

FINAL

EL 1156 Seabed Survey Report

Submitted to:

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LIST OF ABBREVIATIONS AND UNITS

AUV	Autonomous underwater vehicle
C-NLOPB	Canada-Newfoundland and Labrador Offshore Petroleum Board
cm	centimeters
CSRS	Canadian Spatial Reference System
DFO	Fisheries and Oceans Canada
EL	Exploration License
GIS	Geographic information systems
HiPAP	High precision acoustic positioning
m	meters
MODU	Mobile offshore drilling unit
QA/QC	Quality assurance/quality control
ROV	Remotely-operated vehicle
UTM	Universal Transverse Mercator

1.0 INTRODUCTION

Wood Environment and Infrastructure Solutions Canada, a division of Wood Group PLC (Wood), was contracted by Equinor to conduct seabed surveys at four wellsite locations within Exploration Licence (EL) 1156 in the Flemish Pass with assistance from Oceanering. Prior to the authorization of drilling activities, a seabed survey is needed to assess the presence of coral colonies surrounding the proposed drill center sites. The objective of the survey was to characterize possible aggregations of deep-sea corals at four drill center sites (Figure 1-1).

To mitigate effecting deep-sea corals within the vicinity of drilling activities, the Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB) applies a specific guidance prior to authorization of drilling activities. The guidance indicates that drilling activities, shall not occur within 100 m of coral colonies, defined either as:

- *Lophelia pertusa* reef complex; or
- Five or more large corals (larger than 30 centimeters in height/width) within a 100 square metre area.

The following report summarizes the occurrence of deep-sea corals (in accordance with C-NLOPB guidance) within 100-m from the proposed well center. Additionally, in accordance with commitments made by Equinor in their 2019 Coral and Sponge Survey Plan for EL 1156, as well as commitments made in their Flemish Pass Exploration Drilling Environmental Impact Statement and subsequent Information Requests (IRs) (Statoil Canada Ltd. 2017, Equinor Canada Ltd. and EMCP (ExxonMobil Canada Properties) 2018), this report also includes:

- Presence and distribution of coral and sponge functional/morphological groups;
- Surficial substrate observations;
- General observations of marine fish and other marine invertebrate species;
- Other observations (e.g., trawl marks); and
- Any observations of Species at Risk.

These sites were previously surveyed with ROV and AUV in 2018, however the locations of the drill centers were moved, and the 2019 seabed survey was conducted around the new drill centers using ROV. Figure 1-1 presents the location of the EL 1156 drill centers along with regional special areas (Kenchington et al. 2016, CBD Secretariat 2019, DFO 2019a, 2019b, 2019c, 2019c, 2020, IBA Canada 2019, NAFO 2019).

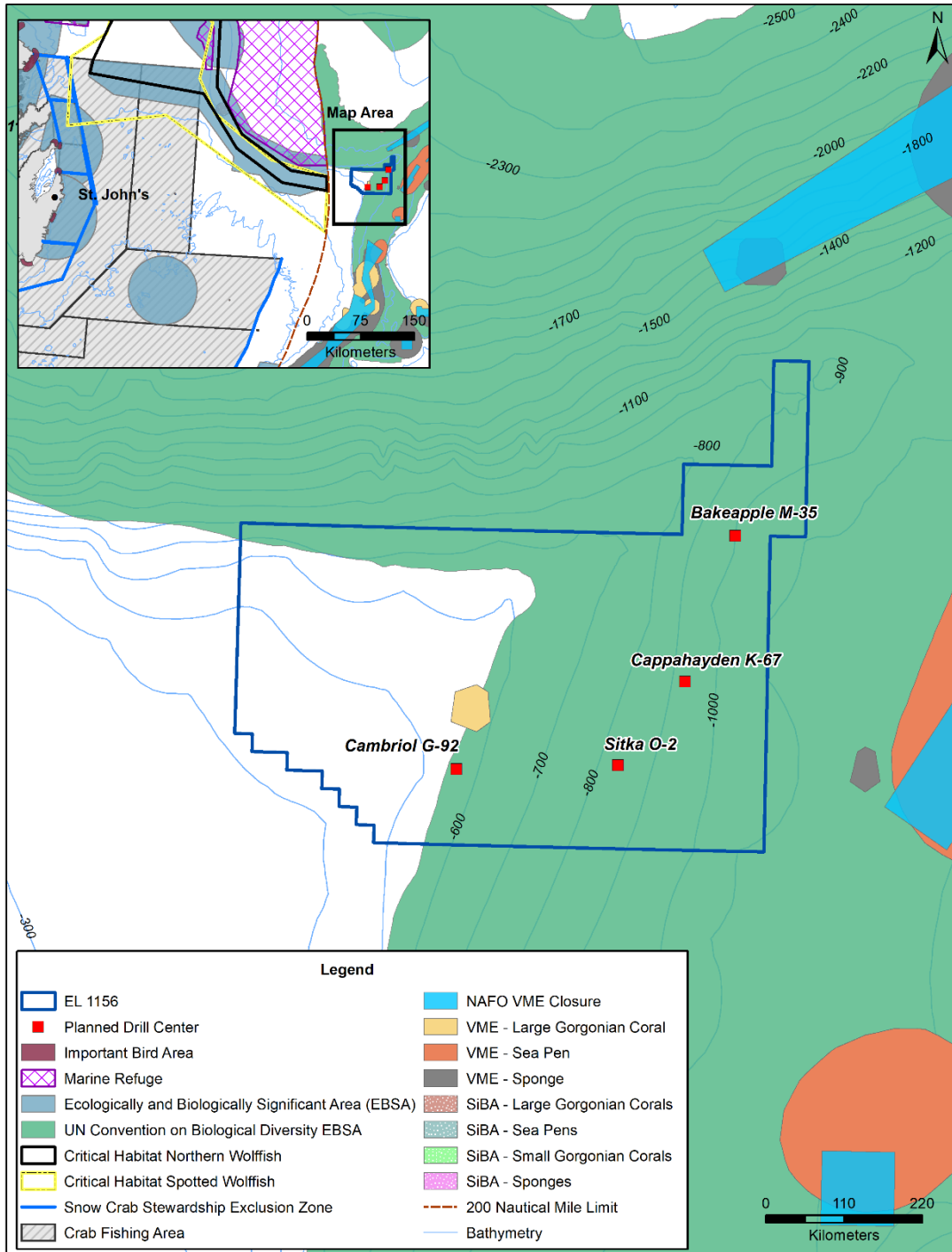


Figure 1-1 Area map of the four well sites for seabed surveys within EL 1156 with regional special areas

2.0 METHODS

Four well sites were surveyed within EL 1156 in the Flemish Pass (Figure 1-1, Table 2-1) from November 2nd to November 13th, 2019 aboard the MV *Horizon Star* with a Magnum remotely-operated vehicle (ROV) (Figure 2-2). The ROV was used to collect video and still imagery along a pre-determined survey design plan. The surveys were designed to investigate within 100-m around the proposed drill centers, and a 500 m radial pattern around the drill centres (8 lines).

Oceanneering was responsible for operation of the ROV, and overall positioning quality assurance / quality control (QA/QC) for the project. All parties participated in vessel health and safety under the ultimate responsibility of the captain of the *Horizon Star*. ROV positioning was determined using the vessel’s high precision acoustic positioning (HiPAP) system. Transects were plotted from coordinates captured using the HiPAP system aboard the *Horizon Star*. These coordinates were then plotted using GIS software ArcMap v10.5 (ESRI 2016). Wood provided onboard marine biologists (24/7) that were responsible for providing direction to ROV operators to ensure the collection of appropriate benthic video imagery for assessment of C-NLOPB guidance and characterizing the benthic environment, as well as marine mammal and seabird observation. Daily update reports were sent to Equinor detailing project activities and survey progress.

Table 2-1 Centre coordinates for seabed survey sites

Site	Latitude (N)	Longitude (W)	Northing (m)	Easting (m)	Water Depth (m)
Cambriol G-92	47 51' 18.01"	46 59' 05.58"	5302091.7	351525.2	612
Cappahayden K-67	47 56' 36.14"	46 39' 54.03"	5311347.9	375663.8	974
Sitka O-2	47 51' 44.77"	46 45' 25.40"	5302505.2	368585.5	840
Bakeapple M-35	48 04' 58.10"	46 35' 53.79"	5326739.2	380968.5	1049
Latitude and Longitude are in degree minutes seconds UTM coordinates in NAD83 (CSRS), Zone 23					

2.1 Seabed Survey

The seabed survey was designed, in consultation with Fisheries and Oceans Canada (DFO) and the C-NLOPB, to investigate within 100-m of the proposed drill center, and a 500-m radial pattern (8 lines) beyond the drill center (Figure 2-1).

The survey transect designs were based on applicable drill cuttings dispersion model results (Statoil Canada Ltd 2017). As part of the Flemish Pass Exploration Drilling environmental assessment conducted prior to the 2019 seabed surveys, a drill cutting footprint model was made for representative drill sites. This model predicts the extent of drill cutting deposition for cutting thicknesses exceeding 1.5 mm and 6.5 mm in deep-water (approximately 1,100 m) sites in the Flemish Pass. The model predicted maximum distance for drill cutting deposition of 6.5 mm to occur within 500 m of the drill center. Thus, the area was surveyed within 500 m of the drill centers to characterize the surficial geology and benthic fauna.

The proposed drill center survey included eleven transects within a 200 x 200 m boundary for comparison against the C-NLOPB guidance for avoiding coral colonies. This included all corals above 30 cm observed along grid lines A through K for a total of 11 transects (Figure 2-1). The drilling operations plan calls for the mobile offshore drilling unit (MODU) to be on dynamic positioning during drilling and will not require seabed anchors, thus no anchor seabed survey was required.

A Magnum ROV was used to collect high-definition video and still imagery at each site (Figure 2-2). Video was collected less than 1 m above the seabed at speeds of less than 1 km/hr along pre-determined transects of the survey design within the survey area. The ROV was equipped with an Ocean ProHD Camera System (1920 x 1080 pixels, 16:9 aspect ratio) and scaling lasers spaced 30 cm apart. The video was overlaid with date, time, depth, heading, and coordinates (UTM) (see example in Figure 2-3). Coral height/width were determined using the scaling lasers and geo-referenced still images were taken of corals above 30 cm within 100-m of the proposed drill center. The survey details for each site are presented in Table 2-2.

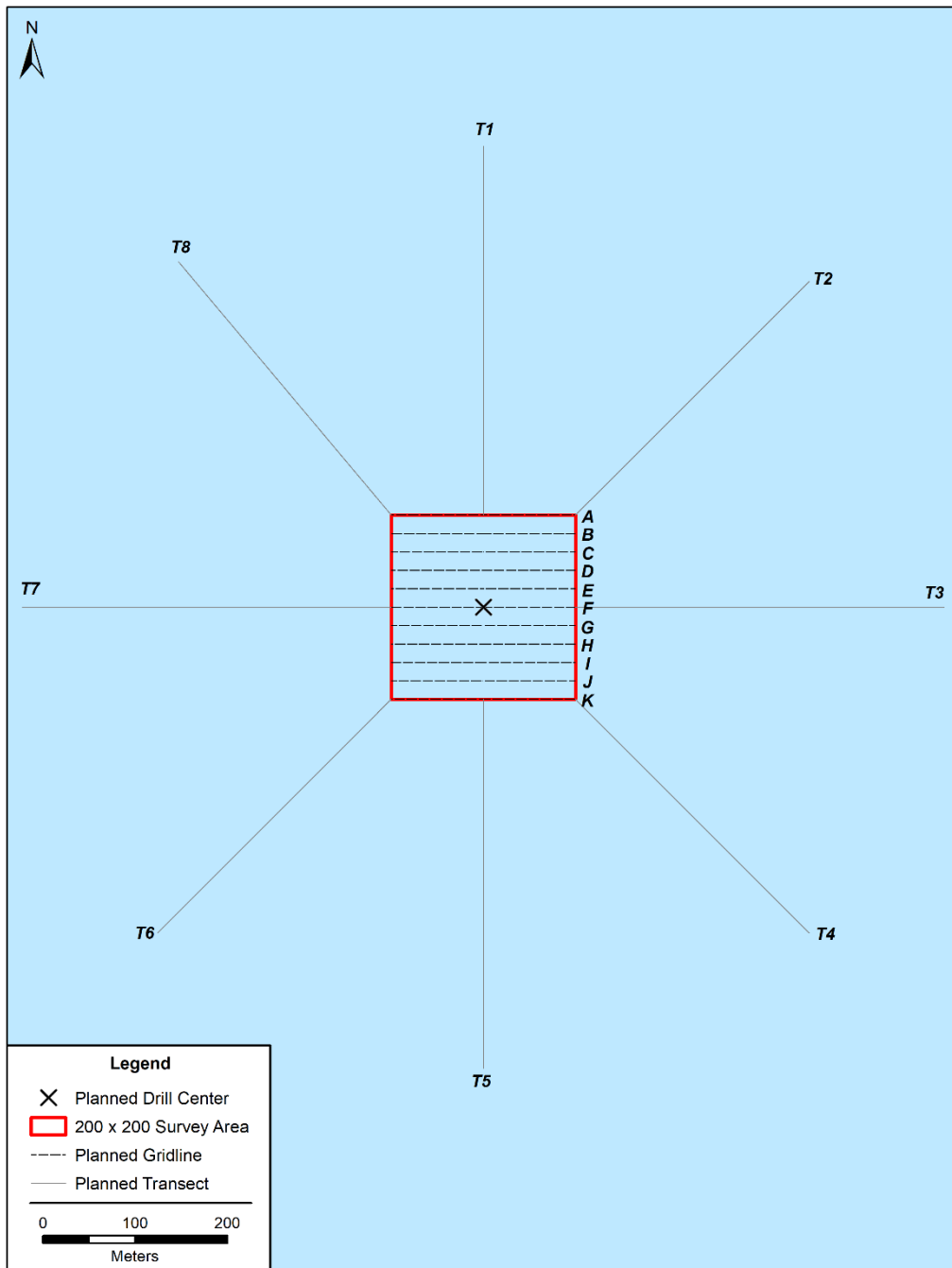


Figure 2-1 Planned seabed survey design for each potential drill center



Figure 2-2 Oceaneering Magnum ROV used for the Flemish Pass benthic survey in its cradle

Table 2-2 The number of transects, depths, survey area, and total video collected (time) by ROV at each site

Area	No. of Transects	Depth Range (m)	Total Survey Area (m ²)	Total Survey Video (hh:mm)	Comments
Cambriol G-921	19	569 - 617	8,066	10:43	Three 2018 radials were extended, and two additional radials were added during the 2019 survey
Cappahayden K-67	19	940 - 989	7,172	07:37	
Sitka O-2	19	846 - 873	7,434	08:06	
Bakeapple M-35	19	1,011 – 1,028	7,704	10:08	
Notes: See Appendix A for start and end points for each transect line.					
1 Additional grid lines and radials were centered around the revised drill center.					

2.2 Analysis

2.2.1 Coral Measurements

Transects within a 200 m x 200 m boundary around the proposed drill center at each site were assessed based on the current (2019) C-NLOPB regulatory coral guidance. This includes noting the presence or absence of the reef-forming deep-sea coral *Lophelia pertusa* and the presence of five or more corals above 30 cm in height/width within a 10 m by 10 m area. Coral height/width exceeding guidance were estimated during the survey with

scaling lasers (30 cm) and a measuring tool with 10 cm sections. A geo-referenced still image (using the digital overlay) for each coral observed above 30 cm in height/width was recorded. The still imagery was analyzed post survey to confirm height/width using the scaling lasers and a measuring tool in the scientific image analysis software ImageJ, (Rueden et al. 2017; Figure 2-3). Corals above 30 cm in height/width were mapped using ArcMAP 10.5 (ESRI) in NAD83 datum zone 23N.

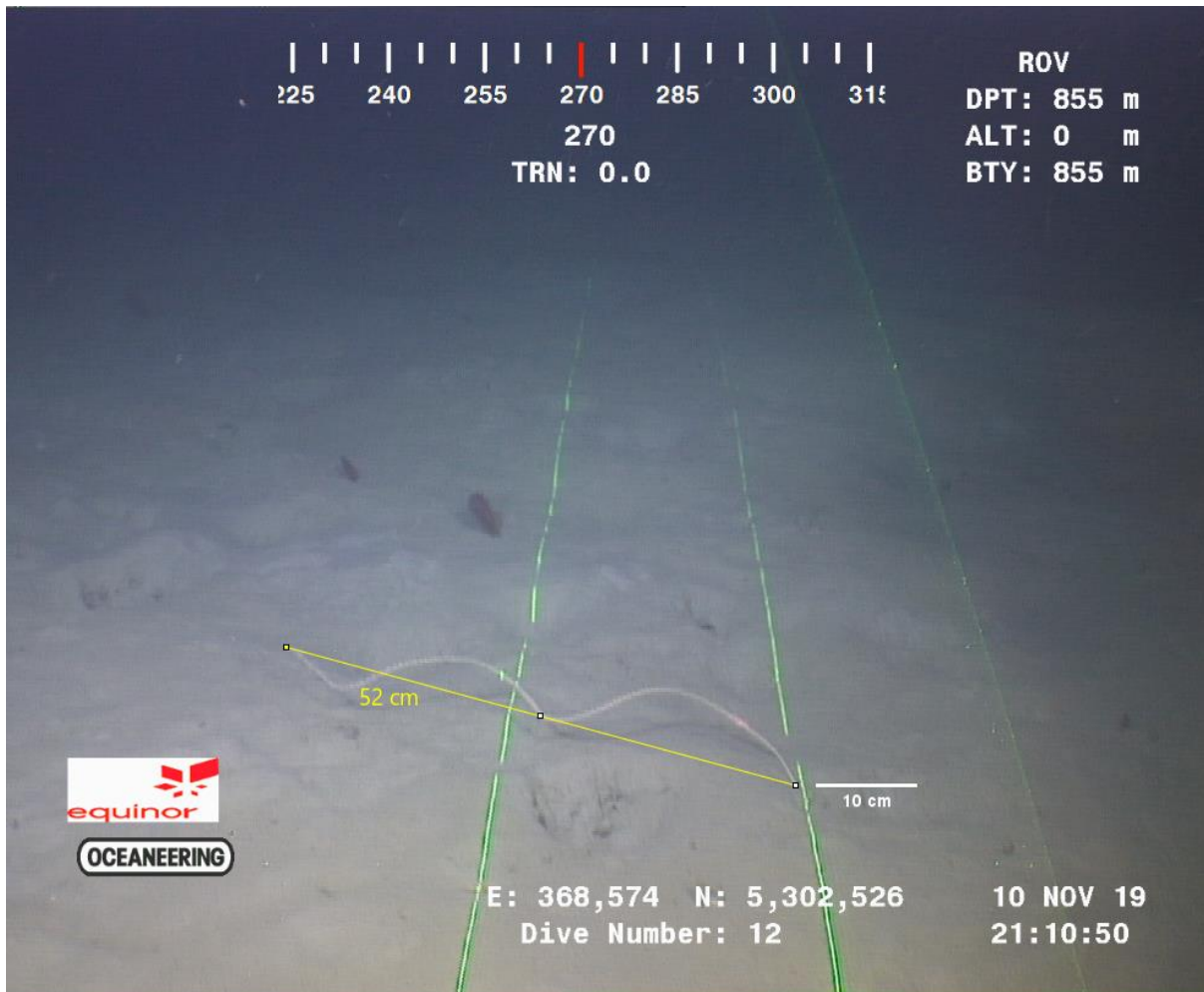


Figure 2-3 Example of measuring coral height/width using ImageJ. Lasers are 30 cm apart.

2.2.2 Macrofauna

Macrofauna were identified using available identification guides (e.g., Scott and Scott 1988, Daigle et al. 2006, Beazley and Kenchington 2015, Kenchington et al. 2015). Faunal densities were based on survey distance with an approximate field of view. Macrofauna identification was dependent on the quality of the imagery and prominence of identifying characteristics. Corals, sponges, and fish were categorized into functional/morphotype groups (Best et al. 2010, Kenchington et al. 2015, Ollerhead et al. 2017). For the purpose of this analysis

invertebrates other than corals and sponges were categorized into phylum or type: echinoderms (e.g. urchins and seastars), cnidaria (e.g., anemones and jellyfish), arthropods (e.g. shrimp, crab), other invertebrates (e.g. molluscs, ctenophores, brachiopods, and annelids). Species under Schedule 1 of the *Species at Risk Act* (SARA), 2012 were noted when observed and briefly discussed.

Coral and Sponge Characterization

Corals were categorized into widely used functional groups that have been established and defined across several coral identification guides (e.g. Kenchington et al. 2015). Coral identification to species often requires recovered specimens as distinguishing features may require examination under magnification by a qualified taxonomist. No corals specimens were collected during the seabed investigation. Coral functional groups are based on shape and species characteristics (Table 2-3). Soft corals (Alcyonacean and Nephtheids) have a soft hydrostatic support system and lack of a hard-supporting structure. Black coral (Antipatharians) generally have a hard black skeleton visible beneath the polyps. Hard (stony) coral (Scleractinia) can form either reefs/mounds or exist as individual cup corals. This functional group includes target species *L. pertusa*. Branching coral (Alcyonacea, also known as gorgonians) form fan or bush like structures with hard skeletons. Sea pens (Pennatulaceans) can appear feather-like or as long whips.

Sponge morphological groups are based on general shapes that are present over several taxonomic classes and families (Table 2-4) (Kenchington et al. 2015). Thin-walled/foliose sponges come in a variety of shapes and sizes, but all have a thin wall. Leaf / Vase shaped sponges are either flat and broad or form vase-like cones. Solid/Massive sponges are thick without a distinct shape or form. Round with projections sponges have projections of various length coming from the top (papillate). Stalked sponges have a central or basal stalk-like structure. Other sponges consist of miscellaneous body types including finger-shaped, encrusting, bladder-like, excavating that are typically found on hard substrates.

Table 2-3 Coral Functional Groups

Class	Functional Group	Example Taxa
Alcyonacea	Soft Coral	<i>Anthomastus</i> sp, family Nephtheidae
Antipatharia	Black Coral	<i>Stauropathes</i> sp., <i>Stichopathes</i> sp.
Scleractinia	Hard Coral	<i>Lophelia pertusa</i> , <i>Desmophyllum</i> sp. <i>Flabellum</i> sp.
Alcyonacea	Branching Coral	<i>Acanella</i> sp., <i>Paragorgia</i> sp.
Pennatulacea	Sea Pens	<i>Anthoptilum</i> sp., <i>Pennatula</i> sp.

Note: Functional groups from Kenchington et al. (2015)

Table 2-4 Sponge Morphological Groups

Class	Family	Morphology	Example Taxa
Hexactinellida	Rosellidae	Thin-Walled / Complex	<i>Asconema</i> sp.
Demospongiae	Axinellidae	Leaf / Vase Shaped	Axinellidae spp.
	Various Families	Solid / Massive	<i>Geodia</i> sp.
	Various Families	Stalked	<i>Chondrocladia</i> sp.
	Polymastiidae	Round with Projections	Polymastiidae spp.
Various Classes	Various Families	Other	<i>Haliclona</i> sp.

Note: Functional groups from Kenchington et al. 2015

2.2.3 Substrate Type

Surficial substrate was identified visually based on the Wentworth-Udden particle scale (Kelly et al. 2009, Wentworth 1922) (Table 2-5) and expressed as a percentage of coverage (rounded to the nearest 5%) for each transect section.

Table 2-5 Substrate categories used to categorize substrate class

Substrate Class	Substrate Type	Definition of particle size class
Bedrock		Continuous solid bedrock
Coarse	Boulder	Rocks greater than 250 mm
	Rubble	Rocks ranging from 130 mm to 250 mm
Medium	Cobble	Rocks ranging from 30 mm to 130 mm
	Gravel	Granule size or coarser, 2 mm to 30 mm
Fine	Sand	Fine deposits ranging from 0.06 mm to 2 mm
	Mud	Material encompassing both silt and clay <0.06 mm
Organic/Detritus		A soft material containing 85 percent or more organic materials
Shells		Calcareous remains of shellfish or invertebrates containing shells

2.2.4 Other Observations

Other observations noted during the field survey and associated data analysis included anthropogenic disturbance (e.g., trawl marks, nets, debris) and presence of macroflora. As sunlight is a key factor on the growth and survival of macroalgae and seagrass, the survey area is generally too deep to support macroalgae and seagrass colonization and growth. Within each surveyed unit of approximately 50 m, the presence or absence of trawl marks was noted. Trawl marks were taken to be any long, straight line or series of parallel lines that appeared non-natural in origin.

2.3 Mapping

ROV video was geo-referenced with coordinates captured using the HiPAP system aboard the MV *Horizon Star* and plotted using the GIS software ArcMap v10.5 (ESRI 2016). Substrates are typically dominated by fine substrates in offshore deep-water environments with discontinuous areas of hard substrates (Miles 2018). Hard substrates are important for particular coral and sponge species for larval settlement and attachment (Beazley et al. 2013, Gullage et al. 2017). Therefore, substrate maps depict the percent coverage of the largest substrate type observed in each transect section. Macrofauna densities by functional, morphological, and phylum per transect section were also mapped.

The ROV track file was used to segment the video by date and timestamp into approximately 50 m sections for analysis (e.g., surficial substrate assessment, macrofauna densities). Video section start and ends were identified in ArcGIS as the closest datapoints to planned survey sections. A discrepancy in video overlay positioning information relative to the ROV track file was noted during video analysis. This resulted in clipping of video information at the beginning or end of the transects. Therefore, some sections are shorter than 50 m in the analysis and on associated maps. Assessments of coral height/width were not affected by this discrepancy as position fixes for measured corals were determined in the field using average ROV positioning.

3.0 RESULTS

A combined total of 36:34 hours (hh:mm) of ROV video covering 30,376 m² of seafloor were analyzed at four sites within EL 1156. Visibility varied due to height/width above seabed, sediment in the water column, and speed of travel, however there was typically several meters of visibility in front and on either side of the ROV. Start and end times and coordinates for each line are presented in Appendix A along with the raw survey data.

3.1 Assessment to C-NLOPB Coral Guidance

3.1.1 Coral Measurements

The guidance indicates that drilling activities, shall not occur within 100 m of coral colonies, defined either as:

- *Lophelia pertusa* reef complex; or
- Five or more large corals (larger than 30 centimeters in height/width) within a 100 square metre area.

The reef-forming coral *Lophelia pertusa* was not observed at any site. In the field 55 corals were estimated to be above the 30 cm threshold. Post-survey the heights were measured using ImageJ and a total of 48 corals above 30 cm in height/width were observed within the 200 m x 200 m boxes at three sites. There were no corals over 30 cm observed at Cambriol, eight were observed at Cappahayden, 18 at Sitka, and 22 at Bakeapple (Figure 3-1 to Figure 3-3). Coral over 30 cm in height/width belonged either to the branching coral functional group, or the sea pen functional group. As no clusters of five or more coral above 30 cm within a 100 square meter area were observed at any site, no C-NLOPB coral colonies were present at any site. See Appendix B for coordinates and details for all corals over 30 cm in height/width.

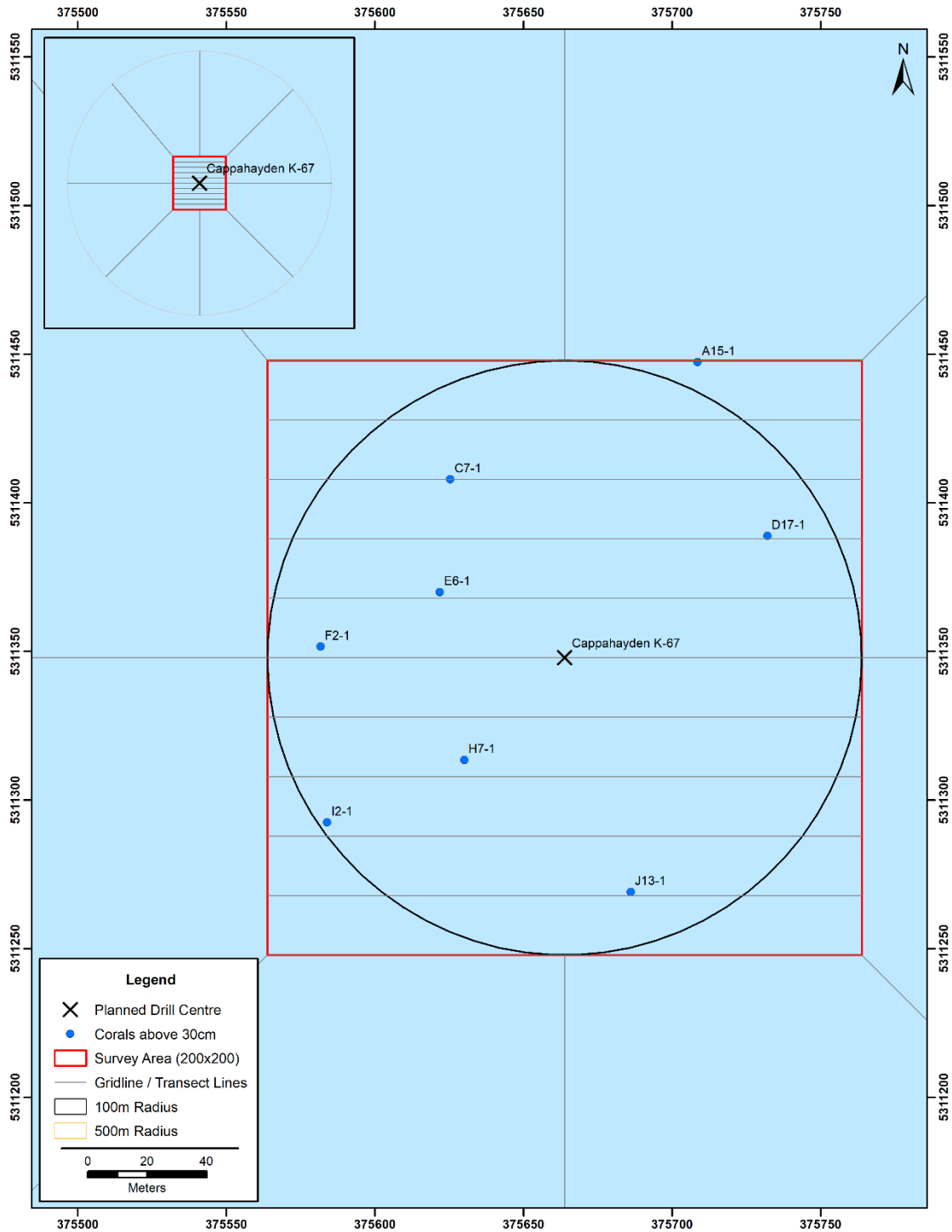


Figure 3-1 Locations of corals above 30 cm observed within the 200 m x 200 m survey area of the proposed drill center at Cappahayden K-67

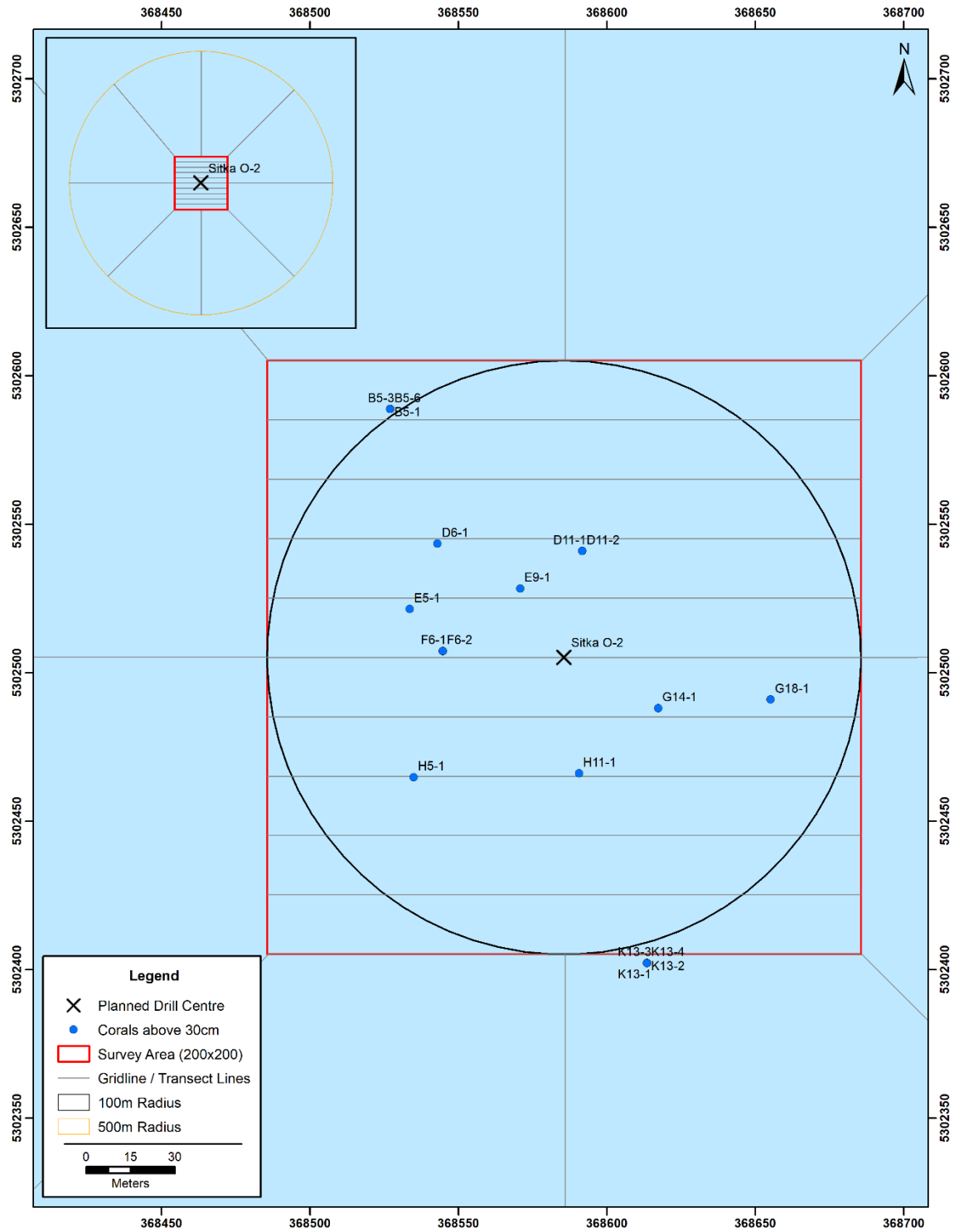


Figure 3-2 Locations of corals above 30 cm observed within the 200 m x 200 m survey area of the proposed drill center at Sitka O-2

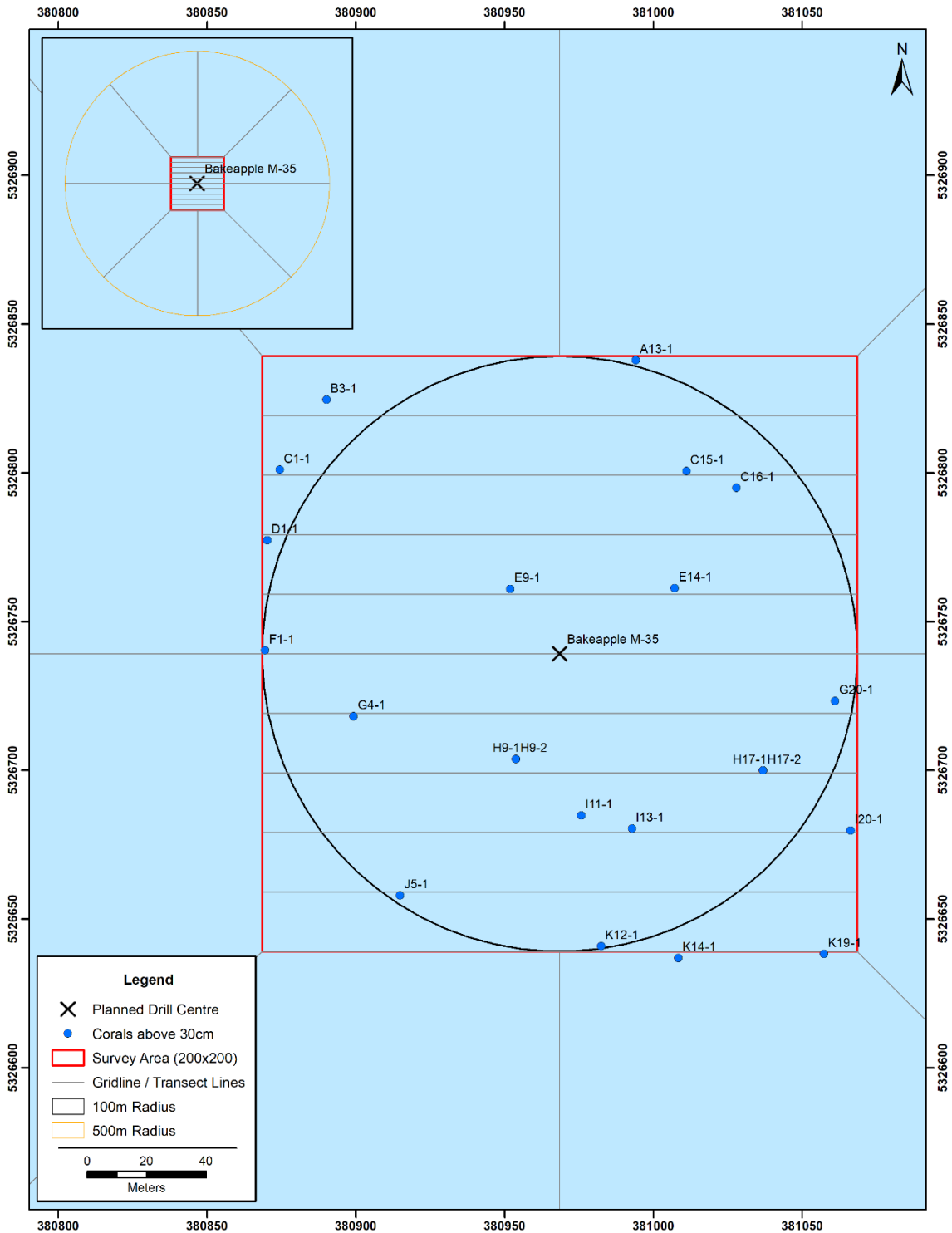


Figure 3-3 Locations of corals above 30 cm observed within the 200 m x 200 m survey area of the proposed drill center at Bakeapple M-35

3.2 Surficial Observations

3.2.1 Substrate

At the four sites, the surficial substrate consisted mainly of fine substrate types (e.g. sand and mud) with sporadic larger hard substrates observed at only three of the sites; Cambriol G-92, Cappahayden K-67, and Sitka O-2. Cambriol G-92 had the highest occurrence of larger substrate types with medium or coarse substrate types observed along each grid line and transect (Figure 3-4). Percent coverage ranged between 5 to 30 percent coarse with a few instances of 5 percent medium. Cappahayden K-67 had only one section with 5 percent coarse substrate coverage along the northern radial; there were no instances of medium or coarse substrate types within the 200 x 200 m grid (Figure 3-5). Percent coverage of large substrate types observed at Sitka O-2 was low and ranged between 5 to 10 percent coarse and one instance of 5 percent medium observed within the 200 x 200 m grid (Figure 3-6). Only fine substrates were observed at Bakeapple M-35 (Figure 3-7).

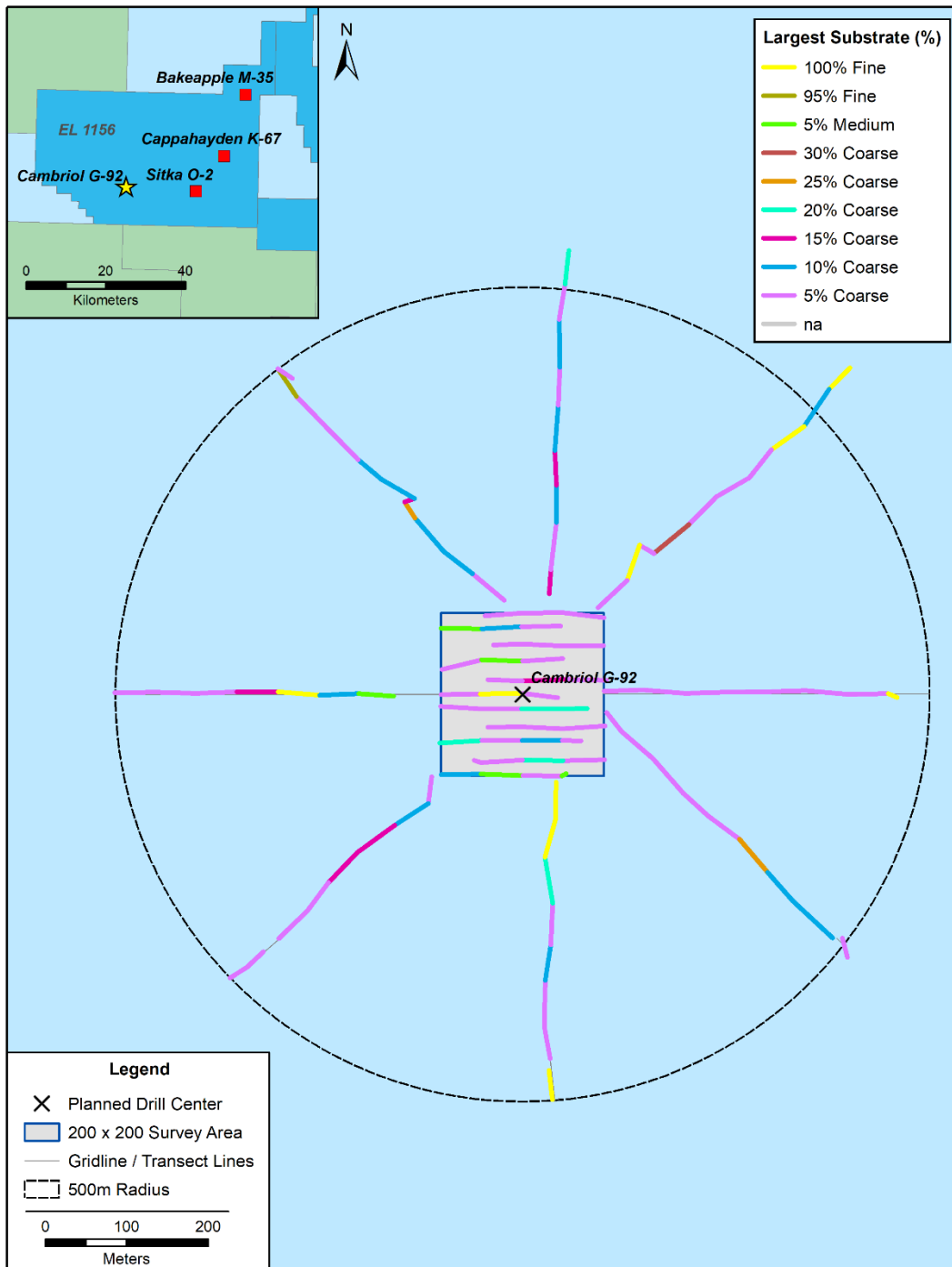


Figure 3-4 Distribution of percent coverage of largest substrate type observed at Cambriol

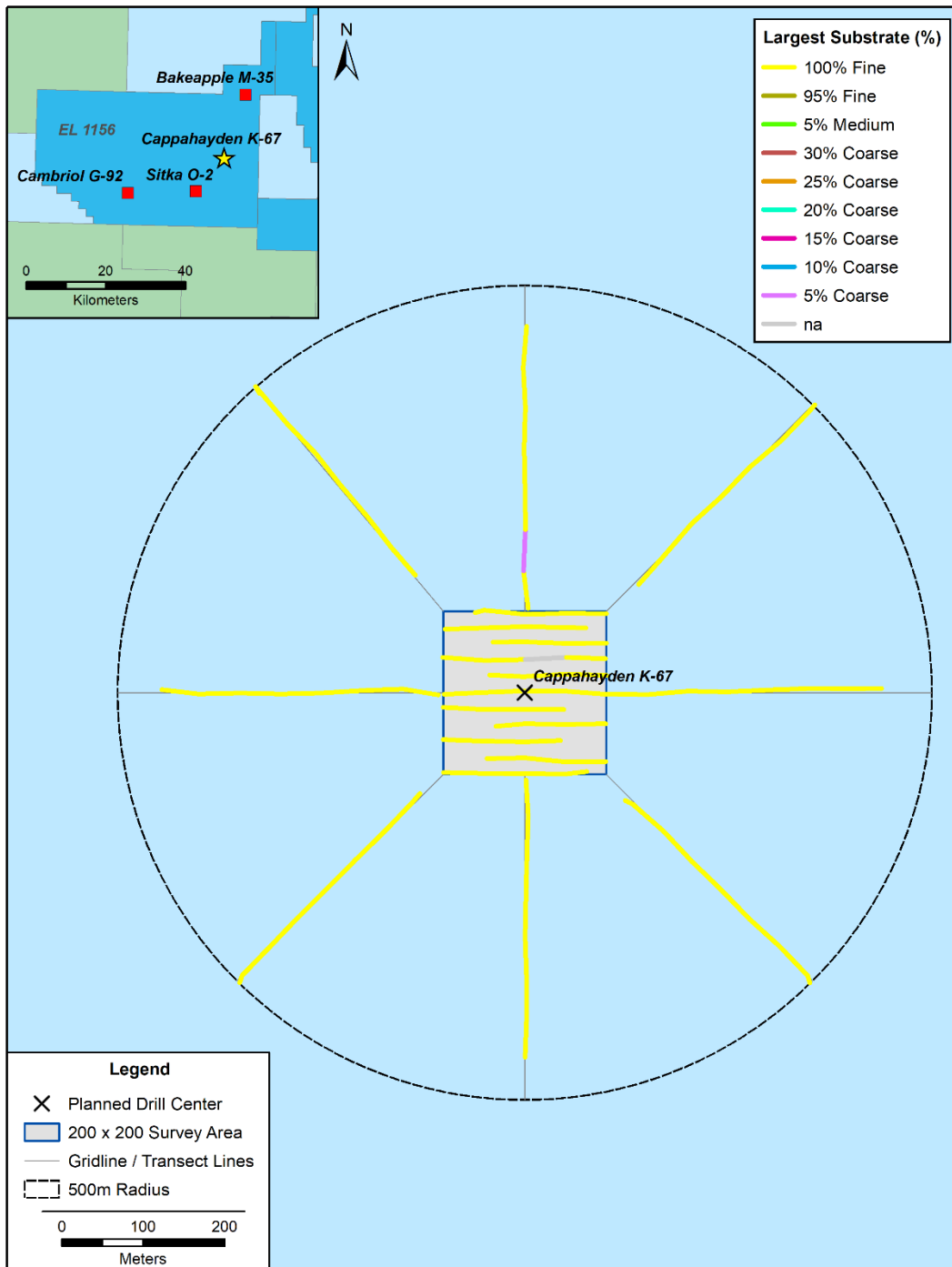


Figure 3-5 Distribution of percent coverage of largest substrate type observed at Cappahayden

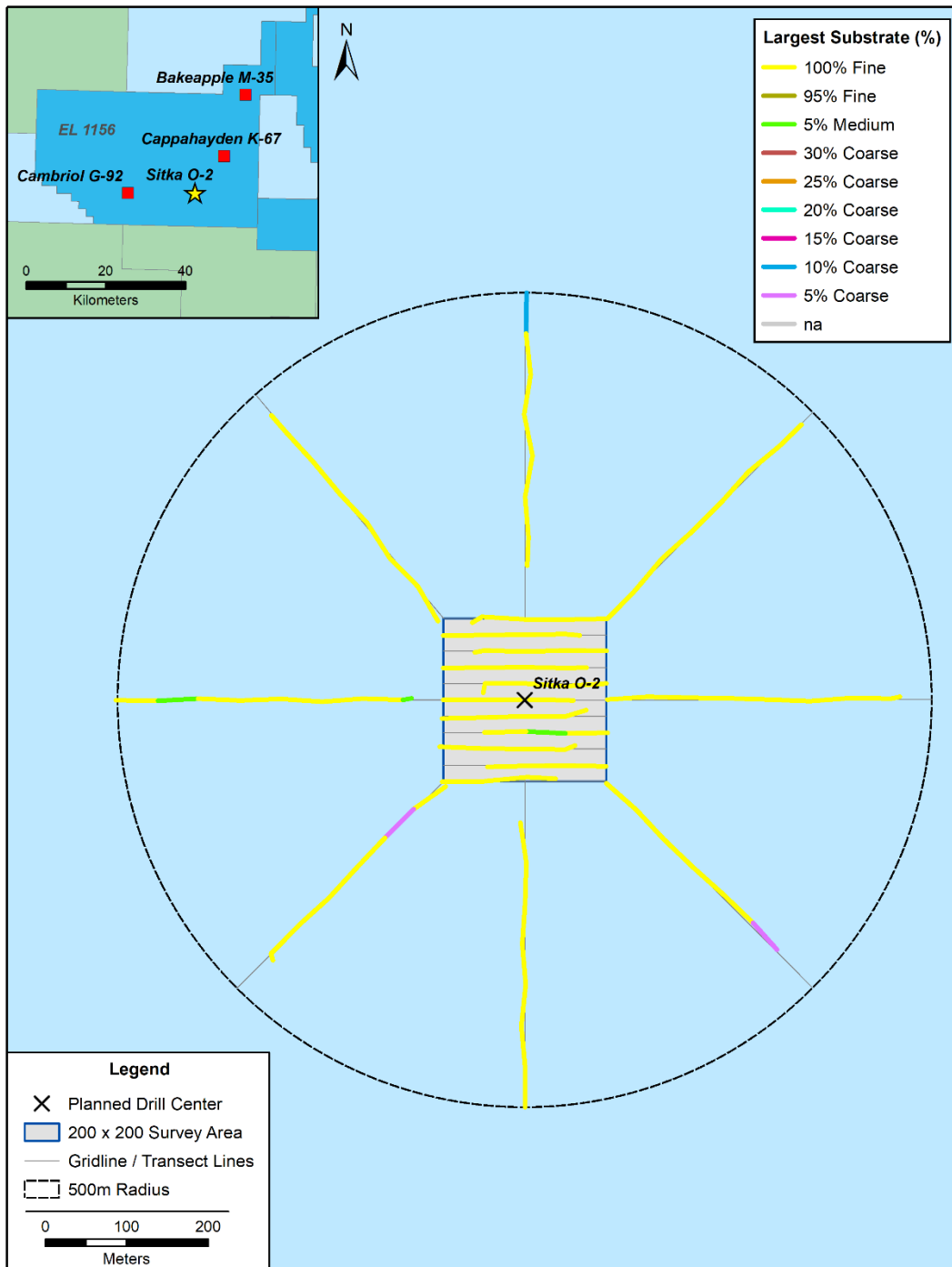


Figure 3-6 Distribution of percent coverage of largest substrate type observed at Sitka

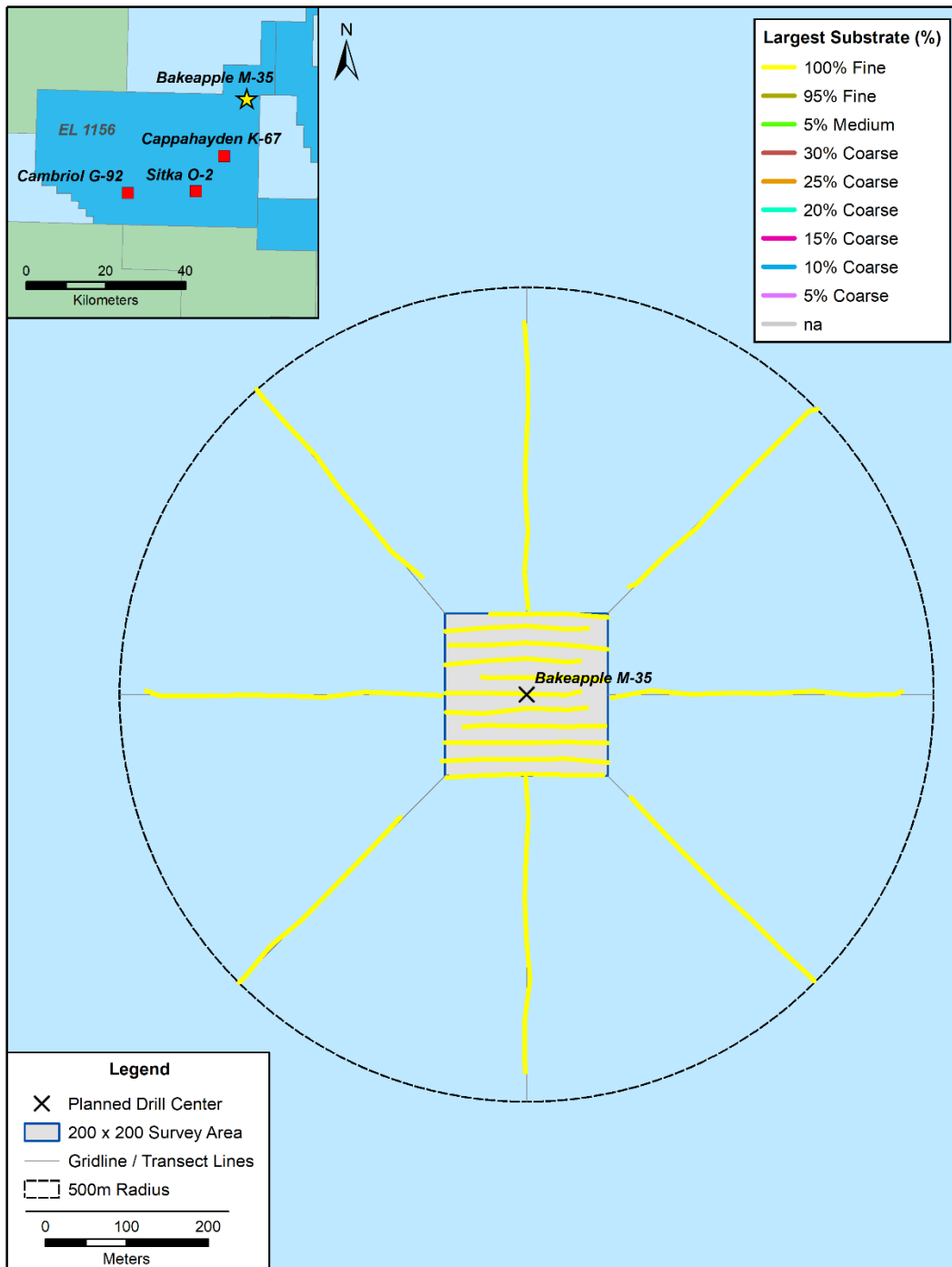


Figure 3-7 Distribution of percent coverage of largest substrate type observed at Bakeapple

3.2.2 Trawl Marks and Other Observations

Within EL 1156, visible trawls marks were observed at all four sites (Figure 3-8, Figure 3-9). These marks typically were long, straight drag lines visible within the fine substrate, frequently covering large areas with parallel otter door marks. Bakeapple had the highest incidence of trawl marks overall, with 46% of lines having one or more observations. Though no abandoned fishing gear was found in the 2019 EL 1156 survey, small debris was found such as the glove and plastic cylinder from Figure 3-8. No association was noted between marks and any group or animals including corals.

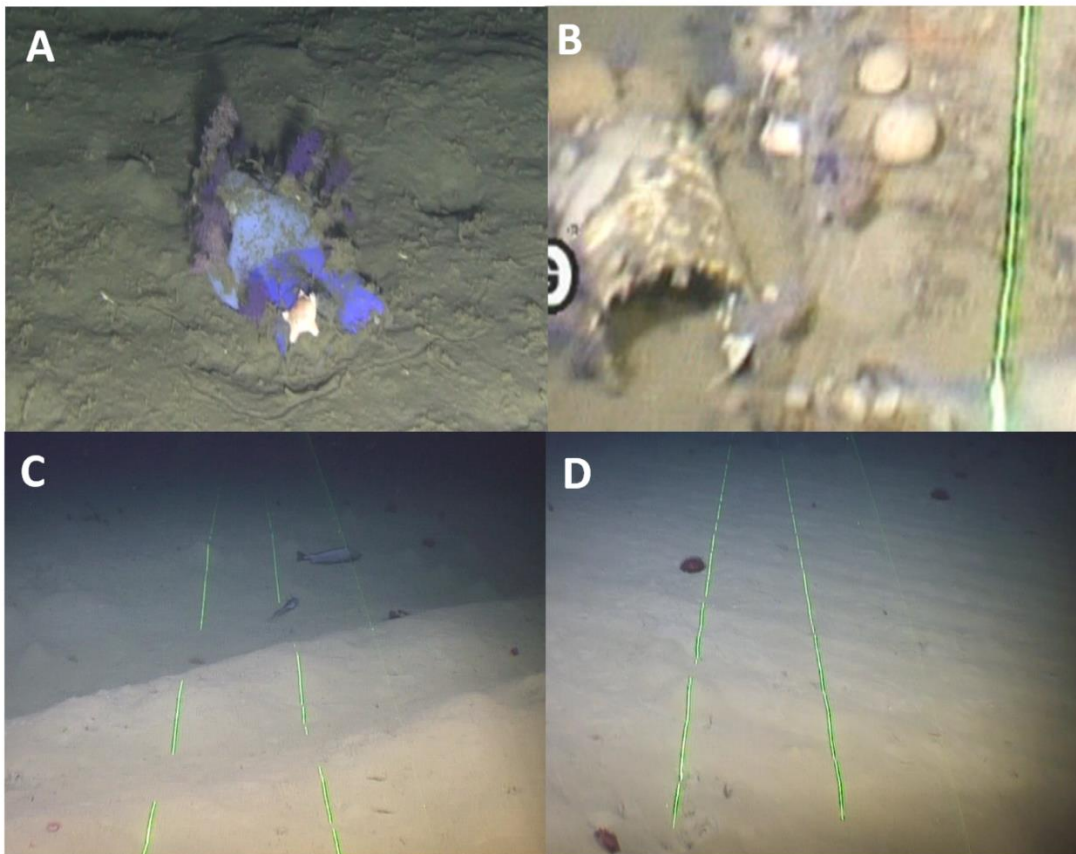


Figure 3-8 Examples of debris and trawl marks observed within EL 1156: A) glove in 2018 Cambriol radials, B) plastic cylinder, C) trawl marks, and D) trawl marks.

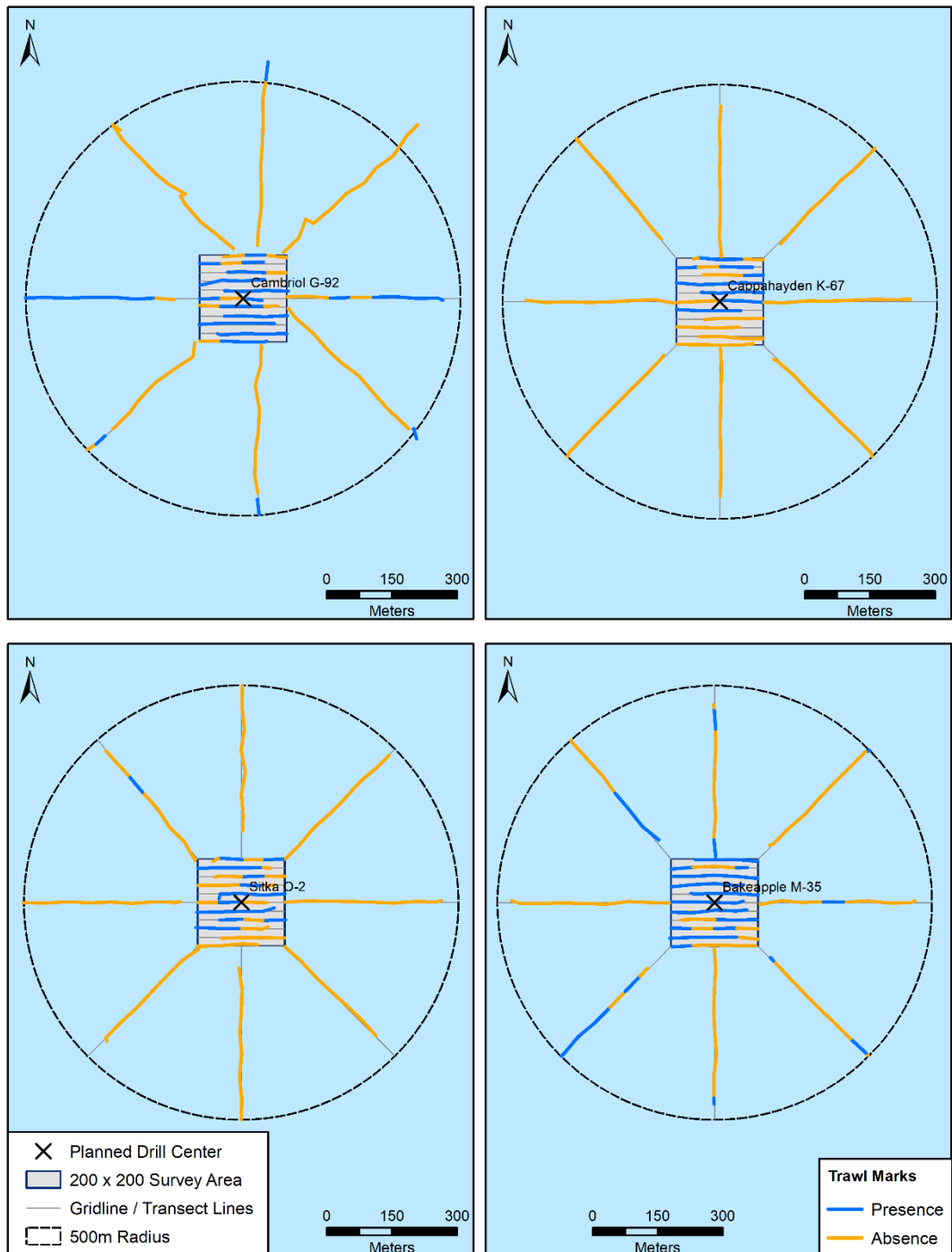


Figure 3-9 Visible trawl marks observed in sampled lines at Cambriol (top left), Cappahayden (top right), Sitka (bottom left), and Bakeapple (bottom right)

3.3 Macrofauna

3.3.1 Coral Functional Groups

Four coral functional groups were observed at all four site during the ROV survey, with the exception of hard corals not observed at Cambriol (Table 3-1, Figure 3-10 to Figure 3-14). No black corals were recorded at any site. Overall, coral densities were highest at Bakeapple, with sea pens having the highest density of any coral functional group (Table 3-1). Soft corals were the second most common functional group, with the highest density at Cambriol. Relatively few hard or branching corals were observed overall, with Cappahayden having the highest density of hard corals and Bakeapple having the highest density of branching coral. For all fauna observed at all sites, coral (primarily sea pens) had the highest overall densities. See Appendix C for maps of each functional group at each site.

Table 3-1 Summary statistics for coral functional groups at all survey sites

Section ¹	Area (m ²)	Density (individuals per m ²)				
		Mean	Standard Deviation	Median	Minimum ²	Maximum
Soft Corals						
Cambriol	8,066	0.609	0.597	0.458	0.013	3.113
Cappahayden	7,172	0.008	0.014	0	0.012	0.060
Sitka	7,434	0.030	0.007	0	0.011	0.048
Bakeapple	7,704	0.001	0.003	0	0.012	0.013
Hard Corals						
Cambriol	8,066	0	-	-	0	0
Cappahayden	7,172	<0.001	0.002	0	0.012	0.014
Sitka	7,434	<0.001	0.002	0	0.012	0.012
Bakeapple	7,704	<0.001	0.001	0	0.012	0.012
Branching Corals						
Cambriol	8,066	0.002	0.006	0	0.010	0.036
Cappahayden	7,172	0.018	0.023	0.012	0.012	0.160
Sitka	7,434	0.041	0.034	0.034	0.011	0.179
Bakeapple	7,704	0.013	0.024	0.012	0.011	0.223
Sea Pens						
Cambriol	8,066	0.137	0.080	0.125	0.011	0.382
Cappahayden	7,172	0.884	0.667	0.716	0.065	4.776
Sitka	7,434	2.352	1.079	2.303	0.831	5.850
Bakeapple	7,704	2.664	1.515	2.459	0.581	14.056
Bolded values are the highest mean or maximum value for a given functional group ¹ Survey Sites: Cambriol G-92, Cappahayden K-67, Sitka O-2, and Bakeapple M-35 ² Minimum values exclude zeros (i.e. smallest non-zero value)						

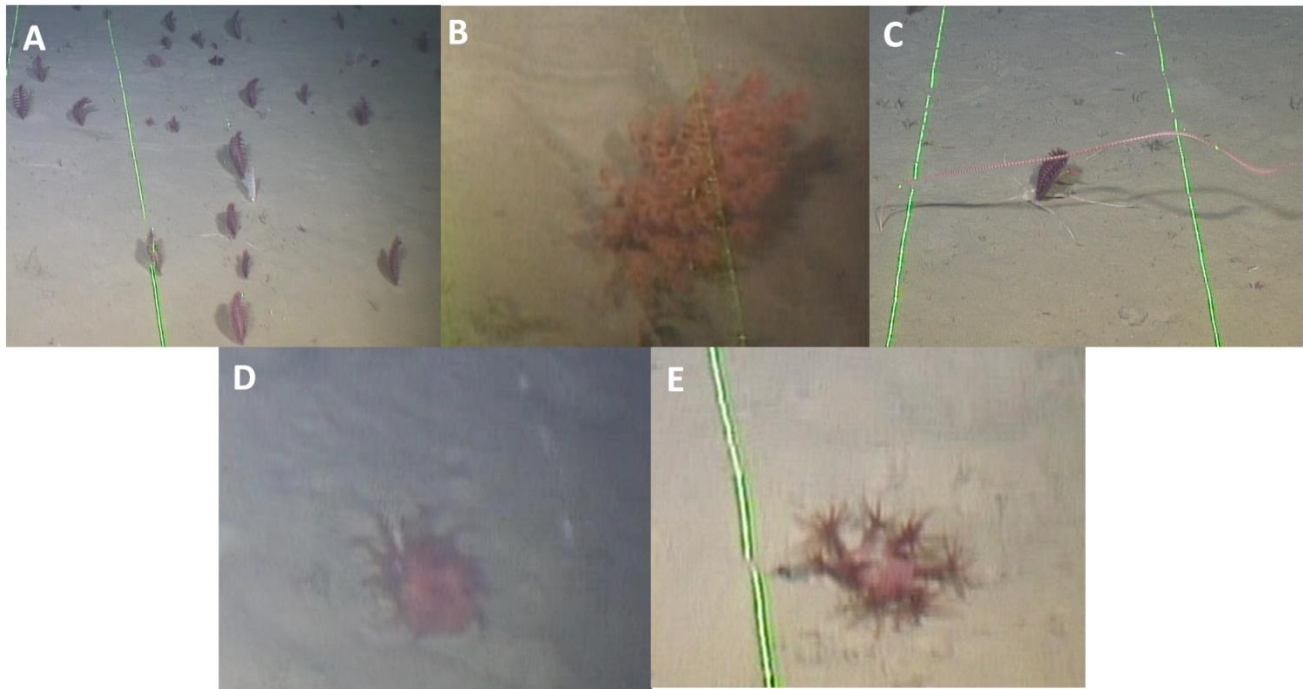


Figure 3-10 Examples of coral functional groups observed at EL 1156: A) sea pens, B) branching coral, C) sea pens, D) hard coral (cup coral), and E) soft coral.

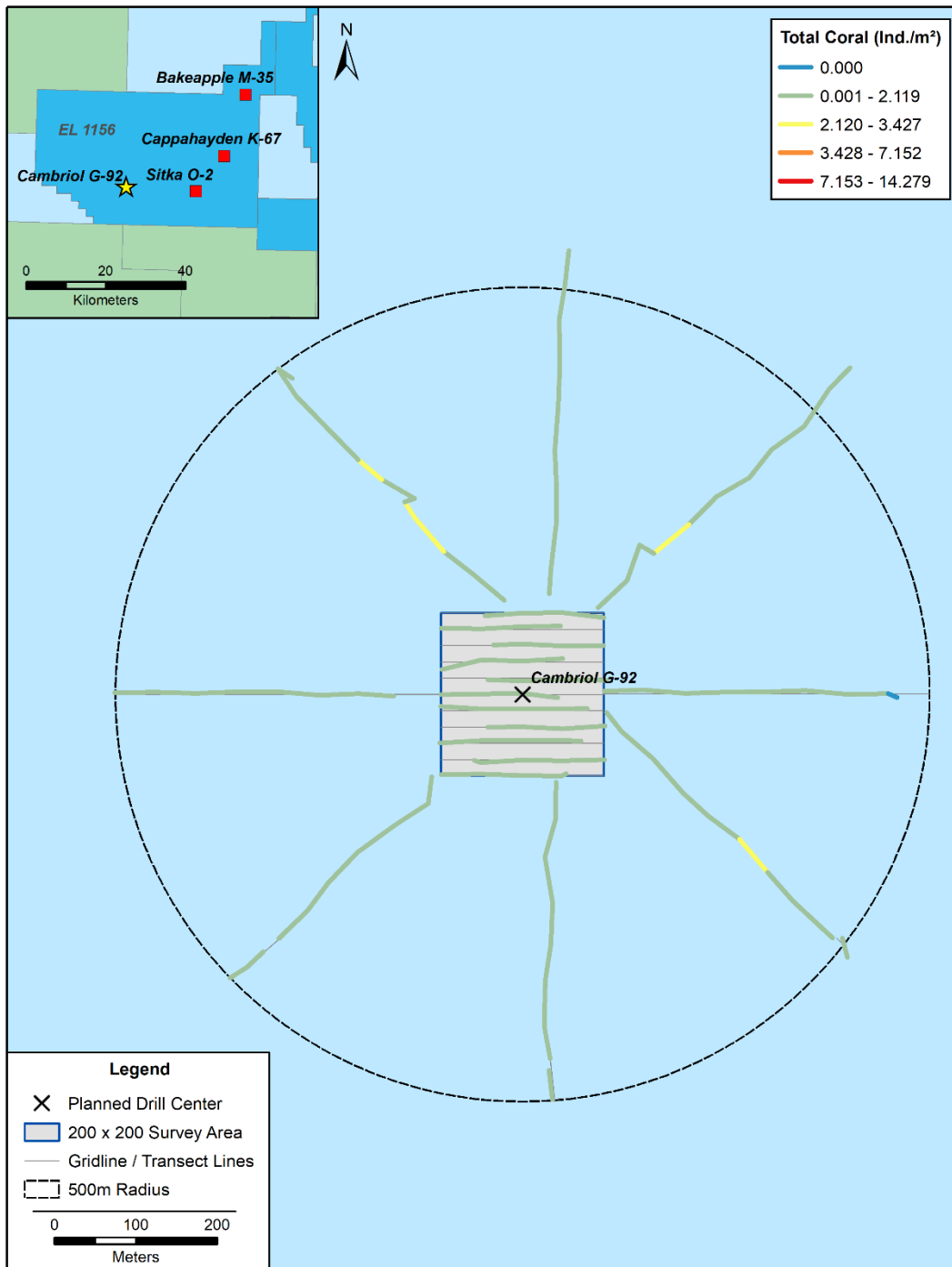


Figure 3-11 Total coral density (ind./m²) observed at Cambriol

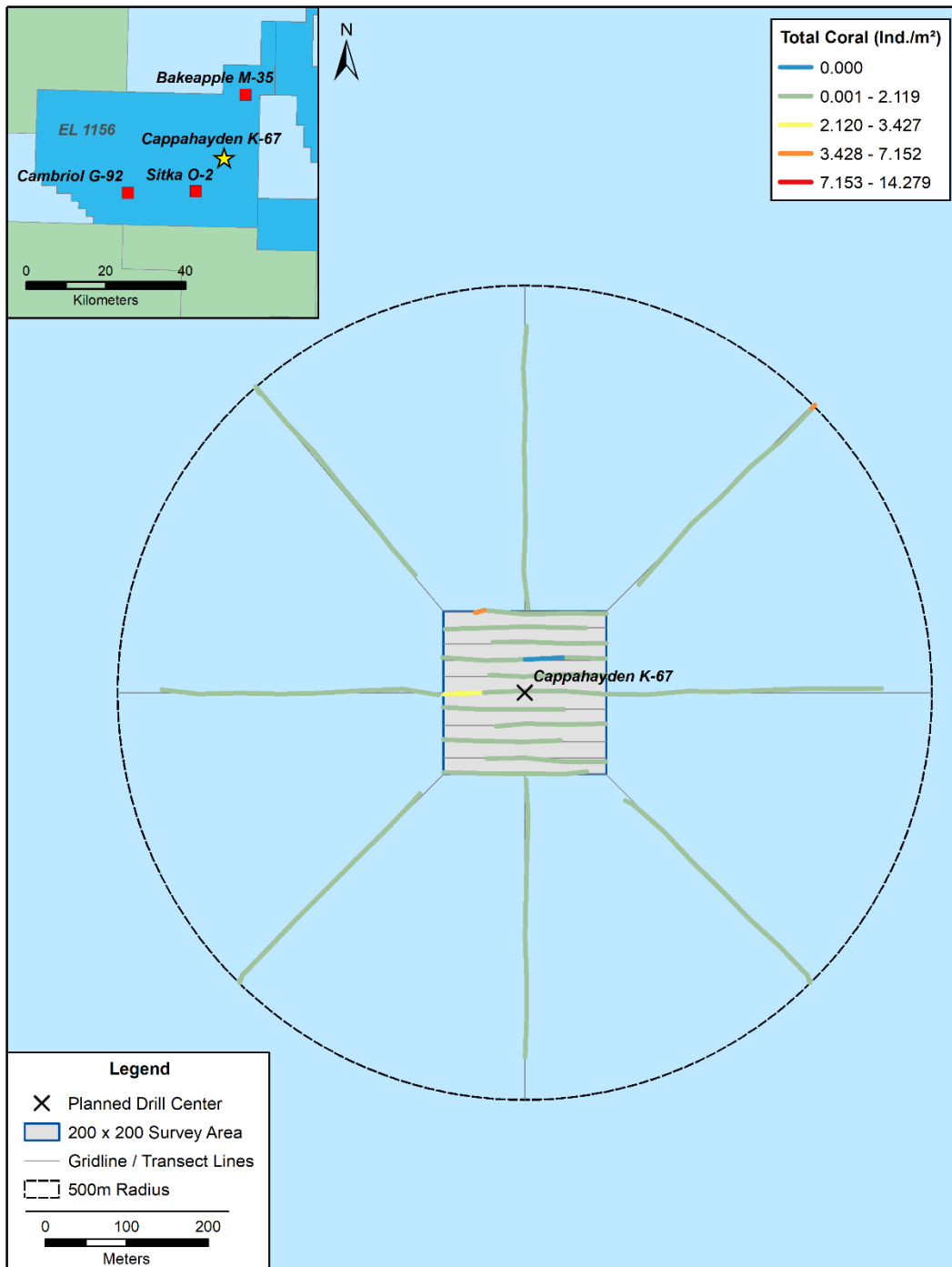


Figure 3-12 Total coral density (ind./m²) observed at Cappahayden

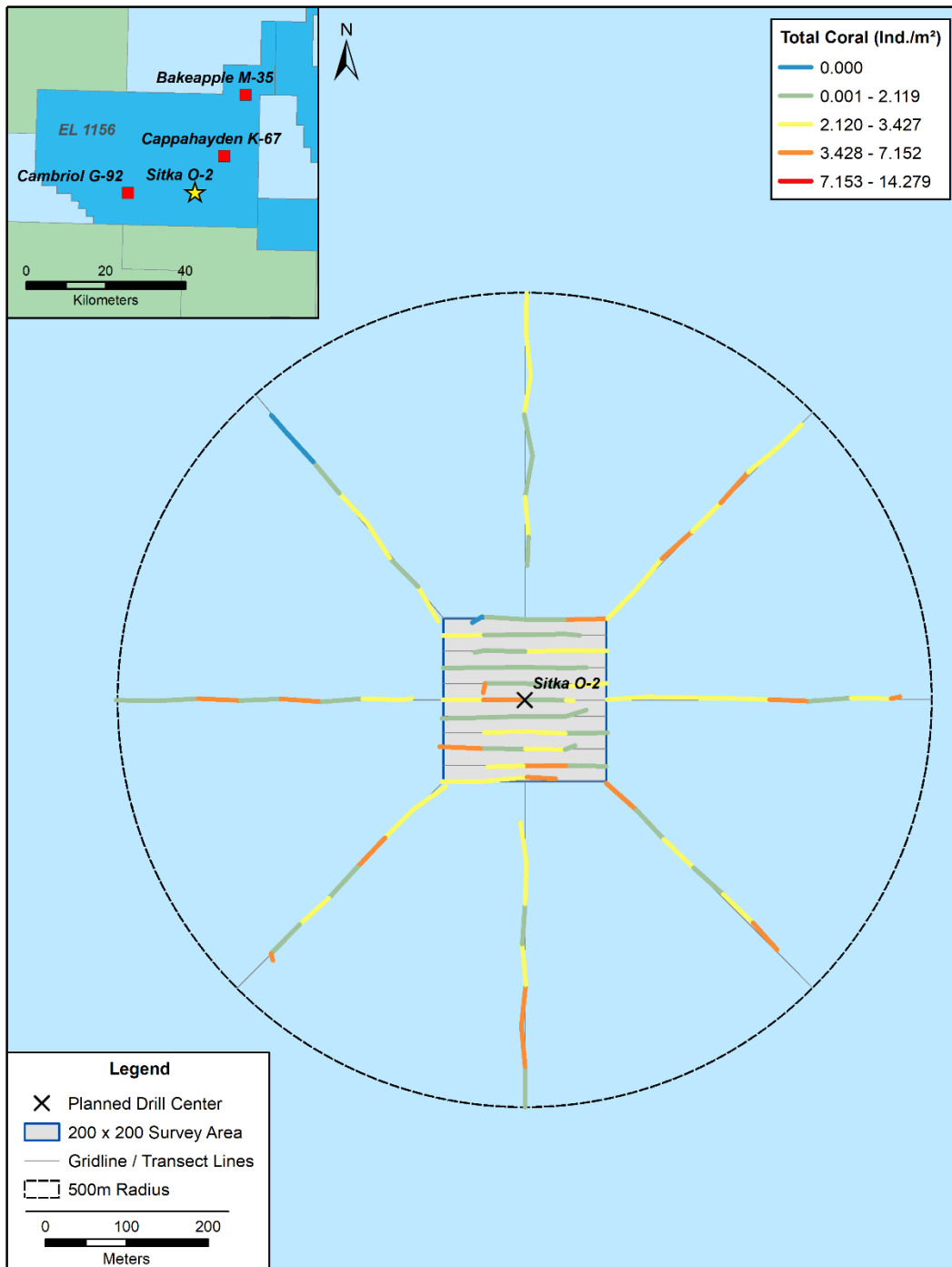


Figure 3-13 Total coral density (ind./m²) observed at Sitka

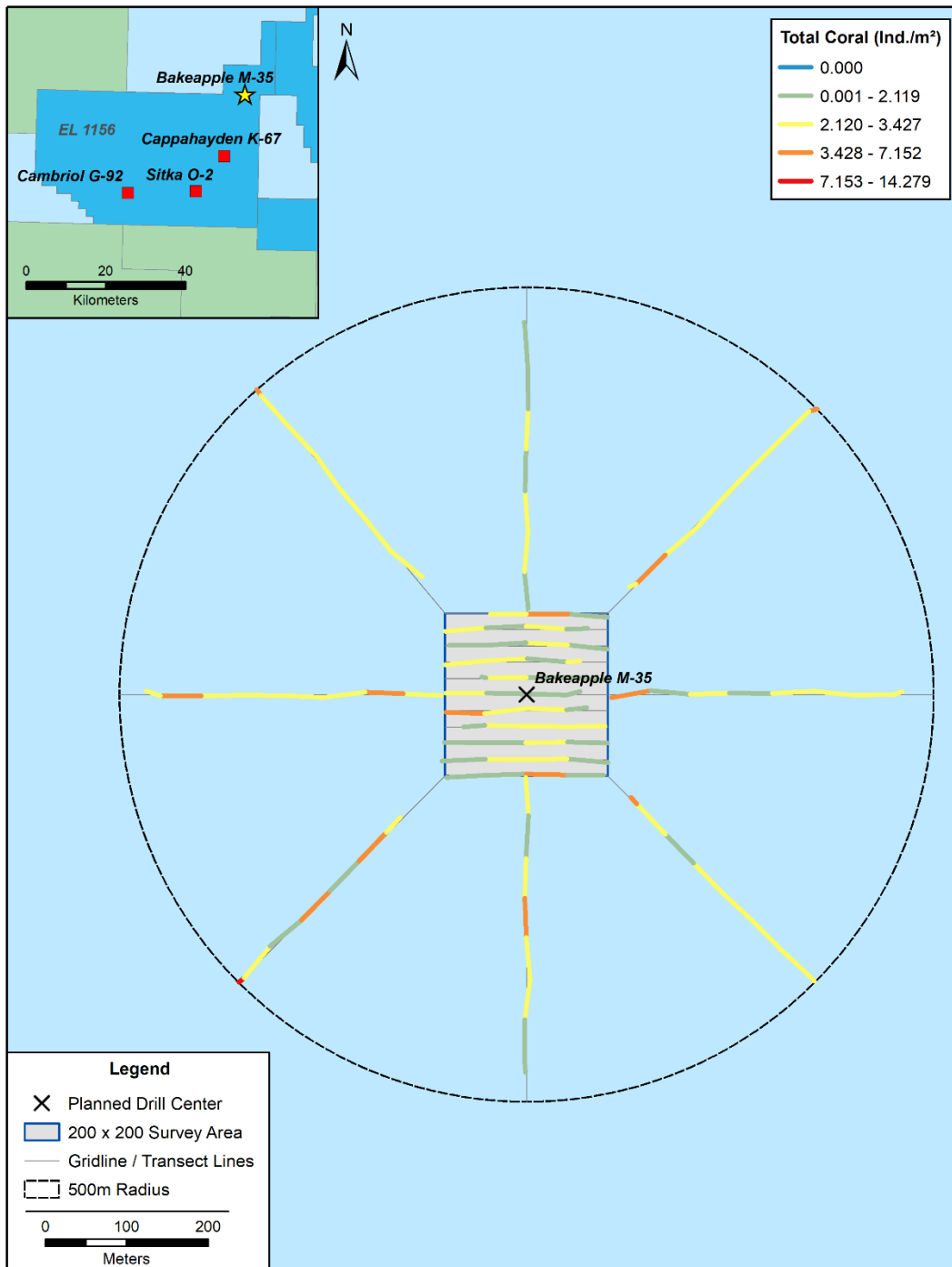


Figure 3-14 Total coral density (ind./m²) observed at Bakeapple

3.3.2 Sponge Morphological Groups

As few instances of hard substrate were noted outside of Cambriol, sponge density was very low overall (Table 3-2, Figure 3-15 to Figure 3-17). No sponges were observed at Bakeapple or Cappahayden. Cambriol had the highest overall density of sponges, with solid / massive sponges having the highest density. All sponge morphological groups had higher density values at Cambriol compared to Sitka, and several groups were only present at Cambriol. See Appendix D for maps of each sponge morphological group at each site.

Table 3-2 Summary statistics for sponge morphological groups at all survey sites

Section ¹	Area (m ²)	Density (individuals per m ²)				
		Mean	Standard Deviation	Median	Minimum ²	Maximum
Solid / Massive						
Cambriol	8,066	0.309	0.311	0.217	0.012	1.864
Cappahayden	7,172	0	-	-	0	0
Sitka	7,434	0.005	0.009	0	0.011	0.047
Bakeapple	7,704	0	-	-	0	0
Leaf / Vase Shaped						
Cambriol	8,066	0.030	0.041	0.012	0.011	0.226
Cappahayden	7,172	0	-	-	0	0
Sitka	7,434	0	-	-	0	0
Bakeapple	7,704	0	-	-	0	0
Round with Projections						
Cambriol	8,066	0.105	0.114	0.057	0.012	0.624
Cappahayden	7,172	0	-	-	0	0
Sitka	7,434	<0.001	0.001	0	0.012	0.012
Bakeapple	7,704	0	-	-	0	0
Thin-walled / Complex						
Cambriol	8,066	0.003	0.011	0	0.010	0.102
Cappahayden	7,172	0	-	-	0	0
Sitka	7,434	0	-	-	0	0
Bakeapple	7,704	0	-	-	0	0
Stalked						
Cambriol	8,066	0.002	0.006	0	0.010	0.041
Cappahayden	7,172	0	-	-	0	0
Sitka	7,434	0	-	-	0	0
Bakeapple	7,704	0	-	-	0	0
Other						
Cambriol	8,066	0.127	0.113	0.103	0.010	0.527
Cappahayden	7,172	0	-	-	0	0
Sitka	7,434	<0.001	0.003	0	0.012	0.024
Bakeapple	7,704	0	-	-	0	0

Bolded values are the highest mean or maximum value for a given functional group
¹ Survey Sites: Cambriol G-92, Cappahayden K-67, Sitka O-2, and Bakeapple M-35
² Minimum values exclude zeros (i.e. smallest non-zero value)

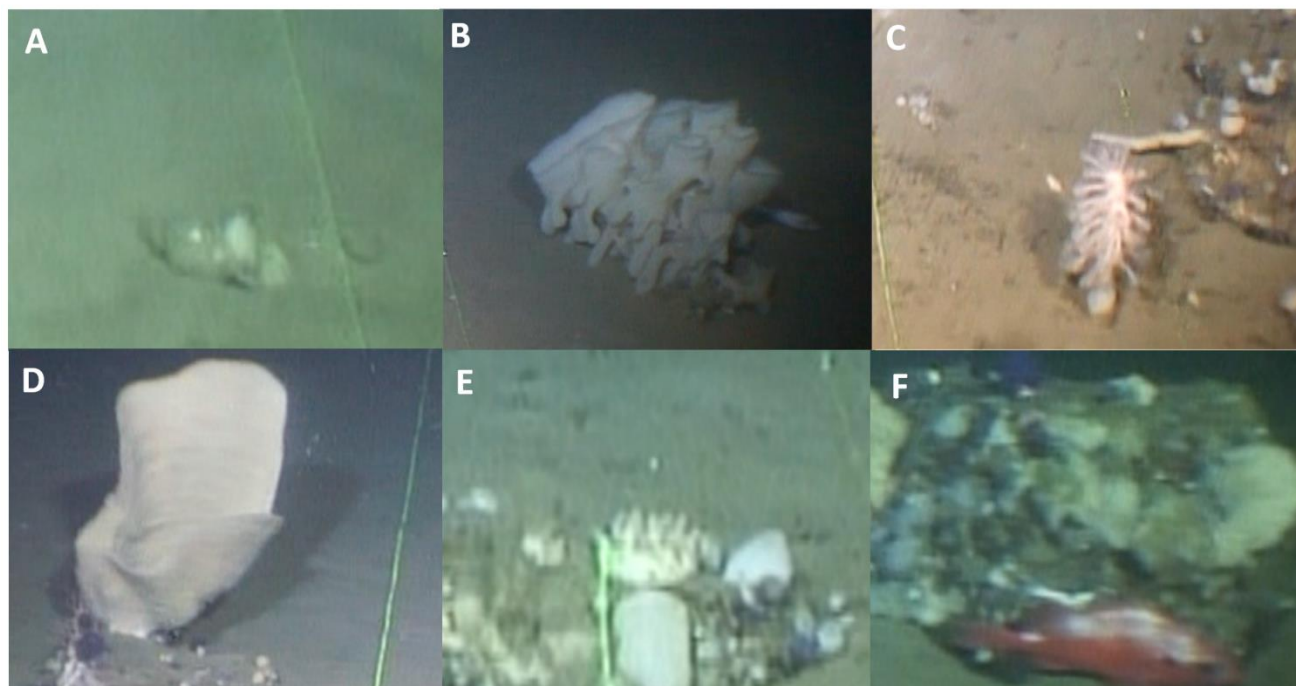


Figure 3-15 Examples of sponge morphological groups observed at EL 1156: A) solid/massive sponge, B) thin-walled, complex sponge, C) stalked sponge, D) leaf/vase shaped sponge, E) round with projections sponge, and F) other (encrusting) sponge.

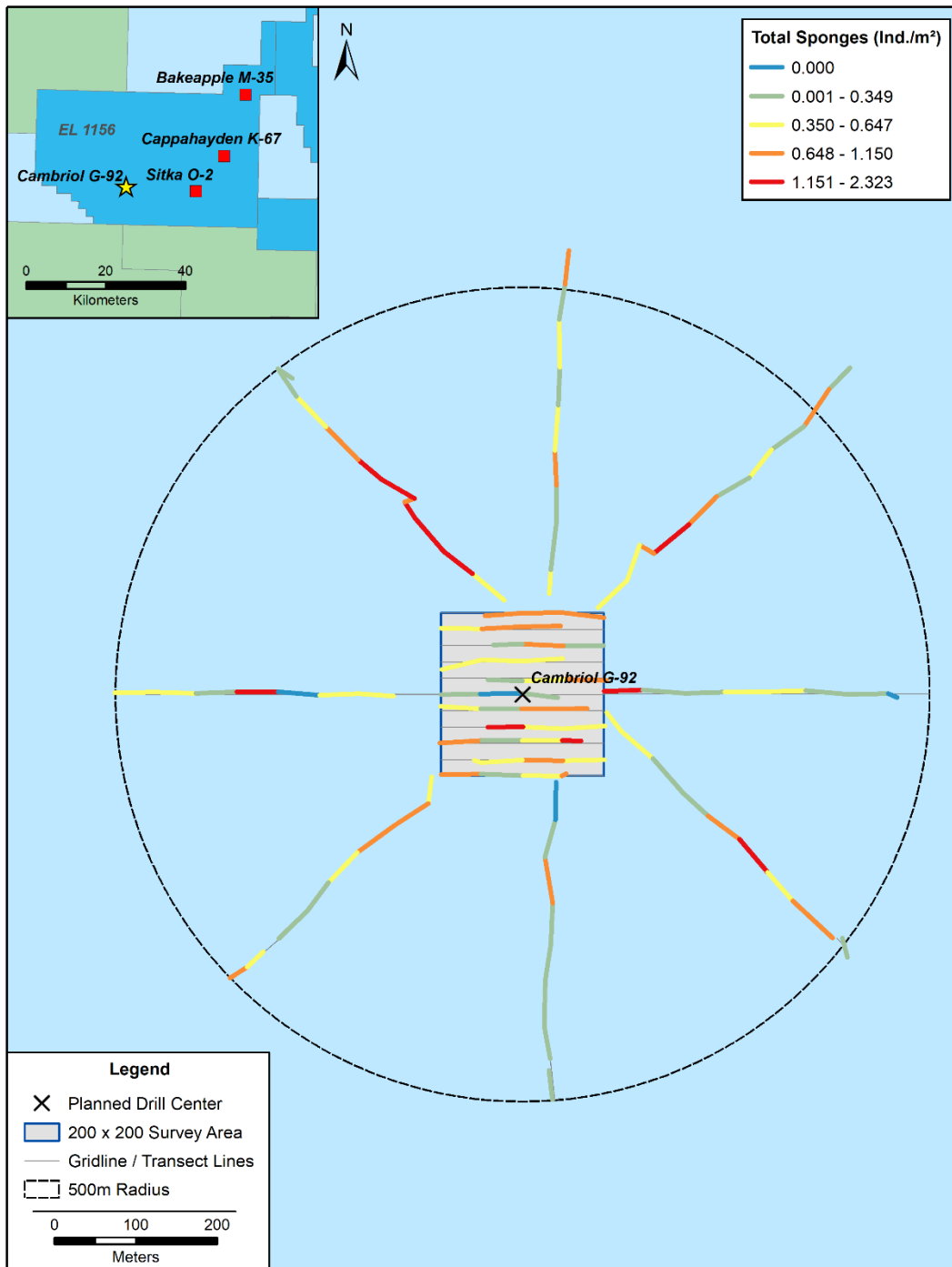


Figure 3-16 Total sponge density (ind./m²) observed at Cambriol

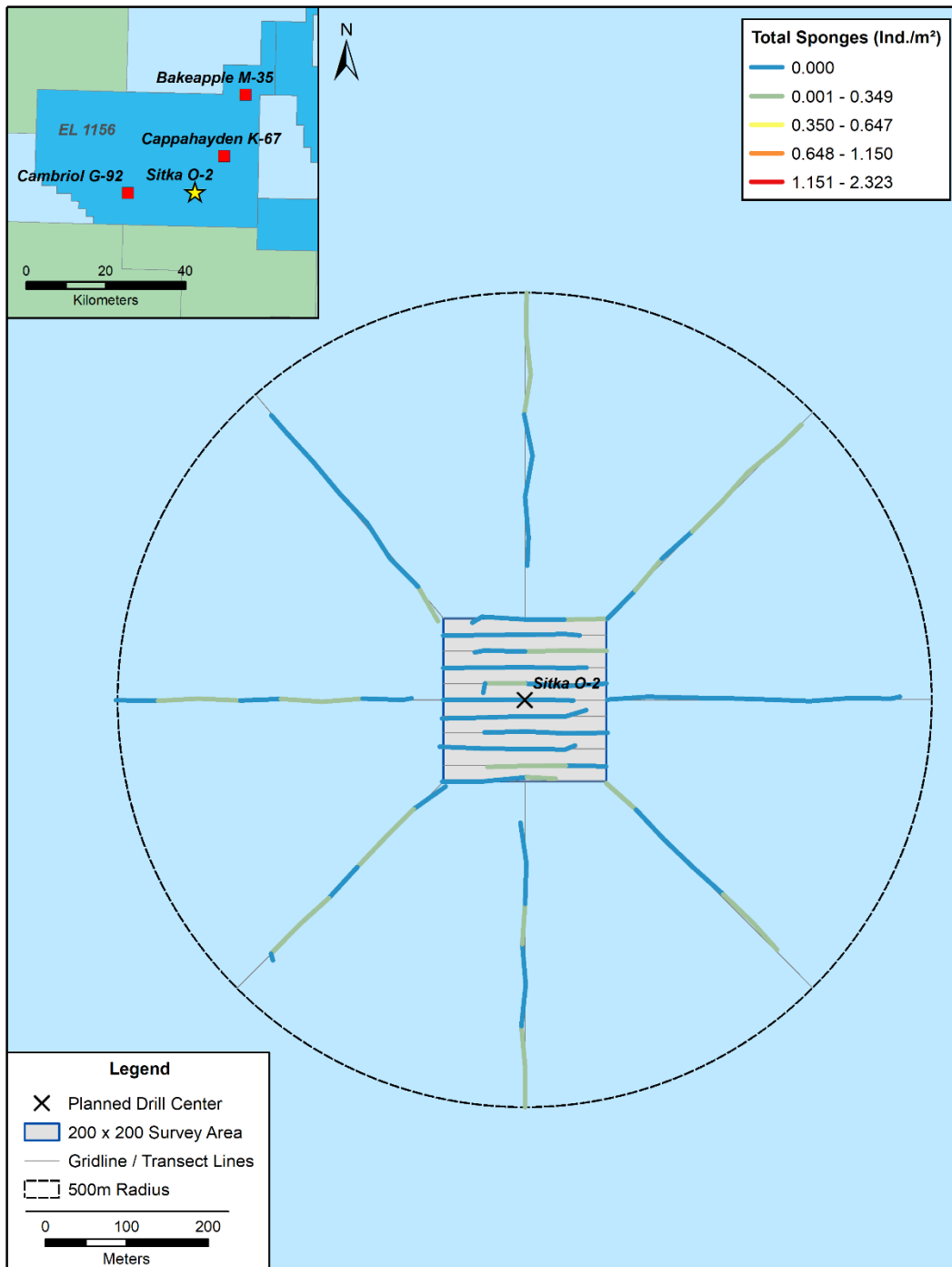


Figure 3-17 Total sponge density (ind./m²) observed at Sitka

3.3.3 Fish Functional Groups

Five functional groups of fish were recorded within EL 1156, including unidentified and poorly observed fish categorized as unknown (Table 3-3, Figure 3-18 to Figure 3-22). Overall, planktivores (lanternfish) had the highest density, with Cappahayden having the overall highest. Benthivores had the second highest density values, with Sitka having the overall highest. Unknown fish, mostly juveniles and an unknown anguilliform, had the third highest density overall. Piscivores and plank-piscivores were seen in relatively low densities. See Appendix E for maps of each functional group at each site.

There were three northern wolffish and one unidentified wolffish recorded within EL 1156. All three species of wolffish in the northwest Atlantic are SARA listed species (Schedule 1), with Atlantic wolffish designated as Special Concern, and spotted and northern wolffish designated as Threatened.

Table 3-3 Summary statistics for fish functional groups at all survey sites

Section ¹	Area (m ²)	Density (individuals per m ²)				
		Mean	Standard Deviation	Median	Minimum ²	Maximum
<i>Benthivores (small, medium, and large)</i>						
Cambriol	8,066	0.080	0.064	0.072	0.010	0.323
Cappahayden	7,172	0.071	0.058	0.059	0.012	0.302
Sitka	7,434	0.076	0.060	0.060	0.011	0.341
Bakeapple	7,704	0.042	0.036	0.036	0.011	0.206
<i>Piscivores</i>						
Cambriol	8,066	0.001	0.004	0	0.011	0.025
Cappahayden	7,172	<0.001	0.002	0	0.010	0.015
Sitka	7,434	<0.001	0.001	0	0.011	0.011
Bakeapple	7,704	0	-	-	0	0
<i>Planktivores</i>						
Cambriol	8,066	0.014	0.034	0	0.010	0.199
Cappahayden	7,172	0.055	0.064	0.036	0.012	0.394
Sitka	7,434	0.034	0.030	0.024	0.011	0.157
Bakeapple	7,704	0.037	0.043	0.024	0.012	0.223
<i>Plank-Piscivores</i>						
Cambriol	8,066	0.002	0.005	0	0.010	0.026
Cappahayden	7,172	0	-	-	0	0
Sitka	7,434	0	-	-	0	0
Bakeapple	7,704	0	-	-	0	0
<i>Unknown Fish</i>						
Cambriol	8,066	0.029	0.012	0.047	0.010	0.294
Cappahayden	7,172	0.011	0.013	0.012	0.012	0.058
Sitka	7,434	0.004	0.007	0	0.011	0.034
Bakeapple	7,704	0.012	0.018	0	0.011	0.112

Bolded values are the highest mean or maximum value for a given functional group
¹ Survey Sites: Cambriol G-92, Cappahayden K-67, Sitka O-2, and Bakeapple M-35
² Minimum values exclude zeros (i.e. smallest non-zero value)

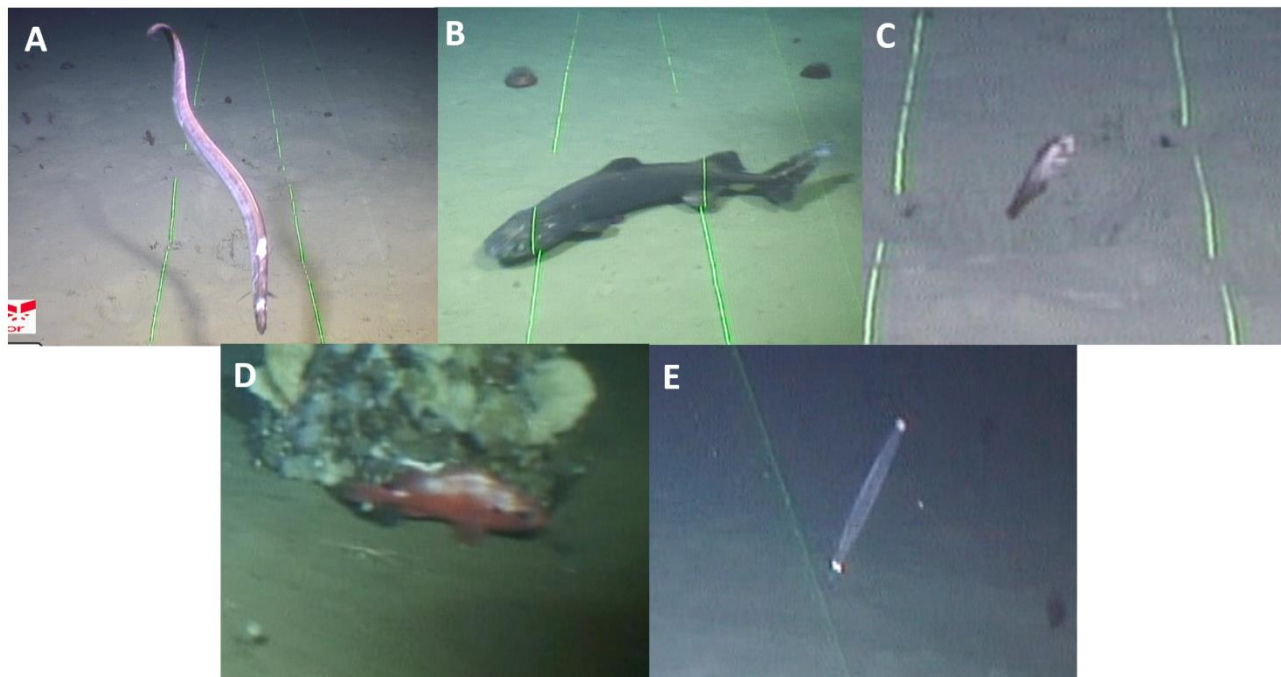


Figure 3-18 Examples of fish functional groups observed at EL 1156: A) benthivore (longnose eel), B) piscivores (black dogfish), C) planktivore (lanternfish), D) plank-piscivore (redfish), and E) unknown fish (unidentified anguilliform)

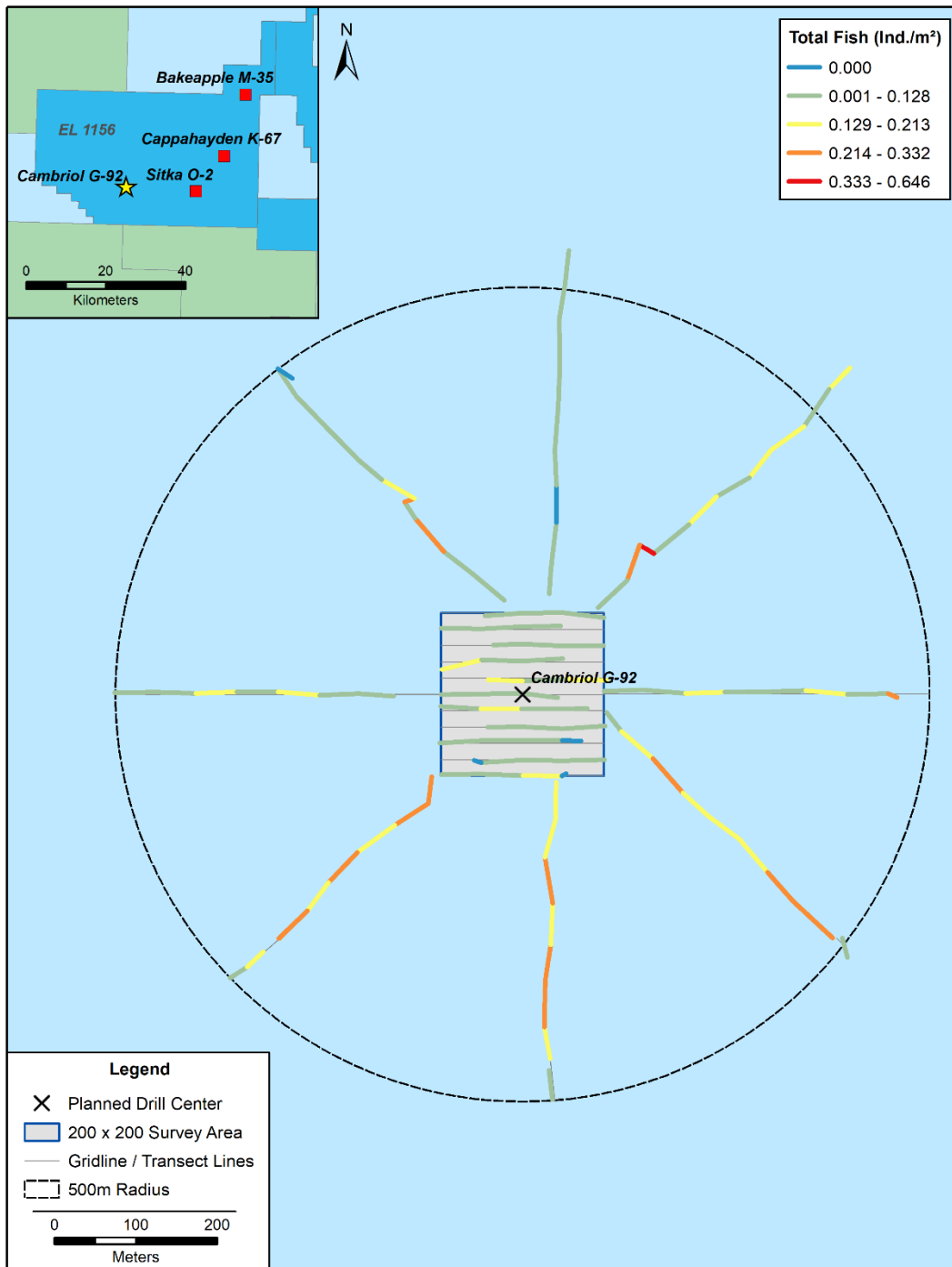


Figure 3-19 Total fish density (ind./m²) observed at Cambriol

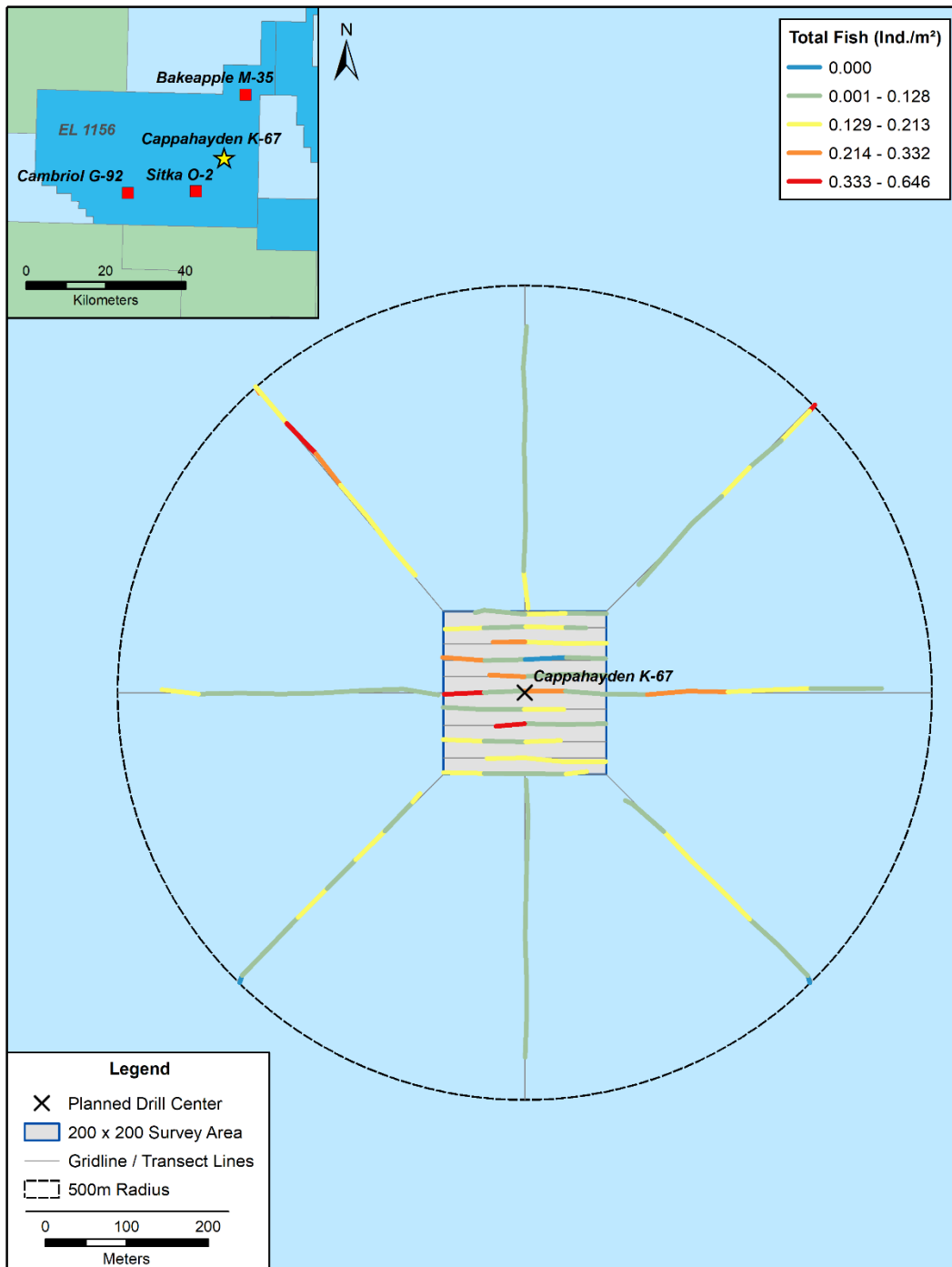


Figure 3-20 Total fish density (ind./m²) observed at Cappahayden

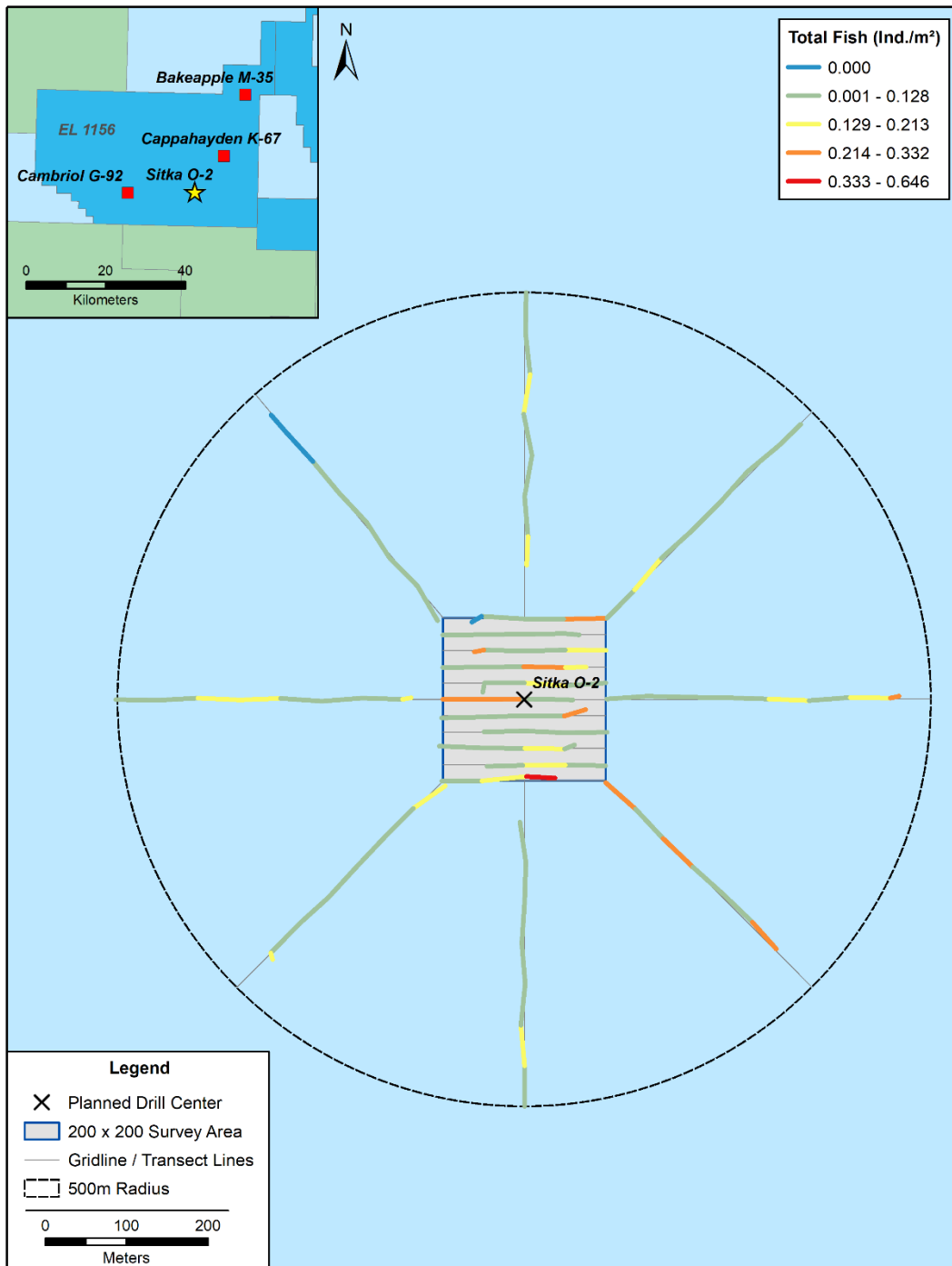


Figure 3-21 Total fish density (ind./m²) observed at Sitka

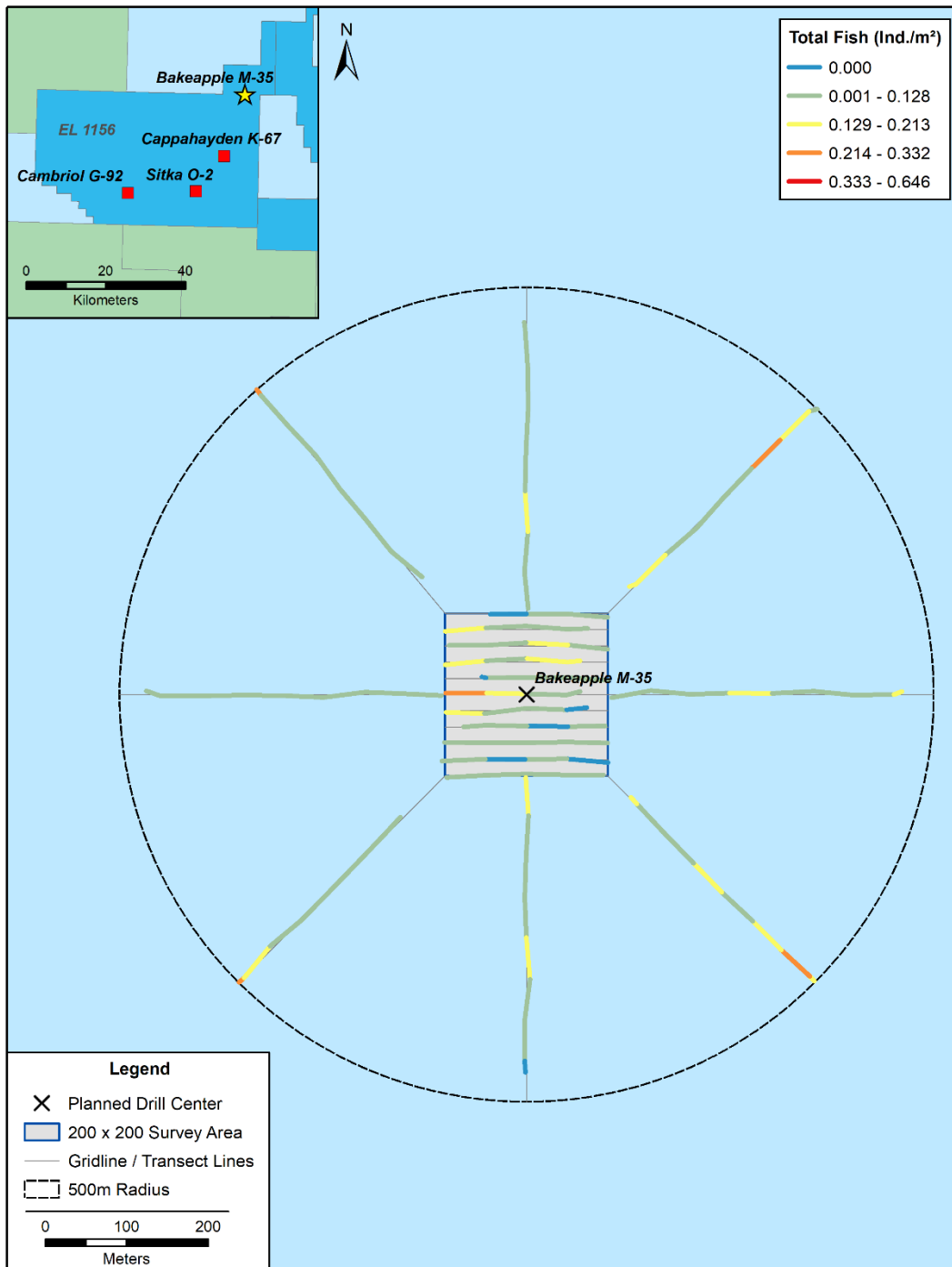


Figure 3-22 Total fish density (ind./m²) observed at Bakeapple

3.3.4 Invertebrate Groups

All non-coral and sponge invertebrates were categorized into four groups: echinoderms, cnidarians, arthropods, and other (including ctenophores, molluscs, annelids, and brachiopods) (Table 3-4, Figure 3-23 to Figure 3-27). Echinoderms (largely sea urchins) had the highest density overall, with Cappahayden having the overall highest value. Arthropods (mostly shrimp) had the second highest density, with Cambriol having the highest overall. Other invertebrates had high overall densities at Cambriol, with brachiopods as the most common group. Cnidarians had the lowest density of the four groups, with the highest value at Cappahayden (mostly sea anemones). See Appendix F for maps of each invertebrate group at each site.

Table 3-4 Summary statistics for invertebrate groups at all survey sites

Section ¹	Area (m ²)	Density (individuals per m ²)				
		Mean	Standard Deviation	Median	Minimum ²	Maximum
<i>Echinoderms</i>						
Cambriol	8,066	0.029	0.036	0.014	0.010	0.220
Cappahayden	7,172	0.521	0.344	0.454	0.153	2.660
Sitka	7,434	0.354	0.155	0.339	0.092	0.726
Bakeapple	7,704	0.384	0.167	0.371	0.073	1.238
<i>Cnidarians</i>						
Cambriol	8,066	0.047	0.035	0.045	0.010	0.147
Cappahayden	7,172	0.042	0.045	0.036	0.012	0.363
Sitka	7,434	0.043	0.034	0.036	0.011	0.189
Bakeapple	7,704	0.025	0.024	0.024	0.011	0.154
<i>Arthropods</i>						
Cambriol	8,066	0.156	0.343	0.012	0.009	2.312
Cappahayden	7,172	0.050	0.058	0.036	0.012	0.484
Sitka	7,434	0.037	0.036	0.033	0.011	0.214
Bakeapple	7,704	0.025	0.028	0.014	0.011	0.150
<i>Other Invertebrates</i>						
Cambriol	8,066	0.283	0.358	0.134	0.012	1.549
Cappahayden	7,172	0.019	0.030	0.012	0.010	0.242
Sitka	7,434	0.025	0.026	0.015	0.011	0.164
Bakeapple	7,704	0.014	0.015	0.012	0.011	0.075

Bolded values are the highest mean or maximum value for a given functional group
¹ Survey Sites: Cambriol G-92, Cappahayden K-67, Sitka O-2, and Bakeapple M-35
² Minimum values exclude zeros (i.e. smallest non-zero value)

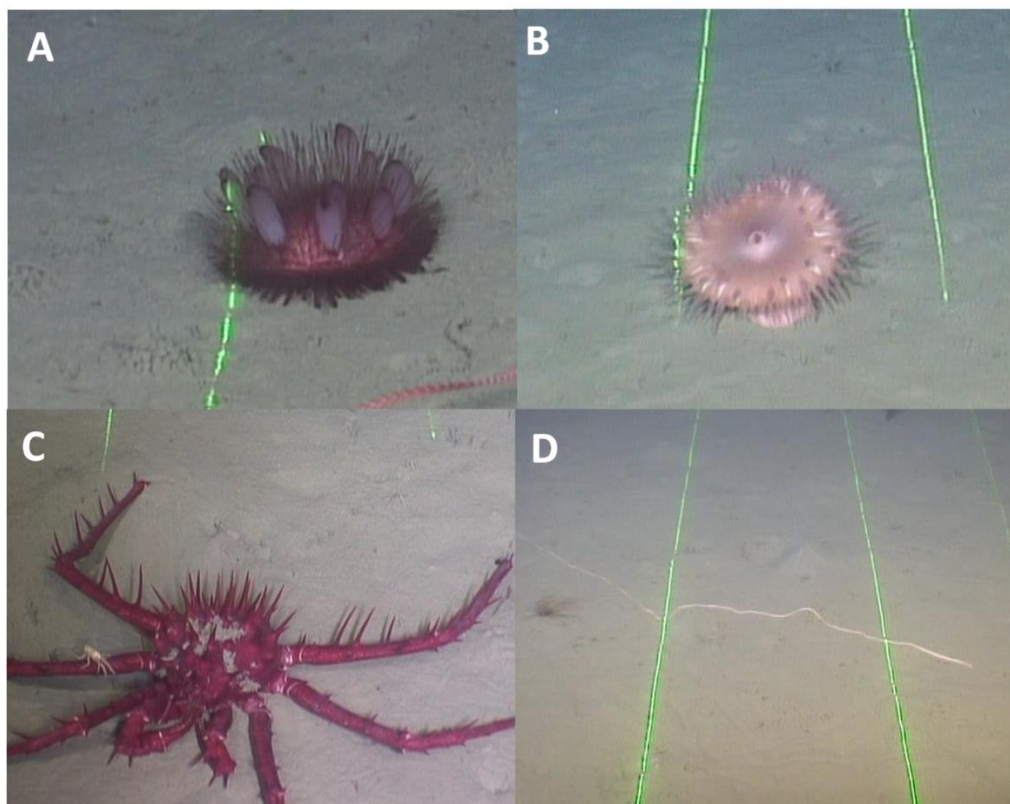


Figure 3-23 Examples of non-coral or sponge invertebrate groups observed at EL 1156: A) echinoderm (sea urchin), B) cnidarian (sea anemone), C) arthropod (porcupine crab), and D) other (annelid worm)

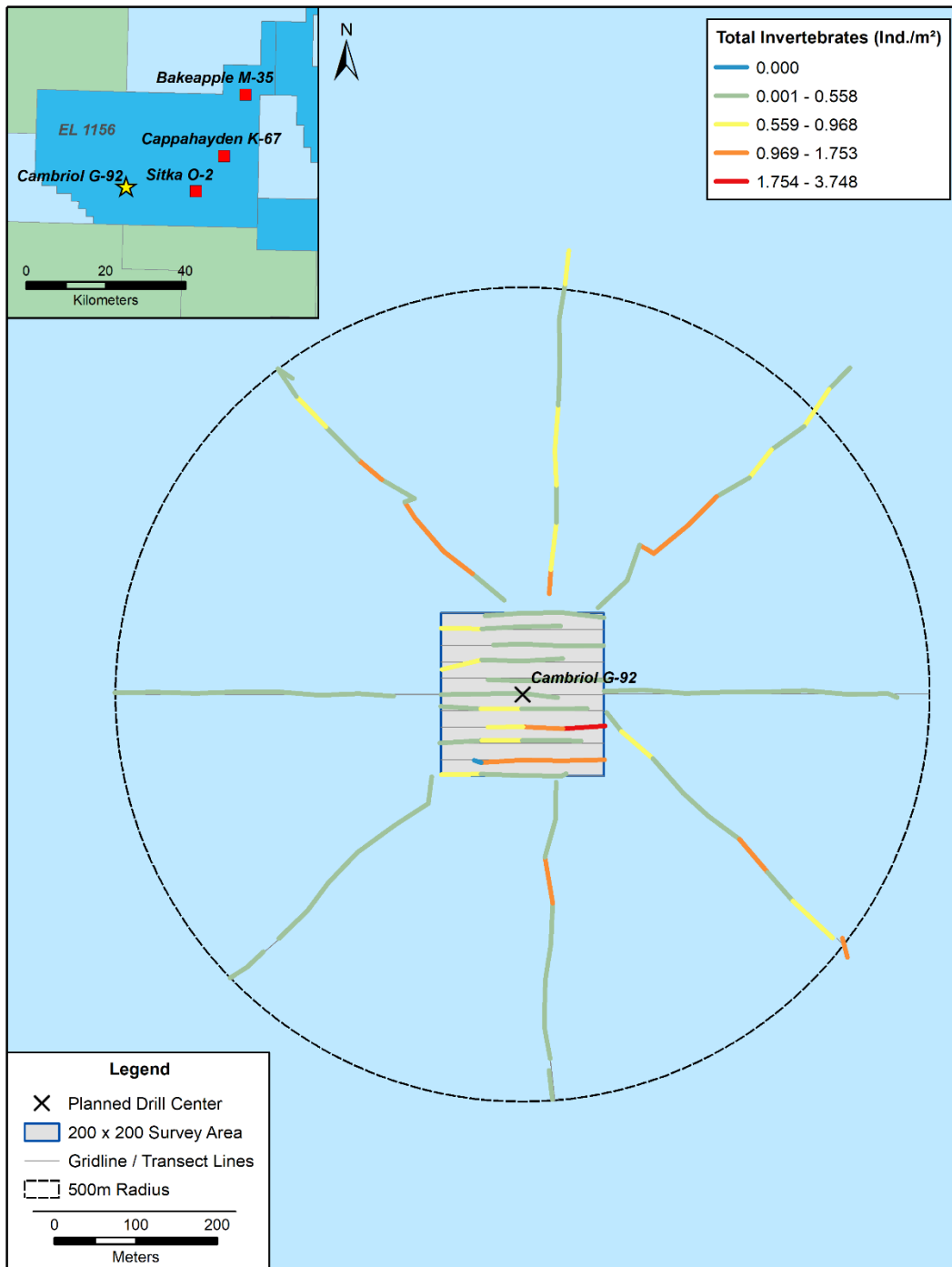


Figure 3-24 Total invertebrate density (ind./m²) observed at Cambriol

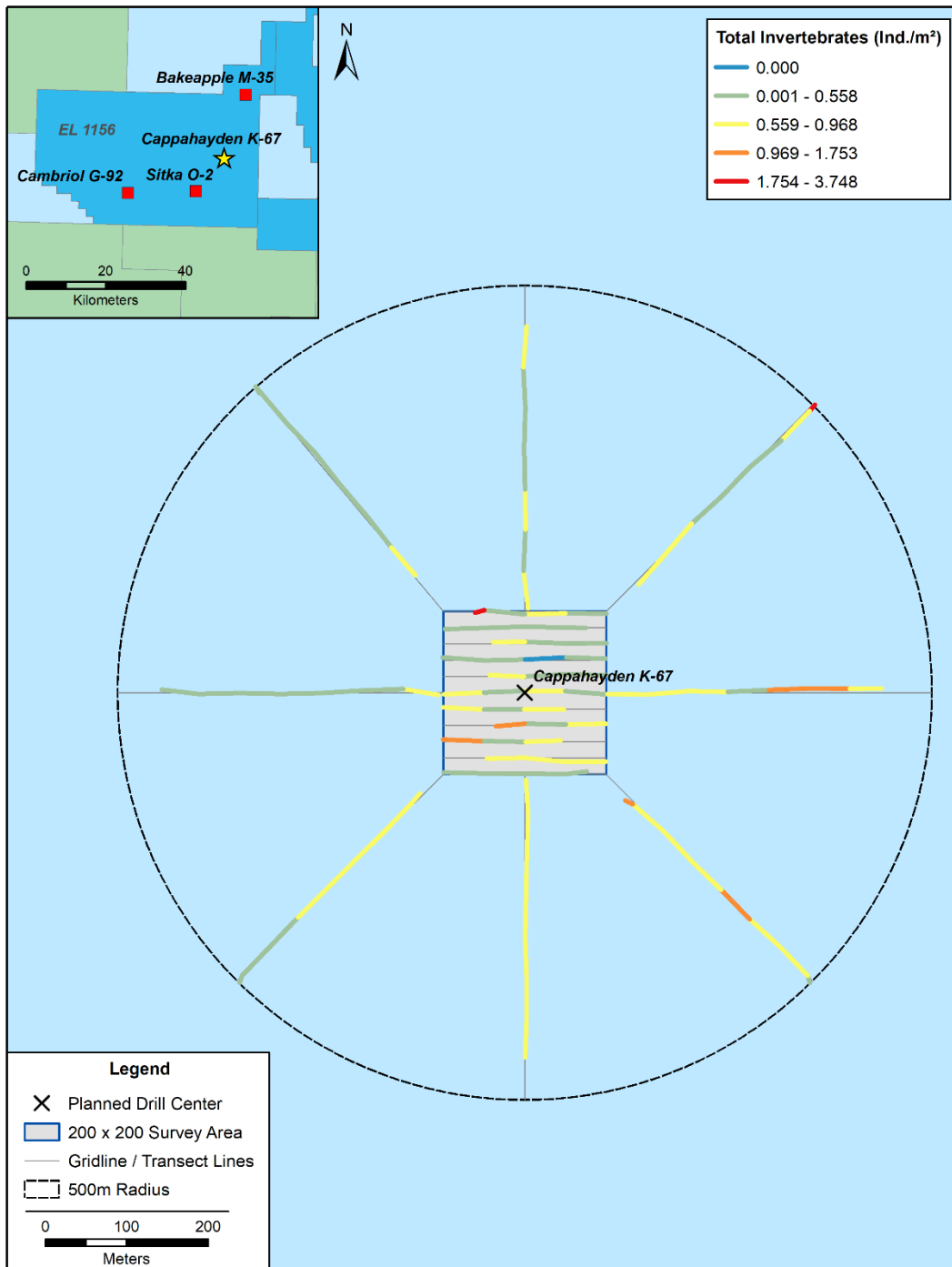


Figure 3-25 Total invertebrate density (ind./m²) observed at Cappahayden

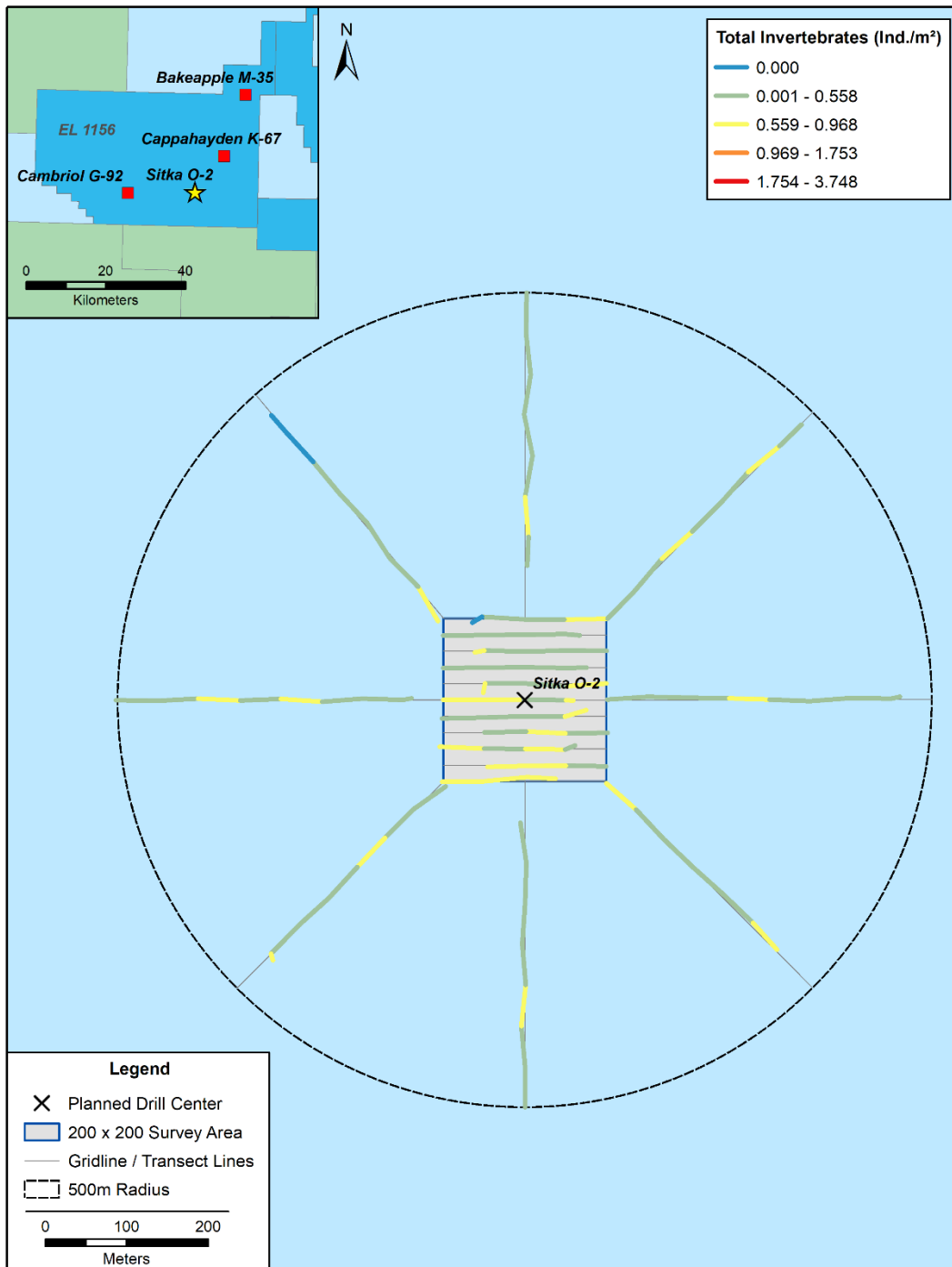


Figure 3-26 Total invertebrate density (ind./m²) observed at Sitka

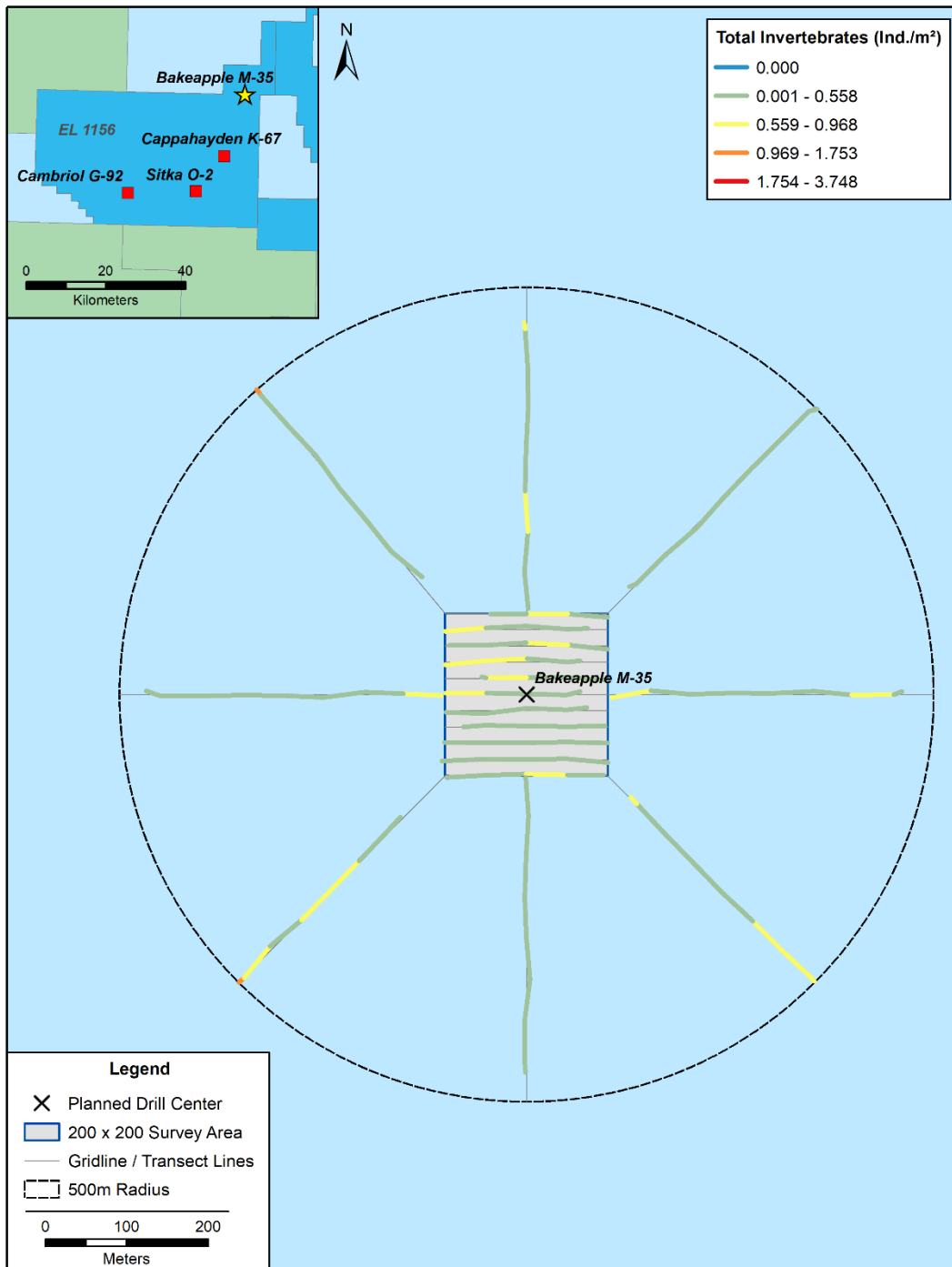


Figure 3-27 Total invertebrate density (ind./m²) observed at Bakeapple

3.4 Macroflora

As surveyed depths within the EL 1156 area are below the photic zone in the north Atlantic, the presence of macroflora was not expected. However, throughout the EL 1156 area several instances of macroalgae were observed (Figure 3-28). No instance was attached to, or appeared to be growing from, a hard substrate. As photosynthesis is not possible at these depths, these are likely instances of rafted algae that have either drifted offshore and sank, or have been potentially carried out (e.g., by ships, icebergs, nets).



Figure 3-28 Macroalgae observed at Bakeapple (tentative ID: *Ascophyllum nodosum*).

4.0 SUMMARY AND CONCLUSION

Seabed video surveys were conducted with an ROV at four sites within EL 1156 and were assessed against C-NLOPB guidance on coral colonies. The guidance states that no drilling activities should occur within 100-m of a coral colony, defined as *Lophelia pertusa* coral or a grouping of five or more corals above 30 cm in height/width in a 10 m x 10 m area. There were no coral colonies above threshold guidance observed as defined by C-NLOPB guidance and *Lophelia pertusa* was not observed at any site.

All four sites within EL 1156 were predominantly mud (fine class substrate), with medium and coarse substrate sporadically distributed. Cambriol had the highest incidence of hard bottom substrate among the four sites. Trawls marks were highly prevalent at Cambriol, Sitka, and Bakeapple, with less noted at Cambriol. Rare instances of anthropogenic debris and macroflora (likely algae) were found within the EL 1156 seabed survey area.

Overall, the densest macrofauna group was coral, of which sea pens were the functional group with the highest density. Sponges were only present at two of four sites, with solid / massive sponges at Cambriol having the highest density overall. Planktivores (of which all were lanternfish) at Cappahayden had the highest density of any fish functional group. Four wolffish, three northern and one unidentified, were noted within EL 1156 seabed survey area. Echinoderms at Cappahayden had the highest density of the invertebrate groups.

5.0 CLOSURE

This report of the biological environment observed at EL 1156 has been prepared for the exclusive use of Equinor. The project was conducted using standard practices by qualified Wood staff and in accordance with verbal and written requests from the client.

Yours sincerely,

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APPENDIX A RAW DATA

Table A.1 Start and end time and coordinates, depth, area, substrate, and densities for all lines at Cambriol

Site	Line	Date	Time Start	Time End	Start Northing	Start Easting	End Northing	End Easting	Depth_m	Calculated_Distance_m	GIS_Calculated_Distance_m	Area_m2	Largest_Substrate_%	Trawl_Mark_Present (Y/N)	Coral_Health_Moribundities	Echinodermata_ind_per_m2	Cnidaria_ind_per_m2	Arthropoda_ind_per_m2	Other_invertebrates_ind_per_m2	Total_invertebrates_ind_per_m2	Soft_Corals_ind_per_m2	Black_Corals_ind_per_m2	Hard_Corals_ind_per_m2	Branching_corals_ind_per_m2	Sea_Pens_ind_per_m2	Total_corals_ind_per_m2	Solid_Massive_ind_per_m2	Leaf_Vase_Shaped_ind_per_m2	Round_with_Projections_ind_per_m2	Thin-Walled_Complex_ind_per_m2	Stalked_ind_per_m2	Other_Sponges_ind_per_m2	Total_sponges_ind_per_m2	Benthivores_ind_per_m2	Piscivores_ind_per_m2	Planktivores_ind_per_m2	Plank-piscivores_ind_per_m2	Unknown_ind_per_m2	Total_fish_ind_per_m2	
Cambriol G-92	233	05-Oct-2018	20:36:20	na	5302207.3	351502.9	5302240.1	351463.4	606.8	51.3	0	85.7	5% Coarse	N	0	0.023	0.035	0.000	0.257	0.677	0.000	0.000	0.000	0.187	0.864	0.362	0.012	0.012	0.000	0.000	0.035	0.420	0.023	0.000	0.012	0.000	0.070	0.105		
Cambriol G-92	233	05-Oct-2018	20:40:20	na	5302240.1	351463.4	5302267.3	351428.4	605.9	44.3	0	74.0	10% Coarse	N	0	0.135	0.068	0.000	1.108	1.310	1.162	0.000	0.027	0.203	1.391	0.716	0.014	0.203	0.000	0.041	0.284	1.256	0.014	0.000	0.000	0.041	0.054			
Cambriol G-92	234	05-Oct-2018	20:47:20	na	5302267.3	351428.4	5302308.2	351392.8	600.3	44.3	0	90.6	10% Coarse	N	0	0.055	0.110	0.011	1.226	1.402	2.385	0.000	0.000	0.110	2.495	1.435	0.077	0.099	0.022	0.011	0.298	1.943	0.144	0.000	0.011	0.000	0.121	0.276		
Cambriol G-92	234	05-Oct-2018	20:58:13	na	5302308.2	351392.8	5302328.2	351380.6	599.8	23.4	0	39.1	25% Coarse	N	0	0.077	0.051	0.000	1.432	1.560	2.302	0.000	0.000	0.077	2.378	1.381	0.026	0.077	0.102	0.000	0.181	1.867	0.000	0.000	0.026	0.051	0.077			
Cambriol G-92	234	05-Oct-2018	21:01:13	na	5302328.2	351380.6	5302332.4	351392.5	595	12.6	0	21.1	15% Coarse	N	0	0.047	0.000	0.000	0.142	0.190	1.422	0.000	0.000	0.332	1.753	0.616	0.000	0.142	0.000	0.047	0.806	0.047	0.000	0.000	0.000	0.284	0.332			
Cambriol G-92	234	05-Oct-2018	21:04:13	na	5302332.4	351392.5	5302355.5	351352.4	598.4	46.3	0	77.4	10% Coarse	N	0	0.039	0.116	0.000	0.362	0.517	1.835	0.000	0.000	0.103	1.938	1.072	0.000	0.052	0.000	0.090	1.215	0.013	0.000	0.000	0.000	0.116	0.129			
Cambriol G-92	234	05-Oct-2018	21:14:13	na	5302355.5	351352.4	5302379.8	351323.2	603.7	37.9	0	63.3	10% Coarse	N	0	0.174	0.032	0.000	1.138	1.343	3.113	0.000	0.000	0.016	0.032	1.160	1.864	0.000	0.111	0.016	0.016	0.316	2.323	0.047	0.000	0.016	0.063	0.126		
Cambriol G-92	235	05-Oct-2018	21:21:13	na	5302379.8	351323.2	5302420.4	351283.8	600.3	56.6	0	94.6	5% Coarse	N	0	0.021	0.053	0.011	0.201	0.286	0.402	0.000	0.000	0.106	0.508	0.582	0.000	0.044	0.000	0.044	0.106	0.340	0.042	0.000	0.021	0.000	0.042	0.106		
Cambriol G-92	235	05-Oct-2018	21:27:58	na	5302420.4	351283.8	5302457.5	351247.5	599.7	51.9	0	86.7	5% Coarse	N	0	0.035	0.035	0.012	0.738	0.819	0.554	0.000	0.000	0.138	0.692	0.346	0.023	0.046	0.000	0.012	0.058	0.485	0.035	0.000	0.000	0.035	0.069			
Cambriol G-92	235	05-Oct-2018	21:39:58	na	5302457.5	351247.5	5302491.7	351224.7	598	41.1	0	68.7	95% Fine	N	0	0.000	0.029	0.029	0.306	0.364	0.146	0.000	0.000	0.131	0.277	0.102	0.000	0.044	0.000	0.000	0.000	0.146	0.029	0.000	0.000	0.000	0.058	0.087		
Cambriol G-92	235	05-Oct-2018	21:47:58	na	5302491.7	351224.7	5302479.7	351242.5	597.7	21.4	0	35.8	5% Coarse	N	0	0.000	0.000	0.000	0.168	0.168	0.475	0.000	0.000	0.000	0.075	0.112	0.000	0.000	0.000	0.056	0.168	0.000	0.000	0.000	0.000	0.000	0.000			
Cambriol G-92	238	05-Oct-2018	22:47:13	na	5302492.6	351927.0	5302466.3	351901.6	610.7	36.6	0	61.1	100% Fine	N	0	0.033	0.016	0.000	0.360	0.409	0.245	0.000	0.000	0.115	0.360	0.164	0.000	0.033	0.000	0.033	0.229	0.000	0.000	0.033	0.229	0.000	0.065	0.000	0.082	0.147
Cambriol G-92	238	05-Oct-2018	22:52:13	na	5302466.3	351901.6	5302420.5	351870.6	610.6	55.2	0	92.1	10% Coarse	N	0	0.054	0.022	0.000	0.543	0.619	1.151	0.000	0.000	0.174	1.324	0.651	0.022	0.063	0.011	0.163	0.912	0.033	0.000	0.000	0.000	0.054	0.087			
Cambriol G-92	238	05-Oct-2018	23:00:13	na	5302420.5	351870.6	5302392.0	351830.7	613.1	49.2	0	82.1	100% Fine	N	0	0.000	0.061	0.000	0.353	0.414	0.268	0.000	0.000	0.097	0.365	0.158	0.012	0.012	0.000	0.195	0.061	0.000	0.000	0.000	0.073	0.134				
Cambriol G-92	238	05-Oct-2018	23:06:13	na	5302392.0	351830.7	5302357.9	351803.7	612.7	43.5	0	72.7	5% Coarse	N	0	0.014	0.014	0.000	0.674	0.701	0.440	0.000	0.000	0.014	0.083	0.536	0.330	0.000	0.055	0.000	0.083	0.468	0.124	0.000	0.000	0.000	0.041	0.165		
Cambriol G-92	239	05-Oct-2018	23:12:13	na	5302357.9	351803.7	5302334.5	351763.2	610.5	46.3	0	78.2	5% Coarse	N	0	0.026	0.064	0.000	0.345	0.396	0.000	0.000	0.000	0.015	0.511	0.243	0.000	0.026	0.000	0.051	0.320	0.102	0.000	0.000	0.000	0.026	0.128			
Cambriol G-92	239	05-Oct-2018	23:17:59	na	5302334.5	351763.2	5302300.3	351729.3	609.5	48.1	0	80.3	5% Coarse	N	0	0.000	0.012	0.000	1.382	1.395	1.009	0.000	0.000	0.012	0.299	1.320	0.448	0.000	0.087	0.000	0.149	0.685	0.149	0.000	0.000	0.037	0.187			
Cambriol G-92	239	05-Oct-2018	23:22:59	na	5302300.3	351729.3	5302264.7	351686.5	608.1	55.7	0	93.0	30% Coarse	N	0	0.065	0.140	0.000	1.549	1.753	3.012	0.000	0.000	0.011	0.108	1.310	1.162	0.011	0.065	0.011	0.022	0.527	1.796	0.065	0.000	0.000	0.054	0.118		
Cambriol G-92	239	05-Oct-2018	23:28:59	na	5302264.7	351686.5	5302275.0	351668.9	607.3	20.4	0	34.1	5% Coarse	N	0	0.059	0.117	0.000	1.087	1.263	0.998	0.000	0.000	0.382	1.380	0.646	0.000	0.029	0.000	0.117	0.793	0.323	0.000	0.029	0.000	0.294	0.646			
Cambriol G-92	240	05-Oct-2018	23:36:59	na	5302275.0	351668.9	5302231.8	351653.6	608.4	45.8	0	76.5	100% Fine	N	0	0.013	0.013	0.000	0.392	0.419	0.458	0.000	0.000	0.000	0.262	0.719	0.340	0.000	0.065	0.000	0.013	0.065	0.484	0.170	0.000	0.013	0.000	0.078	0.262	
Cambriol G-92	240	05-Oct-2018	23:51:47	na	5302231.8	351653.6	5302198.3	351617.9	607.1	48.9	0	81.7	5% Coarse	N	0	0.000	0.098	0.000	0.355	0.453	0.624	0.000	0.000	0.000	0.147	0.771	0.306	0.012	0.000	0.000	0.098	0.539	0.037	0.000	0.000	0.024	0.061			
Cambriol G-92	241	06-Oct-2018	0:44:36	na	5301990.4	351413.6	5301957.7	351409.2	606.7	33.0	0	55.2	5% Coarse	N	0	0.018	0.073	0.000	0.453	0.544	0.308	0.000	0.000	0.000	0.199	0.508	0.326	0.000	0.036	0.000	0.181	0.544	0.254	0.000	0.000	0.054	0.308			
Cambriol G-92	242	06-Oct-2018	0:50:23	na	5301957.7	351409.2	5301931.0	351368.4	607.1	48.7	0	81.4	10% Coarse	N	0	0.037	0.025	0.012	0.430	0.504	1.204	0.000	0.000	0.000	0.172	1.376	0.835	0.000	0.012	0.012	0.025	0.221	1.106	0.233	0.012	0.000	0.074	0.319		
Cambriol G-92	242	06-Oct-2018	0:56:23	na	5301931.0	351368.4	5301897.7	351322.1	603.9	57.1	0	95.4	15% Coarse	N	0	0.031	0.052	0.010	0.357	0.451	0.692	0.000	0.000	0.010	0.126	0.828	0.472	0.000	0.073	0.010	0.000	0.105	0.661	0.168	0.000	0.000	0.042	0.210		
Cambriol G-92	242	06-Oct-2018	1:01:23	na	5301897.7	351322.1	5301860.6	351286.6	602.4	51.3	0	85.6	15% Coarse	N	0	0.047	0.047	0.000	0.432	0.526	0.771	0.000	0.000	0.012	0.117	0.899	0.491	0.000	0.035	0.000	0.105	0.631	0.152	0.012	0.023	0.000	0.035	0.222		
Cambriol G-92	242	06-Oct-2018	1:05:23	na	5301860.6	351286.6	5301825.9	351260.7	606.2	43.3	0	72.3	5% Coarse	N	0	0.014	0.014	0.000	0.373	0.401	0.166	0.000	0.000	0.000	0.138	0.304	0.180	0.000	0.041	0.000	0.090	0.194	0.097	0.000	0.000	0.069	0.166			
Cambriol G-92	243	06-Oct-2018	1:11:23	na	5301825.9	351260.7	5301791.9	351225.7	609	48.8	0	81.5	5% Coarse	N	0	0.012	0.086	0.000	0.196	0.295	0.147	0.000	0.000	0.000	0.098	0.245	0.074	0.012	0.000	0.000	0.049	0.135	0.221	0.025	0.000	0.000	0.025	0.270		
Cambriol G-92	244	06-Oct-2018	2:20:50	na	5302069.4	351628.6	5302046.4	351646.7	614.6	29.3	0	48.9	5% Coarse	N	0	0.020	0.061	0.000	0.245	0.327	0.899	0.000	0.000	0.000	0.347	1.246	0.449	0.000	0.020	0.000	0.061	0.531	0.061	0.000	0.000	0.000	0.061	0.61		
Cambriol G-92	244	06-Oct-2018	2:23:50	na	5302046.4	351646.7	5302013.2	351685.3	614	50.9	0	85.1	5% Coarse	N	0	0.059	0.000	0.012	0.588	0.658	0.811	0.000	0.000	0.000	0.270	1.082	0.435	0.012	0.000	0.000	0.071	0.517	0.106	0.000	0.012	0.000	0.024	0.141		
Cambriol G-92	244	06-Oct-2018	2:30:50	na	5302013.2	351685.3	5301970.7	351722.0	614.5	56.1	0	93.7	5% Coarse	N	0	0.011	0.032	0.000	0.245	0.288	0.224	0.000	0.000	0.000	0.235	0.459	0.288	0.000	0.032	0.000	0.021	0								

Cambriol G-92	G-A	05-Nov-2019	11:40:28	11:44:18	5302185.9	351625.0	5302192.1	351575.3	573	50.0	0	83.5	5%	Coarse	N	0	0.036	0.012	0.156	0.036	0.239	0.587	0.000	0.000	0.000	0.108	0.695	0.239	0.060	0.299	0.000	0.000	0.168	0.766	0.036	0.000	0.000	0.000	0.000	0.000	0.036	
Cambriol G-92	G-A	05-Nov-2019	11:44:18	11:48:08	5302192.1	351575.3	5302191.9	351525.8	586	49.6	0	82.8	5%	Coarse	Y	0	0.012	0.072	0.133	0.097	0.314	0.773	0.000	0.000	0.000	0.145	0.918	0.217	0.048	0.302	0.000	0.024	0.266	0.858	0.036	0.000	0.000	0.000	0.000	0.000	0.036	
Cambriol G-92	G-A	05-Nov-2019	11:48:08	11:51:51	5302191.9	351525.8	5302188.3	351479.2	583	46.7	0	78.0	5%	Coarse	N	0	0.013	0.064	0.218	0.026	0.320	0.756	0.000	0.000	0.000	0.243	0.999	0.231	0.064	0.192	0.000	0.000	0.231	0.718	0.064	0.000	0.013	0.000	0.000	0.000	0.077	
Cambriol G-92	G-B	05-Nov-2019	11:20:09	11:24:15	5302172.9	351424.9	5302172.4	351475.5	581	50.6	0	84.5	5%	Medium	Y	0	0.035	0.035	0.461	0.035	0.568	0.319	0.000	0.000	0.000	0.142	0.461	0.106	0.024	0.225	0.000	0.000	0.142	0.497	0.047	0.000	0.012	0.000	0.000	0.000	0.059	
Cambriol G-92	G-B	05-Nov-2019	11:24:15	11:28:32	5302172.4	351475.5	5302174.8	351524.1	587	48.7	0	81.4	10%	Coarse	N	0	0.012	0.061	0.369	0.025	0.467	0.246	0.000	0.000	0.000	0.061	0.307	0.074	0.012	0.307	0.000	0.012	0.307	0.713	0.074	0.000	0.000	0.000	0.000	0.025	0.098	
Cambriol G-92	G-B	05-Nov-2019	11:28:32	11:31:19	5302174.8	351524.1	5302175.9	351571.8	581	47.7	0	79.7	5%	Coarse	Y	0	0.050	0.075	0.088	0.000	0.213	0.816	0.000	0.000	0.000	0.025	0.841	0.188	0.025	0.452	0.000	0.000	0.326	0.992	0.013	0.000	0.013	0.000	0.000	0.000	0.025	
Cambriol G-92	G-C	05-Nov-2019	10:57:17	11:01:55	5302151.6	351624.6	5302151.3	351575.2	584	49.4	0	82.5	5%	Coarse	N	0	0.012	0.036	0.218	0.012	0.279	0.218	0.000	0.000	0.000	0.194	0.412	0.085	0.000	0.109	0.000	0.303	0.097	0.000	0.012	0.012	0.000	0.000	0.000	0.000	0.121	
Cambriol G-92	G-C	05-Nov-2019	11:01:55	11:05:59	5302151.3	351575.2	5302153.7	351524.9	586	50.3	0	84.0	5%	Coarse	Y	0	0.024	0.083	0.286	0.036	0.428	0.702	0.000	0.000	0.000	0.202	0.904	0.250	0.048	0.226	0.000	0.000	0.202	0.726	0.048	0.000	0.000	0.012	0.000	0.000	0.000	0.059
Cambriol G-92	G-C	05-Nov-2019	11:05:59	11:08:51	5302153.7	351524.9	5302152.6	351489.5	584	35.5	0	59.2	5%	Coarse	Y	0	0.017	0.068	0.135	0.034	0.253	0.321	0.000	0.000	0.000	0.169	0.490	0.186	0.034	0.118	0.000	0.000	0.338	0.051	0.000	0.051	0.000	0.000	0.000	0.000	0.101	
Cambriol G-92	G-D	05-Nov-2019	10:26:54	10:36:19	5302122.5	351426.0	5302134.0	351475.1	582	50.4	0	84.2	5%	Coarse	Y	0	0.012	0.095	0.451	0.059	0.617	0.237	0.000	0.000	0.000	0.178	0.416	0.071	0.107	0.261	0.000	0.000	0.119	0.558	0.142	0.000	0.000	0.012	0.000	0.000	0.000	0.154
Cambriol G-92	G-D	05-Nov-2019	10:36:19	10:42:12	5302134.0	351475.1	5302132.7	351525.4	586	50.3	0	84.1	5%	Medium	Y	0	0.012	0.071	0.321	0.095	0.500	0.262	0.000	0.000	0.000	0.131	0.393	0.202	0.059	0.167	0.000	0.000	0.119	0.547	0.048	0.000	0.000	0.000	0.000	0.000	0.000	0.048
Cambriol G-92	G-D	05-Nov-2019	10:42:12	10:45:01	5302132.7	351525.4	5302135.8	351574.3	582	49.1	0	81.9	5%	Coarse	Y	0	0.024	0.085	0.024	0.012	0.146	1.025	0.000	0.000	0.000	0.037	1.062	0.232	0.024	0.232	0.000	0.012	0.146	0.647	0.048	0.000	0.000	0.000	0.000	0.000	0.000	0.061
Cambriol G-92	G-E	05-Nov-2019	10:04:14	10:10:47	5302108.9	351628.6	5302110.3	351575.3	587	53.3	0	89.0	5%	Coarse	Y	0	0.067	0.124	0.090	0.135	0.416	0.528	0.000	0.000	0.000	0.169	0.697	0.438	0.090	0.169	0.000	0.000	0.079	0.775	0.157	0.000	0.011	0.000	0.000	0.000	0.169	
Cambriol G-92	G-E	05-Nov-2019	10:10:47	10:12:55	5302110.3	351575.3	5302108.1	351524.9	585	50.5	0	84.3	15%	Coarse	Y	0	0.000	0.024	0.012	0.024	0.059	0.344	0.000	0.000	0.000	0.095	0.439	0.142	0.024	0.130	0.000	0.000	0.095	0.391	0.095	0.000	0.000	0.000	0.000	0.000	0.107	
Cambriol G-92	G-E	05-Nov-2019	10:12:55	10:15:07	5302108.1	351524.9	5302109.9	351482.4	583	42.5	0	71.0	5%	Coarse	Y	0	0.014	0.000	0.000	0.084	0.099	0.211	0.000	0.000	0.000	0.169	0.380	0.127	0.000	0.127	0.000	0.000	0.042	0.296	0.169	0.000	0.000	0.000	0.000	0.000	0.169	
Cambriol G-92	G-F	05-Nov-2019	18:28:54	18:31:52	5302091.6	351425.1	5302092.1	351473.4	580	48.2	0	80.5	5%	Coarse	Y	0	0.012	0.075	0.025	0.062	0.174	0.087	0.000	0.000	0.000	0.149	0.236	0.062	0.012	0.050	0.000	0.000	0.037	0.161	0.087	0.000	0.025	0.000	0.000	0.000	0.112	
Cambriol G-92	G-F	05-Nov-2019	18:31:52	18:34:56	5302092.1	351473.4	5302093.0	351525.3	587	52.0	0	86.8	100%	Fine	N	0	0.000	0.000	0.023	0.000	0.023	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.012	
Cambriol G-92	G-F	05-Nov-2019	18:34:56	18:44:16	5302093.0	351525.3	5302087.6	351568.1	587	43.2	0	72.1	5%	Coarse	Y	0	0.014	0.042	0.083	0.042	0.180	0.069	0.000	0.000	0.000	0.069	0.139	0.097	0.014	0.014	0.000	0.000	0.166	0.291	0.125	0.000	0.000	0.000	0.000	0.000	0.125	
Cambriol G-92	G-G	05-Nov-2019	12:39:15	12:44:29	5302077.0	351424.7	5302074.1	351473.6	581	49.0	0	81.9	5%	Coarse	N	0	0.012	0.098	0.110	0.061	0.281	0.672	0.000	0.000	0.000	0.244	0.916	0.171	0.049	0.208	0.000	0.000	0.073	0.501	0.024	0.000	0.024	0.000	0.000	0.000	0.000	0.049
Cambriol G-92	G-G	05-Nov-2019	12:44:29	12:50:55	5302074.1	351473.6	5302074.1	351524.2	586	50.6	0	84.4	5%	Coarse	Y	0	0.000	0.036	0.521	0.107	0.663	0.261	0.000	0.000	0.000	0.142	0.403	0.130	0.000	0.118	0.000	0.000	0.095	0.343	0.154	0.000	0.000	0.000	0.000	0.000	0.000	0.154
Cambriol G-92	G-G	05-Nov-2019	12:50:55	12:55:51	5302074.1	351524.2	5302074.1	351574.1	585	49.9	0	83.3	20%	Coarse	Y	0	0.012	0.060	0.168	0.084	0.324	1.165	0.000	0.000	0.000	0.096	1.261	0.264	0.012	0.624	0.000	0.000	0.192	1.093	0.072	0.000	0.000	0.000	0.000	0.000	0.000	0.072
Cambriol G-92	G-G	05-Nov-2019	12:55:51	12:58:57	5302074.1	351574.1	5302074.6	351604.6	584	30.5	0	81.0	20%	Coarse	N	0	0.020	0.039	0.078	0.059	0.196	0.902	0.000	0.000	0.000	0.078	0.980	0.255	0.039	0.157	0.000	0.000	0.216	0.667	0.000	0.000	0.000	0.000	0.000	0.000	0.020	0.020
Cambriol G-92	G-H	05-Nov-2019	13:10:29	13:15:53	5302052.9	351626.5	5302049.8	351574.8	584	51.8	0	86.5	5%	Coarse	Y	0	0.081	0.058	2.312	0.208	2.659	0.647	0.000	0.000	0.000	0.116	0.763	0.220	0.023	0.046	0.000	0.012	0.139	0.439	0.023	0.000	0.000	0.000	0.012	0.012	0.012	0.046
Cambriol G-92	G-H	05-Nov-2019	13:15:53	13:20:38	5302049.8	351574.8	5302052.0	351525.6	588	49.3	0	82.2	5%	Coarse	Y	0	0.073	0.061	1.216	0.134	1.483	0.717	0.000	0.000	0.000	0.243	0.960	0.170	0.049	0.073	0.000	0.000	0.219	0.511	0.073	0.000	0.012	0.000	0.000	0.000	0.012	0.097
Cambriol G-92	G-H	05-Nov-2019	13:20:38	13:23:17	5302052.0	351525.6	5302051.5	351482.4	581	43.2	0	72.2	5%	Coarse	Y	0	0.083	0.069	0.692	0.083	0.928	0.762	0.000	0.000	0.000	0.125	0.886	0.706	0.069	0.235	0.000	0.000	0.332	1.343	0.028	0.000	0.000	0.000	0.000	0.000	0.028	
Cambriol G-92	G-I	05-Nov-2019	13:33:54	13:37:43	5302032.0	351423.6	5302035.3	351475.1	583	51.7	0	86.3	20%	Coarse	Y	0	0.035	0.070	0.255	0.046	0.406	1.031	0.000	0.000	0.000	0.127	1.159	0.243	0.139	0.232	0.000	0.000	0.104	0.718	0.070	0.000	0.023	0.000				

Table A.3 Start and end time and coordinates, depth, area, substrate, and densities for all lines at Sitka

Site	Line	Date	Time Start	Time End	Start Northing	Start Easting	End Northing	End Easting	Depth_m	Calculated_Distance_m	Area_m2	Largest_Substrate_%	Trawl Mark Present (Y/N)	Coral_Health_Mortality	Echinodermata_ind_per_m2	Cnidaria_ind_per_m2	Arthropoda_ind_per_m2	Other_invertebrates_ind_per_m2	Total_invertebrates_ind_per_m2	Soft_Corals_ind_per_m2	Black_Corals_ind_per_m2	Hard_Corals_ind_per_m2	Branching_corals_ind_per_m2	Sea Pens_ind_per_m2	Total_corals_ind_per_m2	Solid_Massive_ind_per_m2	Leaf_Vase_Shaped_ind_per_m2	Round with Projections_ind_per_m2	Thin-Walled_Complex_ind_per_m2	Stalked_ind_per_m2	Other Sponges_ind_per_m2	Total_sponges_ind_per_m2	Benthivores_ind_per_m2	Piscivores_ind_per_m2	Planktivores_ind_per_m2	Plank-piscivores_ind_per_m2	Unknown_ind_per_m2	Total_fish_ind_per_m2		
Sitka O-2	G-A	10-Nov-2019	23:07:32	23:12:56	5302604.9	368686.4	5302604.1	368633.9	858	52.5	0	87.7	100% Fine	Y	0	0.570	0.046	0.034	0.023	0.673	0.000	0.000	0.000	0.068	3.707	3.776	0.023	0.000	0.000	0.000	0.000	0.000	0.023	0.274	0.000	0.046	0.000	0.000	0.319	
Sitka O-2	G-A	10-Nov-2019	23:12:56	23:15:24	5302604.1	368686.4	5302604.1	368587.6	853	46.2	0	77.2	100% Fine	N	0	0.259	0.078	0.013	0.013	0.363	0.000	0.000	0.000	0.013	1.619	1.632	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.052	0.000	0.013	0.000	0.000	0.065	
Sitka O-2	G-A	10-Nov-2019	23:15:24	23:17:36	5302604.1	368587.6	5302607.4	368532.8	853	54.9	0	91.6	100% Fine	Y	0	0.098	0.022	0.000	0.000	0.120	0.000	0.000	0.000	0.022	0.960	0.982	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.011	0.000	0.022	0.000	0.000	0.033	
Sitka O-2	G-A	10-Nov-2019	23:17:36	23:18:17	5302607.4	368532.8	5302600.2	368521.2	852	13.7	0	22.9	100% Fine	N	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Sitka O-2	G-B	10-Nov-2019	22:32:05	22:49:55	5302584.3	368485.3	5302585.2	368535.4	854	50.1	0	83.7	100% Fine	Y	0	0.358	0.024	0.072	0.024	0.478	0.024	0.000	0.000	0.179	2.187	2.390	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.072	0.000	0.024	0.000	0.024	0.119
Sitka O-2	G-B	10-Nov-2019	22:49:55	22:54:41	5302585.2	368535.4	5302585.2	368586.9	854	51.5	0	86.0	100% Fine	Y	0	0.314	0.023	0.023	0.023	0.384	0.000	0.000	0.000	0.047	1.779	1.826	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.035	0.000	0.035	0.000	0.012	0.081
Sitka O-2	G-B	10-Nov-2019	22:54:41	22:59:06	5302585.2	368586.9	5302586.2	368635.4	857	48.6	0	81.1	100% Fine	Y	0	0.358	0.025	0.012	0.074	0.469	0.000	0.000	0.000	0.074	1.773	1.837	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.049	0.000	0.025	0.000	0.000	0.074	
Sitka O-2	G-B	10-Nov-2019	22:59:06	22:59:52	5302586.2	368635.4	5302584.6	368653.0	858	17.7	0	29.5	100% Fine	N	0	0.237	0.000	0.000	0.034	0.271	0.000	0.000	0.000	0.034	1.592	1.626	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.068	0.000	0.000	0.000	0.068	
Sitka O-2	G-C	10-Nov-2019	22:04:55	22:10:33	5302565.5	368686.1	5302566.0	368635.7	858	50.4	0	84.1	100% Fine	N	0	0.428	0.012	0.000	0.024	0.463	0.000	0.000	0.000	0.095	2.365	2.460	0.024	0.000	0.000	0.000	0.000	0.000	0.000	0.024	0.119	0.012	0.000	0.000	0.131	
Sitka O-2	G-C	10-Nov-2019	22:10:33	22:15:34	5302566.0	368635.7	5302565.0	368585.8	854	50.0	0	83.4	100% Fine	Y	0	0.396	0.012	0.000	0.000	0.408	0.000	0.000	0.000	0.048	2.421	2.469	0.024	0.000	0.000	0.000	0.000	0.000	0.024	0.072	0.000	0.000	0.000	0.072		
Sitka O-2	G-C	10-Nov-2019	22:15:34	22:21:40	5302565.0	368585.8	5302565.9	368535.4	853	50.4	0	84.2	100% Fine	N	0	0.309	0.024	0.059	0.071	0.463	0.000	0.000	0.000	0.024	1.889	1.912	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.036	0.000	0.071	0.000	0.012	0.119	
Sitka O-2	G-C	10-Nov-2019	22:21:40	22:22:48	5302565.9	368535.4	5302563.7	368524.2	852	11.4	0	19.0	100% Fine	N	0	0.578	0.053	0.053	0.000	0.683	0.000	0.000	0.000	1.155	1.155	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.210	0.000	0.053	0.000	0.000	0.263		
Sitka O-2	G-D	10-Nov-2019	21:31:14	21:35:50	5302544.7	368485.3	5302545.1	368537.4	854	52.1	0	87.0	100% Fine	N	0	0.092	0.011	0.057	0.011	0.172	0.011	0.000	0.000	0.011	1.023	1.045	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.080	0.000	0.034	0.000	0.000	0.115	
Sitka O-2	G-D	10-Nov-2019	21:35:50	21:41:25	5302545.1	368537.4	5302545.4	368584.7	854	47.3	0	79.1	100% Fine	N	0	0.266	0.025	0.013	0.000	0.304	0.000	0.000	0.000	0.051	1.518	1.569	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.063	0.000	0.038	0.000	0.013	0.114	
Sitka O-2	G-D	10-Nov-2019	21:41:25	21:49:25	5302545.4	368584.7	5302544.5	368636.3	855	51.6	0	86.2	100% Fine	Y	0	0.441	0.023	0.012	0.000	0.476	0.012	0.000	0.000	0.070	1.822	1.903	0.000	0.000	0.000	0.000	0.000	0.000	0.128	0.000	0.093	0.000	0.023	0.244		
Sitka O-2	G-D	10-Nov-2019	21:49:25	21:52:30	5302544.5	368636.3	5302545.1	368661.2	857	24.9	0	41.6	100% Fine	N	0	0.265	0.000	0.048	0.000	0.313	0.000	0.000	0.000	0.000	0.938	0.938	0.000	0.000	0.000	0.000	0.000	0.000	0.120	0.000	0.048	0.000	0.000	0.168		
Sitka O-2	G-E	10-Nov-2019	21:03:47	21:09:11	5302525.5	368685.8	5302522.1	368635.8	857	50.2	0	83.8	100% Fine	Y	0	0.513	0.036	0.012	0.024	0.585	0.000	0.000	0.000	0.060	2.650	2.710	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.072	0.000	0.024	0.000	0.024	0.119	
Sitka O-2	G-E	10-Nov-2019	21:09:11	21:13:21	5302522.1	368635.8	5302525.6	368585.5	854	50.4	0	84.2	100% Fine	Y	0	0.214	0.024	0.000	0.000	0.237	0.012	0.000	0.000	0.012	0.831	0.855	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.083	0.000	0.059	0.000	0.000	0.142	
Sitka O-2	G-E	10-Nov-2019	21:13:21	21:17:37	5302525.6	368585.5	5302525.6	368535.7	855	48.8	0	81.5	100% Fine	Y	0	0.209	0.012	0.025	0.012	0.258	0.012	0.000	0.000	0.086	1.693	1.791	0.012	0.000	0.000	0.000	0.000	0.000	0.012	0.000	0.037	0.000	0.000	0.037		
Sitka O-2	G-E	10-Nov-2019	21:17:37	21:19:07	5302525.5	368535.7	5302514.1	368534.5	853	11.6	0	19.3	100% Fine	Y	0	0.414	0.155	0.000	0.000	0.569	0.000	0.000	0.000	4.603	4.603	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.052	0.000	0.000	0.000	0.000	0.052		
Sitka O-2	G-F	10-Nov-2019	20:39:20	20:43:03	5302505.4	368485.2	5302505.4	368534.7	853	49.5	0	82.7	100% Fine	N	0	0.423	0.036	0.097	0.060	0.617	0.000	0.000	0.000	0.085	2.444	2.528	0.000	0.000	0.000	0.000	0.000	0.000	0.121	0.000	0.157	0.000	0.000	0.278		
Sitka O-2	G-F	10-Nov-2019	20:43:03	20:51:06	5302505.4	368534.7	5302506.0	368584.1	853	49.4	0	82.5	100% Fine	Y	0	0.594	0.012	0.036	0.012	0.655	0.000	0.000	0.000	0.097	4.037	4.134	0.000	0.000	0.000	0.000	0.000	0.000	0.170	0.000	0.061	0.000	0.012	0.242		
Sitka O-2	G-F	10-Nov-2019	20:51:06	20:54:22	5302506.0	368584.1	5302505.2	368636.2	857	52.1	0	87.0	100% Fine	N	0	0.299	0.023	0.011	0.011	0.345	0.000	0.000	0.000	0.011	1.023	1.034	0.000	0.000	0.000	0.000	0.000	0.000	0.023	0.000	0.046	0.000	0.000	0.069		
Sitka O-2	G-F	10-Nov-2019	20:54:22	20:55:18	5302505.2	368636.2	5302504.7	368645.0	858	8.8	0	14.7	100% Fine	N	0	0.611	0.068	0.068	0.000	0.747	0.000	0.000	0.000	0.068	2.308	2.376	0.000	0.000	0.000	0.000	0.000	0.000	0.068	0.000	0.000	0.000	0.000	0.069		
Sitka O-2	G-G	10-Nov-2019	23:41:03	23:46:15	5302482.7	368483.6	5302483.9	368533.8	853	50.2	0	83.8	100% Fine	Y	0	0.310	0.024	0.072	0.000	0.406	0.000	0.000	0.000	0.024	1.825	1.849	0.000	0.000	0.000	0.000	0.000	0.000	0.024	0.000	0.095	0.000	0.000	0.119		
Sitka O-2	G-G	10-Nov-2019	23:46:15	23:52:01	5302483.9	368533.8	5302485.1	368583.7	855	50.0	0	83.5	100% Fine	Y	0	0.419	0.036	0.036	0.036	0.527	0.000	0.000	0.000	0.084	1.534	1.618	0.000	0.000	0.000	0.000	0.000	0.000	0.048	0.000	0.000	0.000	0.000	0.048		
Sitka O-2	G-G	10-Nov-2019	23:52:01	0:00:10	5302485.1	368583.7	5302485																																	

Table A.4 Start and end time and coordinates, depth, area, substrate, and densities for all lines at Bakeapple

Site	Line	Date	Time Start	Time End	Start Northing	Start Easting	End Northing	End Easting	Depth_m	GS_Calculated_Distance_m	Area_m2	Largest_Substrate_%	Trawl Mark Present (Y/N)	Coral_Health_Mortalities	Echinodermata_ind_per_m2	Cnidaria_ind_per_m2	Arthropoda_ind_per_m2	Other_Invertebrates_ind_per_m2	Total_Invertebrates_ind_per_m2	Soft_Corals_ind_per_m2	Black_Corals_ind_per_m2	Hard_Corals_ind_per_m2	Branching_corals_ind_per_m2	Sea_Pens_ind_per_m2	Total_corals_ind_per_m2	Solid_Massive_ind_per_m2	Leaf_Vase_Shaped_ind_per_m2	Round_with_Projections_ind_per_m2	Thin-Walled_Complex_ind_per_m2	Stalked_ind_per_m2	Other_Sponges_ind_per_m2	Total_sponges_ind_per_m2	Benthivores_ind_per_m2	Pisces_ind_per_m2	Planktivores_ind_per_m2	Plank-pisces_ind_per_m2	Unknown_ind_per_m2	Total_fish_ind_per_m2						
Bakeapple M-35	G-A	11-Nov-2019	17:06:26	17:09:54	5326834.1	381067.9	5326838.4	381018.9	1019	49.1	0.82	100% Fine	Y	1	0.219	0.024	0.012	0.012	0.268	0.000	0.000	0.000	0.012	1.549	1.561	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.037	0.000	0.000	0.000	0.000	0.037					
Bakeapple M-35	G-A	11-Nov-2019	17:09:54	17:16:14	5326838.4	381018.9	5326838.4	380968.1	1017	50.8	0.84	100% Fine	Y	3	0.660	0.071	0.000	0.000	0.731	0.000	0.000	0.000	0.000	3.794	3.794	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.035	0.000	0.024	0.000	0.000	0.059	
Bakeapple M-35	G-A	11-Nov-2019	17:16:14	17:18:35	5326838.4	380968.1	5326837.9	380924.0	1018	44.1	0.73	100% Fine	Y	1	0.435	0.027	0.014	0.000	0.475	0.000	0.000	0.000	0.014	2.309	2.322	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.191		
Bakeapple M-35	G-B	11-Nov-2019	16:42:15	16:49:01	5326816.8	380868.4	5326821.2	380918.5	1018	50.3	0.84	100% Fine	Y	1	0.476	0.048	0.036	0.024	0.584	0.012	0.000	0.000	0.024	3.287	3.323	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.131	0.000	0.060	0.000	0.000	0.191	
Bakeapple M-35	G-B	11-Nov-2019	16:49:01	16:52:46	5326821.2	380918.5	5326823.3	380967.6	1019	49.2	0.82	100% Fine	N	1	0.329	0.037	0.000	0.000	0.365	0.000	0.000	0.000	0.012	2.046	2.059	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.110		
Bakeapple M-35	G-B	11-Nov-2019	16:52:46	16:57:42	5326823.3	380967.6	5326819.6	381017.6	1020	50.1	0.83	100% Fine	N	1	0.251	0.012	0.024	0.012	0.299	0.000	0.000	0.000	0.012	2.210	2.222	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.072		
Bakeapple M-35	G-B	11-Nov-2019	16:57:42	17:00:04	5326819.6	381017.6	5326820.5	381043.5	1020	25.9	0.43	100% Fine	Y	0	0.254	0.000	0.023	0.000	0.277	0.000	0.000	0.000	0.000	1.847	1.847	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.069		
Bakeapple M-35	G-C	11-Nov-2019	16:16:15	16:22:32	5326794.7	381068.0	5326800.0	381019.1	1019	49.3	0.82	100% Fine	Y	1	0.182	0.049	0.049	0.000	0.280	0.000	0.000	0.000	0.012	0.984	0.997	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.085		
Bakeapple M-35	G-C	11-Nov-2019	16:22:32	16:29:38	5326800.0	381019.1	5326802.6	380967.6	1018	51.5	0.86	100% Fine	Y	2	0.698	0.047	0.012	0.023	0.779	0.000	0.000	0.000	0.000	2.767	2.767	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.198	
Bakeapple M-35	G-C	11-Nov-2019	16:29:38	16:33:13	5326802.6	380967.6	5326799.9	380918.1	1017	49.6	0.82	100% Fine	Y	0	0.338	0.060	0.036	0.000	0.435	0.000	0.000	0.000	0.024	2.040	2.065	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.036	
Bakeapple M-35	G-C	11-Nov-2019	16:33:13	16:36:38	5326799.9	380918.1	5326799.9	380733.3	1017	44.8	0.74	100% Fine	Y	1	0.120	0.000	0.013	0.000	0.134	0.013	0.000	0.000	0.000	0.816	0.829	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.027	
Bakeapple M-35	G-D	11-Nov-2019	15:51:57	15:57:59	5326775.8	380868.1	5326780.6	380918.5	1018	50.6	0.84	100% Fine	Y	2	0.615	0.024	0.071	0.012	0.722	0.000	0.000	0.000	0.000	2.650	2.650	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.166	
Bakeapple M-35	G-D	11-Nov-2019	15:57:59	16:02:56	5326780.6	380918.5	5326783.4	380969.3	1019	50.8	0.84	100% Fine	Y	5	0.483	0.047	0.012	0.035	0.578	0.012	0.000	0.000	0.012	3.029	3.053	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.094	
Bakeapple M-35	G-D	11-Nov-2019	16:02:56	16:07:12	5326783.4	380969.3	5326779.0	381018.5	1020	49.5	0.82	100% Fine	Y	0	0.315	0.024	0.024	0.012	0.375	0.000	0.000	0.000	0.000	1.985	1.997	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.145	
Bakeapple M-35	G-D	11-Nov-2019	16:07:12	16:08:28	5326779.0	381018.5	5326779.0	381033.9	1020	15.4	0.25	100% Fine	Y	0	0.350	0.000	0.000	0.039	0.389	0.000	0.000	0.000	0.000	2.720	2.720	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.155	
Bakeapple M-35	G-E	11-Nov-2019	15:27:34	15:31:06	5326756.8	381068.2	5326760.3	381018.0	1019	50.3	0.84	100% Fine	Y	1	0.226	0.048	0.024	0.000	0.297	0.000	0.000	0.000	0.024	1.463	1.487	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.119	
Bakeapple M-35	G-E	11-Nov-2019	15:31:06	15:38:22	5326760.3	381018.0	5326760.2	380968.1	1019	49.9	0.83	100% Fine	Y	1	0.324	0.048	0.012	0.012	0.396	0.000	0.000	0.000	0.012	1.297	1.309	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.096	
Bakeapple M-35	G-E	11-Nov-2019	15:38:22	15:45:12	5326760.2	380968.1	5326759.9	380918.6	1017	49.5	0.82	100% Fine	Y	0	0.629	0.048	0.000	0.000	0.689	0.000	0.000	0.000	0.000	2.527	2.527	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.121	
Bakeapple M-35	G-E	11-Nov-2019	15:45:12	15:45:41	5326759.9	380918.6	5326760.8	380913.5	1017	5.1	0.86	100% Fine	Y	0	0.117	0.000	0.000	0.000	0.117	0.000	0.000	0.000	0.000	0.583	0.583	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Bakeapple M-35	G-F	11-Nov-2019	14:59:30	15:06:44	5326741.3	380869.2	5326741.3	380919.2	1018	50.1	0.83	100% Fine	Y	0	0.538	0.048	0.036	0.012	0.634	0.000	0.000	0.000	0.000	2.392	2.392	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.239
Bakeapple M-35	G-F	11-Nov-2019	15:06:44	15:15:29	5326741.3	380919.2	5326739.9	380968.6	1019	49.4	0.82	100% Fine	Y	0	0.424	0.012	0.012	0.000	0.449	0.000	0.000	0.000	0.000	2.097	2.097	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.145
Bakeapple M-35	G-F	11-Nov-2019	15:15:29	15:20:00	5326739.9	380968.6	5326738.8	381018.1	1019	49.5	0.82	100% Fine	Y	0	0.339	0.024	0.000	0.000	0.363	0.000	0.000	0.000	0.000	2.105	2.105	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.060	
Bakeapple M-35	G-F	11-Nov-2019	15:20:00	15:21:34	5326738.8	381018.1	5326742.9	381034.1	1020	16.5	0.27	100% Fine	Y	1	0.073	0.000	0.036	0.036	0.145	0.000	0.000	0.000	0.036	1.234	1.271	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.073	
Bakeapple M-35	G-G	11-Nov-2019	20:13:08	20:18:00	5326717.6	380869.6	5326715.9	380916.7	1019	47.1	0.78	100% Fine	Y	0	0.394	0.064	0.025	0.051	0.533	0.000	0.000																							

Bakeapple M-35	T-1	11-Nov-2019	22:58:53	23:02:35	5327139.0	380970.2	5327188.4	380966.6	1014	49.6	0	82.8	100%	0.362	0.036	0.048	0.036	0.483	0.000	0.000	0.000	0.012	1.498	1.510	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.048	0.000	0.012	0.000	0.024	0.085
Bakeapple M-35	T-1	11-Nov-2019	23:02:35	23:03:31	5327188.4	380966.6	5327196.3	380965.6	1014	8.0	0	13.3	100%	0.450	0.000	0.150	0.075	0.676	0.000	0.000	0.000	0.000	1.801	1.801	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.075	0.000	0.000	0.000	0.075	
Bakeapple M-35	T-2	11-Nov-2019	21:50:43	21:51:36	5327089.7	381325.4	5327087.2	381315.3	1020	10.5	0	17.5	100%	0.400	0.000	0.057	0.000	0.457	0.000	0.000	0.000	0.000	5.138	5.138	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.057	0.000	0.000	0.057		
Bakeapple M-35	T-2	11-Nov-2019	21:51:36	21:55:07	5327087.2	381315.3	5327051.7	381279.8	1022	50.2	1	0.155	0.024	0.036	0.000	0.215	0.000	0.000	0.000	0.000	0.000	2.769	2.769	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.060	0.000	0.095	0.000	0.024	0.179	
Bakeapple M-35	T-2	11-Nov-2019	21:55:07	22:01:03	5327051.7	381279.8	5327016.9	381244.7	1020	49.5	0	83.8	100%	0.291	0.012	0.024	0.024	0.351	0.000	0.000	0.000	0.000	0.036	2.979	3.015	0.000	0.000	0.000	0.000	0.000	0.000	0.048	0.000	0.145	0.000	0.218	
Bakeapple M-35	T-2	11-Nov-2019	22:01:03	22:05:48	5327016.9	381244.7	5326980.4	381209.5	1019	50.7	1	0.366	0.012	0.024	0.012	0.414	0.000	0.000	0.000	0.000	0.000	2.931	2.931	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.071	0.000	0.047	0.000	0.000	0.118	
Bakeapple M-35	T-2	11-Nov-2019	22:05:48	22:10:11	5326980.4	381209.5	5326943.8	381177.1	1020	48.9	0	0.355	0.012	0.012	0.012	0.392	0.000	0.000	0.000	0.000	0.000	0.012	3.159	3.171	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.024	0.000	0.049	0.000	0.012	0.086
Bakeapple M-35	T-2	11-Nov-2019	22:10:11	22:13:04	5326943.8	381177.1	5326910.5	381138.9	1020	50.7	0	84.6	100%	0.343	0.012	0.012	0.000	0.366	0.000	0.000	0.000	0.000	0.024	2.292	2.316	0.000	0.000	0.000	0.000	0.000	0.000	0.071	0.000	0.024	0.000	0.000	0.095
Bakeapple M-35	T-2	11-Nov-2019	22:13:04	22:17:31	5326910.5	381138.9	5326874.7	381103.0	1021	50.7	0	0.449	0.000	0.047	0.035	0.532	0.000	0.000	0.000	0.000	0.000	0.012	3.497	3.509	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.095	0.000	0.035	0.000	0.012	0.142
Bakeapple M-35	T-2	11-Nov-2019	22:17:31	22:17:44	5326874.7	381103.0	5326871.8	381094.5	1023	9.0	0	15.0	100%	0.200	0.067	0.000	0.000	0.267	0.000	0.000	0.000	0.000	2.199	2.199	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.133	0.000	0.000	0.132	
Bakeapple M-35	T-3	11-Nov-2019	20:37:41	20:43:51	5326735.2	381072.8	5326744.3	381121.3	1021	49.4	0	82.5	100%	0.740	0.024	0.036	0.012	0.812	0.000	0.000	0.000	0.000	0.048	5.686	5.735	0.000	0.000	0.000	0.000	0.000	0.000	0.073	0.000	0.024	0.000	0.024	0.121
Bakeapple M-35	T-3	11-Nov-2019	20:43:51	20:47:12	5326744.3	381121.3	5326739.6	381169.2	1023	48.1	0	0.299	0.000	0.025	0.025	0.348	0.000	0.000	0.000	0.000	0.000	0.000	1.817	1.817	0.000	0.000	0.000	0.000	0.000	0.000	0.025	0.000	0.012	0.000	0.000	0.037	
Bakeapple M-35	T-3	11-Nov-2019	20:47:12	20:51:12	5326739.6	381169.2	5326741.2	381217.9	1023	48.7	0	81.3	100%	0.418	0.000	0.000	0.000	0.418	0.000	0.000	0.000	0.000	0.012	2.634	2.646	0.000	0.000	0.000	0.000	0.000	0.000	0.049	0.000	0.000	0.000	0.000	0.049
Bakeapple M-35	T-3	11-Nov-2019	20:51:12	20:55:13	5326741.2	381217.9	5326740.5	381270.4	1023	52.5	0	0.319	0.000	0.000	0.011	0.430	0.000	0.000	0.000	0.000	0.000	0.011	1.664	1.675	0.000	0.000	0.000	0.000	0.000	0.000	0.046	0.000	0.057	0.000	0.034	0.137	
Bakeapple M-35	T-3	11-Nov-2019	20:55:13	20:59:27	5326740.5	381270.4	5326743.2	381321.2	1025	50.9	0	87.8	100%	0.353	0.012	0.047	0.012	0.424	0.000	0.000	0.000	0.000	0.024	2.188	2.212	0.000	0.000	0.000	0.000	0.000	0.000	0.094	0.000	0.012	0.000	0.000	0.106
Bakeapple M-35	T-3	11-Nov-2019	20:59:27	21:03:35	5326743.2	381321.2	5326738.7	381368.0	1024	47.0	0	78.4	100%	0.395	0.013	0.038	0.000	0.446	0.000	0.000	0.000	0.000	0.000	2.320	2.320	0.000	0.000	0.000	0.000	0.000	0.000	0.089	0.000	0.000	0.000	0.038	0.127
Bakeapple M-35	T-3	11-Nov-2019	21:03:35	21:08:23	5326738.7	381368.0	5326739.6	381419.7	1025	51.7	0	86.3	100%	0.580	0.035	0.000	0.023	0.638	0.000	0.000	0.000	0.000	0.023	3.350	3.373	0.000	0.000	0.000	0.000	0.000	0.000	0.089	0.000	0.000	0.000	0.023	0.081
Bakeapple M-35	T-3	11-Nov-2019	21:08:23	21:09:11	5326739.6	381419.7	5326743.2	381429.5	1023	10.7	0	17.8	100%	0.393	0.000	0.056	0.000	0.449	0.000	0.000	0.000	0.000	0.000	2.584	2.584	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.056	0.000	0.112	0.169
Bakeapple M-35	T-4	12-Nov-2019	4:50:47	4:51:24	5326387.6	381321.7	5326393.4	381316.5	1028	7.8	0	13.0	100%	0.539	0.154	0.077	0.000	0.771	0.000	0.000	0.000	0.000	0.000	3.314	3.314	0.000	0.000	0.000	0.000	0.000	0.000	0.154	0.000	0.000	0.000	0.154	
Bakeapple M-35	T-4	12-Nov-2019	4:51:24	4:58:46	5326393.4	381316.5	5326425.8	381281.4	1025	47.8	0	0.489	0.025	0.050	0.000	0.564	0.000	0.000	0.000	0.000	0.000	0.038	3.210	3.248	0.000	0.000	0.000	0.000	0.000	0.000	0.038	0.000	0.188	0.000	0.038	0.263	
Bakeapple M-35	T-4	12-Nov-2019	4:58:46	5:05:48	5326425.8	381281.4	5326461.0	381246.2	1025	49.7	0	0.650	0.024	0.024	0.000	0.698	0.000	0.000	0.000	0.000	0.000	0.012	2.805	2.817	0.000	0.000	0.000	0.000	0.000	0.000	0.048	0.000	0.096	0.000	0.012	0.156	
Bakeapple M-35	T-4	12-Nov-2019	5:05:48	5:10:53	5326461.0	381246.2	5326496.6	381208.2	1024	52.1	0	0.482	0.023	0.011	0.000	0.517	0.000	0.000	0.000	0.000	0.000	0.011	2.802	2.813	0.000	0.000	0.000	0.000	0.000	0.000	0.046	0.000	0.046	0.000	0.111	0.103	
Bakeapple M-35	T-4	12-Nov-2019	5:10:53	5:17:11	5326496.6	381208.2	5326532.2	381173.4	1023	49.8	0	83.1	100%	0.481	0.000	0.012	0.012	0.505	0.000	0.000	0.000	0.000	0.000	2.840	2.840	0.000	0.000	0.000	0.000	0.000	0.000	0.060	0.000	0.096	0.000	0.012	0.168
Bakeapple M-35	T-4	12-Nov-2019	5:17:11	5:22:08	5326532.2	381173.4	5326567.8	381138.8	1022	49.6	0	0.422	0.012	0.024	0.000	0.458	0.000	0.000	0.000	0.000	0.000	0.000	1.629	1.629	0.000	0.000	0.000	0.000	0.000	0.000	0.060	0.000	0.024	0.000	0.000	0.084	
Bakeapple M-35	T-4	12-Nov-2019	5:22:08	5:27:36	5326567.8	381138.8	5326605.2	381103.8	1022	51.2	0	0.514	0.012	0.000	0.000	0.526	0.000	0.000	0.000	0.000	0.000	0.012	2.138	2.150	0.000	0.000	0.000	0.000	0.000	0.000	0.012	0.000	0.082	0.000	0.000	0.093	
Bakeapple M-35	T-4	12-Nov-2019	5:27:36	5:28:43	5326605.2	381103.8	5326610.4	381096.4	1020	10.7	0	0.559	0.056	0.000	0.000	0.576	0.000	0.000	0.000	0.000	0.000	0.000	5.196	5.196	0.000	0.000	0.000	0.000	0.000	0.000	0.056	0.000	0.056	0.000	0.056	0.168	
Bakeapple M-35	T-5	12-Nov-2019	3:12:25	3:18:15	5326637.5	380967.8	5326590.6	380970.8	1021	47.0	0	87.9	100%	0.407	0.051	0.013	0.064	0.535	0.000	0.000	0.000	0.000	0.025	3.246	3.272	0.000	0.000	0.000	0.000	0.000	0.000	0.102	0.000	0.051	0.000	0.025	0.178
Bakeapple M-35	T-5	12-Nov-2019	3:18:15	3:22:54	5326590.6	380970.8	5326538.2	380967.8	1022	52.6	0	0.296	0.011	0.034	0.023	0.365	0.000	0.000	0.000	0.000	0.000	0.000	1.732	1.732	0.000	0.000	0.000	0.000	0.000	0.000	0.033	0.000	0.046	0.000	0.000	0.068	
Bakeapple M-35	T-5	12-Nov-2019	3:22:54	3:28:38	5326538.2	380967.8	5326489.3	380966.4	1022	48.9	0	81.7	100%	0.343	0.000	0.049	0.024	0.416	0.000	0.000	0.000	0.000	0.012	3.000	3.012	0.000	0.000	0.000	0.000	0.000	0.000	0.027	0.000	0.049	0.000	0.000	0.086
Bakeapple M-35	T-5	12-Nov-2019	3:28:38	3:33:48	5326489.3	380966.4	5326440.8	380968.3	1022	48.5	0	81.0	100%	0.444	0.000	0.025	0.025	0.494	0.000	0.000	0.000	0.000	0.025	4.259	4.283	0.000	0.000	0.000	0.000	0.000	0.000	0.062	0.000	0.000	0.000	0.062	
Bakeapple M-35	T-5	12-Nov-2019	3:33:48	3:39:48	5326440.8	380968.3	5326389.4	380972.8	1022	51.5	0	0.383	0.012	0.035	0.023	0.453	0.000	0.000	0.000	0.000	0.000	0.012	3.172	3.183	0.000	0.000	0.000	0.000	0.000	0.000	0.081	0.000	0.046	0.000	0.023	0.131	
Bakeapple M-35	T-5	12-Nov-2019	3:39:48	3:45:06	5326389.4	380972.8	5326340.0	380966.3	1023	49.9	0																										

APPENDIX B COORDINATES OF CORALS ABOVE 30 CM

Table B.1 Coordinates for Corals measured above 30 cm (NAD 83 (CSRS), Zone 23)

Site	Date	Line	Box	Waypoint	Easting	Northing	Height/width (cm)	Functional Group
Cappahayden	06-Nov-19	F	F2	F2-1	375581.71	5311351.59	85	Branching Coral
Cappahayden	06-Nov-19	A	A15	A15-1	375708.57	5311447.35	59	Branching Coral
Cappahayden	08-Nov-19	C	C7	C7-1	375625.36	5311407.91	57	Branching Coral
Cappahayden	08-Nov-19	D	D17	D17-1	375732.11	5311388.84	54	Branching Coral
Cappahayden	08-Nov-19	E	E6	E6-1	375621.86	5311369.93	61	Branching Coral
Cappahayden	08-Nov-19	H	H7	H7-1	375630.06	5311313.48	62	Branching Coral
Cappahayden	08-Nov-19	I	I2	I2-1	375583.95	5311292.47	55	Branching Coral
Cappahayden	08-Nov-19	J	J13	J13-1	375686.08	5311269.06	81	Branching Coral
Sitka	10-Nov-19	F	F6	F6-1	368544.69	5302507.26	30	Branching Coral
Sitka	10-Nov-19	F	F6	F6-2	368544.69	5302507.26	35	Branching Coral
Sitka	10-Nov-19	E	E9	E9-1	368570.83	5302528.32	53	Branching Coral
Sitka	10-Nov-19	E	E5	E5-1	368533.61	5302521.43	57	Branching Coral
Sitka	10-Nov-19	D	D6	D6-1	368542.96	5302543.41	55	Branching Coral
Sitka	10-Nov-19	D	D11	D11-1	368591.73	5302540.95	46	Branching Coral
Sitka	10-Nov-19	D	D11	D11-2	368591.73	5302540.95	57	Branching Coral
Sitka	10-Nov-19	B	B5	B5-1	368527.06	5302588.77	31	Branching Coral
Sitka	10-Nov-19	B	B5	B5-3	368527.06	5302588.77	31	Branching Coral
Sitka	10-Nov-19	B	B5	B5-6	368527.06	5302588.77	36	Branching Coral
Sitka	10-Nov-19	G	G14	G14-1	368617.33	5302488.06	40	Branching Coral
Sitka	10-Nov-19	G	G18	G18-1	368655.16	5302490.96	43	Sea Pen
Sitka	11-Nov-19	H	H11	H11-1	368590.65	5302466.07	46	Branching Coral
Sitka	11-Nov-19	H	H5	H5-1	368534.96	5302464.81	36	Branching Coral
Sitka	11-Nov-19	K	K13	K13-1	368613.54	5302402.2	37	Branching Coral
Sitka	11-Nov-19	K	K13	K13-2	368613.54	5302402.2	30	Branching Coral
Sitka	11-Nov-19	K	K13	K13-3	368613.54	5302402.2	49	Branching Coral
Sitka	11-Nov-19	K	K13	K13-4	368613.54	5302402.2	50	Branching Coral
Bakeapple	11-Nov-19	F	F1	F1-1	380869.52	5326740.32	63	Branching Coral
Bakeapple	11-Nov-19	E	E14	E14-1	381007.14	5326761.23	76	Branching Coral
Bakeapple	11-Nov-19	E	E9	E9-1	380951.85	5326760.94	46	Branching Coral
Bakeapple	11-Nov-19	D	D1	D1-1	380870.21	5326777.31	56	Sea Pen
Bakeapple	11-Nov-19	C	C16	C16-1	381027.93	5326794.87	51	Branching Coral
Bakeapple	11-Nov-19	C	C15	C15-1	381011.12	5326800.54	63	Sea Pen
Bakeapple	11-Nov-19	C	C1	C1-1	380874.41	5326800.99	49	Branching Coral
Bakeapple	11-Nov-19	B	B3	B3-1	380890.19	5326824.58	45	Branching Coral
Bakeapple	11-Nov-19	A	A13	A13-1	380994.03	5326837.78	57	Branching Coral

Site	Date	Line	Box	Waypoint	Easting	Northing	Height/width (cm)	Functional Group
Bakeapple	11-Nov-19	K	K19	K19-1	381057.33	5326638.32	68	Branching Coral
Bakeapple	11-Nov-19	K	K14	K14-1	381008.39	5326636.94	79	Branching Coral
Bakeapple	11-Nov-19	K	K12	K12-1	380982.43	5326640.91	76	Branching Coral
Bakeapple	11-Nov-19	J	J5	J5-1	380914.87	5326657.97	52	Branching Coral
Bakeapple	11-Nov-19	I	I20	I20-1	381066.29	5326679.79	97	Branching Coral
Bakeapple	11-Nov-19	I	I11	I11-1	380975.74	5326684.82	71	Branching Coral
Bakeapple	11-Nov-19	I	I13	I13-1	380992.79	5326680.43	72	Branching Coral
Bakeapple	11-Nov-19	H	H17	H17-1	381036.86	5326699.91	41	Branching Coral
Bakeapple	11-Nov-19	H	H17	H17-2	381036.86	5326699.91	40	Branching Coral
Bakeapple	11-Nov-19	H	H9	H9-1	380953.83	5326703.79	68	Sea Pen
Bakeapple	11-Nov-19	H	H9	H9-2	380953.83	5326703.79	44	Sea Pen
Bakeapple	11-Nov-19	G	G4	G4-1	380899.22	5326718.15	46	Branching Coral
Bakeapple	11-Nov-19	G	G20	G20-1	381061.07	5326723.33	59	Branching Coral

APPENDIX C CORAL FUNCTIONAL GROUP DENSITY MAPS

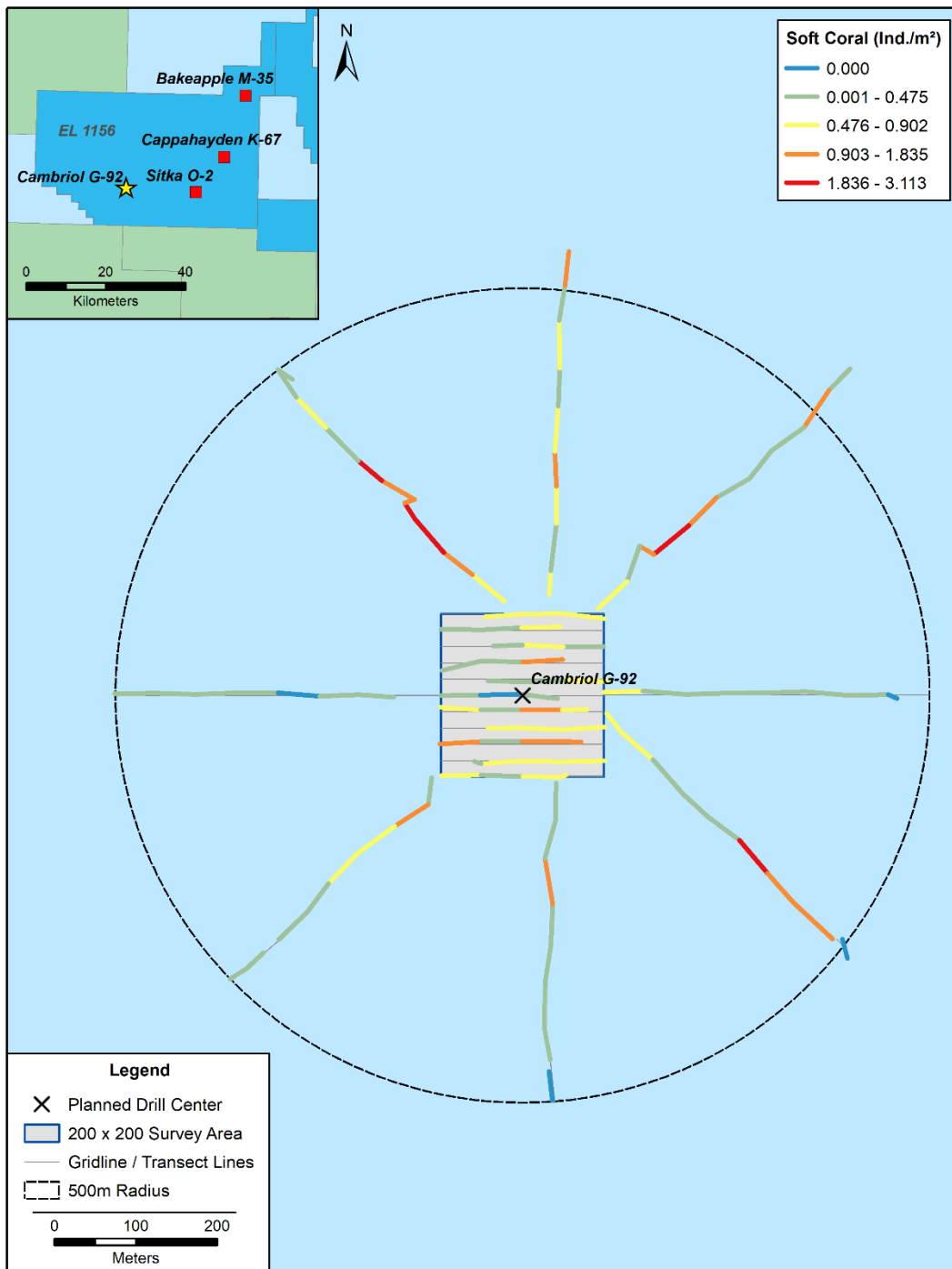


Figure C-1 Soft coral density (ind./m²) observed at Cambriol

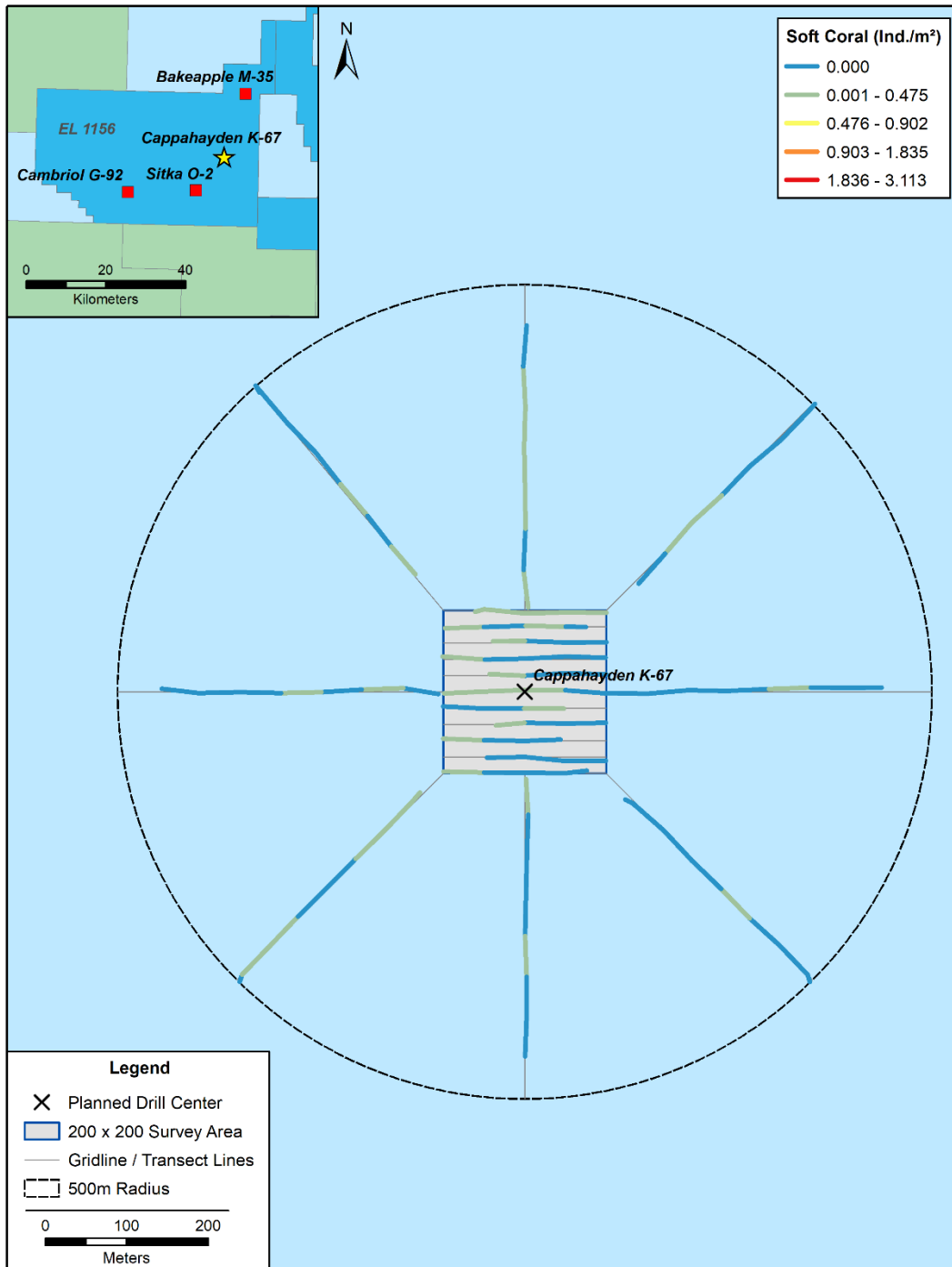


Figure C-2 Soft coral density (ind./m²) observed at Cappahayden

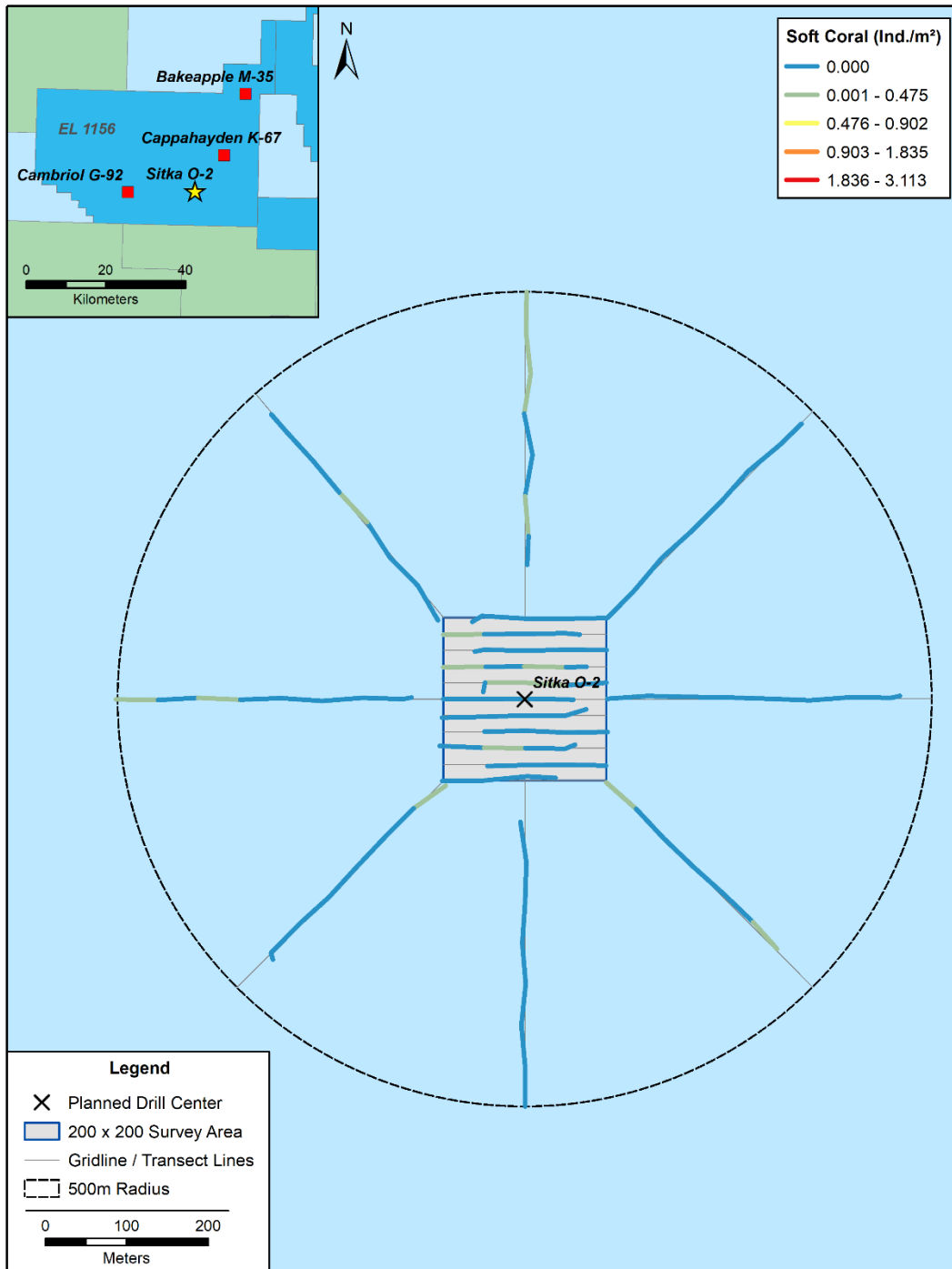


Figure C-3 Soft coral density (ind./m²) observed at Sitka

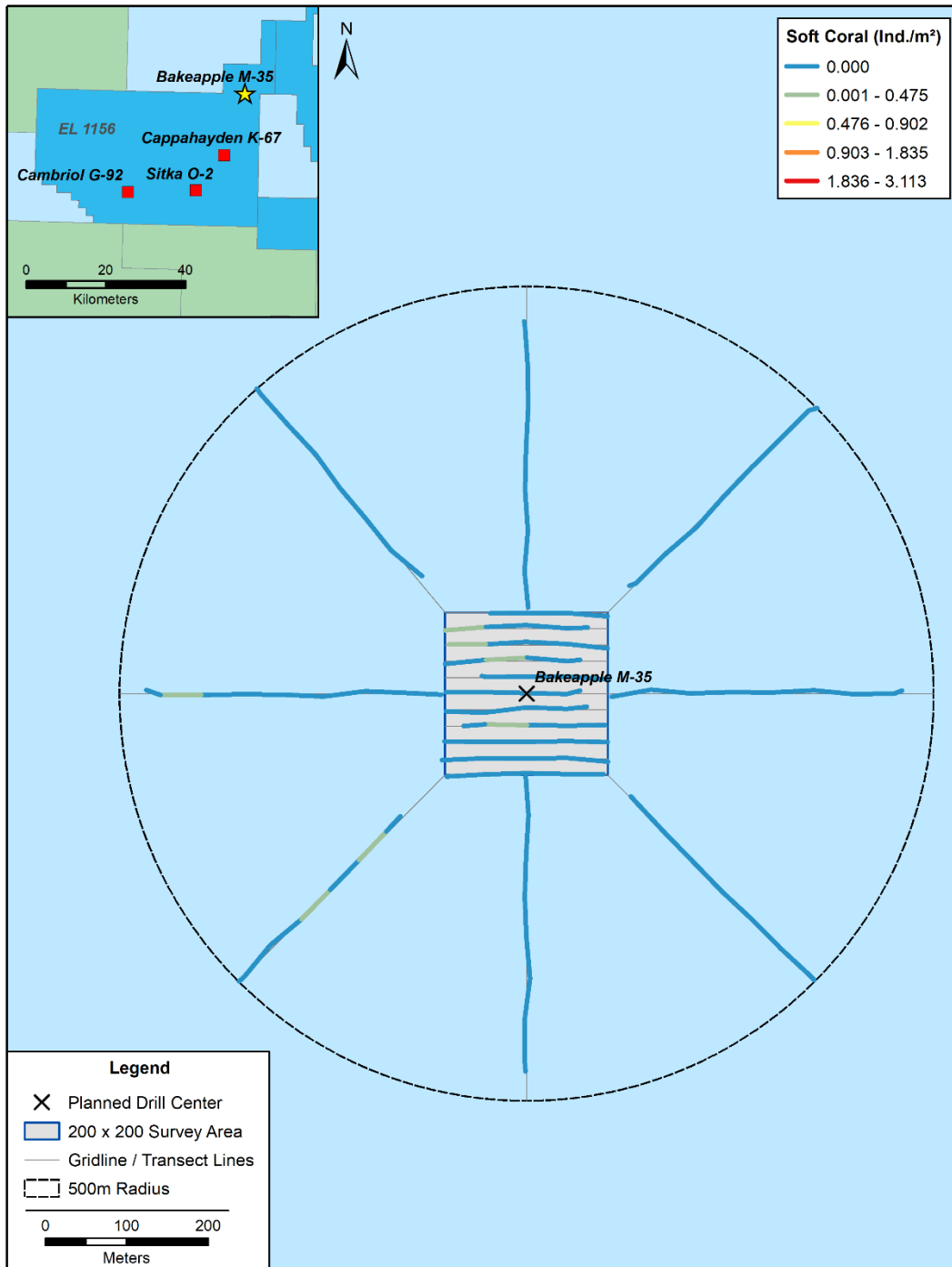


Figure C-4 Soft coral density (ind./m²) observed at Bakeapple

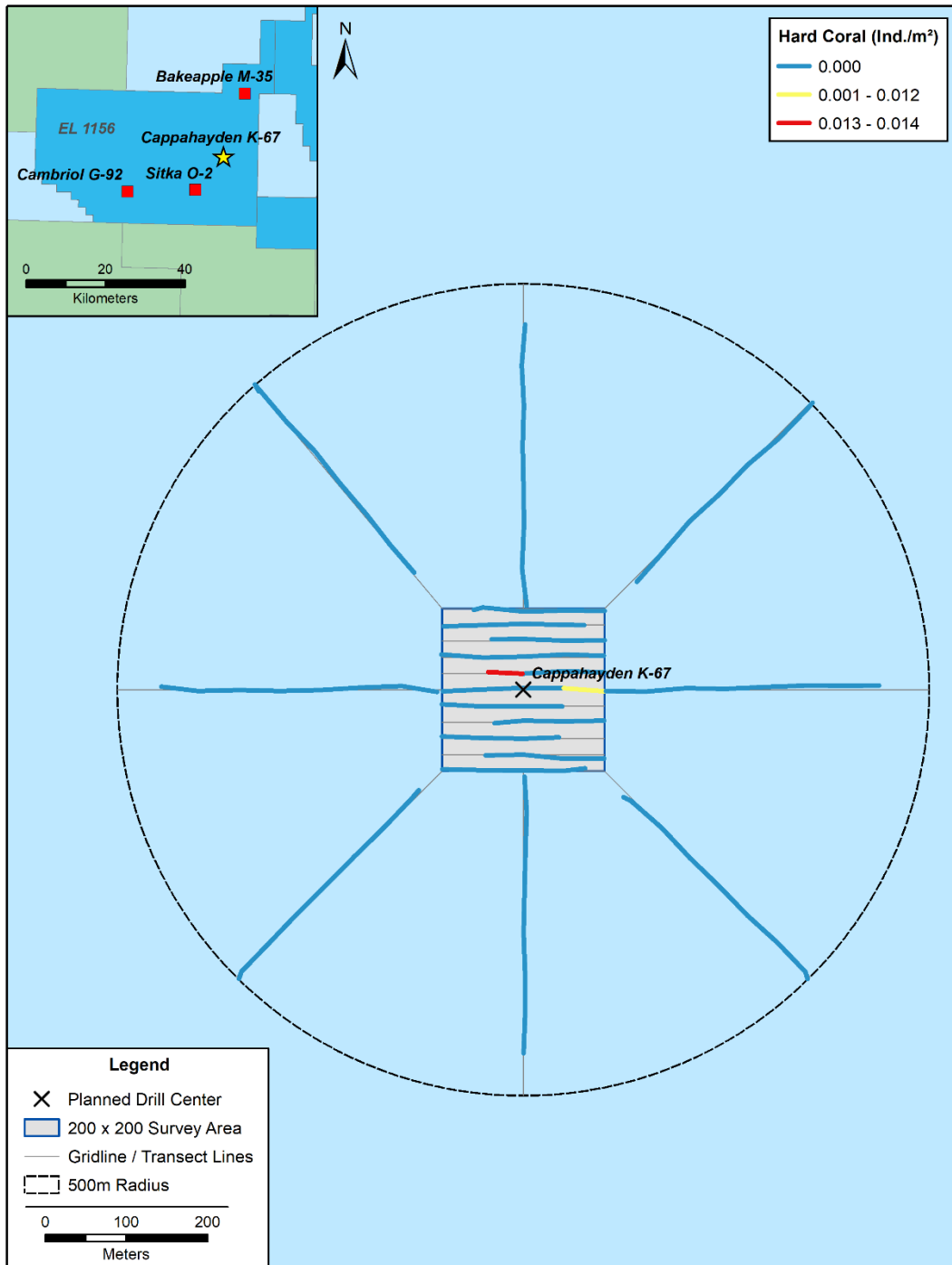


Figure C-5 Hard coral density (ind./m²) observed at Cappahayden

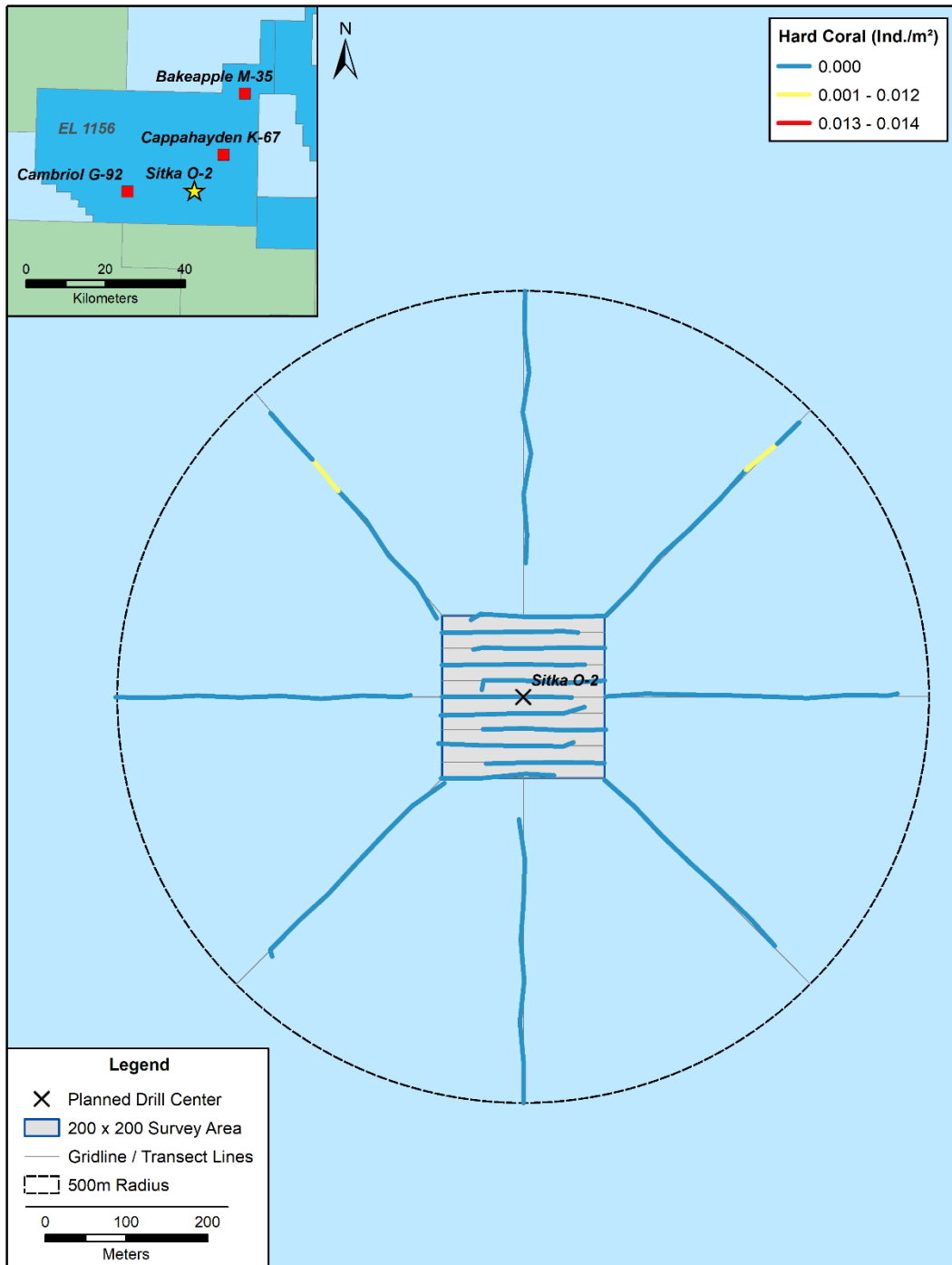


Figure C-6 Hard coral density (ind./m²) observed at Sitka

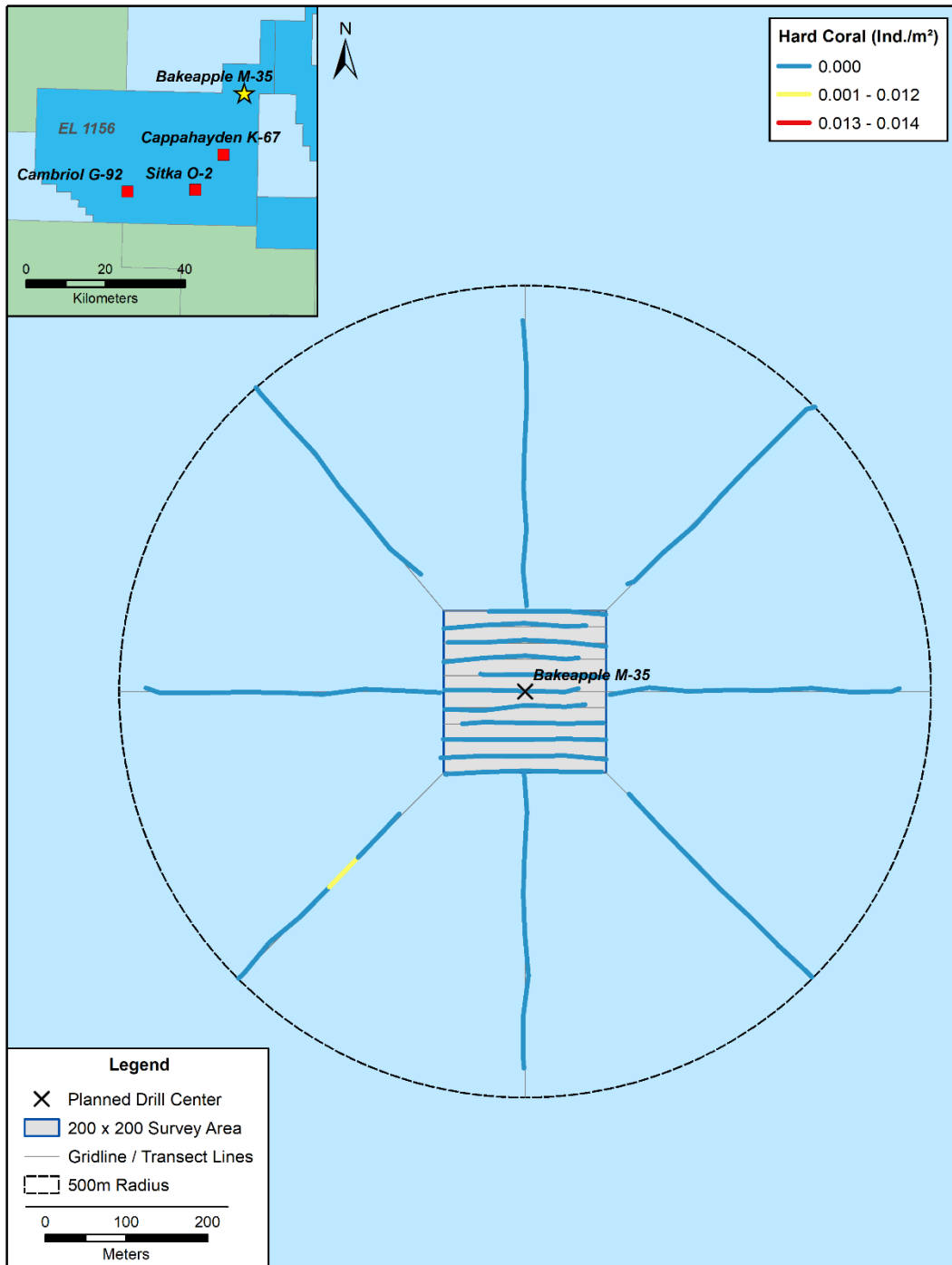


Figure C-7 Hard coral density (ind./m²) observed at Bakeapple

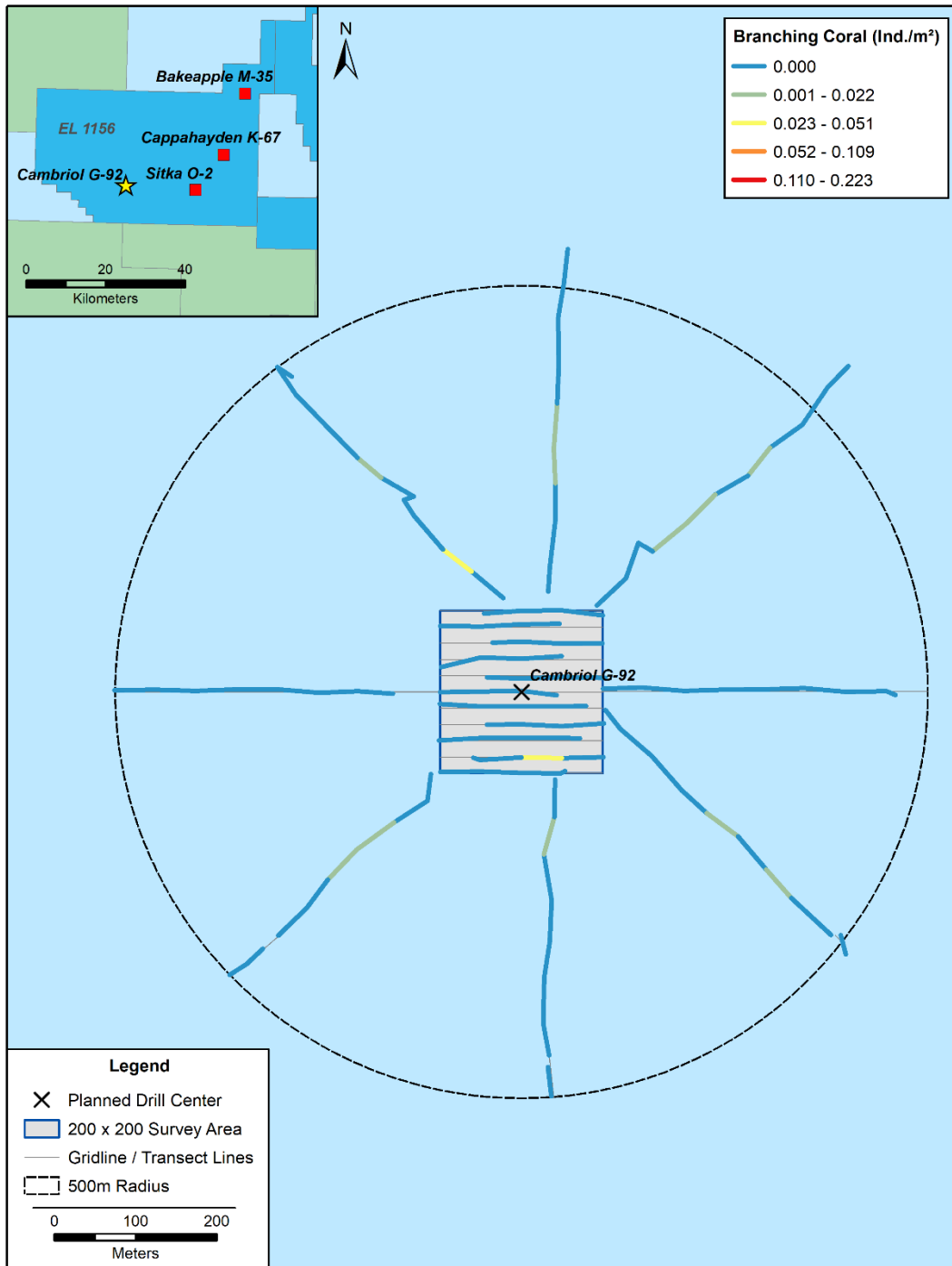


Figure C-8 Branching coral density (ind./m²) observed at Cambriol

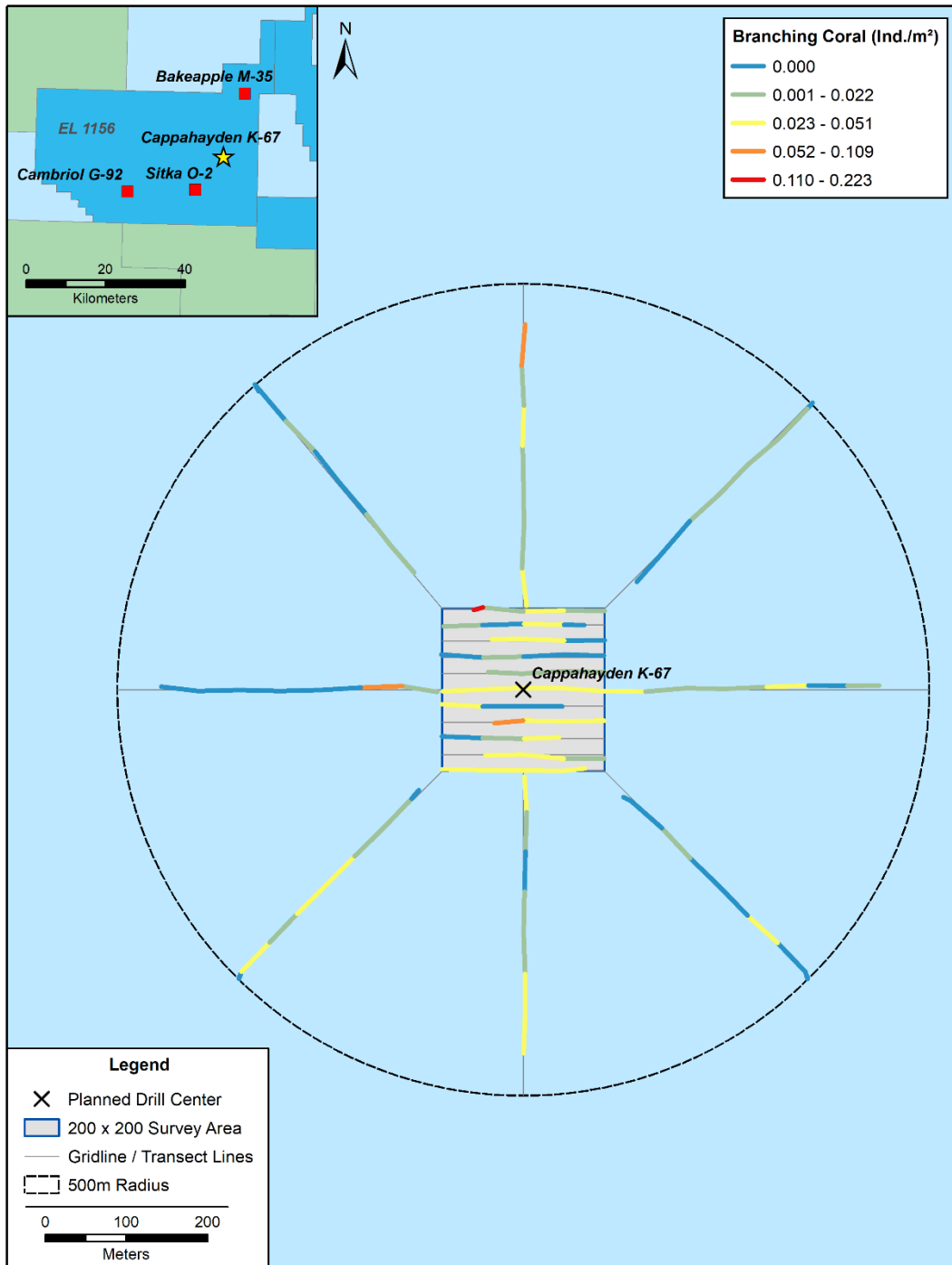


Figure C-9 Branching coral density (ind./m²) observed at Cappahayden

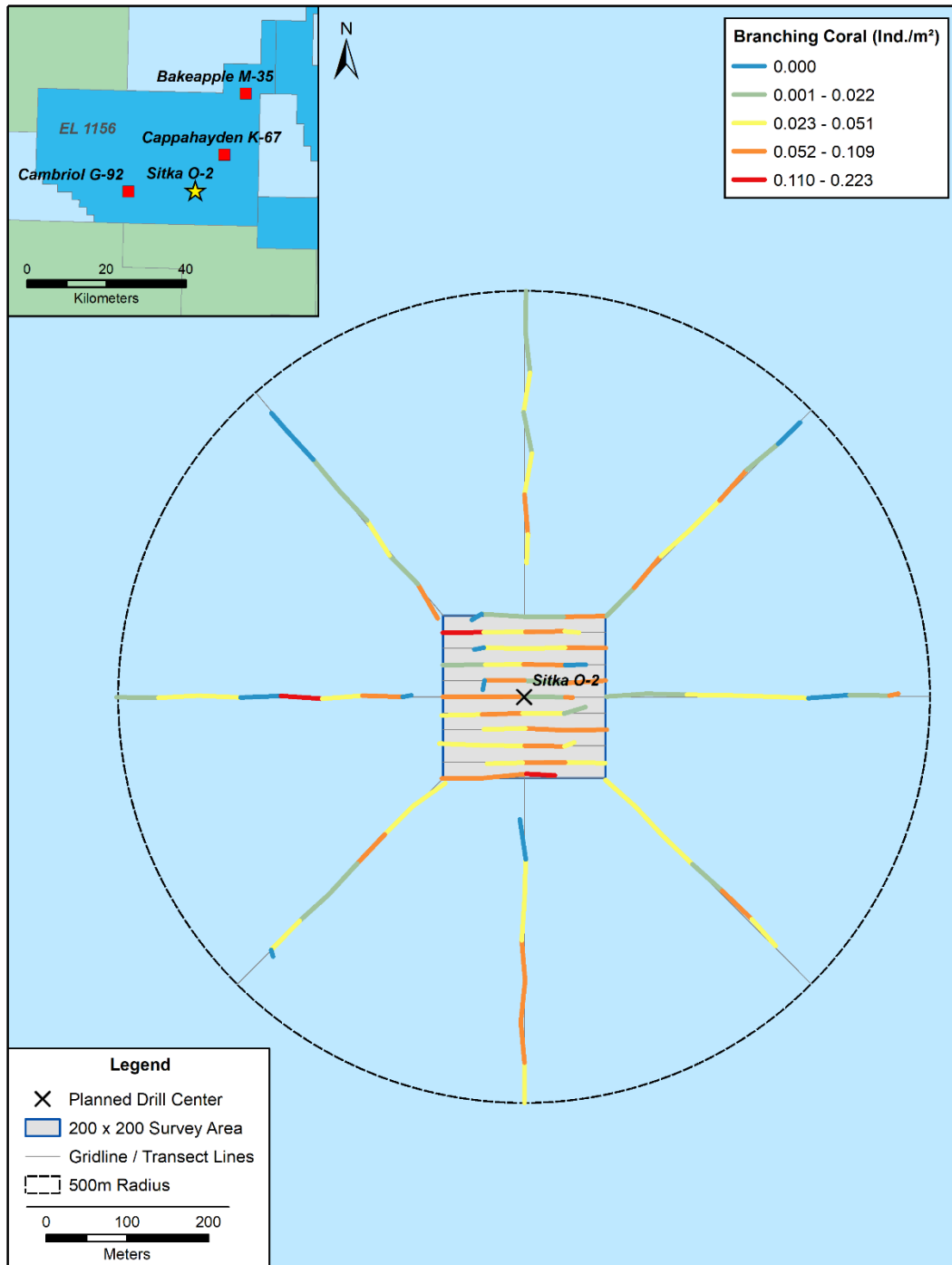


Figure C-10 Branching coral density (ind./m²) observed at Sitka

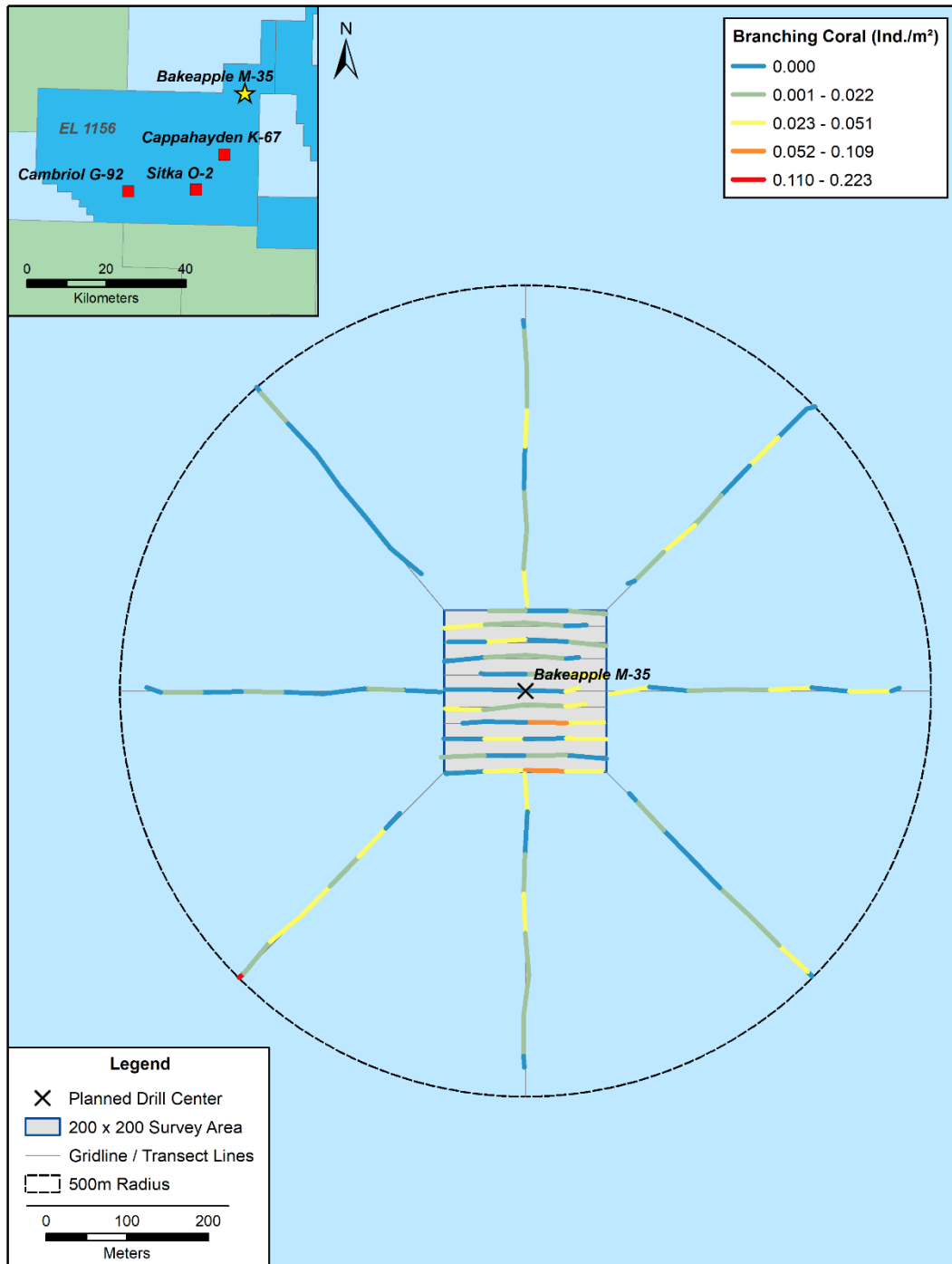


Figure C-11 Branching coral density (ind./m²) observed at Bakeapple

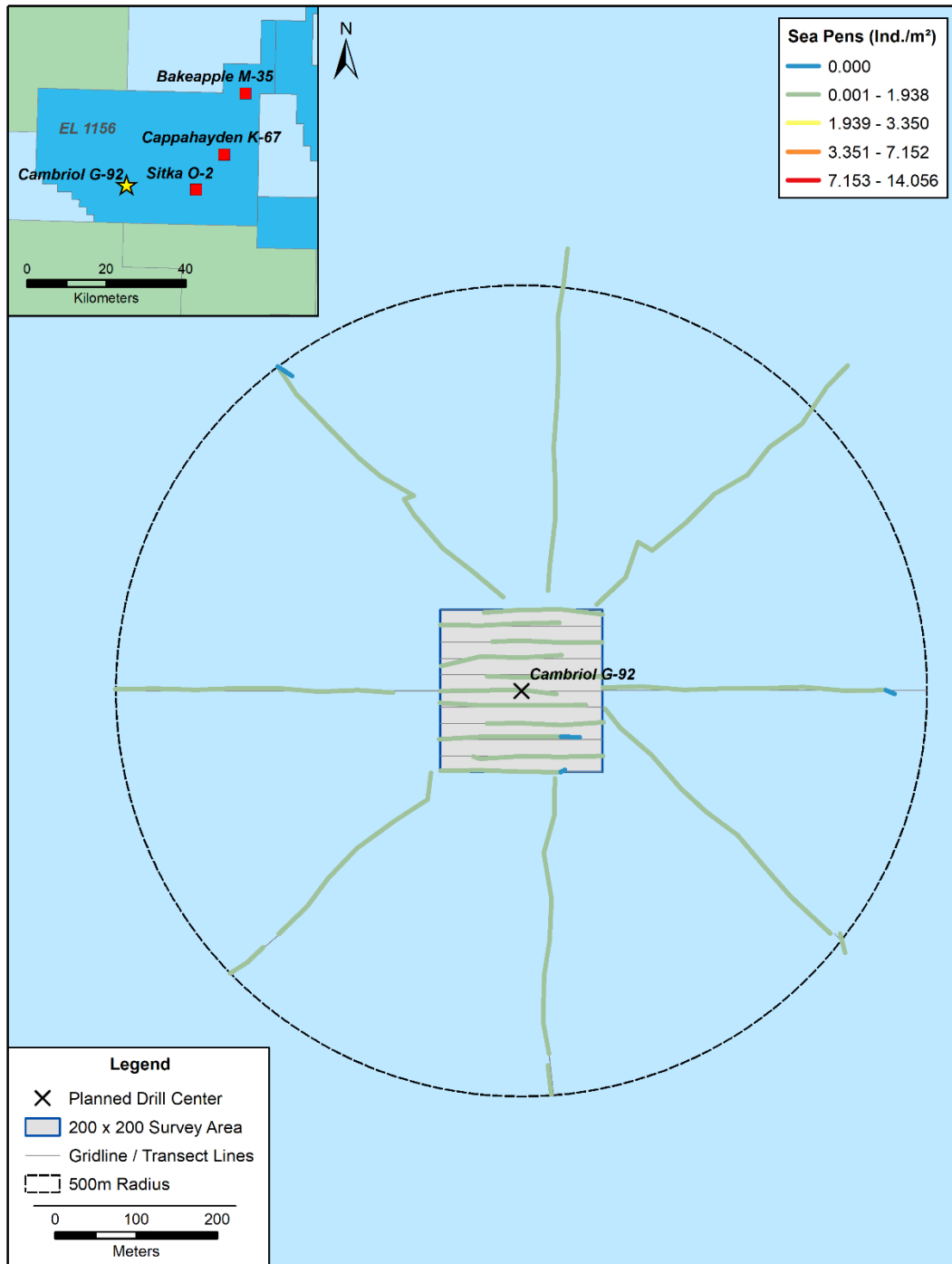


Figure C-12 Sea pen coral density (ind./m²) observed at Cambriol

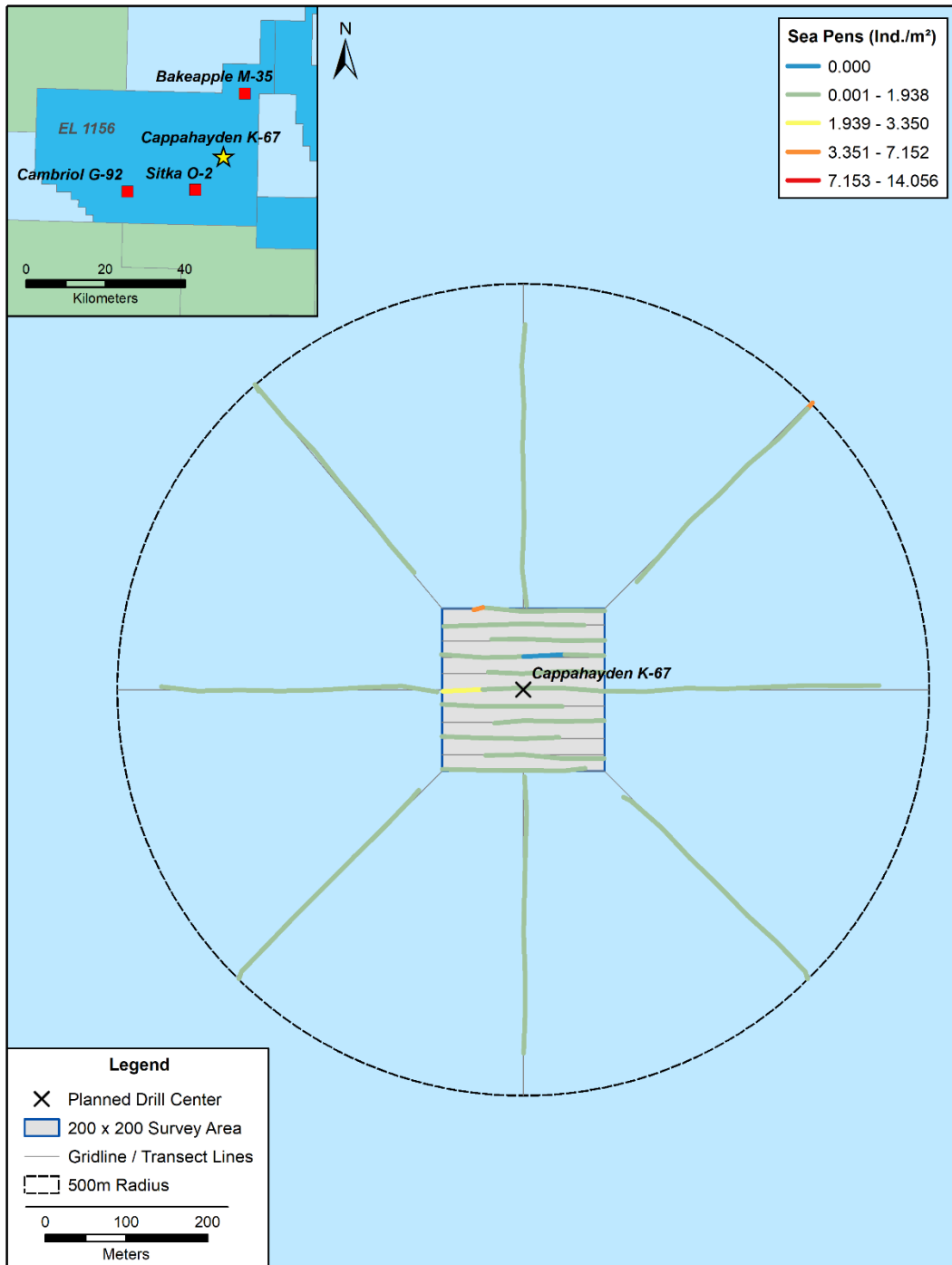


Figure C-13 Sea pen coral density (ind./m²) observed at Cappahayden

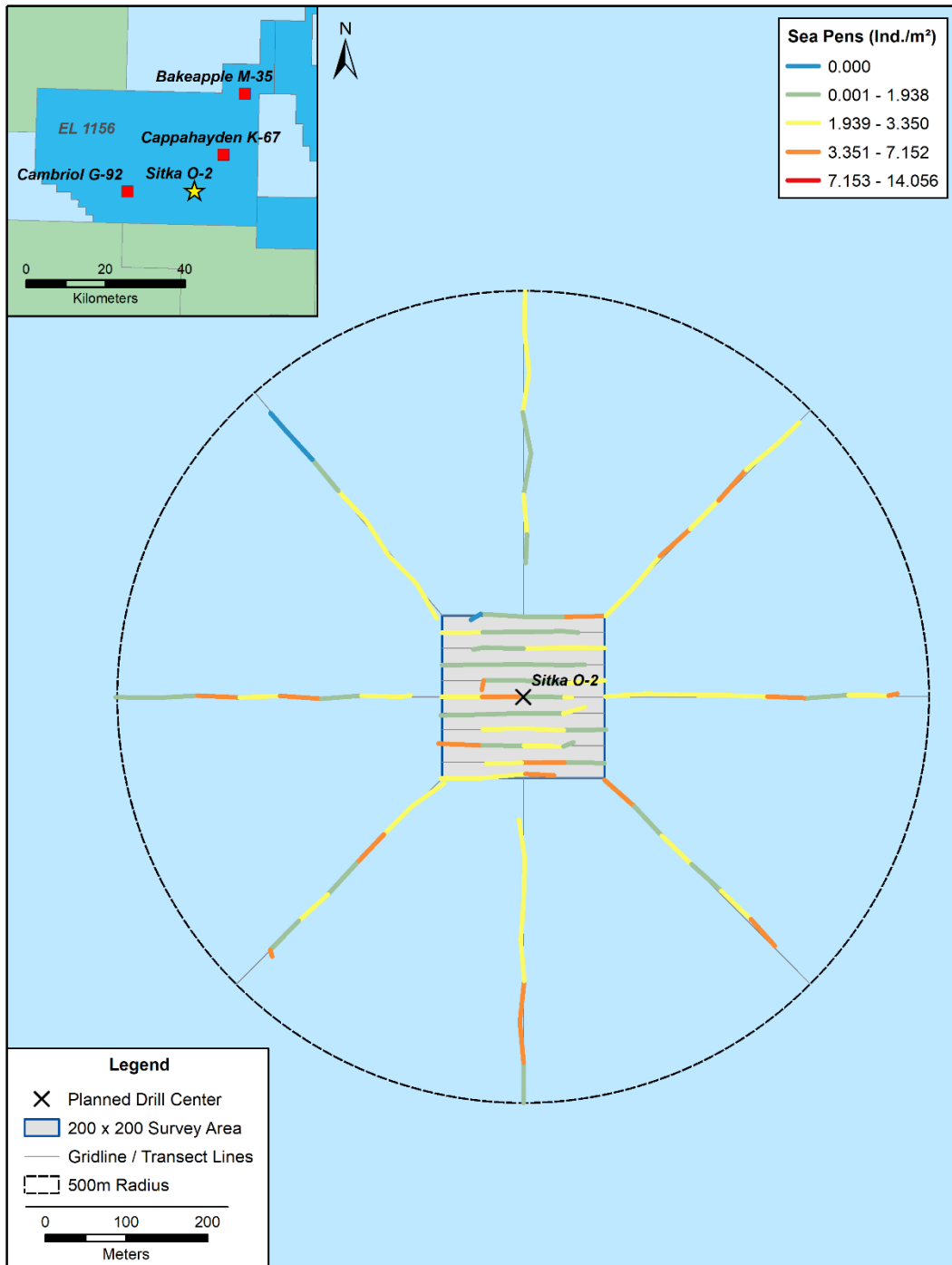


Figure C-14 Sea pen coral density (ind./m²) observed at Sitka

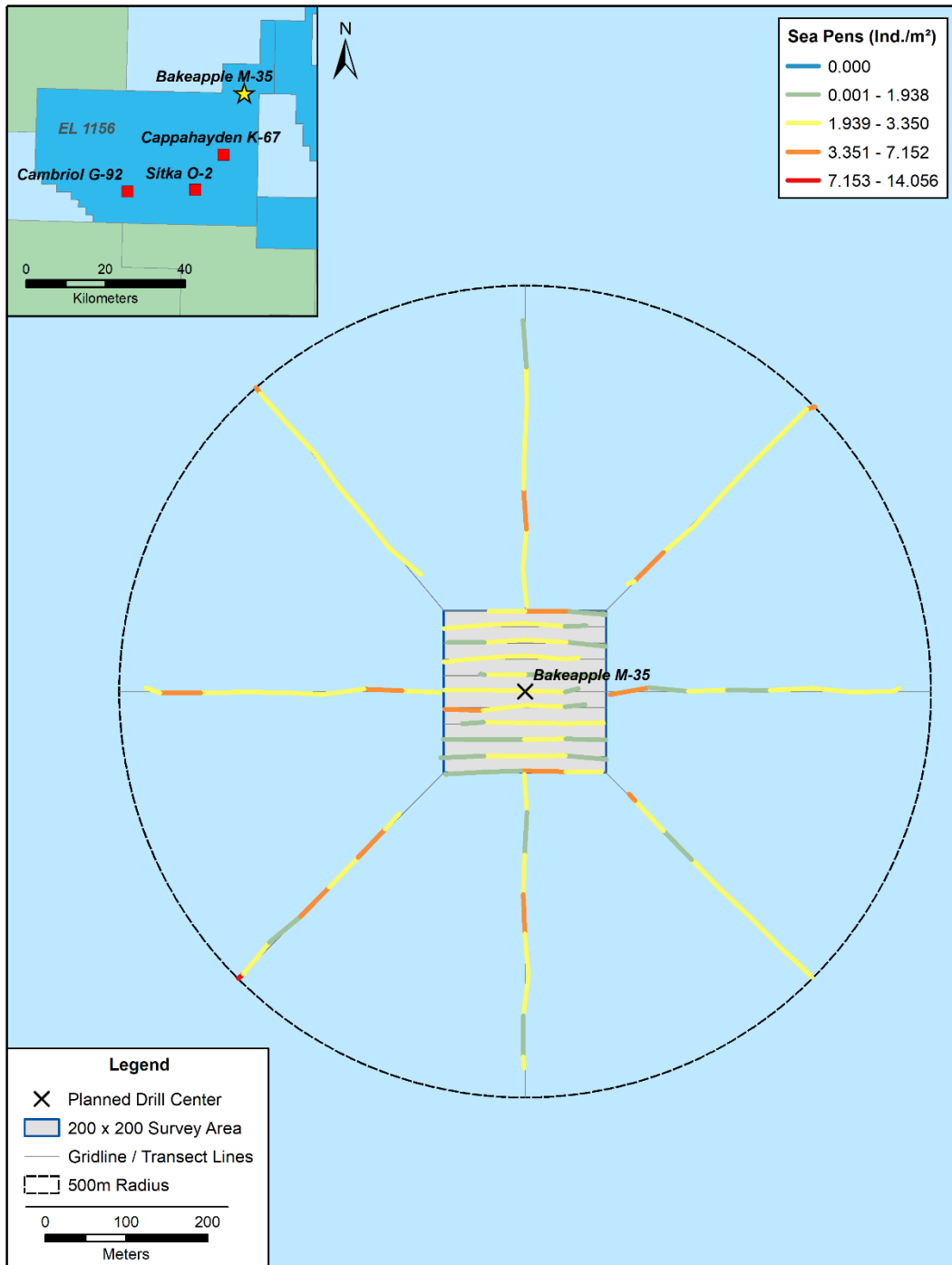


Figure C-15 Sea pen coral density (ind./m²) observed at Bakeapple

APPENDIX D SPONGE MORPHOLOGICAL GROUP DENSITY MAPS

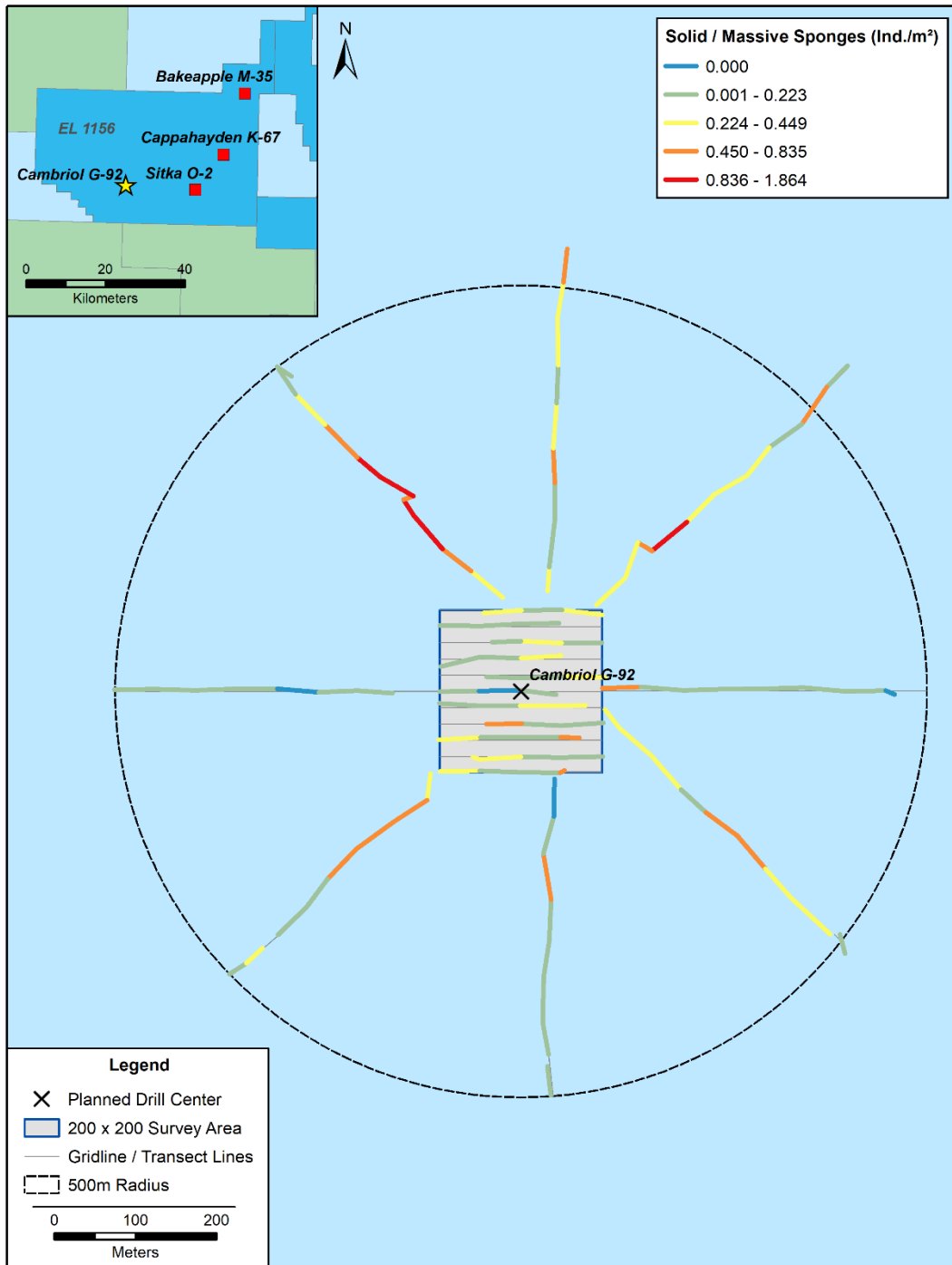


Figure D-1 Solid/massive sponge density (ind./m²) observed at Cambriol

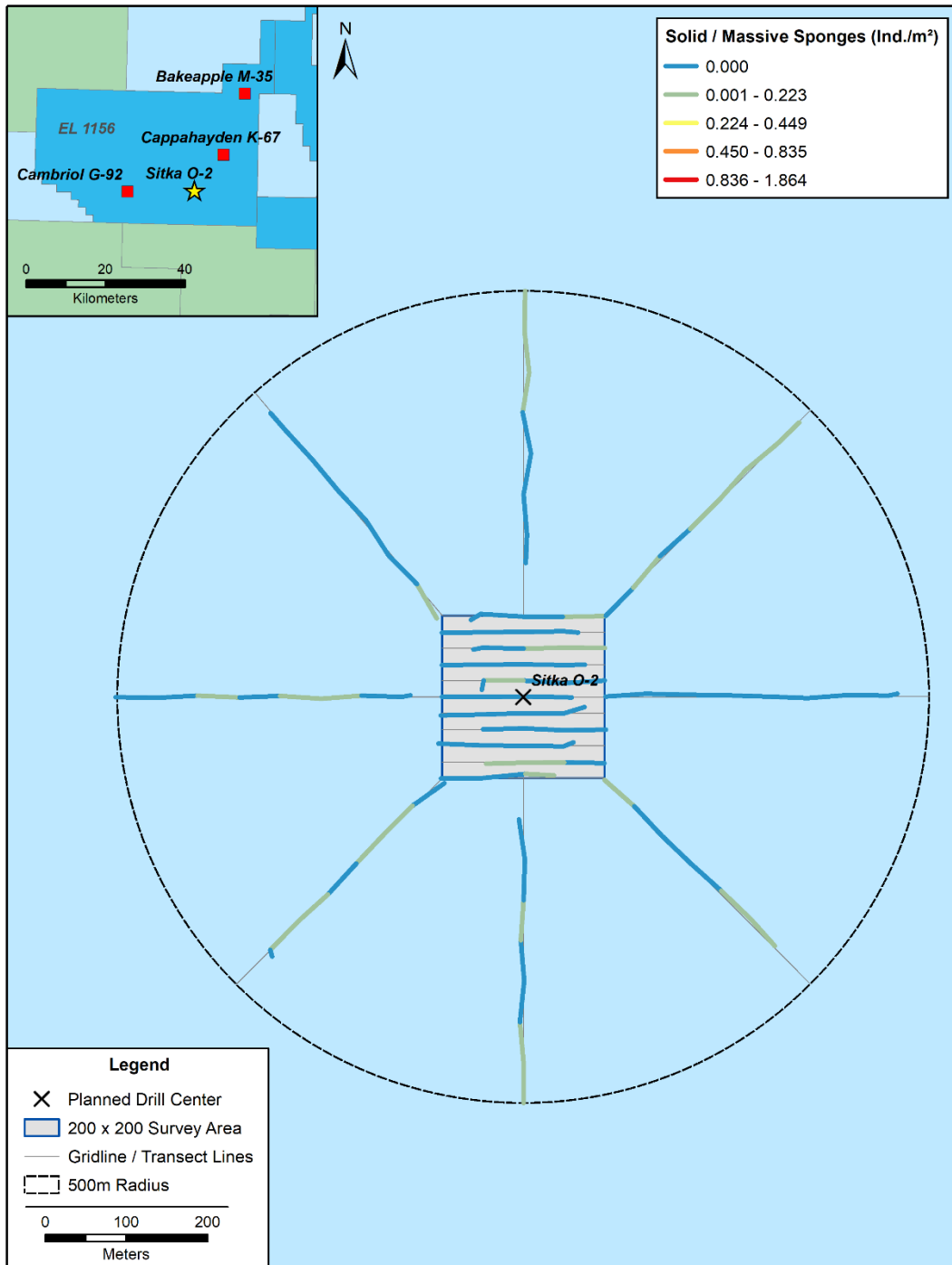


Figure D-2 Solid/massive sponge density (ind./m²) observed at Sitka

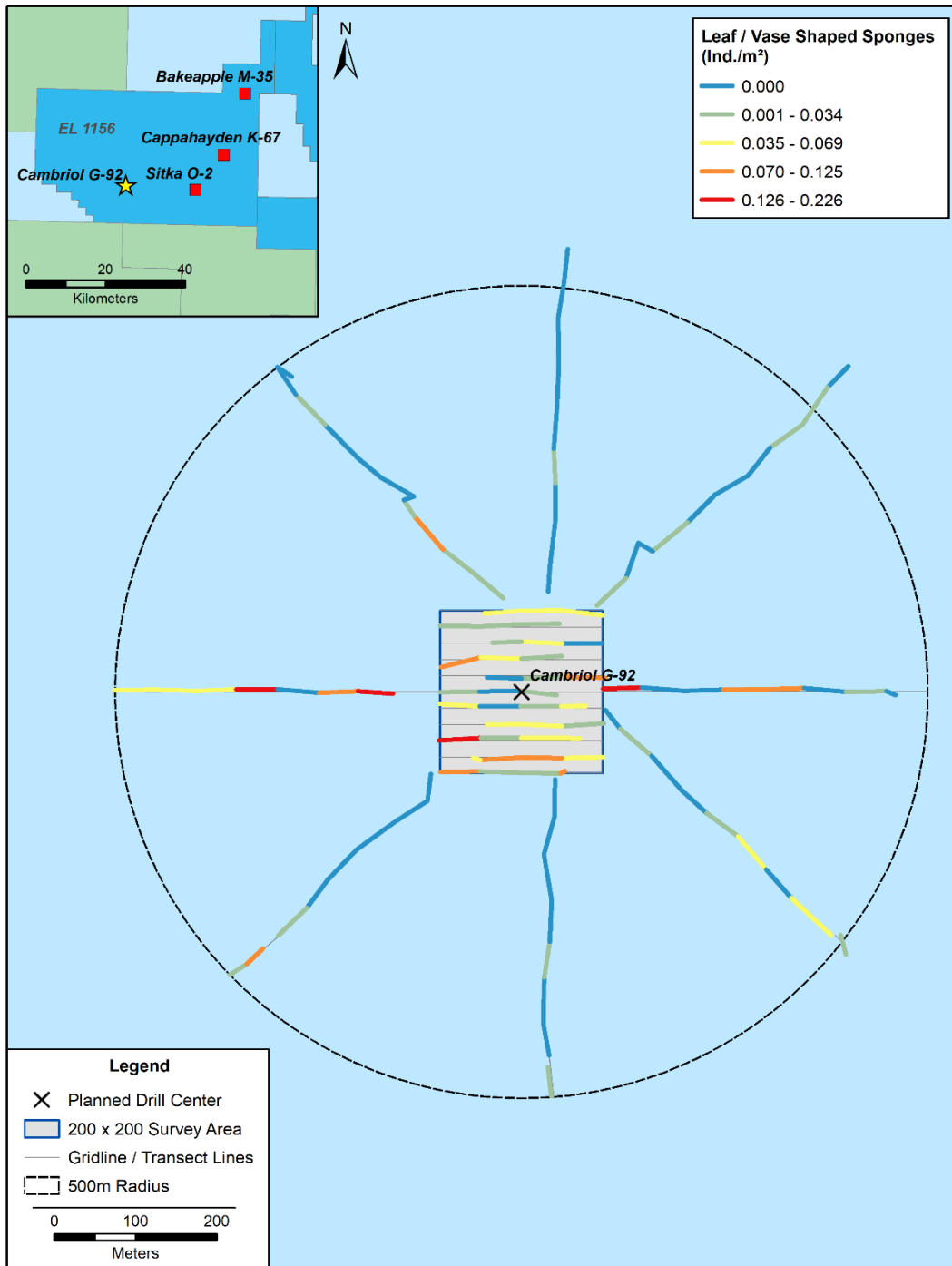


Figure D-3 Leaf/vase shaped sponge density (ind./m²) observed at Cambriol

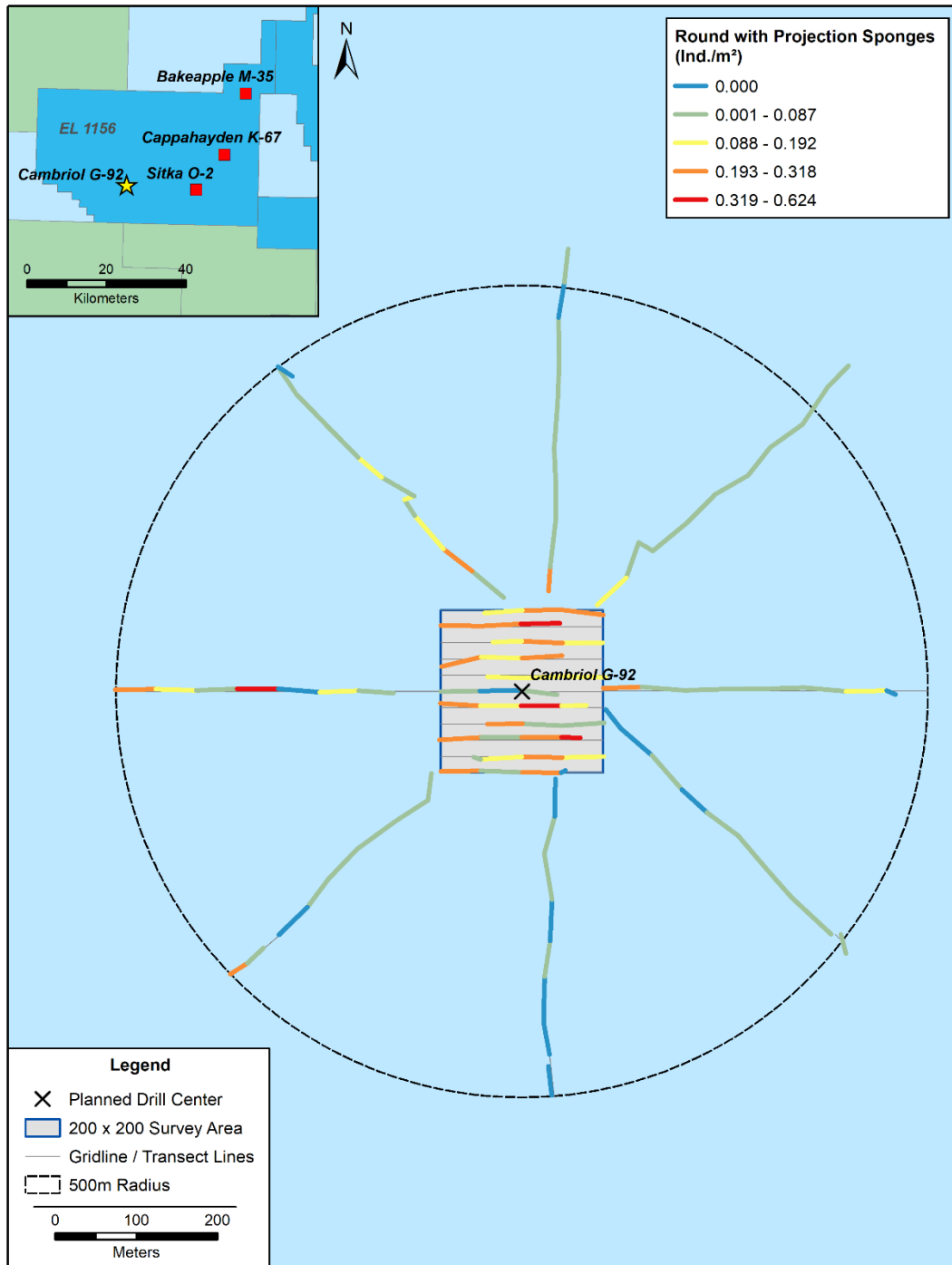


Figure D-4 Round with projection sponge density (ind./m²) observed at Cambriol

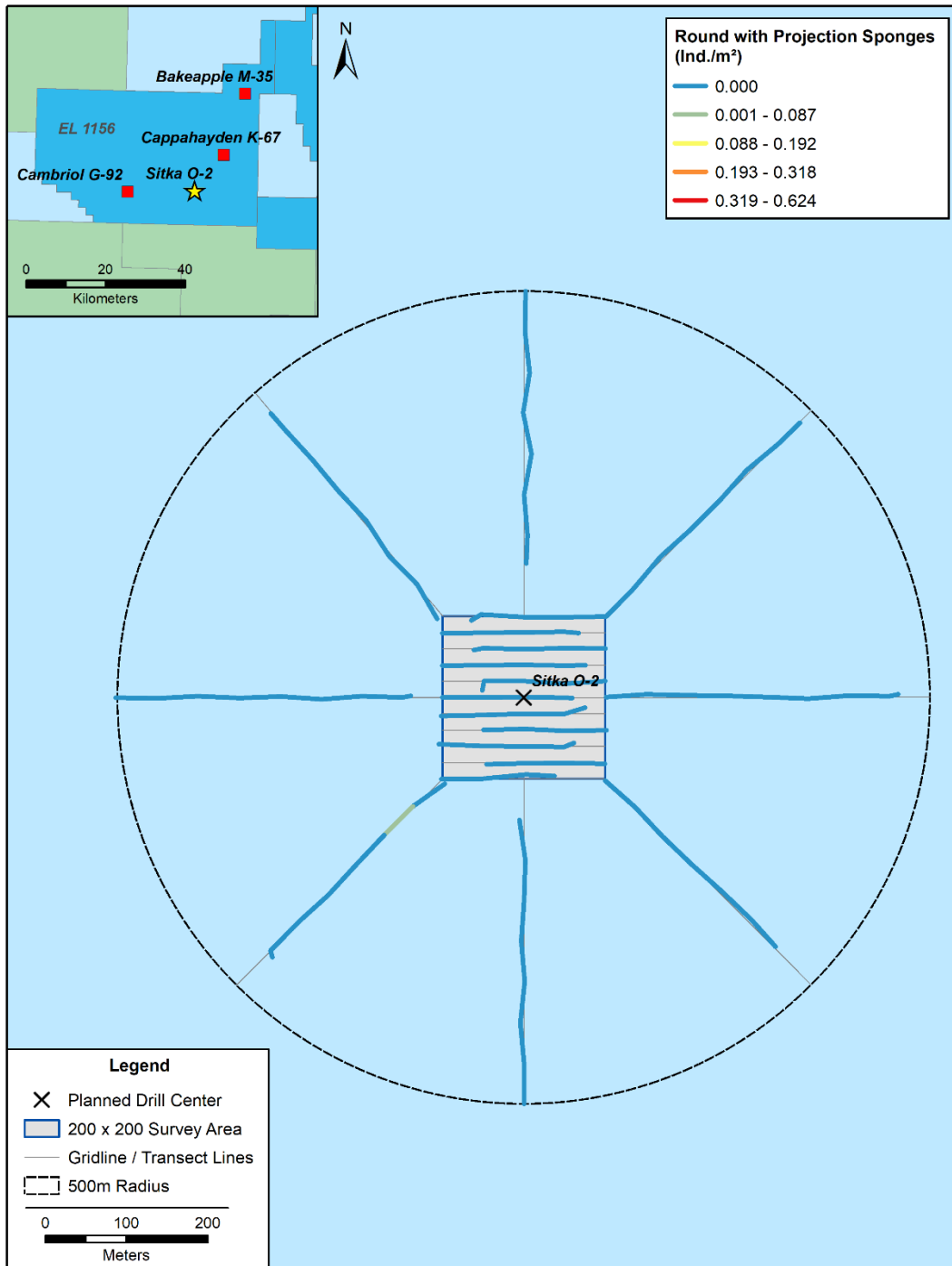


Figure D-5 Round with projection sponge density (ind./m²) observed at Sitka

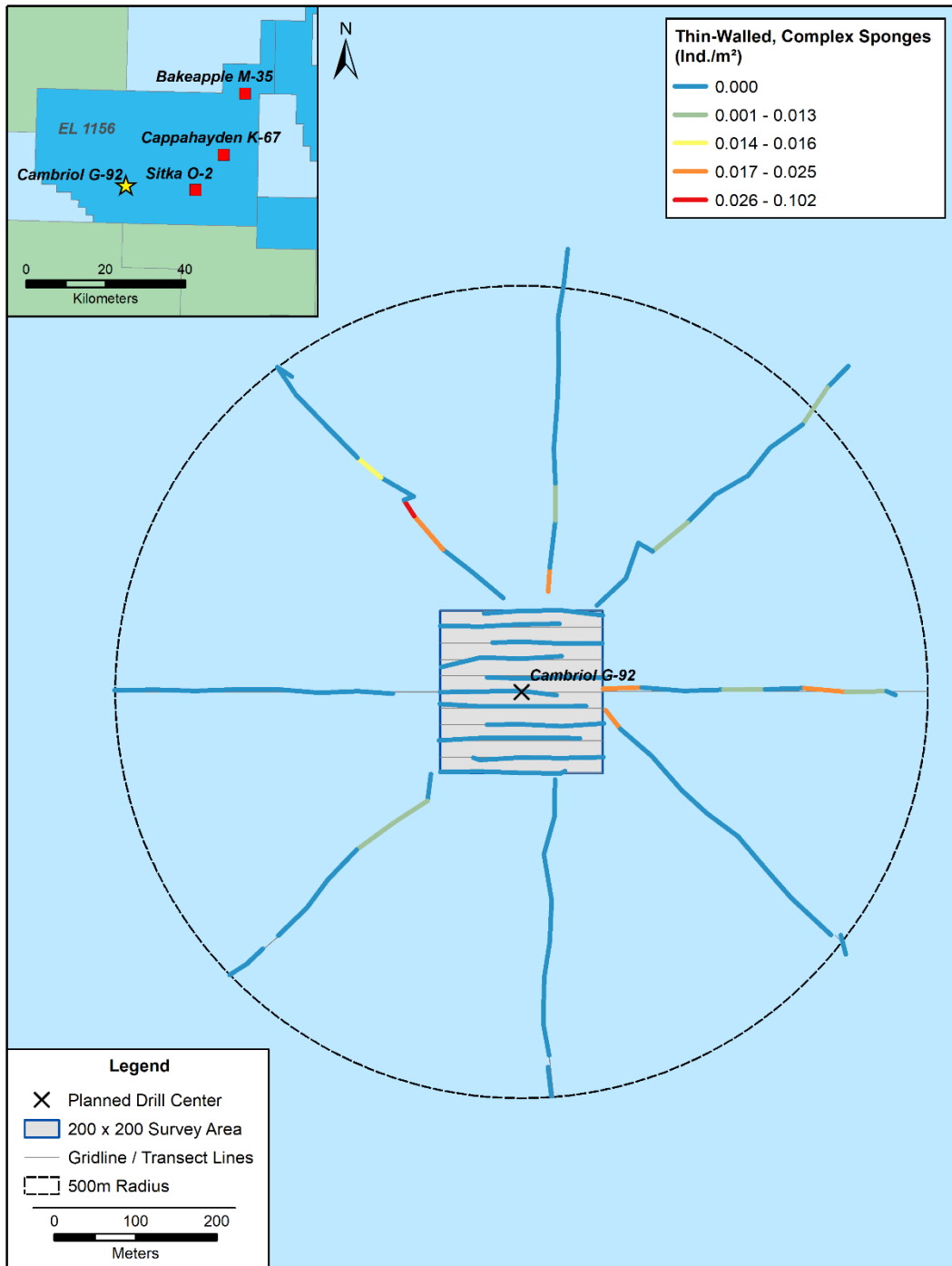


Figure D-6 Thin-walled, complex sponge density (ind./m²) observed at Cambriol

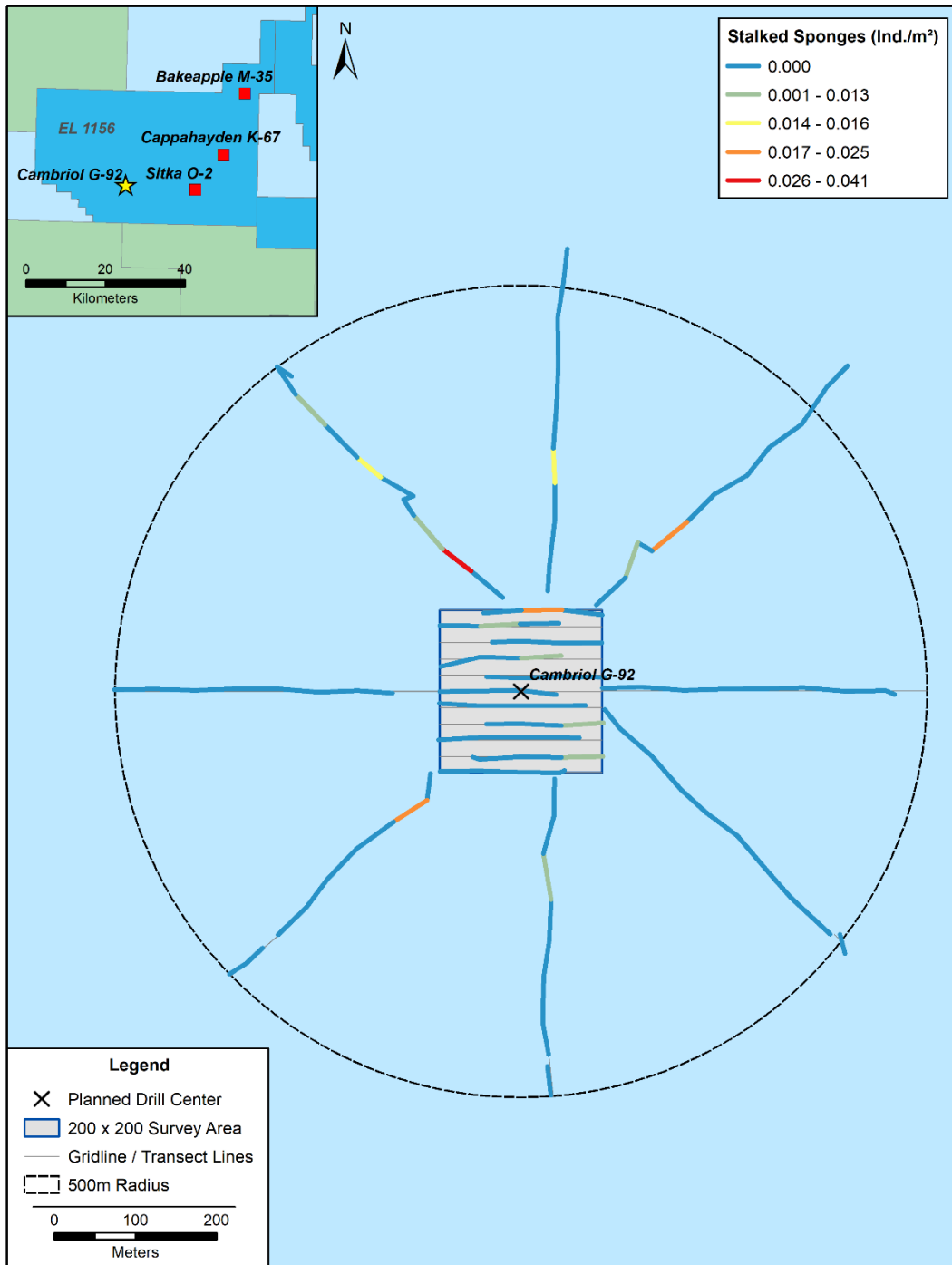


Figure D-7 Stalked sponge density (ind./m²) observed at Cambriol

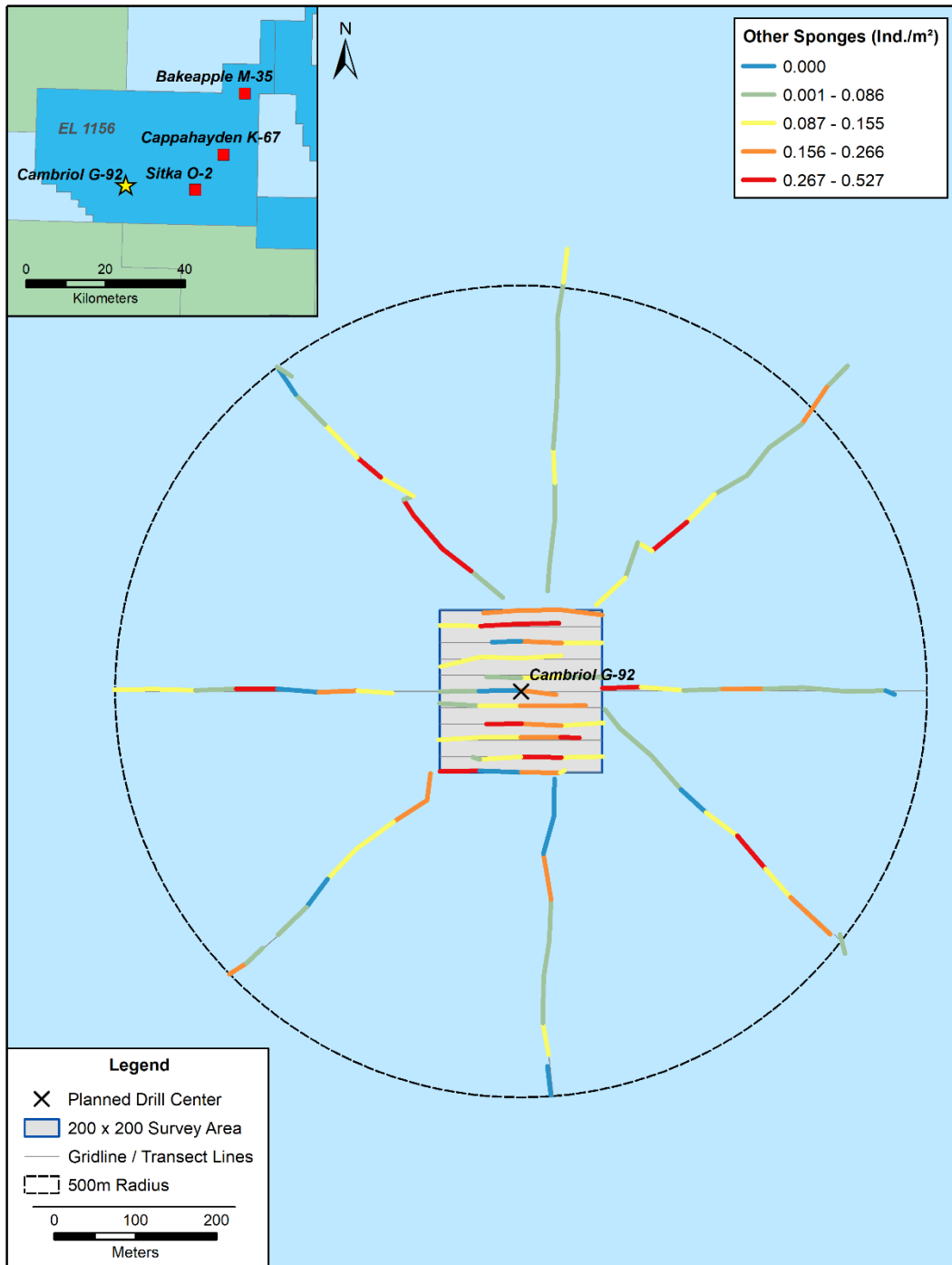


Figure D-8 Other sponge density (ind./m²) observed at Cambriol

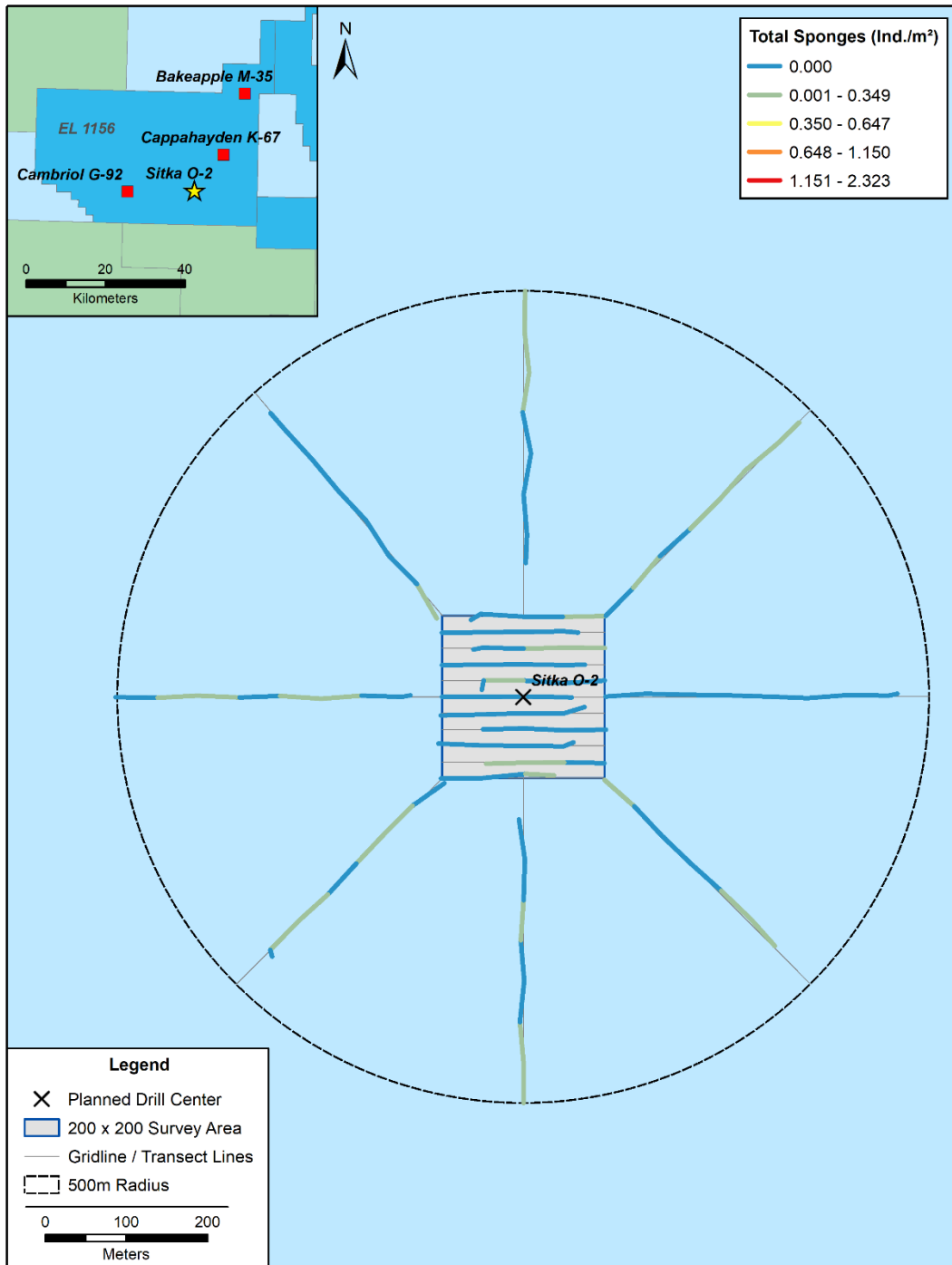


Figure D-9 Other sponge density (ind./m²) observed at Sitka

APPENDIX E FISH FUNCTIONAL GROUPS DENSITY MAPS

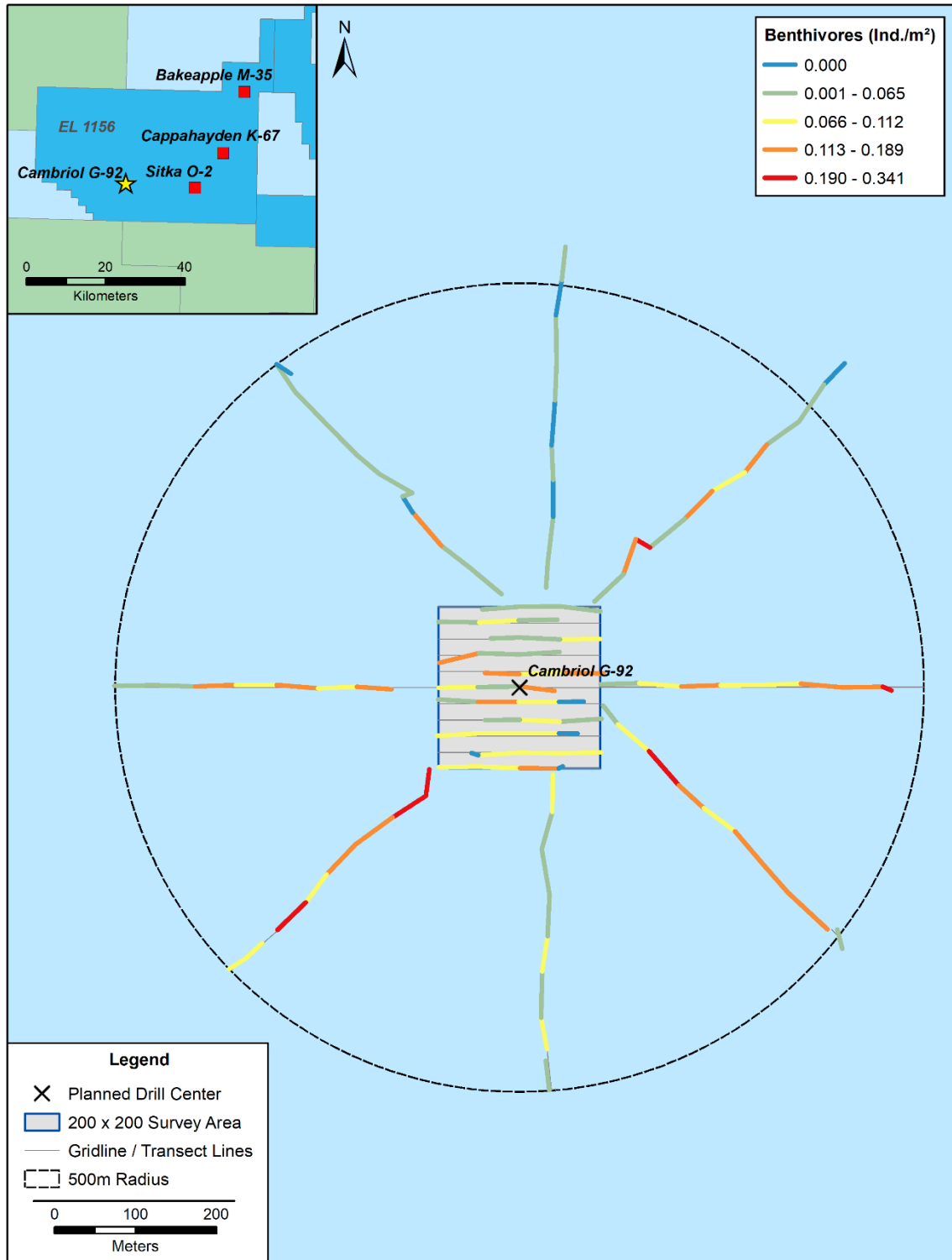


Figure E-1 Benthivore fish density (ind./m²) observed at Cambriol

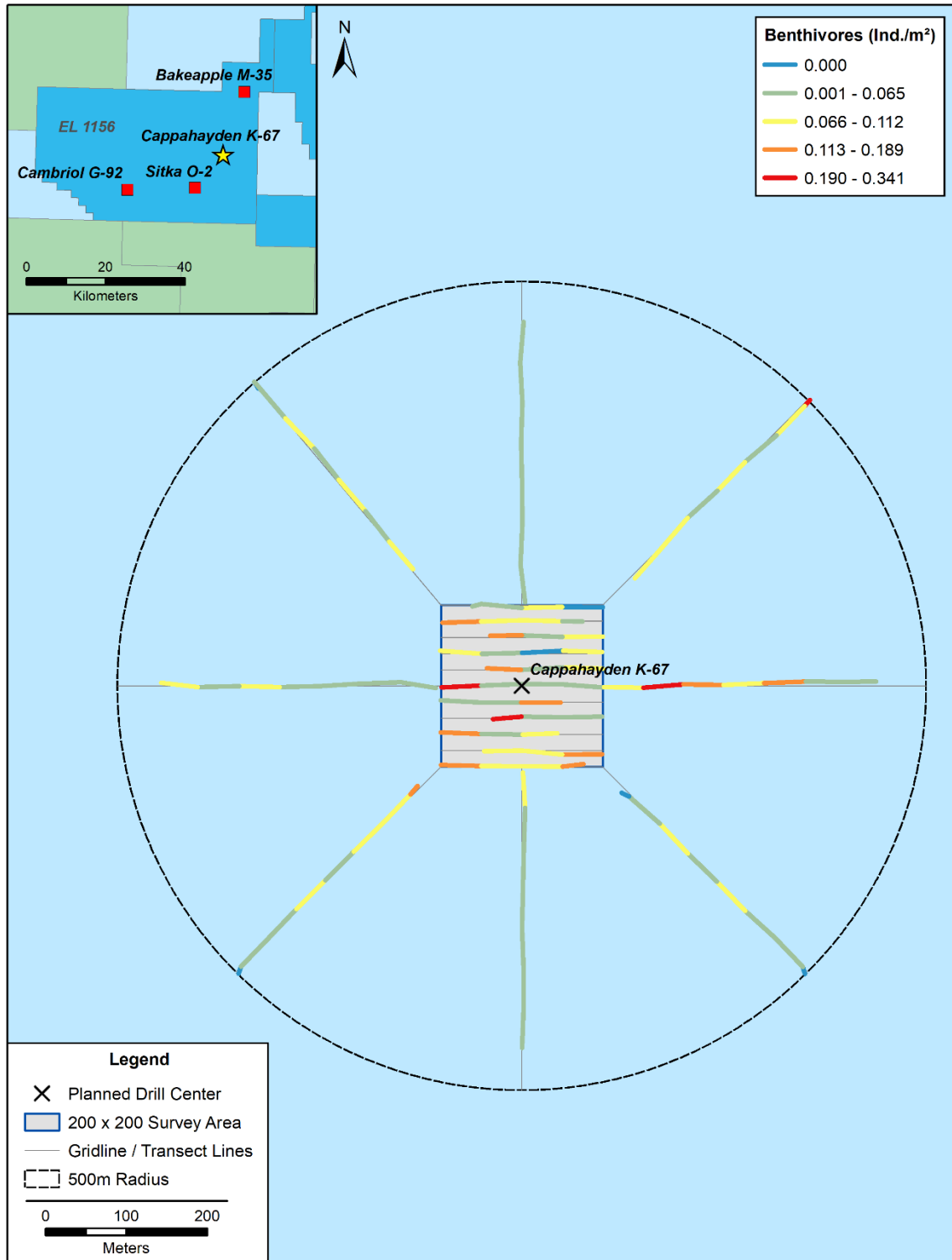


Figure E-2 Benthivore fish density (ind./m²) observed at Cappahayden

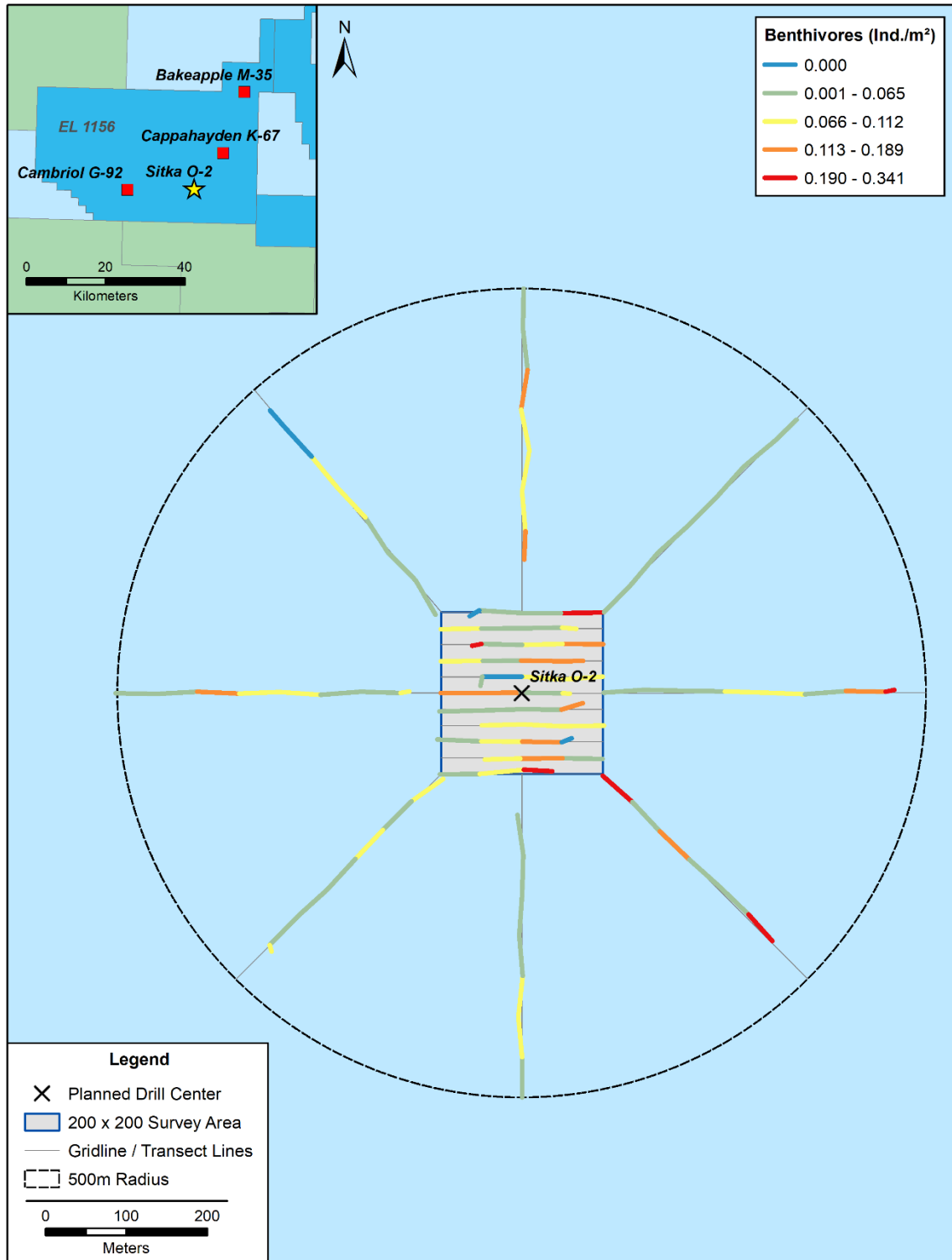


Figure E-3 Benthivore fish density (ind./m²) observed at Sitka

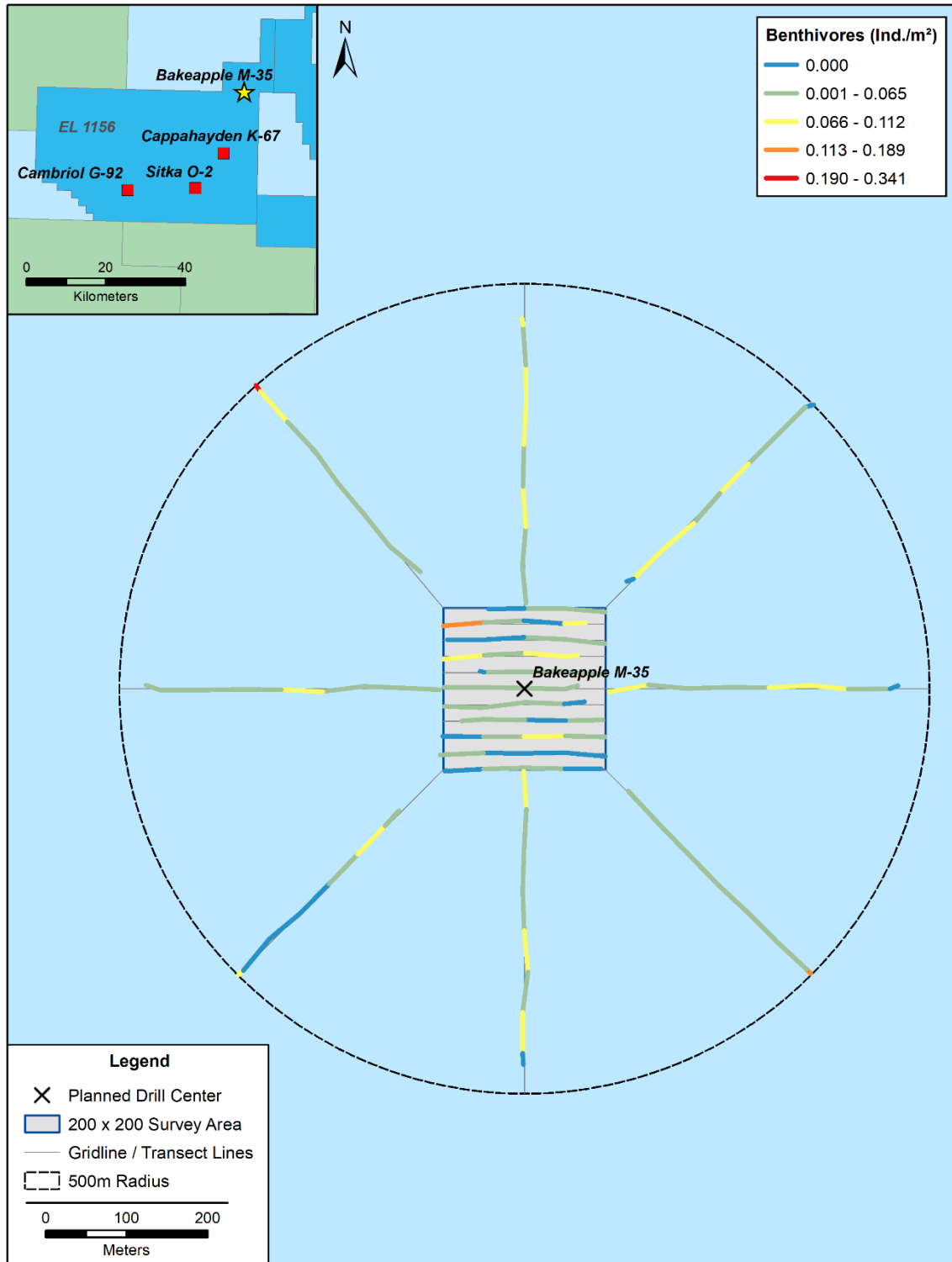


Figure E-4 Benthivore fish density (ind./m²) observed at Bakeapple

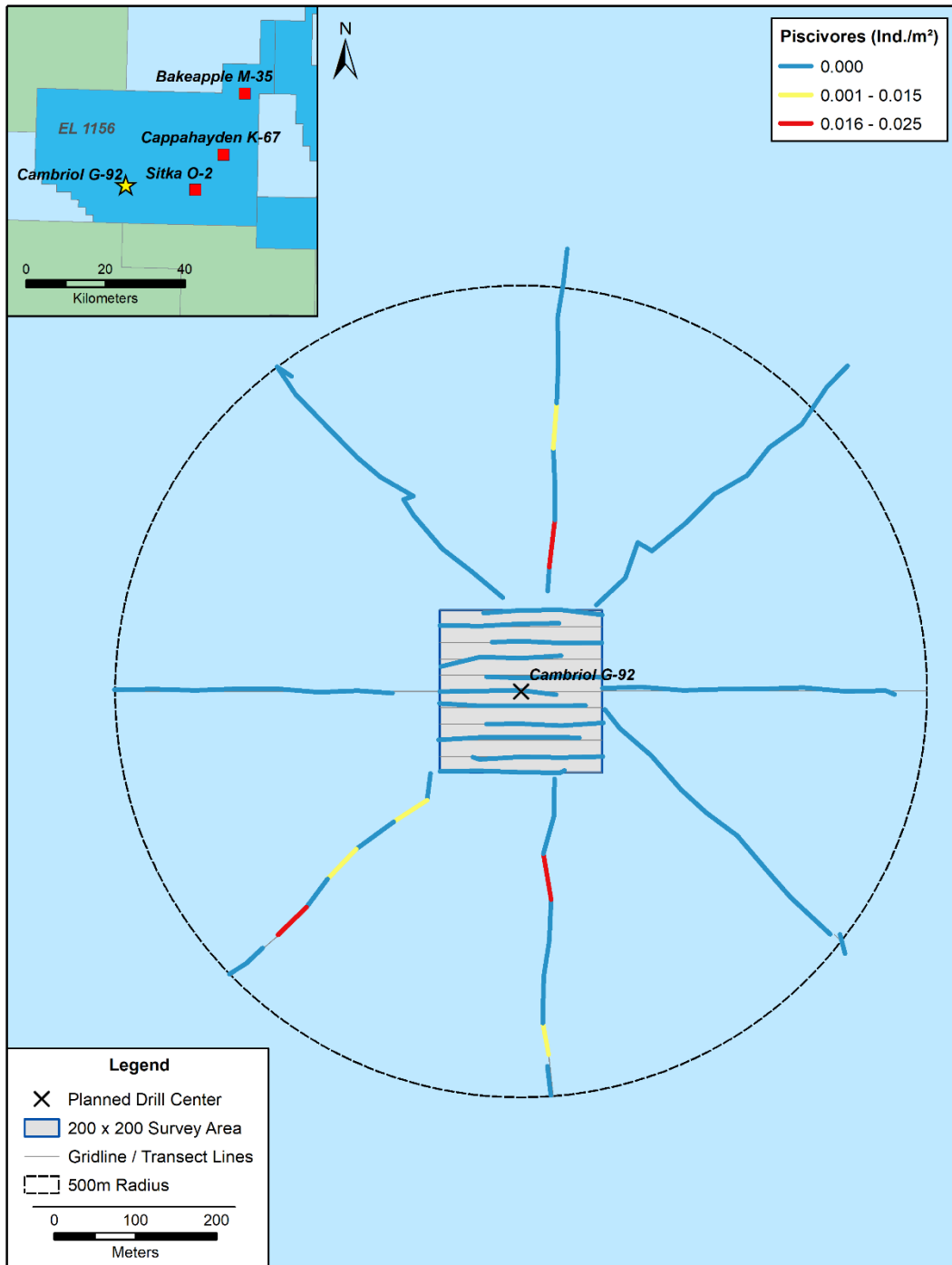


Figure E-5 Piscivore fish density (ind./m²) observed at Cambriol

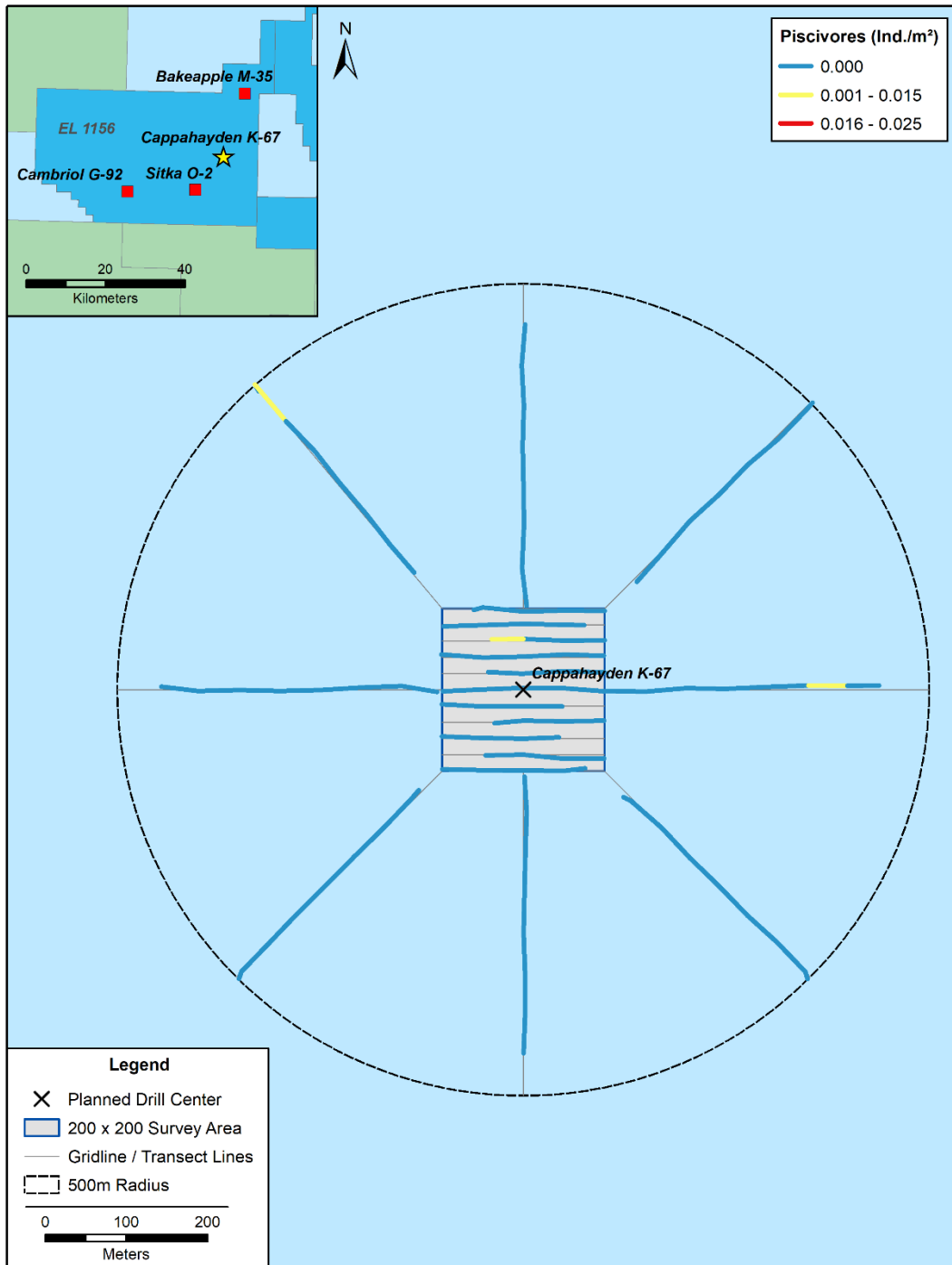


Figure E-6 Piscivore fish density (ind./m²) observed at Cappahayden

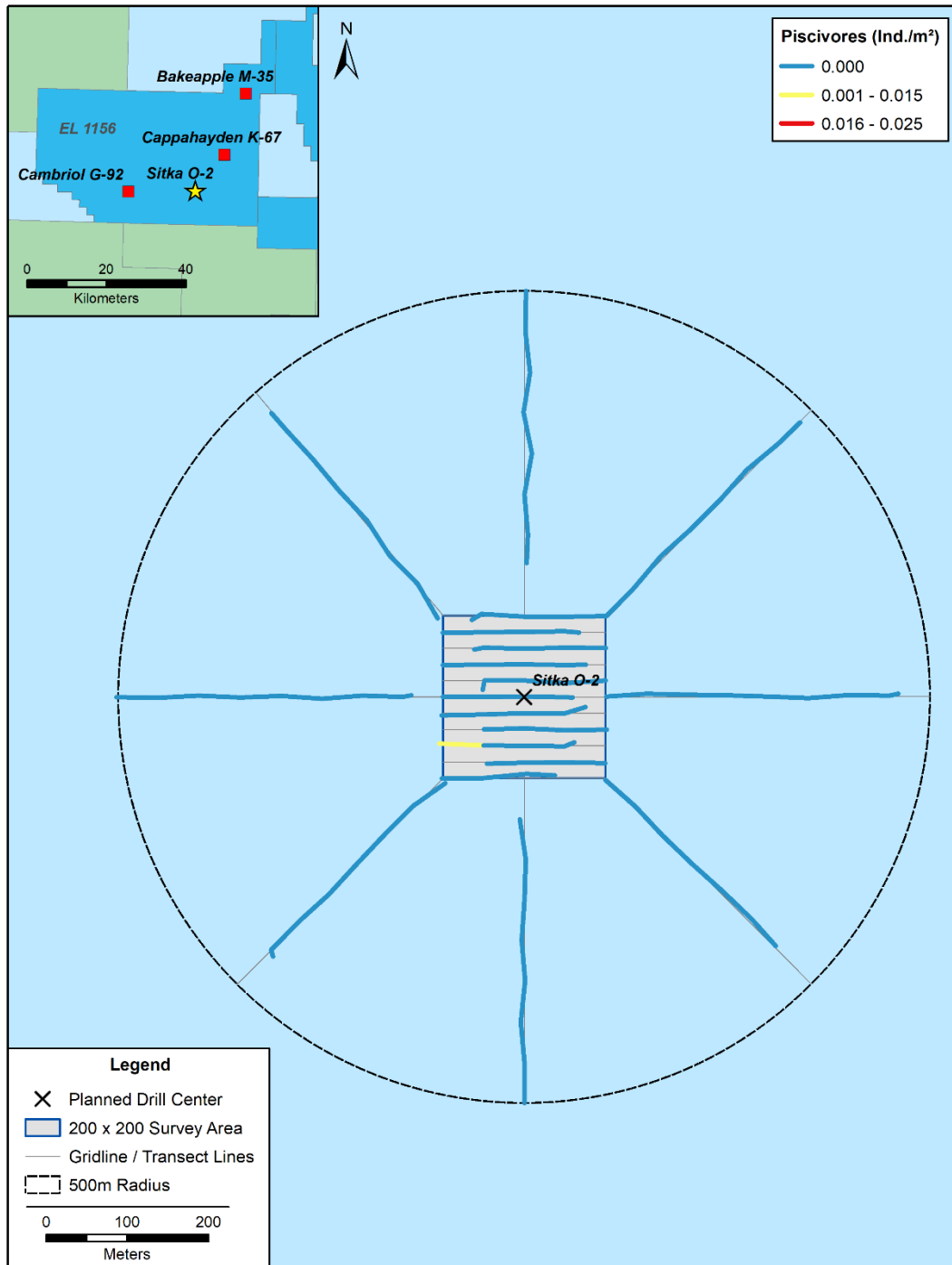


Figure E-7 Piscivore fish density (ind./m²) observed at Sitka

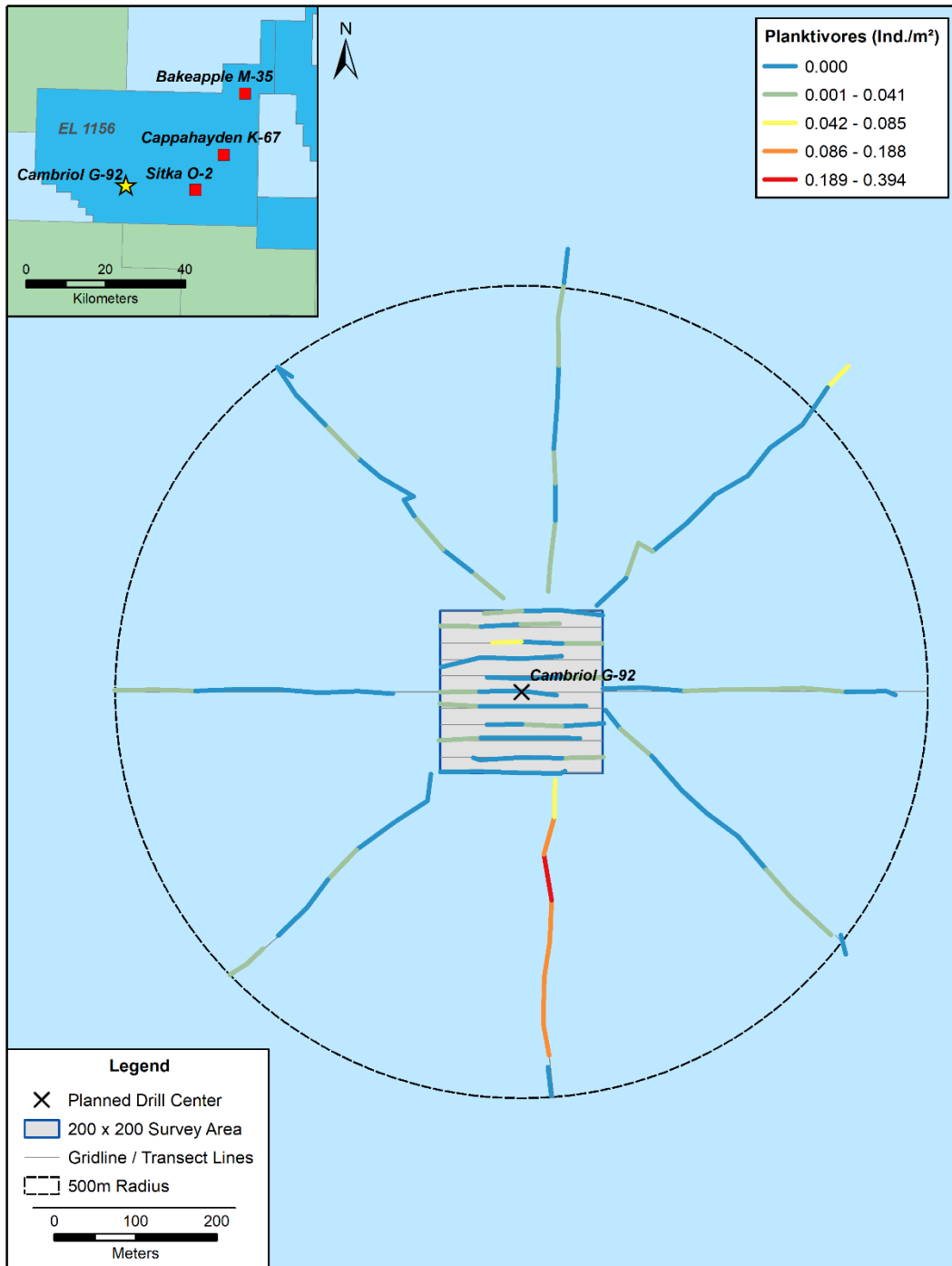


Figure E-8 Planktivore fish density (ind./m²) observed at Cambriol

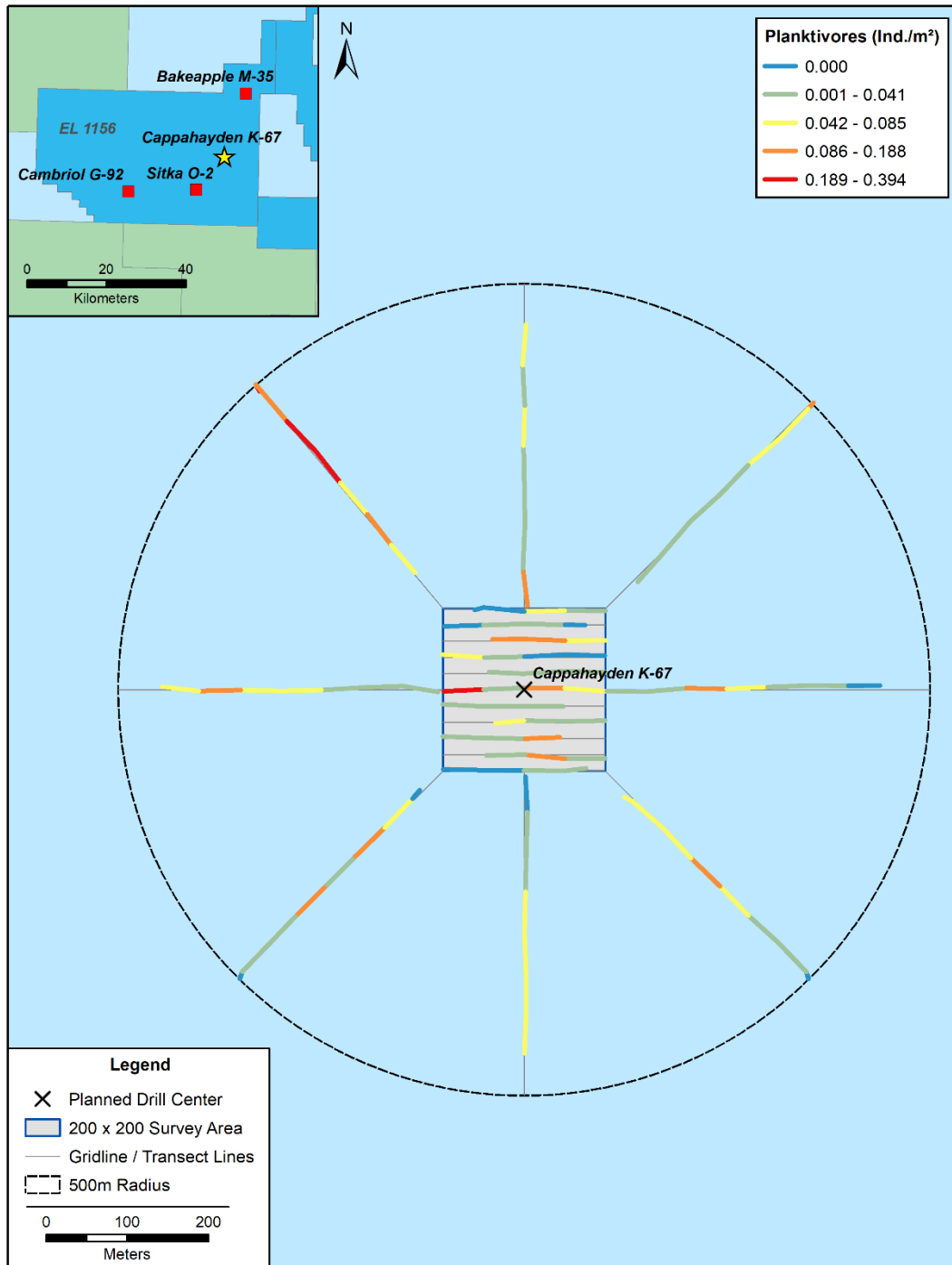


Figure E-9 Planktivore fish density (ind./m²) observed at Cappahayden

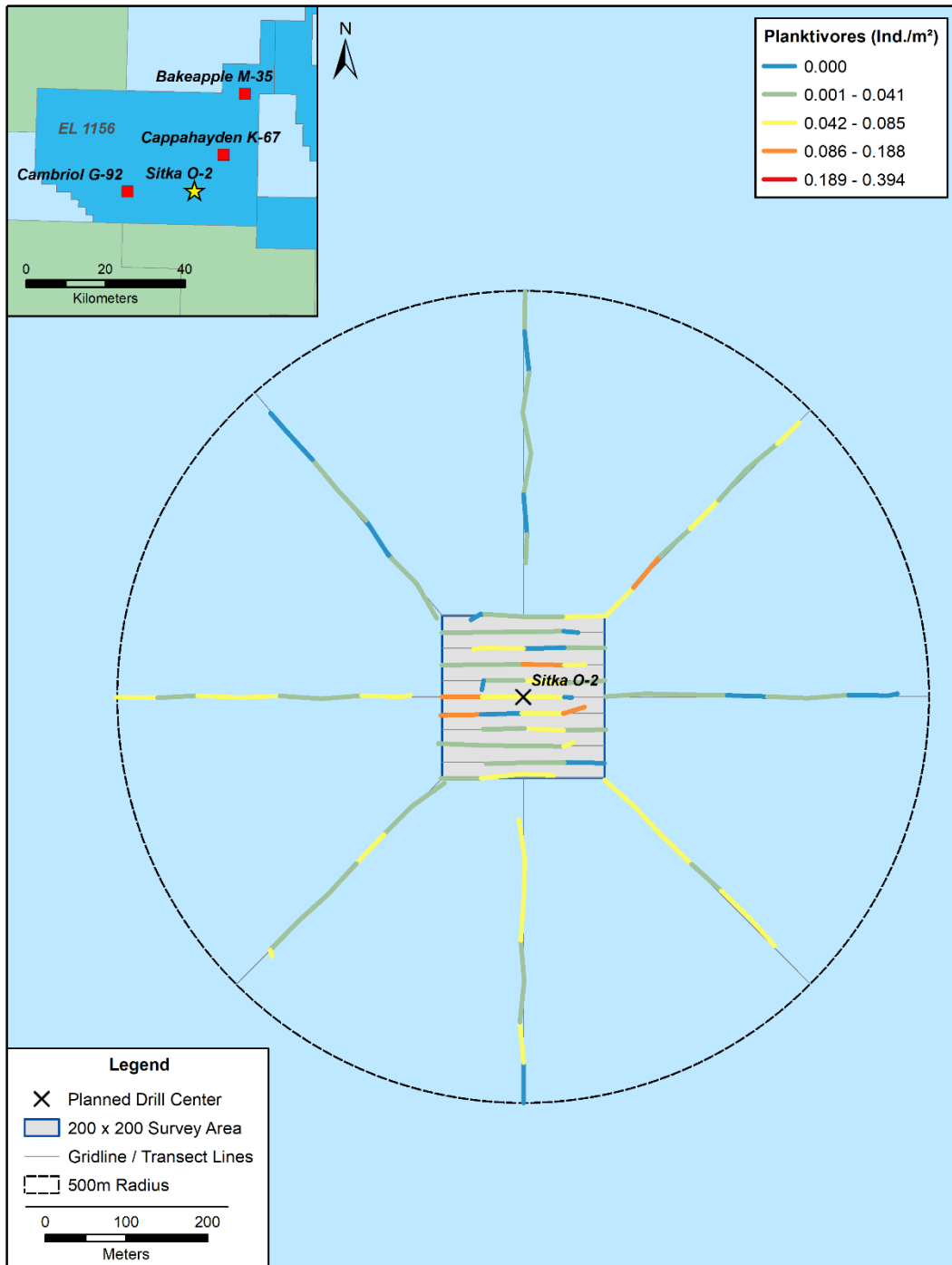


Figure E-10 Planktivore fish density (ind./m²) observed at Sitka

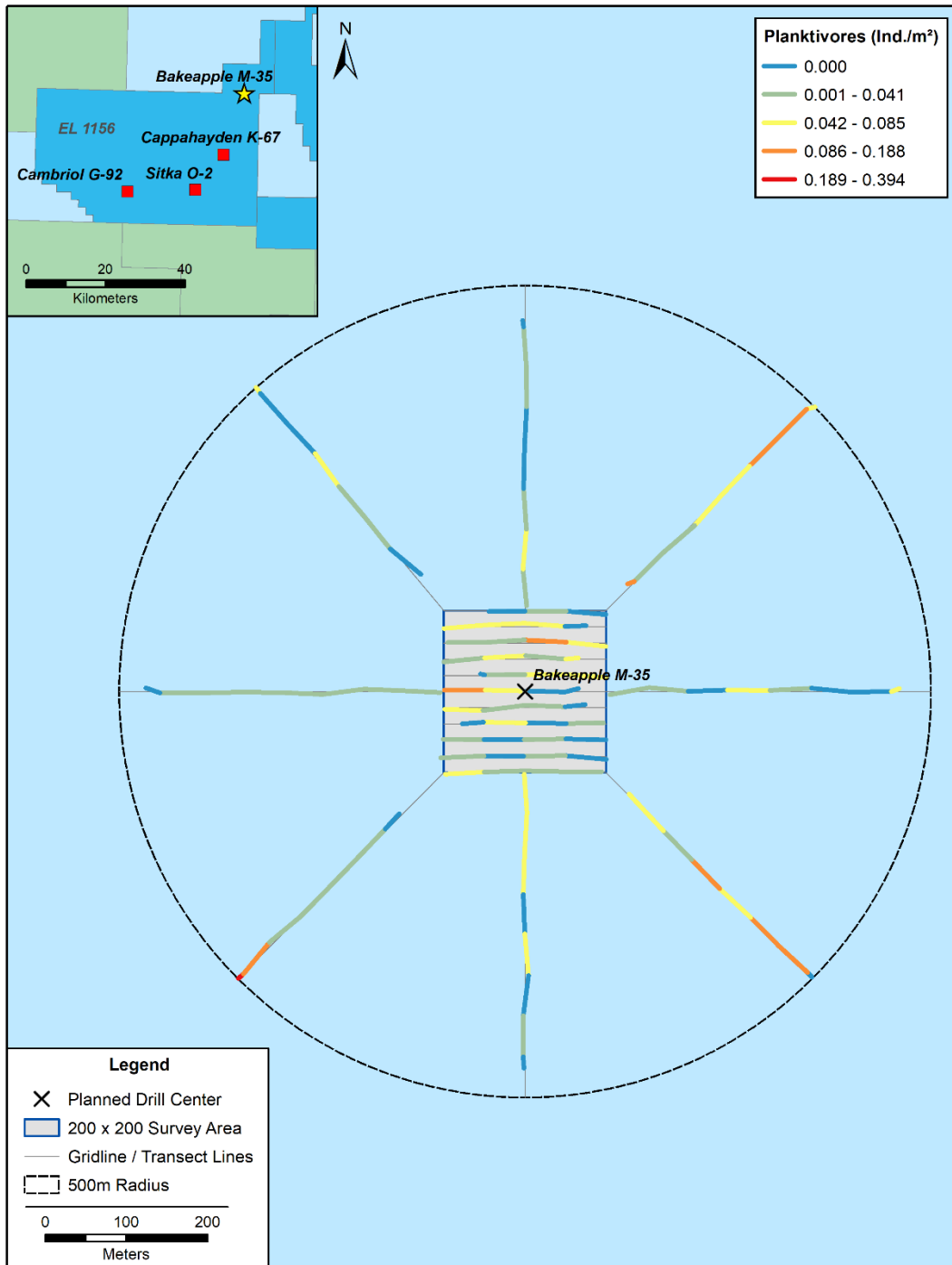


Figure E-11 Planktivore fish density (ind./m²) observed at Bakeapple

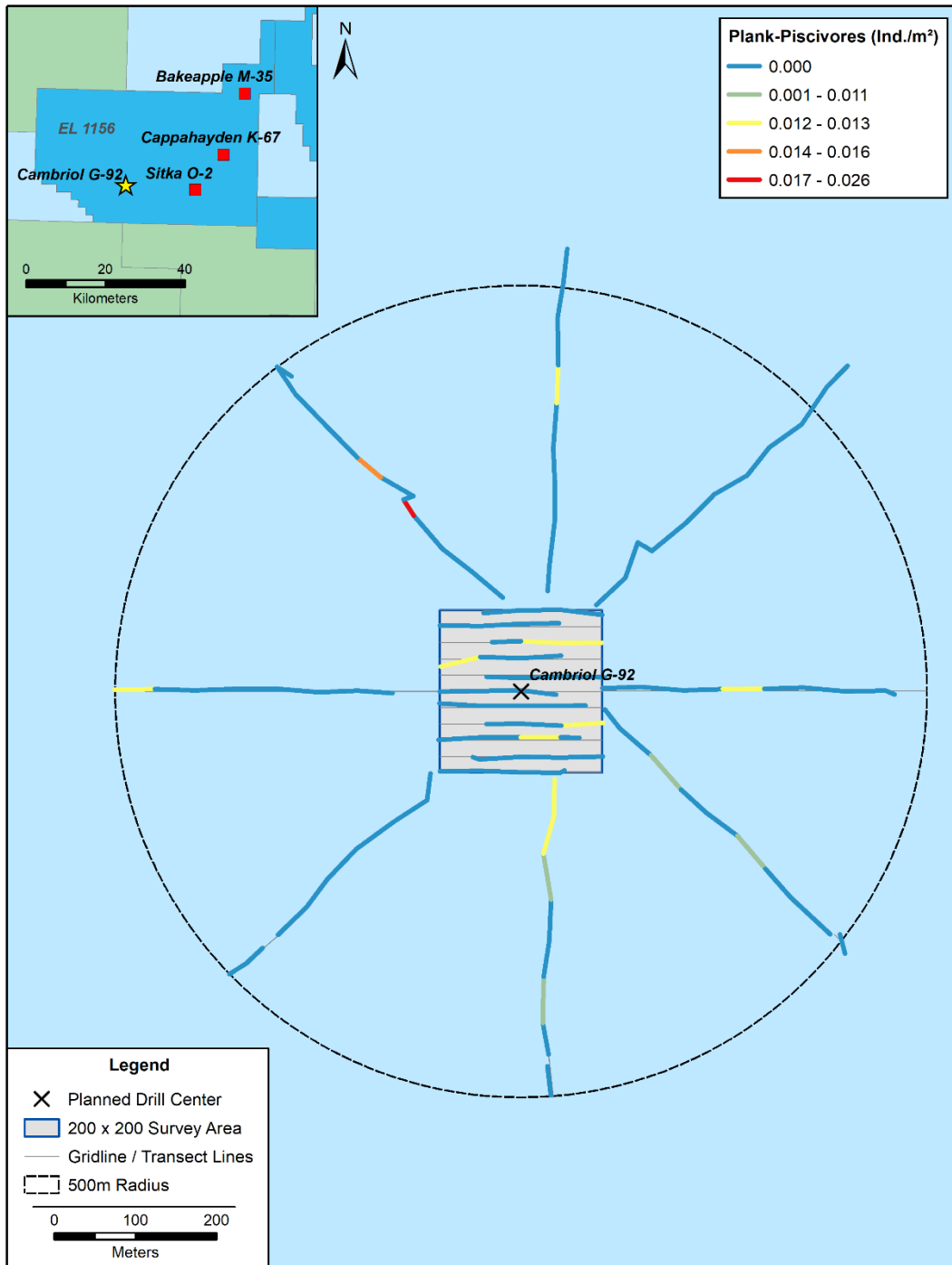


Figure E-12 Plank-piscivore fish density (ind./m²) observed at Cambriol

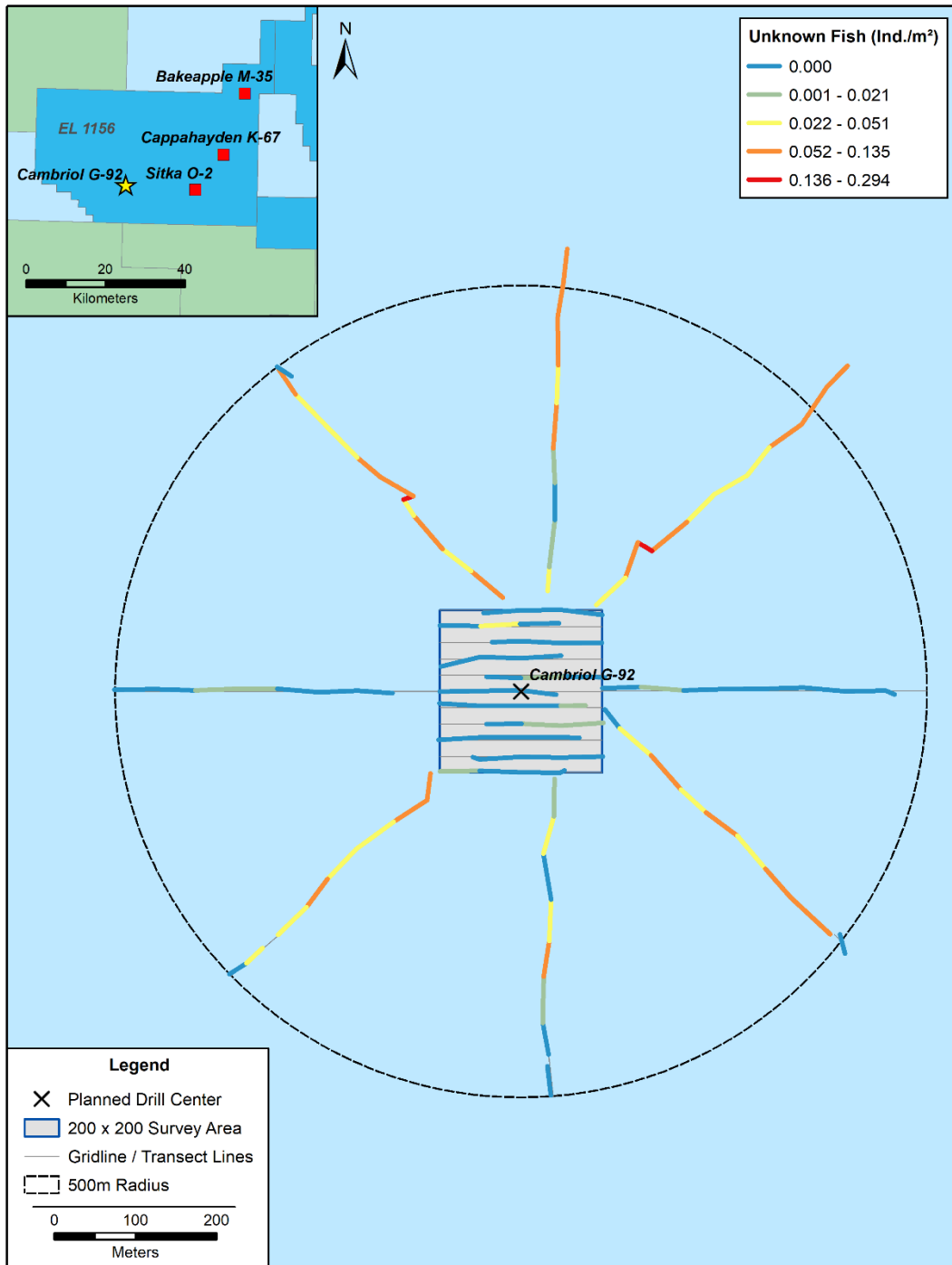


Figure E-13 Unknown fish density (ind./m²) observed at Cambriol

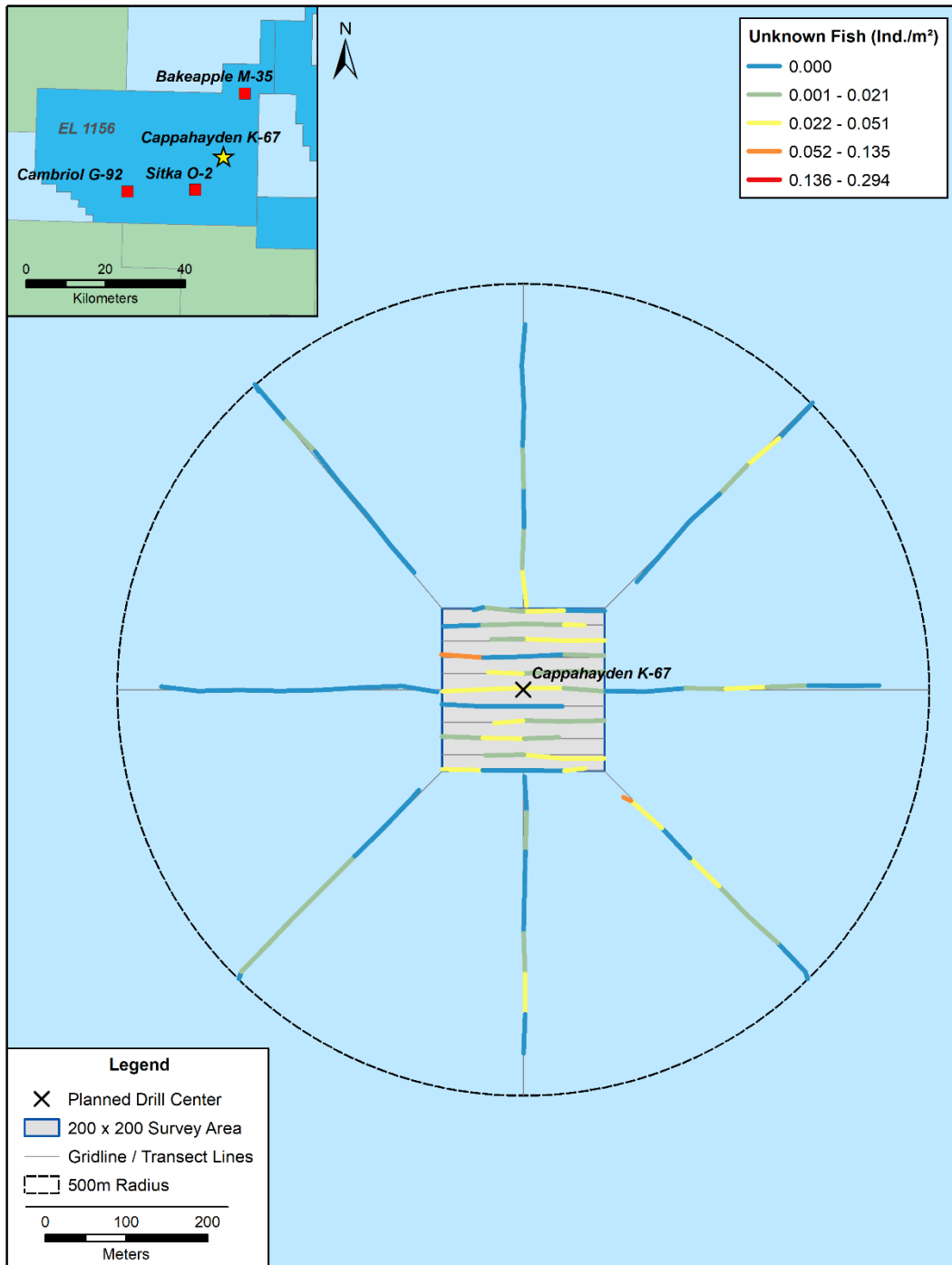


Figure E-14 Unknown fish density (ind./m²) observed at Cappahayden

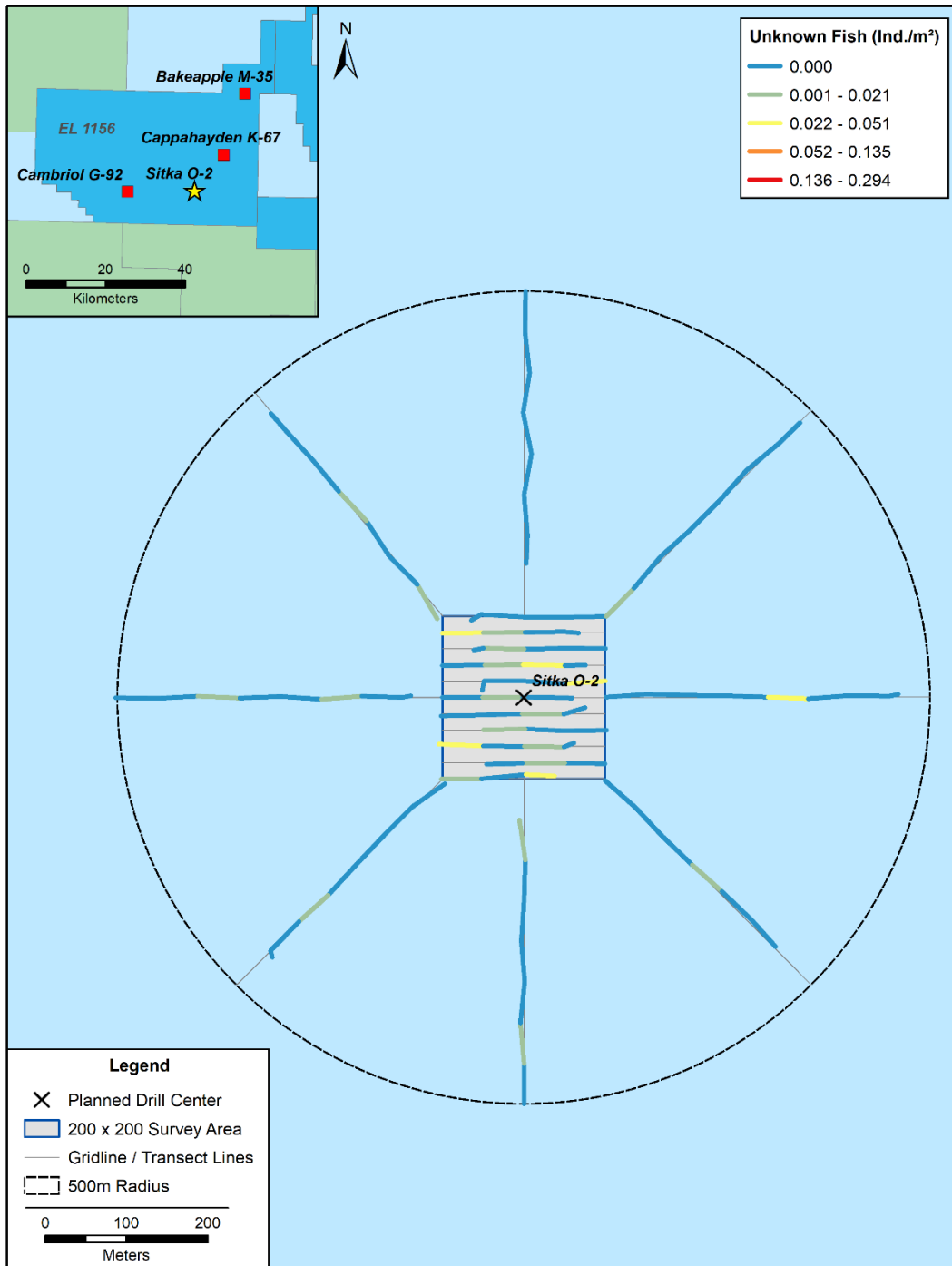


Figure E-15 Unknown fish density (ind./m²) observed at Sitka

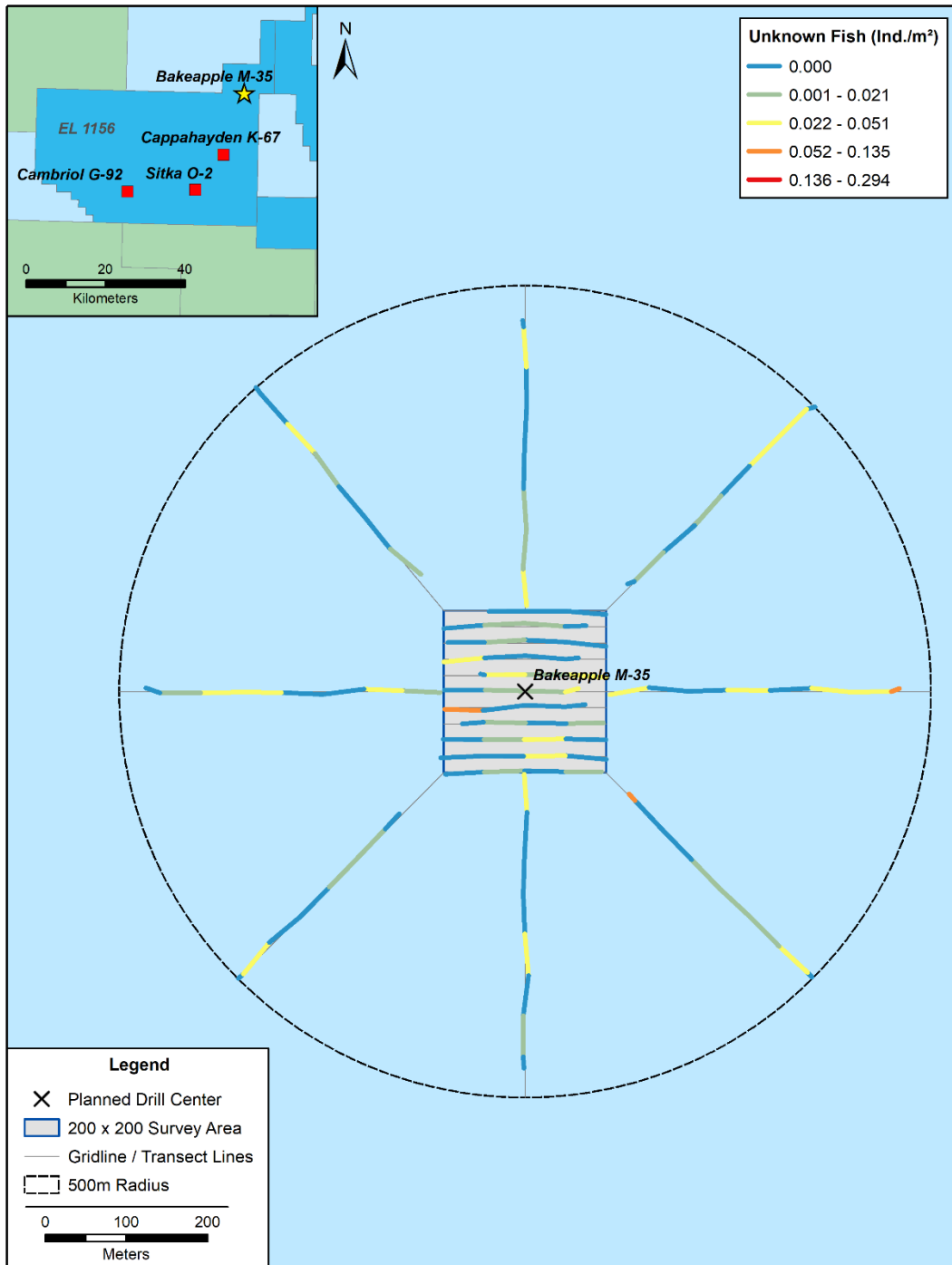


Figure E-16 Unknown fish density (ind./m²) observed at Bakeapple

APPENDIX F INVERTEBRATE GROUPS DENSITY MAPS

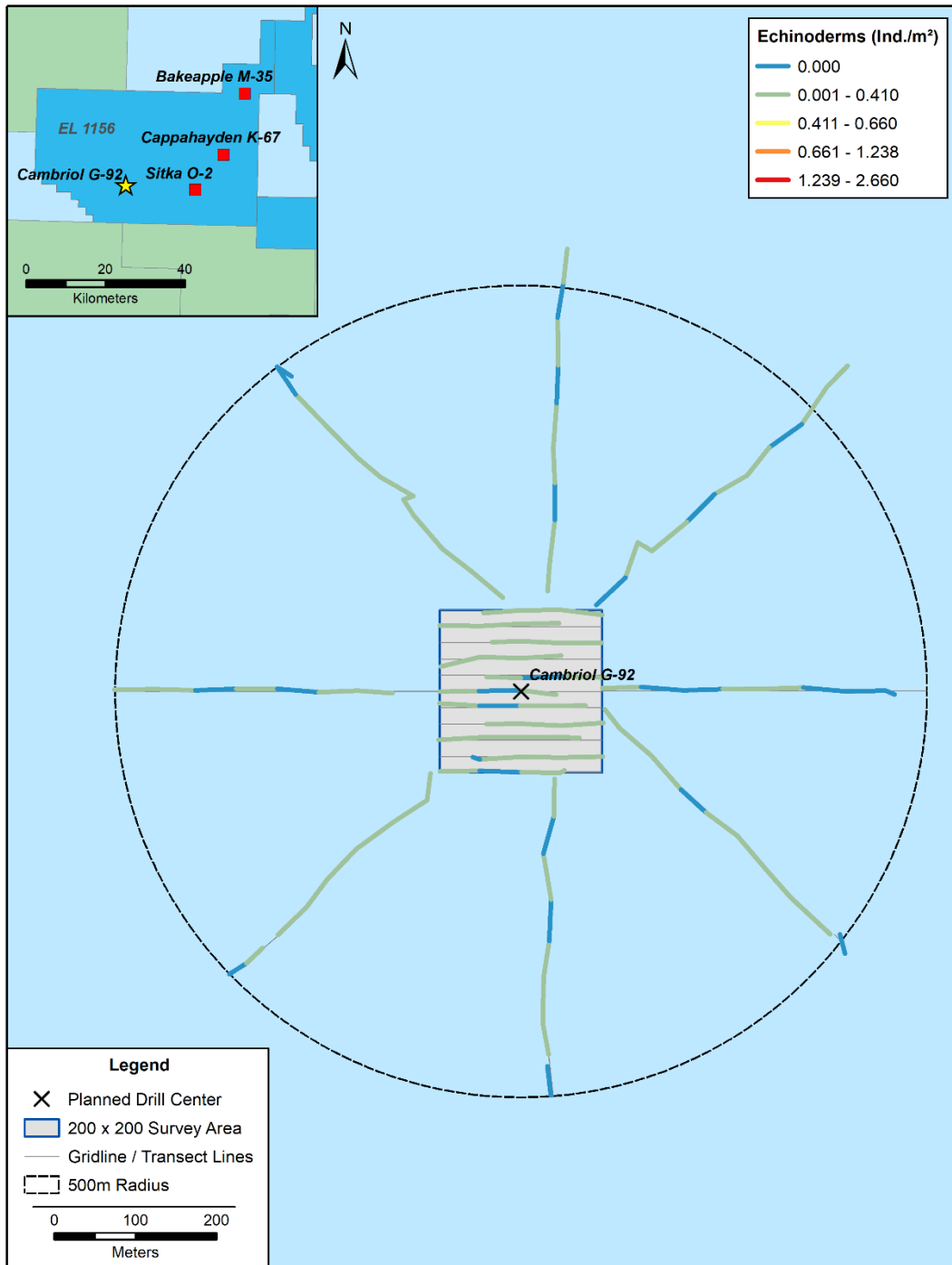


Figure F-1 Echinoderm density (ind./m²) observed at Cambriol

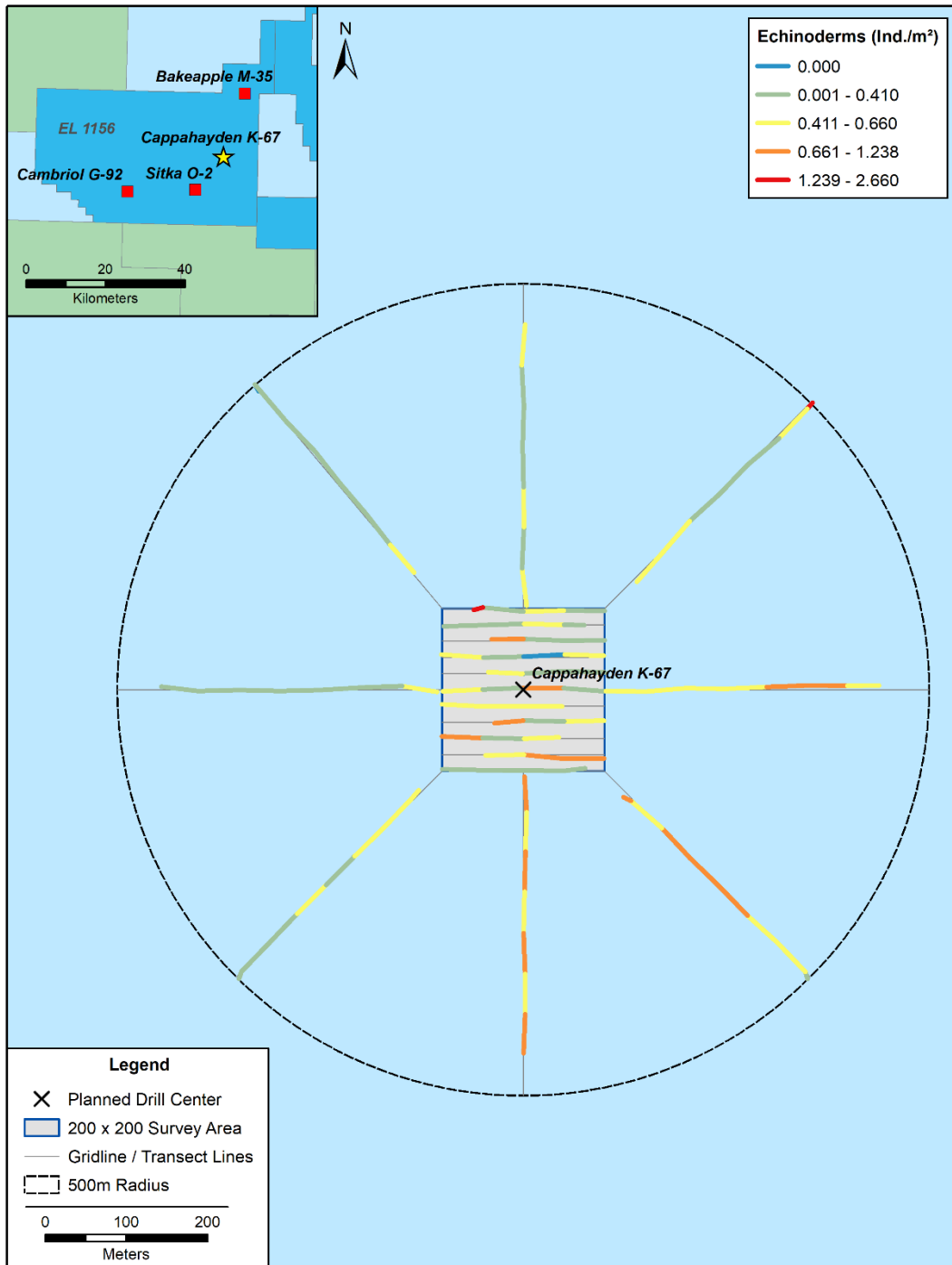


Figure F-2 Echinoderm density (ind./m²) observed at Cappahayden

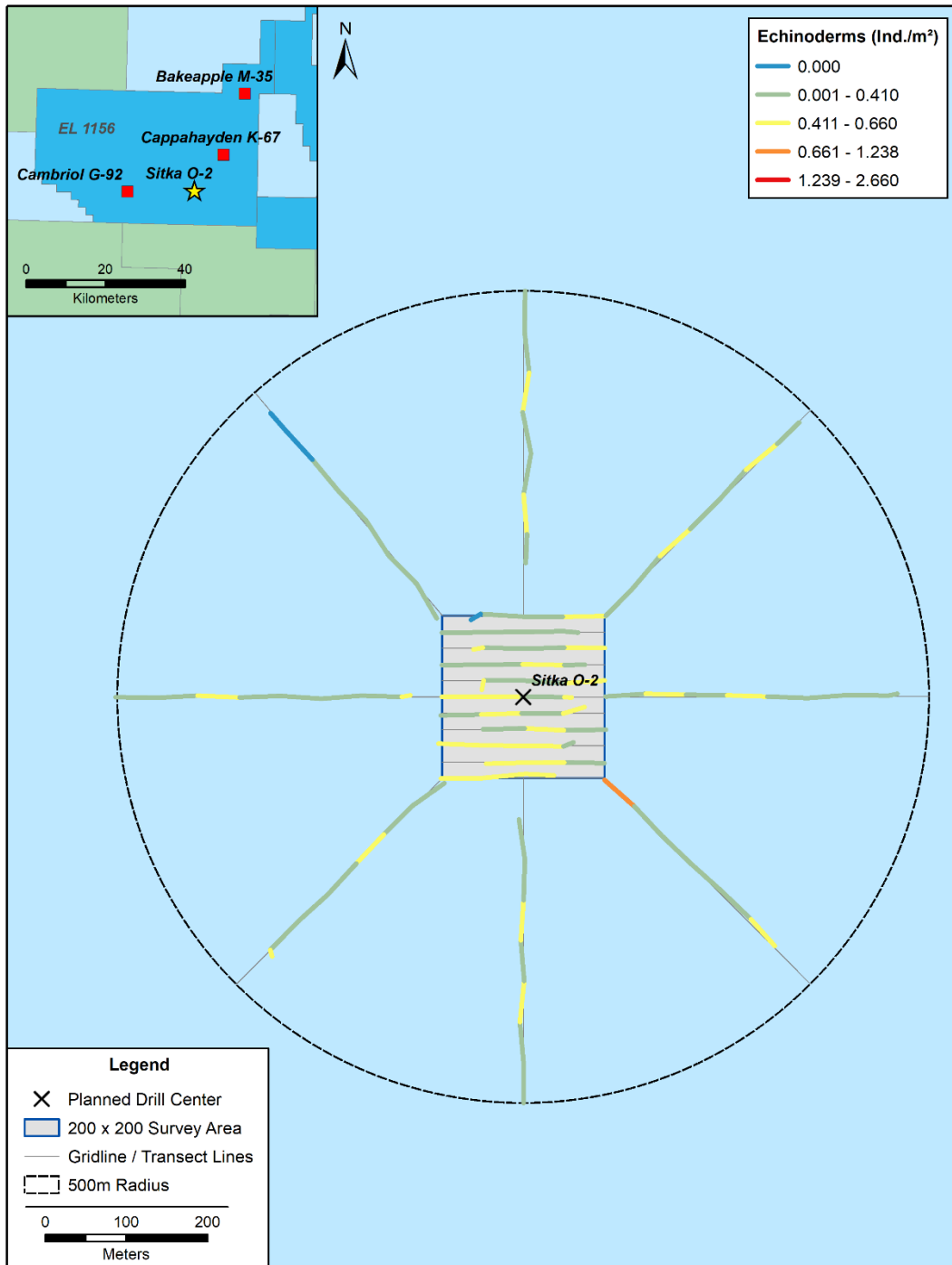


Figure F-3 Echinoderm density (ind./m²) observed at Sitka

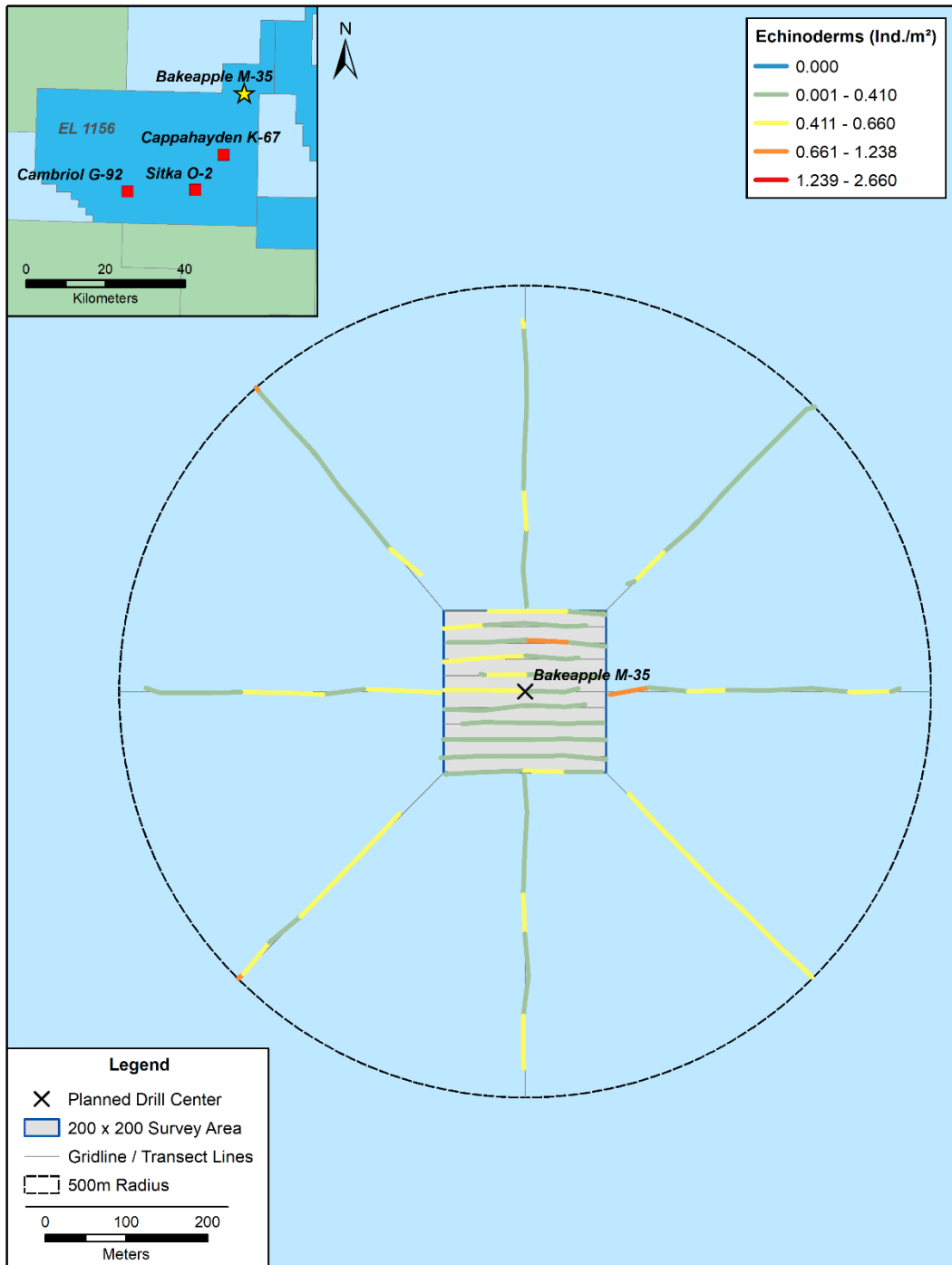


Figure F-4 Echinoderm density (ind./m²) observed at Bakeapple

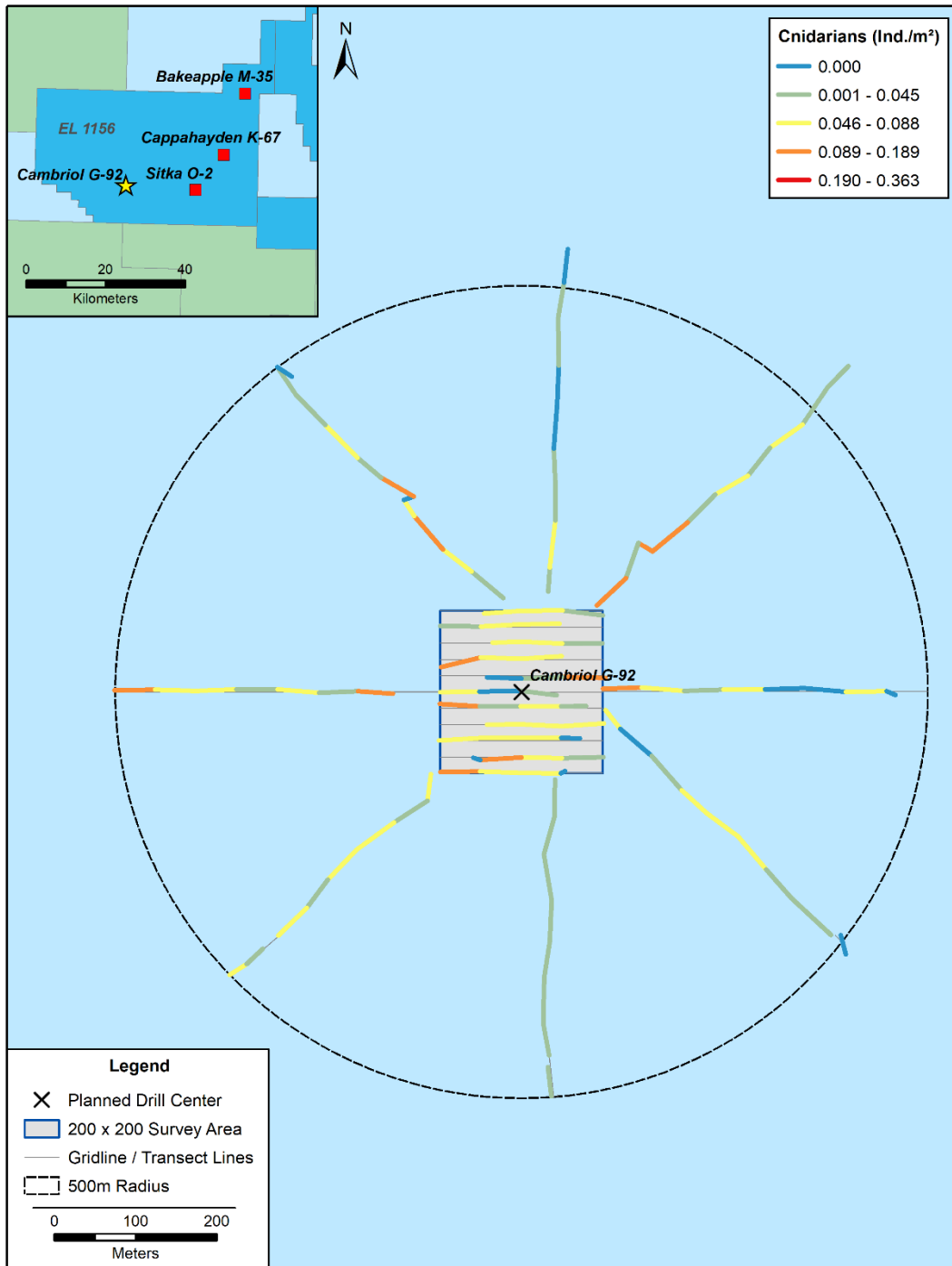


Figure F-5 Cnidarian density (ind./m²) observed at Cambriol

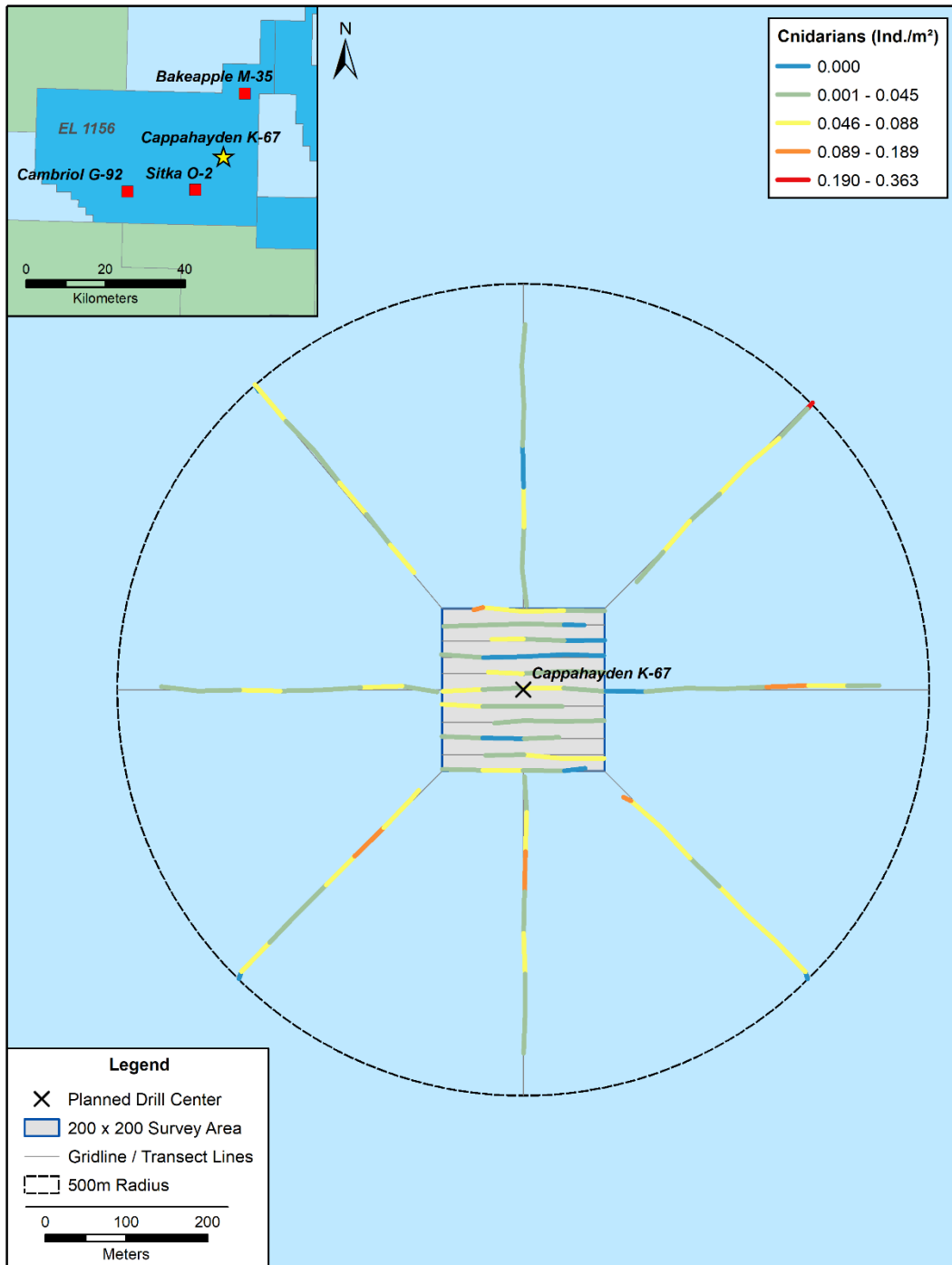


Figure F-6 Cnidarian density (ind./m²) observed at Cappahayden

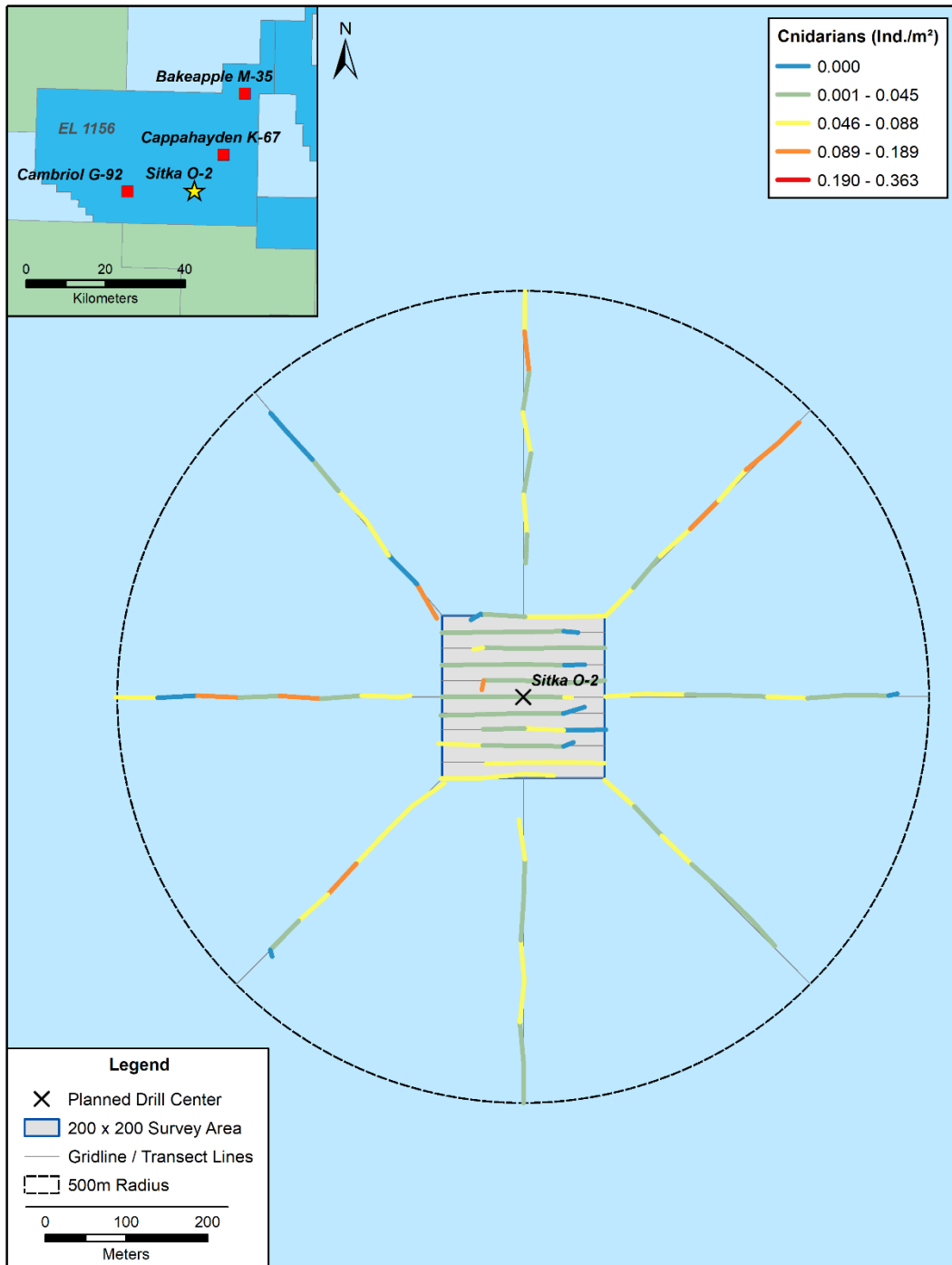


Figure F-7 Cnidarian density (ind./m²) observed at Sitka

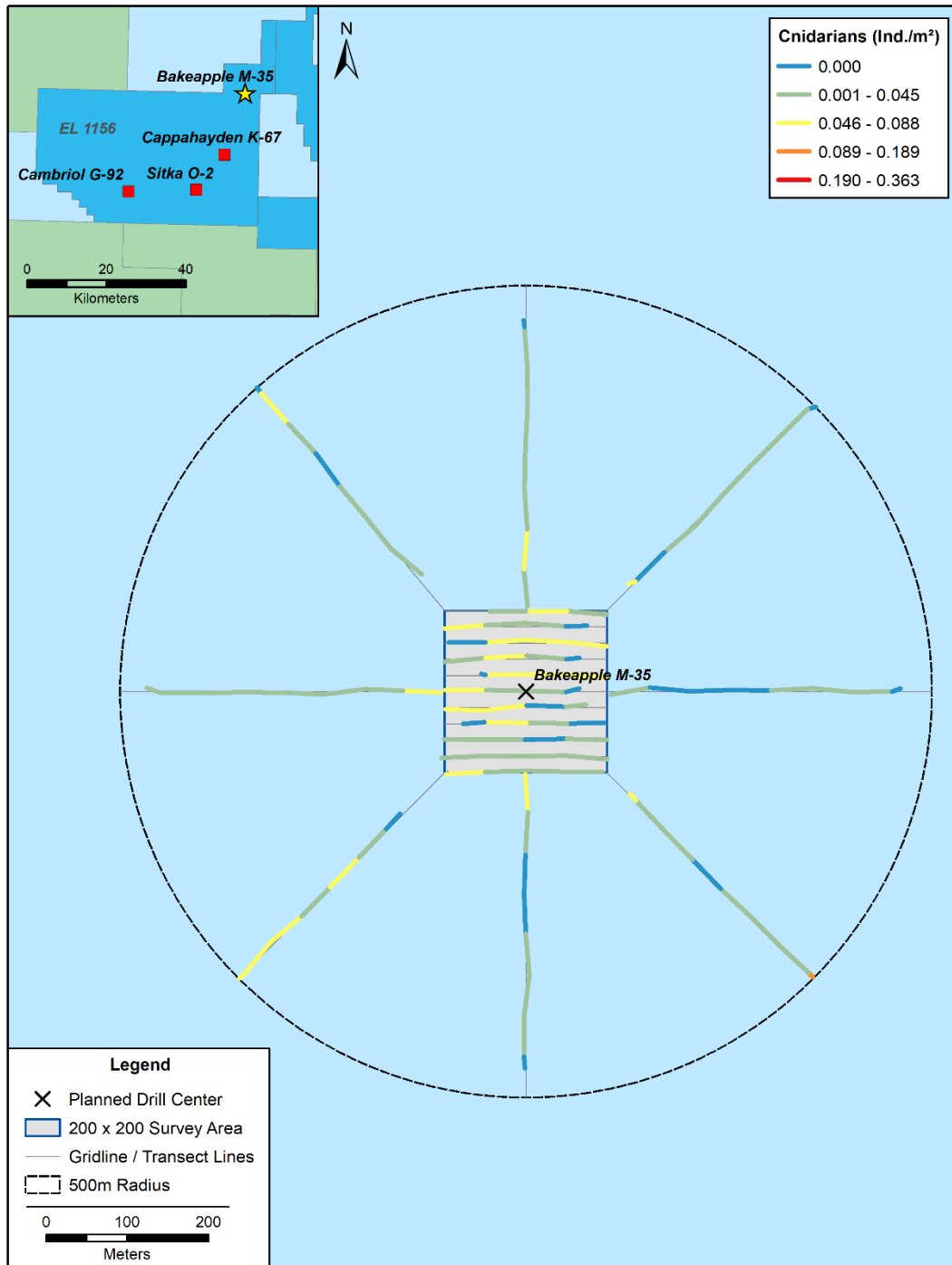


Figure F-8 Cnidarian density (ind./m²) observed at Bakeapple

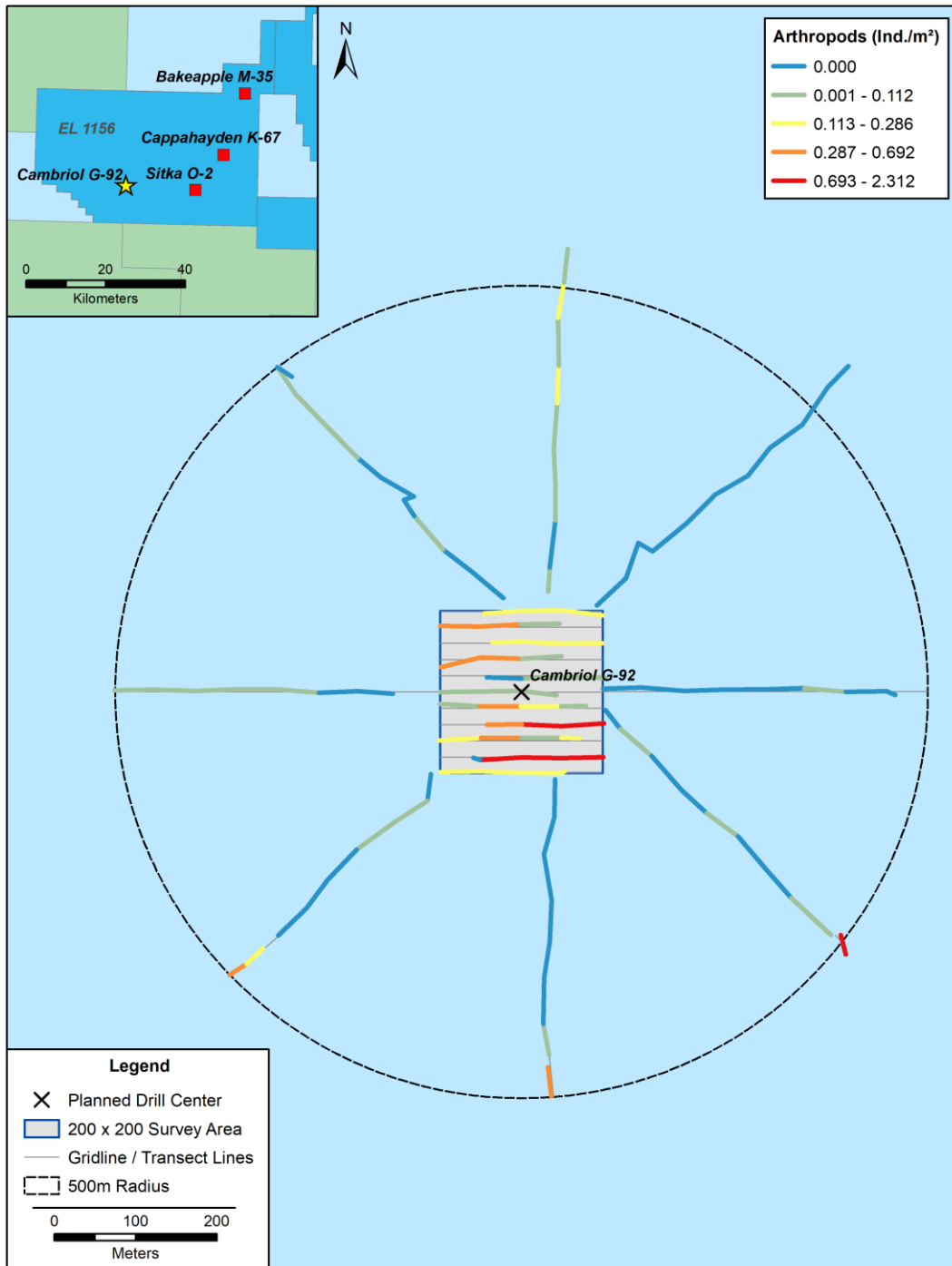


Figure F-9 Arthropod density (ind./m²) observed at Cambriol

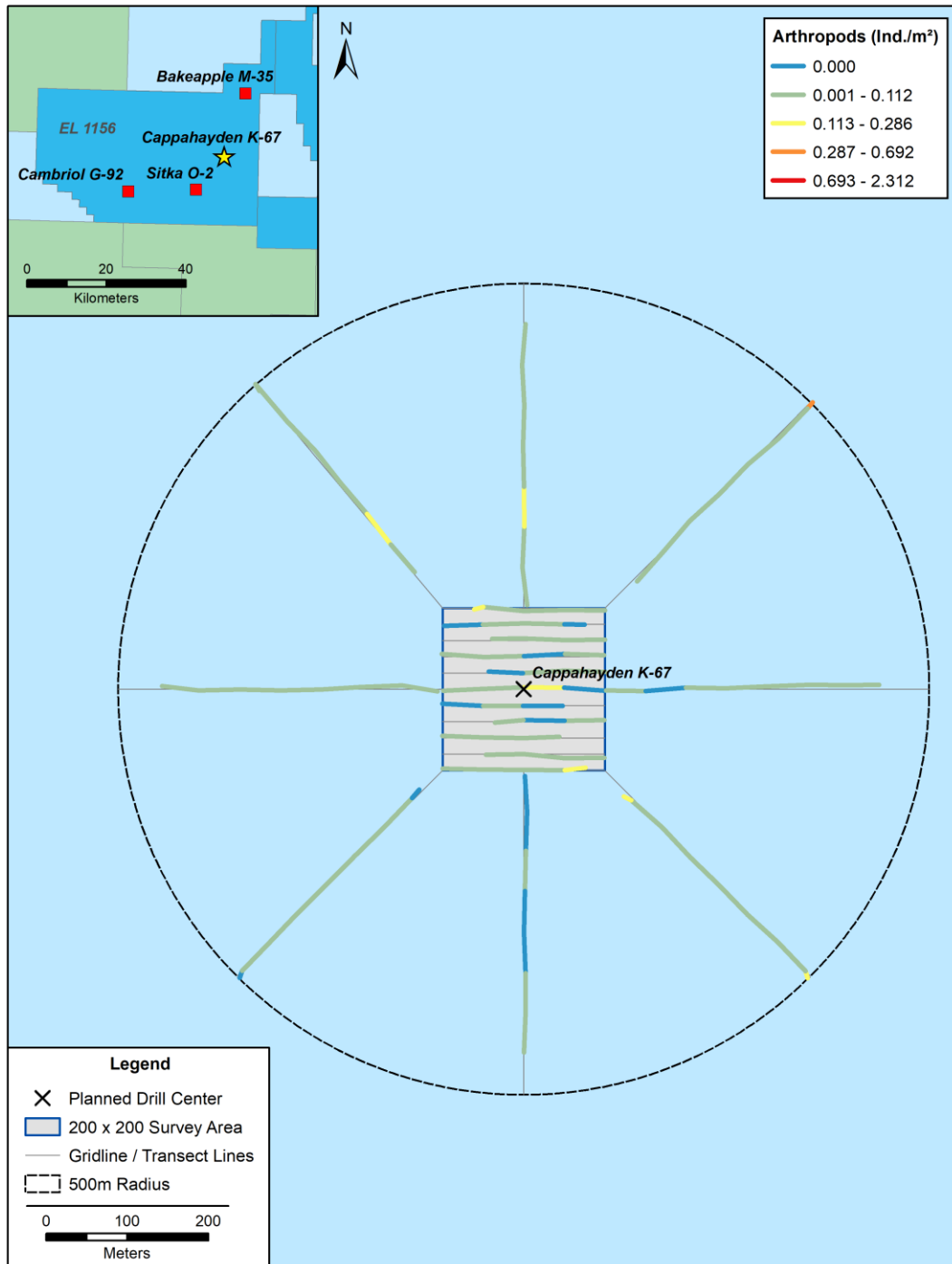


Figure F-10 Arthropod density (ind./m²) observed at Cappahayden

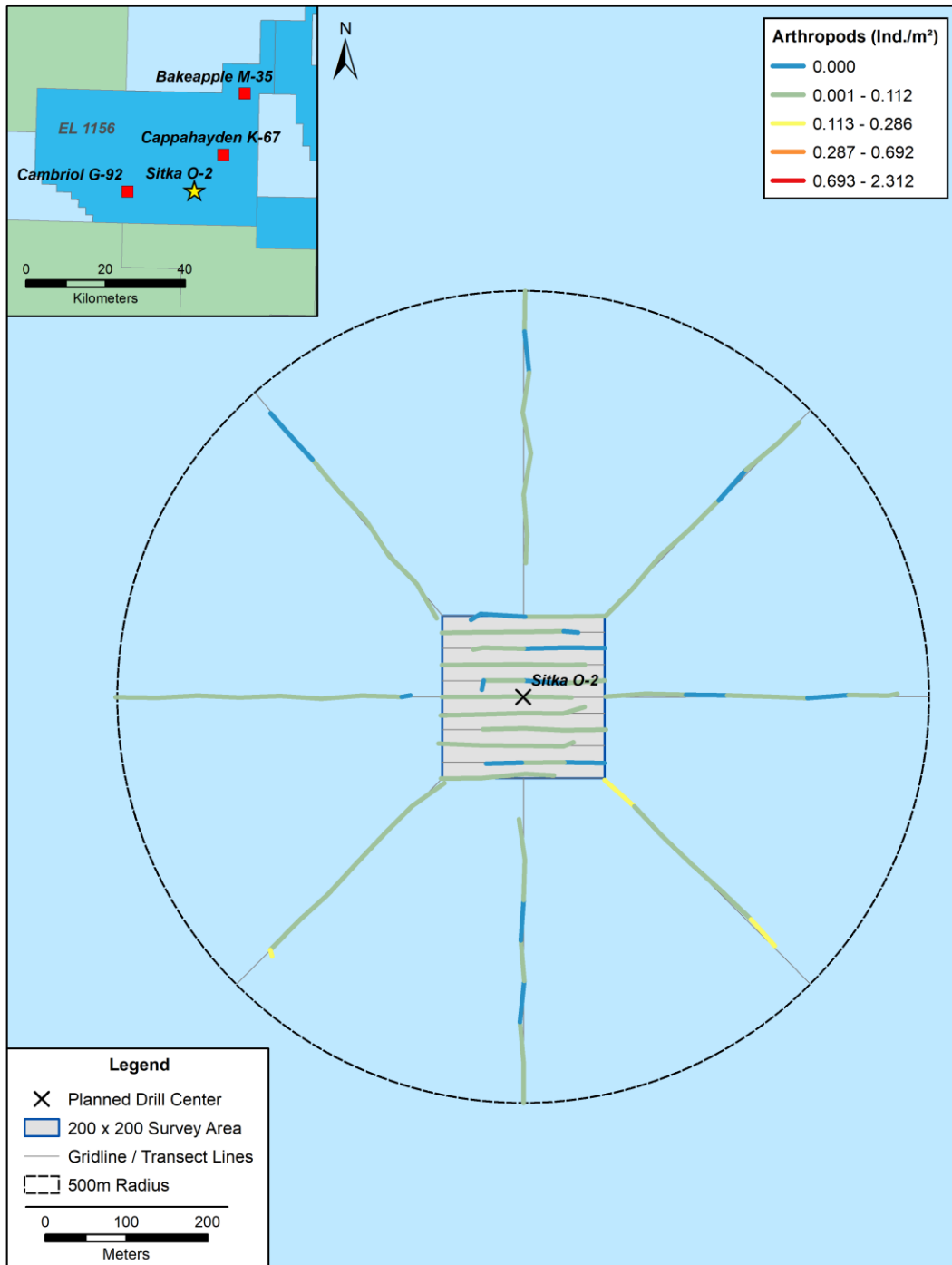


Figure F-11 Arthropod density (ind./m²) observed at Sitka

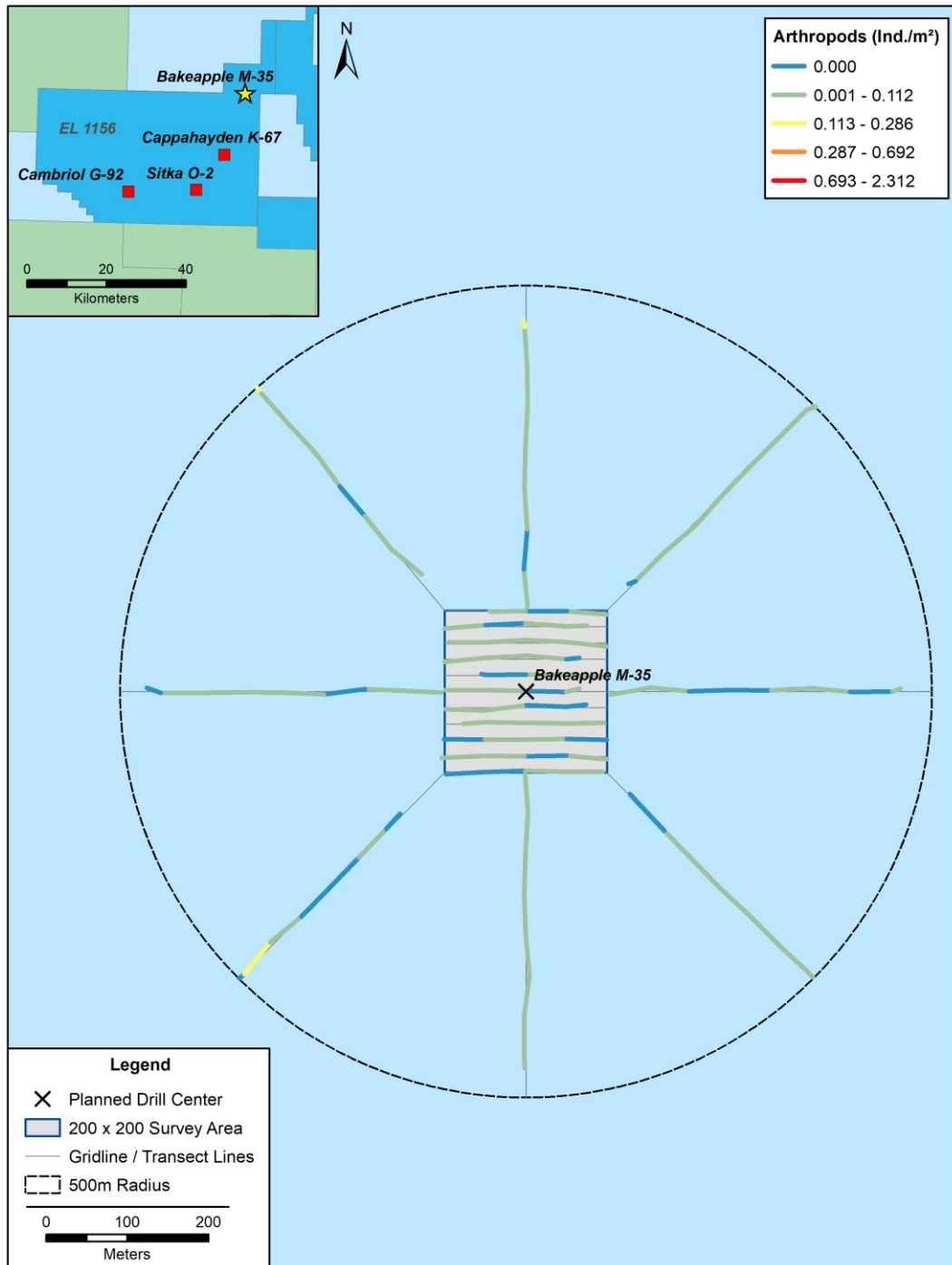


Figure F-12 Arthropod density (ind./m²) observed at Bakeapple

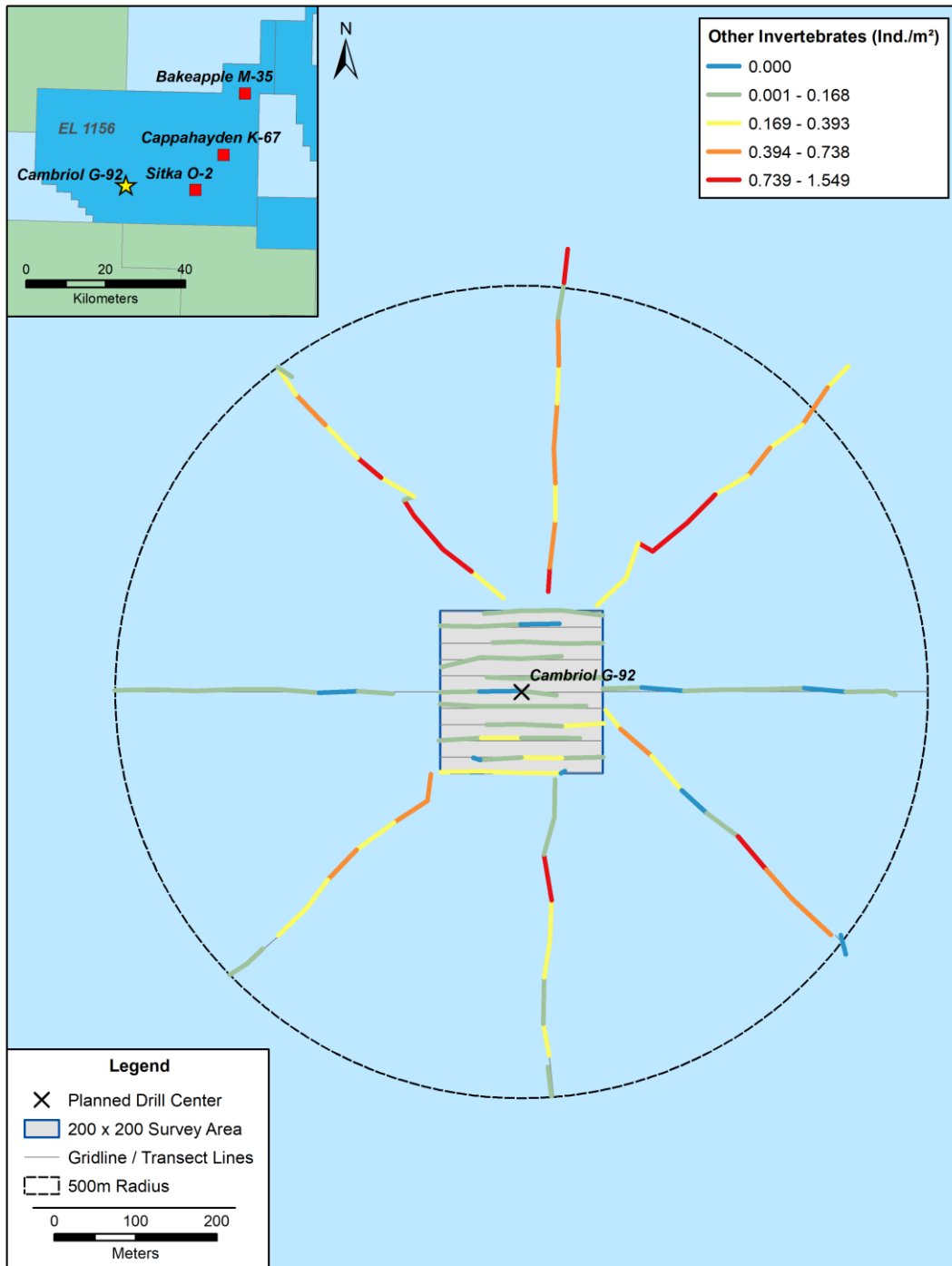


Figure F-13 Other invertebrate density (ind./m²) observed at Cambriol

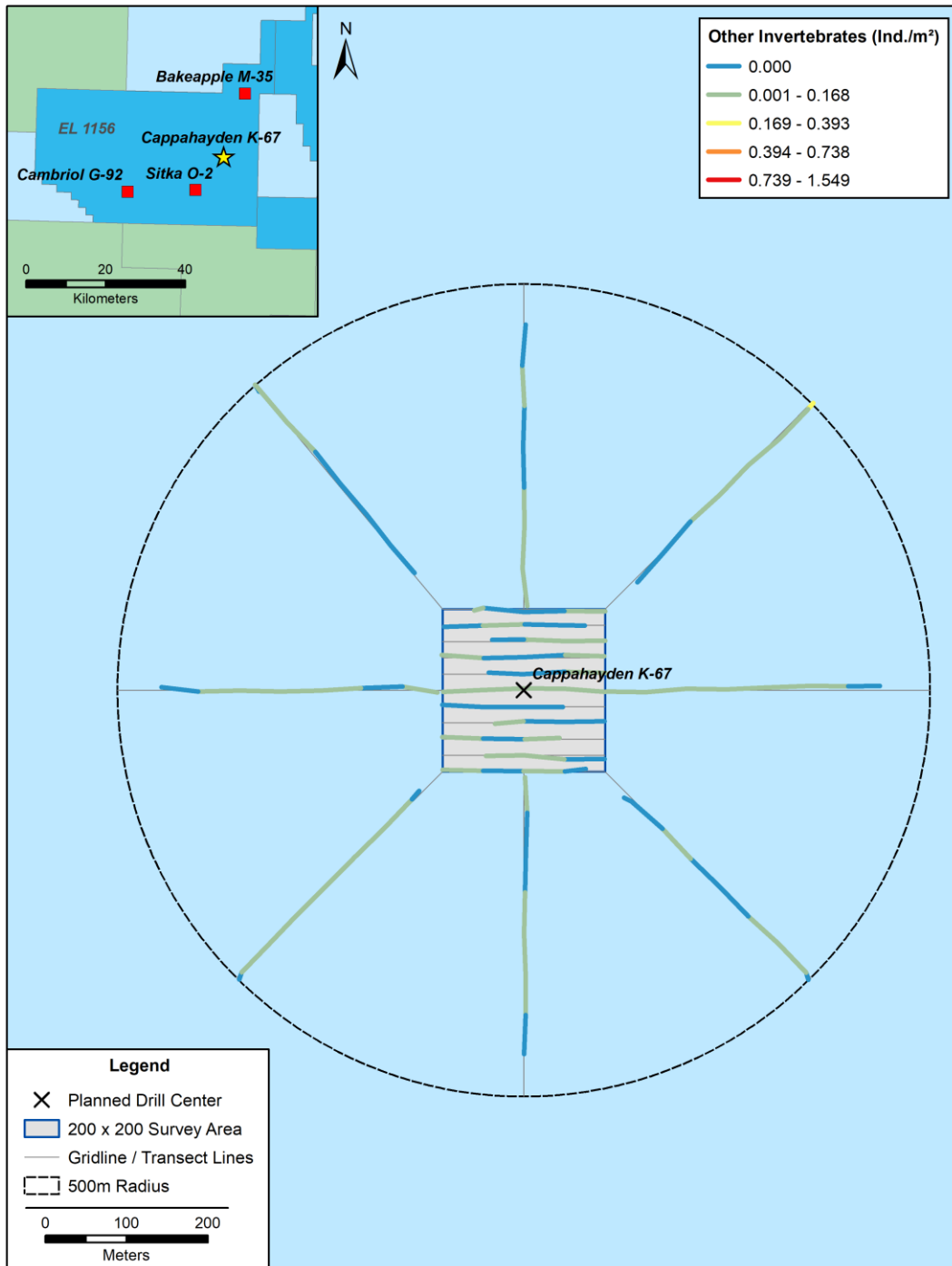


Figure F-14 Other invertebrate density (ind./m²) observed at Cappahayden

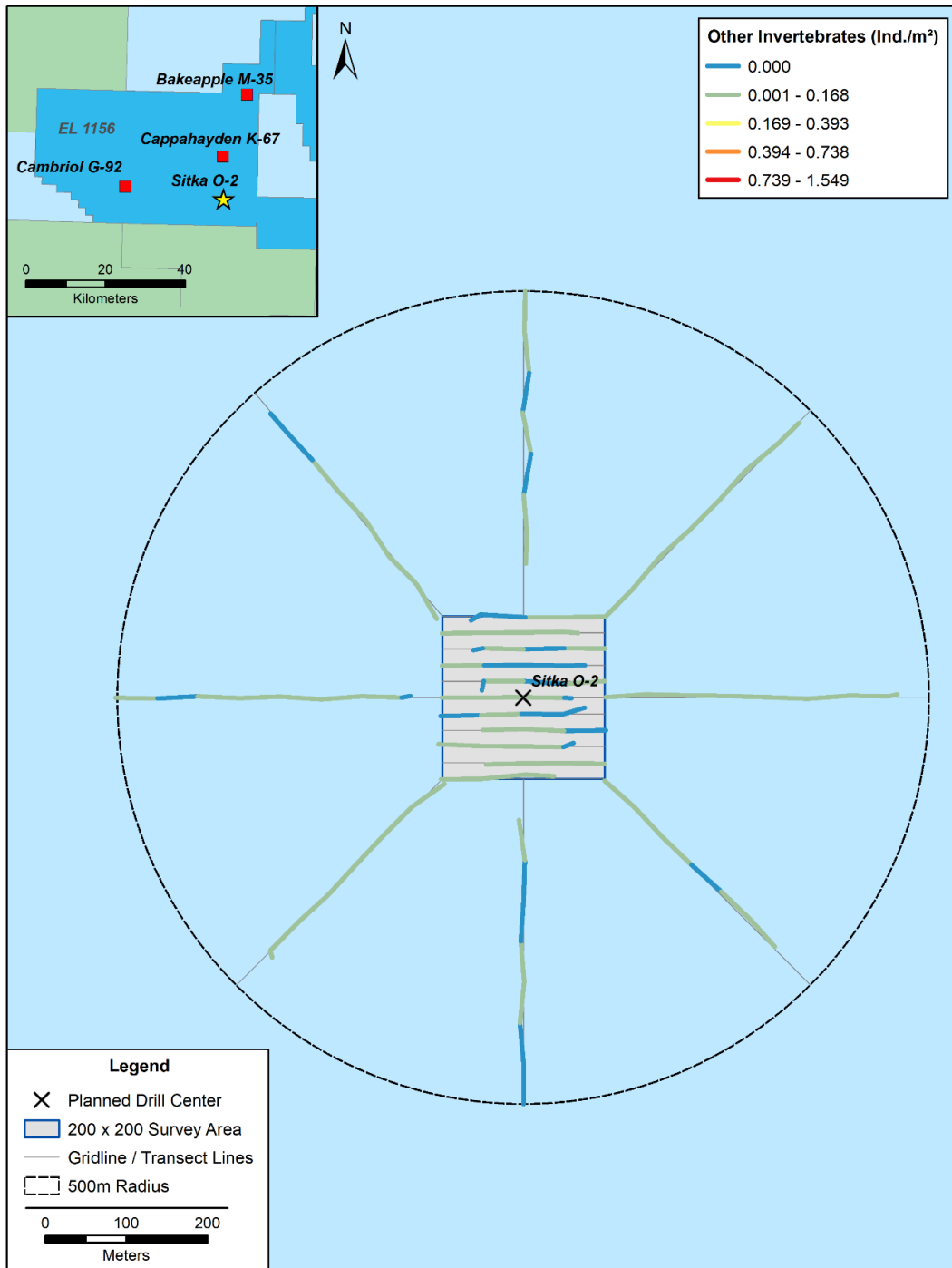


Figure F-15 Other invertebrate density (ind./m²) observed at Sitka

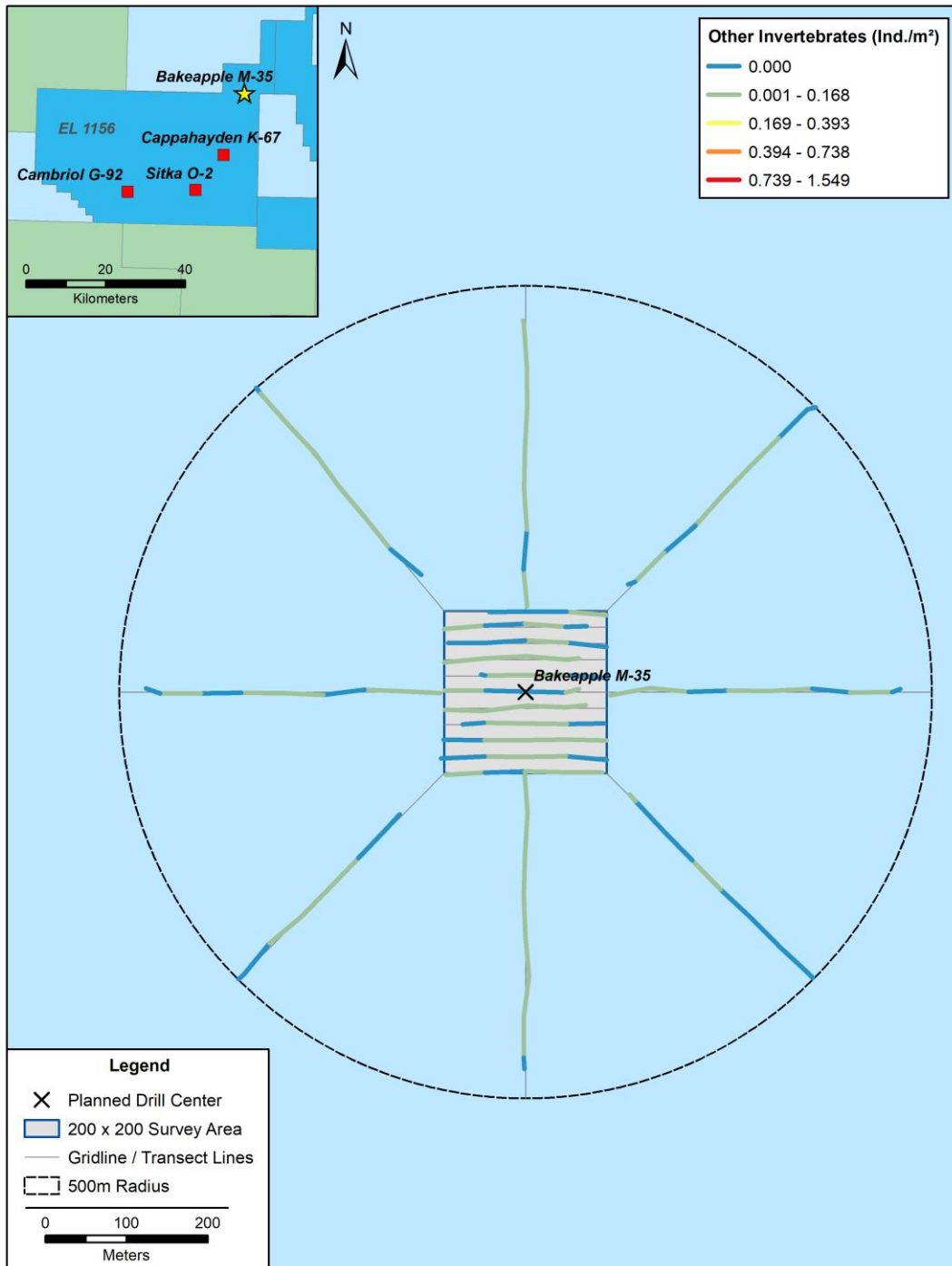


Figure F-16 Other invertebrate density (ind./m²) observed at Bakeapple