge DVR topside data recorder, which allowed annotation and recording of all subsea imagery.

Table 1

Latitude/longitude coordinates and depth of the 13 drop down camera stations from where video footage of the stations was collected. The station numbers correspond to those in Figure 7.

Station	Latitude / Longitude	Depth (m)
1	36° 0.377'N / 14° 26.258'E	51.19
2	36° 0.514'N / 14° 25.996'E	51.37
3	36° 1.100'N / 14° 25.017'E	58.69
4	36° 1.780'N / 14° 23.964'E	70.1
5	36° 2.059'N / 14° 24.003'E	75.67
6	36° 1.794'N / 14° 24.505'E	77.94
7	36° 1.548'N / 14° 25.083'E	68.78
8	36° 1.540'N / 14° 25.083'E	73.71
9	36° 1.236'N / 14° 25.903'E	70.96
10	36° 1.260'N / 14° 25.178'E	63.79
11	36° 0.858'N / 14° 25.754'E	57.41
12	36° 0.960'N / 14° 26.624'E	68.99
13	36° 0.472'N / 14° 26.554'E	57.33

15. Following the field surveys, the video footage was analysed in the laboratory. Grab images from the video footage were taken and used to illustrate the present report.

16. The benthic assemblages recorded from the study area were named according to the nomenclatural scheme adapted by Borg *et al*. (2013) for local use from the RAC/SPA classification system of Mediterranean marine benthic habitats.

3. RESULTS

17. Ecoserv's laboratory report reference for the results of sediment and water analyses given in this report is **144-16**. The sample reference codes for the video footage are **D016 – D028**.

Bathymetry and physical characteristics of the seabed

18. The MBES survey covered a total of 14 transects, which amounted to 13,674,480 individual xyz points. During processing, 7.89 % of the points were rejected by all filters; of these, 4.48 % were rejected by a statistics filter and 3.14 % were rejected manually.

19. For the bathymetric study component, data analysis yielded a 2 m grid model (Figure 3), which had 13,674,480 cells and covered an area of 8,566,180 m². The results indicated that water depths in the surveyed area ranged from 48.5 m to 100 m, with the mean depth value being around 63m (Figure 3). Overall, the survey area appeared to have a northwards facing slope. The shallowest area was a small ridge, located at the south east of the survey area. From there the seafloor descended gradually northward until it reached the submarine cliff which bounded the northern edge of the survey area. The deepest parts of the survey area were recorded off the submarine cliff, which ran along the northern boundary of the site in a northwest – southeast direction. At the edge of the cliff, water depth increases from around 74 m to more than 100 m (Figure 4).

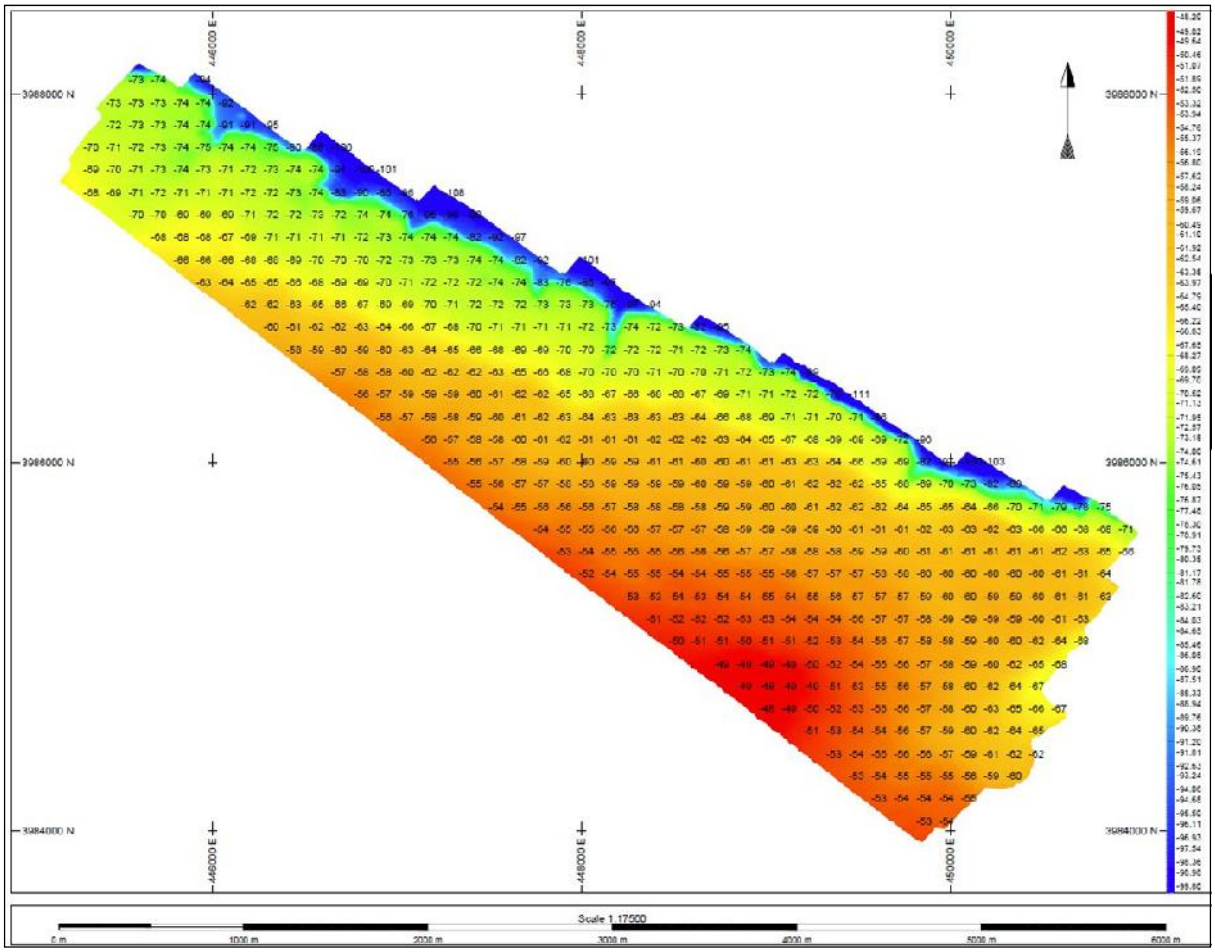

Figure 3. Water depth (in metres) recorded from the study area.

20. The backscatter data indicated very little variation in bottom type (Figures 5 and 6). The acoustic backscatter indicated that the central survey area was homogenous with little variation in the bedform intensity. A number of very low seafloor contours were noted in the shallow central and southeastern parts of the survey area. These radiated in a northerly direction from the southern edge of the survey area, and are visible in the backscatter as slightly darker patches; however, they do not indicate pronounced differences in seabed surface relief, as is often seen with reef and cliff edges. Thus, bedform intensity difference

there was very low, indicating that the variation was very subtle. The break in slope due to the steep submarine cliff along the northern boundary of the survey area was very noticeable. Six small gorge-like indentations are evident. These small indentations were aligned along a roughly north – south axis with a penetration into the cliff of 10-20m, although the backscatter indicated that two shallow depressions associated with these gorges continued for a greater distance.

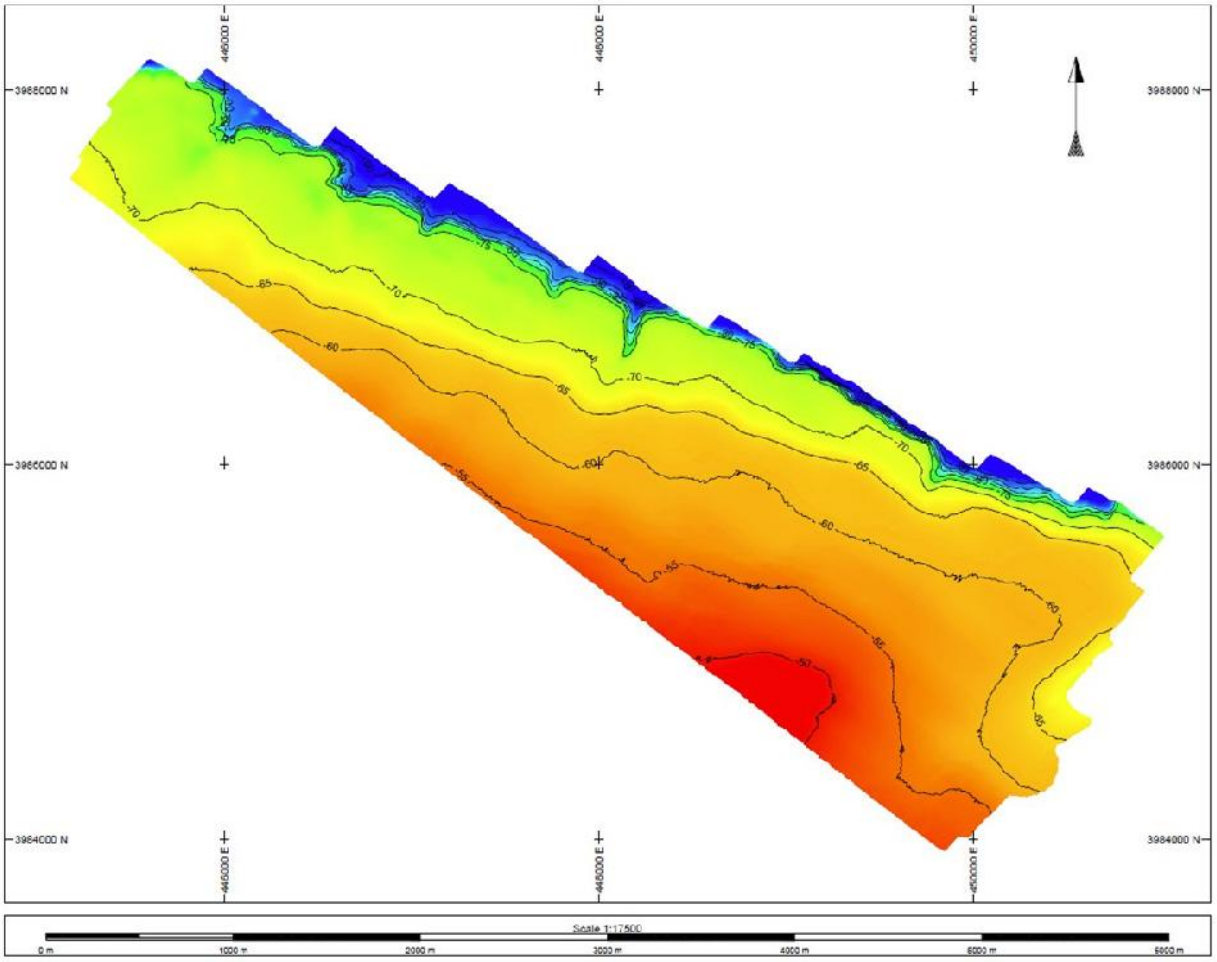

Figure 4. Depth contours (in metres) for the study area.

21. Overall, data from the acoustic backscatter indicate very little variation in seabed hardness within the survey area (Figures 5 and 6). Areas of high reflectivity, such as sand and rock are represented as light shades and areas of low reflectivity are darker. Figure 6, produced from the recorded backscatter, indicates a bottom hardness that ranges between 0.7 and 8.3, where 8.3 represents low reflectivity and 0.7 represents high reflectivity. Reflectivity data for the area where the submarine cliff is located shows an area of low reflectivity at the base, which indicates that the substratum there is most likely comprised of muddy sands. In the rest of the survey area, the acoustic backscatter data indicates that the seabed is comprised of uniform coarse low reflectivity unconsolidated coarse sediments, which the imagery from the video survey study component indicates to be rhodolith beds

and maerl. A small blue area in the south of the survey area indicates the presence of more consolidated material and possibly represents a rocky outcrop.

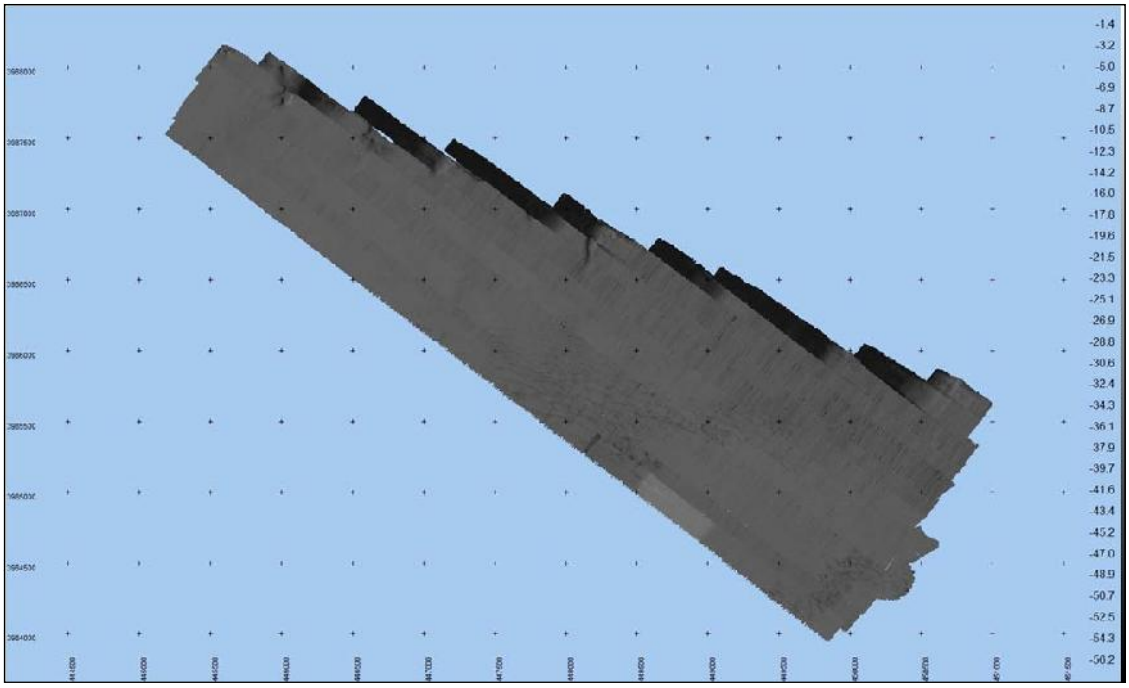

Figure 5. Backscatter image obtained from the MBES survey component.

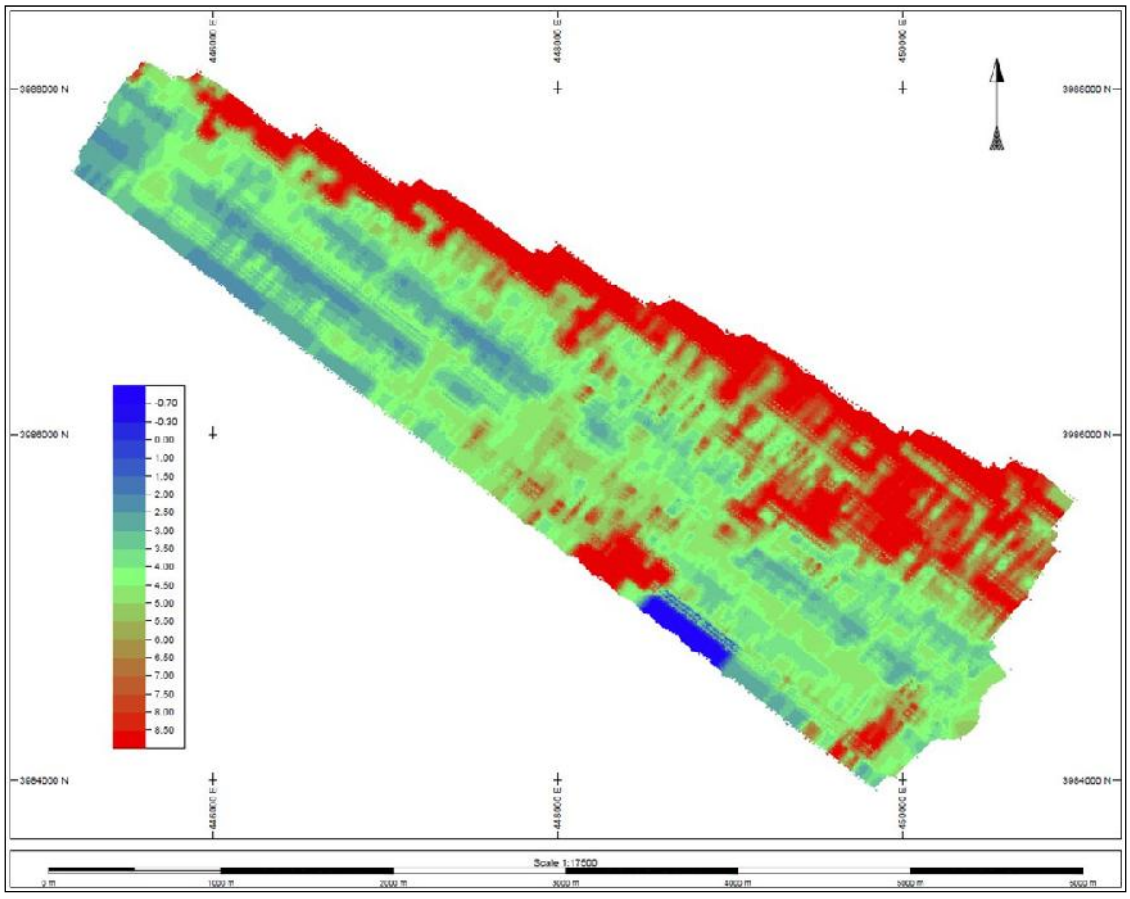

Figure 6. Sediment hardness for the survey area.

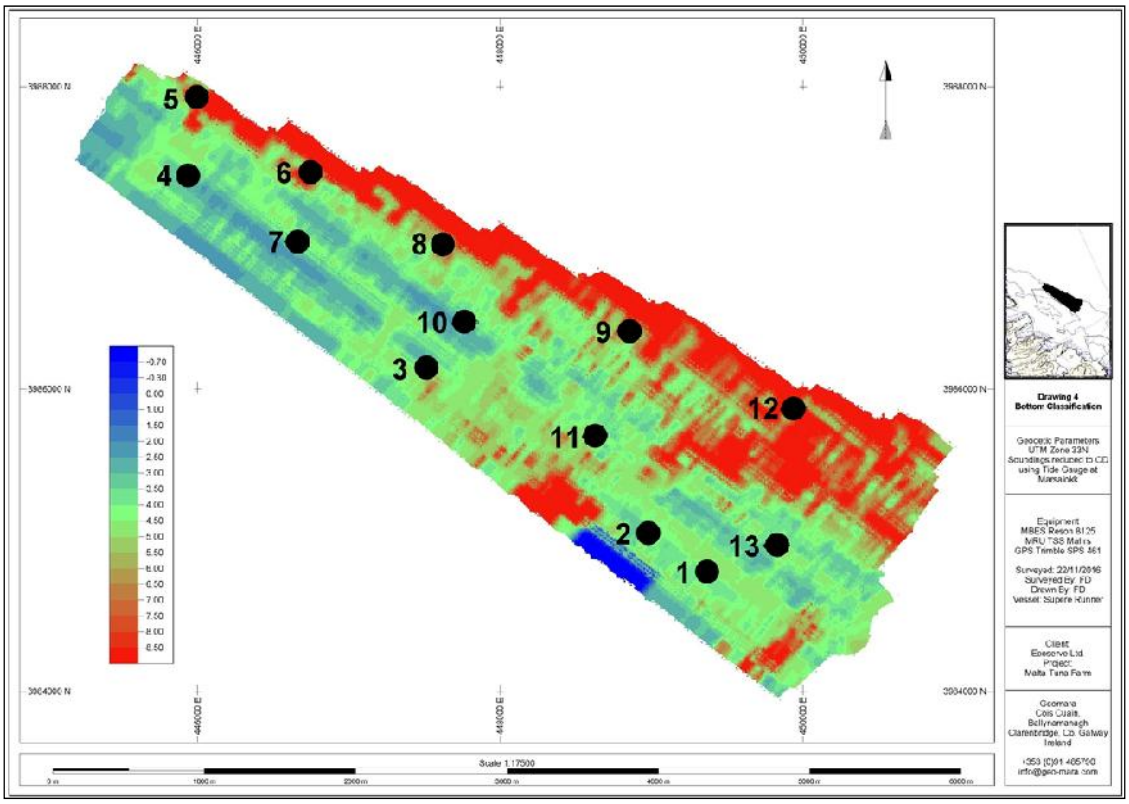

Figure 7. The 13 stations where the drop down camera was deployed, superimposed on the backscatter output from the MBES (Figure 6).

22. In the southern and eastern parts of the survey area, the seabed appears to comprise less coarse material than in the rest of the survey area; probably sediments having a higher sand/mud content.

Biological characteristics

23. The main biotic assemblage type recorded from the study area, as indicated by the video footage collected from the thirteen stations was a **biocoenosis of coarse sands and fine gravels under the influence of bottom currents.** This biocoenosis was characterised by the following two associations:

(i) **Association with maerl**. This association was present in a large part of the survey area and consisted of maerl[2], which is abundant off the northeastern coast of the Maltese Islands (Sciberras *et al.,* 2009). The maerl beds appeared to comprise a pseudo-hard substratum that supported macroalgae (Figures 8 and 9); the predominant alga was *Flabellia petiolata*

[2] 'Maerl' is a term used to describe calcareous sediments dominated by living or dead unattached calcareous rhodophytes (coralline algae). In the Mediterranean literature, the term "maerl" is used broadly as a collective term for several kinds of assemblages of unattached calcareous red algae on sedimentary bottoms, hence as a synonym for "rhodolith bed". However, according to Basso *et al*. (2016), 'rhodolith beds' should be identified and delimited as those areas of the sea floor with >10% cover of live rhodoliths over a minimum surface of 500 m^2, while the term "maerl" refers to a specific type of rhodolith bed that is composed of non-nucleated, unattached growths of branching, twig-like coralline algae. 'Maerl' as used here conforms to the definition of Basso et al. (2016).

(Figures 8 and 9), which in places was accompanied by the brown alga *Zonaria tournefortii*. The main megafaunal species that was recorded from this association is the cidariid sea urchin *Stylocidaris affinis*. What appeared to be an individual of an unidentified pleurobranch mollusc, and another individual of an unidentified ascidian, were also seen in the video footage. In places, the maerl beds were discontinuous and the two aforementioned algal associations were absent, giving the seabed a different structure from that of continuous maerl beds (Figure 10).

Figure 8. **Grab image from video footage (Station 10) showing an association with maerl. Live (pink) and dead (yellow/white) rhodoliths are visible in the image, along with the alga *Flabellia petiolata* (green). An individual of the urchin *Stylocidaris affinis* (red circle) is also visible in the image.**

Figure 9. **As in Figure 8 but a closer view. An individual of the urchin *Stylocidaris affinis* (red circle) is visible in the image.**

(ii) **Association with rhodoliths**[3]. This association occurred as patches interspersed with the maerl beds in places (Figure 10). Apart from the coralline algae forming the rhodoliths themselves, no other macroalgae were recorded from this assemblage type. The associated megafauna was similar to that of the maerl beds as described above, with the most abundant fauna being the cidariid sea urchin *Stylocidaris affinis*. An individual of the seastar *Luidia ciliaris* was visible in the video footage.

Figure 10. Grab image from video footage (Station 3) showing an association with rhodoliths.

4. APPRAISAL

Bathymetry and seabed physical characteristics

24. Water depth within the survey area varied between 48.5 m and 100 m; the deeper parts are located along the northeastern boundary of the survey area and the shallowest parts at the southern-southwestern portion.

25. The bottom in the area surveyed consists predominantly of coarse mobile sediments - while large parts of the study area appeared to have a seabed comprised of coarse sediments with varying degree of sediment compactness, other parts indicated a seabed having less compact coarse sediment; the former would represent areas with maerl and the latter areas with coarse sediments and rhodoliths, but both these overly/are intermixed with coarse sands and fine gravels. Other parts of the survey area (coloured red in Figure 6) appear to have a seabed comprised of less coarse/compact sediments; probably muddy gravelly sand.

[3] Rhodoliths consist either of free-living calcareous rhodophytes (red algae), or else of an inner nucleus, such as stone or shell, encrusted by calcareous rhodophytes.

Biological characteristics of the seabed

26. Overall, the benthic biotic assemblages in the study area are characteristic of the infralittoral and circalittoral zones off the northeastern coast of the Maltese Islands (e.g. Borg *et al*., 1998; Schembri 1998; Sciberras *et al.,* 2009) and are the same as the ones recorded from the adjacent area surveyed in 2008 (Borg & Schembri, 2008), and in 2011 (Schembri, 2011). In most places in the study area, the main benthic biotic assemblage appears to be that of a biocoenosis of coarse sands and fine gravels under the influence of bottom currents, from which two associations were recorded: (i) an association with maerl, and (ii) an association with rhodoliths. Although not evident from the video footage, another benthic assemblage type - the biocoenosis of coarse sands and muddy heterogeneous sediment - also probably occurs with the study area; this would be indicated by areas which the backscatter data from the MBES survey indicate as less coarse/compact sediment (see para 25 above).

27. Although video footage collected from the present survey mainly enabled recogniton of the alga *Flabellia petiolata*, several other algal species are known to occur on maerl/rhodolith habitats, including *Zonaria tournefortii*, *Vidalia volubilis* and *Codium bursa* (see Borg et al., 1998; Borg & Schembri, 2008; Schembri, 2011). Likewise, apart from the urchin *Stylocidaris affinis* recorded from the present survey, numerous other mega- and macrofaunal species undoubtedly occur in both the maerl and rhodolith habitats; these include the anemone *Condylactis aurantiaca*, the echiuran *Bonellia viridis*, the crinoid *Antedon mediterranea*, the seastars *Astropecten aranciacus*, *Luidia ciliaris* and *Marthasterias glacialis,* the seastar *Brisingella coronata* and several species of sponges (see Borg et al., 1998; Borg & Schembri, 2008; Schembri, 2011). Furthermore, in addition to supporting the crinoid *Antedon mediterranea* and the urchin *Stylocidaris affinis,* the association with rhodoliths also typically supports the Needle-Spined urchin *Centrostephanus longispinus* and the irregular urchin *Spatangus purpureus* (see Borg & Schembri, 2008; Schembri, 2011). Apart from these mega and large macrofaunal species, both the association with maerl and the association with rhodoliths support numerous small macrofaunal species including polychaete, mollusc, crustacean and echinoderm taxa (see Schembri, 2011).

28. The entire study area is located outside the boundaries of the '*MT0000105 Marine Area in the Northeast of Malta*' Special Area of Conservation of International Importance declared by Government Notice 851 of 2010[4] under the provisions of the *Flora, Fauna and Natural Habitats Protection Regulations, 2006*. This area forms part of the European Union's NATURA 2000 network.

29. In Maltese waters, the main rhodolith-forming algae in rhodolith/maerl beds are *Lithothamnion corallioides* and *Phymatolithon calcareum/Lithothamnion minervae*[5] with *Peysonnelia rosa-marina*, *Mesophyllum* sp., and *Neogoniolithon brassica-florida* constituting a minor component (Lanfranco *et al*., 1999). Associations with rhodoliths are a habitat type that qualifies sites for inclusion in national inventories of natural sites of conservation interest as required by the Protocol for Specially Protected Areas and Biodiversity in the Mediterranean (SPABIM) of the Barcelona Convention[6]. Furthermore, the coralline algae

[4] *Malta Government Gazette* No.18,633, 17 August 2010.

[5] It is not possible to distinguish between *Phymatolithon calcareum* and *Lithothamnion minervae* using gross morphology alone.

[6] The *Convention for the Protection of the Mediterranean Sea against Pollution* (the Barcelona Convention) was adopted on 16th February 1976. A number of protocols were adopted under this convention, amongst which is the *Protocol concerning Mediterranean Specially Protected Areas* done at Geneva on 3 April 1982. The parties later amended this protocol and its name changed to *Protocol for Specially Protected Areas and Biodiversity in the Mediterranean* (SPABIM). Malta ratified this new Protocol on 28th October 1999. A draft reference list of habitat types for the selection of sites to

Lithothamnion corallioides and *Phymatolithon calcareum* are listed in Annex V (Animal and plant species of Community interest whose taking in the wild and exploitation may be subject to management measures) of the European Union's 'Habitats Directive' as amended[7]. Both species probably occur in the rhodolith/maerl beds in the present study area; however, only microscopic examination of samples of rhodoliths collected from the area will confirm this.

30. *Lithothamnion corallioides*, *Phymatolithon calcareum* together with *Lithothamnion minervae* are listed in Schedule III (Animal and plant species of national interest whose conservation requires the designation of Special Areas of Conservation), and the first two named also in Schedule VII (Animal and plant species of Community interest whose taking in the wild and exploitation may be subject to management measures) of the *Flora, Fauna and Natural Habitats Protection Regulations, 2006* as amended[8], which transpose the requirements of the EU's Habitats Directive to local legislation.

32. Rhodolith and maerl beds are included in the UNEP/MAP/RAC-SPA "Reference list of marine habitat types for the selection of sites to be included in the national inventories of natural sites of conservation interest" (UNEP/MAP/RAC-SPA, 2006) while an action plan for their conservation has been formulated (UNEP/MAP/RAC-SPA, 2008), both within the ambit of the Barcelona Convention. Within European legislation, Council Regulation (EC) 1967/2006, concerning management measures for the sustainable exploitation of fishery resources in the Mediterranean Sea, bans the use of specific fishing gear (trawl nets, dredges, shore seines or similar nets) on coralligenous or maerl beds[9]. In order to conform to the requirements of EC 1967/2006, the local 'Implementation and Enforcement of Certain Fisheries Management Plans Order' (Legal Notice 354 of 2013) amends Zones C and G referred to in Annex V of EC 1967/2006 that originally overlapped with maerl beds as well as closed to trawling all areas where conclusive evidence exists for the presence of such beds (see Figure 44 in LN 354/2013).

be included in the National Inventories of Natural Sites of Conservation Interest was drawn up at the Fourth Meeting of National Focal Points for Specially Protected Areas (Tunis, 12-14 April 1999) [see UNEP(OCA)/MED WG.154/7].

[7] The European Union's *Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora* is known as the 'Habitats Directive'. Annexes I and II of this Directive have been amended by Council Directive 97/62/EC of 27 October 1997. Annex I of the Habitats Directive lists natural habitats whose conservation requires the designation of Special Areas of Conservation. Annex II lists species of plants and animals whose habitats must be protected for their survival. Annex III lists criteria for selecting sites eligible for consideration as "Sites of Community Importance" and designation as Special Areas of Conservation, while Annex IV lists species of Union interest in need of strict protection. Annex V lists species of plants and animals of Union interest whose taking from the wild and exploitation is subject to management, and Annex VI lists prohibited methods and means of capture and killing of mammals and fish, and prohibited modes of transport. In anticipation of the 2004 enlargement of the EU, the Annexes of the Habitats Directive were modified by the Act of Accession signed in Athens on 16th April 2003, to take into account the expanded geographical area of the EU15+10. The annexes were further amended by Council Directive 2006/105/EC of 20 November 2006 in anticipation of Bulgaria and Romania joining the European Union in 2007 and then again by Council Directive 2013/17/EU of 13 May 2013 due to the the accession of the Republic of Croatia.

[8] These regulations were last amended by the Flora, Fauna and Natural Habitats (Amendment) Regulations, 2013.(Legal Notice 322 of 2013).

[9] According to this Regulation,"Mäerl is a collective term for a biogenic structure due to several species of coralline red algae (Corallinaceae), which have hard calcium skeletons and grow as unattached free living branched, twig-like or nodule corallines algae on the seabed, forming accumulations within the ripples of mudflats or sandflats seabed. Maerl beds are usually composed of one or a variable combination of red algae, in particular, *Lithothamnion coralloides* and *Phymatolithon calcareum*"

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Appendix 2

Notice to Mariners No. 12 of 2017

PORTS AND YACHTING DIRECTORATE

Transport Malta

Malta Transport Centre
Marsa, MRS 1917
Malta

Tel: (356) 2122 2203
Fax: (356) 2125 0365
Email: info.tm@transport.gov.mt

www.transport.gov.mt

NOTICE TO MARINERS NO 12 of 2017

Our Ref: **TM/PYD/ 299/81**
TM/PYD/ 155/89

06 March 2017

Chart Correction

Reference is made to BA Chart 2538 – Malta

Mariners are informed that the **Waiting Area Anchorage** (Valletta and Marsaxlokk, shown dashed in green on attached chart) bounded by the following positions:

Position	Latitude (N)	Longitude (E)
A	35° 51'.600	014° 38'.600
B	35° 51'.600	014° 42'.000
C	35° 50'.000	014° 42'.000
D	35° 50'.000	014° 38'.600

is being relocated Eastward from the present position to that shown hatched in red on attached chart, and is bounded by the following positions:

Position	Latitude (N)	Longitude (E)
E	35° 51'.600	014° 41'.930
F	35° 51'.600	014° 45'.330
G	35° 50'.000	014° 45'.330
H	35° 50'.000	014° 41'.930

The new area will come into force by Wednesday 15th March 2017, and will be coordinated by Valletta Port Control (Valletta VTS) and Marsaxlokk Port Control (Marsaxlokk VTS).

Mariners instructed to proceed to the Waiting Area Anchorage (Valletta and Marsaxlokk) are to comply with instructions provided by Valletta Port Control (Valletta VTS) and Marsaxlokk Port Control (Marsaxlokk VTS) on VHF channels 12, 14 and 16 as appropriate.

Transport Malta

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Furthermore, the **Offshore Aquaculture Zone** (shown dashed in blue on attached chart) bounded by the following positions:

Position	Latitude (N)	Longitude (E)
S	35° 53'.580	014° 38'.580
T	35° 53'.580	014° 40'.620
U	35° 52'.100	014° 40'.620
V	35° 52'.100	014° 38'.580

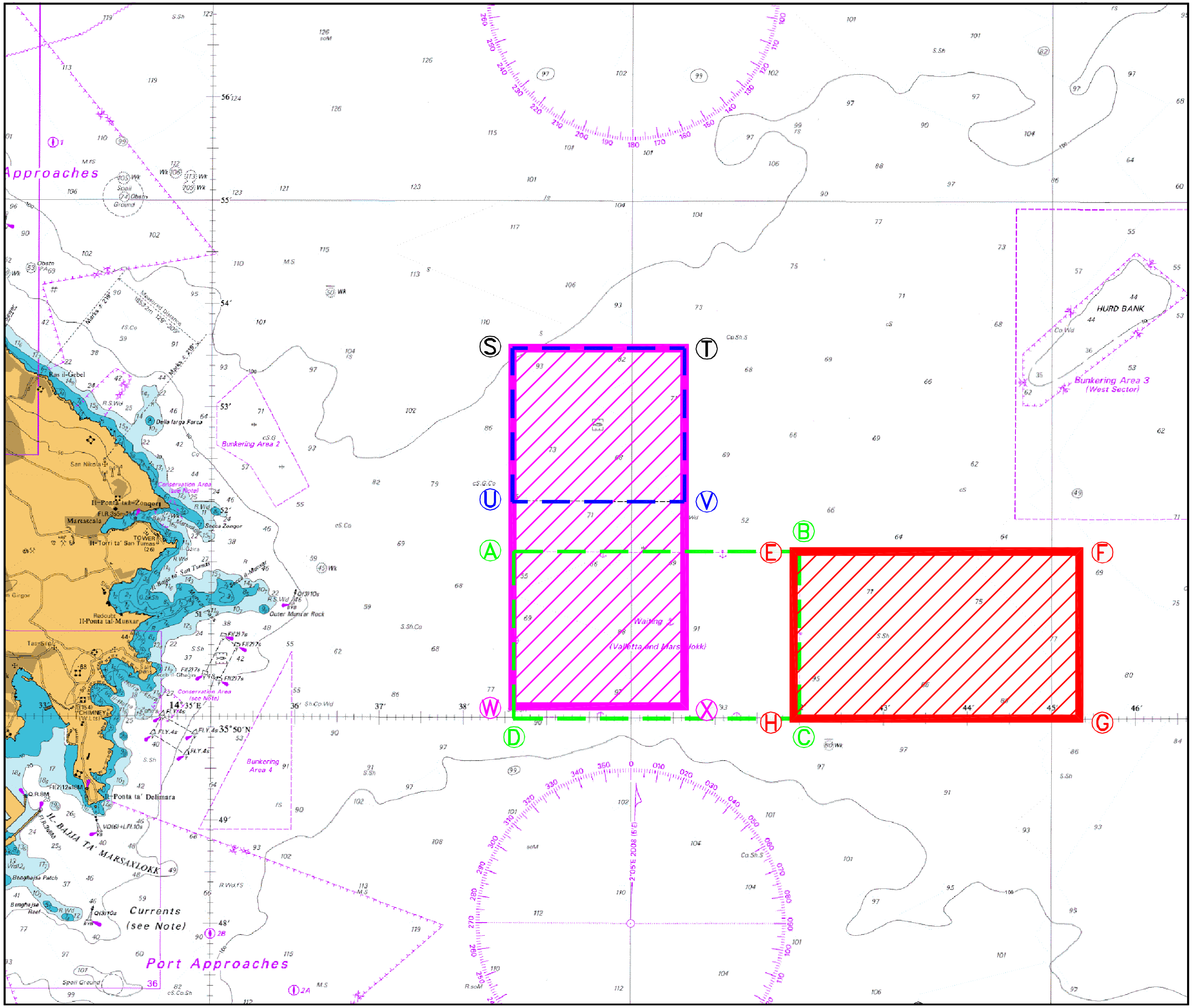
is being extended Southward (shown hatched in magenta on attached chart) and will be bounded by the following positions:

Position	Latitude (N)	Longitude (E)
S	35° 53'.580	014° 38'.580
T	35° 53'.580	014° 40'.620
W	35° 50'.100	014° 40'.620
X	35° 50'.100	014° 38'.580

This extension of the Offshore Aquaculture Zone will take place at a later date.

A notice to mariners will be issued with additional information including details of lights and marine aids to navigation.

Charts Affected BA Chart 194, 2538



The UK Hydrographic Office makes the accompanying data available to Transport Malta under the terms and conditions of agreement HO 1427/020930/01.

DISCLAIMER

Whilst the UK Hydrographic Office has endeavoured to ensure that the material supplied is suitable for the purpose described, it accepts no liability (to the maximum extent permitted by law) for any damage or loss of any nature arising from its use.
The material supplied is used entirely at the Recipient's own risk.

Appendix 3

ICCAT Quotas for Tuna Farming Facilities in Malta

APPENDIX 3: ICCAT FARMING FACILITIES FOR BLUE FIN TUNA IN MALTA

ICCAT Farming Facilities for BluefinTuna. Results of Search

Country : EU.MALTA

Order By : Registry Number, Operator Name

Records 1 to 8 of 8

ICCAT Serial Number	Country	Registry Number	Name of FFB	Owner Name	Owner Address	Operator Name	Operator Adress	Location	Capacity(t)
ATEU1MLT00002	EU.MALTA	MF10F	Malta Mariculture Ltd	Malta Mariculture Ltd	Marfa Road, Mellieha, Mlh7100, Malta	Malta Mariculture Ltd	Marfa Road, Mellieha, Mlh7100, Malta	Comino Channel	800
ATEU1MLT00001	EU.MALTA	MF12F	AJD Tuna Ltd.	Anthony Azzopardi & Charles Azzopardi	Azzopardi Fisheries, Mosta Road, St. Paul'S Bay Spb3111, Malta	AJD Tuna Ltd.	Azzopardi Fisheries, Mosta Road, St. Paul'S Bay Spb3111, Malta	St. Paul´s Bay	2500
ATEU1MLT00004	EU.MALTA	MF25F	MFF Ltd	Saviour Ellul	MFF LTD. 'HANGAR', TRIQ IT- TRUNCIERA, MARSAXLOKK MXK1522, MALTA	Saviour Ellul	MFF LTD. 'HANGAR', TRIQ IT- TRUNCIERA, MARSAXLOKK MXK1522, MALTA	Munxar Reef, Xrobb l-Ghagin, l/o Marsaxlokk	1500
ATEU1MLT00003	EU.MALTA	MF26F	Fish & Fish Ltd.	Fish & Fish Ltd.	Tarxien Road, Ghaxaq, Malta	Joseph Caruana	Tarxien Road, Ghaxaq, Malta	Delimara l/o Marsaxlokk	1500
ATEU1MLT00005	EU.MALTA	MF27F	Fisheries Control Directorate	Fisheries Control Directorate	Barriera Wharf, Valletta	Fisheries Control Directorate	Barriera Wharf, Valletta	Aquaculture Zone off Xrobb l-Ghagin	750
ATEU1MLT00008	EU.MALTA	MF28F	Mare Blu Tuna Farm	Mare Blu Tuna Farm Ltd	74, Liesse Hill, Valetta, Malta	Mare Blu Tuna Farm Ltd	74, Liesse Hill, Valletta, Malta	Aquaculture Zone off Xrobb l-Ghagin	3000
ATEU1MLT00007	EU.MALTA	MF29F	Ta' Mattew Fisheries Ltd	GIOVANNI ELLUL	TA' MATTEW FISHERIES LTD. 'HANGAR', TRIQ IT- TRUNCIERA, MARSAXLOKK MXK1522, MALTA	GIOVANNI ELLUL	TA' MATTEW FISHERIES LTD. 'HANGAR', TRIQ IT- TRUNCIERA, MARSAXLOKK MXK1522, MALTA	Aquaculture Zone off Xrobb l-Ghagin	1500
ATEU1MLT00009	EU.MALTA	MF30	Fisheries Control Directorate	Fisheries Control Directorate	Ghammieri, Marsa	Fisheries Control Directorate	7Ghammieri, Marsa	Aquaculture Zone off Xrobb l-Ghagin	750

ICCAT: Corazón de María, 8. 28002 Madrid, **SPAIN** - Phone: 34 91416 5600 Fax: 34 91 415 2612