Special Ecological Assessment Study (SEAS) of the CO_2 Storage Unit at Prinos within SPA & SCI GR1150014, SPA GR1150001, SAC GR1150010, and SPA GR1150012 of the Natura 2000 Network

ANNEX 16.1 PROJECT EIA

THE PAGE HAS BEEN INTENTIONALLY LEFT BLANK

Copyright Statement

This document was prepared exclusively for the purposes of the Project "CO2 Storage Unit in Prinos". The contents of the document may be used by EnEarth exclusively for the purposes of the Project.

PROJECT	CO_2 STORAGE UNIT AT PRINOS		
STUDY STAGE	Special Ecological Assessment Study (SEAS) within the framework of the Environmental Impact Assessment (EIA).		
CODE STUDY	CCP - 2902		
DATE	25.11.2024		
VERSION	v.01		
REVISION	v.01		
ENV. CONSULTANT	LDK CONSULTANTS A.E. – WSP SA		
PROJECT ORGANISER	ENEARTH GREECE		
ELABORATION	LDK – WSP study group		
CONTROL	Costis Nikolopoulos, LDK Project Manager Anna Borroni, WSP Project Manager		
APPROVAL	Costis Nikolopoulos Project Manager	LDK CONSULTANTS A.E. ΠΑΡΟΔΟΣ ΘΗΒΑΪΔΟΣ 21 - ΚΗΦΙΣΙΑ - Τ.Κ. 145 64 ΤΗΛ. 210 8196700 Α.Φ.Μ. 094061957 - ΔΟΥ: Φ.Α.Ε. ΑΘΗΝΩΝ ΑΡ. ΓΕΜΗ : 324501000	
APPROVAL	Vassilis Tsetoglou Health Safety and Environment Director		
PROJECT ORGANIZATION REPRESENTATIVE	Katerina Sardi, Managing Director – Country Manager	ENEARTH GREECE ΜΟΝΟΠΡΟΣΩΠΗ Α.Ε ΛΕΩΦ.ΚΗΦΙΣΙΑΣ 32 - ΜΑΡΟΥΣΙ Τ.Κ. 151 25 ΤΗΛ. 210 81 74 200 – FAX. 210 81 74299 ΑΦΜ: 802522310 – ΔΟΥ ΚΕΦΟΔΕ ΑΤΤΙΚΗΣ	

THE PAGE HAS BEEN INTENTIONALLY LEFT BLANK

CONTENTS

I Introduction 1

II Brief description of the Project 3

II.1 Key Project Information 3

II.1.1 General Information 3

II.1.2 Existing Facilities 6

II.1.2.1 Onshore facilities Sigma 6

II.1.2.2 Offshore facilities 8

II.1.3 New facilities 12

II.1.3.1 Storage area12

II.1.3.2 Modifications to existing facilities 19

II.1.3.3 CO2 Management Facilities (Reception - Transport - Injection) 21

II.2 Alternative solutions 27

II.5 Construction schedule 27

II.6 Duration of operations 28

III. Identification of Study Area (SA) and Field Research Area (FRA) 29

III.1 Identification of Study Area (SA) 29

III.2 Field Research Area (FRA) Identification 31

III.2.1 FRA 31

III.2.2 Expanded FRA 33

IV. Methodology35

IV.1 Legislation specifications 35

IV.2 Literature Review 35

IV.3 Field research methodology 37

IV.3.1 Duration of fieldwork and scope of field research 37

IV.3.2 Recording methods 37

IV.3.2.1 Birdlife37

IV.3.2.2 Sea mammals 48

IV.3.2.3 Marine habitat and habitat types 51
IV.3.2.4 Terrestrial habitat and habitat types 52

1. Existing State of the Natural Environment 55

1.1 Recording and analysis of the elements of the natural environment 55

A. STUDY AREA (SA) 55

1.1.A1 Brief description of the Natura 2000 site concerned 55
1.1.A1.i Identification of the area (type, registration code, name) 55
1.1.A1.ii Geographical identification of the area (coordinates, altitude, area) 55
1.1.A1.iii Description of the general character of the area with simple reference to: habitat types, habitat categories, quality and importance of the area, vulnerability, reasons for designation 56
1.1.A2 Detailed description of the Study Area (SA) 60
1.1.A2.i Recording of habitat types in Annex I of Joint Ministerial Decree H.P.14849/853/E103/2008 (Government Gazette B'645), especially in terms of their representativeness, relative surface area and conservation status (if they are SACs, SCIs) 60
1.1.A2.ii Recording of flora and fauna species in Annex II of Joint Ministerial Decree H.P.14849/853/E103/2008 (Government Gazette B'645), especially with regard to the size and density of populations, their conservation status and their isolation (if they are SACs, or SCIs) 61
1.1.A2.iii Recording of the bird species of Annex I of Joint Ministerial Decree H.P.37338/1807/E.103/2010 (Government Gazette B'1495), as well as other migratory bird species with a significant presence in the Natura 2000 area, especially in terms of the size and density of the populations, their conservation status and their isolation (if it is a SAC) 63
1.1.A2.iv Recording the main characteristics of all habitat types in Annex I and/or species in Annex II of Directive 92/34/EEC (if they are SACs or SCIs) and/or bird species in Annex I of Directive 2009/147/EC and migratory species with regular arrival (if they are SPAs), their value in relation to the rest of the Natura 2000 Network, as well as the main characteristics of endemic, endangered and protected species 72
1.1.A3 Mapping the above information on maps 75
1.1.A4 Reference to other existing and/or approved projects or activities in the Study Area 76
1.1.A5 Other relevant information concerning the Study Area at the discretion of the SEA researcher 78
1.1.A6 Photographic documentation 89

B. FIELD RESEARCH AREA (FSA) / EXTENDED FSA 90

1.1.B1 Detailed description of the FSA / EXTENDED FSA 90
1.1.B1.i Recording of habitat types (t.o.) of Annex I of Joint Ministerial Decree 14849/853/E103/008 (Government Gazette B' 645), in particular with regard to their representativeness, relative surface area and conservation status (if they are SACs, or SCI) 90

1.1.B1.ii Recording of the flora and fauna species of Annex II of Joint Ministerial Decree 14849/853/E103/2008 (Government Gazette B' 645), especially with regard to the size and density of the populations, their conservation status and their isolation (if they are SACs, SCI) 98

1.1.B1.iii Recording of the bird species of Annex I of Joint Ministerial Decree H.P.37338/1807/E.103 (Government Gazette B'1495), as well as other migratory bird species with a significant presence in the Natura 2000 area, especially in terms of the size and density of the populations, their conservation status and their isolation (if it is a SAC) 126

1.1.B1.iv Recording the main characteristics of all habitat types in Annex I and/or species in Annex II of Directive 92/34/EEC (if it is an SAC, SCI or SCI) and/or bird species in Annex I of Directive 2009/147/EC and migratory species with regular arrival (if it is an SPA), their value in relation to the rest of the Natura 2000 Network, as well as the main characteristics of endemic, endangered and protected species 192

1.1.B2 Recording the above information on Documentation Maps 193

1.2 Recording the state of the natural environment in the Natura 2000 network area 193

1.2.1 Conservation objectives of the Natura 2000 site concerned and the parameters that contribute to the conservation value of the site 193

1.2.1.1 SAC & SCI GR1150014 "Marine Area of Kavala Thassos" 193

1.2.1.2 SAC GR1150001 "Nestos Delta and Keramoti Lagoons and Thasopoula Island" 193

1.2.1.3 SPA GR1150012 «Thasos (Mount Ypsario and coastal zone)» 199

1.2.1.4 SAC GR1150010 "Nestos Delta and Keramoti Lagoons – Wider Area" 201

1.2.2 Conservation status of the habitat types and/or species for which the Natura 2000 site concerned has been designated 209

1.2.3 Main pressures and threats that exist 210

1.2.3.1 General 210

1.2.3.2 SAC & SCI GR1150014 "Marine Area of Kavala Thassos" 213

1.2.3.3 SAC GR1150010 "Nestos Delta and Keramoti Lagoons – Wider Area" 214

1.2.3.4 SAC GR1150001 "Nestos Delta and Keramoti Lagoons and Thasopoula Island" 215

1.2.3.5 SAC GR1150012 "Thassos (Mount Ypsarios and coastal zone)" 217

1.2.4 Existing reference values (baseline conditions) 218

1.2.5 Ecological functions 219

1.2.6 Development trends of the study area (without the project) 219

2. Due Diligence and Impact Assessment 223

2.1 Introduction 223

2.2 Methodology 223

2.2.1 Indicators for quantifying the significance of impacts 223

2.2.2 Method for predicting potential impacts 224

2.3 Appropriate assessment of project impacts (normal operation) 224

2.4 Impacts on the marine ecosystem from an accidental CO2 leak 255

3. Mitigation measures for potential impacts 258

3.1 Prevention and mitigation measures 258

3.2 Specific measures to prevent and mitigate potential risks and emergencies related to a possible CO2 leak 261

4. Compensatory measures 264

5. Monitoring program 265

6. Summary of conclusions 270

7. References 271

8. Study Team 276

9. Annexes 277

9.1 Annex I: Map Documentaion 279

9.2 Annex II: Photographic documentation 281

9.3 Annex III: Standard Data Forms of the relevant areas of the Natura 2000 network 293

TABLES

Table 1: Amounts of CO2 expected to be received in the form of shipments through the Program _ 5

Table 2: Platforms position _____ 10

Table 3: Final drilling depth criteria (UTM zone 35N) _____ 26

Table 4: Construction schedule _____ 27

Table 5: SA and distance from the project under consideration _____ 30

Table 6: Area of overlap between the Field Survey Area (ΠΕΠ) and the respective Natura 2000 sites33

Table7: Fieldwork days per Natura 2000 site under consideration and area covered by fieldwork 37

Table 8: Schedule of fieldwork days for avifauna _____ 47

Table 9: Fieldwork schedule for marine mammal observation _____ 51

Table 10: Habitat types of Annex I of Joint Ministerial Decree 14849/853/E103/2008 in SAC GR1150010 (source: ΤΕΔ & N2000_descr_GR_2020_08_10_V31b.accdb, ΥΠΕΝ) _____ 60

Table 11: Species in SAC & SCI GR1150014 listed in Annex II of Joint Ministerial Decision 14849/853/E103/2008 and site assessment for them (source: ΤΕδ & N2000_descr_GR_2020_08_10_V31b.accdb, ΥΠΕΝ) _____ 62

Table 12: Species in SAC GR1150010 listed in Annex II of Joint Ministerial Decision 14849/853/E103/2008 and site assessment for them (source: ΤΕδ & N2000_descr_GR_2020_08_10_V31b.accdb, ΥΠΕΝ) _____ 62

Table 13: Bird species of Annex I of Joint Ministerial Decree 37338/1807/E.103/2010 in the SAC & SCI GR1150014 area (source: ΤΕδ & N2000_descr_GR_2020_08_10_V31b.accdb, Ministry of Environment and Natural Resources) _____ 64

Table 14: Bird species of Annex I of Joint Ministerial Decision 37338/1807/E.103/2010 in SPA GR1150001 (source: ΤΕδ & N2000_descr_GR_2020_08_10_V31b.accdb, ΥΠΕΝ) _____ 65

Table 15: Bird species listed in Annex I of JMD 37338/1807/E.103 in SPA GR1150012 (source: TED & N2000_descr_GR_2020_08_10_V31b.accdb, Ministry of Environment and Energy). _____ 70

Table 16: Ecological requirements of species of interest in avifauna (Source: Dimalexis, 2009 a,b)72

Table 17: Ecological requirements of fauna species of interest (except avifauna) _____ 74

Table 18: Specific land uses for the proposed zone ZBDFP-05 (source: NPM 01B) _____ 82

Table 19: Abundance of birdlife in lagoons and wetlands, as well as in the adjacent marine area during winter. The values refer to the range of the number of individuals counted (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird counts in Greece" during the period 2014-2023). The population data per area present the range of values for the years that

each species was present in the area. For all areas, the total range of population size values for all years (presence and absence) is given, as well as the average population size (in parentheses). _ 85

Table 20: Land uses according to Corine land cover _____ 91

Table 21: Habitat types (H.T.) in SAC GR1150010 within the FSA _____ 94

Table 22: Habitat types (H.T) in the FSA outside the SAC _____ 94

Table 23: Terrestrial mammal species in the FSA _____ 98

Table 24: Bat species recorded in the FSA and in the EPAMATH area _____ 100

Table 25: Amphibian and reptile species in the FSA _____ 106

Table 26: Bottlenose dolphin sightings in the expanded FSA _____ 112

Table 27: Acoustic recordings of cetaceans in the expanded FSA _____ 117

Table 28: Dominant fish species and protection status in the Thracian Sea based on abundance ranking for the various depth groups _____ 124

Table 29: Total number of species recorded within the Field Survey Area (ΠΕΠ) and the extended Field Survey Area, by threat status category. _____ 127

Table 30: Recorded presence, protection status and threat status for the species and groups of bird species recorded in the FSA, the expanded FSA and the wider project area _____ 127

Table 31: Total number of recorded individuals per species within the Field Survey Area (ΠΕΠ), the extended Field Survey Area, and overall within and outside the extended Field Survey Area (cont.) by sampling period _____ 130

Table 32: Abundance of Phalacrocorax aristotelis desmarestii during winter (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird surveys in Greece" during the period 2014-2023) _____ 135

Table 33: Abundance of Puffinus yelkouan during winter (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird surveys in Greece" during the period 2014-2023) _____ 135

Table 34: Abundance of Larus ridibundus during winter (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird surveys in Greece" during the period 2014-2023)_ 144

Table 35: Abundance of Thalasseus sandvicensis during winter (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird surveys in Greece" during the period 2014-2023) _____ 145

Table 36: Abundance of Gavia arctica during winter (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird surveys in Greece" during the period 2014-2023)_ 150

Table 37: Abundance of Phalacrocorax carbo during winter (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird surveys in Greece" during the period 2014-2023) _____152

Table 38: Abundance of Microcarbo pygmaeus during winter (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird surveys in Greece" during the period 2014-2023) _____153

Table 39: Abundance of Podiceps cristatus during winter (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird surveys in Greece" during the period 2014-2023) _____156

Table 40: Abundance of Podiceps nigricollis during winter (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird surveys in Greece" during the period 2014-2023) _____156

Table 41: Winter abundance of Cygnus olor (source: Hellenic Ornithological Society, 2024, data from the programme “Mid-winter Waterbird Counts in Greece” for the period 2014–2023). _____158

Table 42: Abundance of Anas platyrhynchos during winter (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird surveys in Greece" during the period 2014-2023) _____158

Table 43: Abundance of Mareca penelope during winter (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird surveys in Greece" during the period 2014-2023)_159

Table 44: Abundance of Tadorna tadorna penelope during winter (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird surveys in Greece" during the period 2014-2023) _____159

Table 45: Abundance of Mergus serrator during winter (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird surveys in Greece" during the period 2014-2023)_160

Table 46: Abundance of Fulica atra during winter (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird surveys in Greece" during the period 2014-2023) _____166

Table 47: Abundance of Ardea alba during winter (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird surveys in Greece" during the period 2014-2023) _____168

Table 48: Winter abundance of Ardea cinerea (source: Hellenic Ornithological Society, 2024, data from the programme “Mid-winter Waterbird Counts in Greece” for the period 2014–2023) ____169

Table 49: Abundance of Egretta garzetta during winter (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird surveys in Greece" during the period 2014-2023)_170

Table 50: Abundance of Pelecanus crispus during winter (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird surveys in Greece" during the period 2014-2023) _____170

Table 51: Abundance of Actitis hypoleucos during winter (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird surveys in Greece" during the period 2014-2023) _____178

Table 52: Abundance of Charadrius alexandrinus during winter (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird surveys in Greece" during the period 2014-2023) _____179

Table 53: Abundance of Haematopus ostralegus during winter (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird surveys in Greece" during the period 2014-2023) _____180

Table 54: Abundance of Phoenicopterus roseus during winter (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird surveys in Greece" during the period 2014-2023) _____180

Table 55: Abundance of Alcedo atthis during winter (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird surveys in Greece" during the period 2014-2023)_181

Table 56: Conservation objectives for the protected area SAC & SCI GR1150014 (Ministry of Environment and Natural Resources/D DFPB/50146/1786/10.05.2023) _____193

Table 57: Conservation objectives for SAC GR1150001 (Ministry of Environment and Natural Resources MD ΦΦΠΒ/50146/1786/10.05.2023) _____193

Table 58: Conservation objectives for SPA GR1150012 (Ministerial Decision ΥΠΕΝ/DDFPB/50146/1786/10.05.2023) _____199

Table 59: Conservation objectives for the SAC GR1150010 (ΥΑ ΥΠΕΝ/ΔΔΦΠΒ/24776/985/22.03.2023) _____202

Table 60: Conservation status of SDF species at the national level _____209

Table 61: Conservation status of SDF habitat types at national level _____210

Table 62: Threats and pressures for the SCI and SPA GR1150014 (source: SDF) _____213

Table 63: Main pressures and threats existing in the SAC GR1150010 “Nestos Delta and Keramoti Lagoons – Wider Area” based on the SDF _____214

Table 64: Threats and pressures for SPA GR1150001 (source: SDF) _____216

Table 65: Threats and pressures for SAC GR1150012 (source: SDF) _____218

Table 66: Indicators for quantifying the significance of impacts (source: European Commission Communication 2021/C437/01) _____223

Table 67: Recording the aspects of the project and determining their possible or not impact on general categories of protected objects of the relevant Natura 2000 areas_____226

Table 68: Identification and assessment of impacts caused by the aspects of the project identified in Table 65 Table 67 on the protected objects of the relevant Natura 2000 areas taking into account their conservation objectives. ____ 244

Table 69: Construction schedule ____ 265

Table 70: Environmental Monitoring Plan (EMP), with emphasis on the protected features of the respective Natura 2000 areas. ____ 266

FIGURES

Figure 1: Schematic diagram for Phase 1 of the Prinos CO2 Storage Project ____ 4

Figure 2: Satellite view of existing Project facilities (Bingmaps background, 2019) ____ 7

Figure 3: Location of existing crude oil tanker loading and unloading berth (marked in red) and the project's 24" and 16" subsea pipelines (background Navionics, 2020, Copernicus, 2020) ____ 8

Figure 4: Prinos offshore development area ____ 10

Figure 5: Map of the Prinos Basin with active Concessions ____ 14

Figure 6: Cross-section of the potential CO2 storage field in the Prinos structure (yellow indicates the oil layer, blue the aquifer and white the CO2 plume). CO2 injection wells are shown in green and water production wells in blue. ____ 15

Figure 7: Cross-section of the potential CO2 storage site and storage complex as included in the exploration permit. Following the assessment of the area, the Epsilon field was excluded from the CO2 injection and storage area. ____ 15

Figure 8: Plan view of the polygons of the Prinos complex and CO2 storage site, with the reservoir formations in the background ____ 16

Figure 9: Plan view of the area of the surface storage complex (large polygon with dashed line), the area of the storage site (small polygon with dashed line) and the polygon of the exploration permit (solid line). The coastline in brown. ____ 17

Figure 10: Location of boreholes in the storage field (3D view) ____ 18

Figure 11: Location of boreholes in the storage field (top view) ____ 19

Figure 12: Beta and Delta Platforms ____ 19

Figure 13: Flow diagram from the CO2 pipeline to the CO2 injection wells ____ 20

Figure 14: Road access to serve the new facilities (land facilities) ____ 21

Figure 15: CO2 reception - transport land infrastructure area ____ 22

Figure 16: CO2 pipeline routing ____ 25

Figure 17: Study Area (SA) - SPA & SCI GR1150014, SPA GR1150001, SPA GR1150010 and SPA GR1150012 ____ 30

Figure 18: Field Research Area (FRA) ____ 32

Figure 19: Field Research Area (FRA) and expanded FRA ____ 34

Figure 20: Routes taken for recordings from vessels using the ESAS method ____ 39

Figure 21: Routes taken for boat recordings along the coastline ____ 41

Figure 22: Locations of recordings from coastal viewpoints and viewpoints examined ____ 43

Figure 23: Recording locations using the Direct Observation method ____ 45

Figure 24: Recording locations using the Direct Observation method around the Sigma factory and the lagoons of Keramoti, Agiasma, Eratinos and Vasova ____ 46

Figure 25: Bat recording routes within the perimeter of the factory ____ 53

Figure 26: Internationally Protected Areas in the wider Project area ____ 78

Figure 27: Other Protected Areas in the wider Project area ____ 79

Figure 28: Ramsar Site "Nestos Delta and Adjacent Lagoons" in relation to the Project's Land Facilities (source: Ecoscope) ____ 80

Figure 29: National Park of Eastern Macedonia and Thrace and Aesthetic Forest ____ 81

Figure 30: Proposal NRP 01B regarding protection zones (proposal NRP 01B) within the protected areas of the Natura 2000 network ____ 82

Figure 31: Locations of recording areas of the program "Midwinter waterbird surveys in Greece" in the wetlands of Keramoti. ____ 88

Figure 32: Boundaries of the wetland EL51000303: COASTAL MARSH OF KARVALI PREFACE (source: http://greekwetlands.biodiversity-info.gr/Sites/Details/2631) ____ 90

Figure 33: Land use map and wetland zones in the terrestrial FSA ____ 92

Figure 34: Map of habitats and land uses in the terrestrial part of the FSA ____ 93

Figure 35: Available data for estimating the spatial distribution of marine phanerogam meadows according to Panayiotidis et al. 2022 and Topouzelis et al. 2018 ____ 97

Figure 36: Locations of Eptesicus serotinus and Hypsugo savii records within the FSA. ____ 102

Figure 37: Locations of records associated with Miniopterus schreibersi, Pipistrellus pipistrellus and Pipistrellus pygmaeus within the FSA. ____ 103

Figure 38: Locations of Myotis myotis/blythi and Myotis capaccinii/daubentoni records within the FSA. 104

Figure 39: Pipistrellus kuhlii/Pipistrellus nathusii recording locations within the FSA 105

Figure 40: Foraging areas of the loggerhead sea turtle 109

Figure 41: Boat visual recording routes carried out in May 2024 in the study area 111

Figure 42: Bottlenose dolphin sightings in the study area in May 2024. The size of the circle represents the size of the dolphin group. 113

Figure 43: Boat visual recording routes carried out in October 2024 in the study area 114

Figure 44: Cetacean sightings in October 2024 (common dolphins are marked in red, porpoises in blue and bottlenose dolphins in green) 115

Figure 45: Aerial optical recording routes 117

Figure 46: Map of acoustic recordings in the study area 20-24 June 2024. Bd = bottlenose dolphins, Cd = common dolphins, Hp = porpoise, MS = Mediterranean harbor seal and Un = unidentifiable 118

Figure 47: Map of visual observations in the study area, 20–24 June 2024. Bd = bottlenose dolphins, Cd = common dolphins, Un = unidentified 121

Figure 48: Map of the Rescue and Information Network (RINT in the memorandum) with the records of live (blue) and dead (red) Mediterranean seals from 1992 to the present (source MOm) 122

Figure 49: Section of coastline explored for the presence of terrestrial habitat of the Mediterranean monk seal 123

Figure 50: Fish species richness index for the Mediterranean Sea 124

Figure 51: Locations of Phalacrocorax aristotelis desmarestii recordings during SEAS fieldwork 137

Figure 52: Locations of Puffinus yelkouan recordings during SEAS fieldwork 138

Figure 53: Locations of Calonectris diomedea recordings during MEOA fieldwork 139

Figure 54: Locations of Stercorarius parasiticus recordings during SEAS fieldwork 140

Figure 55: Locations of Larus melanocephalus recordings during SEAS fieldwork 142

Figure 56: Sterna hirundo recording locations during SEAS fieldwork 143

Figure 57: Locations of Larus ridibundus recordings during SEAS fieldwork 146

Figure 58: Hydrocoloeus minutus recording locations during SEAS fieldwork 147

Figure 59: Thalasseus sandvicensis recording locations during SEAS fieldwork 148

Figure 60: Locations of Sternula albifrons and Chlidonias niger records during SEAS fieldwork 149

Figure 61: Locations of Gavia arctica and Gavia stellata recordings during SEAS fieldwork 151

Figure 62: Locations of Phalacrocorax carbo sinensis recordings during SEAS fieldwork 154

Figure 63: Microcarbo pygmaeus recording locations during SEAS fieldwork _____155

Figure 64: Locations of Podiceps cristatus and Podiceps nigricollis records during SEAS fieldwork157

Figure 65: Cygnus olor recording locations during SEAS fieldwork _____161

Figure 66: Anas platyrhynchos recording locations during SEAS fieldwork _____162

Figure 67: Mareca penelope recording locations during SEAS fieldwork _____163

Figure 68: Tadorna tadorna recording locations during SEAS fieldwork _____164

Figure 69: Locations of Somateria mollissima records during SEAS fieldwork _____165

Figure 70: Fulica atra recording locations during SEAS fieldwork _____167

Figure 71: Ardea alba recording locations during SEAS fieldwork _____172

Figure 72: Ardea cinerea recording locations during SEAS fieldwork _____173

Figure 73: Ciconia ciconia recording locations during SEAS fieldwork _____174

Figure 74: Egretta garzetta recording locations during SEAS fieldwork _____175

Figure 75: Locations of Nycticorax nycticorax recordings during SEAS fieldwork _____176

Figure 76: Locations of Pelecanus crispus and Pelecanus onocrotalus records during SEAS fieldwork _____177

Figure 77: Actitis hypoleucos recording locations during SEAS fieldwork _____182

Figure 78: Charadrius alexandrinus recording locations during SEAS fieldwork _____183

Figure 79: Charadrius dubius recording locations during SEAS fieldwork _____184

Figure 80: Locations of Haematopus ostralegus recordings during SEAS fieldwork _____185

Figure 81: Locations of Himantopus himantopus recordings during SEAS fieldwork _____186

Figure 82: Phoenicopterus roseus recording locations during SEAS fieldwork _____187

Figure 83: Locations of Vanellus spinosus recordings during SEAS fieldwork _____188

Figure 84: Circus aeruginosus recording locations during SEAS fieldwork _____190

Figure 85: Locations of Pandion haliaetus recordings during SEAS fieldwork _____191

Figure 86: Main anthropogenic pressures in the wider Project area (source: 1st Revision of River Basin Management Plans / RBMP) _____212

Figure 87: Institutionalized Land Uses near the Project's onshore facilities (source: Land Use Map, GIS of the Municipality of Kavala (Government Gazette 69/ΑΑΡ/11-03-2013) _____220

Figure 88: Areas of the ZOE of the Municipality of Kavala Inside the study area (source: Map P11-A of the ZOE of the Municipality of Kavala (Government Gazette 437-D-1989) _____221

Figure 89: Simulation models of the CO2 leakage path. (A) A “fast” CO2 leakage where CO2 reaches the surface of the water column as a gas (from Chen et al., 2005). (B) A “slow” CO2 leakage where CO2 dissolves in the sea before reaching the surface (from Dewar et al., 2013; Dewar, 2016)__255

Figure 90: A pteropod shell appears to dissolve over time in seawater with a lower pH. (from the US National Oceanic and Atmospheric Administration website) _____256

ABBREVIATIONS

Acronym	EXPLANATION
EMP	Environmental Monitoring Program
ESMMP	Environmental and Social Management and Monitoring Plan
FRA	Field Research Area
HT	Habitat Types
JMD	Joint Ministerial Decision
MD	Ministerial Decision
NECCA	Natural Environment and Climate Change Agency
PAMU	Protected Areas Management Unit
PC	Presidential Decree
SA	Study Area
SCA	Special Conservation Area
SCA	Special Conservation Area
SCI	Site of Community Importance
SDF	Standardized Data Form
SEA	Special Ecological Assessment
SEAS	EPA Study
SES	Special Environmental Study
MMO	Marine Mammal Observer
ΜΠΕ	Environmental Impact Study

I Introduction

This Special Ecological Assessment Study (SEAS) concerns the project "CO_2 Storage Unit at Prinos" and accompanies the Environmental Impact Assessment (EIA). The project under assessment passes through the Special Protection Area (SPA) and Site of Community Importance (SCI) of the Natura 2000 network, GR1150014 "Marine area of Kavala – Thasos," and is located near SPA GR1150001 and the Special Area of Conservation (SAC) GR1150010, while SPA GR1150012 is also found in the broader area. The GR1150014 area was included in the National List of Areas of the European Ecological Network Natura 2000 as both an SPA and SCI according to its most recent revision (Joint Ministerial Decision 50743/11.12.2017).

According to Directive 92/43/EEC, Article 6, any plan not directly connected with or necessary to the site's management, but which may significantly affect the site—individually or in combination with other plans—shall be subject to an appropriate assessment of its implications for the site, taking into account its conservation objectives.

The Natura 2000 protected areas examined in this SEAS (referred to as the relevant Natura 2000 areas) fall under the supervision and responsibility of the Management Unit (MU) of the National Parks of Nestos – Vistonida and Rhodope. The MU is part of Department A of the Directorate for the Management of Protected Areas of the Organization for Natural Environment and Climate Change (OFYPEKA).

Regarding the environmental classification of the project, and in accordance with Ministerial Decision 37674/2016 "Classification of public and private projects into categories and subcategories" pursuant to Article 1(4) of Law 4014/2011, as amended, the project under study is classified under Group 11 "Transport of energy, fuels, and chemical substances," item 6: "Transport and storage infrastructure for CO_2 streams in geological formations pursuant to Directive 2009/31/EC: – transport pipelines, including associated booster stations, – storage sites, – capture installations for geological storage," Category A1 (all projects).

Apart from the general provisions for the protection and management of Natura 2000 areas under Article 9 of Law 3937/2011 "Conservation of Biodiversity and other provisions," no regulatory acts as foreseen by Article 6 of the same law have been issued for the areas under study, which would define specific terms and restrictions for construction, land use, and other matters regarding the protection and ecological management of SPAs and SACs/SCIs. At present, the Ministry of Environment and Energy (YPEN) is implementing the preparation of Special Environmental Studies (SES), Presidential Decree (PD) drafts, and Management Plans for all Natura 2000 areas, funded through the Operational Programme of NSRF 2014–2020. Up until the preparation of this SEAS, public consultation for the corresponding SES 01B had been completed. However, the study had not been approved, and no PD had been issued to designate the protection zones and the permitted or prohibited activities.

The content of the SEAS was specified by Ministerial Decision YA 170225/2014 (Annex 3.2) and includes:

(a) a detailed recording of natural environment data, with emphasis on the protected features of the Natura 2000 areas potentially affected by the project or activity, (b) appropriate assessment and evaluation of

impacts, (c) mitigation measures for potential impacts, (d) compensatory measures (if required), and

(e) a monitoring program.

In the SEAS, the impacts of the project are assessed both individually and cumulatively with other existing or planned projects in the area. Additionally, the integrity of the site and the conservation objectives are taken into account. If the construction of the project is deemed necessary for reasons of overriding public interest, compensatory measures are adopted.

Specifically, the SEAS includes:

- **(Chapter 1)** A description of the existing environmental conditions (based on literature and field surveys to fill information gaps and collect accurate data) for the relevant Natura 2000 areas, taking into account:
    - the habitat types of Annex I of Joint Ministerial Decision 14849/853/E103/2008, especially in terms of representativity, area, and conservation status (for SACs/SCIs),
    - the flora and fauna species of Annex II of the same JMD, particularly regarding population size and density, conservation status, and isolation (for SACs/SCIs),
    - the bird species of Annex I of JMD 37338/1807/E.103/2010, as well as other migratory bird species with significant presence in the Natura 2000 area, especially in terms of population size and density, conservation status, and isolation (for SPAs),
    - the conservation objectives.
- **(Chapter 2)** The appropriate assessment and evaluation of the project's or plan's impacts, either alone or in combination with other plans or projects, taking into account the site's conservation objectives.
- **(Chapter 2)** The determination of whether the project or plan may have adverse effects on the integrity of the site.
- **(Chapter 3)** Examination of mitigation measures.
- **(Chapter 4)** Monitoring program.

II Brief description of the Project

The following sections provide a summary description of the Project. The detailed technical description is presented in Chapter 5 of the Environmental Impact Assessment (EIA).

II.1 Key Project Information

II.1.1 General Information

The project under study is a full-scale CO_2 storage facility located in Prinos. The operation of the facility is planned to be developed in two distinct phases (Phase 1 and Phase 2) to allow scalability and adaptability to market conditions.

- **During Phase 1** (see Figure 1), an initial nominal capacity of up to **1 million tonnes per annum (MTPA)** is foreseen for a 20-year period (with commencement expected around the end of 2025 or early 2026). Phase 1 is subdivided into two sub-phases:
    - **Phase 1a**: CO_2 will be supplied mainly in bulk via a pipeline reaching the boundaries of the onshore facility under suitable conditions for injection. Small volumes of CO_2 will also be delivered to the Sigma onshore facility by trucks as part of pilot carbon capture projects.
    - **Phase 1b**: The facility will be modified to receive liquefied CO_2, which will be delivered by marine carriers at a newly constructed jetty.
- **During Phase 2**, an expansion to a final nominal capacity of **up to 3 MTPA** is planned.

This study focuses on **Phase 1a** of the project. The CO_2 sources and the key reception processes during Phase 1a will be as follows:

1 **Bulk CO_2 Delivery via Pipeline:**

A land-based station within the Sigma facilities, consisting of the CO_2 pipeline receiving manifold, will receive up to **1 MTPA** of compressed CO_2. The CO_2 stream will then be transported via a new dedicated pipeline to an existing offshore platform, where CO_2 will be injected through **dedicated injection wells**.

The CO_2 stream will originate from remote producers and is expected to be delivered under appropriate pressure and temperature conditions for injection through the subsea pipeline. The CO_2 receiving manifold will channel the stream through a **12-16" diameter pipeline, approximately 20 km in length**, to the Prinos offshore facilities. This pipeline will initially handle up to **1 MTPA** of compressed CO_2, but it will also be capable of accommodating the project's future capacity (**3 MTPA**). The **riser** connecting the platforms will be equipped with **Emergency Shut Down Valves (ESDV)** for isolation. Additionally, to prevent low temperatures in the pipeline and the formation of **hydrates/salts** near the injection site, an **electric start-up heater** and a **methanol injection system** will be installed.

2 **CO_2 Cargo Reception:**

CO_2 cargos will arrive by **truck** at the Sigma onshore facilities and will be transferred into **ISO containers**. These containers will be loaded onto **supply vessels** or **barges** using cranes, transported, and unloaded at the existing **Beta platform** of the offshore Prinos facilities via a **flexible hose system**.

This unloading process involves connecting the vessel to the platform piping and supplying CO_2, which will be conditioned to meet the necessary injection parameters. On the platform, appropriate conditions for injection will be achieved (**pressure: 101 barg, temperature: 20°C**, according to the pre-FEED study). The main processing equipment, including a **pumping/compression station**, will be installed on the open deck of the Beta platform.

Furthermore, the vessel may be equipped with **integrated pumps/compressors** to boost the CO_2 stream pressure, facilitating flow through the flexible hose from the vessel to the platform. Provision will also be made for the **direct injection of CO_2 cargos** into the **onshore manifold**, using a **compression station** during unloading from the trucks.

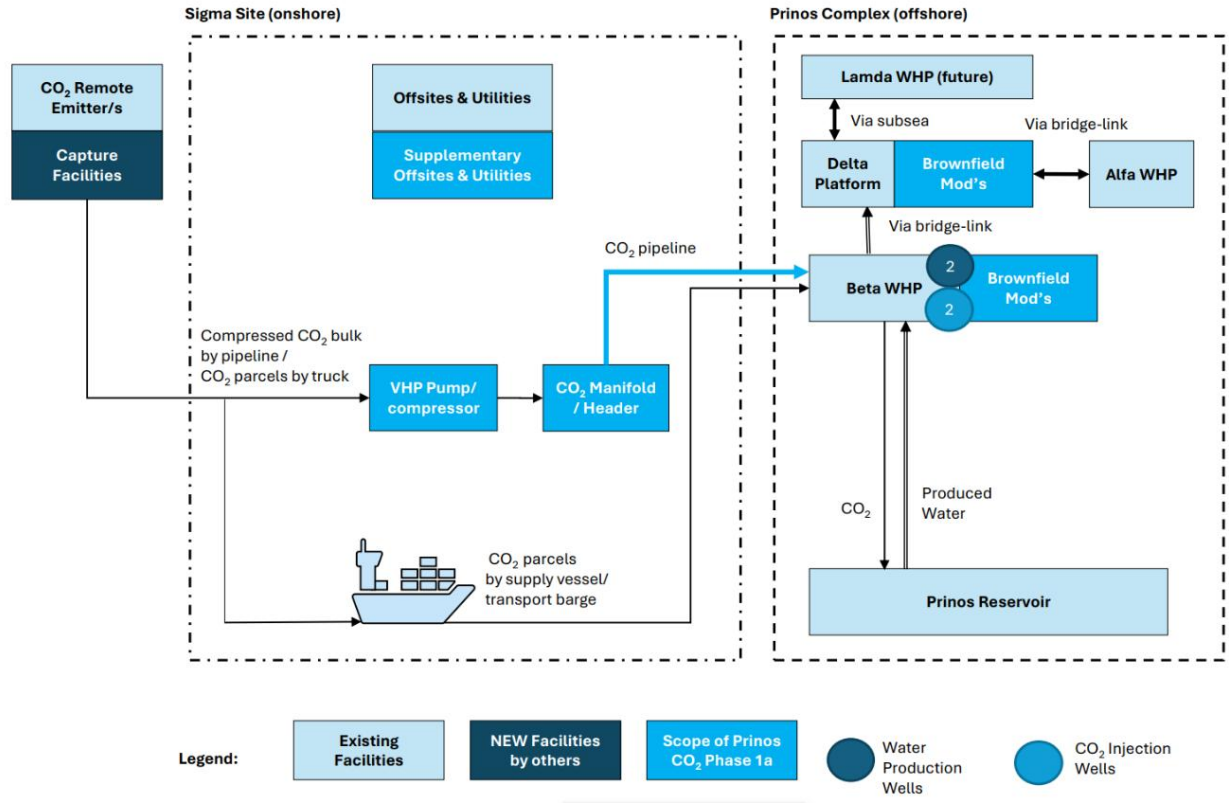


Figure 1: Schematic diagram for Phase 1 of the Prinos CO2 Storage Project

Table 1: Amounts of CO2 expected to be received in the form of shipments through the Program

EU Horizon Program	Q4 -2025	2026	2027
Pilot Program 1		400-1.400 tons	
Pilot Program 2	5.475 tons		

Regarding the quantities of CO2 expected to be received in loads and the frequencies of receipt, the following assumptions are made:

- Considering a quantity of 400 tons from Pilot Project 1 in the light of the EU Horizon Europe program, 19 trips by a truck with a capacity of 21,375 kg will be needed (indicatively, 18 trips with 100% loading capacity, 1 trip with 71% loading capacity) to deliver the total quantity of CO2 loads. A frequency of 1 truck per week is assumed for a duration of almost 5 months (19 weeks).
- Considering a quantity of 40 tons from Pilot Project 2 in the light of the EU Horizon Europe program, it will be necessary to make 2 trips by a truck with a capacity of 21,375kg (indicatively, 1 time with 100% loading capacity, 1 time with 87% loading capacity) to deliver the total quantity of CO2 loads. A frequency of 1 truck per 3 months is assumed.

There is also provision for direct injection of CO2 cargoes from the containers into the pipeline's receiving manifold at the onshore facilities. This configuration creates the need for a compression station upon unloading from the trucks adjacent to the receiving manifold area. In this case, the trucks will unload the ISO containers adjacent to the receiving manifold area. A flexible hose will be used to discharge the contents of the ISO containers into the compressor, from where the CO2 will be directed to the receiving manifold ensuring that all safety measures for safe operation are observed.

The frequency of cargo transfers to BETA by Energean vessel will be in line with that of the trucks delivering cargoes to the Sigma onshore facility.

The new facilities and wells envisaged for the operation of the CO2 Storage Project include:

- Onshore facilities: modification of a certain area within the existing area at the Sigma plant for the construction of the receiving collector and an unloading area.
- Offshore pipeline: a subsea pipeline connecting the Sigma plant area to the Beta offshore platform, approximately 20 km long.
- Offshore platform: modification of the existing Prinos offshore facilities to receive CO2 from the new subsea pipeline and CO2 cargoes in containers, and injection into the new wells.
- Wells: 2 CO2 injection wells and 2 water production wells on the existing Beta platform of the Prinos offshore complex.

II.1.2 Existing Facilities

II.1.2.1 Onshore facilities Sigma

The Sigma onshore unit includes facilities for the desalination and stabilization of the produced (in offshore facilities) crude oil, the separation of sweet from the produced (in offshore facilities) sour gas, the production of liquid sulfur, as well as the required facilities for the safe storage and handling of the produced crude oil, natural gas and sulfur.

The Sigma unit also has the required auxiliary facilities (typical examples: steam production and distribution, air compression & dehumidification, nitrogen storage, deionized water production, flare) as well as facilities for the collection, temporary storage and treatment of the waste produced at each stage of the production process and the urban wastewater of the personnel.

According to JMD 1958/2012 as amended by the Ministry of Energy and Water Resources/Oil and Gas. 37674/10-8-2016 and the Ministerial Decree no. 2307/14-02-2018, the project belongs to the 9th Group: Industrial activities and related facilities and is classified overall in Subcategory A1. According to the classification table of industrial activities in degrees of nuisance of the Ministerial Decree no. 3137/191/Φ.15/2012 as in force (Government Gazette 1048/B/2012), the project includes High and Medium nuisance activities.

Also, the project is classified as a higher-level facility according to the Ministerial Decree no. 172058/2016 on compliance with Directive 2012/18/EU (Seveso III), as it includes onshore storage facilities for stabilized crude oil and liquid fuel gas.

The project includes the following activities according to NACE Rev.2 / STAKOD 2008:

- 20.13 Production of basic inorganic chemicals by chemical conversion
- 20.13 Production of inorganic chemicals only by simple mixing or hydration of components
- 52.10 Onshore storage facilities for petroleum, liquid fuels and chemical products
- 52.10 Storage of gaseous fuels
- 52.24 Cargo handling

The unit has been operating since July 1981 with a short interruption in the period 1998 - 1999 and 2021 - 2023. Every 2 years, operation is interrupted for approximately 15 days as part of the planned preventive maintenance of the facilities. The plant is supplied with crude oil and sour gas (raw materials of the production process) produced by the offshore production facilities through submarine pipelines in accordance with the relevant no. 8413/24-04-2018 ΑΕΡΟ.

The project operator, within the framework of no. 213450/05-12-2013 (ADA: ΒΛΓΦ0-ΒΦ7) ΑΕΡΟ of the project and the company's applied Health, Safety & Environment policy, has established an Environmental Unit within the facilities with a Responsible Environmental Engineer. A Waste Management Plan (WMP), a Ship Waste Management & Reception Plan, a Pollution Emergency Response Plan, a Safety and Health Plan and File (SAY-FAY) are implemented at the facilities. The project operator complies with the specifications and requirements of Joint Ministerial Decree 172058/2016 (Directive 2012/18/EE-Seveso III), as well as

the specifications of the International Ship and Port Facility Security Code (ISPS Code) of the International Maritime Organization (IMO).

The area of the Sigma facilities plot is 204,059 m2 and the total coverage of the buildings is 3,874 m2.

A total of 184 people are employed at the project facilities on a permanent basis (daily and in shifts). The technical staff consists of production operators, electricians, equipment technicians, welders, lifting equipment operators and mechanical equipment maintenance technicians.

The Sigma industrial unit, as environmentally licensed with No. 213450/05-12-2013 ΑΕΡΟ, includes the following processing and production lines:

- Line 1: Crude Oil Processing / Stabilization (Production capacity of stabilized crude oil: 27,000 bbls/d).
- Line 2: Processing of Sour Gas produced by the offshore facilities (Production capacity of desulfurized gas 333,000 Nm3/d).
- Line 3: Production of sulfur in liquid or solid form (Production capacity 478 MT/d):
- Line 4: Production of electricity for self-consumption with combined use of 2 gas turbines and 1 steam turbine (Production capacity 17.67 MWe).
- Line 5: Production of combustible gas liquids - NGL (Production capacity 264 m3/d).

Figure 2 shows the existing facilities of the Sigma plant. Figure 3 shows the loading and unloading berth and the submarine crude oil pipelines.



Figure 2: Satellite view of existing Project facilities (Bingmaps background, 2019)

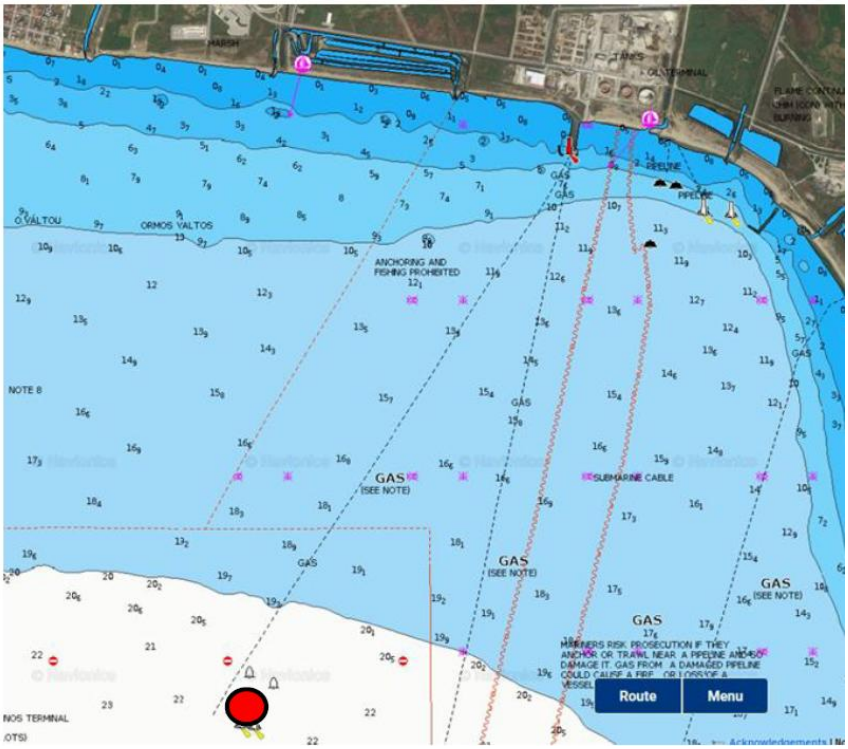


Figure 3: Location of existing crude oil tanker loading and unloading berth (marked in red) and the project's 24" and 16" subsea pipelines (background Navionics, 2020, Copernicus, 2020)

II.1.2.2 Offshore facilities

According to the current Env. Terms DIPA/8413/24.04.2018 (ADA: ΨΓΛ14653Π8-Ζ79), the Prinos Offshore Development project concerns the existing offshore oil and gas extraction facilities located in the Gulf of Kavala, in the Northeastern Aegean, and its expansion with two new platforms, one of which is long-term. The total production capacity is 27,000 barrels/day of stabilized crude oil.

The key elements of the Prinos Offshore Development project are summarized as follows:

- Existing offshore project, consisting of the following sub-facilities (which remain essentially unchanged during the project, with only minor modifications to the Prinos Delta platform to connect planned and potential future platforms):
- Kappa Platform located in the sweet, non-oil-derived natural gas field in South Kavala.
- 12 km, 6" pipeline (8-12 barg operating pressure) that transports sweet natural gas and condensate from South Kavala (Kappa platform) to the Delta platform of Prinos.
- Alpha and Beta production platforms, twelve drilling heads each, which are part of the Prinos complex, are connected by bridges to the Delta platform and are designed to accommodate suitable drilling rigs

- Delta processing platform that contains all the offshore primary processing facilities and which to date receives the oil, natural gas, water and condensate produced from the Prinos, North Prinos, Epsilon and South Kavala fields. The Delta platform is connected by bridges to the Alpha and Beta platforms as well as to the flare of. New vertical risers are being added to the Delta platform, to enable the reception of produced fluids from the Lamda platform (and possibly the Omicron platform) and to send natural gas (gas lift) and water for injection into the Lamda platform. A vertical protective conduit is also being added for the installation of the multi-carrier cable that will carry power, data, communications and auxiliary fluids to the Lamda platform.
- Prinos platform complex flare.
- 18 km, 12" pipeline (8 barg operating pressure) for the transport of sour natural gas from the Delta platform to onshore facilities.
- 18 km, 8" pipeline (20-40 barg operating pressure) for the transport of crude oil from the Delta platform to the onshore facilities.
- 18 km, 5.3" pipeline for the transport of fresh natural gas (gas lift) from the onshore facilities to the Delta platform.
- Two 10 kVA submarine power cables each, from the onshore facilities to the Prinos platform complex.
- Immediate expansion project, which includes the installation of a new satellite platform Lambda (currently under construction) as well as the drilling of 5 to 9 new production wells from this installation. The key elements of the planned expansion project are summarized as follows:
- New Lamda platform (currently under construction) approximately 3.5 km northwest of the existing Prinos platforms. The Lamda platform will host 5 to 9 wells producing from the Epsilon deposit. The platform is designed to be unmanned. All produced fluids are transferred to the Prinos Delta platform where the initial separation of oil, produced water and natural gas is performed using existing equipment and processes.
- Three subsea pipelines (currently under construction) connecting the Lambda platform to the Delta platform, which include a 10" pipeline to transport all produced fluids from the Lambda platform to the Delta platform and two 6" pipelines to transport injection water into the field and natural gas for gas lift, respectively, from the Delta platform of Prinos to Lambda.
- Five to nine wells to be drilled from the Lambda platform in the Epsilon field, which will initially be completed as producers, while two to four of them will subsequently be converted for water injection. The final number of wells will be finalized after the confirmation of recoverable reserves. The new platform is equipped with 15 well sockets. Initial drilling will be carried out with a partnered suitable rig, followed by the installation of the Energean Force rig on the rig and its barge moored at eight mooring points.
- Future expansion project, for the further development of the North Prinos and Kazaviti fields, with the installation of a second new drilling rig, similar to Lambda, to be called Omicron and located

between the North Prinos and Prinos fields. Kazaviti will be drilled with the 3rd lateral from the Prinos Alpha rig, in order to inform the decision on the viability of its development.

The location of the existing and future offshore development of Prinos is given in Figure 4 and the coordinates of the platforms in Table 2.

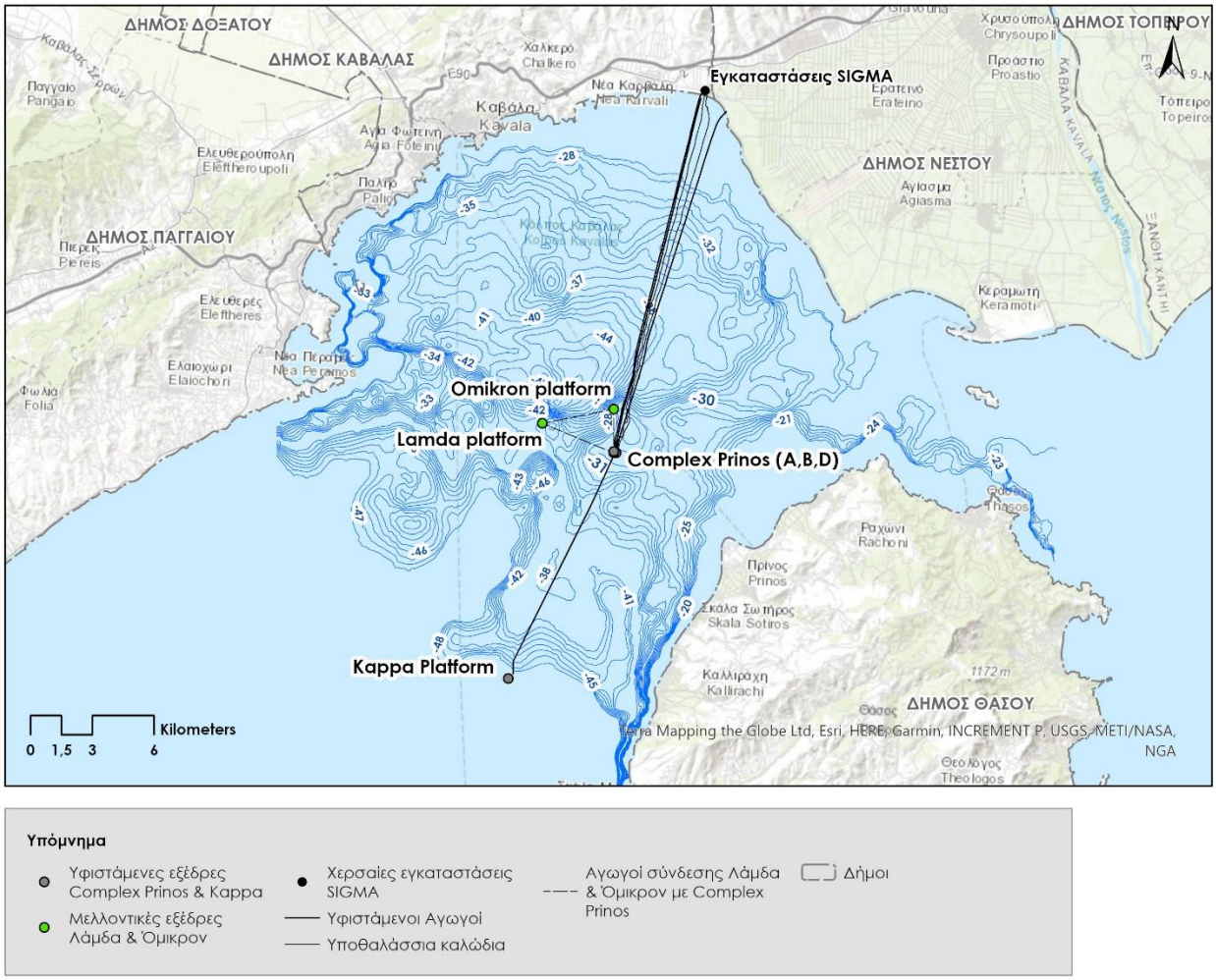


Figure 4: Prinos offshore development area

Table 2: Platforms position

Platforms	Latitude (WGS 84)	Longitude (WGS 84)
Alpha (Complex Prinos) - existing	24°29′ 49.62′ ′ E	40°47′ 57.62′ ′ N
Beta (Complex Prinos) - existing	24°29′ 54.41′ ′ E	40°47′ 55.36′ ′ N
Delta (Complex Prinos) - existing	24°29′ 50.40′ ′ E	40°47′ 54.92′ ′ N
Kapa - existing	24°26′ 34.95′ ′ E	40°42 03.74′ ′ N
Lamda – future	24°27′ 12.97′ ′ E	40°48′ 33.55′ ′ N
Omicron - future	24°29′ 45.17′ ′ E	40°47′ 06.71′ ′ N

Water treatment on the Delta platform

A special mention is made below of the water treatment carried out on the Delta platform, as these facilities will also be used to treat water from the new water wells on the Beta platform.

The water produced by the V-101 A/B and V-107 separators is transferred to the M-111 oil separator. This is a horizontal vessel (1,850 mm in diameter and 7,625 mm in length) that performs the following functions:

- Separation and removal of small quantities of gas and hydrogen sulfide, which are produced as the water expands from the high pressure of the separators to the atmospheric pressure of the oil separator.
- Separation of oil droplets from the water by gravity and with the help of special plastic agglomeration networks.
- Oil collection and removal to the oil collector M-166.
- Water removal and transfer to the second oil separator in series M-111 B.

The part of the oil separator where the agglomeration occurs provides a large contact surface, where the oil droplets join together, rise to the surface and create an oily layer. The oil is collected and transferred to the oil collector M-166 and then to the oily water and oil collection tank V-133.

When a sufficient amount of liquid is collected, the automatic monitoring system, depending on the level, activates one or both of the P-133 A/B pumps, which return the liquids from V-133 to the inlet of the V-101 A/B separators.

The water from the agglomeration part of the oil separator is transferred to the stilling zone at the rear of the vessel, where any oil droplets are separated by gravity, and is then transferred to the V-111 hydrogen sulfide stripper.

Although the first oil separator M-111 usually achieves complete oil retention, a second oil separator M-111 B (2,700 mm diameter and 6,650 mm long) operating at zero pressure is operated in series, of similar design but with significantly greater capacity. The second oil separator ensures the quality of the discharge water in the event of a malfunction of the upstream equipment. In normal operation, no oil is removed from this vessel.

The capacity of the two oil separators in series is 164 m3/hour (3,936 m3/day). The two oil separators can also operate in parallel with a total capacity of 238 m3/hour (5,712 m3/day).

The V-111 hydrogen sulfide stripper is a 30 m high tower with 35 trays operating at near zero pressure and a temperature of 77°C. In this tower, the remaining hydrogen sulfide is removed from the produced water.

Although the first oil separator M-111 usually achieves complete oil retention, a second oil separator M-111 B (2,700 mm diameter and 6,650 mm length) operating at zero pressure is operated in series and is of similar design, but with significantly greater capacity. The second oil separator ensures the quality of the discharge water in case of malfunction of the upstream equipment. In normal operation, no oil is removed from this vessel.

The capacity of the two oil separators in series is 164 m3/hour (3,936 m3/day). The two oil separators can also operate in parallel with a total capacity of 238 m3/hour (5,712 m3/day).

The V-111 hydrogen sulfide stripper is a 30 m high tower with 35 trays operating at near zero pressure and a temperature of 77°C. In this tower, the remaining hydrogen sulfide is removed from the produced water.

The removal of hydrogen sulfide is achieved through a flow of sweet natural gas. The addition of hydrochloric and citric acid at the inlet of the stripper contributes to the removal of hydrogen sulfide and the prevention of the formation of salts inside it.

The stripper is designed for a maximum water production of 100 m3/hour (2,400 m3/day). In case of exceeding 100 m3/hour (not observed), the excess is directed to the M-164 tubular oil separator, after passing through the M-111 and M-111 B oil separators.

The high capacity and good oil separation efficiency on the Delta platform (M-111, M-111 B), means that the water after the oil separators – which then enters the V-111 stripper, contains minimal residual hydrogen sulfide, which can in turn be removed in the M-164 skim pile and the TK-164 subsea settling tank, where the treated water ends up. This allows the V-111 stripper to be avoided when the water flow is low.

The produced water treatment system is designed to reduce the oil concentration in the water to 10 ppm. Regular sampling is carried out to ensure this water quality. The actual concentration in the water released to the sea is slightly below this level, due to the residence time in the skim pile and the subsea settling tank. Additionally, the oil droplets are agglomerated and the separated oil in the settling tank is pumped back to the platform.

II.1.3 New facilities

II.1.3.1 Storage area

II.1.3.1.1 Activation of CO2 Storage Right

Energean holds, among others, the rights to explore for and exploit hydrocarbons in the offshore exploitation area of the Prinos oil fields under the contract with the Greek State dated 23.11.1999, as ratified by Law 2779/1999 (Government Gazette A 296/30.12.1999) and as in force today. Consequently, within the framework of its activities in the area, Energean proceeded with the design and licensing of a CO2 Storage Unit in Prinos, making use of Article 173 of Law 4964/2022. More specifically, in accordance with Law 4964/2022 (Government Gazette A 150/30.07.2022) entitled "Provisions for the simplification of environmental licensing, establishment of a framework for the development of Offshore Wind Farms, addressing the energy crisis, environmental protection and other provisions", and more specifically based on no. 173 thereof, the entities to which the Greek State has granted (according to Law 2289/1995 (A' 27)) the right or permit to explore and exploit hydrocarbons in a specific area, and which have sufficient data (in particular geological, geophysical and drilling) to document the eligibility in principle as a carbon dioxide (CO2) storage site, of a geological formation or formations located in the subsoil of the granted area (onshore or offshore), acquire (under the conditions of the said article) the right to continue and complete the exploration process of the specific area in order to determine its suitability for CO2 storage.

Based on the above, Energean requested from HEREMA on 31.08.2022 the activation of the right to continue and complete the investigation of the structures of the Prinos, Epsilon fields and the underlying aquifer (the "Area") in order to determine their suitability as CO2 storage sites. The said application was

accepted with the Decision to Activate the Right to Explore for CO2 Storage (as approved by the decision of the Hellenic Energy and Natural Resources Development Authority (EGD) No. 14577/29.09.2022 (Government Gazette 5247/B/11.10.2022)), which approved the in-principle eligibility of the storage site, which is located within the boundaries of the Prinos concession and includes the structures of the Prinos, Epsilon fields and the underlying aquifer, as well as approved the continuation and completion of the exploration of the Area as a storage site for a period of twenty-two (22) months starting from October 1, 2022 by Energean.

The Area extends from a depth of 1900 to a depth of 4200 m, with the delimited volume of the storage space set at 93.4 km3.

According to par. 5 of art. 173 of L. 4964/2022, after the completion of the suitability investigation and before the expiration of the right to complete the investigation, the interested entity submits an application to EDEYEP, in order to determine the suitability of the geological formation as a CO2 storage site and to activate the entity's storage right. Based on this Law, the interested entity may be either the entity with the right to continue and complete the investigation (in this case Energean), or an affiliated company with the same, whose exclusive purpose is the activity of CO2 storage (in this case EnEarth).

With the progress and completion of the exploration procedures of the Area as a CO2 storage site, EnEarth, as an affiliated company of Energean, submitted on 30.06.2024 an application in order to determine the suitability of the geological formation as a CO2 storage site and to activate the storage right of the entity in accordance with par. 5 of article 173 of Law 4964/2022. Energean, as the entity with the right to continue and complete the exploration, has co-signed the above application.

II.1.3.1.2 Key Features of the CO2 Storage Site

The CO2 storage site under study is located within the Prinos Basin, in the Gulf of Kavala, in the North Aegean. The deposits in this area have been explored since the 1970s, followed by oil production from 3 deposits within the Prinos Concession, as well as natural gas production from the South Kavala Concession (see Figure 5), since the 1980s.

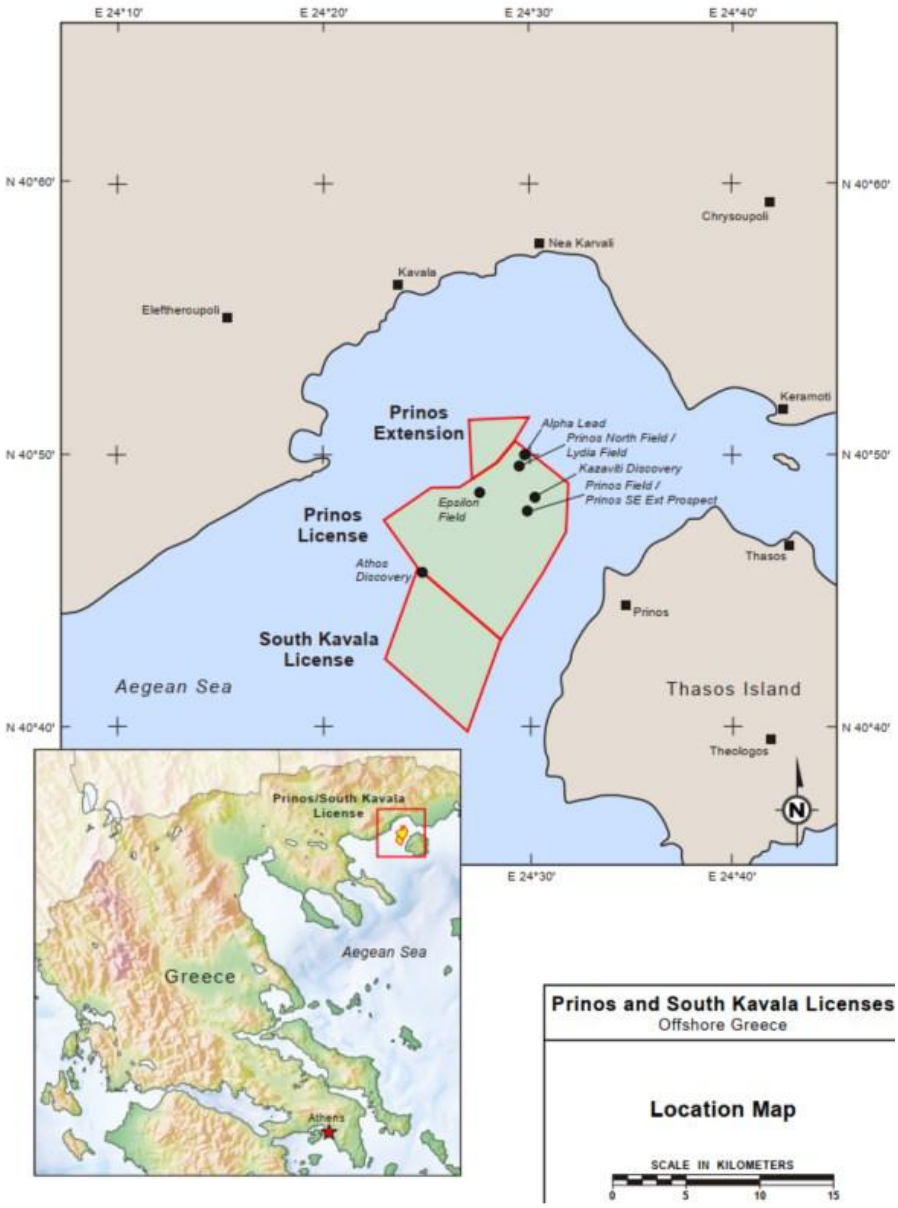


Figure 5: Map of the Prinos Basin with active Concessions

The area of interest for the exploration site for CO2 storage is located within the Prinos Concession, where Energean has held 100% of the interests and management for oil and gas exploration and development activities since 2007.

As the studies carried out for the Project matured, it was found that it is more efficient to confine the CO2 storage to the Prinos structure.

The potential CO2 storage location is located within the Prinos structure, as shown in Figure 6.

In order to qualify this area as suitable for CO2 storage (at a reservoir scale), the wider surrounding area is assessed as a storage complex (at a basin scale), covering a wider area of the required minimum radius of 1 km around the storage site (see Figure 7).

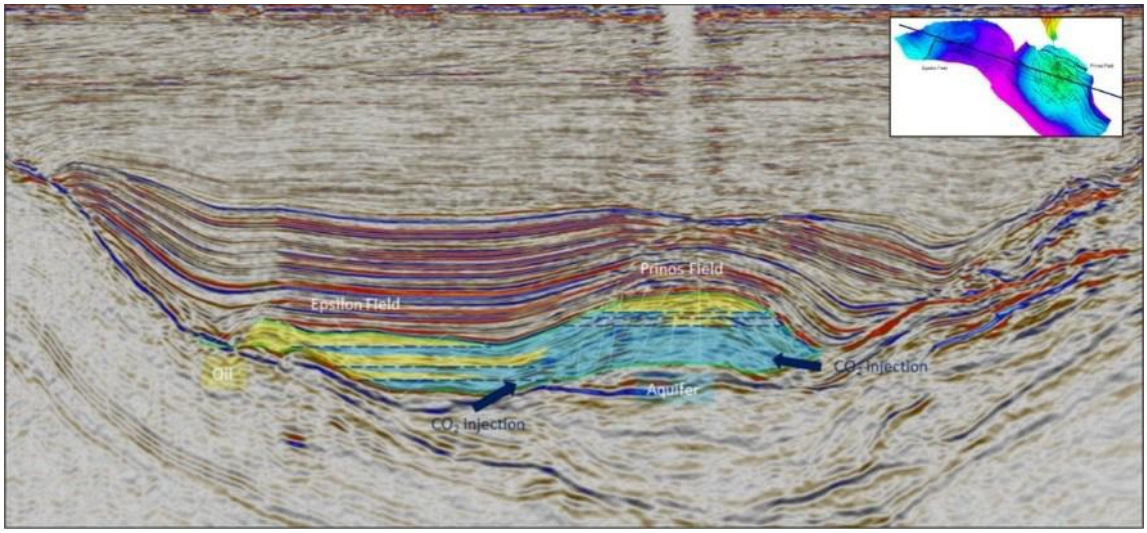


Figure 6: Cross-section of the potential CO2 storage field in the Prinos structure (yellow indicates the oil layer, blue the aquifer and white the CO2 plume). CO2 injection wells are shown in green and water production wells in blue.

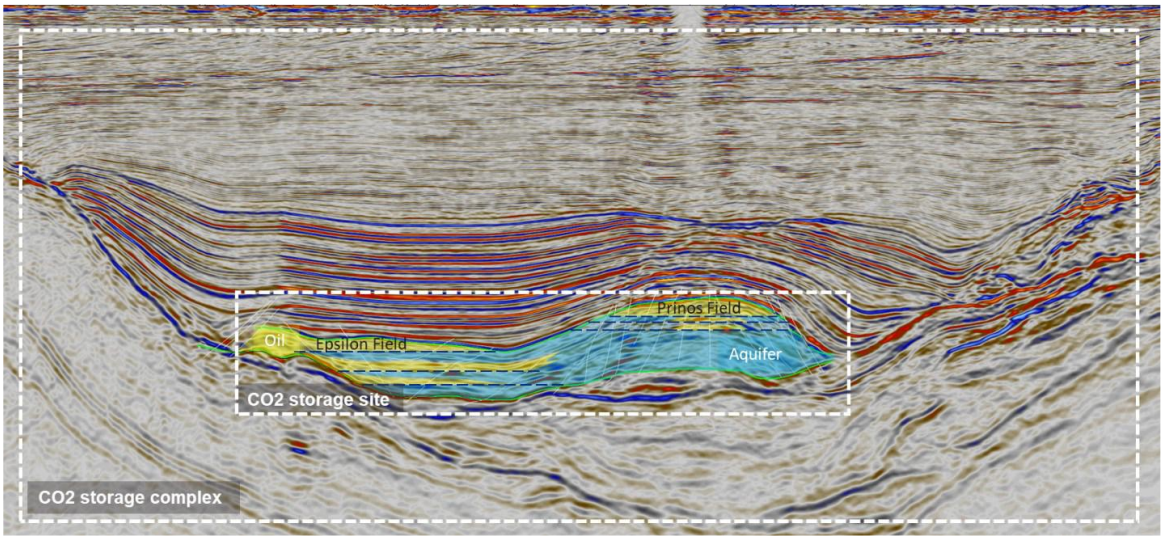


Figure 7: Cross-section of the potential CO2 storage site and storage complex as included in the exploration permit. Following the assessment of the area, the Epsilon field was excluded from the CO2 injection and storage area.

II.1.3.1.3 CO2 Storage Site and CO2 Storage Complex

The concept of storage complex is broader than the concept of storage site, as shown in Figure 8. It includes the storage site as well as the surrounding geological formations, the nature of which is decisive for the effectiveness and safety of CO2 storage. These formations contribute to the overall storage capacity and the integrity of the CO2 storage project;.

A storage site refers to a specific volume within a geological formation that is selected and shaped for the purpose of storing CO2. It is designed to receive the injected CO2 and ensure its long-term storage. The site is supported by infrastructure for injecting CO2 into the geological formation, and surface infrastructure, which includes the necessary equipment and facilities for monitoring, controlling and maintaining the storage.

The continuous presence of impermeable rocks (caprocks) throughout the storage complex is essential for its integrity and safety. These containment formations provide a secure containment mechanism, reducing the risk of CO2 leakage or migration to the surface or other subsurface areas. Their continuity is a critical factor in identifying and characterizing a storage complex.

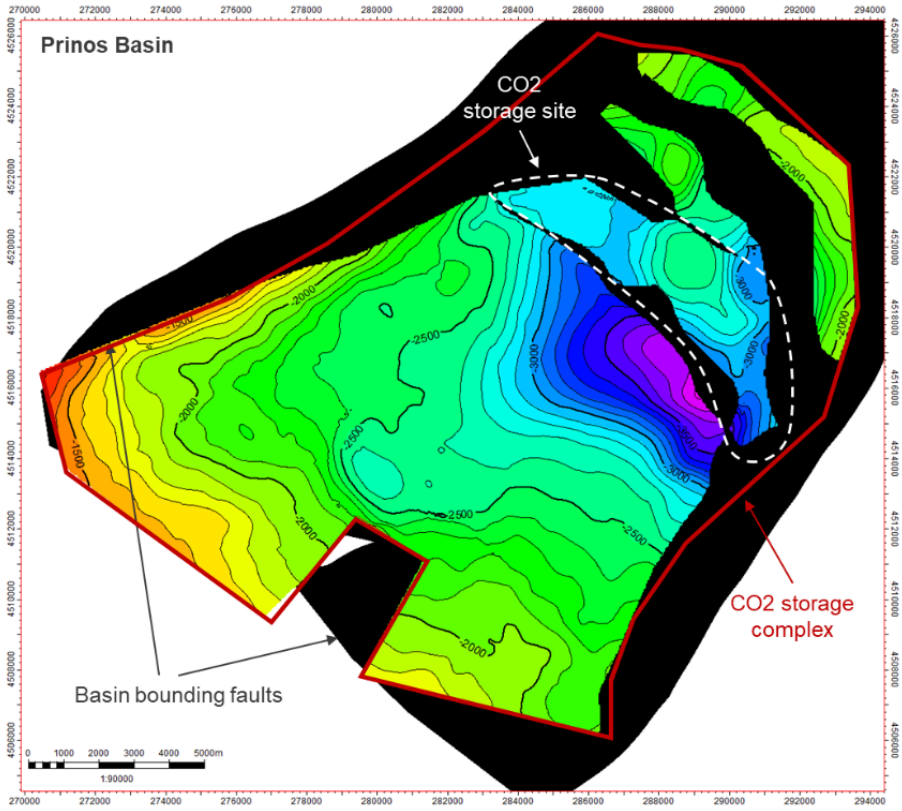


Figure 8: Plan view of the polygons of the Prinos complex and CO2 storage site, with the reservoir formations in the background

The storage complex area has therefore been selected due to the continuity of the geological formations within the basin, as well as the boundaries of the Prinos basin in all directions (demarcation by faults in the NE, SW, NW and SE). It is also noted that the sufficiency of data from oil and gas exploration and development

activities carried out over the last 40 years, enhances the certainty regarding the assessment of the site and the storage complex.

Figure 9 depicts the storage complex and the extent of the storage area, as well as the polygon of the Exploration Permit for CO2 Storage, within the Prinos basin.

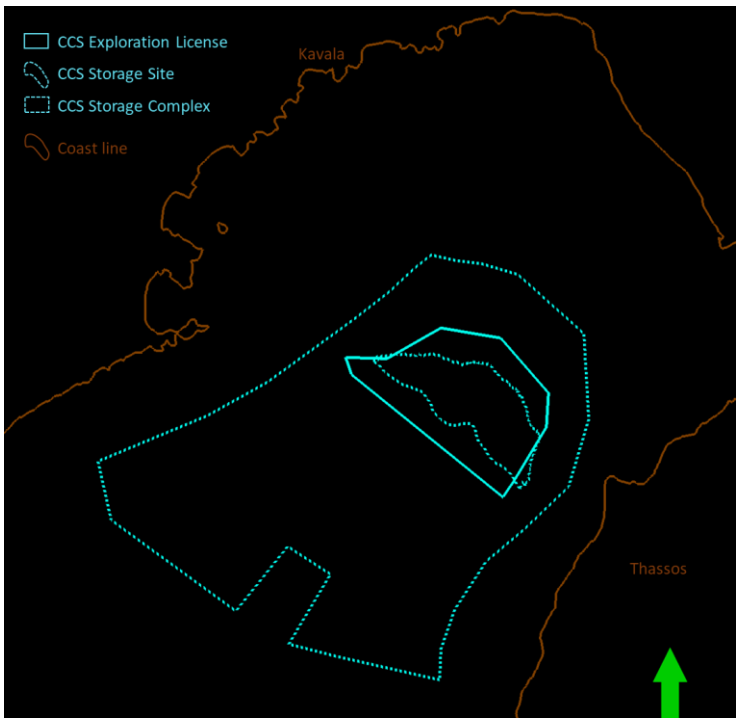


Figure 9: Plan view of the area of the surface storage complex (large polygon with dashed line), the area of the storage site (small polygon with dashed line) and the polygon of the exploration permit (solid line). The coastline in brown.

The storage complex covers an area of approximately 256.86 km2, with a perimeter of approximately 72.99 km. The storage site covers an area of approximately 20.16 km2 with a perimeter of 26.77 km.

The main units of the Prinos reservoir selected for CO2 storage consist of saline aquifers in the equivalent zones A1, A2, B and C. These aquifers present favorable rock quality, with a pure to mixed ratio exceeding 66%, an average porosity of 14% and an average permeability of 250 mD (with a maximum of approximately 6 Darcy). The top of the structure is located at a depth of -2475m TVDSS, the deepest parts of the structure are approximately -3615m TVDSS, and the storage site formations have an average thickness of approximately 285 m.

To ensure the tightness of the storage site, multiple seals are being considered. The basic cap consists of the shale layer covering the storage formations, which is defined by the seismic horizon of the lower saline bed, which extends throughout the area and has an average thickness of 20 m. In addition, the evaporite sequence overlying this sealing shale rock contains several layers of salt alternating with clastics, further contributing to the containment capabilities of the system. The effectiveness of the impermeable formations cap is also supported by the fact that they have effectively retained hydrocarbons over the geological time scale. The shales present in each of the four distinct reservoir units can be considered as secondary caps

(as evidenced by the oil production history of the last >40 years) or, at the very least, as potential barriers to vertical flow, enabling and enhancing CO2 sequestration.

Oil production from zones B and C of the Prinos field will be completed before CO2 storage begins. Production from zone A, as well as the Epsilon Field Development Program (FDP), will continue until 2035. CO2 injection will target zones B and C of the reservoir with two injection wells during the period 2025-2035 and two water wells, and will then be extended to the entire reservoir by the end of the Project.

The following Figures indicate the location of the water injection and production wells (Figure 10, Figure 11).

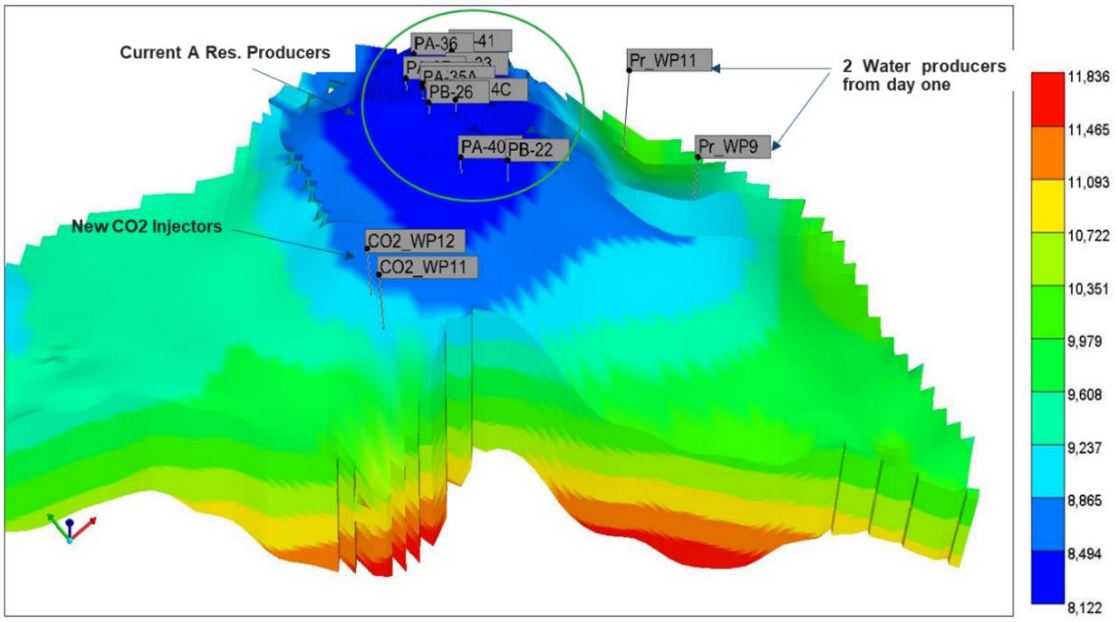


Figure 10: Location of boreholes in the storage field (3D view)

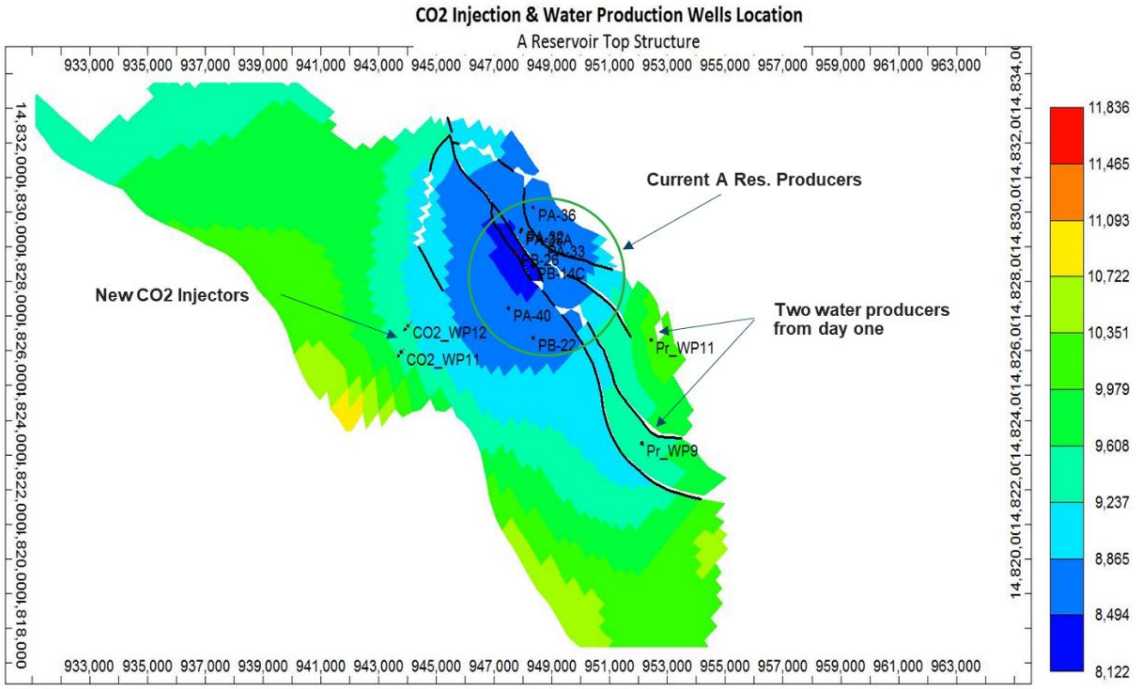


Figure 11: Location of boreholes in the storage field (top view)

II.1.3.1.4 Estimated capacity of the CO2 storage site

The CO2 storage site operating scenario includes a stepwise increase in the injection rate through the 2 wells in reservoirs B and C, starting in December 2025. The CO2 injection rate starts at 0.25 MTPA and gradually increases to 1 MTPA within the first three years. The maximum injection rate of the 2 wells is 0.5 MTPA per well. According to the results of the geomechanical study of the formation, a maximum flow pressure at the bottom of the wells (max FBHP) of 7000 psi has been set. To manage the reservoir pressure, the 2 water wells produce water from the aquifer of reservoirs B and C at a maximum rate initially of 7.5 kbwpd, and then (in 2035) at 9 kbwpd. The total CO2 storage capacity of this baseline scenario is estimated to reach 18 MT by the end of 2045 (20 years) and 22.8 MT by the end of 2050.

II.1.3.2 Modifications to existing facilities

II.1.3.2.1 Beta Platform modifications

The existing Beta platform has 12 wells and is connected to the Delta processing platform (see Figure 12).

The Beta platform will be modified to include the necessary CO2 injection facilities. It will be equipped with a riser, header, CO2 cargo processing equipment, while the auxiliary facilities may be upgraded to accommodate the new activities. Two CO2 injection wells and two water production wells will be drilled. The new wells will be diverted using the existing wells on the Beta platform. Prior to diversion, the existing wells will be sealed and abandoned. The two water wells will operate Electric Submersible Pumps (ESPs) to produce the required water, which will then be managed in the existing processing facility on the Delta platform.

The 4 of the 12 slots will be used for the two new CO2 injection wells and the two new water production wells.



Figure 12: Beta and Delta Platforms

The work will be carried out under safe conditions and with SIMOPS work permits currently in place as part of the Prinos operating procedures.

The process flow diagram below illustrates the equipment required from the top of the riser to the injection well (see Figure 13):

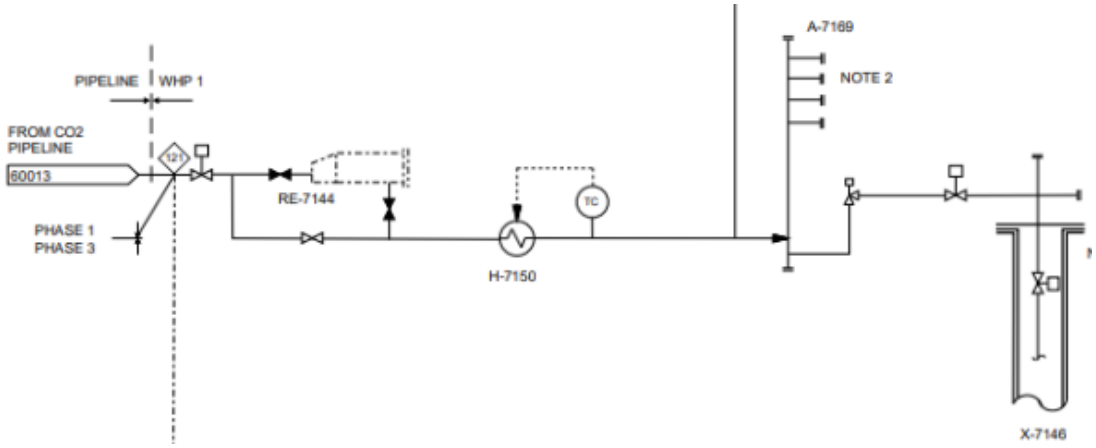


Figure 13: Flow diagram from the CO2 pipeline to the CO2 injection wells

- The equipment additions/modifications to the Beta platform will be summarized as follows:
- Piping to connect the new CO2 pipeline to a temporary connection point to the well.
- Piping related to the required start-up heater and compressor.
- Pipe connections to the “Christmas tree” and the injection wellhead.
- Safety valves and shutdown systems.
- Electrical interconnection and equipment for monitoring and communication with onshore control stations.
- Piping from the water production wells and piping connecting to the existing water treatment facility on the Delta platform via the existing bridge.

II.1.3.2.2 Delta Platform modifications

The Delta platform modification will involve a comprehensive upgrade of the ancillary facilities, the produced water treatment and disposal unit and the control and safety systems, so that the water that will be produced for reservoir pressure management purposes is treated using the existing facilities. This integrated approach optimizes the use of resources, while enhancing the operational efficiency of the platform and environmental management.

It is expected that the produced water from the storage project will undergo the same treatment as that of the current operation. However, this will be further investigated by taking water samples from the aquifer at the storage complex.

II.1.3.3 CO2 Management Facilities (Reception - Transport - Injection)

II.1.3.3.1 Onshore facilities – area configuration

The main infrastructure for the reception at the Sigma plant site during Phase 1a of the Project will be a reception station, consisting of the onshore CO2 pipeline manifold and a compression/pumping station for the CO2 loads. The area where the onshore equipment bases will be located is estimated at approximately 50 m2. The estimated excavation area for the onshore section of the pipeline is 200 m2.

Road access for the needs of the new Project will result from the delivery of CO2 loads by trucks from the Sigma plant Central Gate (see Figure 14).



Figure 14: Road access to serve the new facilities (land facilities)

The layout of the Sigma plant and the area designated for the reception and start point of the pipeline is shown below in red. The area will be approximately 30 m x 30 m and will also serve as the start point of the submarine pipeline on shore (see Figure 15).

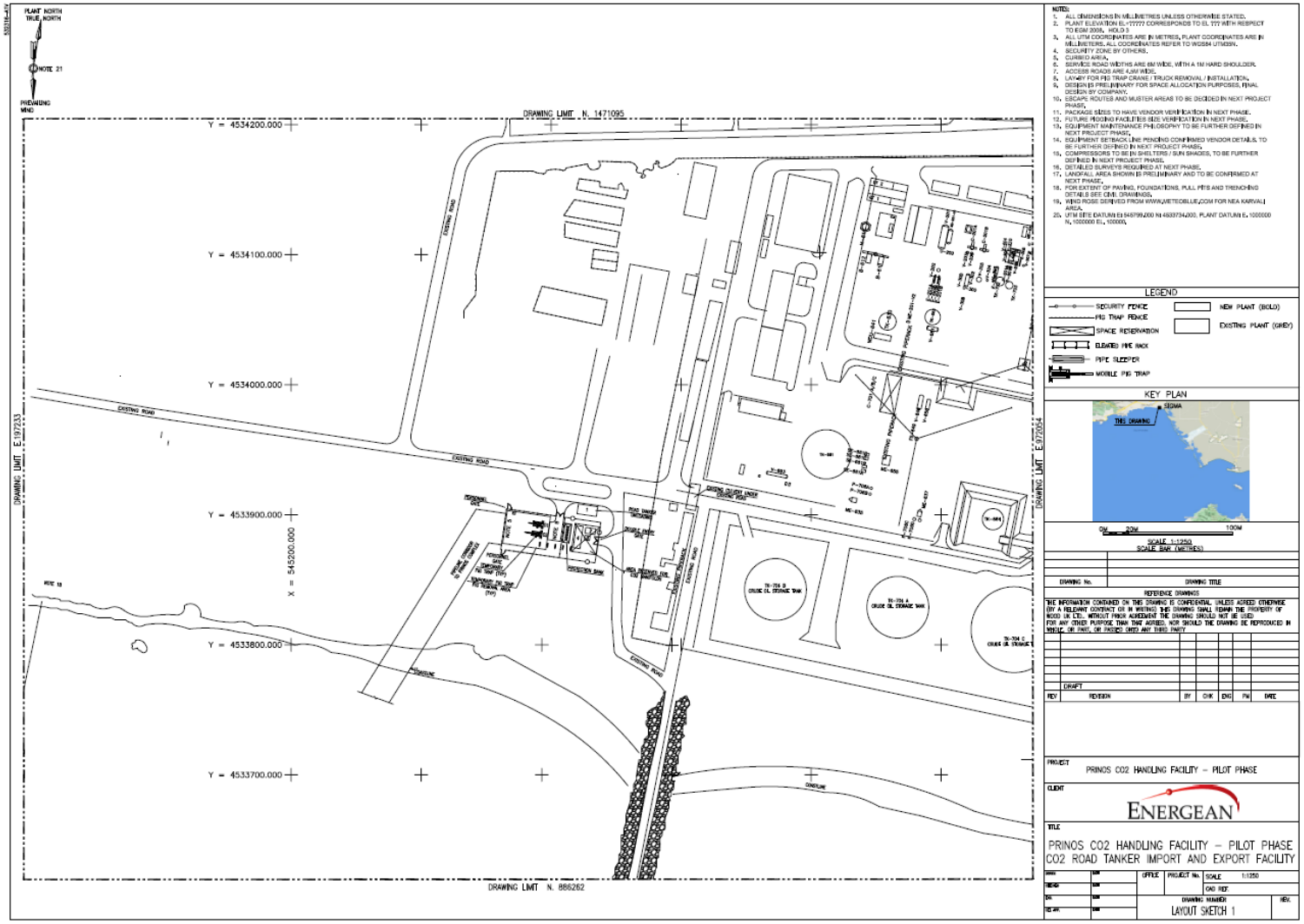


Figure 15: CO2 reception - transport land infrastructure area

The layout of the proposed onshore facilities has been developed in accordance with current industry standards for onshore oil and gas facilities. The key features of the facility include the following:

- 15 m safety distance from the site boundary for major equipment,
- 10 m distance for equipment placement,
- 6 m service road width with 1 m emergency lane,
- 10 m minimum inner radius for main service roads,
- 4 m access road width.

The main service roads will serve all units for operation/maintenance/construction and emergency access, ensuring vehicular movement in and out of the facility in both directions. The internal service roads will ensure flexible movement around the facilities for operations and maintenance.

The access road to the factory from the existing western road to Kavala will be asphalted and will have speed limit signs for vehicles approaching the factory. The main entrance gate for vehicles and personnel to the factory is located centrally on the western perimeter fence.

II.1.3.3.2 CO2 reception and management equipment

The onshore CO2 management facilities (reception, processing and pumping to the storage site) are located within the Sigma facility.

The type and nature of these facilities will be based on standard industry practices for gas transport from onshore to offshore facilities.

The basic equipment, the technical specifications of which are presented according to the results of the pre-FEED study, includes:

- Gathering pipeline with appropriate flange outlets. Design pressure: 240 barg, Design temperature: -46 °C, (operating conditions 90 to 220 barg).
- Portable pig launcher/receiver for the subsea pipeline. Design pressure: 240 barg.
- 12-16" onshore pipeline with welded connection to the subsea pipeline. Design pressure: 240 barg, Design temperature: -46 °C, (operating conditions 90 to 220 barg).
- Monitoring equipment, safety valves, control room.

The manifold and all required equipment for the supply of liquid CO2 via pipelines will be located in such a way as to minimize interaction with the existing installation.

The piping will be designed to minimize flange connections. All valves will be located to allow access for operation and maintenance, taking into account the duration and frequency of their use.

The CO2 cargoes will be transported to the Sigma dock and loaded onto supply vessels or the barge that will transport them to the offshore facilities of Prinos.

II.1.3.3.3 CO2 transport pipelines for storage

A 12-16" wide pipeline will be installed for the maximum capacity of Phase 1, which will also be sufficient for Phase 2 (1500#, material: CS, WT: 0.5", 3mm LPP coating, design pressure: 240 barg, design temperature: -46 °C).

The pipeline will be routed from the Sigma plant onshore area to an arrival point at the Beta platform (see Figure 16):

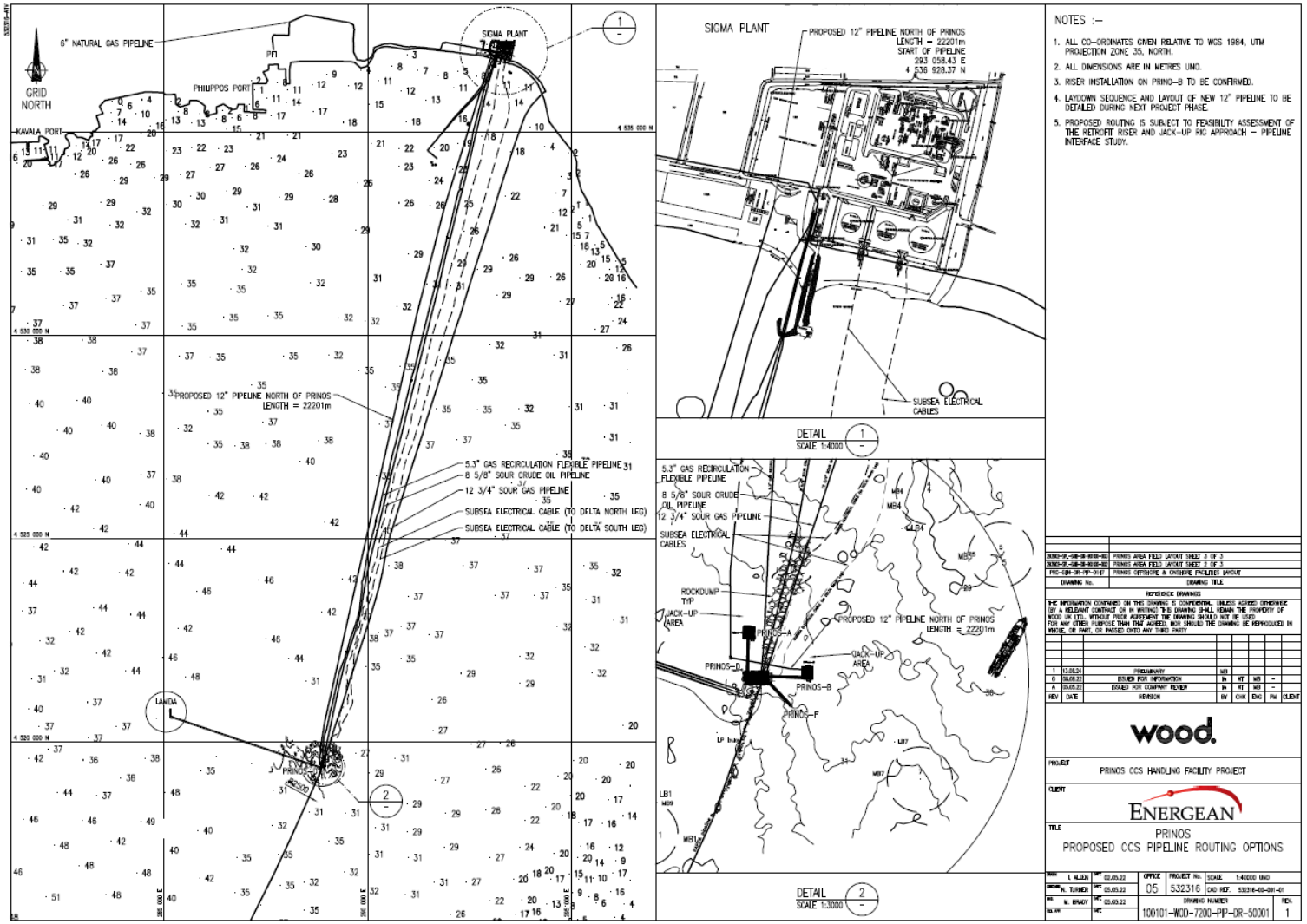


Figure 16: CO2 pipeline routing

Key pipeline features according to the preliminary design study (pre-FEED) completed in 2022:

- Length: 20 km, within the existing Prinos pipeline corridor.
- Size: 12-16" OD, 3 mm anti-corrosion coating, 30 to 50 mm thick concrete cover.
- Anti-corrosion protection: Anodes at appropriate intervals to provide a 30-year service life.
- Laying: The pipeline will be buried along its entire length to protect it from trawling fishing activities in the area. In the onshore section in the first 500 m, the burial depth from the top of the pipeline will be 2 m and in the offshore section the burial depth will be 1 to 1.5 m.
- Maximum water depth: 32 m at the platform location.

II.1.3.3.4 CO2 Injection and Water Production Drilling

It is planned to drill 2 CO2 injection wells and 2 water production wells in the Prinos field (see Table 3). All wells should be drilled within zones B and C of the Prinos reservoir in order to inject CO2 and simultaneously produce water from the aquifers located below zone A of the reservoir. The objectives of each well have been determined based on the Geomechanical Mapping Model of the reservoir boundaries.

Table 3: Final drilling depth criteria (UTM zone 35N)

TYPE OF BOREHOLE	NAME	DRILLING START	DEPTH OF NEW WELL (M)	TARGET	LOCATION
CO2 Injection	PBC-1	PB-17A	1.000	X:287725.69 y:4518803.72 Z:-2779.95	X:288963.21 y:4519413.86
CO2 Injection	PBC-2	PB-24	1.000	X:287778.73 y:4519015.54 Z:-2718.38	X:288963.21 y:4519411.57
Water Production	PBW-1	PB-22	1.000	X:290192.01 y:4517931.73 Z:-2741.54	X:288967.79 y:4519416.15
Water Production	PBW-2	PB-23A	1.000	X:290060 y:4518995 Z:-2840	X:288965.50 y:4519413.86

The drilling stages for each section up to the final measured depth of 3,700 m briefly include:

- 16" diameter drilling to a measured depth of up to ~ 2,200 m (vertical depth of 1,850 m).
- 12-1/4" diameter drilling to a measured depth of up to ~ 3,150 m (vertical depth of 2,667 m).
- 8-1/2" diameter borehole measuring depth up to ~ 3,700 m (vertical depth 2,800 m).

During the first 3 years of operation of the storage site, the CO2 injection rate will gradually increase, from 0.25 to 0.5, then to 0.75 and finally to 1.0 MTPA.

CO2 injection will target zones B and C of the reservoir with two injection wells during the period 2025-2035 and will then be extended to the entire reservoir by the end of the Project.

The water wells will be equipped with Electrical Submersible Pumps (ESP) and will extract water from the reservoir, to provide a means of actively managing the reservoir pressure. The produced water is channeled to the offshore water treatment facilities at the existing Delta platform, from where the clean water is finally released to the sea. The development of the water well operation is expected as follows, according to the present simulation studies:

- The two water production wells will operate with a production of up to 7500 bwpd each during the period 2025-2030 (6 years).
- Water production will increase to 9000 bwpd per well in 2031 and by the end of the Project.
- The capacity of 7500 bwpd/well is achieved with the electric submersible pump (ESP) operating at 83% of its capacity, while the capacity of 9000 bwpd/well is achieved with the electric submersible pump (ESP) operating at 100% of its capacity.

The water well layout will be similar to that of the CO2 injection wells.

II.2 Alternative solutions

As part of the EIA (Chapter 7), alternative solutions for the implementation of the Prinos CO2 Storage Project and for the offshore approach of CO2 loads to the storage field were examined and evaluated. Alternative solutions for routing the CO2 pipeline to the injection wells were also examined, as well as the "zero solution" alternative.

The exploration of alternative solutions focused on the development options that Energean explored during the design stages of the Prinos CO2 Storage Project. In line with international best practices in oilfield operations, Energean applies a structured process for the advancement of projects, which begins with the feasibility stage and the exploration of possible approaches and alternatives.

Each alternative was subjected to a comparative evaluation, based on economic criteria such as investment costs (CAPEX), operating costs (OPEX), as well as qualitative criteria such as operational flexibility, risk and environmental impact. The ultimate goal of the evaluation process is to identify the option that best aligns with key priorities such as minimizing environmental impacts, ensuring As Low As (Technically and Reasonably) Possible Risk (ALARP), maximizing the utilization of available facilities, resources and personnel, and minimizing investment and operating costs.

II.5 Construction schedule

The work schedule for the new onshore and offshore facilities and the drilling of the wells that will serve the CO2 Storage Project is presented in Table 4.

Table 4: Construction schedule

Project Activity during the construction stage	Duration
Onshore facilities: modification of a certain area within the existing area at the Sigma plant for the construction of the collector and an unloading and compression area.	3 months

Project Activity during the construction stage	Duration
Offshore pipeline: a subsea pipeline connecting the Sigma plant area to the Beta offshore platform, approximately 20 km long. The pipeline works will be carried out in several phases:	9 months
Phase 1 Geophysical and Geotechnical investigations along the pipeline route	1 month
Phase 2 Works to bring the pipeline closer to the shore, by dredging a 500 m section of the coastline, in the area of the pipeline head at the Sigma plant. The trench will be approximately 3 m deep throughout its length and will end at seabed level at the end of the 500 m zone	6 months
Phase 3 Subsea pipeline installation and hydrotesting using a specialized pipeline laying vessel	2 – 3 weeks
Phase 4 Installation of a riser on the existing Beta platform and work with divers to connect the riser to the end of the subsea pipeline	1 week
Phase 5 Final commissioning and testing	1 month
Offshore platform: modification of the existing Prinos offshore facilities to receive CO2 from the new subsea CO2 pipeline and inject it into the new wells.	4 months
Drilling: 2 CO2 injection wells and 2 water production wells on the existing Beta platform of the Prinos offshore complex.	8 months

II.6 Duration of operations

Energean envisages the construction of a full-scale carbon dioxide storage facility at Prinos, capable of storing significant quantities of CO2. The operation of the facility is planned to be developed in two distinct phases (Phase 1 & Phase 2), for reasons of scalability and adaptation to supply conditions, each of which has synergistic prospects that can achieve significant CO2 reductions.

- Phase 1: initial nominal capacity up to 1 MTPA for 25 years (starting 31/12/2025).
- Phase 2: expansion to a final nominal capacity up to 3 MTPA.

This study examines Phase 1 of the Project, during which the CO2 will be supplied mainly in bulk, by pipeline arriving on site in suitable conditions for injection. In small quantities, CO2 loads will also be received at the Sigma onshore facilities by truck through pilot projects.

III. Identification of Study Area (SA) and Field Research Area (FRA)

III.1 Identification of Study Area (SA)

According to the content specifications of the SEA (MD 170225/2014), the Study Area (SA) is defined as the entire Natura 2000 area covered by the project (see Figure 17), including the project alternatives.

Based on Annex 3.2 of MD 170225/2014, the SA may be extended outside the Natura 2000 Network area where the project under consideration is located and to a neighboring Natura 2000 area, when the project is likely to affect this area (individually or synergistically with other projects).

The project under consideration passes within the SPA & SCI GR1150014 “Marine area of Kavala - Thassos” which is included in the SA of the Project. As regards the bird fauna, the MP also extends to the neighboring areas of SPA GR1150001 “Nestos Delta and Keramoti Lagoons and Thasopoula Island” and GR1150012 “Thassos (Mount Ypsario and coastal zone)” because (A) the population of the Great Cormorant (Phalacrocorax aristotelis desmarestii) within SPA GR1150014 and a protected object of this area, is common with the one that breeds and gathers in SPA GR1150001 and SPA GR1150012, (B) certain breeding, wintering and migratory species of seabirds, aquatic and wading birds of SPA GR1150001 use the marine area of GR1150014 for feeding and movement and (C) the western part of SPA GR1150001 is located near the location of the terrestrial part of the project under consideration.

With regard to the other fauna and habitat types, the terrestrial part of the project under consideration is located at a distance of approximately 1 km from SPA GR1150010 “Nestos Delta and Keramoti Lagoons” and for this reason the Study Team considered it useful to include this area in the WP.

The distances of the project from the relevant Natura 2000 areas are given in Table 5.

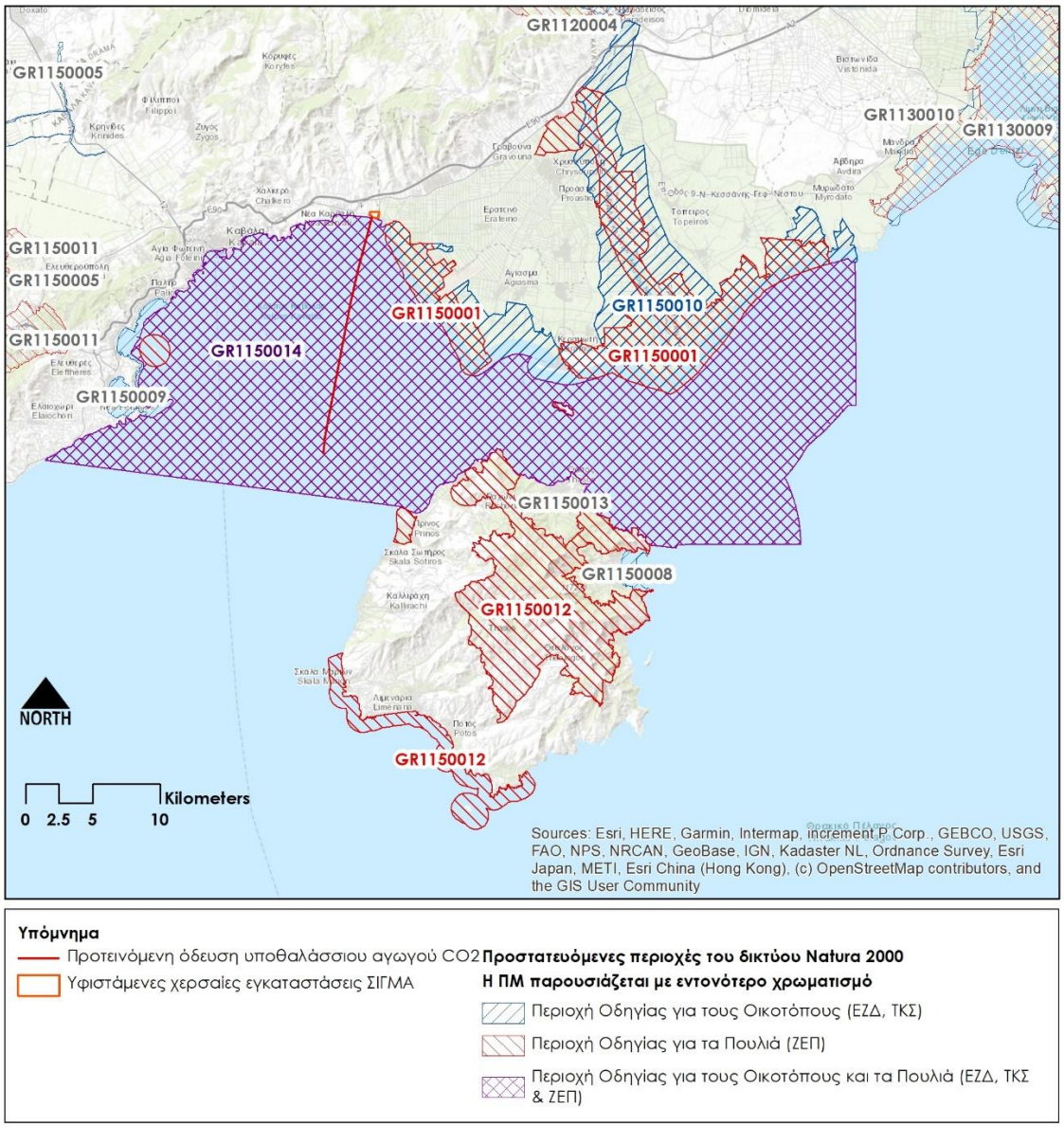


Figure 17: Study Area (SA) - SPA & SCI GR1150014, SPA GR1150001, SPA GR1150010 and SPA GR1150012

Table 5: SA and distance from the project under consideration

Code	Type	Name	Minimum distance from the project (km)
GR1150014	SPA & SCI	Kavala - Thassos marine area	Falls under
GR1150010	SPA	Nestos Delta and Keramoti Lagoons and Thasopoula Island	1,2
GR1150001	SAC	Nestos Delta and Keramoti Lagoons	1,2
GR1150012	SPA	Thassos (Mount Ypsarios and coastal zone)	6,9

III.2 Field Research Area (FRA) Identification

III.2.1 FRA

According to the content specifications of the MEOA based on the H.A. 170225/2014, the Field Research Area (FRA) for point and area projects or activities of Category A1 is defined as the area at a distance of at least 1 km from the boundaries of the field or the occupied area, while for linear projects at a minimum of 500 m on either side of their axis. In this SEAS and for reasons of uniform approach, an area at a distance of 1 km from the project was defined as FRA for both the linear and area characteristics of the project (see Figure 18). The total area of the FRA and its individual surface within the relevant Natura 2000 areas are presented in Table 6.

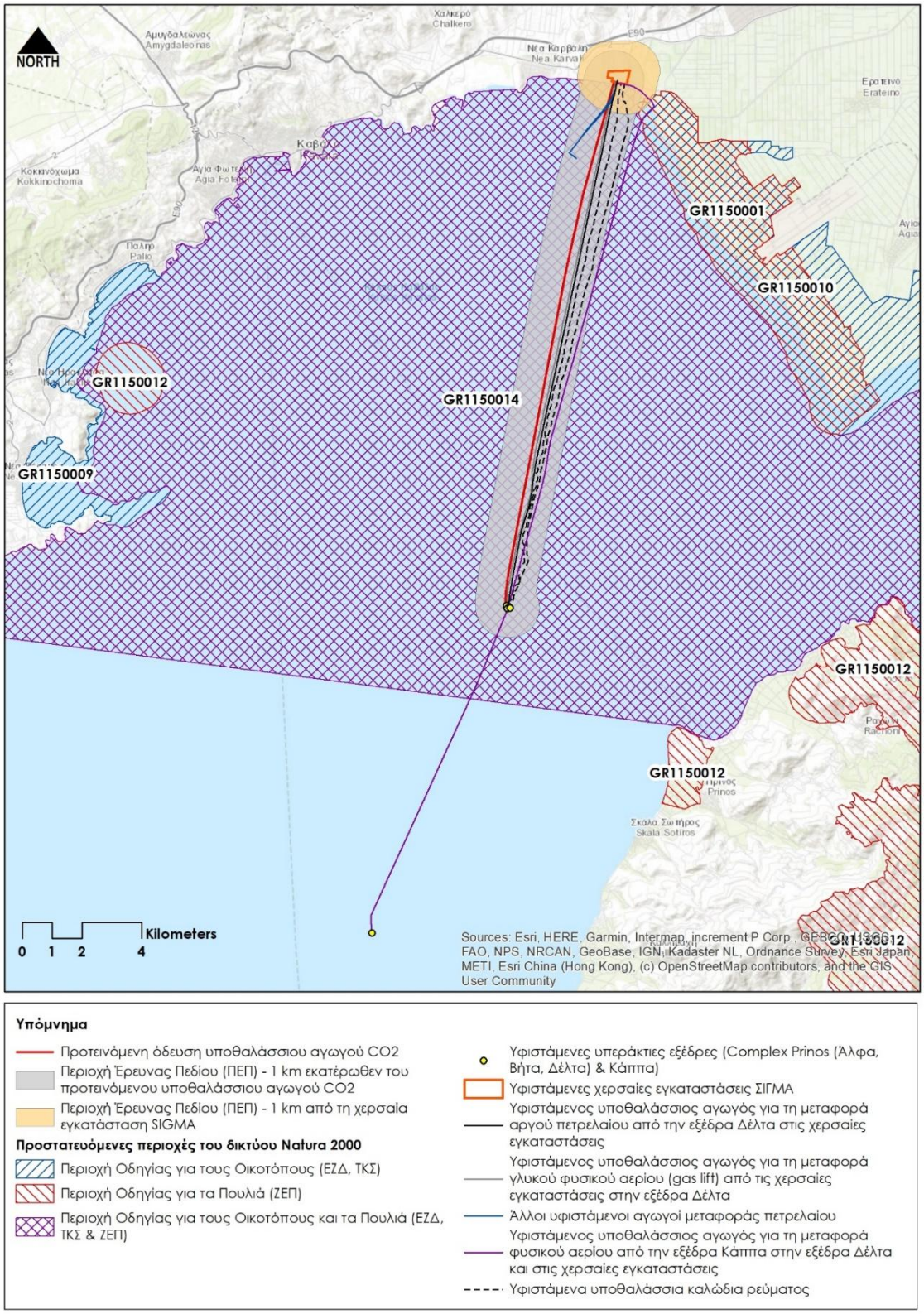


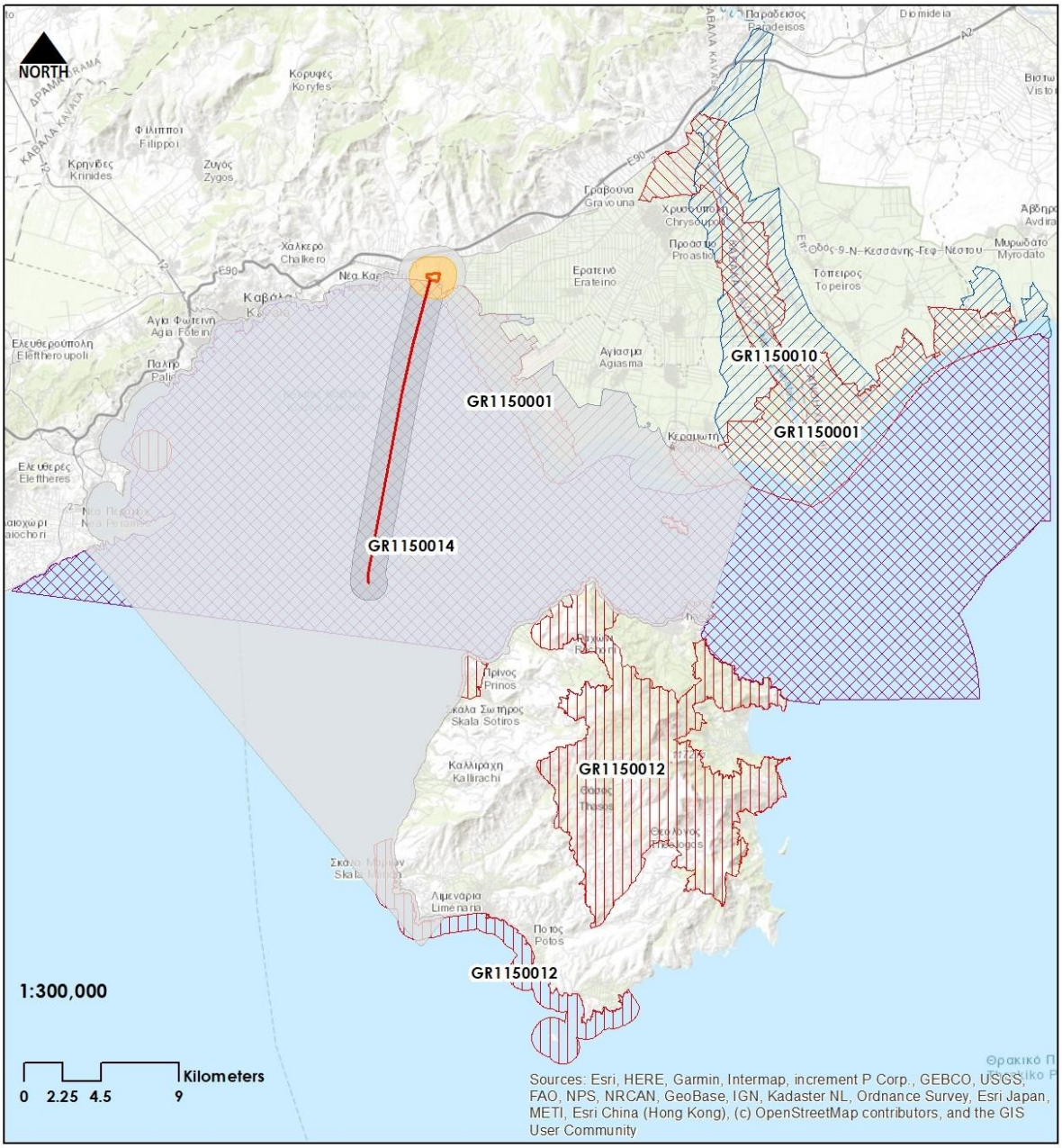
Figure 18: Field Research Area (FRA)

Table 6: Area of overlap between the Field Survey Area (ΠΕΠ) and the respective Natura 2000 sites

FRA and relevant Natura 2000 area	Area of the FRA located within (or outside) a Natura 2000 area (ha)	Percentage (%) of overlap of the FRA with the relevant protected area	Protected area (ha)	Percentage of the area of the protected area concerned that is within the FRA in relation to the total area of the protected area
FRA included in SPA and SCI GR1150014	3740.8434	90.36%	75686.0300	4.94%
FRA included in SCA GR1150010	8.0730	0.20%	23028.1100	0.04%
FRA included in SCA GR1150001	8.0730	0.20%	14773.6900	0.05%
FRA included in SCA GR1150012	0	0.00%	17333.2900	2.21%
FRA outside of any protected area	382.9269	9.25%	-	-
Total areal of FRA	4139.9163	100.00%	-	-

III.2.2 Expanded FRA

Due to the mobility of the fauna species that constitute the protected object in the MP, an expanded PEP was defined within the SPA & SCI GR1150014, SAC GR1150010, SPA GR1150001, SPA GR1150012 and SAC GR115009, which covers the entire Gulf of Kavala, including the coastline, up to the imaginary line between Cape Vrasidas in Nea Peramos and Cape Kefalas in Thassos, the Keramoti - Thassos channel up to Monastiraki beach in the east, the parts of the Natura 2000 areas in the Keramoti, Agiasma, Eratino and Vasova lagoons, as well as a 1.5 km zone around the Sigma factory (see Figure 19).



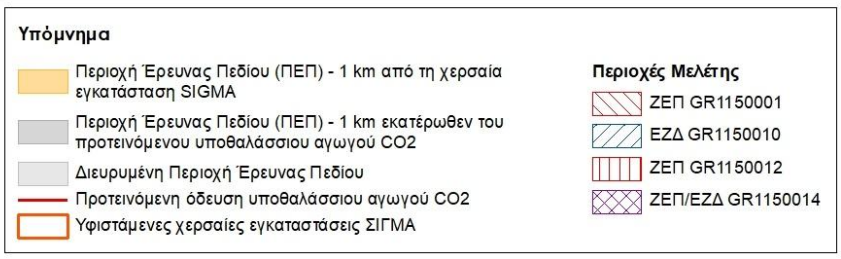


Figure 19: Field Research Area (FRA) and expanded FRA

IV. Methodology

IV.1 Legislation specifications

According to the MD 170225/2014 for projects falling under Category A1, within the framework of the Special Environmental Survey for the description of the existing state of the natural environment, a description, recording and analysis of the elements of the natural environment and a recording of the state of the natural environment, in terms of the elements to be protected, their conservation status as well as the conservation objectives of the area, are carried out in the Survey Area (SA) and the Field Research Aera (FRA) of the project under consideration, including the project alternatives.

The description of the existing state for the SA is based on the most recently available bibliographic data for the area, focusing on its protected object that may be affected by the project under consideration.

The description of the existing state for the FRA is based on elements of the natural environment, collected through field work carried out within the framework of the Special Ecological Survey, focusing on its protected object that may be affected by the project under consideration.

According to the MD 170225/2014 for projects falling under Category A1, and implemented within Natura 2000 areas or outside them but potentially affecting them, and for which the EIA falls under the category of Annex 3.2.1, the fieldwork is required to cover the ecological requirements of a time period of one annual cycle for each species and habitat type (depending on seasonal presence), unless otherwise documented. The duration of the fieldwork must be at least 20 days at the appropriate period, in order to obtain sufficient ecological data for the appropriate assessment. Specifically for SPAs, fieldwork is required to cover the ecological requirements of an annual cycle of birdlife, depending on the seasonal presence of the species and to include at least observations during (a) the breeding season, (b) the migration season and the wintering season, depending on the seasonal presence of the species in each area.

In determining the number of field days, the specific characteristics of the species and habitat types under investigation, the area, relief and habitats of the area, the size and type of the project are taken into account.

IV.2 Literature Review

For the purposes of preparing this SES, a literature review was conducted utilizing existing databases as well as bibliographic material for the area of interest. In the context of this research, existing information was collected and recorded on the specific ecological characteristics that shape the value of the examined areas of the Natura 2000 network. The main bibliographic sources utilized are the following. The full list of bibliography is given in Chapter 7.

- Cartographic data of spatial mapping of habitat types (EKXA AE, 2017).
- Chandrinos, George, Savvas Kazantzidis, Charalambos Alivizatos, Triantafyllos Akriotis, & Danae Portolou (2015). Midwinter Waterfowl Counts in Greece (1968-2006). Population Analysis of Anseriformes and Coot (Fulica Atra). Athens: Hellenic Ornithological Society - Hellenic Bird Ringing Center.

- Draft Special Environmental Study: OMIKRON S.A., 2022. Study 1: Preparation of SES and MP for the Natura 2000 areas of the Region of Eastern Macedonia and Thrace - Deliverable C3.3 "Final Draft SES of the 2nd Group of Areas-Chapter 2". Ministry of Environment and Energy, Athens, 486 pp.
- Fric, J., Portolou, D., Manolopoulos, A. and T. Kastritis (2012). Important Areas for Seabirds in Greece. LIFE07 NAT/GR/000285 - Hellenic Ornithological Society (HOS / BirdLife Greece), Athens.
- General Directorate of Fisheries of the Ministry of Agriculture, Fisheries and Marine Resources, 2015. Identification, mapping, and recording on nautical charts, of the underwater Posidonia meadows throughout the Greek Territory with modified technical specifications, for the needs of the General Directorate of Fisheries of the Ministry of Agriculture, Fisheries and Marine Resources in the context of Measure 3.1-Collective Actions, of Priority Axis 3-Measures of Common Interest, in the Operational Program "ALIEIAS 2007-2013, 2015. Contractors: Hellenic Center for Marine Research (HCMR), Hellenic Agricultural. "DIMITRA" Organization - Institute of Fisheries Research (INALE), University of Patras - Marine Geology & Physical Oceanography Laboratory (ETHAGEFO). Within the framework of the project, maps with estimated Posidonia meadow coverage class were produced on the 1x1 km European Environment Agency grid.
- Implementation reports of Directives 92/43/EEC and 2009/147/EC.
- Konstantinos Topouzelis, Despina Makri, Nikolaos Stoupas, Apostolos Papakonstantinou, Stelios Katsanevakis "Seagrass mapping in Greek territorial waters using Landsat-8 satellite images" Int J Appl Earth Obs Geoinformation 67 (2018) 98–113. It concerns the mapping of Posidonia in the entire coastal area of the country using remote sensing methods on Landsat8 satellite images with a pixel dimension of 15 m.
- Ministry of Environment and Natural Resources/D ΔΦΠΒ/50146/1786/10.05.2023 "Determination and approval of conservation objectives for bird fauna species of par. 1 and 2 of article 4, of Directive 2009/147/EC on Special Protection Areas (SPA) of the national ecological network NATURA 2000"
- Panayotidis Panayiotis, Papathanasiou Vasillis, Gerakaris Vasilis, Fakiris Elias, Orfanidis Sotiris, Papatheodorou Georgios, Kosmidou Maria, Georgiou Nikos, Drakopoulou Paraskevi, Loukaidi Vasiliki (2022). Seagrain The Greek Seas. SEANOE. https://doi.org/10.17882/87740
- Portolou, D., S. Bourdakis, H. Vlachos, T. Kastritis, & T. Dimalexis, eds. (2009) Important Areas for Birds of Greece: Priority Areas for Biodiversity Conservation. Hellenic Ornithological Society.
- Results of the monitoring projects and assessment of the conservation status of species and habitat types of the Management Body of the National Park of Eastern Macedonia and Thrace.
- Results of the study: Monitoring and assessment of the conservation status of species and habitat types in Greece (YPEN, 2015).
- Standard Data Form (SDF) of Natura 2000 areas GR1150001, GR1150010, GR1150012 and GR1150014

IV.3 Field research methodology

IV.3.1 Duration of fieldwork and scope of field research

Taking into account the requirements of the legislation for conducting fieldwork in the context of the preparation of the SES for Category A1 projects, fieldwork was carried out in the SA and the extended SA. This work focused on the protected object of the relevant Natura 2000 areas that may be affected by the project under consideration. The methodology used and described below consists of the use of internationally accepted methods for recording habitat types and species.

Within the framework of the SES, the required number of days of fieldwork was carried out for the relevant Natura 2000 areas in the period March - June and September - October 2024 (see Table 7) and recent recording data provided by the Non-Governmental Organizations (NGOs) Hellenic Ornithological Society and Archelon were used. Existing data were also provided by OFYPEKA.

As for the avifauna, the field work covered the end of the wintering period, the spring migration, the breeding period and for some species the post-breeding period (e.g. the Eurasian Cormorant), while the autumn migration and the wintering period were covered bibliographically.

Table7: Fieldwork days per Natura 2000 site under consideration and area covered by fieldwork

Natura 2000 Area	Number of days (man-days) in the field	Object of study / observation	Area extent where fieldwork was conducted (SA or Extended SA)
SPA & PCI GR1150014	31 (53)	Birdlife – Other fauna	Extended SA
SPA & PCI GR1150014	14 (31)	Marine mammals	Extended SA
SPA GR1150001 and immediate area	31 (53)	Birdlife	Extended SA / GR1150001
SCA GR1150010 and immediate area	5	Habitat types - Other fauna	SA / GR1150010
PCI GR1150010 and immediate area	2 nights	Chiroptera	SA / GR1150010
SCA GR1150012 and immediate area	26 (45)	Birdlife	Extended SA

IV.3.2 Recording methods

IV.3.2.1 Birdlife

The design of the fieldwork aimed at the optimal recording of species of interest was based on (1) the biology and ecology of the species of interest, (2) the knowledge and experience of the experts for the area, (3) the availability of bibliographic data for the species of interest and their degree of adequacy and (4) the size of the area.

To record avifauna in the marine environment, 3 recording methods were applied:

- A) **Visual recordings from boats with the European Seabirds at Sea «ESAS»** method include the recording of birds and other species of marine fauna at sea along linear routes based on Tasker et al. (1984) and Champhuysen & Garthe (2004), as adapted to Greek/Mediterranean conditions through the LIFE Nature project for the identification of Important Marine Bird Areas (IMBAs) in Greece, entitled "Concrete Conservation Actions for the Mediterranean Shag and Audouin's Gull in Greece, including the Inventory of Relevant Marine IBAs" (LIFE07 NAT/GR/000285) and described by Fric & Gaganis (2009).

In summary, the method aims at the systematic recording of seabirds, marine mammals and sea turtles, as well as human activities in the SA, in linear routes by trained observers, from a vessel moving at a constant low speed (<15 kn). Individuals of the species are recorded continuously in a 300 m wide strip on either side of the vessel (total width 600 m), and flying birds are recorded at 1 minute intervals. The optical scanning angle is 360°. The vertical distance of swimming individuals is recorded in relation to the linear path of the vessel in 5 distance zones: A=0-50 m, B=50-100 m, C=100-200 m, D=200-300 m and E>300 m. For flying birds, the code F is used and the direction of flight is noted. The position of the vessel (poskey), i.e. longitude and latitude, is recorded with a GPS device. Marine species are located with the naked eye or binoculars and identified with binoculars.

To determine distances at sea and more specifically the 300 m distance from the vessel, a method described by Heinemann (1981) is used, which determines the width of the transverse line.

The survey vessel data include: start and end date, time and geographical position of each segment of the linear route, sea state, visibility and floating objects (including fishing vessels). Data for the species recorded include: species, number of individuals, age (where applicable), distance from the observation vessel, position within or outside the 300 m zone of the linear route, flight direction (for birds), behaviour and association with human activities or other species.

The results of the ESAS data analyses include the spatial distribution of the absolute number of individuals and the density of individuals (number of individuals per square kilometer) in a reference grid, the determination of temporal and seasonal changes in distribution, abundance and space use and the identification of aggregation areas. This method was applied by both research vessels and ships of the line. The recordings with the ESAS method were carried out mainly within the area of SPA & SCI GR1150014 but also within SPA GR1150001 and SPA GR1150012 (see Figure 20). The total length of recording routes with the ESAS method was 795 nautical miles (NM).

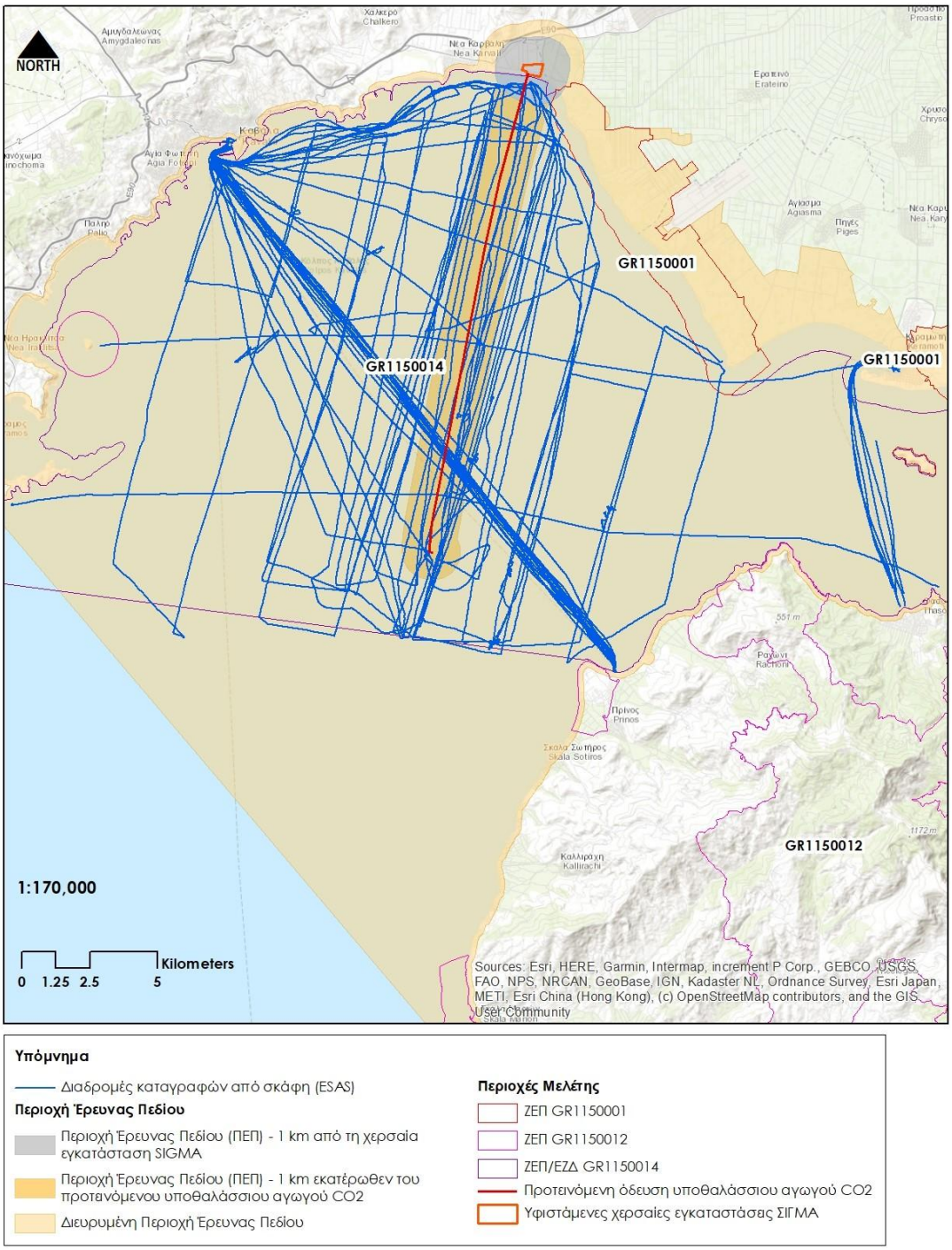


Figure 20: Routes taken for recordings from vessels using the ESAS method

- (B) **Visual surveys from a vessel along the coastline** include the recording of birds and other fauna species in the coastal marine and terrestrial zone from a vessel, as described in Fric et al. (2012) and Dimalexis et al. (2008).

In summary, the method involves the visual recording of fauna from a vessel following the coastline and moving at low speed at 50-200 m from the shore. The geographical position of the vessel and the recording locations is determined by a GPS device. Species are identified with the naked eye or

binoculars and are identified with binoculars. The survey vessel data include: start and end date, sea state, visibility and vessel route, as recorded by a GPS device. The data for the species recorded include: species, number of individuals, age (if applicable), behavior, geographical location, as recorded by a GPS device.

The results of the analyses of the collected data include the spatial distribution of the absolute number of individuals per species, the use of space and the identification of the areas of aggregations. The recordings were carried out by a high-speed boat with an emphasis on the wider area of the main colonies and breeding areas of the Great Shag (Phalacrocorax aristotelis desmarestii) and gull-like species, as well as the wider area of the Sigma factory. The recording period focused on the period after the breeding season, when, based on the existing knowledge about the Great Shag in the area, the dispersal in the wider area of the Gulf of Kavala is greater compared to other ecological seasons of the species.

The surveys from the vessel along the coastline were carried out mainly within the SPAs GR1150001 and GR1150012, but also in SPA & SCI GR1150014 (see Figure 21). The total length of survey routes was 74.2 nautical miles (NM).

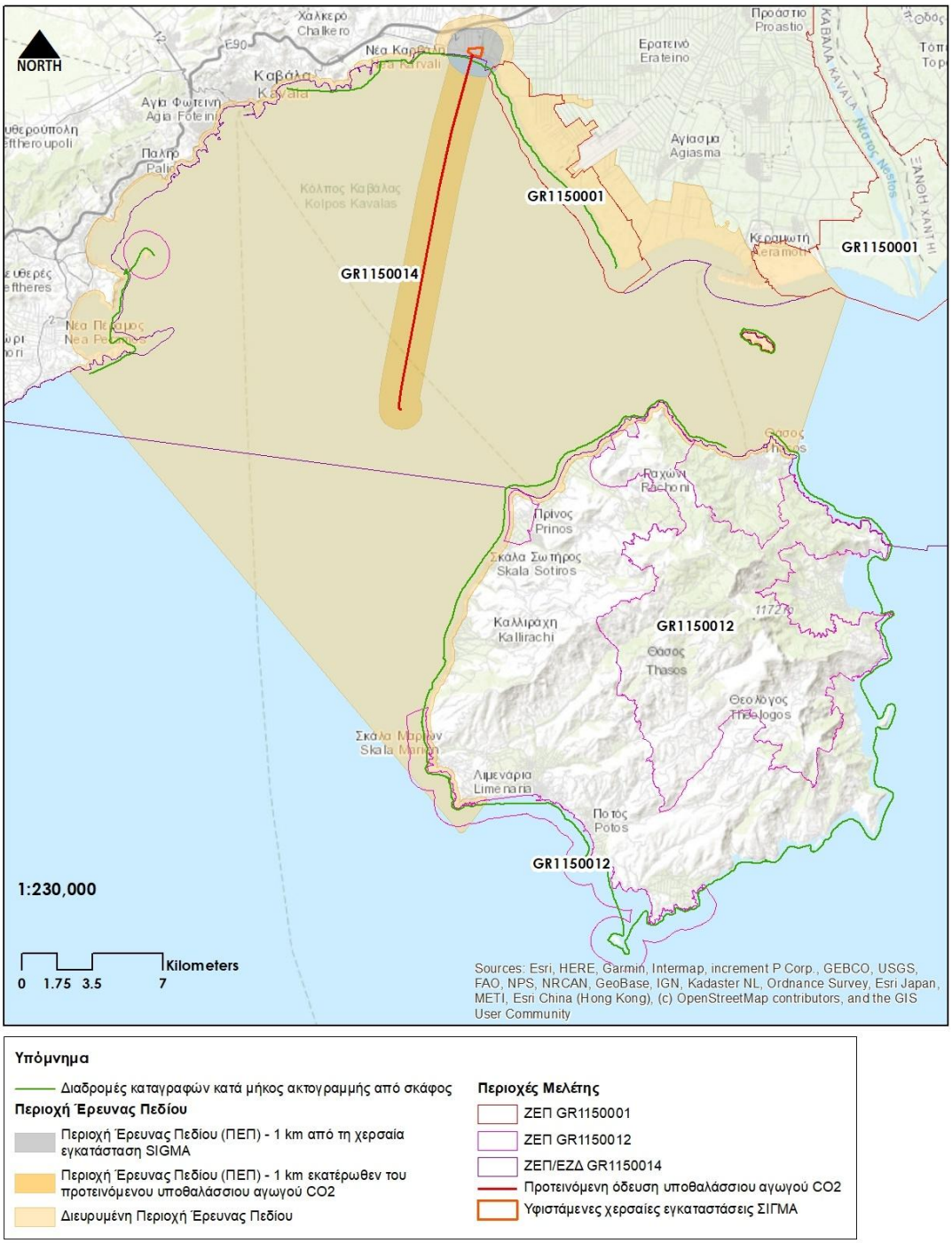


Figure 21: Routes taken for boat recordings along the coastline

- (C) Visual surveys from pre-selected coastal vantage points include the recording of birds and other fauna species in the coastal marine and terrestrial zone from coastal vantage points, as described in Fric et al. (2012), with the aim of recording space use and migration/movement flows in areas where, due to the topography of the area, concentrations of seabirds are expected, in order to assess the flow of seabirds to and from the Gulf of Kavala. These areas include the

Keramoti-Thassos channel, Cape Vrasidas in Nea Peramos and Cape Kefalas and Skala Prinos in Thassos.

The method concerns the recording of the use of space by seabirds with an emphasis on areas where concentrations are expected, such as in narrow migration or regular movement routes as well as in areas around the main colonies of seabirds. The data collected include the location of the viewing point, the date and time of the start and end of the recordings, the weather conditions, visibility, species, number of individuals, flight direction and behavior, while their location is noted on a GPS device.

The method was applied from 3 viewing points, namely at the cape of Skala Prinos, at the cape of Chora of Thassos and at the cape of Keramoti. In March 2024, seabird movements were also examined at Cape Vrasidas in Nea Peramos and Cape Kefalas at the southwestern tip of Thassos, however, no systematic recordings were made as no significant flow of seabird movements to and from the Gulf of Kavala was observed.

The recordings from pre-selected viewing points on the coast covered the marine areas of the channel between Keramoti and Thassos (SPA & SCI GR1150014 and SPA GR1150001), as well as the marine area around the cape at Skala Prinou (SPA & SCI GR1150014) (see Figure 22). The total duration of recordings was 489 minutes.

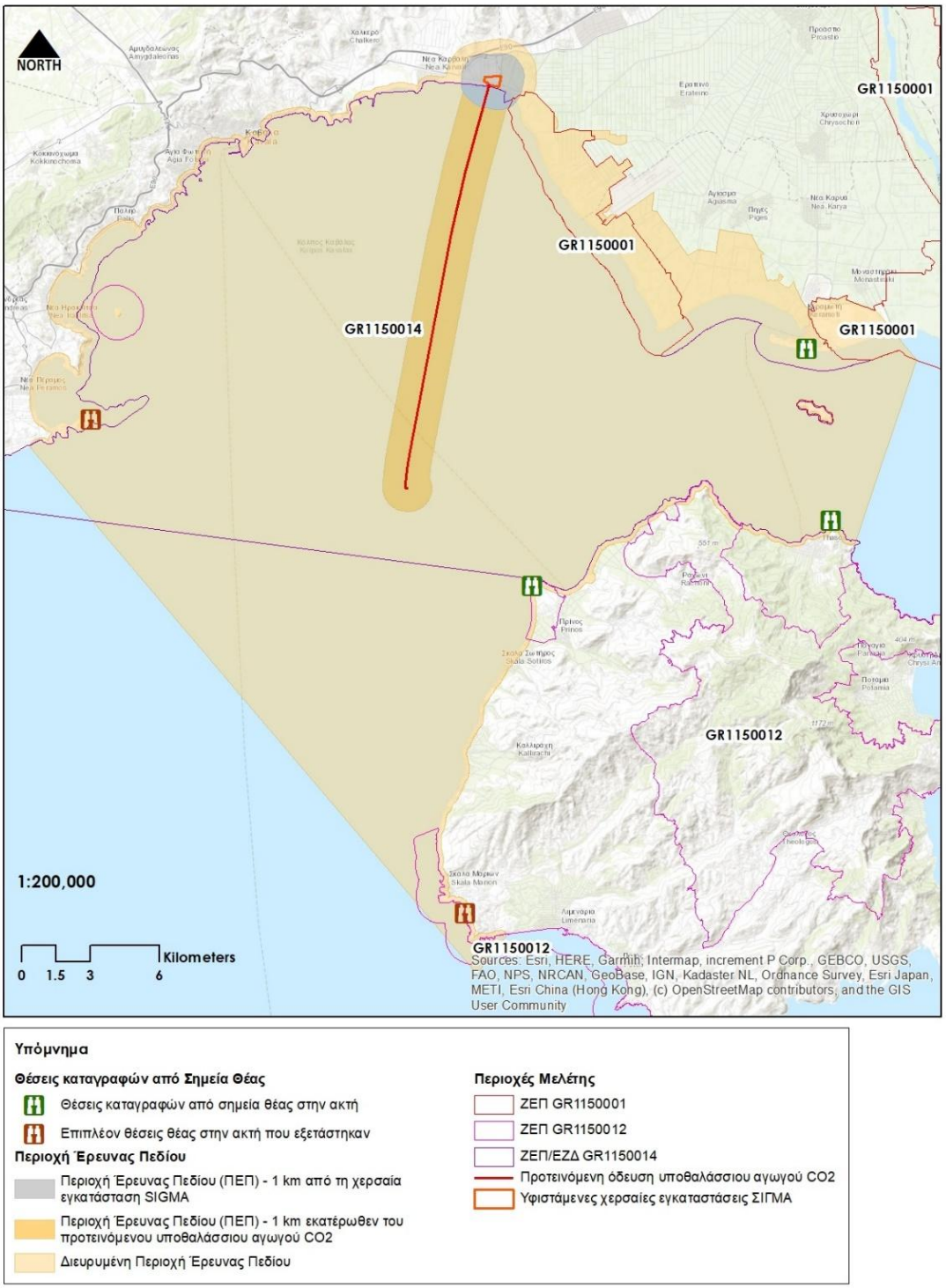


Figure 22: Locations of recordings from coastal viewpoints and viewpoints examined

A recording method was applied to record birdlife in the terrestrial and wetland environment:

- (A) Direct observation (Look-and-See) concerns the recording of birds from selected observation points that are selected based on the existing knowledge of the area regarding the species of

interest and their habitats (e.g. Hadjicharalambous et al., 2004) with the aim of assessing the distribution and abundance of the bird fauna. The points were chosen so as to cover the area under consideration to the greatest possible extent spatially.

The identification and identification of bird fauna species and the counting of individuals are done with the naked eye, binoculars or a telescope depending on the distance from the observer. In the case of cryptic species, the identification and identification of species can also be done acoustically. The data collected include for each observation point the date and time of the start and end of the recordings, the weather conditions, the visibility, while for each bird recording the species, the number of individuals, the geographical location with GPS, as well as, where applicable, the flight direction, the behavior and the signs of reproduction are noted.

The Direct Observation method covered both the terrestrial and wetland areas as well as the coasts and the coastal marine zone (see Figure 23 and Figure 24). The method was mainly applied around the Sigma factory and the lagoons of Keramoti, Agiasma, Eratinos and Vasova as well as at other points in the wider Study Area where the presence of the species of interest was expected. After the initial examination of the area, the field researchers carried out the recordings simultaneously at different points of the field research area in order to maximize the research effort. Direct observation was carried out from a total of 453 observation points from March to September 2024.

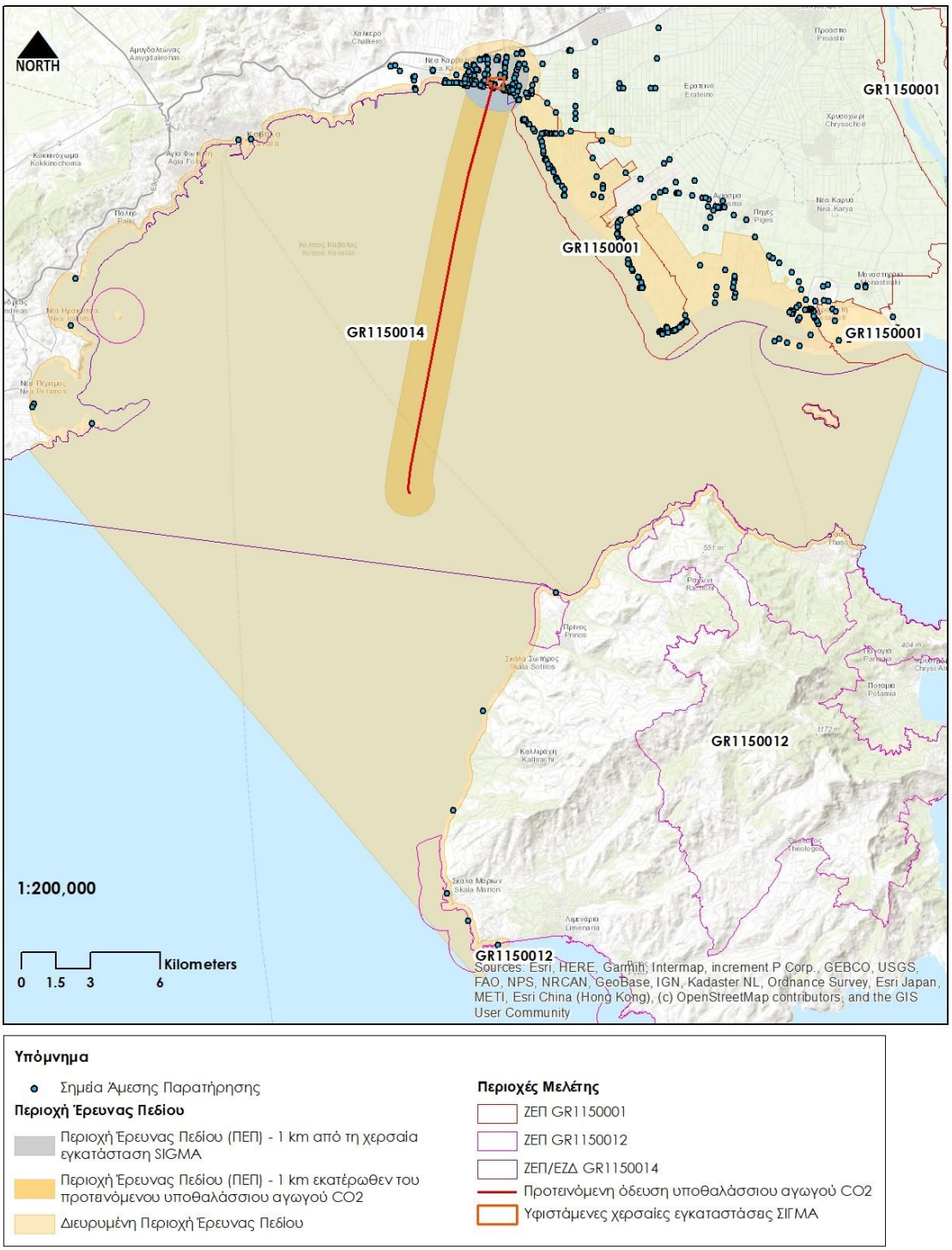


Figure 23: Recording locations using the Direct Observation method

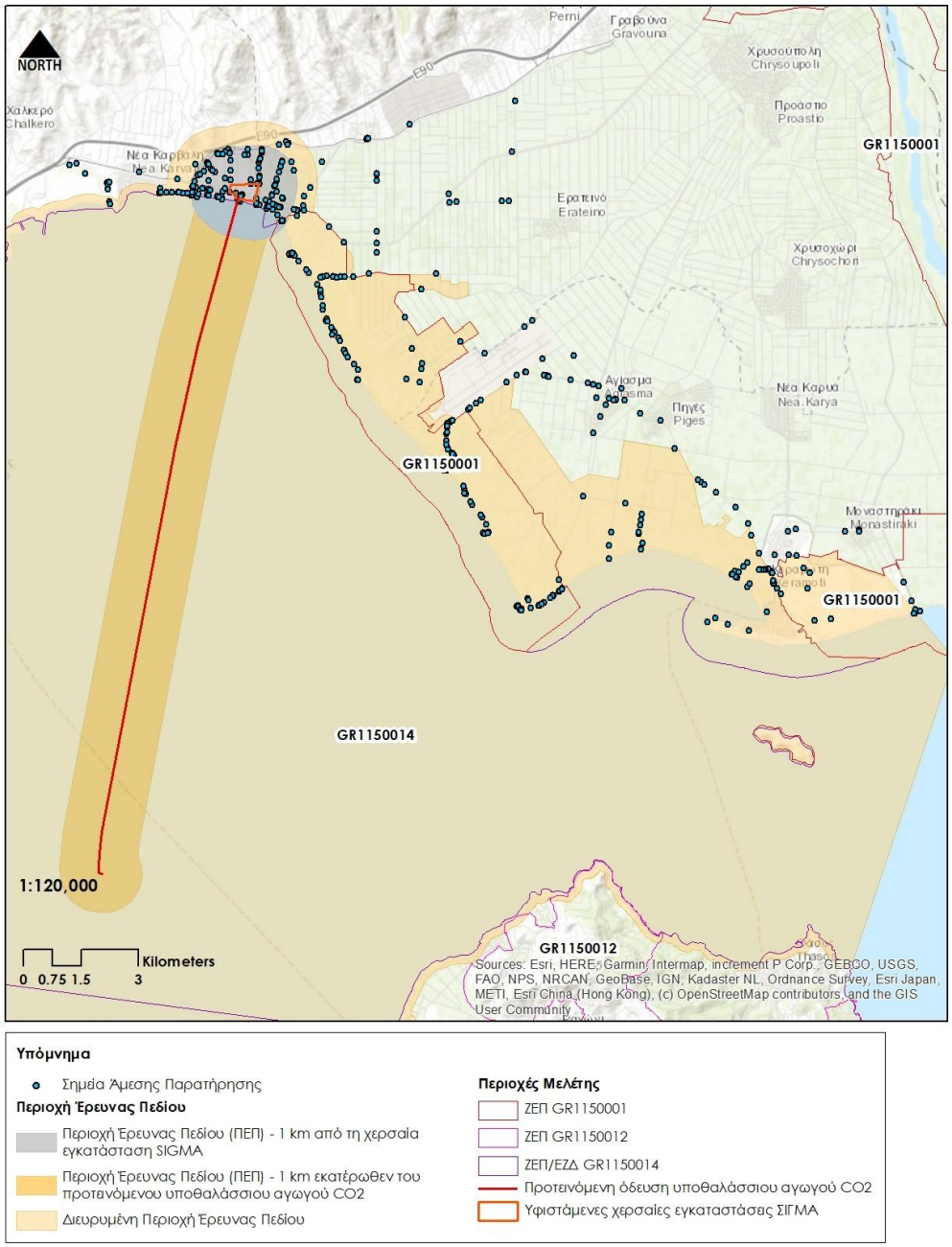


Figure 24: Recording locations using the Direct Observation method around the Sigma factory and the lagoons of Keramoti, Agiasma, Eratinos and Vasova

Based on the specifications of the legislation, 31 calendar days of field work and 53 man-days of work were carried out (see Table 8)

Table 8: Schedule of fieldwork days for avifauna

DATE	FIELD RESEARCHERS (NUMBER)	METHOD	AREA	SPA / SCA GR1150014	SCIA GR1150001	SCIA GR1150012
26/03/2024	2	Look and See	Wider Sigma factory area, coastal zone and coastal wetlands in the western part of SCA GR1150001	√	√	√
27/03/2024	2	Look and See	Coastal zone and lagoons of Eratinos, Vasovas and Agiasma	√	√	√
28/03/2024	2	ESAS	Sea area between Sigma factory and Ptinos Complex platforms using the vessel Akra Prinos	√	√	√
29/03/2024	2	ESAS	Sea area between Sigma factory and Ptinos Complex platforms using the vessel Akra Prinos	√	√	√
30/03/2024	2	Look and See, Viewing points	Agiasma Lagoon, Keramoti wetlands, Monastiraki and Keramoti beaches	√	√	
31/03/2024	2	ESAS, Viewing points, Look and See	ESAS routes Kavala – Prinos, Keramoti – Thassos – Keramoti with liners and viewpoints at the cape of Thassos and Prinos and along the west coast of Thassos	√	√	√
01/04/2024	1	ESAS	Route Kavala – Prinos – Kavala	√	√	√
01/04/2024	1	Look and See	Greater Sigma plant area	√	√	√
02/04/2024	2	Look and See	Along the western coast of the Gulf of Kavala	√		√
22/04/2024	2	Look and See	Greater Sigma plant area	√	√	√
23/04/2024	2	Look and See	Agiasma Lagoon, Keramoti wetlands, Monastiraki and Keramoti beaches	√	√	
24/04/2024	2	Look and See	Greater Sigma plant area, Vasova	√	√	√
24/04/2024	2	ESAS	Sea area between Sigma plant and Prinos Complex platforms	√	√	√
25/04/2024	2	ESAS	Sea area between Sigma plant and Prinos Complex platforms	√	√	√
26/04/2024	2	Look and See	Greater Sigma plant area, Vasova	√	√	√
27/04/2024	2	Look and See	Eratinos Lagoon	√	√	√
24/05/2024	2	ESAS	Bays of Kavala	√	√	√
25/05/2024	1	Look and See	Greater Sigma plant area, Eratinos and Vasova lagoons	√	√	√
25/05/2024	1	ESAS	Bays of Kavala	√	√	√
26/05/2024	2	ESAS	Route Kavala – Prinos - Kavala	√	√	√
27/05/2024	1	Look and See	Greater Sigma plant area, Eratinos and Vasova lagoons	√	√	√
27/05/2024	1	ESAS	Bay of Kavala	√	√	√
28/05/2024	1	Look and See	Greater Sigma plant area, Eratinos and Vasova lagoons	√	√	√
28/05/2024	1	ESAS, recordings along the coastline	Bays of Kavala, coastline from the bay of Keramoti to the commercial port of Kavala	√	√	√
29/05/2024	1	Look and See	Coastal zone and lagoons of Eratinos, Vasovas and Agiasma	√	√	√
29/05/2024	1	ESAS	Διαδρομή Καβάλα – Πρίνος - Καβάλα	√	√	√
30/05/2024	1	Look and See	Vasova and Agiasma lagoons, Keramoti wetlands	√	√	
30/05/2024	1	ESAS, Viewing points	Route Keramoti – Thassos – Keramoti	√	√	√
31/05/2024	2	Look and See	Agiasma Lagoon, Keramoti wetlands and Monastiraki beach.	√	√	
19/06/2024	1	Recordings along the coastline, ESAS	Thasopoula, Thassos, Gulf of Kavala, Fidonisi	√	√	√

DATE	FIELD RESEARCHERS (NUMBER)	METHOD	AREA	SPA / SCA GR1150014	SCIA GR1150001	SCIA GR1150012
20/06/2024	1	ESAS	Keramoti-Thassos and Prinos - Kavala routes	√	√	√
22/09/2024	1	ESAS, Viewing points	Route Keramoti – Thassos – Keramoti, Thassos	√	√	√
23/09/2024	1	Look and See	Greater Sigma plant area, Vasova lagoon and Eratinos lagoon	√	√	√
24/09/2024	1	Look and See	Agiasma Lagoon, Keramoti wetlands, Monastiraki and Keramoti beaches	√	√	
25/09/2024	1	Look and See	Greater Sigma plant area	√	√	√
26/09/2024	1	ESAS, Viewing points	Route Kavala – Prinos – Kavala, West coast of the Gulf of Kavala	√	√	√
02/10/2024	1	ESAS	Sea area between Sigma plant and Prinos Complex platforms using the Akra Prinos vessel	√	√	√
03/10/2024	1	ESAS	Route Kavala – Prinos – Kavala, Sea area between Sigma factory and Ptinos Complex platforms using the Akra Prinos vessel	√	√	√

IV.3.2.2 Sea mammals

Visual recordings from a boat

The survey design is similar to the established methodological designs for such surveys used by the scientific community worldwide (Buckland et al. 2001, 2004) and used parallel lines (Transects) at a distance of 3 km from each other that provide comprehensive coverage of the study area. The transects were designed using the Distance 7.5 program to ensure uniform coverage of the study area to the greatest extent possible.

The research vessel follows the transects at speeds between 11-16 knots recording the presence of species of interest along the way. The visual observation team consisted of 2 experienced marine mammal observers, searching for cetaceans 180° either side of the vessel and 180° ahead of the vessel mainly with the naked eye, but occasionally using 7x50 binoculars to scan areas that were not fully visible away from the vessel. The average eye height of the observers was approximately 2 m above sea level.

When a group of cetaceans was spotted by any of the observers, the systematic search effort was interrupted, while the vessel was diverted from the line to approach the observed animals, in order to achieve more accurate determinations of the species, group size, age class of the group members and the activity of the group that was spotted. In addition to basic environmental data (e.g. Beaufort Sea state, visibility conditions, etc.) collected during the surveys, data collected for each observation included time, GPS coordinates, initial bearing and radial distance to the cetacean group (used to calculate the vertical distance of sighting from the tracking line), species, group size (number of individuals), age categories of the group (3 age categories: adults, juveniles, small) and general activity of the group (e.g. foraging, traveling, socializing, resting). Attempts were also made to take photographs when approaching the animals to ensure correct species identification as well as to correctly record group size and age composition. Where possible, the photographs taken were also used for photo-identification of individuals to ensure that the same group of animals was

not counted twice during the same survey day. Taking high-quality photo-identification photographs was not a research priority.

The navigation schedule for which transects would be followed each day was decided on the same day as the survey activities began. Of the 8 total lines, 6 were covered daily. This was done to ensure that each part of the study area would be covered under the best possible observation conditions for that day, based on the differences in wind intensity across the study area.

Encounter rates (for an initial comparison with other areas of the country) were calculated as the number of encounters/100 km of active observation navigation. A subsequent Report will include a detailed analysis of the data using the Distance 7.5 program to calculate the density of individuals and the total population of the recorded species in the study area.

Aerial visual recordings

A Cessna C172R Skyhawk light aircraft with a Lycoming IO-360-L2A, 160 Hp engine was used for the aerial surveys. This four-seater aircraft offers excellent views from its cockpit and is considered suitable, reliable and economical for such a mission. Kavala airport was used as a base for the aerial missions in the project area. The flights were carried out in the extended PEP at an altitude of 1000 feet MSL and an average ground speed of 85 knots. The flights were carried out under ideal weather conditions (wind speed less than 10 knots, clear sky and visibility greater than 8 km). In each case where an “object of interest/s” was detected, the aircraft abandoned its course and performed one or more circles over the object/s in order to visually identify it. In addition, the object was photographed, in order to keep a proper record of its observation and identification. The photography was carried out using a full-frame DSLR (Nikon D750) with a 70-200 mm F/2.8 Tamron SP lens. All photos were georeferenced, since the camera was equipped with a GPS unit (Nikon GP-1A). The flights were monitored and recorded using two specialized applications, namely GARMIN-Pilot and Fore-Flight.

Acoustic recordings by boat

The acoustic detection team worked in collaboration with the visual observers, detecting cetaceans using a hydrophone towed behind the vessel. The hydrophone system consists of 2 Magrec HP03 high frequency hydrophones, consisting of an HP03 preamplifier (low cut filter set at 2kHz) with a nominal sensitivity of 1.5kHz - 150kHz together with a Magrec HP/27ST amplifier together with a Lenovo Thinkpad laptop using the PAMGUARD acoustic analysis software specifically developed for cetacean monitoring, covering the spectrum of possible vocal expressions for the species that we are likely to encounter during our surveys. The hydrophone system consists of 2 hydrophones recording on 2 different channels. The PAM operator immediately informed the visual observer team of each acoustic detection. The hydrophone recordings were analyzed by the PAMGUARD software using the "whistle & moan detector" module.

Methodology for recording and assessing the terrestrial habitat of the Mediterranean monk seal (p.o. 8330)

The methodology for recording the terrestrial habitat of the Mediterranean monk seal that was followed was based on the one that, after long-term experience in the field, has been formulated by the MOm/Society for the Study and Protection of the Mediterranean Monk Seal and which in turn is based on international seal study standards. The main points of the methodology are as follows:

- The movement to the study area and the approach to the recording areas are carried out by a suitable vessel (in this case the inflatable research vessel "NAFTILOS", owned by BIOTOPIAS O.E.)
- In each recording area, a circumnavigation of the coastline and a detailed examination of the coast are carried out to determine if there are any entrances to sea caves/land refuges of the species.
- If the existence of a sea cave is detected, a thorough inspection of its interior is carried out, as follows: at a distance of approximately 50 m from each shelter located, the researchers turn off the engine of the inflatable boat so that it is not perceived by the animals that may be inside the cave. The final approach to the shelters is done by swimming, while inside the shelter the minimum possible source of artificial light is used, which is necessary for the effective inspection of its interior.
- During the inspection of a shelter, if no animal is detected, a detailed investigation of its interior is carried out, on the one hand, to record its morphological characteristics and, on the other hand, with the aim of identifying any indication of the previous presence of an animal in the shelter (e.g. tracks, odor, feces, hair, blood, tissues, etc.). All data are recorded, and if relevant biological material is identified, samples are collected for future analysis.
- If an animal is detected, the researchers, without getting any closer, record all its obvious external characteristics (e.g. size, stage of development, coloration, external marks and abrasions, condition of the animal, sex, etc.). For the age classification and determination of the sex of the animals, the researchers use well-documented criteria that have been determined based on specific scientific results (Badosa et al. 1998, Dendrinos et al. 1999, Badosa et al. 2006). Depending on the circumstances of each case and whenever possible (e.g. the animal/animals are in a sleeping state), the researchers take photographs and/or videos with the aim of comparative identification of different individuals of the species.
- The assessment of the suitability of a refuge and a sampling area as a whole as a potential habitat for the Mediterranean monk seal is based mainly on the methodology and parameters described by Dendrinos et al. 2007b but also on the many years of experience of the research team of BIOTOPIAS O.E. in its work with this specific research subject. It should also be noted that the above methodology is in line with the National "Specifications for the Implementation of Monitoring Actions for Populations and Habitats of the Mediterranean monk seal" as proposed by the MOm and approved by the Y.PEN.

Methodology for collecting and evaluating information on the presence of the Mediterranean monk seal through the National Rescue and Information Collection Network

Εκτός από τις επισκέψεις στα καταφύγια φώκιας, οι ερευνητές συνέλεξαν και αξιολόγησαν τις αναφορές για τις παρατηρήσεις φώκιας που έγιναν από άλλους παρατηρητές (όπως ντόπιους πολίτες, τουρίστες, δύτες, professional and amateur fishermen). The location, date and time of observation, the behavior of the animal, as well as visible characteristics (size, stage of development, coloration, external marks or scars on the skin, general condition of the animal) were recorded. This data collection method is based on the methodology of the National Rescue and Information Collection Network (Adamantopoulou et al., 1999). Although this information comes from non-scientists, it is an important source of relevant data, which, after careful

evaluation and analysis, complements the work carried out directly in the field. Furthermore, the collection of data from non-scientists in combination with the data collected by the researchers allows the MOm field team to respond immediately to emergencies, such as animals in need of assistance or dead animals.

The field work schedule for the observation of marine mammals is given in see Table 9.

Table 9: Fieldwork schedule for marine mammal observation

DATE	FIELD RESEARCHERS (NUMBER)	METHOD	AREA	SPA/ SCA GR1150014
24.05.2024 – 30.05.2024	2	Visual recordings by boat	Extended SA	√
26.03.2024 – 02.04.2024	2	Opportunistic visual recordings	Extended SA	√
05.2024	2	Aerial visual recordings	Extended SA	√
20.06.2024 – 24.06.2024	2	Acoustic recordings by boat	Extended SA	√
02.10.2024- 03.10.2024	2	Visual recordings by boat	Extended SA	√

IV.3.2.3 Marine habitat and habitat types

IV.3.2.3.1 Marine habitat types

The investigation of marine habitat types was carried out for the SA within the SCA GR1150014 as marine habitats are included in its protected area. Field work in the marine environment has been carried out in the past by the LDK company in the context of the preparation of the 2015 EIA for the offshore installations of Prinos as well as in the years 2021 and 2023 in the context of the preparation of the Annual Environmental Monitoring Reports in compliance with the terms of AEPO 8413/24.04.2018/YPEN. In particular, field work in the marine environment has been carried out in the periods: 06.11.2023 – 09.11.2023, 26.06.2021 – 27.06.2021 and 11.10.2015 – 19.10.2015.

IV.3.2.3.2 Fish fauna

A literature review was conducted and the information obtained was assessed as sufficient.

IV.3.2.3.3 Sea turtles

During the surveys for cetaceans and seabirds, emphasis was also placed on recording the presence of sea turtles.

For sea turtles, an additional survey was carried out on the coast along the entire length of the SA but also on the coast up to Keramoti where the bird fauna surveys were carried out in order to record dead animals and possible signs of nesting. All available data on dead turtles that had washed up on the coast were also collected.

IV.3.2.4 Terrestrial habitat and habitat types

IV.3.2.4.1 Terrestrial habitat types

The habitat types within the SAC have been mapped and are the subject of species conservation monitoring projects as in all SACs in Greece. The section of the terrestrial SCA where the pipeline passes and the facilities will be developed passes outside Natura sites. In this section, the habitat types are described mainly as habitat for terrestrial fauna species with the same categorization with which the habitat types are recorded in Natura sites. As it is a disturbed dune due to the passage of pipelines, there are special conditions and for this reason the description is made as a mosaic of habitat types. Field observations were carried out in May 2024.

IV.3.2.4.2 Terrestrial mammals

Terrestrial mammals were recorded by surveying for biosignatures of presence (mainly tracks and droppings). For jackals, the recording was done by emitting howls from a device to which this species responds very easily. The broadcasts took place at dusk and in the evening on two different nights in May 2024.

IV.3.2.4.3 Chiroptera

Bat calls were recorded using passive bioacoustic ultrasound recording using a Wildlife Acoustics Echo Meter Touch 2 PRO device along paths around the Sigma factory in March (1 night) and May 2024 (1 night). (see Figure 25). The recorded calls were analyzed with BatExplorer 2.2.6.0 and BatScope 4 software for species identification. The recorded audio files were analyzed with BatExplorer software to identify recordings containing bat calls for which their characteristics were determined with BatExplorer and BatScope software. Based on the characteristics of the calls, the species or groups of species are identified based on the available data on characteristic calls in Greece and Europe (Papadatou et al. 2008, Georgiakakis 2009, Barataud 2015).

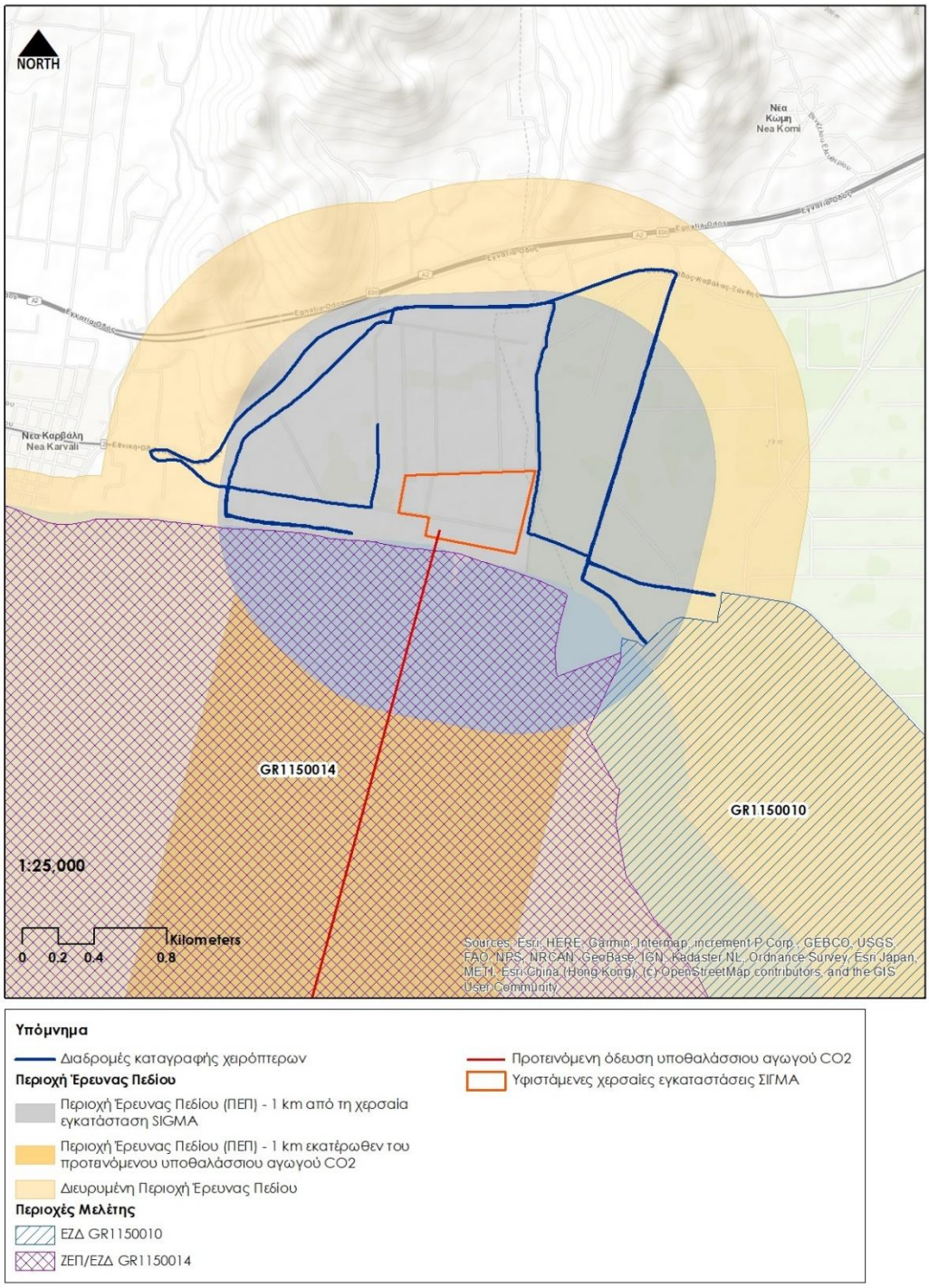


Figure 25: Bat recording routes within the perimeter of the factory

IV.3.2.4.4 Amphibians and reptiles

Amphibians were recorded from the positions of the koasmos at dusk and at night during the survey for mammals.

Terrestrial reptiles were recorded by slow movement in space. In the dunes, the population of land turtles was recorded by movement of 2 researchers in lines, when it was found that it has a significant population depending on the dunes in protected areas in northern Greece.

1. Existing State of the Natural Environment

1.1 Recording and analysis of the elements of the natural environment

A. STUDY AREA (SA)

1.1.A1 Brief description of the Natura 2000 site concerned

1.1.A1.i Identification of the area (type, registration code, name)

In this SAS, the following protected areas of the Natura 2000 network were examined:

- SPA & SCI GR1150014 “Kavala Thassos Marine Area”,
- SPA GR1150001 “Nestos Delta and Keramoti Lagoons and Thasopoula Island”,
- SPA GR1150010 “Nestos Delta and Keramoti Lagoons – Wider area”,
- SPA GR1150012 “Thassos (Mount Ypsario and coastal zone)”.

1.1.A1.ii Geographical identification of the area (coordinates, altitude, area)

1.1.A1.ii.1 SPA & PCI GR1150014 "Marine Area of Kavala Thassos"

The following are the spatial characteristics of the area SPA & PCI GR1150014 based on the SDF.

- Longitude (WGS84 decimal degrees): 24.430497
- Latitude (WGS84 decimal degrees): 40.860527
- Area (ha): 75686.0300
- Marine area: 100 %

1.1.A1.ii.2 SAC GR1150010 “Nestos Delta and Keramoti Lagoons – Wider Area»

The spatial characteristics of SAC GR1150010 based on SDF are presented below.

- Longitude (WGS84 decimal degrees): 24.758225
- Latitude (WGS84 decimal degrees): 40.918430
- Area (ha): 23028.1100
- Marine area: 18.13 %

1.1.A1.ii.3 SAC GR1150001 «Nestos Delta and Keramoti Lagoons and Thasopoula Island"

The spatial characteristics of SAC GR1150001 based on SDF are presented below.

- Longitude (WGS84 decimal degrees): 24.814812
- Latitude (WGS84 decimal degrees): 40.878736
- Area (ha): 14773.6900
- Marine area: 20.91 %

1.1.A1.ii.4 SAC GR1150012 "Thassos (Mount Ypsarios and coastal zone)"

The spatial characteristics of SAC GR1150012 based on SDF are presented below.

- Longitude (WGS84 decimal degrees): 24.688534
- Latitude (WGS84 decimal degrees): 40.702654
- Area (ha): 17333.2900
- Marine area: 19.81 %

1.1.A1.iii Description of the general character of the area with simple reference to: habitat types, habitat categories, quality and importance of the area, vulnerability, reasons for designation

1.1.A1.iii.1 SAC & SCI GR1150014 "Marine Area of Kavala Thassos"

The SAC & SCI GR1150014 “Marine Area of Kavala Thassos” is located within the administrative boundaries of the Region of Eastern Macedonia and Thrace and has an area of 75,686.03 ha. The area partially overlaps with the Important Bird Area GR250 “Gulf of Kavala and marine area of Thassos”. The area marginally overlaps with the Ramsar site “Nestos Delta and adjacent lagoons” (area code: 56) mainly east of the Nestos estuary. The area is adjacent to the west with the SPA GR1150009 “Gulf of Paleo - Bay of Eleftheron”, to the east with the SPA GR1150001 “Nestos Delta and Keramoti Lagoons and Thasopoula Island” and the SAC GR1150010 “Nestos Delta and Keramoti Lagoons – Wider Area”, while to the south in the region of Thassos with the SAC GR1150012 “Thassos (Mount Ypsario and coastal zone)”. It is worth mentioning that the islet of Fidonisi, located in the western part of the Gulf of Kavala, together with its coastal marine zone, belong to the neighboring GR1150012, while the islet of Thasopoula, located north of Thassos, belongs to GR1150001. Also, the two rocky islets of Kotsa and Kalamitsi in the northern part of the area are not included in this SPA

The area GR1150014 was included in the National List of Sites of the European Ecological Network Natura 2000 with its most recent revision (JUD 50743/11-12-2017, Government Gazette 4432/B/15-12-2017 Revision of the national list of sites of the European Ecological Network Natura 2000).

The area includes the entire marine area of the wider Thassos channel and the Gulf of Kavala. To the west and southwest, the area is delimited by the straight line connecting the beach of Elaichori in Kavala with

Cape Prinos in Thassos. To the east, the area is bounded by the western side of the port of Abdera and to the southeast by the Pyrgos cape of Thassos. The area is home to one of the largest fishing grounds in the country, while there are extensive Posidonia seagrass meadows (Posidonia oceanicae). Cetaceans, mainly dolphins and harbour porpoises (Phocoena phocoena), as well as the Mediterranean monk seal (Monachus monachus) are regularly found in the area. The shallow and very productive waters of the marine area constitute an important habitat for the local population of porpoises. The marine area is considered to be of extremely high importance for populations of rare, endangered and vulnerable cetaceans. The most important feature of the area is the high density (compared to the rest of the northern Aegean) of the porpoise population. Together with the marine area of Thrace, they constitute the most important areas at national level, but also in the Mediterranean, for the survival of the species. The high productivity of the marine environment, due to the neighboring river deltas and the extensive plateau of the Thracian Sea create an ideal habitat for both coastal dolphin species: the Bottlenose Dolphin (Tursiops truncatus) and the Common Dolphin (Delphinus delphis). Apparently for nutritional reasons, the local populations seem to thrive compared to populations further south in the Aegean or Ionian Sea. Therefore, they are considered as important population reserves not only for the Aegean, but also for the entire Eastern Mediterranean.

According to Fric et al. (2012), the area is one of the most important areas for seabirds in the North Aegean. The area includes marine areas where some of the largest and most important colonies of the Black-headed Shag (Phalacrocorax aristotelis desmarestii) in Greece occur, which are mainly located on uninhabited islets and inaccessible coasts. The local breeding population represents a significant part of the national breeding population of the species, while it is estimated that a significant part of the national wintering population occurs in the post-breeding period. Given that the area is characterized by shallow waters, the feeding areas of the species are not limited exclusively to the coastal zone. The area also contains significant populations of the Shearwater (Puffinus yelkouan). As no colonies of the species have been recorded in the area, it is estimated that individuals using the area for feeding originate from colonies located in the North and possibly Central Aegean Sea. Maximum numbers of Black-backed Gulls have been recorded during the winter months, when the birds return from the Black Sea to their breeding areas in the Aegean Sea and the rest of the Mediterranean, while significant concentrations have also been recorded during the breeding season.

The area is also regularly used by the Diomede's Gull (Calonectris diomedea) during the breeding season. Like the Black-backed Gull, the species is not known to breed in the area and the individuals found are estimated to originate from colonies in the North and Central Aegean Sea.

The North Aegean is an area very rich in nutrients, which flow in from rivers (Sylaios et al. 2005) and from the Black Sea (Poulos et al. 1997). The wider area is recognized as important for cetaceans at the Mediterranean level by ACCOBAMS (The Agreement on the Conservation of Cetaceans in the Black Sea, Mediterranean Sea and contiguous Atlantic area) and has been proposed for the establishment of a marine protected area (ACCOBAMS 2004, 2007, 2010).

Specifically, the SPA & SCI GR1150014 “Kavala Thassos Marine Area”, the main area of interest for cetaceans in this project, has very rich and relatively shallow waters <50 m depth. The characteristics of the area make it ideal for the 3 cetacean species of Greece that prefer coastal, shallow waters: the Bottlenose Dolphin (Tursiops truncatus), the Common Dolphin (Delphinus delphis) and the Harbour Porpoise (Phocoena phocoena). The Bottlenose Dolphin and the Harbour Porpoise are species of Annex II of Directive 92/43/EEC.

1.1.A1.iii.2 SAC GR1150010 “Nestos Delta and Keramoti Lagoons – Wider Area”

SAC GR1150010 includes the Nestos Delta, the Keramoti lagoons and the coastal zone. The vegetation is characterized by wetland forests, poplar plantations, as well as dune and brackish habitats.

In detail, the area in question is a large Delta consisting of agricultural land with some freshwater lagoons separated from the sea by narrow sandy strips. A small part of the once extensive Riparian Forest or Kotza Orma (Great Forest) is found along the flow of the Nestos River and near its mouth and the poplar plantations. This is a water-rich forest that once exceeded 125,000 acres in area and was one of the largest and most remarkable riverside forests in Europe in terms of flora and fauna, which was unfortunately cleared in 1950 to give the land to the residents of the area and cultivate agricultural plants. In addition to the above, the area has reed beds along the riverbed and mainly along the canals. In addition, there is a rocky islet, the island of Thalassopoula. In the area of Chrysoupoli there are freshwater lakes with reed beds and water lilies. In the northern part of the river, on the steep rocks, there is rich vegetation and diverse fauna. Most of the area of the Nestos River is backfilled with retaining embankments to separate it from cultivated land. The Keramoti Lagoons are a complex of coastal saltwater lagoons, located at the western end of the Nestos Delta, west of the city of Keramoti. The most important habitat types are the large coastal dunes, salt marshes, reed beds, and mainly marine vegetation - communities of vascular plants (Zostera, Posidonia, etc.). In each lagoon there are fish farms, while in close proximity there is an airport and the facilities of an abandoned US military radio station.

The area is the most important wetland due to the large area it occupies and because of its rich habitat types. Today, it continues to be a valuable part of a chain of wetlands included between the Axios River and the Evros Delta of northern Greece. However, its importance has decreased due to the lack of protection. From an ichthyological point of view, especially the wider part of the river estuary, it is an important breeding and spawning ground for several commercially, intensively exploited species (sea bream, sea bass, mullet, eel, etc.). In addition, the Keramoti lagoons are an important area from an ichthyological and ornithological point of view. The area is important for the breeding, passage and wintering of waterfowl, raptors and wading birds associated with reed beds.

1.1.A1.iii.3 SAC GR1150001 "Nestos Delta and Keramoti Lagoons and Thasopoula Island"

SAC GR1150001 "Nestos Delta and Keramoti Lagoons and Thasopoula Island", is located within the administrative boundaries of the Region of Eastern Macedonia and Thrace, the Regional Units of Xanthi and Kavala and has an area of 23,028.11 ha. The largest part of the area overlaps with the Natura 2000 network area SAC GR1150010 "Nestos Delta and Keramoti Lagoons - Wider Area and Coastal Zone. The area is located within the boundaries of the National Park of Eastern Macedonia and Thrace as it was in force until 2012, which however no longer legally exists, as well as the Important Bird Area GR012 “Nestos Delta and coastal lagoons”, while it partially overlaps with the Wildlife Refuge K769 “Kotza Orman Nestos Municipality of Topeiros”. The area is included within the Ramsar site Nestos Delta and adjacent lagoons (area code: 56). The area is managed by the Management Unit of Nestos - Vistonida and Rodopi National Parks, OFYPEKA.

The SPA GR1150001 comprises a large delta and consists of agricultural land with a few freshwater lagoons separated from the sea by narrow sandy strips. Of the water-rich forest of Kotzas Orman, only one area along the river, close to the mountain and the white plantations, is preserved today. In the area of Chrysoupolis, there are freshwater lakes with reeds and water lilies. In the northern part of the river, on the steep slopes, rich vegetation grows and various species of fauna live. In most of the area of Nestos, retention dikes have been constructed, so that it is separated from the cultivated land. The Keramoti lagoons are a complex of coastal saltwater lagoons, located at the western end of the Nestos Delta, west of the city of Keramoti. The most important habitats are the large coastal dunes, the salt marshes, the reeds and the marine communities of vascular plants (Zostera, Posidonia, etc.).

SAC GR1150001 is one of the most important wetlands in Greece due to its large area and the variety of habitat types it contains. Today, it remains a valuable part of a chain of wetlands in Northern Greece (including the Axios River and the Evros Delta). It is an important area for breeding, migratory and wintering water and wading birds as well as raptors and passerines associated with the reed beds. The riverine forest of the area is home to the only wild and genetically pure population of the Pheasant (Phasianus colchicus) in Greece, while the riverine forest of Nestos is an important breeding and wintering area for birds of prey, such as the Lesser Spotted Eagle (Clanga pomarina), the Lesser Spotted Eagle (Clanga clanga) and the Lesser White-tailed Eagle (Haliaeetus albicilla). The mixed colony of herons in Keramoti is of particular value. The area also includes a rocky islet, Thasopoula.

According to Chandrinos et al. (2015), the wetland does not host internationally significant populations of any waterfowl species (Wildfowl and Coots) in winter. During the decade 1997-2006, 2.0% of the total wintering population of waterfowl in Greece, as well as large populations of Greylag Goose at a national level, wintered in this area. The most numerous species in the area for the same period was the Eurasian Coot, while it is worth noting that in 1999, 4 individuals of the Lesser White-fronted Goose were also recorded (Chandrinos et al., 2015).

1.1.A1.iii.4 SAC GR1150012 "Thassos (Mount Ypsarios and coastal zone)"

SAC GR1150012 “Thassos (Mount Ypsarios and coastal zone)”, is located within the administrative boundaries of the Region of Eastern Macedonia and Thrace, the Regional Unit of Thassos and has an area of 17,333.29 ha. Within the area is the Wildlife Refuge “Limenaria, Theologos, Potamia, Prinos, Marion Island of Thassos”. The area is managed by the Nestos - Vistonida and Rodopi National Parks Management Unit, OFYPEKA.

Thassos is a forested island, with a large coverage of coniferous, broadleaf and mixed forests. The forest fires of previous years (mainly in 1985), have created a large area with little or no forest cover, an ideal foraging habitat for predators. The area includes the highest mountain of the island (Mount Ypsario), as well as many adjacent small rocky islets.

The island of Thassos is one of the most important breeding sites, at European level, for the Common Shag (Phalacrocorax aristotelis desmarestii) and the Golden Kestrel (Falco biarmicus). The area is important for breeding raptors, as well as migratory birds.

SAC GR1150012 includes some sections of coastline that include geological formations that may form sea caves (p.o. 8330). The presence and suitability of the breeding habitat of the Mediterranean monk seal has not yet been explored. The investigation of the area is part of the present project. Existing data collected through the National Seal Rescue and Information Collection Network indicate the presence of the species on the coast of Thassos, which is used as a feeding area.

1.1.A2 Detailed description of the Study Area (SA)

1.1.A2.i Recording of habitat types in Annex I of Joint Ministerial Decree H.P.14849/853/E103/2008 (Government Gazette B'645), especially in terms of their representativeness, relative surface area and conservation status (if they are SACs, SCIs)

1.1.A2.i.1 SAC GR1150010 "Nestos Delta and Keramoti Lagoons – Wider Area"

22 habitat types (H.T.) of Annex I of JMD 14849/853/E103/2008 are displayed, of which: three (3) are priority habitats (1150, 3170 and 91E0), 9 are habitats with conservation grade A, 10 with conservation grade B, 2 with conservation grade C, while for 1170 there is insufficient data (see Table 10). (source: Database of the European Ecological Network 2000 sites in Greece (file N2000_descr_GR_2020_08_10_V31b.accdb), Ministry of Environment and Natural Resources)

Table 10: Habitat types of Annex I of Joint Ministerial Decree 14849/853/E103/2008 in SAC GR1150010 (source: ΤΕΔ & N2000_descr_GR_2020_08_10_V31b.accdb, ΥΠΕΝ)

Code	Description	PF	Area(ha)	Data quality	Representativity	Relative surface	Conservation	Overall rating
					A / B / C / D	A / B / C	A / B / C	A / B / C
1110	Sandbanks that are constantly covered by shallow seawater		2918.51	P	A	A	B	A
1130	Estuaries		17.86	G	B	A	B	B
1140	Muddy and sandy flats exposed at low tide			G	C		A	A
1150*	Coastal lagoons	**1**	849.68	G	A	B	B	B
1170	Reefs			G	D			
1210	Annual vegetation between the high and low tide limits		34.07	G	A	B	C	B
1310	Primary vegetation with Salicornia and other annual species of muddy and sandy zones		23.01	G	B	C	A	B
1410	Mediterranean salt flats (Juncetalia maritimi)		1632.68	G	B	A	B	B
1420	Mediterranean and thermo-Atlantic halophilic thickets (Sarcocornetea fruticosi)		424.97	G	A	B	A	A
2110	Atypical moving dunes		85.42	G	B	B	A	B
2120	Moving dunes of the coastline with Ammophila arenaria («white dunes»)		107.28	G	A	B	A	B
2190	Wet hollows between dunes		13.58	G	A	B	B	B
2220	Dunes with Euphorbia terracina		80.19	G	B	A	A	A

Code	Description	PF	Area(ha)	Data quality	Representativity	Relative surface	Conservation	Overall rating
					A / B / C / D	A / B / C	A / B / C	A / B / C
3150	Eutrophic natural lakes with Magnopotamion or Hydrocharition type vegetation		11.21	G	A	C	B	B
3170	Mediterranean seasonal backwaters	**1**	0.05	G	B	C	C	C
3280	Mediterranean rivers with permanent flow of Paspalo-Agrostidion and dense vegetation in the form of a curtain of Salix and Populus alba on their banks		422.58	G	A	A	B	A
62A0	Dry grasslands of the eastern Mediterranean (Scorzoneratalia villosae)		332.53	G	C	C	B	C
6420	Moist Mediterranean grasslands with tall grasses of Molinio-Holoschoenion		1127.64	G	B	A	B	B
91E0	Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)	**1**	513.85	G	B	A	A	A
91F0	Mixed forests with Quercus robur, Ulmus laevis, Ulmus minor, Fraxinus excelsior or Fraxinus angustifolia (Ulmenion minoris) along large rivers		157.45	G	A	A	B	A
92A0	Forests – galleries with Salix alba and Populus alba		623.62	G	A	B	A	A
92D0	Southern riparian forests – galleries and thickets (Nerio-Tamaricetea and Securinegion tinctoriae)		672.52	G	B	B	A	B

Legend
T.C. Code: Four-digit habitat type code
T.C. Description: Habitat type name
PF: Priority Habitat (Value 1: Priority Habitat)
Area (ha): Area of the H.T. in hectares
Data Quality: G= Good, M= Moderate, P= Insufficient, DD= Data Deficient
Representativeness: provides a measure of "how typical" a habitat type is. A (excellent), B (good), C (sufficient), D (not significant presence).

1.1.A2.ii Recording of flora and fauna species in Annex II of Joint Ministerial Decree H.P.14849/853/E103/2008 (Government Gazette B'645), especially with regard to the size and density of populations, their conservation status and their isolation (if they are SACs, or SCIs)

1.1.A2.ii.1 SAC & SCI GR1150014 "Marine Area of Kavala Thassos"

In the SAC & SCI GR1150014 "Marine Area of Kavala Thassos" area, 1 species of fish fauna and 2 species of marine mammals occur (see Table 11). There is insufficient data regarding their conservation status. (source: Database of the European Ecological Network 2000 sites in Greece (file N2000_descr_GR_2020_08_10_V31b.accdb), Ministry of Environment and Natural Resources)

Table 11: Species in SAC & SCI GR1150014 listed in Annex II of Joint Ministerial Decision 14849/853/E103/2008 and site assessment for them (source: ΤΕδ & N2000_descr_GR_2020_08_10_V31b.accdb, ΥΠΕΝ)

Species			Natura site						Natura site			
Species group	Code	Scientific name	Type	Size		Unit	Population data category	Data quality	A/B/C/D	A/B/C		
				Min	Max				Pop.	Con.	Iso.	Glo.
F	*1103*	*Alosa fallax*	r				P	DD	D			
M	*1351*	*Phocoena phocoena*	p				P	DD	D			
M	*1349*	*Tursiops truncatus*	p				P	DD	D			

Legend
Species group: A = Amphibians, B = Birds, F = Fish, I = Invertebrates, M = Mammals, P = Plants, R = Reptiles
Species: Latin species name
Type: p = resident, r = breeding, c = congregating, w = wintering
Size: i = individuals, p = pairs
Data pop. category: C = common, R = rare, V = very rare, P = present or population size in individuals (i) or pairs (p).
Data quality: G = Good, M = Moderate, P = Poor, DD = Data deficient
Pop.: Population: Relative size and density of the species in the area in relation to the total population within the national boundaries. A: 100%>=p> 15%, B: 15%>=p>2%, C: 2%>=p>0, D: not significant population.
Con.: Conservation: degree of conservation of habitat features that are important for the species and restoration possibilities. A: excellent conservation, B: good conservation, C: moderate or limited conservation.
Iso.: Isolation: Degree of isolation of the population present in the area in relation to the natural distribution of the species. A: Isolated (almost) population, B: Non-isolated population, but located on the edges of the distribution area, C: Non-isolated population, within the wider distribution area.
Glo.: Global: Overall assessment of the value of the site for the conservation of the species. A: excellent, B: Good, C: Adequate.

1.1.A2.ii.2 SAC GR1150010 "Nestos Delta and Keramoti Lagoons – Wider Area"

5 species of fish, 3 species of invertebrates, 7 species of reptiles, 5 species of mammals and 2 species of amphibians are present (see Table 12). The conservation status is B for 8 species, C for 8 species and for the remaining 6 species there is insufficient data. (source: Database of European Ecological Network 2000 sites in Greece (file N2000_descr_GR_2020_08_10_V31b.accdb), Ministry of Environment and Natural Resources)

Table 12: Species in SAC GR1150010 listed in Annex II of Joint Ministerial Decision 14849/853/E103/2008 and site assessment for them (source: ΤΕδ & N2000_descr_GR_2020_08_10_V31b.accdb, ΥΠΕΝ)

Species			Natura site						Natura site			
Species group	Code	Scientific name	Type	Size		Unit	Population data category	Data quality	A/B/C/D	A/B/C		
				Min	Max				Pop.	Con.	Iso.	Glo.
F	1103	*Alosa fallax*	r				P	DD	C	C	C	C
F	1152	*Aphanius fasciatus*	p				C		B	B	C	B
F	5263	*Barbus strumicae*	p				C	DD		B	C	B
A	1193	*Bombina variegata*	p				C		D			
R	1224	*Caretta caretta*	p				P	DD				
F	6963	*Cobitis taenia Complex*	p				C	DD		B	C	B
R	1279	*Elaphe quatuorlineata*	p				P		A	C	A	A

Species			Natura site						Natura site			
Species group	Code	Scientific name	Type	Size		Unit	Population data category	Data quality	A/B/C/D	A/B/C		
				Min	Max				Pop.	Con.	Iso.	Glo.
R	6095	*Zamenis situla*	p				P		D			
R	1220	*Emys orbicularis*	p				C		B	C	C	C
I	1043	*Lindenia tetraphylla*	p				P		C	B	C	B
M	1355	*Lutra lutra*	p						B	C	A	B
I	1060	*Lycaena dispar*	p				R		C	B	A	C
R	2373	*Mauremys rivulata*	p				C		B	C	C	C
M	1310	*Miniopterus schreibersii*	p				R	P	D	B	C	C
I	1037	*Ophiogomphus cecilia*	p				P		B	B	C	C
M	1351	*Phocoena phocoena*	p				P	DD	D			
M	1304	*Rhinolophus ferrumequinum*	p				R	P	D	C	C	C
F	5339	*Rhodeus amarus*	p				C	DD		B	C	B
R	1219	*Testudo graeca*	p				R		C	C	C	C
R	1217	*Testudo hermanni*	p				P		B	C	C	C
A	1171	*Triturus karelinii*	p				V		D			
M	1349	*Tursiops truncatus*	p				P	DD	D	C	C	C

Legend
Species group: A = Amphibians, B = Birds, F = Fish, I = Invertebrates, M = Mammals, P = Plants, R = Reptiles
Species: Latin species name
Type: p = resident, r = breeding, c = congregating, w = wintering
Size: i = individuals, p = pairs
Data pop. category: C = common, R = rare, V = very rare, P = present or population size in individuals (i) or pairs (p).
Data quality: G = Good, M = Moderate, P = Poor, DD = Data deficient
Pop.: Population: Relative size and density of the species in the area in relation to the total population within the national boundaries. A: 100%>=p> 15%, B: 15%>=p>2%, C: 2%>=p>0, D: not significant population.
Con.: Conservation: degree of conservation of habitat features that are important for the species and restoration possibilities. A: excellent conservation, B: good conservation, C: moderate or limited conservation.
Iso.: Isolation: Degree of isolation of the population present in the area in relation to the natural distribution of the species. A: Isolated (almost) population, B: Non-isolated population, but located on the edges of the distribution area, C: Non-isolated population, within the wider distribution area.
Glo.: Global: Overall assessment of the value of the site for the conservation of the species. A: excellent, B: Good, C: Adequate.

1.1.A2.iii Recording of the bird species of Annex I of Joint Ministerial Decree H.P.37338/1807/E.103/2010 (Government Gazette B'1495), as well as other migratory bird species with a significant presence in the Natura 2000 area, especially in terms of the size and density of the populations, their conservation status and their isolation (if it is a SAC)

1.1.A2.iii.1 SAC & SCI GR1150014 «Marine Area of Kavala–Thasos»

The SDF of the area includes two (2) bird species of Annex I of Joint Ministerial Decision 37338/1807/E.103/2010 (see Table 13). Regarding the conservation status of the species within the area, there is no assessment, due to insufficient data. (source: Database of the European Ecological Network 2000 sites in Greece (file N2000_descr_GR_2020_08_10_V31b.accdb), Ministry of Environment and Natural Resources)

Table 13: Bird species of Annex I of Joint Ministerial Decree 37338/1807/E.103/2010 in the SAC & SCI GR1150014 area (source: TEδ & N2000_descr_GR_2020_08_10_V31b.accdb, Ministry of Environment and Natural Resources)

Species			Natura site						Species			
Species group	Code	Species group	Code	Species group		Code	Species group	Code	A/B/C/D	A/B/C		
				Min	Max				Pop.	Con.	Iso.	Glo.
B	A392	*Phalacrocorax aristotelis desmarestii*	r	168	182	p	P	G				
B	A392	*Phalacrocorax aristotelis desmarestii*	c	580	1000	i	P	G				
B	A464	*Puffinus yelkouan*	c	500	2000	i	P	G				

Legend
Species group: B= Birds
Species: Latin species name
Type: p = resident, r = breeding, c = congregating, w = wintering
Size: i= individuals, p= pairs
Data pop. category: C = common, R = rare, V = very rare, P = present or population size in individuals (i) or pairs (p).
Data quality: G= Good, M= Moderate, P= Insufficient, DD= Data deficient
Pop.: Population: Relative size and density of the species in the area in relation to the total population within the national boundaries. A: 100%>=p> 15%, B: 15%>=p>2%, C: 2%>=p>0, D: insignificant population.
Con.: Conservation: degree of conservation of habitat features that are important for the species and possibilities for restoration. A: excellent conservation, B: good conservation, C: moderate or limited conservation.
Iso.: Isolation: Degree of isolation of the population present in the area in relation to the natural distribution of the species. A: Isolated (almost) population, B: Non-isolated population, but located on the edge of the distribution area, C: Non-isolated population, within the wider distribution area.
Glo.: Global: Overall assessment of the value of the site for the conservation of the species. A: excellent, B: Good, C: Adequate.

1.1.A2.iii.2 SAC GR1150001 "Nestos Delta and Keramoti Lagoons and Thasopoula Island"

The SDF includes 175 bird species, of which 5 species are permanent residents, 82 species are summer visitors that breed in the area, 66 species winter in the area and finally 55 species use it as a stopover during their annual migratory movements. Some species belong to more than one category. Most species are common or present, while three species are rare.

The bird fauna species characterizing the area are the following: Vanellus spinosus, Dendrocopos syriacus, Sternula albifrons, Glareola pratincola, Ixobrychus minutus, Lanius minor, Cygnus olor, Phalacrocorax carbo, Microcarbo pygmeus, Burhinus oedicnemus, Larus melanocephalus, Numenius tenuirostris, Pelecanus crispus, Phalacrocorax aristotelis, Puffinus yelkouan, Calandrella brachydactyla, Aythya nyroca, Clanga clanga, Anser erythropus and Ardea alba.

The conservation status of the species has been classified as good (B), except for 15 species for which there is insufficient data (see Table 14). (source: Database of European Ecological Network 2000 areas in Greece (file N2000_descr_GR_2020_08_10_V31b.accdb), Ministry of National Economy)

Table 14: Bird species of Annex I of Joint Ministerial Decision 37338/1807/E.103/2010 in SPA GR1150001 (source: TEδ & N2000_descr_GR_2020_08_10_V31b.accdb, ΥΠΕΝ)

Species			Population (Natura site)						Area assessment (Natura site)			
Species type	Code	Scientific name	Type	Size		Unit	Population data category	Data quality	A/B/C/D	A/B/C		
				Min	Max				Pop.	Con.	Iso.	Glo.
B	A402	*Accipiter brevipes*	r	12	17	i		G	C	B	B	B
B	A298	*Acrocephalus arundinaceus*	r				P		C	B	C	B
B	A293	*Acrocephalus melanopogon*	c				P		C	B	C	B
B	A296	*Acrocephalus palustris*	c				P		C	B	C	B
B	A295	*Acrocephalus schoenobaenus*	r				P		C	B	C	B
B	A297	*Acrocephalus scirpaceus*	r				P		C	B	C	B
B	A168	*Actitis hypoleucos*	c				P		C	B	C	B
B	A247	*Alauda arvensis*	r				P		C	B	C	B
B	A247	*Alauda arvensis*	w				P		C	B	C	B
B	A229	*Alcedo atthis*	r	2	2	p	P		C	B	C	B
B	A229	*Alcedo atthis*	w	3	7	i	P		C	B	C	B
B	A054	*Anas acuta*	w	1	380	i	P		C	B	C	B
B	A857	*Spatula clypeata*	w	140	430	i	P		C	B	C	B
B	A052	*Anas crecca*	w	1	440	i	P		C	B	C	B
B	A855	*Mareca penelope*	w	842	1662	i	P		C	B	C	B
B	A053	*Anas platyrhynchos*	r	1	29	p	P		C	B	C	B
B	A053	*Anas platyrhynchos*	w	20	930	i	P		C	B	C	B
B	A856	*Spatula querquedula*	c	50	100	i	P		C	B	C	B
B	A856	*Spatula querquedula*	r	2	11	p						
B	A889	*Mareca strepera*	r	3	3	p	P		C	B	C	B
B	A889	*Mareca strepera*	w	19	69	i	P		C	B	C	B
B	A394	*Anser albifrons albifrons*	w	36	329	i		G	B	B	C	B
B	A043	*Anser anser*	w	1	63	i		G	C	B	B	B
B	A042	*Anser erythropus*	w	0	1	i		G	A	B	B	B
B	A255	*Anthus campestris*	r				P		C	B	C	B
B	A258	*Anthus cervinus*	c				P		C	B	C	B
B	A257	*Anthus pratensis*	c				P		C	B	C	B
B	A259	*Anthus spinoletta*	w				P		C	B	C	B
B	A256	*Anthus trivialis*	w				P		C	B	C	B
B	A228	*Tachymarptis melba*	c				P		C	B	C	B
B	A226	*Apus apus*	r				P		C	B	C	B
B	A227	*Apus pallidus*	r				P		C	B	C	B
B	A091	*Aquila chrysaetos*	r	2	2	p	P		C	B	C	B
B	A859	*Clanga clanga*	w	1	13	i		G	C	B	B	B
B	A404	*Aquila heliaca*	c	2		i		G	A	B	B	B
B	A858	*Clanga pomarina*	r	3	4	p		G	B	B	B	B
B	A028	*Ardea cinerea*	r	70	110	p		G				
B	A028	*Ardea cinerea*	w	64	192	i						
B	A029	*Ardea purpurea*	r	3	8	p		G	A	B	C	B
B	A222	*Asio flammeus*	r	1	1	p						
B	A222	*Asio flammeus*	w				P		C	B	C	B
B	A221	*Asio otus*	r	1	2	p						
B	A059	*Aythya ferina*	w	9	90	i	P		C	B	C	B
B	A061	*Aythya fuligula*	w	1	40	i	P		C	B	C	B
B	A060	*Aythya nyroca*	r	5	5	p						
B	A021	*Botaurus stellaris*	r	1	1	p		G	B	B	B	B
B	A215	*Bubo bubo*	p				R		B	B	C	B
B	A215	*Bubo bubo*	r	1	1	p						

Species			Population (Natura site)						Area assessment (Natura site)			
Species type	Code	Scientific name	Type	Size		Unit	Population data category	Data quality	A/B/C/D	A/B/C		
				Min	Max				Pop.	Con.	Iso.	Glo.
B	A133	*Burhinus oedicnemus*	r	2	7	p		G	C	B	C	B
B	A087	*Buteo buteo*	r	8	8	p	P		C	B	C	B
B	A087	*Buteo buteo*	w	30	90	i		G	C	B	C	B
B	A403	*Buteo rufinus*	c				P		C	B	B	B
B	A403	*Buteo rufinus*	r	1	1	p	P		C	B	B	B
B	A243	*Calandrella brachydactyla*	r				P		C	B	C	B
B	A149	*Calidris alpina*	c				P		C	B	C	B
B	A149	*Calidris alpina*	w	1	390	i	P		C	B	C	B
B	A147	*Calidris ferruginea*	c				P		C	B	C	B
B	A145	*Calidris minuta*	w	1	450	i	P		C	B	C	B
B	A146	*Calidris temminckii*	c				P		C	B	C	B
B	A224	*Caprimulgus europaeus*	r				P		C	B	C	B
B	A138	*Charadrius alexandrinus*	r	1	7	p		G	C	B	C	B
B	A138	*Charadrius alexandrinus*	w	1	21	i						
B	A137	*Charadrius hiaticula*	c				P		C	B	B	B
B	A734	*Chlidonias hybrida*	w	300	300	i		G	C	B	C	B
B	A198	*Chlidonias leucopterus*	c	600	600	i		G	C	B	C	B
B	A197	*Chlidonias niger*	c	300	300	i		G	C	B	C	B
B	A030	*Ciconia nigra*	r	3	3	p		G	B	B	B	B
B	A080	*Circaetus gallicus*	r	4	4	p	P		C	B	C	B
B	A081	*Circus aeruginosus*	r	10	10	p		G	A	B	C	B
B	A081	*Circus aeruginosus*	w	22	58	i		G	A	B	C	B
B	A082	*Circus cyaneus*	w	1	6	i		G	B	B	C	B
B	A084	*Circus pygargus*	c				P		C	B	C	B
B	A231	*Coracias garrulus*	r	2	9	p	P		C	B	C	B
B	A113	*Coturnix coturnix*	c				P		C	B	C	B
B	A113	*Coturnix coturnix*	r				P		C	B	C	B
B	A212	*Cuculus canorus*	r				P		C	B	C	B
B	A036	*Cygnus olor*	r	1	20	p						
B	A036	*Cygnus olor*	w	37	266	i		G	C	B	C	B
B	A738	*Delichon urbicum (urbica)*	r				P		C	B	C	B
B	A868	*Leiopicus medius*	p				P		C	B	C	B
B	A429	*Dendrocopos syriacus*	r	20	20	p	P		C	B	B	B
B	A236	*Dryocopus martius*	p				P		C	B	B	B
B	A236	*Dryocopus martius*	r	1	25	p						
B	A773	*Ardea alba*	w	10	60	i		G	A	B	B	B
B	A026	*Egretta garzetta*	c	200	200	i		G	A	B	C	B
B	A026	*Egretta garzetta*	r	90	190	p		G	B	B	C	B
B	A026	*Egretta garzetta*	w	22	40	i		G	B	B	C	B
B	A447	*Emberiza caesia*	c				P		C	B	C	B
B	A382	*Emberiza melanocephala*	r				P		C	B	C	B
B	A269	*Erithacus rubecula*	w				P		C	B	C	B
B	A101	*Falco biarmicus*	w	1	2	i		G	B	B	C	B
B	A098	*Falco columbarius*	w	4	4	i		G	C	B	C	B
B	A100	*Falco eleonorae*	c			i		G	C	B	B	B
B	A103	*Falco peregrinus*	w	1	2	i	P		C	B	C	B
B	A099	*Falco subbuteo*	r	5	5	p	P	G	C	B	C	B
B	A097	*Falco vespertinus*	c	20	30	i		G	C	B	C	B
B	A321	*Ficedula albicollis*	c				P		C	B	C	B

Species			Population (Natura site)						Area assessment (Natura site)			
Species type	Code	Scientific name	Type	Size		Unit	Population data category	Data quality	A/B/C/D	A/B/C		
				Min	Max				Pop.	Con.	Iso.	Glo.
B	A322	*Ficedula hypoleuca*	c				P		C	B	C	B
B	A442	*Ficedula semitorquata*	c				P		C	B	C	B
B	A657	*Fringilla coelebs all others*	r				P		C	B	C	B
B	A125	*Fulica atra*	r				P		C	B	C	B
B	A125	*Fulica atra*	w	3950	12660	i	P		C	B	C	B
B	A153	*Gallinago gallinago*	w	1	30	i		G	C	B	C	B
B	A002	*Gavia arctica*	w	2	9	i		G	B	B	B	B
B	A001	*Gavia stellata*	w	2	2	i		G				
B	A135	*Glareola pratincola*	r	2	19	p		G	C	B	C	B
B	A078	*Gyps fulvus*	c			i		G	B	B	C	B
B	A130	*Haematopus ostralegus*	r	2	21	p	P		C	B	C	B
B	A130	*Haematopus ostralegus*	w	2	2	i						
B	A075	*Haliaeetus albicilla*	c	1	5	i		G	A	B	B	B
B	A075	*Haliaeetus albicilla*	r	1	1	p		G	A	B	B	B
B	A707	*Hieraaetus fasciatus (Aquila fasciata)*	c					G	C	B	B	B
B	A092	*Hieraaetus pennatus (Aquila pennata)*	c					G	C	B	C	B
B	A131	*Himantopus himantopus*	r	25	25	p	P		C	B	C	B
B	A299	*Hippolais icterina*	c				P		C	B	C	B
B	A479	*Cecropis daurica*	r				P		C	B	C	B
B	A251	*Hirundo rustica*	r				P		C	B	C	B
B	A022	*Ixobrychus minutus*	r	1	7	p	P		C	B	C	B
B	A233	*Jynx torquilla*	c				P		C	B	C	B
B	A338	*Lanius collurio*	r				P		C	B	C	B
B	A339	*Lanius minor*	r				P		C	B	C	B
B	A341	*Lanius senator*	r				P		C	B	C	B
B	A179	*Larus ridibundus*	w			i		G	C	B	C	B
B	A181	*Larus audouinii*	c				R		B	B	B	B
B	A180	*Larus genei*	w	13	60	i		G	A	B	C	B
B	A176	*Larus melanocephalus*	c					G	A	B	C	B
B	A176	*Larus melanocephalus*	r	160	160	p		G	A	B	C	B
B	A862	*Hydrocoloeus minutus*	c				P		C	B	C	B
B	A292	*Locustella luscinioides*	r				P		C	B	C	B
B	A246	*Lullula arborea*	w				P		C	B	C	B
B	A271	*Luscinia megarhynchos*	r				P		C	B	C	B
B	A242	*Melanocorypha calandra*	r				P		C	B	C	B
B	A069	*Mergus serrator*	w	1	1	i		G	C	B	C	B
B	A230	*Merops apiaster*	r				P		C	B	C	B
B	A073	*Milvus migrans*	r	1	1	p	P		B	B	C	B
B	A073	*Milvus migrans*	w	1	8	i	P		B	B	C	B
B	A074	*Milvus milvus*	c					G	A	B	B	B
B	A262	*Motacilla alba*	r				P		C	B	C	B
B	A261	*Motacilla cinerea*	w				P		C	B	C	B
B	A260	*Motacilla flava*	r				P		C	B	C	B
B	A319	*Muscicapa striata*	c				P		C	B	C	B
B	A319	*Muscicapa striata*	r				P		C	B	C	B

Species			Population (Natura site)						Area assessment (Natura site)			
Species type	Code	Scientific name	Type	Size		Unit	Population data category	Data quality	A/B/C/D	A/B/C		
				Min	Max				Pop.	Con.	Iso.	Glo.
B	A077	*Neophron percnopterus*	c			i		G	B	B	C	B
B	A159	*Numenius tenuirostris*	c				P		A	B	B	B
B	A023	*Nycticorax nycticorax*	c	20	50	i		G	C	B	C	B
B	A278	*Oenanthe hispanica*	r				P		C	B	C	B
B	A277	*Oenanthe oenanthe*	r				P		C	B	C	B
B	A337	*Oriolus oriolus*	r				P		C	B	C	B
B	A214	*Otus scops*	p				P		C	B	C	B
B	A214	*Otus scops*	r	1	4	p						
B	A094	*Pandion haliaetus*	c					G	B	B	C	B
B	A355	*Passer hispaniolensis*	r				P		C	B	C	B
B	A020	*Pelecanus crispus*	c	150	200	i		G	C	B	B	B
B	A020	*Pelecanus crispus*	w	100	350	i		G	C	B	B	B
B	A019	*Pelecanus onocrotalus*	c	100	150	i		G	A	B	B	B
B	A072	*Pernis apivorus*	r	4	4	p	P	G	C	B	C	B
B	A392	*Phalacrocorax aristotelis desmarestii*	r	6	6	p		G	A	B	C	B
B	A392	*Phalacrocorax aristotelis desmarestii*	w	20	40	i	P	G	C	B	B	B
B	A391	*Phalacrocorax carbo sinensis*	w	60	2500	i		G	B	B	C	B
B	A875	*Microcarbo pygmaeus*	w	50	170	i		G	A	B	B	B
B	A170	*Phalaropus lobatus*	c				P		B	B	B	B
B	A663	*Phoenicopterus roseus*	w	380	1310	i		G	B	B	C	B
B	A273	*Phoenicurus ochruros*	w				P		C	B	C	B
B	A274	*Phoenicurus phoenicurus*	c				P		C	B	C	B
B	A572	*Phylloscopus collybita s. str.*	w				P		C	B	C	B
B	A314	*Phylloscopus sibilatrix*	c				P		C	B	C	B
B	A316	*Phylloscopus trochilus*	c				P		C	B	C	B
B	A234	*Picus canus*	p				P		C	B	B	B
B	A234	*Picus canus*	r	2	17	p						
B	A034	*Platalea leucorodia*	w	10	16	i	P		C	B	C	B
B	A032	*Plegadis falcinellus*	c	100	200	i		G	B	B	C	B
B	A140	*Pluvialis apricaria*	w	110	120	i	P		C	B	C	B
B	A141	*Pluvialis squatarola*	w	1	60	i	P		C	B	C	B
B	A005	*Podiceps cristatus*	r	1	2	p	P		C	B	B	B
B	A005	*Podiceps cristatus*	w	50	300	i	P		C	B	B	B
B	A008	*Podiceps nigricollis*	w	20	70	i		G	C	B	C	B
B	A892	*Zapornia parva*	c				P		C	B	B	B
B	A893	*Zapornia pusilla*	c				P		C	B	B	B
B	A464	*Puffinus yelkouan*	w	700	1000	i		G	C	B	B	B
B	A132	*Recurvirostra avosetta*	w	40	160	i	P		C	B	C	B
B	A249	*Riparia riparia*	r				P		C	B	C	B
B	A275	*Saxicola rubetra*	c				P		C	B	C	B
B	A189	*Gelochelidon nilotica*	r	1	1	p		G	C	B	C	B
B	A894	*Hydroprogne caspia*	w	2	2	i		G	C	B	C	B

Species			Population (Natura site)						Area assessment (Natura site)			
Species type	Code	Scientific name	Type	Size		Unit	Population data category	Data quality	A/B/C/D	A/B/C		
				Min	Max				Pop.	Con.	Iso.	Glo.
B	A863	*Thalasseus sandvicensis*	w	1	10	i		G	C	B	C	B
B	A193	*Sterna hirundo*	r	5	21	p		G	B	B	C	B
B	A210	*Streptopelia turtur*	r				P		C	B	C	B
B	A351	*Sturnus vulgaris*	r				P		C	B	C	B
B	A351	*Sturnus vulgaris*	w				P		C	B	C	B
B	A310	*Sylvia borin*	c				P		C	B	C	B
B	A304	*Sylvia cantillans*	r				P		C	B	C	B
B	A309	*Sylvia communis*	r				P		C	B	C	B
B	A574	*Sylvia curruca*	c				P		C	B	C	B
B	A397	*Tadorna ferruginea*	w	72	72	i		G	A	B	B	B
B	A048	*Tadorna tadorna*	r	1	20	p	P		C	B	C	B
B	A048	*Tadorna tadorna*	w	21	156	i	P		C	B	C	B
B	A166	*Tringa glareola*	c	30	50	i	P		C	B	C	B
B	A164	*Tringa nebularia*	w	1	1	i		G	C	B	C	B
B	A165	*Tringa ochropus*	w	1	1	i	P		C	B	C	B
B	A163	*Tringa stagnatilis*	c				P		C	B	C	B
B	A162	*Tringa totanus*	r	1	6	p	P		C	B	C	B
B	A162	*Tringa totanus*	w	30	70	i	P		C	B	C	B
B	A285	*Turdus philomelos*	c				P		C	B	C	B
B	A232	*Upupa epops*	r				P		C	B	C	B
B	A728	*Vanellus (Hoplopterus) spinosus*	r	2	21	p						
B	A142	*Vanellus vanellus*	r	1	1	p						
B	A142	*Vanellus vanellus*	w	170	440	i	P	G	C	B	C	B
B	A167	*Xenus cinereus*	c	12	17	i	R	G	B	B	B	B

Legend
Species group: B= Birds
Species: Latin species name
Type: p = resident, r = breeding, c = congregating, w = wintering
Size: i= individuals, p= pairs
Data pop. category: C = common, R = rare, V = very rare, P = present or population size in individuals (i) or pairs (p).
Data quality: G= Good, M= Moderate, P= Insufficient, DD= Data deficient
Pop.: Population: Relative size and density of the species in the area in relation to the total population within the national boundaries. A: 100%>=p> 15%, B: 15%>=p>2%, C: 2%>=p>0, D: insignificant population.
Con.: Conservation: degree of conservation of habitat features that are important for the species and possibilities for restoration. A: excellent conservation, B: good conservation, C: moderate or limited conservation.
Iso.: Isolation: Degree of isolation of the population present in the area in relation to the natural distribution of the species. A: Isolated (almost) population, B: Non-isolated population, but located on the edge of the distribution area, C: Non-isolated population, within the wider distribution area.
Glo.: Global: Overall assessment of the value of the site for the conservation of the species. A: excellent, B: Good, C: Adequate.

1.1.A2.iii.3 SAC GR1150012 « Thassos (Mount Ypsarios and coastal zone)»

The SDF includes 39 bird species, of which 4 species are permanent residents, 20 species are summer visitors that breed in the area, 4 species winter in the area and finally 20 species use it as a stopover during their annual migratory movements. Some species belong to more than one category (see Table 15). Most species are common or present, while Hippolais olivetorum is considered rare.

The bird fauna species characterizing the area are the following: Phalacrocorax aristotelis, Falco biarmicus and Buteo rufinus.

The conservation status of the species has been classified as excellent (A) for 6 species, as good (B) for 28 species, while two species (Alauda arvensis, Chlidonias leucopterus) show moderate or limited conservation and for 12 species there are insufficient data. (source: Database of European Ecological Network 2000 areas in Greece (file N2000_descr_GR_2020_08_10_V31b.accdb), Ministry of National Economy)

Table 15: Bird species listed in Annex I of JMD 37338/1807/E.103 in SPA GR1150012 (source: TED & N2000_descr_GR_2020_08_10_V31b.accdb, Ministry of Environment and Energy).

Species			Population (Natura site)						Area assessment (Natura site)			
Species type	Code	Scientific name	Species type	Code		Scientific name	Species type	Code	Scientific name	Species type		
B	A402	*Accipiter brevipes*	r	4	4	p		G	C	A	C	B
B	A247	*Alauda arvensis*	c				C	DD	C	C	C	C
B	A229	*Alcedo atthis*	p	5	10	p		G	C	B	C	B
B	A229	*Alcedo atthis*	w	5	5	p		G	C	B	C	B
B	A228	*Tachymarptis melba*	r	100		p		M	B	B	C	A
B	A226	*Apus apus*	r				C	DD	C	B	C	C
B	A091	*Aquila chrysaetos*	p	1	1	p		G	C	B	C	B
B	A091	*Aquila chrysaetos*	w	3	5	i		G	C	B	C	B
B	A028	*Ardea cinerea*	w				P	DD	D			
B	A029	*Ardea purpurea*	c				P	DD	D			
B	A024	*Ardeola ralloides*	c				P	DD	D			
B	A021	*Botaurus stellaris*	c				P	DD	D			
B	A215	*Bubo bubo*	p	2	4	p		G	C	A	C	B
B	A087	*Buteo buteo*	p	5		p		M	C	A	C	B
B	A087	*Buteo buteo*	w	5		p		M		A		
B	A403	*Buteo rufinus*	r	2		p		M	C	B	C	B
B	A850	*Calonectris diomedea s. str.*	c				P	DD	C		C	B
B	A850	*Calonectris diomedea s. str.*	r				P	DD	C	B	C	B
B	A224	*Caprimulgus europaeus*	r				C	DD	C		C	B
B	A734	*Chlidonias hybrida*	c				P	DD	D			
B	A198	*Chlidonias leucopterus*	c				P	DD	D	C		
B	A197	*Chlidonias niger*	c				P	DD	D			
B	A080	*Circaetus gallicus*	r	2	4	p		G	C	A	C	B
B	A081	*Circus aeruginosus*	p	1	3	i		G	D			
B	A084	*Circus pygargus*	c				P	DD	D			
B	A231	*Coracias garrulus*	c				P	DD	C	B	C	C
B	A231	*Coracias garrulus*	r	1	3	p		G	C	B	C	C
B	A738	*Delichon urbicum (urbica)*	r				C	DD	C	B	C	B
B	A026	*Egretta garzetta*	c				P	DD	D	B		
B	A447	*Emberiza caesia*	c				P	DD	C	B	C	B
B	A447	*Emberiza caesia*	r				P	DD	C	B	C	B
B	A379	*Emberiza hortulana*	c				P	DD	C	B	C	B
B	A379	*Emberiza hortulana*	r				P	DD	C	B	C	B
B	A101	*Falco biarmicus*	p	2	3	p		G	C	B	B	B
B	A100	*Falco eleonorae*	c	30	60	i		G	C	B	C	B
B	A103	*Falco peregrinus*	p	5	6	p		G	B	B	C	B
B	A321	*Ficedula albicollis*	c				P	DD	C		C	C
B	A320	*Ficedula parva*	c				P	DD	C		C	C
B	A075	*Haliaeetus albicilla*	w	1	1	i		G	D			

Species			Population (Natura site)						Area assessment (Natura site)			
Species type	Code	Scientific name	Species type	Code		Scientific name	Species type	Code	Scientific name	Species type		
B	A707	*Hieraaetus fasciatus (Aquila fasciata)*	p	2	2	p		G	C	B	C	B
B	A092	*Hieraaetus pennatus (Aquila pennata)*	c				P	DD	C	B	C	C
B	A131	*Himantopus himantopus*	c				P	DD	D	B		
B	A439	*Hippolais olivetorum*	c				P	DD	C	B	C	C
B	A439	*Hippolais olivetorum*	r				R	DD	D	B		
B	A251	*Hirundo rustica*	r				C	DD	C	B	C	B
B	A014	*Hydrobates pelagicus*	c				P	DD	C	B	C	B
B	A022	*Ixobrychus minutus*	c				P	DD	C		C	B
B	A338	*Lanius collurio*	c				C	DD	C	B	C	B
B	A338	*Lanius collurio*	r				P	DD	C	B	C	B
B	A339	*Lanius minor*	c				P	DD	C	B	C	B
B	A339	*Lanius minor*	r				P	DD	C	B	C	C
B	A179	*Larus ridibundus*	w				C	DD				
B	A181	*Larus audouinii*	w				R	DD	C	B	C	C
B	A176	*Larus melanocephalus*	c				C	DD	C	A	C	C
B	A246	*Lullula arborea*	r				P	DD	C		C	C
B	A230	*Merops apiaster*	r				C	DD	C	B	C	B
B	A260	*Motacilla flava*	c				P	DD	C	B	C	B
B	A260	*Motacilla flava*	r				C	DD	C	B	C	B
B	A023	*Nycticorax nycticorax*	c				P	DD	D			
B	A337	*Oriolus oriolus*	c				C	DD	C	B	C	B
B	A337	*Oriolus oriolus*	r	2		i		M	C	B	C	B
B	A072	*Pernis apivorus*	r	3		p		M	C	A	C	B
B	A392	*Phalacrocorax aristotelis desmarestii*	r	150		p		M	B	B	C	A
B	A663	*Phoenicopterus roseus*	c				P	DD				
B	A464	*Puffinus yelkouan*	p				C	DD	C	B	C	B
B	A249	*Riparia riparia*	c				C	DD	C		C	C
B	A189	*Gelochelidon nilotica*	c				P	DD	D			
B	A885	*Sternula albifrons*	c				C	DD	C		C	C
B	A863	*Thalasseus sandvicensis*	w				C	DD	C		C	C
B	A193	*Sterna hirundo*	c				C	DD	C		C	C
B	A210	*Streptopelia turtur*	r				C	DD	C	B	C	B
B	A440	*Sylvia rueppelli*	r	4	4	p	C	DD	C	B	C	C

Legend
Species group: B= Birds
Species: Latin species name
Type: p = resident, r = breeding, c = congregating, w = wintering
Size: i= individuals, p= pairs
Data pop. category: C = common, R = rare, V = very rare, P = present or population size in individuals (i) or pairs (p).
Data quality: G= Good, M= Moderate, P= Insufficient, DD= Data deficient
Pop.: Population: Relative size and density of the species in the area in relation to the total population within the national boundaries. A: 100%>=p> 15%, B: 15%>=p>2%, C: 2%>=p>0, D: insignificant population.
Con.: Conservation: degree of conservation of habitat features that are important for the species and possibilities for restoration. A: excellent conservation, B: good conservation, C: moderate or limited conservation.

Iso.: Isolation: Degree of isolation of the population present in the area in relation to the natural distribution of the species. A: Isolated (almost) population, B: Non-isolated population, but located on the edge of the distribution area, C: Non-isolated population, within the wider distribution area.
Glo.: Global: Overall assessment of the value of the site for the conservation of the species. A: excellent, B: Good, C: Adequate.

1.1.A2.iv Recording the main characteristics of all habitat types in Annex I and/or species in Annex II of Directive 92/34/EEC (if they are SACs or SCIs) and/or bird species in Annex I of Directive 2009/147/EC and migratory species with regular arrival (if they are SPAs), their value in relation to the rest of the Natura 2000 Network, as well as the main characteristics of endemic, endangered and protected species

The following tables present the main ecological requirements of the species of interest in the respective Natura areas.

Table 16: Ecological requirements of species of interest in avifauna (Source: Dimalexis, 2009 a,b)

Code	Scientific name	Presence status (SDF)	Breeding Habitat	Feeding habitat
A020	*Pelecanus crispus*	c, w	-	Freshwater wetlands (lakes), coastal wetlands with lagoons
A022	*Ixobrychus minutus*	r, c	Reed beds in freshwater wetlands, swamps, lakes with dense vegetation of tall reeds and trees	Marshes and freshwater swamps with dense vegetation of reeds, shrubs and trees
A036	*Cygnus olor*	r, w	Eutrophic wetlands, with reed beds or other dense vegetation, more rarely in coastal wetlands with brackish waters	Wetlands of all types, coastal and inland
A042	*Anser erythropus*	w	-	Wet meadows, stagnant freshwater, cultivated land, salt marshes, lagoons
A060	*Aythya nyroca*	r	Inland wetlands, but also in coastal habitats with a mosaic of reed beds or other dense vegetation	
A101	*Falco biarmicus*	w, p	*Steep vertical cliffs, canyons and coastal slopes*	Steppes and dry calcareous meadows, shrubs, rocky columns and coasts, inland cliffs
A133	*Burhinus oedicnemus*	r	Sand dunes and sandy coasts, steppes and dry calcareous grasslands, dry siliceous grasslands	
A135	*Glareola pratincola*	r	Open flat areas with minimal vegetation, salt flats, mudflats and dry riverbeds on the edges of wetlands and on lagoon islands Artificial waterscapes, cultivated land, lagoons, stagnant fresh/brackish and salt waters	Open flat areas with minimal vegetation, salt flats, mudflats and dry riverbeds on the edges of wetlands and on lagoon islands Artificial waterscapes, cultivated land, lagoons, stagnant fresh/brackish and salt waters
A176	*Larus melanocephalus*	r, c	Islets with low vegetation of halophytic or sand-loving species in coastal lagoons and salt lakes or salt marshes Salt marshes, artificial waterscapes, lagoons, cultivated land, coastal areas.	Islets with low vegetation of halophytic or sand-loving species in coastal lagoons and salt lakes or salt marshes Salt marshes, artificial waterscapes, lagoons, cultivated land, coastal areas.

Code	Scientific name	Presence status (SDF)	Breeding Habitat	Feeding habitat
A243	*Calandrella brachydactyla*	r	Dry, siliceous meadows, mesophilous meadows, steppes and dry limestone meadows	
A339	*Lanius minor*	r, c	Trees Meadows and pastures with scattered low shrubs and few trees, arable land, wastelands	Trees Meadows and pastures with scattered low shrubs and few trees, arable land, wastelands
A391	*Phalacrocorax carbo sinensis*	w	On trees in coastal and inland wetlands Coastal and inland wetlands, sea.	On trees in coastal and inland wetlands Coastal and inland wetlands, sea.
A392	*Phalacrocorax aristotelis desmarestii*	r, w, c	Coastal rocks, often in inaccessible, steep positions both on the mainland coasts and on large islands and small uninhabited islets Coastal waters at depths up to 50 m	Coastal rocks, often in inaccessible, steep positions both on the mainland coasts and on large islands and small uninhabited islets Coastal waters at depths up to 50 m
A403	*Buteo rufinus*	c, r	Rocks in open areas with rock formations, forest clearings, forest stand boundaries	Steppe, semi-desert areas with phrygian vegetation
A429	*Dendrocopos syriacus*	R	Low-altitude areas with mature forests, mainly deciduous, adjacent to open areas e.g. clearings, meadows, crops with scattered old trees, streamside woody vegetation	
A464	*Puffinus yelkouan*	w, p, c	Deep cavities or crevices in rocks near the coastline of islets	Open sea or in the coastal waters of the islets where it nests
A728	*Vanellus (Hoplopterus) spinosus*	r	Open flat areas of wetlands with minimal vegetation, salt flats, sandy areas, heathlands, dry banks	
A773	*Ardea alba*	w	Colonies in reed beds or trees and shrubs, isolated or on islands	*Swamps, wet meadows, marshes, river and lake banks, shallow coastal bays, lagoons, agricultural crops mainly in rice fields*
A859	*Clanga clanga*	w	-	Large wetlands and sporadic crops with waterfowl, lowland roosting and riparian forests as well as eucalyptus stands near wetlands
A875	*Microcarbo pygmaeus*	W	Coastal and inland wetlands	Standing waters, lagoons, rivers and streams
A885	*Sternula albifrons*	c	*Small islands, extensive salt flats or coasts, salt marshes, salt marshes and wet meadows.*	Artificial waterscapes, lagoons, sea bays and coastal formations
Aquatic			Riparian vegetation of inland and coastal wetlands with a mosaic of habitats	Inland and coastal wetlands with relatively deep and open water surfaces, fresh and salt stagnant waters, lagoons, salt marshes, salt marshes, mudflats, salt flats, etc. with water-loving plant matter. Some species also in the marine coastal area.
Gulliformes			Coastal environments with small islands, extensive salt flats, rocky islets	Lagoons, stagnant fresh and salt waters, salt marshes, sea bays and coastal and marine areas.
Egrets			Colonies in trees or reed beds in inland and coastal wetlands with shallow water areas, alluvial and water-rich forests.	Inland and coastal wetlands with shallow water areas, stagnant fresh and salt waters, wet meadows, salt marshes, lagoons, reed beds.

Code	Scientific name	Presence status (SDF)	Breeding Habitat	Feeding habitat
Waders			Inland and coastal wetlands with shallow water areas.	Inland and coastal wetlands with shallow water areas, wet meadows, salt marshes, standing waters, mudflats, lagoons, salt marshes. Some species also in coastal areas.
Predators and Nocturnal Animals			Deciduous and coniferous forests, vertical rocky slopes. Circus aeroginosus in reed beds.	Open areas with low vegetation. Circus aeroginosus in reedbeds and wetlands
Types of agropastoral ecosystems			Open areas with low vegetation and the presence of trees and hedges.	
Intra-forest			Deciduous forests, riverine forests, agricultural areas with mosaicism and the presence of hedgerows, etc.	
Types of reed beds			Reed beds in inland or coastal wetlands	

Table 17: Ecological requirements of fauna species of interest (except avifauna)

Species group/species	Code	Scientific name	Habitats in the Study Area
I	1043	*Lindenia tetraphylla*	Odonata found in lakes and rivers with subaqueous or irrigated vegetation units
I	1037	*Ophiogomphus cecilia*	Odonata found in river creeks with sandy-gravelly bottoms, moderate flow velocity and shallow water depth, shaded in places by trees on the banks.
I	1060	*Lycaena dispar*	A butterfly that is found mainly in meadows but also near the banks of rivers and lakes and generally in areas where there is enough water and is always associated with the plant Rumex hydrolapathum (hydrolapathum)
F	1103	*Alosa fallax*	A migratory species that lives in the seas and rivers. It eats small fish and arthropods
F	1152	*Aphanius fasciatus*	It lives mainly in brackish, calm waters. It feeds on invertebrates, insect nymphs and plants.
F	5263	*Barbus strumicae*	It lives in flowing waters of rivers and streams with rocky or gravelly bottoms. Its diet consists mainly of small invertebrates and plant matter.
F	6963	*Cobitis taenia* Complex	It lives in shallow freshwater such as rivers and lakes with sandy or muddy bottoms. Its diet consists mainly of small invertebrates and organic remains that it finds on the bottom.
F	5339	*Rhodeus amarus*	It lives in shallow, slow-moving or stagnant freshwater such as rivers, lakes and marshes with abundant vegetation. Its diet consists mainly of small invertebrates and algae.
A	Amphibia		Freshwater (absent from lagoons, present in ponds, irrigation and drainage ditches and the river)
R	Tortoises Testudo graeca, Testudo hermanni		Open habitats, except irrigated areas, sand dunes
R	2373	*Mauremys rivulata*	Freshwater with a preference for flowing water

Species group/species	Code	Scientific name	Habitats in the Study Area
R	1220	*Emys orbicularis*	Freshwater with a preference for marshes and lakes
R	1224	*Caretta caretta*	Foraging in the sea, does not breed in the area (unconfirmed information about nests on the coast east of Nestos)
R	1279	*Elaphe quatuorlineata*	Open environments, practically the entire area except brackish waters
R	6095	*Zamenis situla*	Open environments, practically the entire area except brackish waters
M	1355	*Lutra lutra*	Freshwater areas, sporadic occurrence in brackish waters
M	1310	*Miniopterus schreibersii*	Lives in caves and underground shelters where it is found in large colonies. Its diet consists mainly of insects that it catches in flight during the night.
M	1304	*Rhinolophus ferrumequinum*	Lives in caves, abandoned buildings and forests. Its diet consists mainly of nocturnal insects, such as moths and beetles, which it catches in flight.
M	1349	*Tursiops truncatus*	The habitat of Tursiops truncatus includes coastal and open marine waters in tropical and temperate zones. Its diet consists of fish, squid and occasional crustaceans.
M	*1351*	*Phocoena phocoena*	The habitat of Phocoena phocoena includes coastal waters, particularly in areas with reefs, estuaries and tidal zones. Its diet consists mainly of small fish, squid and other marine organisms.

1.1.A3 Mapping the above information on maps

Documentation maps are presented in the corresponding paragraphs of this SEAS. Species distribution maps are presented in Annex 9.1. The source of data for fauna species, except for birds, is the 4th national implementation report of Directive 92/43/EEC.

In particular, the distribution maps for birds in the MP were created based on the following available data:

- Distribution and range maps of birds in the area of responsibility of the Nestos Delta - Vistonida - Ismarida Management Body. The data are presented in ETRS LAEA 89 reference grids with cell dimensions of 1x1 km, 5x5 km and 10x10 km. Source: OFYPEKA, “Monitoring and assessment of the conservation status of bird species in the area of responsibility of the Nestos Delta – Vistonida – Ismarida Management Body”.
- Distribution data of breeding birds in the Kavala area in a grid reference to the Greek Geodetic Reference System 1987 (EGSA 87) with grid cell dimensions of 10x10km. The data refer to the recording years 2017 and 2018. Source: Hellenic Ornithological Society. It should be noted that the data for the reference cell with code “54/453”, which covers the wider area of the Sigma factory and the terrestrial part of the PEP, were not available.
- Seabird distribution data in the areas of SPA GR1150001, SPA GR1150012 and SPA & SCI GR1150014. The data are presented in an ETRS LAEA 89 reference grid with cell dimensions of 5x5km. Source: Hellenic Ornithological Society, Kastritis, Th., Portolou, D., Fric, J., Christidis, D., Kordopatis, P., Evangelidis A. & Dimalexis, A. (Publication coordinators) 2023. Final report. Phase

7 of the project "Sampling, analysis and data synthesis for the determination of Good Environmental Status (GES) of Descriptor 1 of the MSFD (biodiversity) with the subject of seabirds (Section 2)". NCC Environmental Studies Ltd., Hellenic Ornithological Society, Athens, 39 pp.

1.1.A4 Reference to other existing and/or approved projects or activities in the Study Area

The Prinos Offshore Development project and the Sigma onshore industrial unit are located in the immediate area of the project. According to the current ΑΕΡΟ ΔΙΠΑ/8413/24.04.2018 (ADA: ΨΓΛ14653Π8-Ζ79), the Prinos Offshore Development project concerns the existing offshore oil and gas extraction facilities located in the Gulf of Kavala, in the Northeastern Aegean, and its expansion with two new platforms, one of which is long-term. The total production capacity is 27,000 barrels/day of stabilized crude oil.

The existing offshore project consists of the following individual facilities:

• Kapa Platform located in the sweet natural gas field, not originating from an oil field, in South Kavala.

• 12 km, 6" pipeline (8-12 bar operating pressure) that transports sweet natural gas and condensate from South Kavala (Kappa platform) to the Delta platform of Prinos.

• Alpha and Beta production platforms, twelve drilling heads (wells) each, which are part of the Prinos complex, are connected by bridges to the Delta platform and are designed to accommodate drilling rigs (e.g. Energean Force), repairs (Work Over Rig), maintenance (Service Rig) and any other suitable drilling rig. In particular, drilling rigs such as Energean Force are supported by a barge that ties to eight anchorage points, while the Work Over Rig and Service Rig drills are autonomous and are transported to the platform where maintenance is deemed operationally appropriate of wells.

• Delta processing platform containing all the offshore primary processing facilities and which to date receives the oil, natural gas, water and condensate produced from the Prinos, North Prinos and South Kavala fields. The Delta platform is connected by bridges to the Alpha and Beta platforms as well as to its flare. New vertical risers are being added to the Delta platform, to enable it to receive the produced fluids from the Lambda platform (and possibly the Omicron platform) and to send natural gas (gas lift) and water for injection into the Lambda platform. A vertical protective conduit is also being added for the installation of the multi-carrier cable that will carry power, data, communications and auxiliary fluids to the Lambda platform.

• Flare Prinos platform complex.

• 18 km, 12" pipeline (8 barg operating pressure) for the transport of sour natural gas from the Delta platform to the onshore facilities.

• 18 km, 8" pipeline (20-40 barg operating pressure) for the transport of crude oil from the Delta platform to the onshore facilities.

• 18 km, 5.3" pipeline for the transport of sweet natural gas (gas lift) from the onshore facilities to the Delta platform.

• Two submarine power cables of 10 kVA each, from the onshore facilities to the Prinos platform complex.

The Sigma onshore industrial unit includes facilities for the desalination, dehumidification, stabilization and desulfurization of the produced crude oil, the conversion of the produced sour gas into sweet gas, the production of liquid and solid sulfur, as well as the required facilities for the safe storage and handling of the produced crude oil, natural gas and sulfur.

In the Gulf of Kavala, a multitude of infrastructures and activities are located that could potentially interact with the proposed project, and more specifically the following:

- Commercial port "Philip II"
- Passenger port "Apostolos Pavlos"
- Passenger port of Keramoti
- Section of the PATHE motorway
- Hellenic Fertilizers (ELFE), which was initially founded in 1961 (as Phosphoric Fertilizer Industry S.A. (PFI) and began operating in Nea Karvali in 1965. The facilities include:
    - Ammonia production plant,
    - Nitric acid and nitrate fertilizer production plant,
    - Sulfuric acid production plant,
    - Phosphoric acid production plant.
    - Compound fertilizer production plant.
- Wastewater treatment plants (WTP).
    - Kavala WTP (GR115001016) with discharge to the sea,
    - EEL Palaio Tsifliki (GR 11500101117) with discharge to the sea,
    - EEL Filippi (GR 1150100118) with discharge to the sea,
    - EEL Nea Peramos (GR 1150030115) with discharge to the sea,
    - EEL Chrysoupoli (GR 115011018) with discharge to the sea,
    - EEL Limenas Thassos (GR 1150040116) with discharge to the sea.

The aforementioned projects are not directly or indirectly linked to the proposed project, with the exception of the industrial facility Hellenic Fertilizers (ELFE), which could present synergies with the project under consideration, as it itself is a significant producer of CO2 that could be captured and stored in the project under consideration.

1.1.A5 Other relevant information concerning the Study Area at the discretion of the SEA researcher

Figure 26 presents the internationally protected areas in the wider Project area.

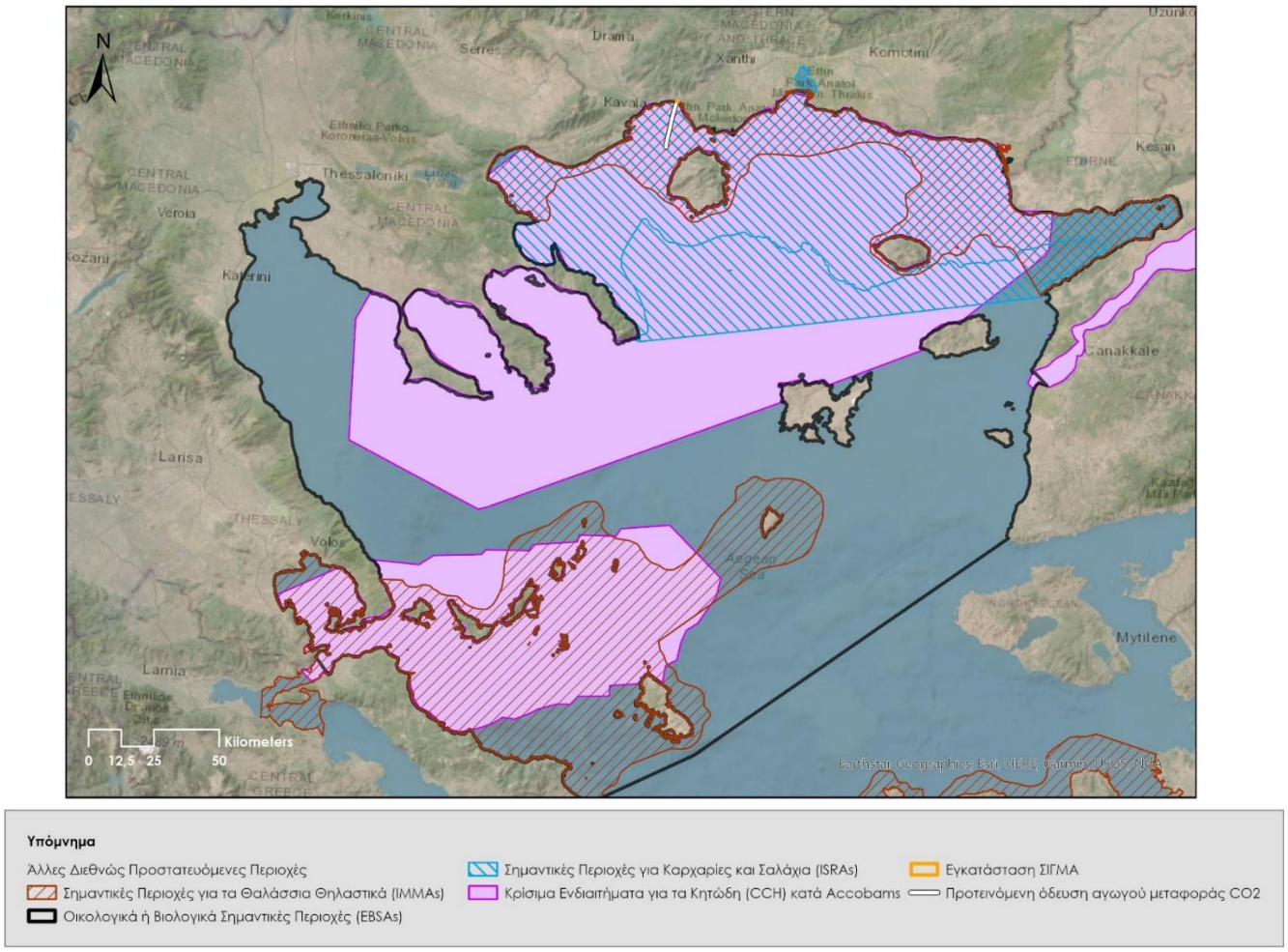


Figure 26: Internationally Protected Areas in the wider Project area

As can be seen from the above figure, the new submarine pipeline falls within the boundaries of Accobams Zone 9 in the North-East Mediterranean (Thracian Sea) and within the Important Marine Mammal Areas (IMMAs) named “North Coast and Islands of the Thracian Sea” with a total area of 5441 km2. In addition, the entire North Aegean region has been identified as one of the 3 Ecologically or Biologically Important Areas in Greece and the Project in the MID zone 17 EBSAs according to the geospatial data. The Project area is located within the Important Shark and Ray Area (ISRAs) named “Thracian Sea Shelf” with a total area of 9,980.6 km2.

Figure 27 presents the other protected areas within and near the Project area.

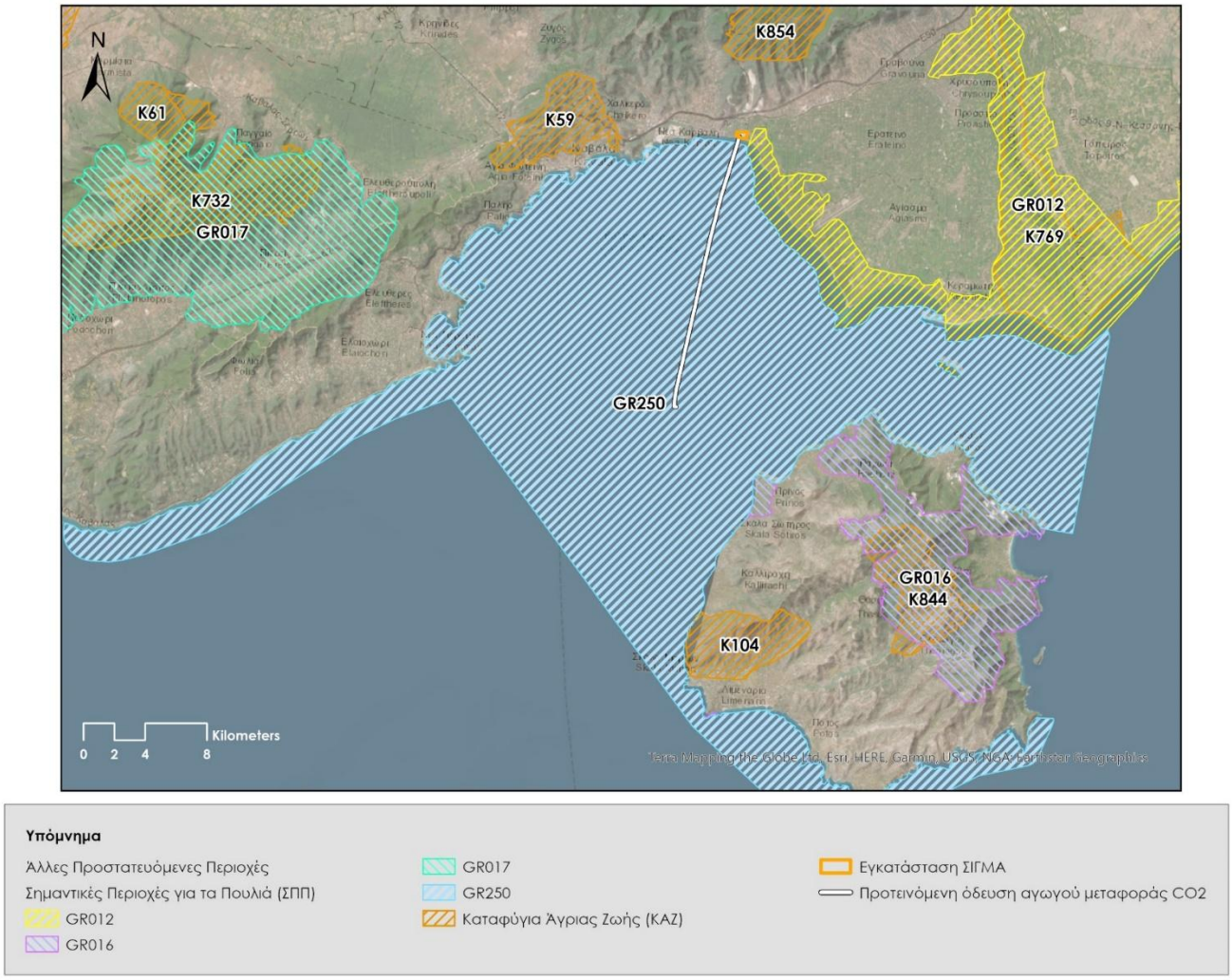


Figure 27: Other Protected Areas in the wider Project area

The marine area of the project is included in the Important Bird Area (IBA) with code GR250 and name "Gulf of Kavala and marine area of Thassos", while nearby is the area with code GR016 and name "Island of Thassos and Xironisi" as well as the area with code GR012 and name "Nestos Delta and Coastal Lagoons". The Project area does not include a designated Wildlife Sanctuary (hereinafter referred to as WSA) in accordance with paragraph 3 of Article 6 of Law 3937/2011. The closest WSA to the wider Project area, at a distance of approximately 4.8km, is the "Kastene Dag Municipality of Orinou" with code K854 which is protected by Government Gazette 625/B/2001.

In the immediate area of the project, within the boundaries of the Municipality of Nestos, there is one (1) Ramsar Wetland (see Figure 28), which is also included in the Montreux List.



Figure 28: Ramsar Site "Nestos Delta and Adjacent Lagoons" in relation to the Project's Land Facilities (source: Ecoscope)

The wetland in question, named "Nestos Delta and adjacent lagoons", with a total area of 21,930 ha, acceded to the Ramsar Convention in 1975.

Near the Project is part of the National Park of Eastern Macedonia - Thrace as well as its Peripheral Zone, as shown in Figure 29. The National Park of Eastern Macedonia and Thrace, as established in 2008 by the Joint Ministerial Decision (JMD) 44549/2008 (Government Gazette 497/A/17-10-2008), includes the protected areas of the Nestos Delta wetland, the lakes Vistonida and Ismarida and the surrounding areas, with a total land and water area of 930,000 acres.



Figure 29: National Park of Eastern Macedonia and Thrace and Aesthetic Forest

In the wider study area, in the Kavala Regional Municipality, the "Amygdaleona Kavala Aesthetic Forest" is located with a total area of 2522.77ha, at an altitude of 473m as shown in the figure above.

Figure 30 is an excerpt from Map 8 of NPM01B "Demarcation of protected object – Protection zones" and illustrates the proposals that NPM01B concludes regarding the demarcation of protection zones that internally divide the protected areas. The protection zones are characterized based on the provisions of Law 4685/2020 as "Areas of absolute nature protection", "Nature protection areas", "Habitat and species conservation areas" and "Areas of sustainable natural resource management". It is noted that currently NPR 01B is not approved by Presidential Decree. According to the figure below, the project under consideration falls within the ZVDPTH-05 zone which is a Sustainable Natural Resources Management Zone. The specific land uses for the proposed ZVDPTH-05 zone according to NPR 01B are presented in Table 18.

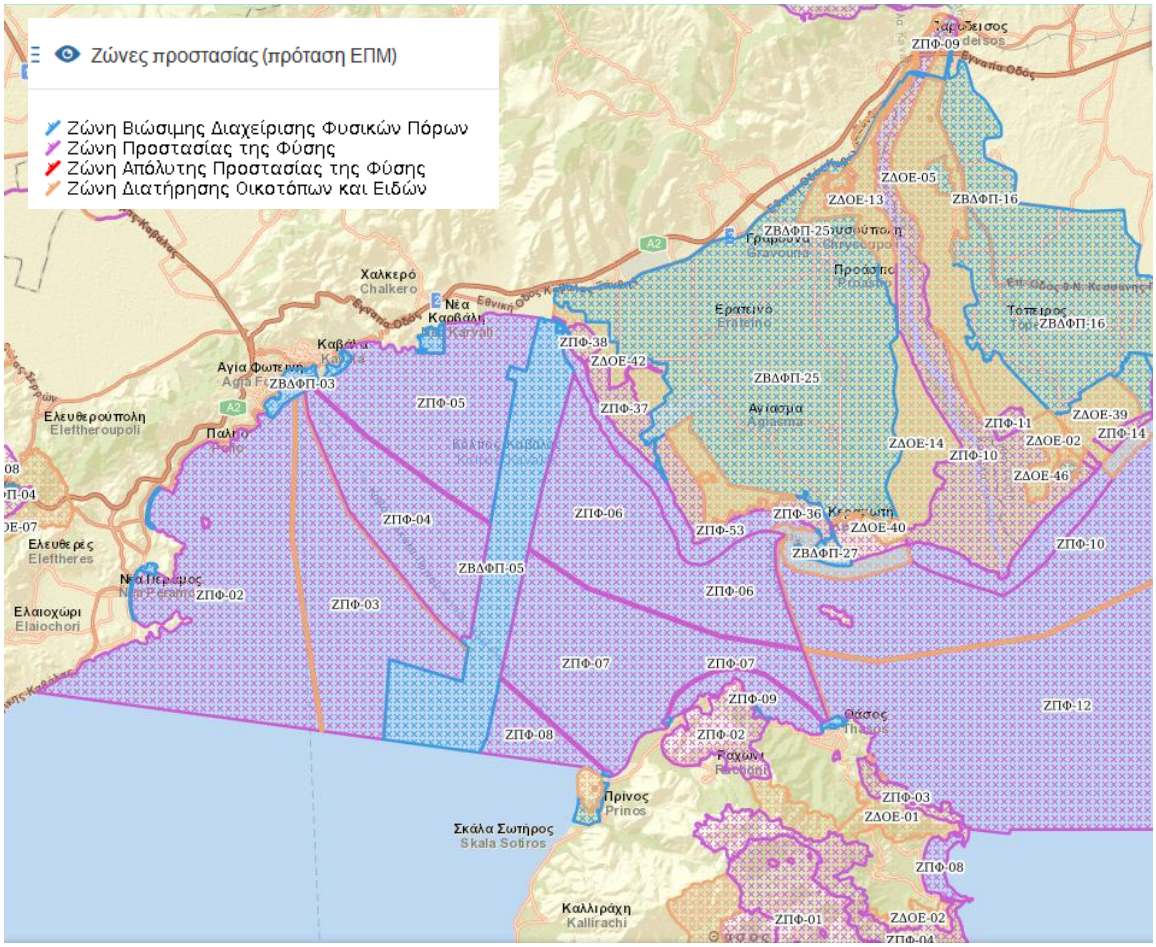


Figure 30: Proposal NRP 01B regarding protection zones (proposal NRP 01B) within the protected areas of the Natura 2000 network

Table 18: Specific land uses for the proposed zone ZBDFP-05 (source: NPM 01B)

SPECIAL LAND USES FOR THE ZVDFP BASED ON PD 59/2018 AS IN FORCE	ΖΒΔΦΠ-05
(1) HOUSING	
(2) SOCIAL WELFARE	
(3) EDUCATION	
(4.1) SMALL SPORTS FACILITIES	
(4.2) LARGE SPORTS FACILITIES	
(4.3) SPECIAL SPORTS FACILITIES	
(5) RELIGIOUS PLACES	
(6) CULTURAL FACILITIES	
(7) ADMINISTRATION	
(8.1) (CARE) PRIMARY HEALTH SERVICES WITHOUT HOSPITALIZATION	
(8.2) (CARE) SECONDARY AND TERTIARY HEALTH SERVICES THAT INCLUDES NURSING	
(8.3) (CARE) OUT-HOSPITAL MENTAL HEALTH UNITS.	
(8.4) (TREATMENT) UNITS FOR THE PREVENTION AND COMBAT OF ADDICTION	

SPECIAL LAND USES FOR THE ZVDFP BASED ON PD 59/2018 AS IN FORCE	ΖΒΔΦΠ-05
(9) PUBLIC MEETING PLACES / CONFERENCE CENTERS (ONLY FOR	
AREAS WITHIN A PLAN OR WITHIN A SETTLEMENT)	
(10.1) COMMERCIAL STORES.	
(10.2) STORES PROVIDING PERSONAL SERVICES.	Special permit for scientific research
(10.3) FOOD SUPERMARKETS	
(10.4) DEPARTMENTS	
(10.5) SHOPPING CENTERS (ONLY FOR AREAS WITHIN A PLAN	
(10.6) TRADE EXHIBITION FACILITIES EXHIBITION CENTERS	
(ONLY FOR AREAS WITHIN A PLAN	
(11) OFFICES/RESEARCH CENTERS/BUSINESS WARM HOUSES	
(12) CATERING	
(13) REFRESHMENTS	
(14) RECREATION - ENTERTAINMENT CENTERS	
(15) TOURIST ACCOMMODATIONS, SPECIAL TOURIST INFRASTRUCTURE FACILITIES AND OTHER TOURIST ENTERPRISES (L. 4276/2014)	
(16) PARKING (FIELD BUILDING)	
(17) FUEL AND ENERGY STATIONS	
(18) CAR WASHES, GAS STATIONS	
(19) GARAGE	Fishing operations and activities are governed by the conditions and restrictions referred to in special use 24.9
(20) WAREHOUSES (LOW, MEDIUM, HIGH DISTURBANCE)	
(21) SUPPLY FACILITIES	
(21.A) DATA CENTERS AND TECHNOLOGICAL SUPPORT	
OF COMPANIES AND OTHER ASSOCIATED ACTIVITIES (DATA	
CENTRES)	
(22) PROFESSIONAL LABORATORIES	
(23) INDUSTRIAL AND INDUSTRIAL FACILITIES (LOW AND MEDIUM DISTURBANCE - A2 AND B CATEGORIES OF LAW 4635/2019) *	
	Additional restrictions may be determined by OFYPEKA, maintenance and modernization of existing fishing shelters
(24) AGRICULTURAL FACILITIES AND ACTIVITIES	To meet the individual needs of the residents of the zone and for limited commercial use after the preparation and approval by OFYPEKA of a relevant list of the species permitted for collection
(24.1) AGRICULTURAL, FORESTRY, LIVESTOCK, FISHING AND OTHER AGRICULTURAL FACILITIES AND ACTIVITIES	
(24.13) ΕΓΓΕΙΟΒΕΛΤΙΩΤΙΚΑ ΕΡΓΑ ΑΓΡΟΤΙΚΗΣ ΑΝΑΠΤΥΞΗΣ	
(25) MINING ACTIVITIES (MINES, QUARRIES, SAND EXTRACTION, HYDROCARBON EXPLORATION, EXPLORATION AND EXPLOITATION AREAS). (26) PUBLIC TRANSPORT FACILITIES, WITH SPECIALIZATION BY SUBCATEGORIES ACCORDING TO THE ZONE	Operation of legally existing hydrocarbon prospecting, research and exploitation facilities, improvement and modernization and new
(26.1) AIRPORTS (ONLY FOR AREAS WITHIN A PLAN OR WITHIN A SETTLEMENT)	
(26.2) HELICOPTERY	
(26.3) WATERWAYS	
(26.4) RAILWAY STATIONS	
(26.5) FREIGHT RAILWAY STATIONS	
(26.6) SPECIAL RAILWAY FACILITIES	

SPECIAL LAND USES FOR THE ZVDFP BASED ON PD 59/2018 AS IN FORCE	ΖΒΔΦΠ-05
(26.7) URBAN BUS STATIONS, TROLLEYS ,TRAM	
(26.8) PARKING AREAS FOR TOURIST BUSES (COACHES),	
TRUCKS AND CARAVANS	
(26.9) M.E.A. (MOTORWAY SERVICE STATIONS)	
(26.10) TRANSPORT TRANSFER STATIONS	
(26.11) PORT AREAS OF PASSENGER, COMMERCIAL, FISHING, INDUSTRIAL AND TOURISTIC ACTIVITY, MARINAS	
(26.12) LINEAR TRANSPORT INFRASTRUCTURE	
(26.12.1) ROADS (MOTOR VEHICLE TRAFFIC)	
(POSSIBILITY OF SPECIALIZATION UNDER NATIONAL LEGISLATION)	
(26.12.2) LOW-TRAFFIC ROADS	
(26.12.3) PEDESTRIAN PATHS	
(26.12.4) CYCLE PATHS	
(26.12.5) SQUARES	
(26.12.6) PATHS (PEDESTRIAN)	Additional movement restrictions may be determined by OFYPEKA
(27) VEHICLE TECHNICAL INSPECTION CENTERS (KTEO, IKTEO)	
(28) VEHICLE TRANSPORTATION STATIONS	
(29) PACKAGING AND MATERIALS RECYCLING FACILITIES	
(30) RECYCLING CORNERS AND GREEN POINTS (SMALL) (JOINT MINISTERIAL DECISION 18485/26.4.2017, B' 1412).	
(31) SOLID WASTE TREATMENT, STORAGE AND DISPOSAL AREA / SOLID TOXIC WASTE TREATMENT, DISPOSAL AREA (ONLY FOR AREAS WITHIN A PLAN OR WITHIN A RESIDENTIAL ESTATE)	
(32) WASTEWATER TREATMENT AND DISPOSAL AREA (BIOLOGY)	
(33) ELECTRICITY AND NATURAL GAS, WATER SUPPLY, TELECOMMUNICATIONS AND RELATED INSTALLATIONS	
(34) RENEWABLE ENERGY SOURCES INSTALLATIONS.	
(35) TELECOMMUNICATIONS, RADIO AND TELEVISION STATIONS.	
(36) MILITARY INSTALLATIONS	
(36.A) WILDLIFE CARE CENTERS (WRC) (ONLY	
(37) END OF LIFE VEHICLE FACILITIES (ELV) (ONLY FOR AREAS WITHIN A PLAN OR WITHIN A SETTLEMENT)	
(38) CEMETERIES	
(39) CREMATION CENTERS	
(40) CORRIDORS PRISONS DETENTION CENTERS	
(41) TEMPORARY RECEPTION AND HOSPITALITY FACILITIES FOR MIGRANTS/REFUGES AND VULNERABLE GROUPS	
(42) HORSE TRACK (ONLY FOR AREAS WITHIN A PLAN OR WITHIN A SETTLEMENT)	
(44) CASINO (ONLY FOR AREAS WITHIN A PLAN OR WITHIN A RESIDENCE)	
(45) PLACES FOR HOLDING TECHNICAL ENTERTAINMENT AND GAMBLING GAME FACILITIES (ONLY FOR AREAS WITHIN A PLAN OR WITHIN A SETTLEMENT)	
(46) URBAN AGRICULTURE VEGETABLE GARDEN	
(47) CAMPS CHILDREN'S COUNTRYSIDES	
(48) CONSTRUCTIONS IN PUBLIC COMMON AREAS UNDER ARTICLE 20 OF THE NOK	
(48.1) CONSTRUCTIONS FOR:	
(48.1) A) THE FORMATION OF THE LAND, SUCH AS STAIRS, WALLS, CORRIDORS, INCLINED LEVELS, MECHANICAL MEANS OF COVERING DIFFERENCES IN ELEVATION, AS WELL AS CONSTRUCTIONS FOR THE SERVICING OF DISABLED AND/OR IMPROVED PEOPLE	
(48.1) Β) ΚΑΤΑΣΚΕΥΕΣ ΓΙΑ ΤΟΝ ΕΞΩΡΑΪΣΜΟ ΚΑΙ ΤΗΝ ΑΙΣΘΗΤΙΚΗ ΤΟΥΣ ΑΝΑΒΑΘΜΙΣΗ, ΤΟΝ ΕΞΟΠΛΙΣΜΟ ΚΑΙ ΤΗΝ ΑΣΦΑΛΕΙΑ ΤΟΥΣ ΚΑΙ ΓΕΝΙΚΑ ΚΑΤΑΣΚΕΥΕΣ ΓΙΑ ΤΗΝ ΕΞΥΠΗΡΕΤΗΣΗ ΤΟΥ ΠΡΟΟΡΙΣΜΟΥ ΤΩΝ ΧΩΡΩΝ ΑΥΤΩΝ	
(48.1) C) DEMOUNTABLE AND TEMPORARY STRUCTURES	
(48.1) D) THE OPERATION AND SERVICE OF PUBLIC TRANSPORT.	

SPECIAL LAND USES FOR THE ZVDFP BASED ON PD 59/2018 AS IN FORCE	ΖΒΔΦΠ-05
(48.2) FACILITIES:	
(48.2) A) THE CONSTRUCTION OF INFRASTRUCTURE NETWORKS AND PUBLIC UTILITY FACILITIES, INCLUDING THESE ANNEXES (SURFACE AND UNDERGROUND)	
(48.2) B) THE INSTALLATION OF MEASURING STATIONS FOR ATMOSPHERIC POLLUTION, NOISE AND METEOROLOGICAL PARAMETERS WITH THE NECESSARY EQUIPMENT	
(48.2) C) SURFACE AND UNDERGROUND DISTRIBUTION OR METERING AND REGULATION STATIONS OF NATURAL GAS	
(48.2) D) THE INSTALLATION OF NATURAL BOILERS OR HIGH-EFFICIENCY COGENERATION UNITS FOR DISTRICT HEATING	
(48.2) E) THE INSTALLATION OF ELECTRIC VEHICLE CHARGING STATIONS	
(48.2) F) THE INSTALLATION OF DESALATION UNITS AND OTHER WATER TREATMENT SYSTEMS FOR THE WATER SUPPLY OF MUNICIPAL NETWORKS, AFTER THE ASSOCIATED WORKS REQUIRED FOR THEIR FULL OPERATION	
(49) INFORMATION KIOSK/ENVIRONMENTAL INTERPRETATION PROJECTS (SIGNS, TOILETRIES, KIOSKS, SHELTERS, ETC.)	Environmental interpretation projects
(50) PROJECTS TO PREVENT OR TREAT SALIFATION OF GROUNDWATER OR SOIL	
(51) EROSION, SLOPE AND SOIL PROTECTION WORKS	
(52) GENTLE MARINE RECREATION (SWIMMING, WINDSURFING, DIVING, UNDERWATER PHOTOGRAPHY, ETC.)	
(53) PROJECTS RELATING TO THE RESTORATION AND IMPROVEMENT OF WATER RESERVOIRS	
(54) FLOATING INFRASTRUCTURES AND MARINE RECREATION FACILITIES	
(55) LIGHTHOUSES.	
Legend: ***Color code:*** ***Red: Not selected based on the SES*** ***Orange: Selected based on the SES with conditions / specialization*** ***Green: Selected based on the SES*** ***Light blue: Not applicable to the zone***	

An important source of data on the abundance and distribution of birds in the MM Study Area is the data from the "Midwinter Waterbird Surveys in Greece" program, which has been conducted in the country since 1968. The Hellenic Ornithological Society has made available the data for the last decade (2014-2023) for the Keramoti and Nestos wetlands. Table 19 presents the aggregated population data for the lagoons and wetlands, as well as their adjacent marine area, located within the Study Area.

Table 19: Abundance of birdlife in lagoons and wetlands, as well as in the adjacent marine area during winter. The values refer to the range of the number of individuals counted (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird counts in Greece" during the period 2014-2023). The population data per area present the range of values for the years that each species was present in the area. For all areas, the total range of population size values for all years (presence and absence) is given, as well as the average population size (in parentheses).

Scientific name	Energean	Vasova Lagoon	Eratinos Lagoon	Agiasma lagoon	Karamoti lagoon	Marine lagoon area	Total
Accipiter nisus		1	1	1			0-1 (0.3)
Actitis hypoleucos	1	1	1			1	0-2 (0.6)
Alcedo atthis	1	1 - 8	1 - 7	1 - 3	1 - 2	2	0-20 (4.6)
Anas acuta			3 - 70	2 - 4			0-72 (8.8)
Anas crecca		7 - 35	1 - 143	1 - 190	46		2-308 (143.4)
Anas platyrhynchos	30	1 - 37	8 - 218	4 - 215	2 - 12	800	7-987 (213.3)

Scientific name	Energean	Vasova Lagoon	Eratinos Lagoon	Agiasma lagoon	Karamoti lagoon	Marine lagoon area	Total
Anas spp.						400	0-400 (44.4)
Aquila chrysaetos			2				0-2 (0.2)
Ardea alba	1	3 - 26	1 - 145	2 - 55	1 - 14		5-151 (54.9)
Ardea cinerea	2 - 3	10 - 57	33 - 86	1 - 62	3 - 33	3	56-169 (101.3)
Ardeola ralloides				1			0-1 (0.1)
Aythya ferina			4 - 41	6 - 245			0-267 (52.2)
Aythya fuligula				1 - 43			0-43 (6.2)
Bucephala clangula			2				0-2 (0.2)
Buteo buteo	2 - 3	2 - 16	1 - 20	2 - 9	1 - 8	2	5-34 (18.7)
Calidris alba			89				0-89 (9.9)
Calidris alpina	6		42 - 512	5 - 308	5 - 10		0-820 (177.6)
Calidris canutus			3	6			0-6 (1.0)
Calidris minuta			4 - 17	15 - 211	12		0-211 (28.8)
Calidris spp.				220			0-220 (24.4)
Charadrius alexandrinus				1			0-1 (0.1)
Ciconia nigra		1					0-1 (0.1)
Circus aeruginosus	2	1 - 21	1 - 17	1 - 16	1 - 3		3-47 (18.3)
Circus cyaneus		3	1 - 2	1 - 2	1		0-7 (1.9)
Clanga clanga			1 - 2	1			0-2 (0.8)
Cygnus columbianus bewickii				3			0-3 (0.3)
Cygnus cygnus				2			0-2 (0.2)
Cygnus olor		3 - 15	1 - 92	1 - 184			1-206 (90.8)
Egretta garzetta	8	1 - 15	1 - 17	1 - 18	1 - 3		8-35 (21.1)
Falco columbarius				1			0-1 (0.1)
Falco peregrinus					1		0-1 (0.1)
Falco tinnunculus	1 - 2	1 - 5	2 - 3	1 - 2	1 - 4		0-13 (4.4)
Fulica atra	1 - 8	7 - 1601	105 - 1934	90 - 12093	3 - 205	5	431-12496 (4627.8)
Gallinago gallinago			1 - 4				0-4 (0.6)
Gallinago media			1				0-1 (0.1)
Gavia arctica	1	1 - 7	1		1	1 - 20	0-21 (5.4)
Haematopus ostralegus			1				0-1 (0.2)
Haliaeetus albicilla			1				0-1 (0.1)
Hydroprogne caspia		1					0-1 (0.1)
Larus canus						1	0-1 (0.1)
Larus genei		1 - 10	2 - 10	2 - 4			0-17 (4.0)
Larus michahellis	20 - 52	4 - 110	5 - 260	6 - 45	1 - 20	28 - 250	0-662 (160.1)
Larus ridibundus	25 - 70	3 - 174	2 - 256	2 - 480	1 - 40	3 - 15	13-523 (202.2)
Larus spp.					15		0-15 (1.7)
Mareca penelope		2 - 59	2 - 315	139 - 1361		148	139-1430 (649.7)
Mareca strepera			2 - 26	2 - 23			0-49 (11.7)
Melanitta nigra						8	0-8 (0.9)
Mergellus albellus				1			0-1 (0.1)
Mergus serrator		2	2	2			0-2 (0.7)
Microcarbo pygmaeus	1 - 8	1 - 27	6 - 74	7 - 171	1 - 15	3	15-218 (84.6)
Milvus migrans				8			0-8 (0.9)
Numenius arquata		1	3 - 26	2 - 5			0-30 (9.7)
Pelecanus crispus		1 - 23	4 - 46	1 - 29	2 - 4	4 - 35	2-85 (31.6)
Phalacrocorax aristotelis desmarestii	1					1 - 18	0-18 (2.2)
Phalacrocorax carbo sinensis	50 - 120	3 - 281	38 - 275	1 - 61	8 - 50	1 - 796	18-1004 (331.2)

Scientific name	Energean	Vasova Lagoon	Eratinos Lagoon	Agiasma lagoon	Karamoti lagoon	Marine lagoon area	Total
Phoenicopterus roseus	2 - 8	1 - 327	4 - 494	98 - 925	2 - 25		219-1169 (716.4)
Platalea leucorodia		4 - 20	1 - 21	2 - 49			0-56 (18.4)
Pluvialis apricaria			19	28			0-28 (5.2)
Pluvialis squatarola		2	23 - 25	2 - 8	1		0-31 (6.8)
Podiceps auritus				1			0-1 (0.1)
Podiceps cristatus	1	1 - 42	10 - 83	2 - 27	1 - 13	3 - 83	11-130 (57.0)
Podiceps grisegena	1						0-1 (0.1)
Podiceps nigricollis	1	2 - 26	2 - 43	7 - 105		5 - 64	5-141 (53.0)
Puffinus yelkouan						1-2	0-2 (0.3)
Recurvirostra avosetta		1	4 - 71	31 - 421	1 - 8		0-421 (99.7)
Spatula clypeata		31 - 75	1 - 82	25 - 529	4 - 5		32-535 (179.8)
Tachybaptus ruficollis	1 - 6	1 - 63	7 - 113	4 - 129	1 - 4		5-243 (81.3)
Tadorna tadorna		4 - 29	6 - 78	2 - 37	1 - 5		0-138 (37.1)
Thalasseus sandvicensis		2	1 - 3	1 - 2		15	0-15 (3.3)
Tringa erythropus				1			0-1 (0.1)
Tringa glareola			1				0-1 (0.1)
Tringa nebularia		1		1	2		0-2 (0.6)
Tringa ochropus		2					0-2 (0.2)
Tringa totanus	1	3 - 7	2 - 137	2 - 30	1 - 15		5-139 (37.2)
Vanellus vanellus		75	12 - 150	15 - 120			0-195 (77.1)

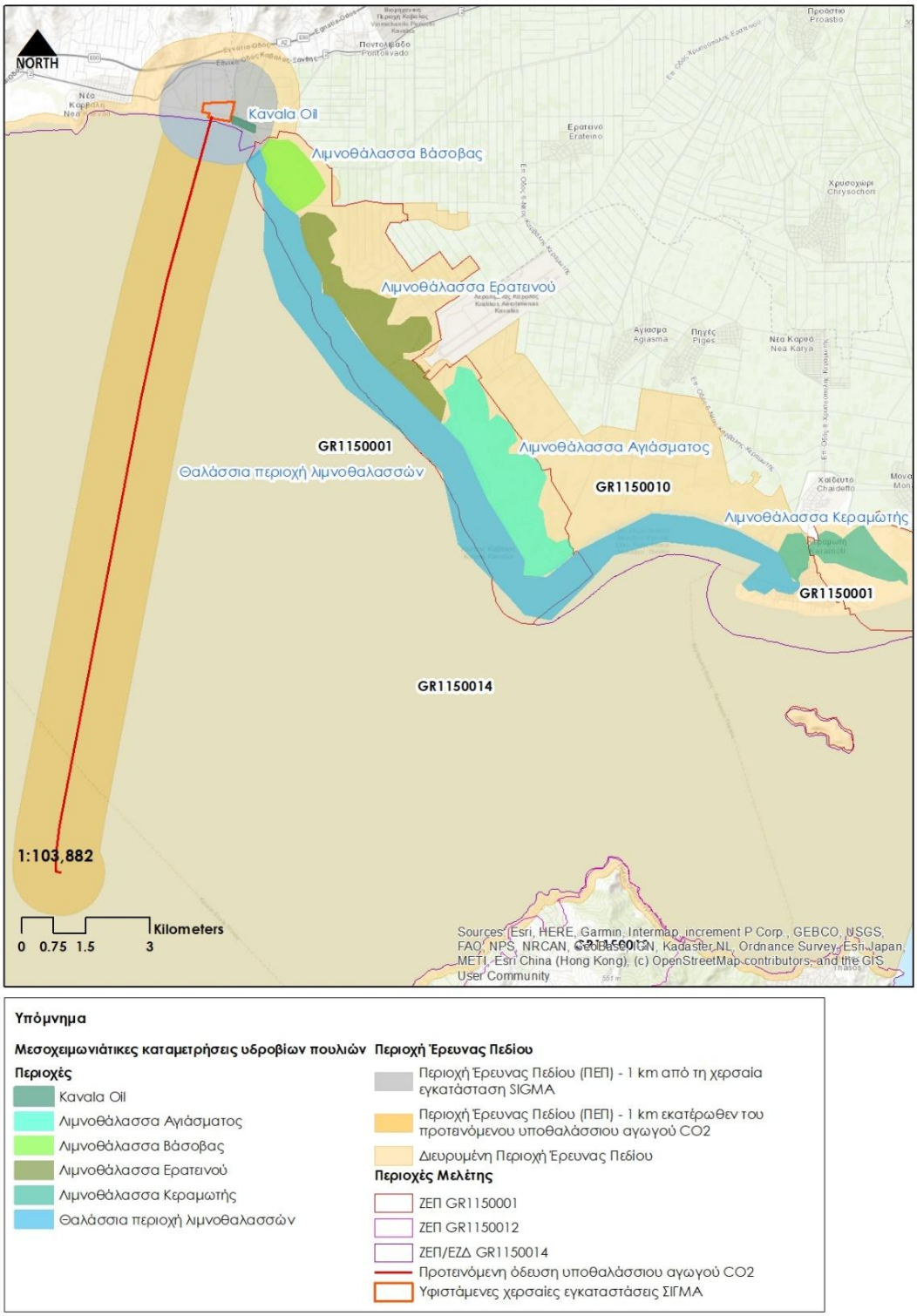


Figure 31: Locations of recording areas of the program "Midwinter waterbird surveys in Greece" in the wetlands of Keramoti.

1.1.A6 Photographic documentation

Photographic documentation is included in Annex 9.2.

B. FIELD RESEARCH AREA (FSA) / EXTENDED FSA

1.1.B1 Detailed description of the FSA / EXTENDED FSA

1.1.B1.i Recording of habitat types (t.o.) of Annex I of Joint Ministerial Decree 14849/853/E103/008 (Government Gazette B' 645), in particular with regard to their representativeness, relative surface area and conservation status (if they are SACs, or SCI)

1.1.B1.i.1 General

In the pipeline transit zone in the onshore zone on the coast, sand dunes are found where a large mixture of different habitat types is observed. This location in front of the plant is disturbed as pipelines pass to the plant but also parallel to the coast towards Nea Karvali to the fertilizer plant.

This area was the wetland and was drained in a large part to be used for cultivation. Wetland areas, influenced by the Nestos River, also exist further west of Nea Karvali which have also been degraded to create the fertilizer plant.

Within the FSA, just west of the SAC GR1150010, the wetland EL51000303 has been identified and mapped: COASTAL ELOS N. KARVALIS, with an area of 1628.44 acres (see Figure 32).

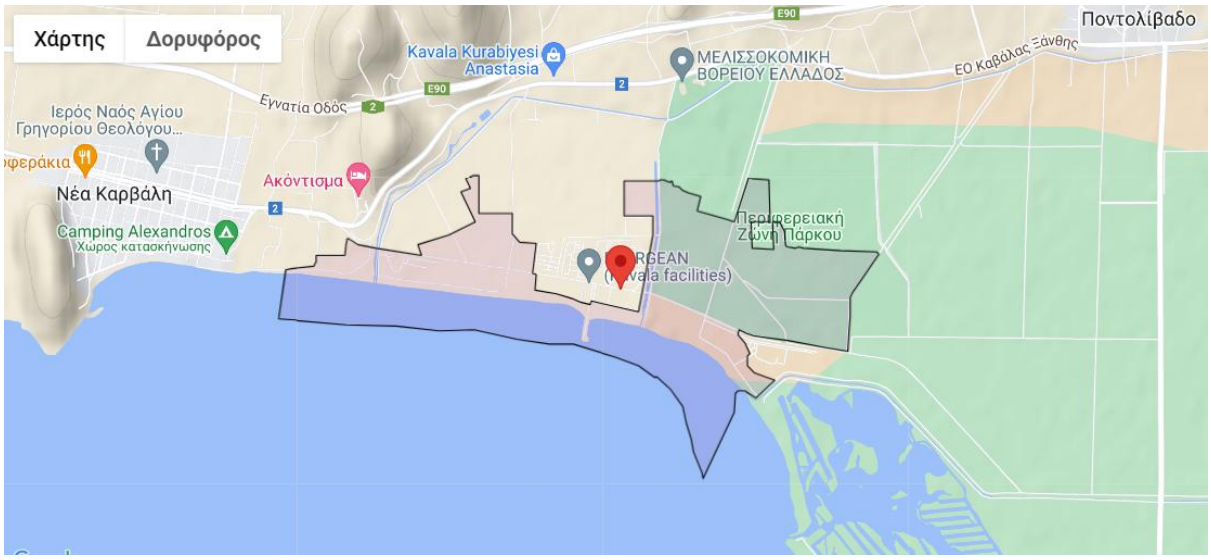


Figure 32: Boundaries of the wetland EL51000303: COASTAL MARSH OF KARVALI PREFACE (source: http://greekwetlands.biodiversity-info.gr/Sites/Details/2631)

The main elements that can be distinguished in the land part of the PEP, in terms of landscape and natural environment, are the following:

- the Energean factory,
- the port in front of the factory,

- the sand dune zone along the entire length of the coast,
- the shallow bay with turbid waters due to the influence of the Nestos,
- the lagoon east of the factory and the brackish marshlands,
- the landscaped fish farm west of the factory,
- the springs (Aji Sou) and the ditch (which also functions as a fish farm) that ends in the sea but also supplies the coastal fish farm,
- the drainage ditches and concrete irrigation network,
- the irrigated annual crops,
- the national road and the Egnatia highway,
- the hilly zone with different coverage zones of evergreen broadleaf trees,
- industrial buildings and warehouses between the national road and the Egnatia motorway.

The mapping of land uses according to Corine land cover includes the land uses presented in Table 20.

Table 20: Land uses according to Corine land cover

Corine Code	Name
121	Industrial or commercial zones
122	Road and rail networks and adjacent land
131	Mining areas
211	Non-irrigated arable land
212	Permanently irrigated land
242	Complex cropping systems
321	Natural pastures
331	Beaches, dunes, sandbanks
421	Maritime marshes
521	Coastal lagoons
523	Seas and oceans

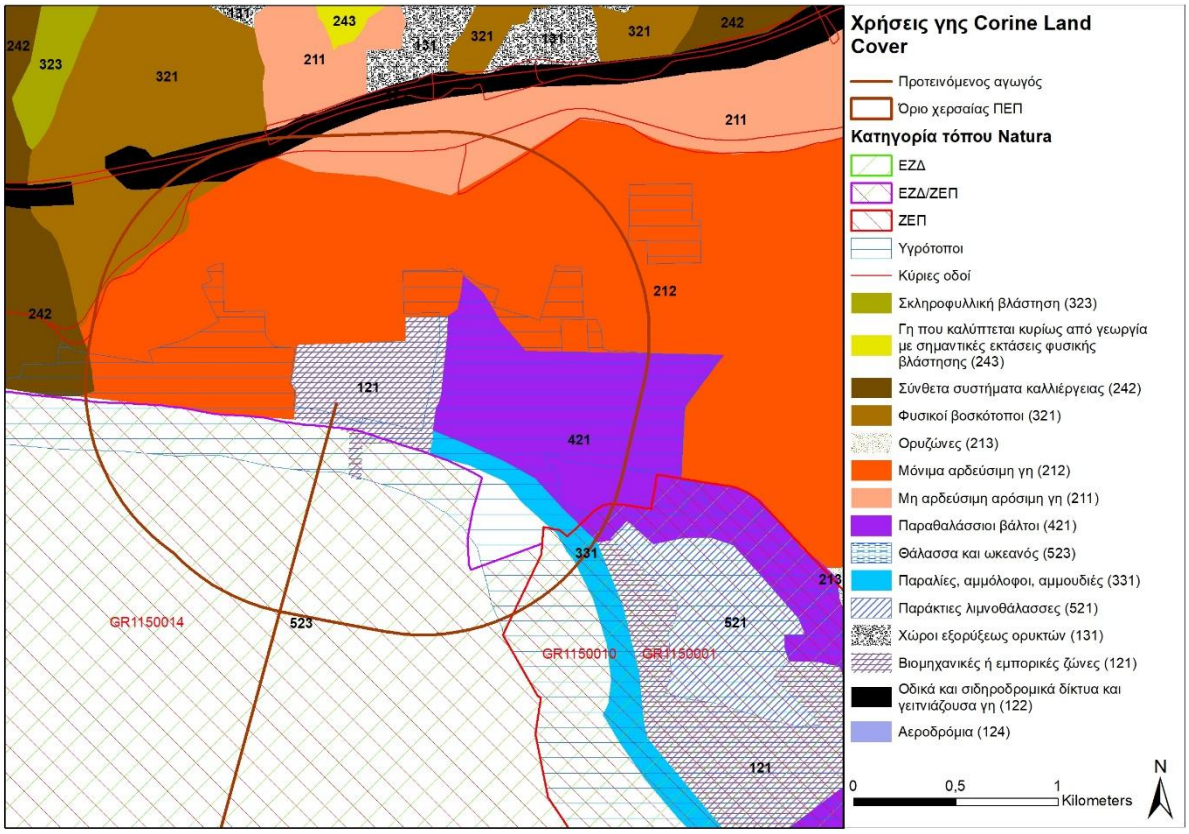


Figure 33: Land use map and wetland zones in the terrestrial FSA

As these categories are coarse-grained (see Corine Land Cover map / Figure 33) especially in the more natural part, the following chapter records the habitats in terms of habitat type. A map was also produced showing the different habitats and land uses in the terrestrial part of the ROP (see Figure 34).

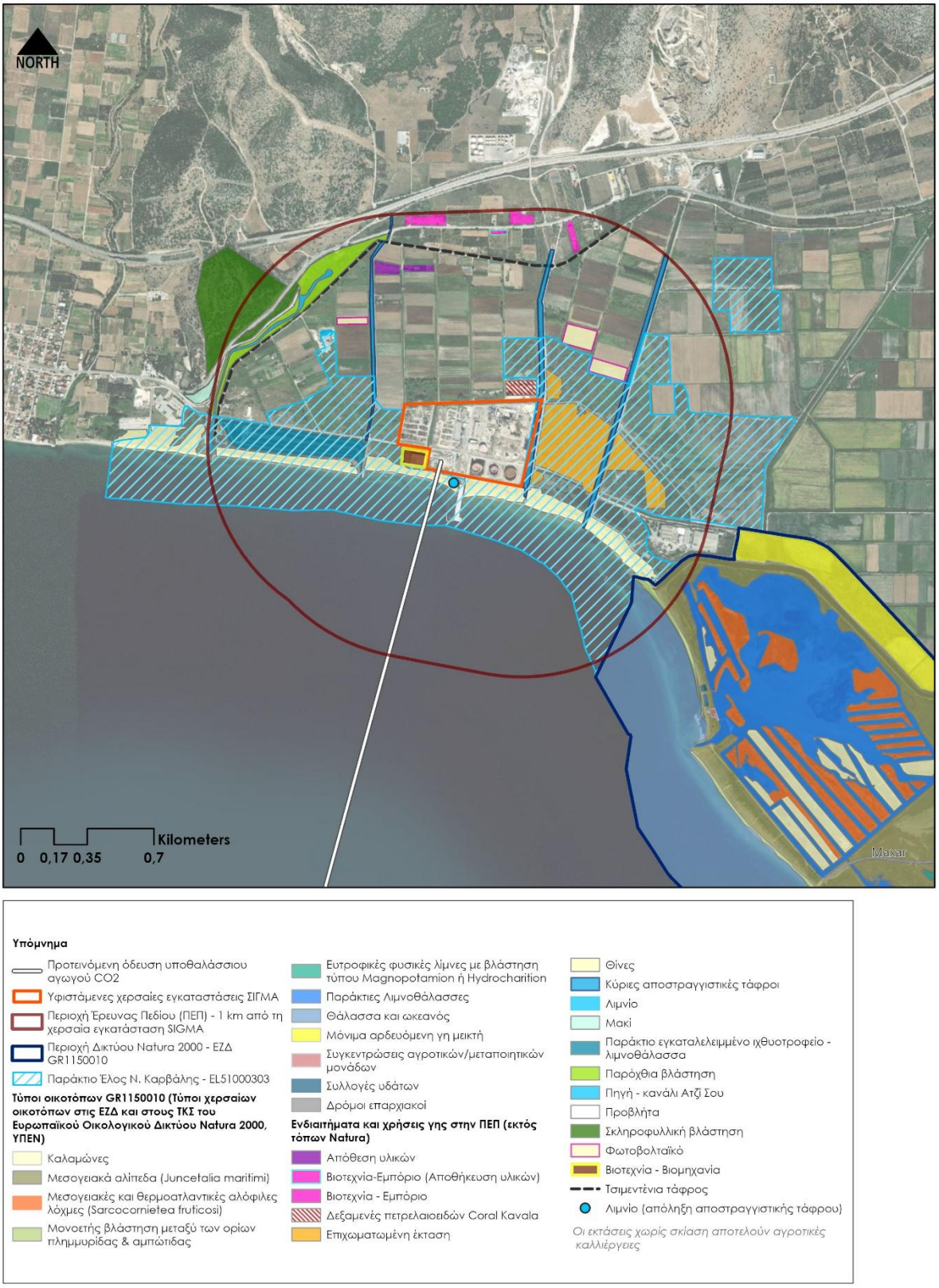


Figure 34: Map of habitats and land uses in the terrestrial part of the FSA

1.1.B1.i.2 Especially in terms of habitat types

1.1.B1.i.2.1 Terrestrial habitat types

A small part of the FSA (<10%) includes the SAC G1150010 "Nestos Delta and Keramoti Lagoons – Wider Area" where the habitat types (t.o.) have been recorded. These are presented in Table 21.

Table 21: Habitat types (H.T.) in SAC GR1150010 within the FSA

Code	Name	H.T priority	H.T Annex I	Other natural H.T	Complementary H.T.
1057	Permanently irrigated mixed land				v
1150	Coastal Lagoons	v	v		
1160	Shallow inlets and bays		v		
1210	Annual vegetation between the high and low tide limits		v		
1410	Mediterranean salt marshes (Juncetalia maritimi)		v		
1420	Mediterranean and thermo-Atlantic halophilic thickets (Sarcocornietea fruticosi)		v		

Outside the SAC, other habitats are also present, but they have not been officially mapped since this mapping is the responsibility of the Ministry of Environment exclusively within the SACs.

However, a list of habitat types that are present is provided (see Table 22), in the FSA outside the SACs, which include four habitats in a strong mix in the sand dune zone as the area is strongly disturbed on the coast, while the factory and wetland habitats are then interspersed in a mix with crops as within the wetland zone there have been extensive earthworks in the past and developments for the creation of fish farming near the coast and drainage works for the conversion of land to agriculture.

Table 22: Habitat types (H.T) in the FSA outside the SAC

Code	Name	H.T priority	H.T Annex I	Other natural H.T	Complementary H.T.
1022	Highways				v
1023	National roads				v
1056	Permanently irrigated land of pure				v
1057	Permanently irrigated mixed land				v
1069	Mixed olive groves				v
1150	Coastal Lagoons	v	v		
1160	Shallow inlets and bays		v		
1210	Annual vegetation between high tide and low tide		v		

Code	Name	H.T priority	H.T Annex I	Other natural H.T	Complementary H.T.
1310	Primary vegetation with Salicornia and other annual species of muddy and sandy zones		v		
1410	Mediterranean salt flats (Juncetalia maritimi)		v		
1420	Mediterranean and thermo-Atlantic halophilic thickets (Sarcocornietea fruticosi)		v		
2110	Atypical moving dunes		v		
2120	Moving dunes of the coastline with Ammophila arenaria ("white dunes")		v		
2190	Wet hollows between the dunes		v		
2210	Dunes with Euphorbia terracina		v		
5340	Eastern Mediterranean garrigues				
8210	Calcareous rocky slopes with chasmophytic vegetation				

The wetland zone and the sand dunes are of greatest interest.

The coastal wetland in the form of a marsh to the east of the factory (formerly part of a lagoon) and the salt marsh that surrounds it have been fragmented by the passage of a road and a drainage ditch, perpendicular to the coast. The wetland zones around the perimeter are also drained by ditches to be used for cultivation. However, the remaining open waters and the salt marshes that surround them continue to function as a habitat for birdlife and for aquatic and wading species to nest there.

West of the factory, a fish farm has been formed with earthworks, which also functions as a wetland as lagoon vegetation develops and certain sections function as islands in the lagoon.

The dunes are disturbed by the construction of the port, which seems to have disturbed the deposition of sand, which happens in all structures with a pier on sandy shores. The reduced solid supply from the Nestos River after the construction of the Thisavros and Platanovrissi dams has probably also contributed to the historical changes in the coastline. Although there have been serious interventions in the dune zone, especially the passage of pipelines parallel to the coast to the fertilizer factory in Nea Karvali and pipelines to the Energean factory, the isolation of the coast, the reduced human activity and the difficulty of vehicle access lead to the preservation of the dune vegetation and to reduced disturbance. The main pressure on the dunes is grazing, mainly east of the factory, which in places gives the appearance of overgrazing. In the dune zone, there are 4 sq. which present a very intense mixing. The H.T 2190 "wet hollows between the dunes" has probably been formed by works for the construction of the pipelines.

1.1.B1.i.2.1 Marine habitat types

According to the geospatial data for the assessment of the spread of seagrass meadows (Panayiotidis et al. 2022, Topouzelis et al. 2018), the presence of marine seagrass meadows is estimated in the PM and the FSA as shown in Figure 35.

The marine seagrass communities include 4 species: Posidonia oceanica, Cymodocea nodosa, Zostera noltei and Halophila stipulacea. Their distribution pattern along the coasts varies depending on the species, with the endemic species Posidonia oceanica showing the widest distribution. The total coverage of Posidonia oceanica meadows amounts to approximately 2,500 km2 and 25-35% (~600 to 800 km2) of this area is included in the Natura 2000 network. The species Cymodocea nodosa shows a wide distribution but on a smaller scale. The species Zostera noltei has a limited and local presence related to the presence of freshwater, while the Lessepsian species Halophila stipulacea has also been recorded on the coasts of the Mediterranean Sea.

Posidonia oceanica meadows are a protected habitat in the EU through a series of conventions, directives and regulations, at national and European level. In particular, the legal framework for the protection of Posidonia oceanica (Díaz & Duarte, 2008; Boudouresque et al. 2012; Pergent et al. 2016) is the Bern Convention par. I (Decision 82/72/EEC), the Barcelona Convention par. II (2102/2015/EEC), the Ramsar Convention, the EU Fisheries Policy Regulation 1967/2006/EEC, EU Legislation UNEP - MAP - RAC/SPA 2009 (strictly protected EU MPAs in the Mediterranean), EU Habitats Directive (92/43/EEC), EU Marine Strategy Framework Directive (MSFD, 2008) EU Water Framework Directive (WFD, 2000). Finally, national and EU legislation prohibits the use of towed and circular fishing gears (trawls and purse seines) over Posidonia Meadows.

Posidonia oceanica is a long-lived plant with a widespread distribution and presence and, as such, is classified as “Least Concern” according to the latest IUCN assessment, although its population trend is estimated to be decreasing throughout its range (Pergent et al. 2016). Its extremely slow growth rate makes it extremely vulnerable to external disturbances, thus making it very difficult to recover in case of degradation. (Giovos et al. 2022)

Posidonia oceanica meadows are a breeding ground, nursery or permanent habitat for many species (over 400 different plant species and several thousand animal species inhabit the meadows, many of which are of commercial importance), creating a unique biodiversity hotspot. Posidonia oceanica is also considered an “ecosystem engineer” as it stabilizes the sediment with its roots and changes the hydrodynamic state of the subtidal zone and protects the coasts from erosion (Pergent et al., 2012). In addition, it improves water quality by reducing particle loads (Hemminga and Duarte, 2000). Furthermore, the plants have the ability to produce large amounts of atmospheric oxygen, while removing carbon dioxide (CO2). Through this process, meadows can store large amounts of organic carbon, acting as long-term carbon stores (Pergent et al. 2012). (Giovos et al. 2022).

The health status of a seagrass meadow can be assessed by examining various parameters, such as the number of shoots, the length of the blades, the leaf coverage, the percentage of coverage, as well as the populations of fish and invertebrates around the meadow, the levels of anthropogenic pollution in the area, etc. (source: Archipelagos).

In the area of the FSA within the SAC GR1150010 and according to the field work carried out in the periods 06.11.2023 – 09.11.2023, 26.06.2021 – 27.06.2021 and 11.10.2015 – 19.10.2015, areas of soft substrate (mainly sandy) with vegetation of the marine phanerogam Cymodocae nodosa have been recorded per area. No Posidonia meadows were observed. In SAC & SCI GR1150014 and based on the cocommetric

analysis of sediments carried out in 2015, 2021 and 2024, the bottom is expected to be mainly muddy / sandy.

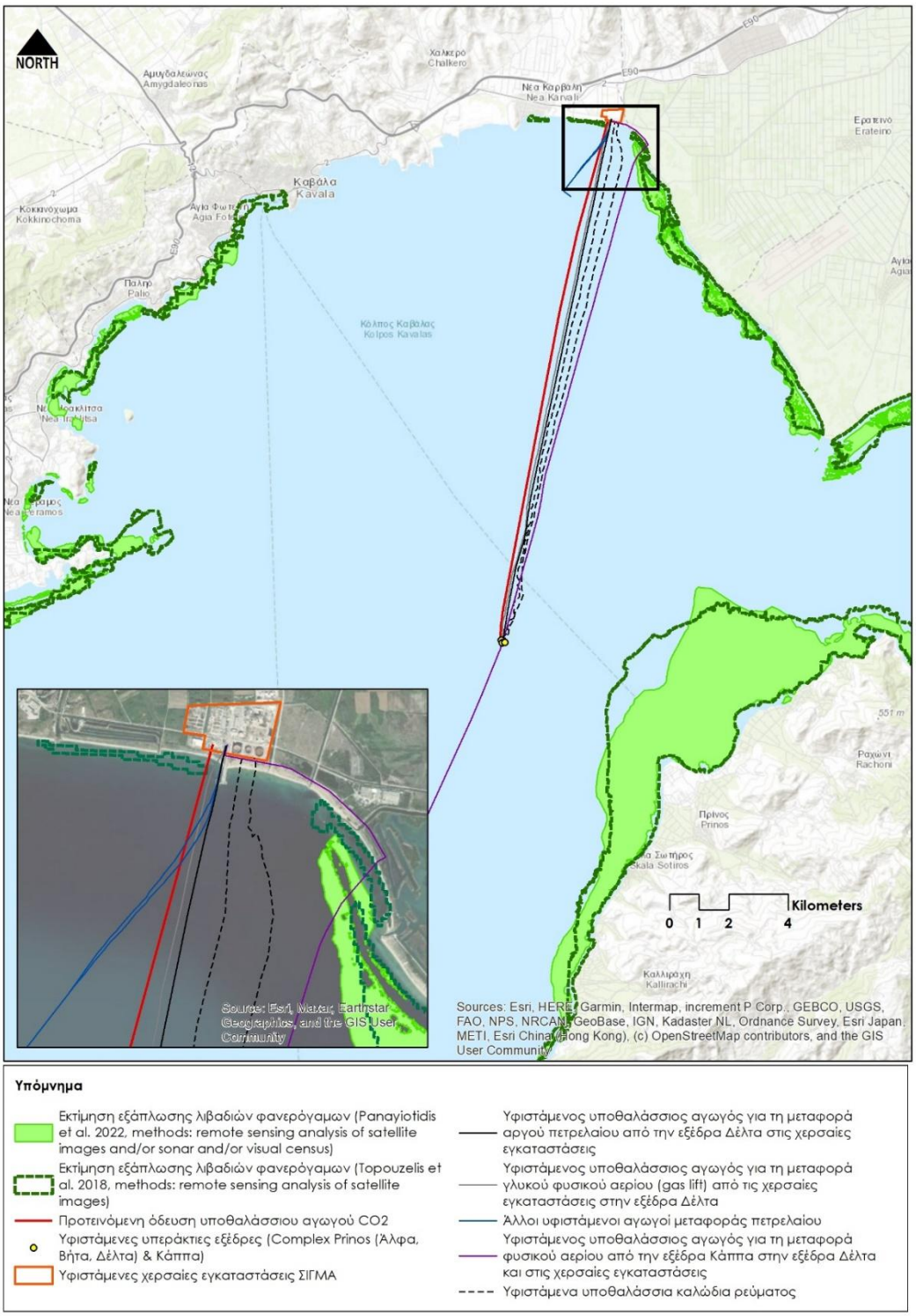


Figure 35: Available data for estimating the spatial distribution of marine phanerogam meadows according to Panayiotidis et al. 2022 and Topouzelis et al. 2018

1.1.B1.ii Recording of the flora and fauna species of Annex II of Joint Ministerial Decree 14849/853/E103/2008 (Government Gazette B' 645), especially with regard to the size and density of the populations, their conservation status and their isolation (if they are SACs, SCI)

The species recorded during the fieldwork are presented in the tables below by species group.

1.1.B1.ii.1 Terrestrial mammals

Table 23 presents the mammal species recorded during the field surveys for this study. The table also gives the presence of the species present in the wider area – in the specific presence mapping square – according to the project of monitoring the conservation status of mammal species in the National Park of Macedonia Thrace (Gioulatos D. et al. 2015).

Table 23: Terrestrial mammal species in the FSA

Scientific name	Greek name	IUCN	Red book	Directive 92/43	FSA Research SEA	FSA Supervision 2015	Remarks
Talpa caeca ή *Talpa europaea*	Τυφλασπάλακας ή Ασπάλακας	LC	DD		v		The genus was identified by the presence of galleries on the ground
Erinaceus roumanicus	Σκατζόχοιρος Ευρωπαϊκός	LC	NE		v		
Canis aureus	Τσακάλι	LC	EN		v		It was not recorded in 2015 although the same method was used in this area.
Vulpes vulpes	Αλεπού	LC	NE		v		
Martes foina	Κουνάβι	LE	NE		v		
Lutra lutra	Βίδρα	NT	EN	II	v	v	
Felis silvestris	Αγριόγατα	LC	NE	IV		v	

Note:
Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora:
II: Annex II (Species whose conservation requires the designation of conservation areas). For these species, it is necessary to ensure the maintenance or, where appropriate, the restoration at a favourable conservation status of the natural habitat types and their habitats in their natural range.
IV: Annex IV (Species requiring strict protection)
V: Annex V (Animal and plant species of Community interest the taking in the wild and exploitation of which may be subject to management measures)
* : "priority species": the species referred to in the item for the conservation of which the Community has particular responsibility.
Conservation status
IUCN: Globally Threatened. The category in which the species are classified according to the IUCN criteria is indicated. The symbols are the same as in the Red Book of Threatened Animals of Greece.
Red Book of Threatened Animals of Greece:
• CR - CRITICALLY ENDANGERED: Taxa that face an extremely high risk of extinction from their natural habitat in the near future.
• EN - ENDANGERED: These taxa are not Critically Endangered, but face a very high risk of extinction in their natural habitat in the near future.
• VU - VULNERABLE: Taxa that do not fall into the above categories but face a high risk of extinction in the medium term.
• NT - NEAR THREATENED: A taxon that has been assessed as not belonging to one of the three previous risk categories, but is nevertheless close to meeting the relevant criteria and is therefore likely to be included in them in the near future.

• LC - LEAST CONCERN: A taxon that has been assessed as not belonging to the Critically Endangered, Endangered, Vulnerable or Near Threatened categories. They are usually relatively common or widespread species.
• DD - DATA DEFICIENT: A taxon for which there is insufficient data to assess their status based on their distribution and/or the status of their populations. That is, a taxon may have been studied and its biology known, but appropriate data on its distribution or abundance are lacking. If these are found, the Poorly Known species may prove to be in fact at risk.
• NE - NOT EVALUATED: Taxa that have not yet been assessed against the previous criteria.

The absence of the hare, which is found in other dune ecosystems in northern Greece, is striking. This is probably related to the existence of hunting pressure and extensive poaching in the wetland zones.

The otter was recorded with the presence of droppings in the stream located east of Nea Karvali, at the mouth of the fish farm and at the mouth of the perimeter ditch of the Vasova lagoon. We consider it likely to be found in the fish farm and in the springs of Atzi Sou and in the ditch connected to them, but access for control is almost impossible. In the 2015 mammal conservation monitoring program, the westernmost location where the species was recorded was in the Vasova lagoon. It is believed that the otter seems to use the entire irrigation network of the Delta area for feeding and movement. Abandoned nets, placed to prevent the approach of fish-eating birds, in the ditch that functions as a fish farm can be a serious problem for the species if trapped.

The wildcat was recorded with cameras during the survey of the mammal conservation status monitoring program in the Vasova lagoon.

The jackal was not recorded during the survey of the mammal conservation status monitoring program at the western end of the SAC. However, during the field survey, the species was present at both locations within the SAC where an acoustic survey was carried out, and there were responses from jackals on both days. It was recorded twice by visual observation, once within the SAC, and one was found dead on a road. The visual observations within the SAC were made in April 2024. It is concluded that there is a small group of jackals within the SAC. It appears that the species has expanded in the area and that the dense riparian vegetation of ditches and other locations constitutes its main refuge and perhaps the place where it builds its nest.

1.1.B1.ii.2 Chiroptera

Table 24 presents the species and species groups recorded during the field surveys for this study. This table also provides the presence of species present in the wider area of the National Park of Eastern Macedonia and Thrace (EPAMATH) as derived from the results of the monitoring project and assessment of the conservation status of species and habitat types in the area of responsibility of the EPAMATH Management Body.

3 species of bats and 6 groups of bat species were recorded. Bat species groups were defined in cases where, due to significant overlap in characteristics of recorded calls between different species, species identification was not possible. These species groups are: Myotis myotis/blythi, Myotis capaccinii/daubentoni, Pipistrellus kuhlii/Pipistrellus nathusii, Pipistrellus pipistrellus/Miniopterus schreibersii, Pipistrellus pipistrellus/Pipistrellus pygmaeus/Miniopterus schreibersii and Pipistrellus pygmaeus/Miniopterus schreibersii. Therefore, the actual number of species within the FSA is likely to be higher due to species grouping.

The bats were recorded mainly near water surfaces such as canals and fish farms. The highest abundance of species was recorded in the canal next to the old National Road in the northern part as almost all species

and species groups were recorded. A significant presence of bats was also recorded in the fish farm west of the Sigma factory, where Hypsugo savii, Myotis capaccinii/Myotis daubentonii and Pipistrellus kuhlii/Pipistrellus nathusii were recorded near the factory (see Figure 36, Figure 37, Figure 38, Figure 39).

Table 24: Bat species recorded in the FSA and in the EPAMATH area

Scientific name	Greek name	IUCN	Red book	Directive 92/43	FSA Research SEA	FSA Supervision 2015	Remarks
Eptesicus serotinus	Τρανονυχτερίδα	LC	LC	IV	v	v	
Hypsugo savii	Βουνονυχτερίδα	LC	LC	IV	v	v	
Miniopterus schreibersi	Πτερυγονυχτερίδα	NT	NT	II, IV	v	v	
Myotis aurascens	Στεπομυωτίδα	LC	DD	IV		v	
Myotis myotis/blythi	Τρανομυωτίδα/ Μικρομυωτίδα	LC/LC	NT/LC	II, IV	v	v	
Myotis capaccinii/daubentoni	Ποδαρομυωτίδα/ Μυωτίδα του Daubenton	VU/LC	NT/VU	II, IV	v	v	
Myotis emarginatus	Πυρρομυωτίδα	LC	NT	II, IV		v	
Nyctalus lasiopterus	Μεγάλος νυκτοβάτης	VU	VU	IV		v	
Nyctalus leisleri	Μικρονυκτοβάτης	LC	LC	IV		v	
Nyctalus noctula	Νυκτοβάτης	LC	DD	IV		v	
Pipistrellus kuhlii	Λευκονυχτερίδα	LC	LC	IV		v	
Pipistrellus nathusii	Νυχτερίδα του Nathusius	LC	DD	IV		v	
Pipistrellus pipistrellus	Νανονυχτερίδα	LC	DD	IV		v	
Pipistrellus pygmaeus	Μικρονυχτερίδα	LC	DD	IV		v	
Plecotus austriacus	Σταχτιά Ωτονυχτερίδα	NT	DD	IV		v	
Rhinolophus blasii	Ρινόλοφος του Blasius	LC	NT	II, IV		v	
Rhinolophus ferrumequinum	Τρανορινόλοφος	LC	LC	II, IV		v	
Rhinolophus hipposideros	Μικρορινόλοφος	LC	LC	II, IV		v	
Tadarida teniotis	Νυχτονόμος	LC	LC			v	
Vespertilio murinus	Παρδαλονυχτερίδα	LC	LC	IV		v	
Other species							
Pipistrellus kuhlii / Pipistrellus nathusii	Λευκονυχτερίδα	LC/LC	LC/DD	IV	v		The species are already mentioned above
Pipistrellus pipistrellus / Miniopterus schreibersii	Νανονυχτερίδα / Πτερυγονυχτερίδα	LC/NT	DD/NT	II, IV	v		The species are already mentioned above
Pipistrellus pipistrellus / Pipistrellus pygmaeus / Miniopterus schreibersii	Νανονυχτερίδα / Μικρονυχτερίδα / Πτερυγονυχτερίδα	LC/LC /NT	DD/ DD /NT	II, IV	v		The species are already mentioned above
Pipistrellus pygmaeus / Miniopterus schreibersii	Μικρονυχτερίδα / Πτερυγονυχτερίδα	LC/NT	DD /NT		v		The species are already mentioned above

Note:
Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora:
II: Annex II (Species whose conservation requires the designation of conservation areas). For these species, it is necessary to ensure the maintenance or, where appropriate, the restoration at a favourable conservation status of the natural habitat types and their habitats in their natural range.
IV: Annex IV (Species requiring strict protection)
V: Annex V (Animal and plant species of Community interest the taking in the wild and exploitation of which may be subject to management measures)
* : "priority species": the species referred to in the item for the conservation of which the Community has particular responsibility.
Conservation status
IUCN: Globally Threatened. The category in which the species are classified according to the IUCN criteria is indicated. The symbols are the same as in the Red Book of Threatened Animals of Greece.
Red Book of Threatened Animals of Greece:
• CR - CRITICALLY ENDANGERED: Taxa that face an extremely high risk of extinction from their natural habitat in the near future.
• EN - ENDANGERED: These taxa are not Critically Endangered, but face a very high risk of extinction in their natural habitat in the near future.
• VU - VULNERABLE: Taxa that do not fall into the above categories but face a high risk of extinction in the medium term.
• NT - NEAR THREATENED: A taxon that has been assessed as not belonging to one of the three previous risk categories, but is nevertheless close to meeting the relevant criteria and is therefore likely to be included in them in the near future.
• LC - LEAST CONCERN: A taxon that has been assessed as not belonging to the Critically Endangered, Endangered, Vulnerable or Near Threatened categories. They are usually relatively common or widespread species.
• DD - DATA DEFICIENT: A taxon for which there is insufficient data to assess their status based on their distribution and/or the status of their populations. That is, a taxon may have been studied and its biology known, but appropriate data on its distribution or abundance are lacking. If these are found, the Poorly Known species may prove to be in fact at risk.
• NE - NOT EVALUATED: Taxa that have not yet been assessed against the previous criteria.

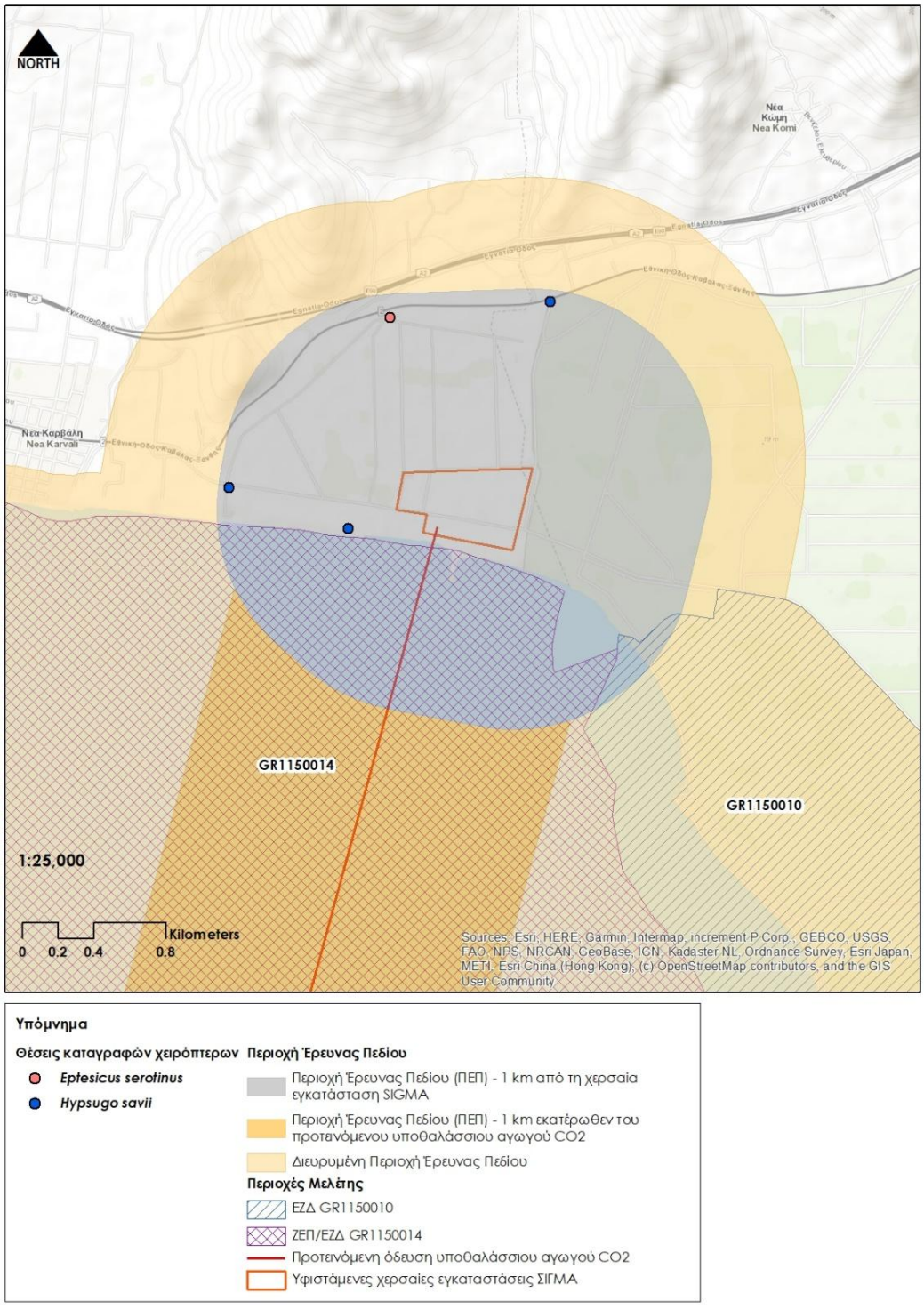


Figure 36: Locations of Eptesicus serotinus and Hypsugo savii records within the FSA.

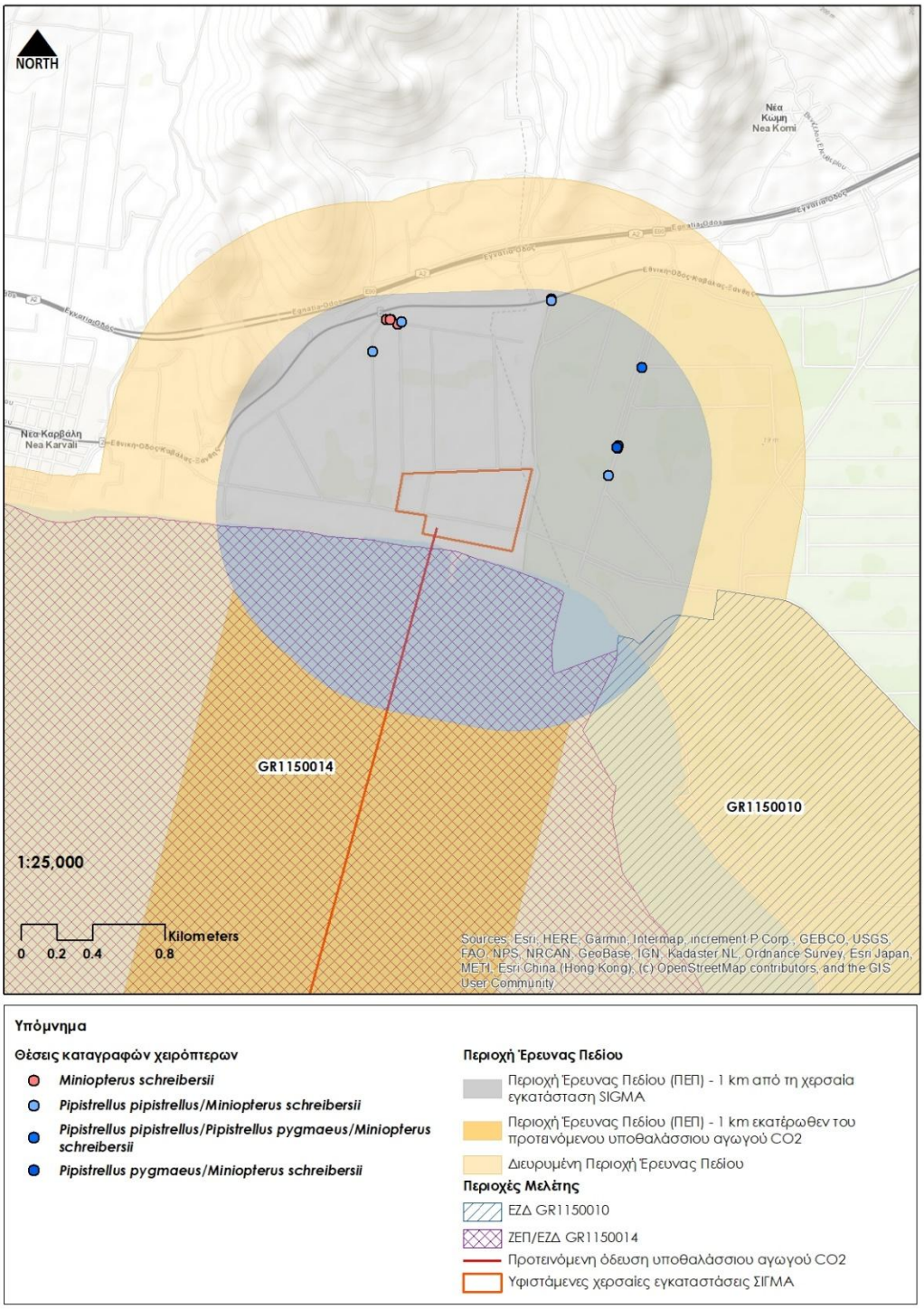


Figure 37: Locations of records associated with Miniopterus schreibersi, Pipistrellus pipistrellus and Pipistrellus pygmaeus within the FSA.

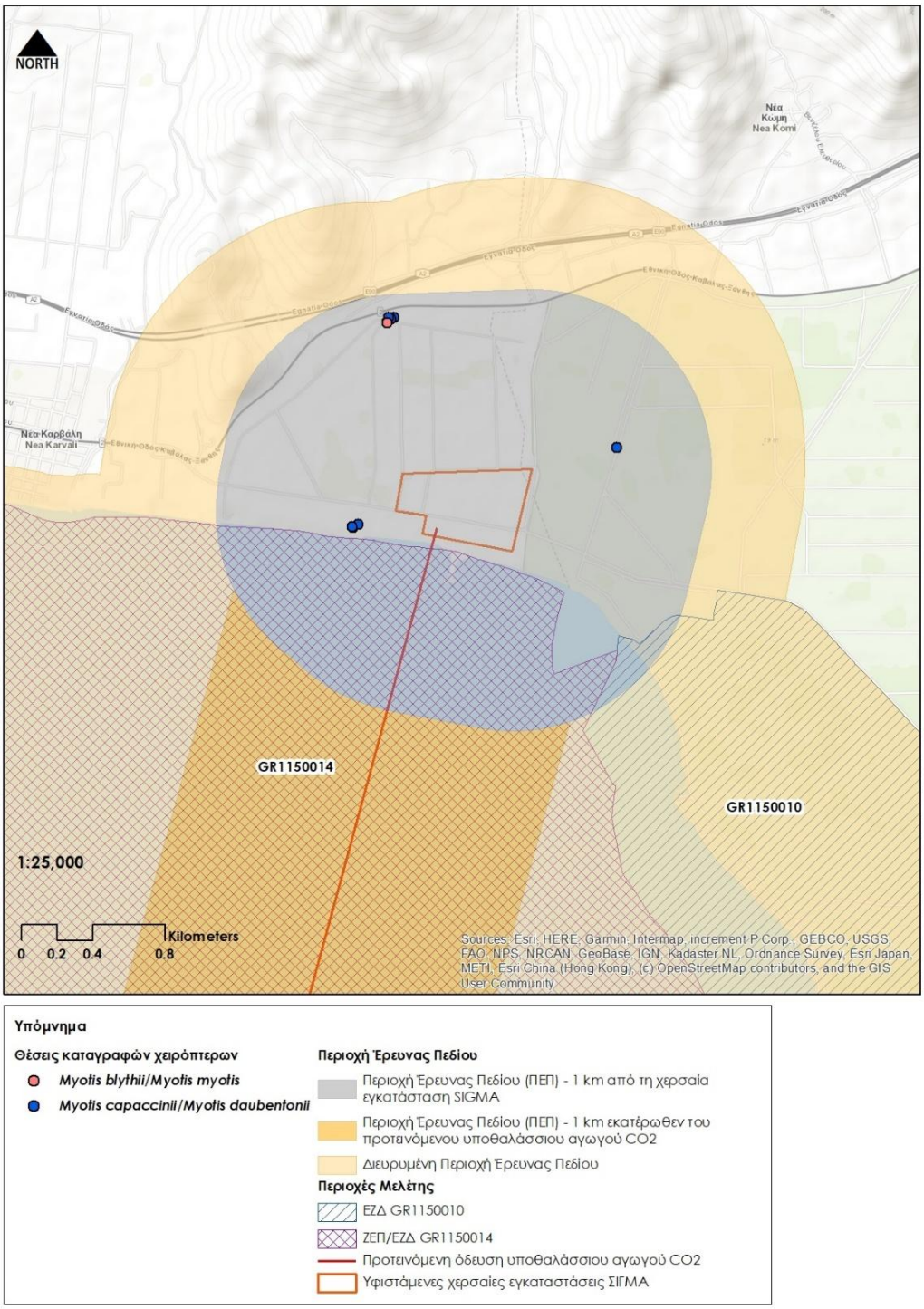


Figure 38: Locations of Myotis myotis/blythi and Myotis capaccinii/daubentoni records within the FSA.

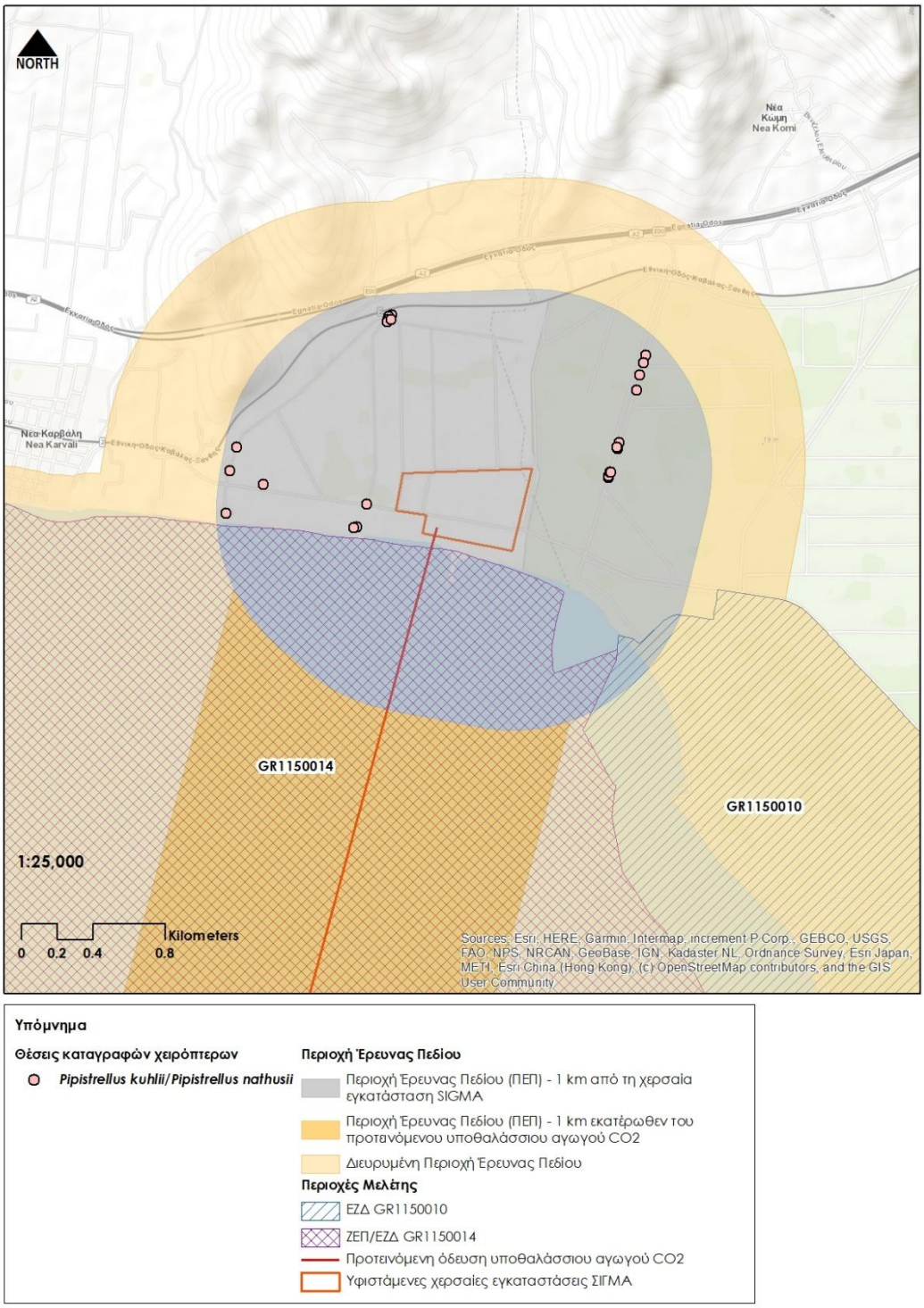


Figure 39: Pipistrellus kuhlii/Pipistrellus nathusii recording locations within the FSA

1.1.B1.ii.3 Amphibians and reptiles

Table 25 presents the amphibian and reptile species recorded during the field surveys for this study. The table also provides the presence of species present in the wider area – in the specific presence mapping square – according to the project of monitoring the conservation status of mammal species in the National Park of Macedonia and Thrace (Bousbouras D. et al. 2015).

Table 25: Amphibian and reptile species in the FSA

Scientific name	Greek name	IUCN	Red book	Directive 92/43	FSA Research SEA	FSA Supervision 2015
Amphibians						
Hyla arborea	Δενδροβάτραχος		LC	IV	v	v
Pelophylax kurtmuelleri	Λιμνοβάτραχος των βαλκανίων	LC	LC	V	v	v
Reptiles						
Caretta caretta	Χελώνα Καρέττα	EN	EN	II*	v	v
Chelonia mydas	Χελώνα Μύδας	EN	EN	II*		v
Dermochelis coriacea	Δερματοχελώνα	CR	CR	IV		
Emys orbicularis	Βαλτοχελώνα	NT	NT	II	v	v
Mauremys rivulata	Ποταμοχελώνα	LC	LC	II	v	v
Testudo hermanni	Μεσογειακή χελώνα	NT	VU	II	v	v
Testudo graeca	Ελληνική χελώνα	NT	LC	II	v	v
Pseudopus apodus	Τυφλίτης	LC	LC	IV	v	
Lacerta viridis	Σμαραγδόσαυρα	LC	LC	IV	v	v
Dolichophis caspius	Αστραπόφιδο	LC	LC	IV	v	
Elaphe quatuorlineata	Λαφιάτης	NT	LC	II		
Malpolon monspessulanus	Σαπίτης	LC	LC		v	v
Natrix natrix	Νερόφιδο	LC	LC			
Platyceps najadum	Σαΐτα	LC	LC	IV		v
Telescopus fallax	Αγιόφιδο	LC	LC	IV		v

Note:
Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora:
II: Annex II (Species whose conservation requires the designation of conservation areas). For these species, it is necessary to ensure the maintenance or, where appropriate, the restoration at a favourable conservation status of the natural habitat types and their habitats in their natural range.
IV: Annex IV (Species requiring strict protection)
V: Annex V (Animal and plant species of Community interest the taking in the wild and exploitation of which may be subject to management measures)
* : "priority species": the species referred to in the item for the conservation of which the Community has particular responsibility.
Conservation status
IUCN: Globally Threatened. The category in which the species are classified according to the IUCN criteria is indicated. The symbols are the same as in the Red Book of Threatened Animals of Greece.
Red Book of Threatened Animals of Greece:
• CR - CRITICALLY ENDANGERED: Taxa that face an extremely high risk of extinction from their natural habitat in the near future.
• EN - ENDANGERED: These taxa are not Critically Endangered, but face a very high risk of extinction in their natural habitat in the near future.
• VU - VULNERABLE: Taxa that do not fall into the above categories but face a high risk of extinction in the medium term.
• NT - NEAR THREATENED: A taxon that has been assessed as not belonging to one of the three previous risk categories, but is nevertheless close to meeting the relevant criteria and is therefore likely to be included in them in the near future.
• LC - LEAST CONCERN: A taxon that has been assessed as not belonging to the Critically Endangered, Endangered, Vulnerable or Near Threatened categories. They are usually relatively common or widespread species.
• DD - DATA DEFICIENT: A taxon for which there is insufficient data to assess their status based on their distribution and/or the status of their populations. That is, a taxon may have been studied and its biology known, but appropriate data on its distribution or abundance are lacking. If these are found, the Poorly Known species may prove to be in fact at risk.
• NE - NOT EVALUATED: Taxa that have not yet been assessed against the previous criteria.

The main areas where amphibians were recorded, mainly acoustically at dusk, are the springs and the ditch that functions as a fish farm and the drainage ditch that runs east of the factory and the marsh, perpendicular to the coast. The ditches carry fresh water, while in the fish farm the brackish waters are not suitable for amphibians.

The land turtles were recorded near the coast and mainly in the sand dunes and less in the embankments or roads inland where irrigated crops dominate and the habitat is not suitable for the two species. The Greek tortoise is dominant while the Mediterranean tortoise is relatively rare. The sand dunes are a suitable habitat because they provide food of moderate quality and quantity but very good places for reproduction. The population of the Greek tortoise seems to be very important, corresponding to extensive sand dunes located near wetlands with relatively low human presence in other areas of Greece such as the sand dunes at Kitros salt flats in Pieria (Bousbouras 2023) and the sand dunes of Agios Mamas in Halkidiki.

East of the factory, a very dense population was recorded in the sand dunes with 14 tortoises in 3 acres, although in other parts of the dunes it is smaller. However, this population makes the area equivalent to the sand dunes of Kitros Salt flats which have the largest population of terrestrial tortoises in Europe, although this is a Mediterranean tortoise. However, in order to have a complete picture of the population, an accurate measurement using a special method is required. Behind the dunes the habitat is not suitable for land turtles and in addition there are serious obstacles to movement with the ditches and the concrete irrigation network.

Freshwater turtles are found in all freshwater habitats. The common terrapin is dominant while the other species is expected which prefers marshes and swamps. Only one juvenile terrapin was found, which may have been carried away by the irrigation network. The population of the common terrapin is very large in the drainage network and in the main concrete ditch with hundreds of individuals >370 individuals in a length of 400 m.

As in other wetlands where water for irrigation is transported by open concrete irrigation networks, there is a serious problem of amphibians and reptiles being trapped in the wells where the animals end up dying in winter from the cold, creating a serious pollution problem at the same time.

Sea turtles, and especially loggerheads, are identified by animals that have washed up on the shore, probably after death or after being caught in fishing nets or by being hit by a propeller. During fieldwork in the wider area, 5 dead loggerheads were recorded, 4 on the shore and one floating in the sea, and a loggerhead turtle dead on the shore. The deaths that have been recorded are numerous, which indicates that the species gathers in the area to feed or that currents carry the dead animals to the shore.

Specifically, based on data from the NGO Archelon, which deals with sea turtles, over the last 4 years (2020 – 2023), 81 sea turtle strandings have been recorded within the SAC GR1150014:

- 71 loggerhead turtles
- 4 Chelonia mydas turtles
- 1 Dermochelys coriacea (Leatherback turtle)
- 5 cases where the species could not be identified, however they are classified in the Chelonidae family.

The killing is mainly a result of being caught in fishing gear. However, the location of death cannot be known because there are currents in the area that transport the dead animals over long distances. However, it appears that the area is a feeding zone mainly for young individuals but also for mature individuals that lay eggs (with a curved eel length >70 cm).

The presence of the species in the area has been known for a long time. According to data from the port authority and the management body of the national park of Eastern Macedonia and Thrace, as reported in the amphibian and reptile monitoring project in 2012-13, 5 loggerhead turtles and one loggerhead turtle were identified on the coast from Nea Karvali to the beach of Imeros, Komotini.

The sea turtle uses various habitats depending on its life stage. It makes large migrations between feeding / wintering grounds and breeding areas that can be thousands of kilometers. In the Mediterranean, nests are 6,000 - 8,000 per year with Greece having the largest population recording 3,500 nests per year (National Action Plan for the Sea Turtle 2021). The distribution of the species is considered satisfactory because the reproductive activity is extensive along a large length of the Greek coastline. The positive population increase in recent decades, as shown by the recording of reproductive activity, is mainly due to the significant reduction in egg predation due to long-term protective measures. However, important breeding habitats such as Rethymno, Chania and to a lesser extent Zakynthos show negative population trends.

According to the “National Action Plan for the Loggerhead Sea Turtle (Caretta caretta) in Greece”, the area is not included in the nesting zones, without mentioning the different sporadic nesting sites which in Greek seas represent 445 nests/year, 15% of the total recorded nesting. Nevertheless, a tendency for nesting on the coasts of the islands of the northern Aegean appears.

Figure 40 presents the foraging zones of the Loggerhead Sea Turtle. (a) refers to juveniles and (b) refers to adults, according to presence data from 1991 to 2020 (Chatzimeros et al 2021).

The state of the marine environment in the Kavala Thassos region and the habitats found in the marine area, despite the fact that the presence of Posidonia meadows is small, are rather suitable for feeding of the 2 sea turtles and mainly the loggerhead, which feeds mainly on animal organisms and less so for the loggerhead turtle which is exclusively herbivorous in the adult phase.

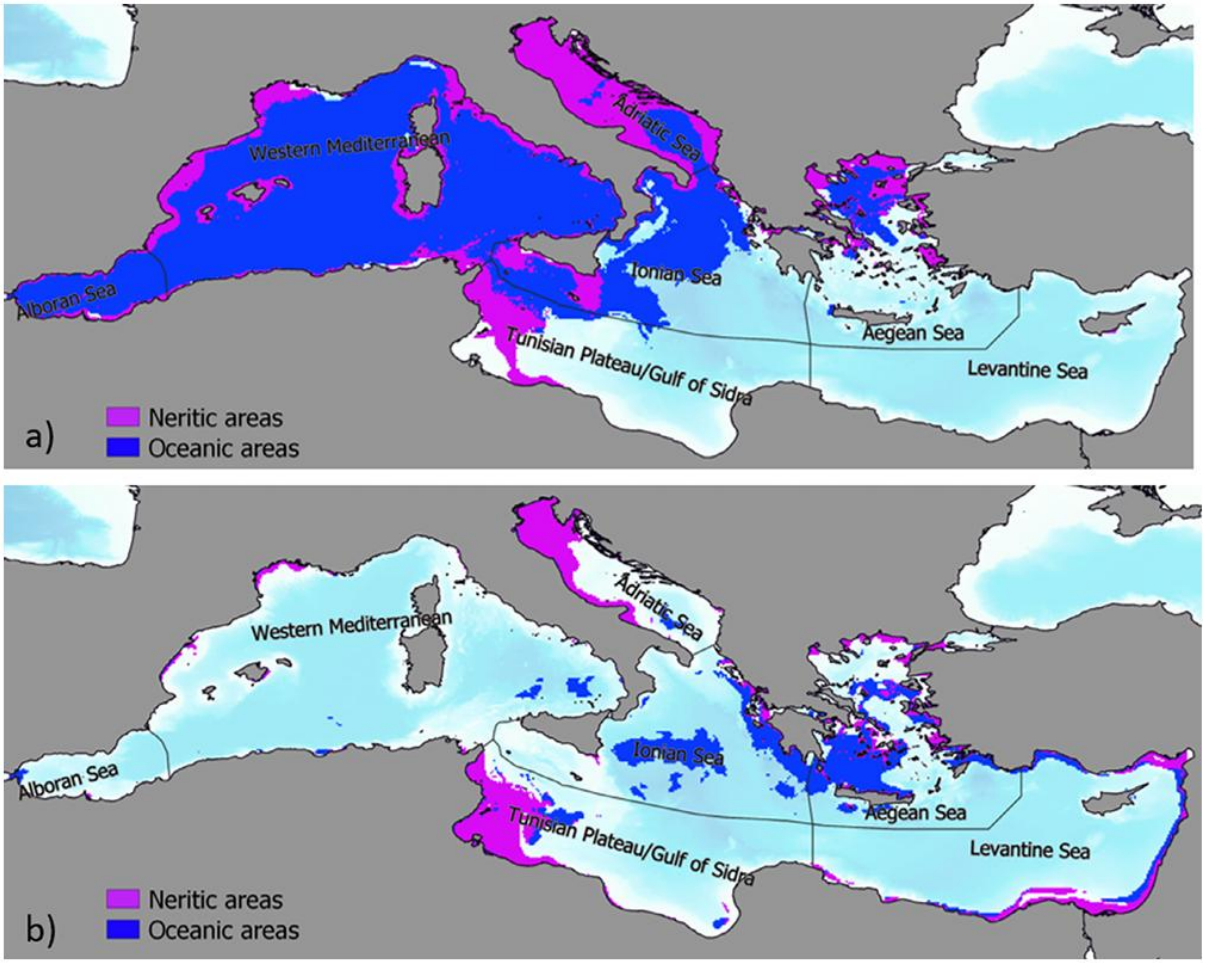


Figure 40: Foraging areas of the loggerhead sea turtle

The coasts of the area with large widths of sand dunes and especially the most inaccessible or low-disturbance ones are suitable for the nesting of sea turtles. Extensive such zones exist from the area in front of the factory to the sand dunes in front of the Agiasma lagoon. The protection of the species and the tendency of population growth may lead in the future to the use of these sand dunes for nesting in a systematic way.

Lizards and snakes are found outside the wetland zones. For water snakes there are suitable habitats mainly in the ditches, because the wetland zones are brackish. Traces of a snake were found in the dunes but no lizards.

1.1.B1.ii.4 Cetaceans

1.1.B1.ii.4.1 Literature information

The literature data we have for the area regarding the cetacean populations that inhabit it come mainly from 3 scientific publications, two by Milani et al. (2017 & 2019) and one by Cucknell et al. 2016. The first two refer to the numbers of bottlenose dolphins (Tursiops truncatus) (Milani et al. 2017) and common dolphins (Delphinus delphis) (Milani et al. 2019). The area to which these publications refer, with an area of approximately 2000km2, includes the study area of this project and extends east of Thassos. The numbers given for the bottlenose dolphin population in this area are 377 individuals with an encounter rate (ER) of 0.46 groups / 100km (2.5 dolphin/100km) and an average of individuals per group of 3.45. The presence of bottlenose dolphins seems to be slightly higher in winter and spring. (Milani et al. 2017). The largest part of their recordings is located in the area of interest of the present project west of Thassos with fewer recordings east of Thassos. Regarding the common dolphin, the annual presence of the species in the area according to the data of Milani et al. (2019) seems to be about 185 animals. The ER for common dolphins was 0.24 groups/100 km (1.5 dolphins/100 km), with an average number of individuals per group of 6.88.

The publication by Cucknell et al. presented the results of field surveys (systematic visual and acoustic recordings from a boat) carried out in the N. Aegean in the summer of 2013 to investigate the presence of the porpoise in the area. The presence of the species was also confirmed in the study area (northern part of the Gulf of Kavala) through acoustic recordings. Until the publication of this study, the presence of the species in the area was known only from opportunistic wash-up data and very limited data from random visual observations. The population of the species in the northern Aegean is estimated from 30 to 450 individuals based on estimates based on the Black Sea population, but it is most likely that the population is actually at the lower end of this estimate.

In addition to the above publications, information on the presence of cetaceans in the area is also available from the MARINE MAMMAL OBSERVER / PASSIVE ACOUSTIC MONITORING REPORT DURING 3D Marine Seismic Survey in Kavala Basin by Geo-Marine Consultants in the summer of 2015. During the surveys, observations were made of bottlenose dolphins (10 observations), common dolphins (1 observation), striped dolphins (4 observations), bottlenose dolphins (1 observation) as well as 6 observations of dolphins in which the species was not identified. Population estimates cannot be derived from these data. Regarding the striped dolphins and bottlenose dolphins recorded, the oceanographic characteristics of the study area of this project do not offer suitable habitat for these 2 usually deep-sea species. The records of striped dolphins do not appear on the map of the project study area in 2015 and we consider that they were made outside the study area during the transition to the seismic survey site (all striped dolphin records were made on the same day, at the beginning of the project within a few minutes of each other). The recording of the blowfish, although interesting as an observation, was made 8 km from the monitoring platform (boat), and this is either a random observation of the species in the area, or an incorrect recording.

The observations of bottlenose dolphins and common dolphins in the 2015 project agree largely with the observations of Milani et al. But also with the recordings of the present project.

1.1.B1.ii.4.2 Visual recordings by boat

The present study to determine the status of species listed in Annex II of Directive 92/43/EEC focused on visual surveys by boat and aerial visual surveys by light aircraft in the "pelagic surveys" area within the SPA & SCI GR1150014.

The visual surveys by boat were carried out in spring (May 2024) and autumn (October 2024), following the methodology of Buckland et al. (2004). Data analysis was carried out with the Distance 7.5 program (see IV Methodology).

During the fieldwork in spring, and specifically from 24 May to 30 May 2024, a total of 570 km of navigation were carried out in 5 days of research. This navigation was carried out under good visibility conditions and winds up to 3 Bf. The coverage is shown in Figure 41. The last day of recordings was made from the passenger ferry from Kavala to Prinos.

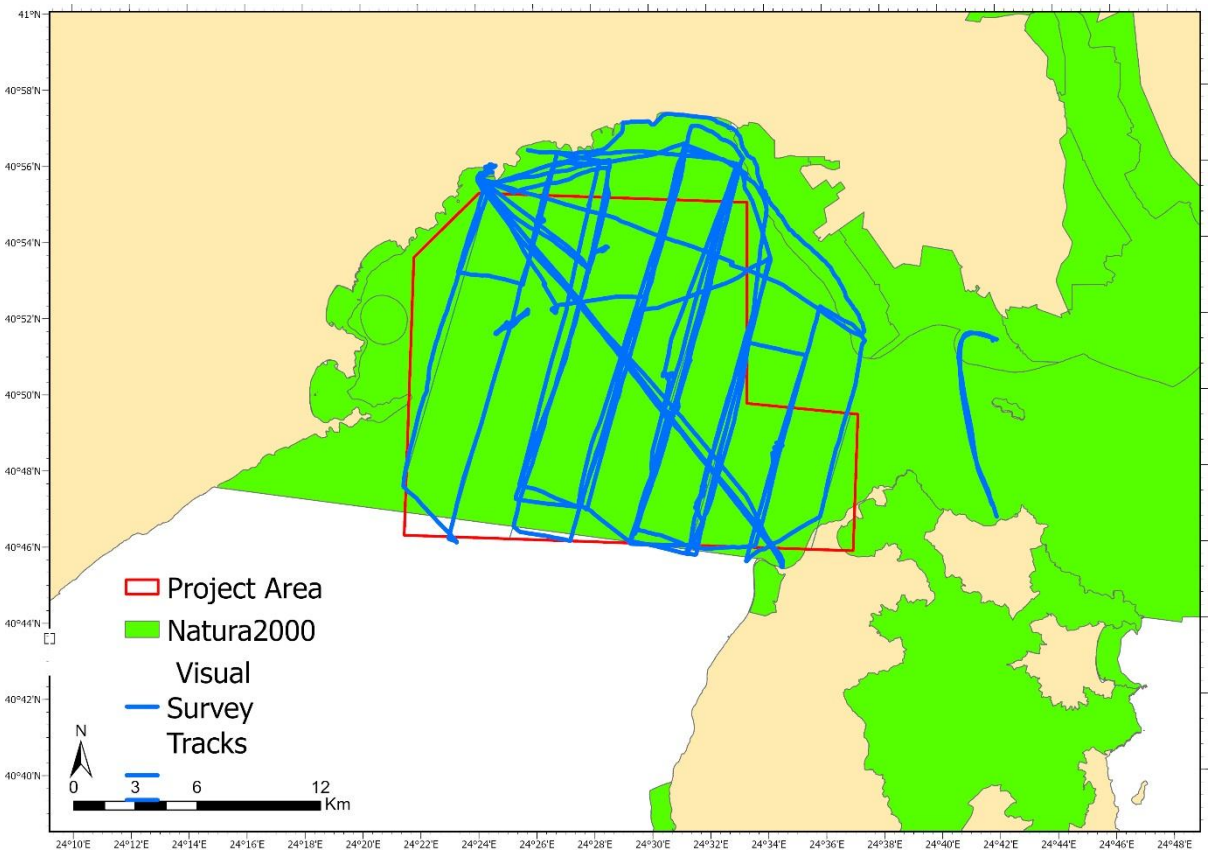


Figure 41: Boat visual recording routes carried out in May 2024 in the study area

Bottlenose dolphin: population distribution and size

Groups of bottlenose dolphins were observed 14 times during the research visual surveys by boat in May. The ER of groups is estimated at 2.45 groups/100km and the ER of individuals is estimated at 16 individuals/100km. The average size of bottlenose dolphin groups was estimated at 6.5 individuals/group. Analysis of the Line Transect data reveals a density of 0.33 individuals/km2 of bottlenose dolphins in the

area. Therefore, in the project area with an area of 326 km2 the bottlenose dolphin population is estimated at 106 animals. These results are comparable with the bibliographic data (Milani et al. 2017) therefore this number can be considered to be very close to reality.

Table 26: Bottlenose dolphin sightings in the expanded FSA

Date	Time	Species	Individuals	Adults	Juvenile	Calves	Latitude [deg]	Longitude [deg]
24/5/2024	10:13	*Tursiops truncatus*	3	3	0	0	40.866150	24.421500
24/5/2024	10:31	*Tursiops truncatus*	6	6	0	0	40.872233	24.430917
24/5/2024	11:32	*Tursiops truncatus*	4	3	1	0	40.898200	24.470017
25/5/2024	10:19	*Tursiops truncatus*	9	9	0	0	40.812017	24.575033
25/5/2024	11:14	*Tursiops truncatus*	10	9	1	0	40.797067	24.533067
25/5/2024	12:14	*Tursiops truncatus*	7	6	1	0	40.840583	24.512483
27/5/2024	10:14	*Tursiops truncatus*	11	9	1	1	40.827650	24.514517
28/5/2024	9:18	*Tursiops truncatus*	4	3	0	1	40.929467	24.422800
28/5/2024	10:48	*Tursiops truncatus*	14	13	0	1	40.823833	24.511000
28/5/2024	12:21	*Tursiops truncatus*	8	7	1	0	40.768117	24.523717
29/5/2024	9:59	*Tursiops truncatus*	3	3	0	0	40.840533	24.502183
29/5/2024	10:05	*Tursiops truncatus*	5	4	1	0	40.826217	24.518350
29/5/2024	10:10	*Tursiops truncatus*	4	4	0	0	40.814200	24.531400
29/5/2024	12:11	*Tursiops truncatus*	3	3	0	0	40.773900	24.566800

The density of bottlenose dolphins in the study area is high and comparable to the density reported by Bearzi et al. (2008) in the Amvrakikos Gulf, the highest recorded bottlenose dolphin density in Greece at 0.37 individuals/km2.

Therefore, the bottlenose dolphin population in the area is considered to be very important at a national level.

Observations of bottlenose dolphins during fieldwork in May are presented in Figure 42.

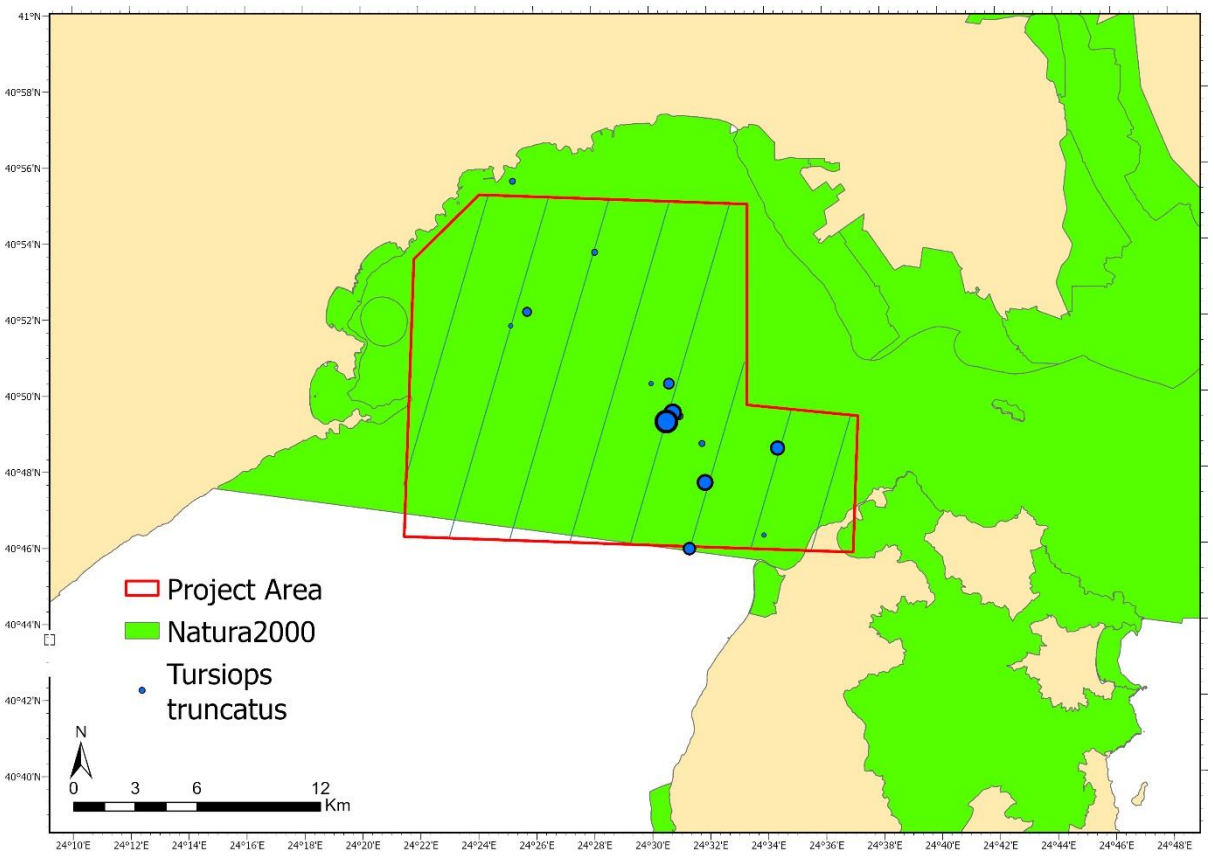


Figure 42: Bottlenose dolphin sightings in the study area in May 2024. The size of the circle represents the size of the dolphin group.

On the map, it is interesting to note that the majority of dolphin sightings in the area occur near the pumping platform and the pipeline. This finding may be coincidental but may also be related to the fishing ban in these areas, resulting in increased food availability and therefore increased dolphin presence.

Porpoise: distribution and population size

No porpoise was visually observed during the field surveys in May. This result is expected as the porpoise population in the northern Aegean is estimated to survive in very small numbers.

Common dolphin: distribution and population size

No common dolphins were observed during the field surveys in May. From the literature, it appears that common dolphins have a lower presence in the area during the summer months and a higher presence in the autumn. This may explain the absence of records during the period when the fieldwork was conducted.

During the autumn fieldwork, from 2 to 3 October 2024, 151 km were covered under favourable weather conditions (Beaufort 3 wind and good visibility). The geographical coverage of the area is shown in Figure 43.

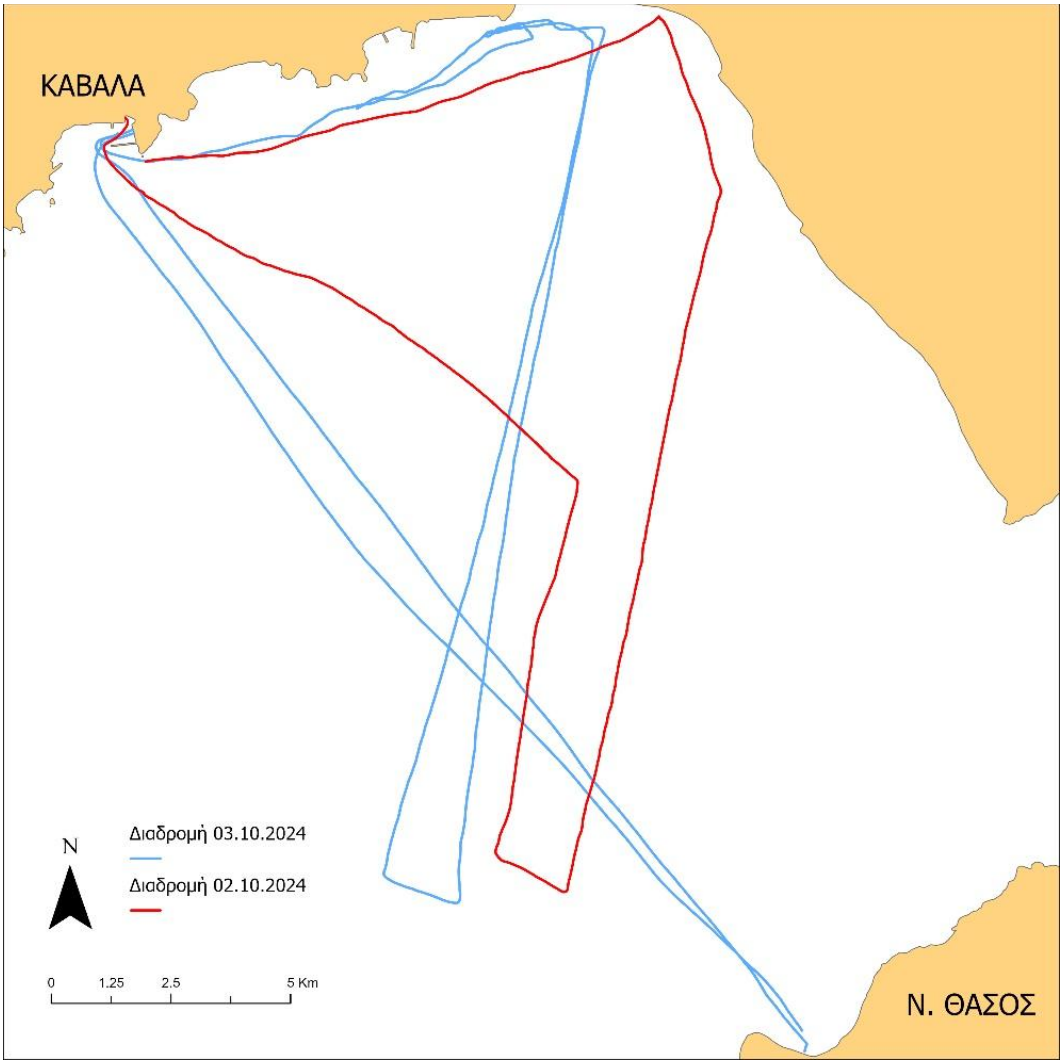


Figure 43: Boat visual recording routes carried out in October 2024 in the study area

During the fieldwork, cetaceans were observed on the following occasions:

- 02/10/2024: one (1) group of three (3) common dolphins (Delphinus delphis) near the shore.
- 03/10/2024: two (2) individuals of harbour porpoise (Phocoena phocoena) near the shore.
- 03/10/2024: three (3) groups of bottlenose dolphins (Tursiops truncatus), which consisted of 2 to 3 individuals.

The locations where the cetaceans were observed, as well as the number of individuals, are illustrated in the following Figure (Figure 44).

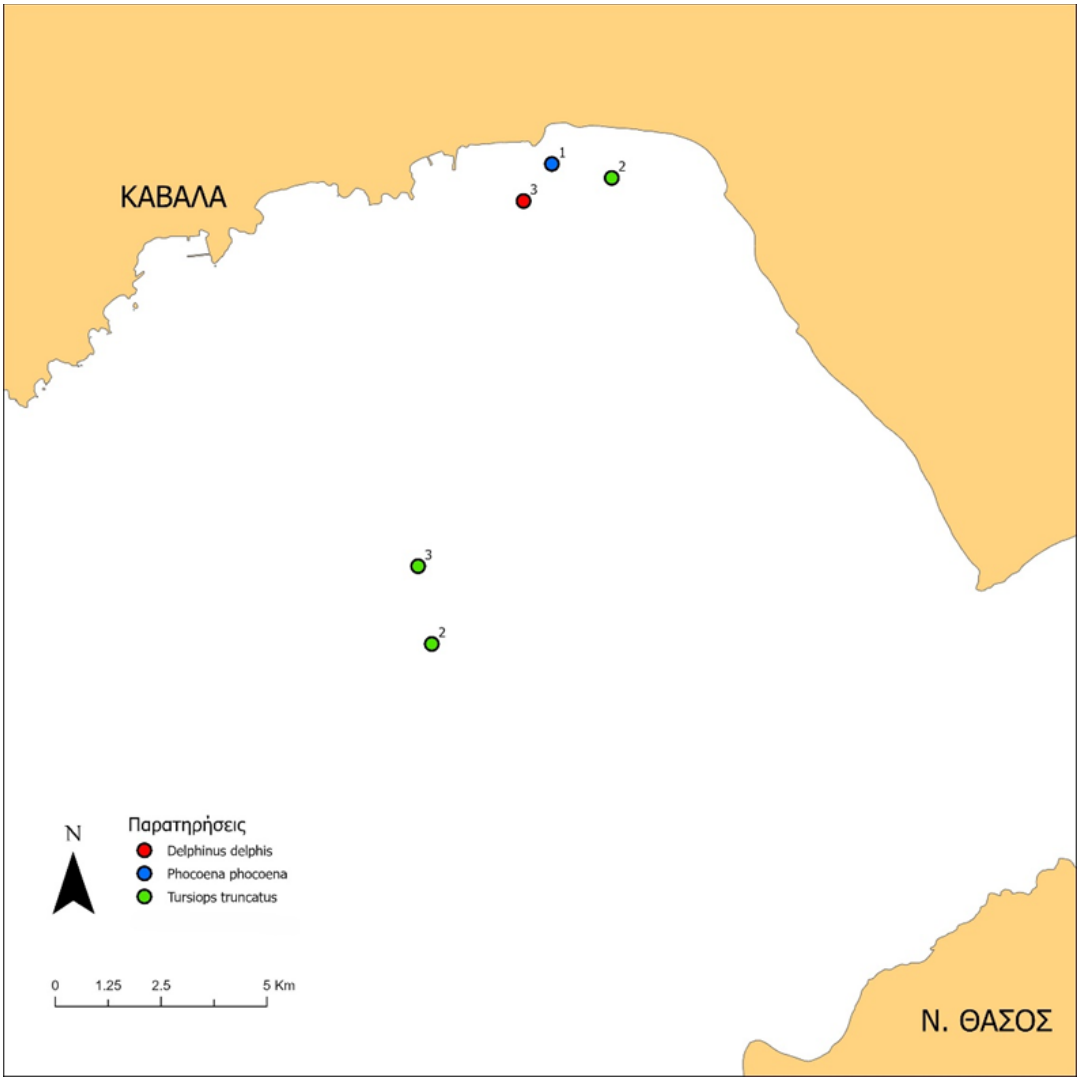


Figure 44: Cetacean sightings in October 2024 (common dolphins are marked in red, porpoises in blue and bottlenose dolphins in green)

Based on the above observations and the kilometers of the sea routes made, the "encounter rate" is estimated at two (2) groups of bottlenose dolphins / 100 kilometers, and 0.75 groups / 100 kilometers for common dolphins and porpoises. The exact number of porpoise individuals could not be determined, as the observation was short before their disappearance.

The autumn recordings provide important complementary data on the cetaceans of the area, without changing the general picture of their presence in the bay. The data indicate a possible decrease in cetacean activity near the pipeline route compared to spring 2024. The groups of bottlenose dolphins recorded during this period were numerically smaller than those in spring, which may be related to the general ecological behavior of the species, such as foraging in larger groups.

The recording of a common dolphin, with the presence of a young individual, is an indication of the species' reproduction in the bay area. Also, the recording of a porpoise confirms the frequent presence of the species, especially near the coasts.

1.1.B1.ii.4.3 Opportunistic visual recordings of cetaceans

From the opportunistic recordings of cetaceans during seabird surveys, both by boat (ESAS) and from land, which took place from 26/3 - 2/4 of 2024 in the wider study area, 12 recordings of bottlenose dolphins, 10 recordings of common dolphins, 3 recordings of porpoises and 6 recordings of dolphins where the species was not identified.

Bottlenose dolphins

The bottlenose dolphin records complement the bottlenose dolphin observations from the visual boat surveys conducted for cetaceans. These records do not add detail to the population density but are an indication of the movement of the species in the area. 11 of the 12 bottlenose dolphin records were made from visual observation from land and reveal the frequent movement of bottlenose dolphins very close to the coast. 4 records were made between Thassos and mainland Greece (Keramoti), 4 records were made in Nea Karvali, 1 record was made within the port of Kavala, 2 records were made in West Thassos in Prinos Bay and 1 record was made within the cetacean study area (see Figure 42).

Common dolphin

For the common dolphin, out of a total of 10 recorded sightings, 5 were made in the strait between Thasos and mainland Greece (Keramoti), 1 was recorded just outside the study area for cetaceans in Western Thasos, and 4 were made within the study area. Based on these records, it is not possible to calculate population density; however, they clearly indicate the presence of the species in the area. The assumption of an apparent seasonal variation of the population within the project's study area is further supported.

Porpoise

The most important finding of the opportunistic recordings is the recording of 3 groups of porpoises with a total of 7 individuals. 2 of these recordings were made from the passenger ferry of the Kavala-Prinos line and 1 from observation from the land off Keramoti. With these observations, the presence of the species in the area is confirmed both visually and acoustically.

1.1.B1.ii.4.4 Aerial visual recordings

Aerial visual surveys were conducted in the study area in the spring of 2024. A total of 600 km of aerial surveys were covered (see Figure 45). No cetaceans were observed during the aerial visual surveys.

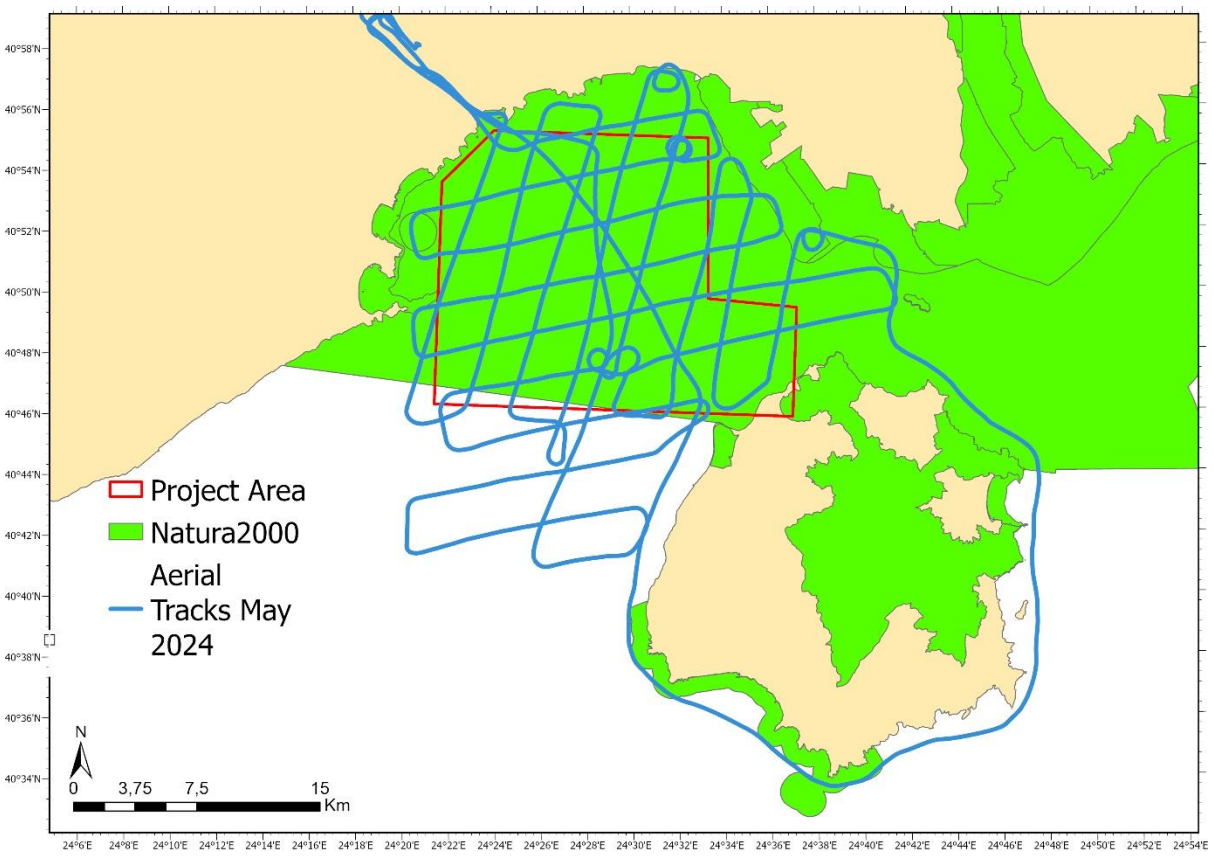


Figure 45: Aerial optical recording routes

1.1.B1.ii.4.5 Acoustic recordings by boat

Boat acoustic recordings were carried out in the study area on 20-24 June 2024. During the boat acoustic recordings, 13 marine mammal recordings, 4 bottlenose dolphin recordings, 1 common dolphin recording, 4 porpoise recordings and 3 recordings of unidentifiable cetaceans were made as well as a random recording of a Mediterranean monk seal (see Table 27, Figure 46).

Table 27: Acoustic recordings of cetaceans in the expanded FSA

Date Time	Species	Latitude	Longitude	Type
20/6/2024 3:59	*Monachus monachus*	40.719	24.5281	Tonal
20/6/2024 4:00	*Tursiops truncatus*	40.7213	24.5258	Click
20/6/2024 4:39	*Unidentified*	40.7803	24.4671	Click
20/6/2024 4:59	*Tursiops truncatus*	40.7641	24.5105	Click
21/6/2024 4:21	*Unidentified*	40.8117	24.4381	Whistles
22/6/2024 11:31	*Tursiops truncatus*	40.5886	23.8067	Click
23/6/2024 5:15	*Phocaena phocaena*	40.8191	24.508	Click Train
23/6/2024 10:14	*Phocaena phocaena*	40.9085	24.5512	Click Train
23/6/2024 11:05	*Phocaena phocaena*	40.8885	24.5774	Click Train
24/6/2024 6:07	*Phocaena phocaena*	40.797	24.5102	Click Train

Date Time	Species	Latitude	Longitude	Type
24/6/2024 6:18	*Tursiops truncatus*	40.7759	24.5149	Click
24/6/2024 8:12	*Delphinus delphis*	40.7588	24.3617	Click
24/6/2024 11:35	*Unidentified*	40.6744	24.4624	Whistle

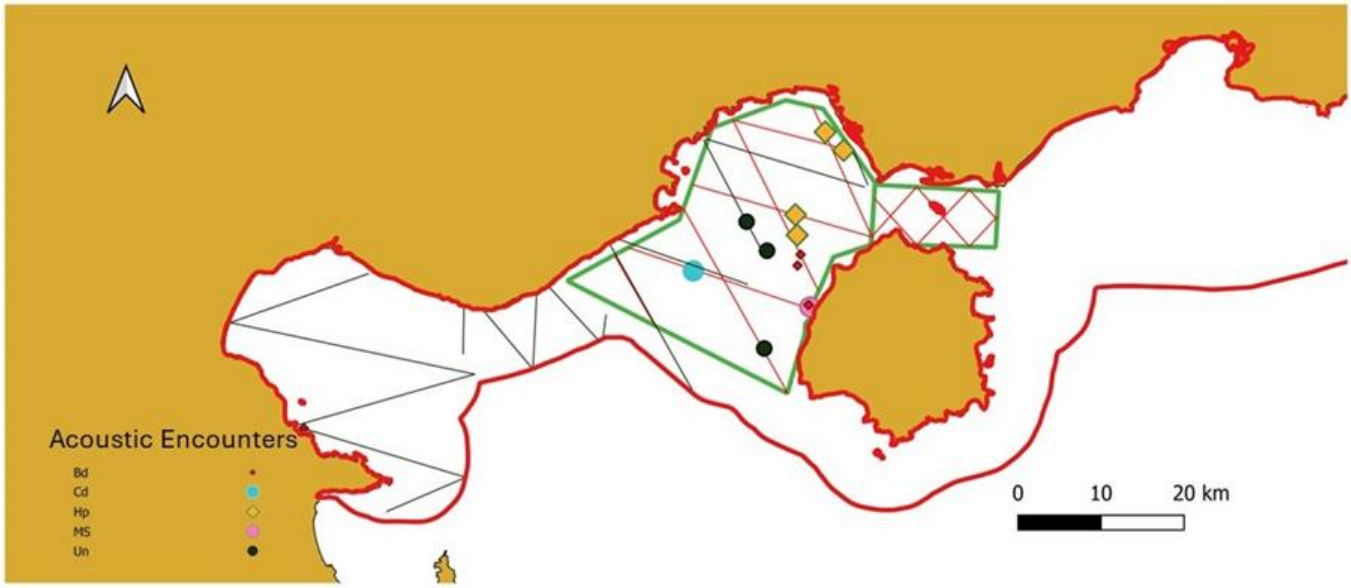
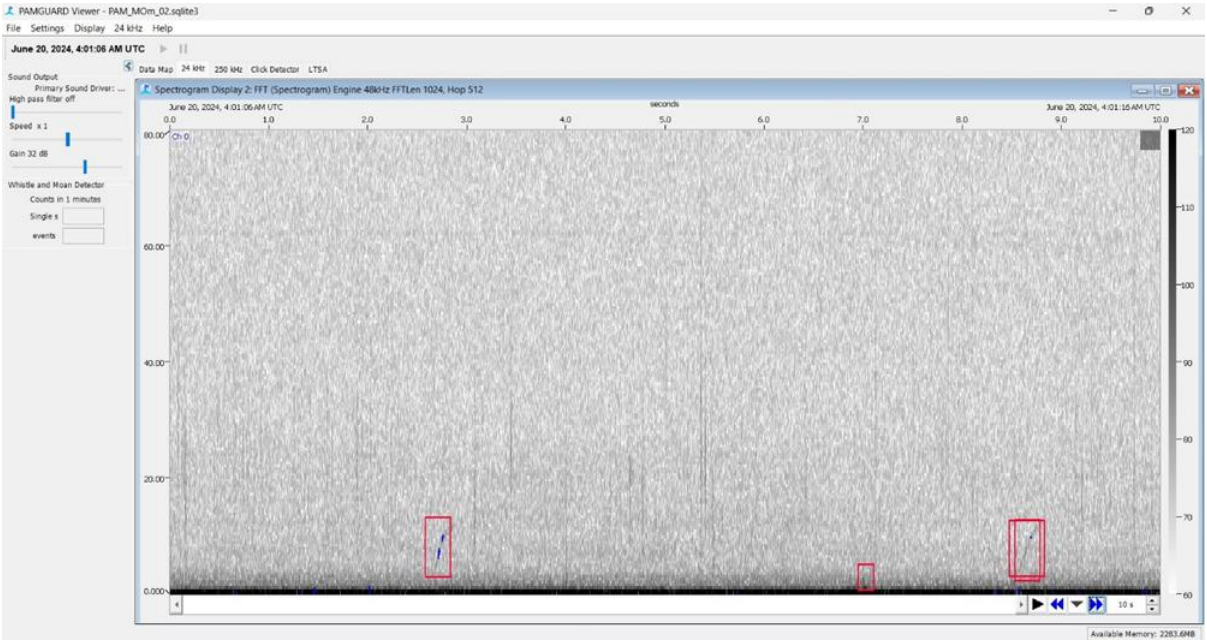


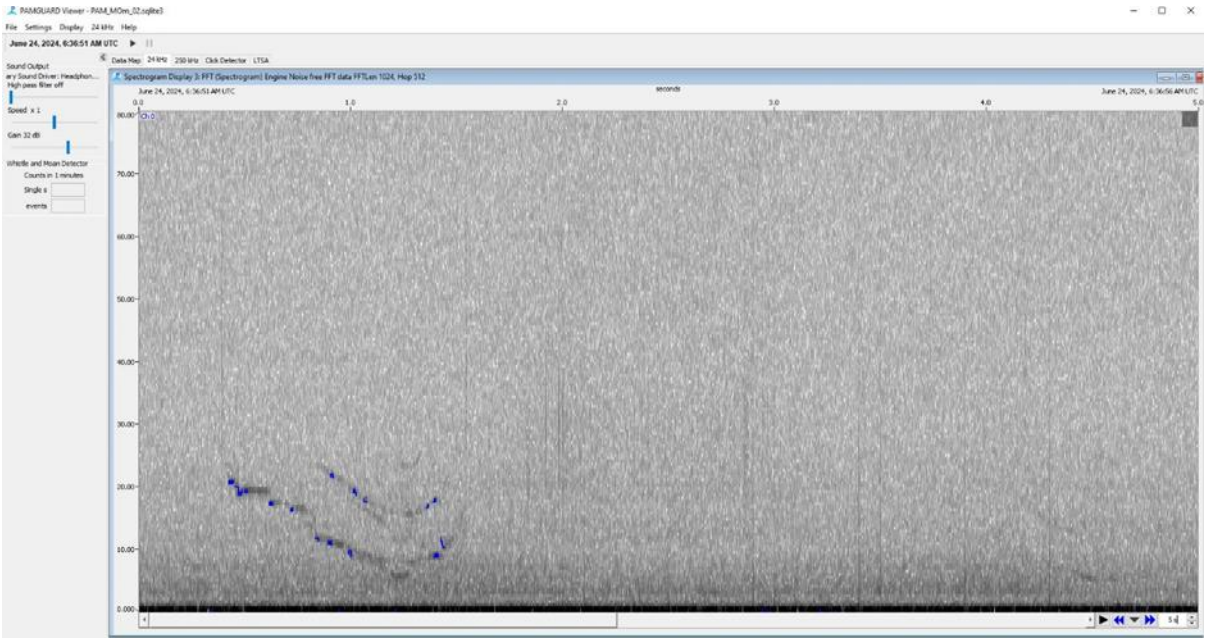
Figure 46: Map of acoustic recordings in the study area 20-24 June 2024. Bd = bottlenose dolphins, Cd = common dolphins, Hp = porpoise, MS = Mediterranean harbor seal and Un = unidentifiable

The acoustic recordings again confirm the presence of porpoises in the area. However, once again, in all 4 cases of acoustic recording of the species, no visual recording was made. Although these data confirm the presence of the common porpoise species in the area, it is not possible to calculate population density.

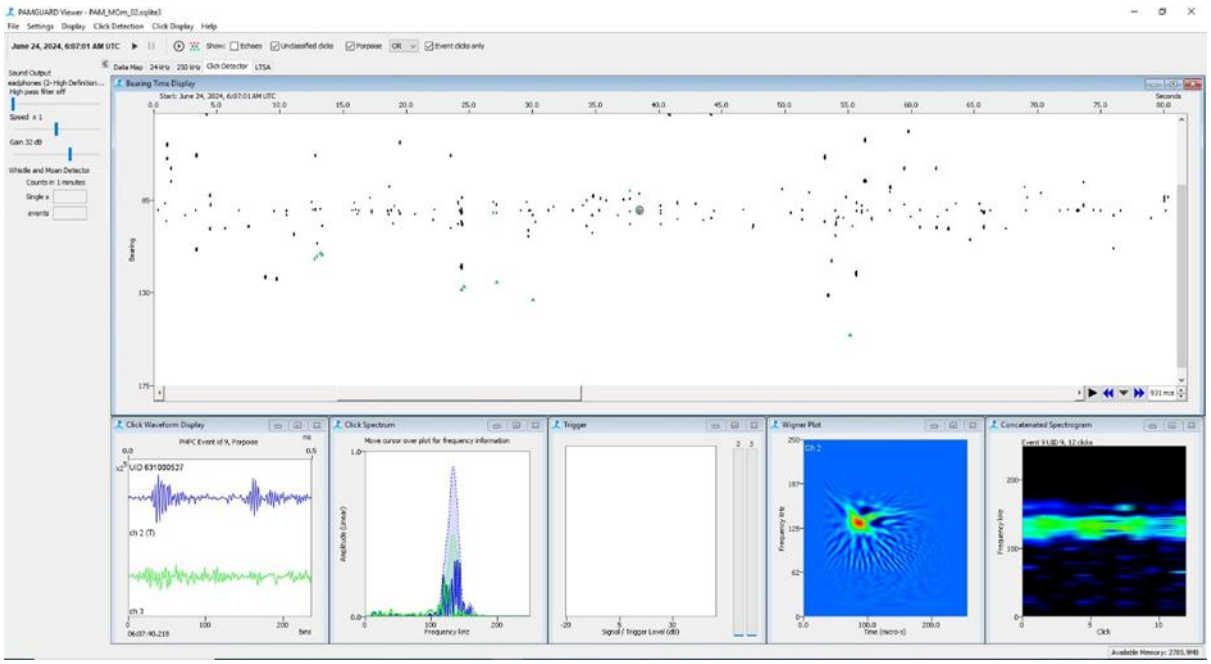
The figures below show examples of animal detections from the PAMGUARD program.



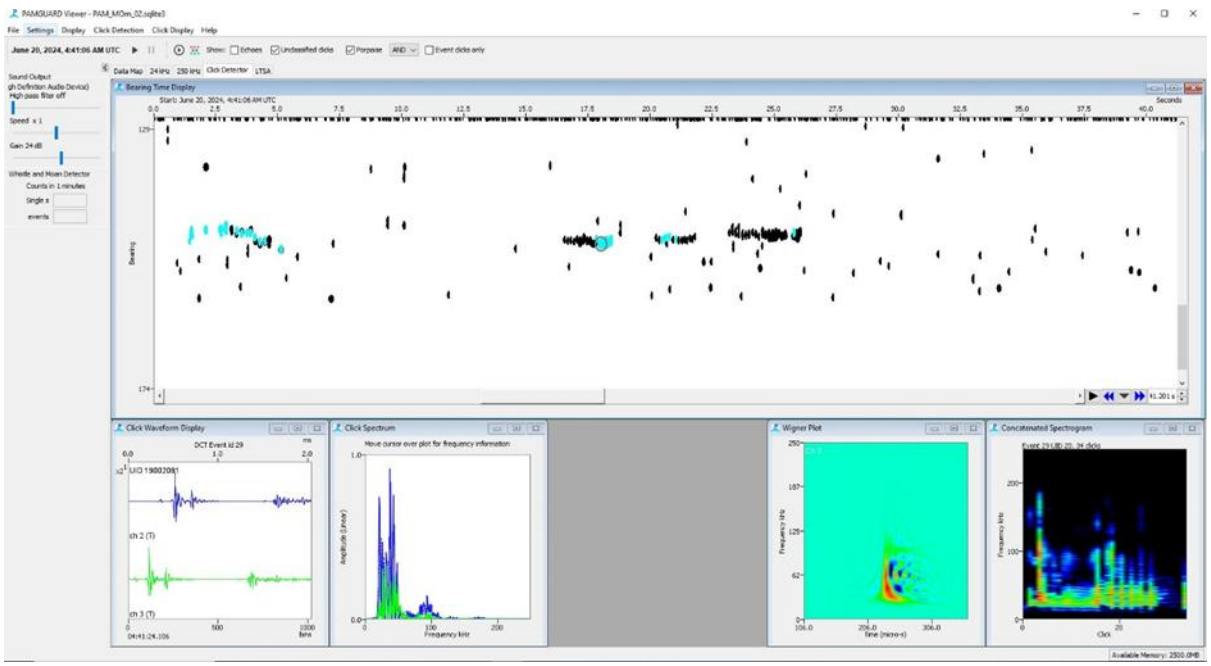
Sounds of the Mediterranean seal



Bottlenose dolphin whistles



"Click" of echolocation by porpoises



Bottlenose dolphin "click" sequences

The design of the survey and the analysis of the acoustic data were carried out with the assistance of KIRKI Ltd.

Visual recordings during the acoustic surveys

During the acoustic recordings, 9 visual observations of cetaceans were also made. Five observations concerned bottlenose dolphins, two concerned common dolphins, and two were of dolphins where species identification was not possible. The locations of these observations are shown on the map below. The map

also indicates a strongly coastal distribution of the bottlenose dolphin and the activity of the species near the production platform.

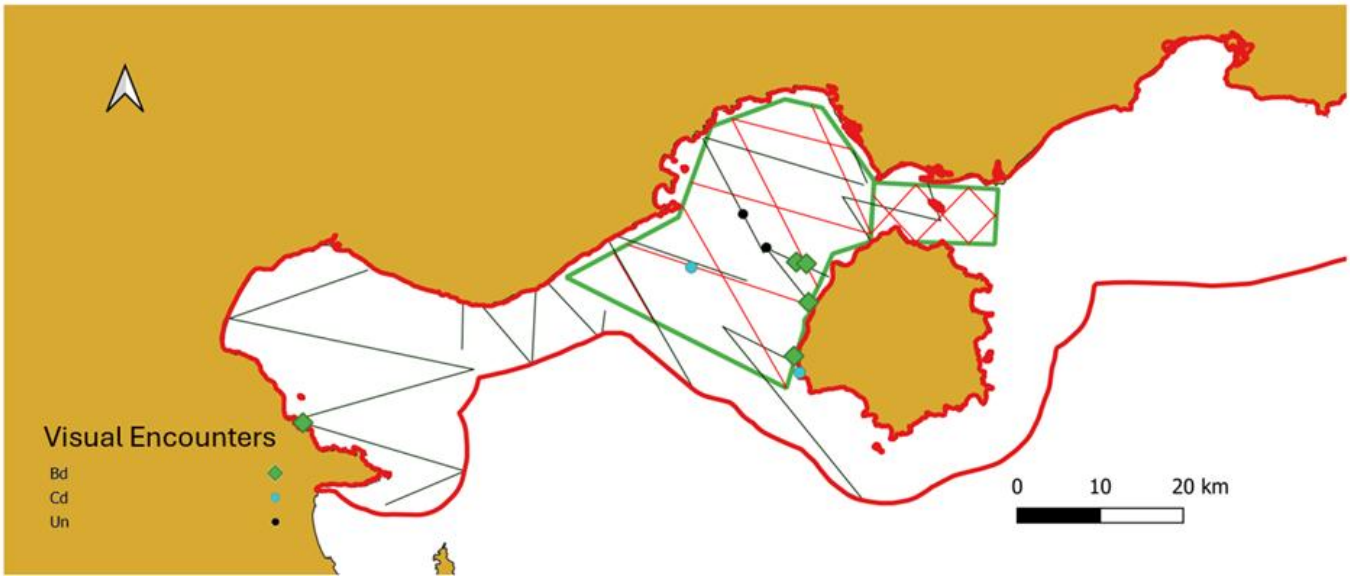


Figure 47: Map of visual observations in the study area, 20–24 June 2024. Bd = bottlenose dolphins, Cd = common dolphins, Un = unidentified

1.1.B1.ii.4.6 Methodology for recording the presence of the Mediterranean monk seal

Rescue and Information Collection Network Elements

To assess the presence of the Mediterranean monk seal in the study area, data collected through the National Rescue and Information Network for the species, which has been operating continuously for the last 35 years by the MOm/Society for the Study and Protection of the Mediterranean Seal (Adamantopoulou et al., 2022), were used. The data confirm the presence of the species in the area but do not indicate any reproductive activity in the study area. The total observations of individuals of the species (live and dead) are presented in the map below.

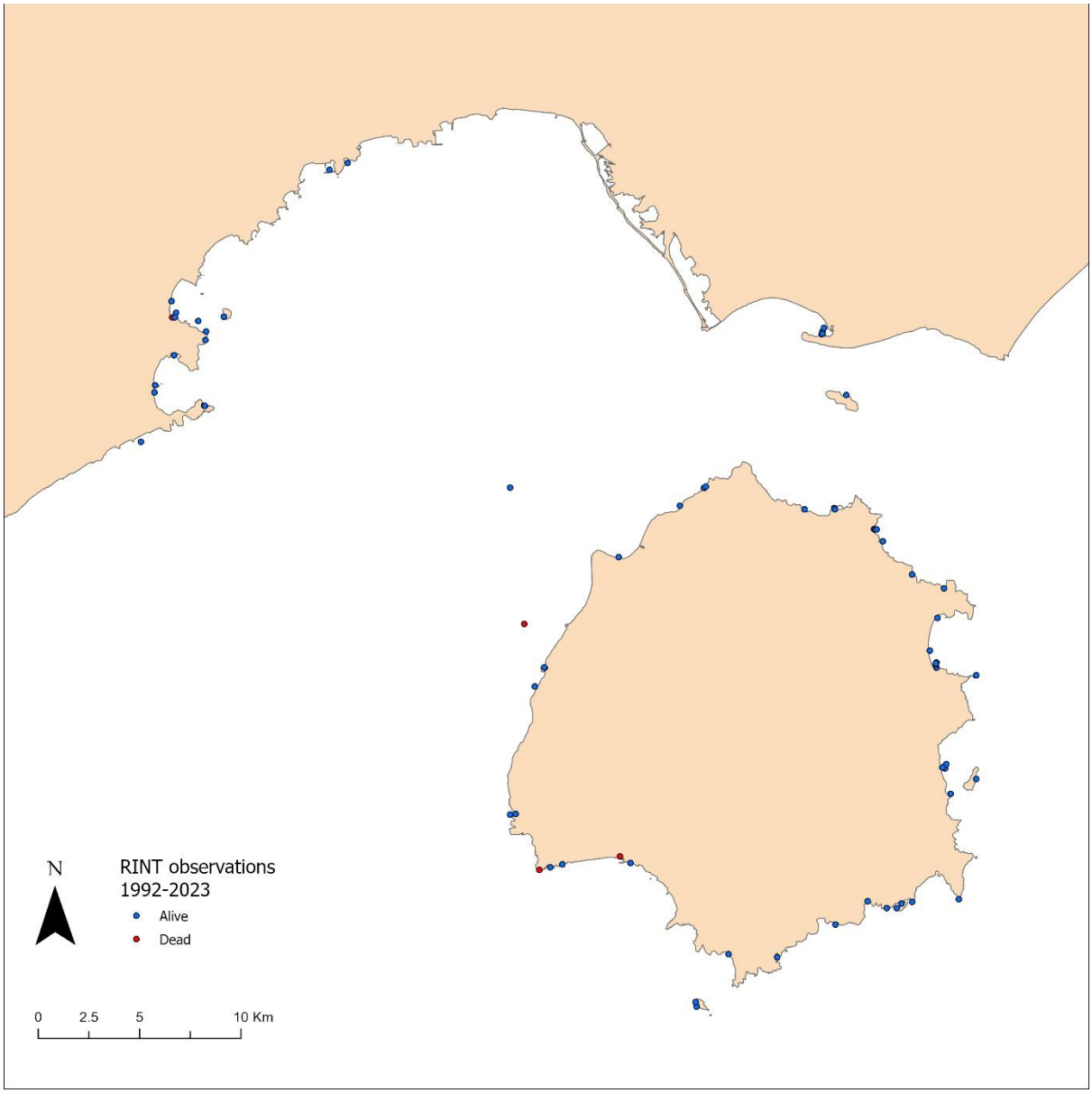


Figure 48: Map of the Rescue and Information Network (RINT in the memorandum) with the records of live (blue) and dead (red) Mediterranean seals from 1992 to the present (source MOm)

Coastal survey of the terrestrial habitat of the Mediterranean monk seal (p.o. 8330)

In addition to the MOm Rescue Network data, a detailed survey of the coastline adjacent to the study area was carried out with the aim of recording suitable places for the reproduction of the species (suitable semi-submerged sea caves with a beach inside as described by Dendrinos et al., 2007). The section of the coastline surveyed is shown in Figure 49.

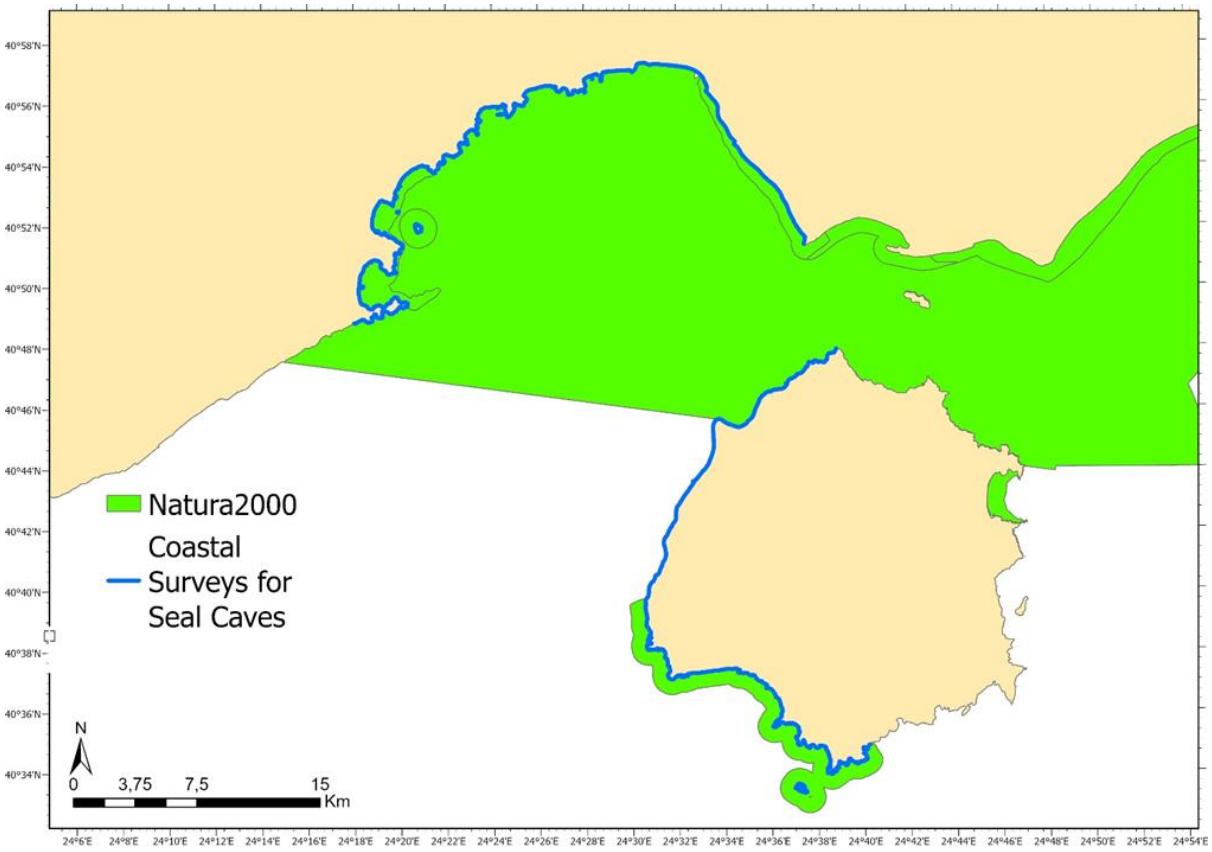


Figure 49: Section of coastline explored for the presence of terrestrial habitat of the Mediterranean monk seal

During the field survey for the detailed examination of the coastline, no suitable breeding caves of the species were identified. Also, no Mediterranean monk seal individuals were observed during the coastal field surveys. Taking into account all the above data, the area is not considered to be particularly important for the species and appears to be used occasionally and only as a feeding area.

1.1.B1.ii.5 Fish fauna

The Mediterranean Sea, although representing a small part of the world's oceans, is home to an exceptionally rich and diverse biodiversity. In detail, it includes approximately 17,000 species, which represent 4–18% of global marine biodiversity, and includes species from temperate, cosmopolitan, subtropical, Atlantic and Indo-Pacific regions. This richness is due to its diverse geological and climatic history, which has created conditions for the development of both temperate and subtropical species, making it a true biodiversity hotspot with approximately 20-30% endemic species.

Figure 50 shows the fish species richness index for the Mediterranean Sea, as illustrated in the scientific article Carmezin et al. (2022).

The fish species richness index shows an average of 170 fish species per cell, ranging from 81 to 372 species per cell. The distribution of the index shows a longitudinal gradient with higher values in the western part of the basin and lower values in the southeastern part.

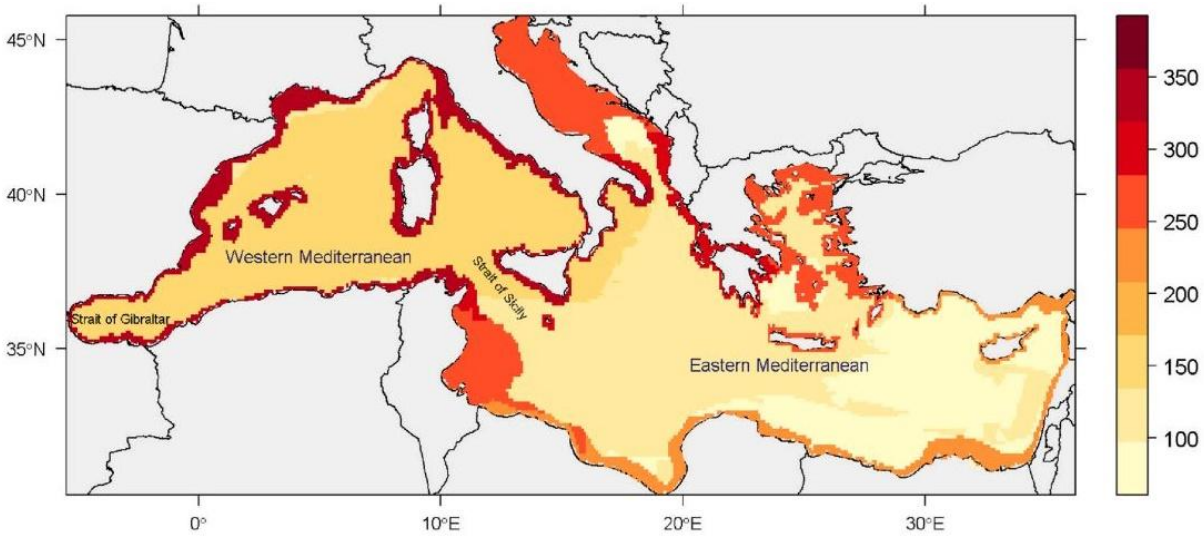


Figure 50: Fish species richness index for the Mediterranean Sea

The Aegean Sea is divided into two sub-regions in terms of the distribution of the ichthyofauna: (a) the northern Aegean, a roughly rectangular basin, separated from the southern Aegean by the Cyclades archipelago and characterized by a cold-water fauna, and (b) the southern Aegean characterized by more thermophilic species, as well as migratory species from the Red Sea. Specifically, according to Simboura et al. (2019) the Greek ichthyofauna is divided into (a) small pelagic fish, mainly sardine (Sardina pilchardus) and anchovy (Engraulis encrasicolus) which are mainly concentrated in the northern Aegean, (b) large pelagic fish (swordfish and tuna) which migrate along the Mediterranean, and (c) demersal or benthic fish which live in close connection with the bottom and are also more abundant in the northern Aegean.

The following table presents the dominant fish species found in the Thracian Sea according to depth, as analyzed in the scientific article Papaconstantinou et al. (2007).

Table 28: Dominant fish species and protection status in the Thracian Sea based on abundance ranking for the various depth groups

Species	Protection status - Berne Convention	Protection status Habitats Directive 2009/147/EC
Fish species at a depth of 16-28 m average similarity: 67,8 SD: 4,9		
Arnoglossus laterna	-	-
Serranus hepatus	-	-
Diplodus annularis	-	-
Gobius niger	-	-
Mullus barbatus	-	-
Trisopterus minutus capelanus	-	-
Spicara flexuosa	-	-
Trigla lucerna	-	-
Merlangius merlangus euxinus	-	-
Scorpaena notata	-	-
Merluccius merluccius	-	-
Gobius paganellus	-	-
Solea vulgaris	-	-
Cepola rubescens	-	-
Fish species at a depth of 30-90 m average similarity: 73,8 SD: 7,1		
Serranus hepatus	-	-

Species	Protection status - Berne Convention	Protection status Habitats Directive 2009/147/EC
Trisopterus minutus capelanus	-	-
Mullus barbatus	-	-
Arnoglossus laterna	-	-
Merluccius merluccius	-	-
Spicara flexuosa	-	-
Lepidotrigla cavillone	-	-
Cepola rubescens	-	-
Deltentosteus quadrimaculatus	-	-
Callionymus maculatus	-	-
Scyliorhinus canicula	-	-
Citharus linguatula	-	-
Lophius budegassa	-	-
Serranus cabrilla	-	-
Symphurus ligulatus	-	-
Gaidropsarus sp.	-	-
Raja clavata	-	-
Arnoglossus thori	-	-
Fish species at a depth of 100-190 m μέση ομοιότητα: 73.6 SD=4.4		
Trisopterus minutus capelanus	-	-
Merluccius merluccius	-	-
Argentina sphyraena	-	-
Lophius budegassa	-	-
Lepidorhombus boscii	-	-
Arnoglossus laterna	-	-
Scyliorhinus canicula	-	-
Lepidotrigla cavillone	-	-
Callionymus maculatus	-	-
Cepola rubescens	-	-
Serranus hepatus	-	-
Capros aper	-	-
Phycis blennoides	-	-
Aspitrigla cuculus	-	-
Trigla lyra	-	-
Mullus barbatus	-	-
Fish species at a depth of 100-190 m average similarity: 73.6 SD=4.4		
Hymenocephalus italicus	-	-
Gadiculus argenteus argenteus	-	-
Lepidorhombus boscii	-	-
Micromesistius poutassou	-	-
Coelorhynchus coelorhynchus	-	-
Phycis blennoides	-	-
Lophius budegassa	-	-
Argentina sphyraena	-	-
Merluccius merlucciu	-	-
Galeus melastomus	-	-
Trigla lyra	-	-
Capros aper	-	-

According to the SDF of the Natura area GR1150014, the protected ichthyofauna species of the shad (Alosa fallax) is found in the study area. This species is a species of Annex II of Directive 92/43/EC. The SDF of GR1150010 also mentions the following ichthyofauna species of Annex II of Directive 92/43/EC: Alosa fallax, Aphanius fasciatus, Barbus strumicae, Cobitis taenia Complex and Rhodeus amarus.

1.1.B1.ii.6 Benthic macroinvertebrates

Identification of benthic macroinvertebrates in combination with physicochemical analyses of water and sediment have been carried out at sampling stations located 500 m from the existing platforms. The analyses were carried out in the context of the 2015 Environmental Impact Study and the 2021 and 2023 Environmental Monitoring Reports for the Energean offshore project. Comparisons were made with historically available data Papazacharias (1991) and Zarkanellas (1977).

According to the results, the benthic communities in the area of the sampling stations are typical of the Mediterranean for the specific depths. In the analyses carried out in 2023, the most dominant group of benthic macroinvertebrates was polychaetes, which represented 40% of the species and 48% of the individuals, followed by molluscs with 46% of the species and 24% of the individuals. Arthropods followed in abundance with 18% of the individuals and 7% of the species. Miscellaneous also has a significant number of individuals (5%). Finally, the groups that were least represented in the samples were echinoderms (3%) and sipunculoids (2%).

For the interpretation of the results, statistical analysis (PRIMER) and the BENTIX biotic index were applied. The ecological status of the sampling stations, which was weighted based on the BENTIX index, was characterized from moderate to high for the years 2015, 2021, 2023, while no substantial deterioration of the status related to Energean's offshore activities in the area was observed.

1.1.B1.iii Recording of the bird species of Annex I of Joint Ministerial Decree H.P.37338/1807/E.103 (Government Gazette B'1495), as well as other migratory bird species with a significant presence in the Natura 2000 area, especially in terms of the size and density of the populations, their conservation status and their isolation (if it is a SAC)

During the fieldwork, a total of 156 species and 18 species groups of avifauna were recorded, of which 94 species and 8 species groups within the PEP and 150 species and 18 species groups within the expanded PEP.

Within the WIP and within the extended WIP, the following were recorded:

- 29 and 45 species of Annex I of the Birds Directive for which special conservation measures are foreseen, respectively,
- 63 and 93 species of Annex II of the Bern Convention concerning strictly protected species, respectively,
- 52 and 92 migratory species of the Bonn Convention, respectively,
- 38 and 72 species of migratory waterbirds of the Agreement on the Conservation of Migratory Waterbirds and their Habitats (AEWA), respectively,
- 8 and 13 species of the CITES Convention, respectively.

The threat status, based on the Red Book of Threatened Animals of Greece and the IUCN Red List, of the species recorded in one of the PEPs and within the expanded PEP is presented in Table 29.

Table 29: Total number of species recorded within the Field Survey Area (ΠΕΠ) and the extended Field Survey Area, by threat status category.

	FSA				Extended FSA			
	GR	MED	EU	Global	GR	MED	EU	Global
CRITICALLY ENDANGERED (CR)	0	0	0	0	2	0	0	0
ENDANGERED (EN)	3	0	1	0	4	1	2	0
VULNERABLE (VU)	10	0	6	3	17	0	12	3
NEAR THREATENED (NT)	3	0	2	1	7	0	7	9
LENGTH OF LESS CONCERN (LC)	9	7	85	90	14	9	128	138
DIFFICULT TO KNOW (DD)	1	0	0	0	1	0	0	0
NOT ASSESSED (NE)	67	0	0	0	104	0	0	0

Legend: Threat status at National (GR), Mediterranean (MED), European (EU) and Global levels.

The tables below present in detail the recorded presence and abundance, as well as the protection and threat statuses for the species recorded within the FSA, the expanded FSA and in the wider project area outside the expanded FSA.

Table 30: Recorded presence, protection status and threat status for the species and groups of bird species recorded in the FSA, the expanded FSA and the wider project area

Scientific name	Registered presence			Bird Directive	International Conventions				Red book/ IUCN 2024			
	FSA	EFSA	OUT		Βέρνης	Βόννης	AEWA	CITES	GR	ME	EU	GL
Species of the SDF recorded												
Acrocephalus arundinaceus	√	√	√		II	II			NE		LC	LC
Acrocephalus scirpaceus	√	√	√		II	II			NE		LC	LC
Actitis hypoleucos	√	√	√		II	II	√		NE		LC	LC
Alauda arvensis		√	√	II/2	III				NT		LC	LC
Alcedo atthis	√	√	√	I	II				DD		LC	LC
Anas acuta		√	√	II/1; III/2	III	II	√		NE		VU	LC
Anas crecca		√	√	II/1; III/2	III	II	√		NE		LC	LC
Anas platyrhynchos	√	√	√	II/1; III/1	III	II	√		NE		LC	LC
Anthus trivialis	√	√	√		II				NE		LC	LC
Apus apus	√	√	√		III				NE		NT	LC
Ardea alba	√	√	√	I	II	II	√		VU		LC	LC
Ardea cinerea	√	√	√		III		√		NE		LC	LC
Ardea purpurea	√	√	√	I	II	II	√		EN		LC	LC
Ardeola ralloides		√	√	I	II		√		VU		LC	LC
Arenaria interpres		√	√		II	II	√		NE		LC	LC
Aythya ferina	√	√	√	II/1; III/2	III	II	√		LC		VU	VU
Aythya nyroca		√	√	I	III	I; II	√		VU		LC	NT
Burhinus oedicnemus		√	√	I	II	II			NT		LC	LC
Buteo buteo	√	√	√		II	II		II	NE	LC	LC	LC
Calidris alpina		√	√		II	II	√		NE		LC	LC
Calidris ferruginea		√	√		II	II	√		NE		VU	NT
Calidris minuta		√	√		II	II	√		NE		LC	LC
Calidris pugnax		√	√	I; II/2	III	II	√		NE		NT	LC

Scientific name	Registered presence			Bird Directive	International Conventions				Red book/ IUCN 2024			
	FSA	EFSA	OUT		Βέρνης	Βόννης	AEWA	CITES	GR	ME	EU	GL
Calonectris diomedea s. str.	√	√	√	I	II				LC		LC	LC
Cecropis daurica	√	√	√		II				NE		LC	LC
Charadrius alexandrinus	√	√	√	I	II	II	√		LC		LC	LC
Chlidonias niger	√	√	√	I	II	II	√		EN		LC	LC
Ciconia ciconia	√	√	√	I	II	II	√		VU		LC	LC
Ciconia nigra		√	√	I	II	II	√	II	EN		LC	LC
Circaetus gallicus	√	√	√	I	II	II		II	NT	LC	LC	LC
Circus aeruginosus	√	√	√	I	II	II		II	VU	LC	LC	LC
Circus pygargus			√	I	II	II		II	CR	VU	LC	LC
Coracias garrulus	√	√	√	I	II	II			VU		LC	LC
Coturnix coturnix	√	√	√	II/2	III	II			NE		NT	LC
Cuculus canorus		√	√		III				NE		LC	LC
Cygnus olor		√	√	II/2	III	II	√		LC		LC	LC
Dendrocopos syriacus	√	√	√	I	II				NE		LC	LC
Egretta garzetta	√	√	√	I	II		√		LC		LC	LC
Erithacus rubecula	√	√	√		II	II			NE		LC	LC
Falco eleonorae		√	√	I	II	II		II	LC	LC	LC	LC
Falco peregrinus		√	√	I	II	II		I	LC	LC	LC	LC
Falco subbuteo	√	√	√		II	II		II	NE	LC	LC	LC
Falco vespertinus			√	I	II	II		II	DD	CR	VU	VU
Fringilla coelebs all others	√	√	√		III				NE		LC	LC
Fulica atra		√	√	II/1; III/2	III	II	√		NE		NT	LC
Gallinago gallinago		√	√	II/1; III/2	III	II	√		NE		VU	LC
Gavia arctica	√	√	√	I	II	II	√		NE		LC	LC
Gavia stellata		√	√	I	II	II	√		NE		LC	LC
Gelochelidon nilotica		√	√	I	II	II	√		VU			
Glareola pratincola		√	√	I	II	II	√		VU		LC	LC
Haematopus ostralegus	√	√	√	II/2	III	II	√		NE		VU	NT
Himantopus himantopus	√	√	√	I	II	II	√		LC	LC	LC	LC
Hirundo rustica	√	√	√		II				NE		LC	LC
Hydrocoloeus minutus	√	√	√	I	II		√		NE		LC	LC
Hydroprogne caspia		√	√	I	II	II	√		NE		LC	LC
Iduna pallida s. str.	√	√	√		II	II			NE		LC	LC
Ixobrychus minutus	√	√	√	I	II	II	√		LC		LC	LC
Lanius collurio	√	√	√	I	II				NE		LC	LC
Lanius senator		√	√		II				NE		NT	NT
Larus genei	√	√	√	I	II	II	√		VU		VU	LC
Larus melanocephalus	√	√	√	I	II	II	√		EN		LC	LC
Larus ridibundus	√	√	√	II/2	III		√		NE		LC	LC
Luscinia megarhynchos	√	√	√		II	II			NE		LC	LC
Mareca penelope		√	√	II/1; III/2	III	II	√		NE		LC	LC
Mergus serrator		√	√	II/2	III	II	√		NE		NT	LC
Merops apiaster	√	√	√		II	II			NE		LC	LC
Microcarbo pygmaeus	√	√	√	I	II	II	√		LC		LC	LC
Milvus migrans			√	I	II	II		II	CR	LC	LC	LC
Motacilla alba		√	√		II				NE		LC	LC
Motacilla cinerea	√	√	√		II				NE		LC	LC
Motacilla flava		√	√		II				NE		LC	LC
Muscicapa striata		√	√		II	II			NE		LC	LC
Numenius arquata arquata		√	√	II/2	III	II	√		LC		NT	NT
Nycticorax nycticorax		√	√	I	II		√		NT		LC	LC
Oenanthe hispanica			√		II	II			NE		LC	LC
Oenanthe oenanthe	√	√	√		II	II			NE		LC	LC
Oriolus oriolus	√	√	√		II				NE		LC	LC
Pandion haliaetus		√	√	I	II	II		II	LC	EN	LC	LC
Passer hispaniolensis	√	√	√		III				NE		LC	LC
Pelecanus crispus		√	√	I	II	I; II	√	I	VU		LC	NT
Pelecanus onocrotalus	√	√	√	I	II	I; II	√		VU		LC	LC

Scientific name	Registered presence			Bird Directive	International Conventions				Red book/ IUCN 2024			
	FSA	EFSA	OUT		Βέρνης	Βόννης	AEWA	CITES	GR	ME	EU	GL
Phalacrocorax aristotelis desmarestii	√	√	√	I***	II				NT		LC	LC
Phalacrocorax carbo sinensis	√	√	√		III		√		NE		LC	LC
Phoenicopterus roseus	√	√	√	I	II	II	√	II	LC		LC	LC
Phylloscopus collybita s. str.	√	√	√		II	II			NE		LC	LC
Phylloscopus sibilatrix	√	√	√		II	II			NE		LC	LC
Phylloscopus trochilus	√	√	√		II	II			NE		LC	LC
Platalea leucorodia	√	√	√	I	II	II	√	II	VU		LC	LC
Plegadis falcinellus		√	√	I	II	II	√		CR		LC	LC
Pluvialis apricaria		√	√	I; II/2; III/2	III	II	√		NE		LC	LC
Pluvialis squatarola		√	√	II/2	III	II	√		NE		LC	LC
Podiceps cristatus	√	√	√		III		√		NE		LC	LC
Podiceps nigricollis	√	√	√		II		√		NE		VU	LC
Puffinus yelkouan	√	√	√	I	II				NT		VU	VU
Riparia riparia		√	√		II				NE		LC	LC
Saxicola rubetra		√	√		II	II			NE		LC	LC
Spatula clypeata	√	√	√	II/1; III/2	III	II	√		NE		LC	LC
Spatula querquedula		√	√	II/1	III	II	√		VU		LC	LC
Sterna hirundo	√	√	√	I	II	II	√		LC		LC	LC
Sternula albifrons		√	√	I	II	II	√		NT		LC	LC
Streptopelia turtur	√	√	√	II/2	III	II			NE		VU	VU
Sturnus vulgaris	√	√	√	II/2					NE		LC	LC
Sylvia cantillans		√	√		II	II			NE		LC	LC
Sylvia communis	√	√	√		II	II			NE		LC	LC
Tachymarptis melba		√	√		II				NE		LC	LC
Tadorna tadorna	√	√	√		II	II	√		VU		LC	LC
Thalasseus sandvicensis	√	√	√	I	II	II	√		VU		LC	LC
Tringa erythropus	√	√	√	II/2	III	II	√		NE		LC	LC
Tringa glareola	√	√	√	I	II	II	√		LC		LC	LC
Tringa nebularia	√	√	√	II/2	III	II	√		NE		LC	LC
Tringa ochropus		√	√		II	II	√		NE		LC	LC
Tringa stagnatilis		√	√		II	II	√		NE		LC	LC
Tringa totanus		√	√	II/2	III	II	√		NE		VU	LC
Turdus merula		√	√	II/2	III	II			NE		LC	LC
Upupa epops	√	√	√		II				NE		LC	LC
Vanellus spinosus	√	√	√	I	II	II	√		VU		LC	LC
Vanellus vanellus		√	√	II/2	III	II	√		VU		VU	NT
Other endangered species												
Phasianus colchicus		√	√	II/1; III/1	III				CR		LC	LC
Podiceps auritus		√	√	I	II	II	√		NE		VU	NT
Somateria mollissima		√	√	II/2; III/2	III	II	√		NE		EN	NT
Stercorarius parasiticus	√	√	√		III				NE		EN	LC
Other species recorded												
Accipiter nisus all others	√	√	√		II	II		II	NE	LC	LC	LC
Athene noctua			√		II			II	NE	LC	LC	LC
Carduelis carduelis	√	√	√		II				NE		LC	LC
Cettia cetti	√	√	√		II	II			NE		LC	LC
Charadrius dubius	√	√	√		II	II	√		NE		LC	LC
Chloris chloris	√	√	√		II				NE		LC	LC
Cisticola juncidis	√	√	√		II	II			NE		LC	LC
Coccothraustes coccothraustes	√	√	√		II				NE		LC	LC
Columba livia	√	√	√	II/1	III				NE		LC	LC
Corvus corax	√	√	√		III				NE		LC	LC
Corvus corone	√	√	√	II/2					NE		LC	LC
Corvus monedula		√	√	II/2					NE		LC	LC
Cyanistes caeruleus s. str.	√	√	√		II				NE		LC	LC

Scientific name	Registered presence			Bird Directive	International Conventions				Red book/ IUCN 2024			
	FSA	EFSA	OUT		Βέρνης	Βόννης	AEWA	CITES	GR	ME	EU	GL
Delichon urbicum	√	√	√		II				NE		LC	LC
Emberiza calandra	√	√	√		III				NE		LC	LC
Emberiza cirlus		√	√		II				NE		LC	LC
Falco tinnunculus	√	√	√		II	II		II	NE	LC	LC	LC
Galerida cristata	√	√	√		III				NE		LC	LC
Gallinula chloropus	√	√	√	II/2	III		√		NE		LC	LC
Garrulus glandarius	√	√	√	II/2					NE		LC	LC
Larus fuscus all others		√	√	II/2			√		NE		LC	LC
Larus michahellis	√	√	√	II/2	III		√		NE		LC	LC
Parus major	√	√	√		II				NE		LC	LC
Passer domesticus s. str.	√	√	√						NE		LC	LC
Passer montanus	√	√	√		III				NE		LC	LC
Pica pica	√	√	√	II/2					NE		LC	LC
Psittacula krameri		√	√		IIIa				NE			LC
Ptyonoprogne rupestris		√	√		II				NE		LC	LC
Rallus aquaticus	√	√	√	II/2	III		√		NE		LC	LC
Remiz pendulinus		√	√		III				NE		LC	LC
Serinus serinus			√		II				NE		LC	LC
Streptopelia decaocto	√	√	√	II/2	III				NE		LC	LC
Sylvia atricapilla	√	√	√		II	II			NE		LC	LC
Sylvia melanocephala		√	√		II	II			NE		LC	LC
Tachybaptus ruficollis	√	√	√		II		√		NE		LC	LC
Species groups recorded												
Acrocephalus sp.		√	√									
Anas sp.	√	√	√									
Anthus sp.		√	√									
Apus sp.		√	√									
Calidris sp.		√	√									
Charadrius sp.	√	√	√									
Circus pygargus/Circus macrourus	√	√	√									
Circus sp.		√	√									
Falco sp.		√	√									
Larus sp.	√	√	√									
Motacilla sp.	√	√	√									
Passer sp.	√	√	√									
Phalacrocorax sp.	√	√	√									
Picus sp.		√	√									
Stercorarius sp.		√	√									
Sterna sp.	√	√	√									
Tringa sp.		√	√									
Tringa sp. & Pluvialis sp.		√	√									

Legend: FSA = recorded presence within the FSA, EFSA = recorded presence within the extended FSA, OUT = recorded presence in the wider area of the extended FSA, Birds Directive: Annex to the Birds Directive (2009/147/EC), Bern Convention: Annex to the Bern Convention, Bonn: Annex to the Bonn Convention, AEWA: Agreement on the Conservation of African and Eurasian Migratory Waterbirds (AEWA), CITES Convention, Red Book/IUCN GR/ME/EU/GL: Threat status at National/Mediterranean/European and Global level. Threat status: CR = CRITICALLY ENDANGERED, EN = ENDANGERED, VU = VULNERABLE, NT = NEAR THREATENED, LC = LESS CONCERN, DD = LOW KNOWN and NE = NOT ASSESSED.

Table 31: Total number of recorded individuals per species within the Field Survey Area (ΠΕΠ), the extended Field Survey Area, and overall within and outside the extended Field Survey Area (cont.) by sampling period

Scientific name	26/03-02/04/2024			22/04-27/04/2024			24/05/2024-20/06/2024			22/09/2024-03/10/2024		
	FSA	EFSA	OUT	FSA	EFSA	OUT	FSA	EFSA	OUT	FSA	EFSA	OUT
Acrocephalus arundinaceus	0	0	0	7	13	16	5	13	21	0	0	0

Scientific name	26/03-02/04/2024			22/04-27/04/2024			24/05/2024-20/06/2024			22/09/2024-03/10/2024		
	FSA	EFSA	OUT	FSA	EFSA	OUT	FSA	EFSA	OUT	FSA	EFSA	OUT
Acrocephalus scirpaceus	4	7	7	10	23	28	6	10	14	0	0	0
Actitis hypoleucos	3	8	8	14	29	31	1	2	2	4	5	5
Alauda arvensis	0	0	0	0	1	1	0	1	1	0	0	0
Alcedo atthis	2	2	2	1	1	1	0	0	0	2	7	8
Anas acuta	0	28	28	0	0	0	0	0	0	0	6	6
Anas crecca	0	2	2	0	0	0	0	0	0	0	32	32
Anas platyrhynchos	0	27	30	2	6	6	0	2	7	0	59	59
Anthus trivialis	1	14	15	0	0	0	0	0	0	4	6	6
Apus apus	0	2	2	8	10	10	0	0	32	0	0	0
Ardea alba	0	26	26	2	11	11	0	0	0	0	28	28
Ardea cinerea	3	273	276	1	130	132	1	231	232	5	194	196
Ardea purpurea	0	0	0	1	3	3	0	11	12	0	1	1
Ardeola ralloides	0	0	0	0	1	1	0	0	0	0	1	1
Arenaria interpres	0	0	0	0	1	1	0	0	0	0	0	0
Aythya ferina	0	0	0	0	0	0	0	0	0	2	4	4
Aythya nyroca	0	4	4	0	0	0	0	0	0	0	3	3
Burhinus oedicnemus	0	0	0	0	0	0	0	3	3	0	0	0
Buteo buteo	6	10	14	6	7	7	1	2	4	1	1	3
Calidris alpina	0	32	32	0	0	0	0	7	7	0	0	0
Calidris ferruginea	0	0	0	0	30	30	0	0	0	0	0	0
Calidris minuta	0	0	0	0	9	9	0	0	0	0	0	0
Calidris pugnax	0	5	5	0	6	6	0	0	0	0	0	0
Calonectris diomedea s. str.	0	3	3	17	58	58	11	302	302	16	49	54
Cecropis daurica	4	4	4	1	1	1	1	1	2	0	0	0
Charadrius alexandrinus	22	54	54	5	23	23	6	33	33	34	34	34
Chlidonias niger	0	0	0	1	2	2	0	0	0	0	0	0
Ciconia ciconia	0	4	14	3	14	43	0	0	44	0	0	0
Ciconia nigra	0	2	2	0	0	1	0	0	0	0	0	0
Circaetus gallicus	0	0	0	1	2	3	0	0	0	0	0	0
Circus aeruginosus	12	37	44	2	13	15	1	17	28	0	7	9
Circus pygargus	0	0	0	0	0	1	0	0	0	0	0	0
Coracias garrulus	0	0	0	1	5	5	0	0	2	0	0	0
Coturnix coturnix	0	0	0	0	0	0	1	1	1	0	0	0
Cuculus canorus	0	0	1	0	0	1	0	2	6	0	0	0
Cygnus olor	0	10	10	0	67	67	0	102	102	0	367	367
Dendrocopos syriacus	1	1	1	0	1	1	0	0	4	1	2	3
Egretta garzetta	15	57	57	23	61	61	5	36	39	8	63	65
Erithacus rubecula	0	0	0	1	1	1	0	0	0	0	0	0
Falco eleonorae	0	0	0	0	0	0	0	1	1	0	0	0
Falco peregrinus	0	1	1	0	0	1	0	1	1	0	0	0
Falco subbuteo	0	0	0	1	3	4	0	2	4	0	0	3
Falco vespertinus	0	0	0	0	0	20	0	0	0	0	0	0
Fringilla coelebs all others	8	10	11	0	0	0	0	0	1	0	0	0
Fulica atra	0	92	92	0	0	0	0	0	0	0	7180	7180
Gallinago gallinago	0	1	1	0	0	0	0	0	0	2	2	2
Gavia arctica	34	130	130	1	3	3	0	0	0	0	0	0
Gavia stellata	0	2	2	0	0	0	0	0	0	0	0	0
Gelochelidon nilotica	0	0	0	0	1	1	0	3	3	0	8	8
Glareola pratincola	0	0	0	0	0	0	0	35	35	0	0	0
Haematopus ostralegus	54	107	107	8	33	35	5	103	113	0	13	13
Himantopus himantopus	30	70	71	18	62	62	16	34	34	3	3	3
Hirundo rustica	15	41	42	55	171	171	5	70	74	0	80	80
Hydrocoloeus minutus	8	69	69	5	19	19	0	1	1	0	4	4
Hydroprogne caspia	0	0	0	0	1	1	0	1	1	3	11	11
Iduna pallida s. str.	0	0	0	2	4	4	6	19	21	0	0	0
Ixobrychus minutus	0	0	0	0	1	1	1	1	4	0	0	0
Lanius collurio	0	0	0	11	17	17	0	0	0	5	9	9
Lanius senator	0	0	0	0	1	1	0	0	0	0	0	0
Larus genei	3	7	7	1	1	1	0	1	1	0	0	0
Larus melanocephalus	15	69	69	1	50	50	0	3	3	9	1081	1371
Larus ridibundus	76	100	100	5	10	10	8	11	11	62	523	523
Luscinia megarhynchos	0	3	6	26	40	49	3	12	24	0	0	0

Scientific name	26/03-02/04/2024			22/04-27/04/2024			24/05/2024-20/06/2024			22/09/2024-03/10/2024		
	FSA	EFSA	OUT	FSA	EFSA	OUT	FSA	EFSA	OUT	FSA	EFSA	OUT
Mareca penelope	0	21	21	0	0	0	0	0	0	0	10	10
Mergus serrator	0	1	1	0	1	1	0	1	1	0	0	0
Merops apiaster	0	0	1	44	91	91	3	22	57	0	0	0
Microcarbo pygmaeus	10	112	112	2	22	22	0	4	4	3	89	89
Milvus migrans	0	0	0	0	0	0	0	0	2	0	0	0
Motacilla alba	0	0	5	0	0	0	0	1	1	0	0	0
Motacilla cinerea	0	0	0	0	0	0	0	0	0	1	1	1
Motacilla flava	0	3	6	0	13	14	0	8	11	1	2	2
Muscicapa striata	0	1	1	0	0	0	0	0	0	0	1	1
Numenius arquata arquata	0	8	8	0	1	1	0	1	1	0	2	2
Nycticorax nycticorax	0	0	0	0	6	6	0	14	14	0	1	1
Oenanthe hispanica	0	0	3	0	0	0	0	0	0	0	0	0
Oenanthe oenanthe	3	7	7	2	4	4	0	0	0	0	0	0
Oriolus oriolus	0	0	0	3	3	3	0	1	1	0	0	0
Pandion haliaetus	0	3	3	0	1	1	0	0	0	0	0	0
Passer hispaniolensis	0	0	100	11	13	13	0	0	3	0	0	0
Pelecanus crispus	0	2	2	0	0	0	0	1	1	0	40	42
Pelecanus onocrotalus	32	56	56	50	73	73	0	0	9	0	19	19
Phalacrocorax aristotelis desmarestii	62	482	492	73	200	201	145	635	672	117	381	410
Phalacrocorax carbo sinensis	8	87	89	2	94	94	1	60	60	5	368	480
Phoenicopterus roseus	38	741	741	8	496	496	6	1774	1774	6	823	823
Phylloscopus collybita s. str.	0	1	1	1	1	1	0	0	0	0	0	0
Phylloscopus sibilatrix	0	0	0	1	1	1	0	0	0	0	0	0
Phylloscopus trochilus	0	0	0	0	0	0	0	0	0	5	5	5
Platalea leucorodia	0	11	11	1	4	4	0	1	1	0	8	8
Plegadis falcinellus	0	162	162	0	0	0	0	5	5	0	0	0
Pluvialis apricaria	0	3	3	0	0	0	0	0	0	0	0	0
Pluvialis squatarola	0	0	0	0	7	7	0	1	1	0	0	0
Podiceps cristatus	32	61	61	1	2	2	0	0	0	0	1	1
Podiceps nigricollis	3	18	18	0	0	0	0	0	0	0	35	35
Puffinus yelkouan	34	678	678	0	12	12	0	1	1	0	7	30
Riparia riparia	0	0	0	0	0	0	0	0	0	0	53	53
Saxicola rubetra	0	1	4	0	2	4	0	0	0	2	3	3
Spatula clypeata	20	84	84	0	0	0	0	0	0	3	3	3
Spatula querquedula	0	76	76	0	0	0	0	0	0	0	0	0
Sterna hirundo	3	3	3	13	214	214	11	199	199	0	0	0
Sternula albifrons	0	0	0	0	2	2	0	1	1	0	0	0
Streptopelia turtur	0	0	0	2	2	4	0	0	0	0	0	0
Sturnus vulgaris	0	20	20	0	9	9	45	45	377	4	19	19
Sylvia cantillans	0	1	1	0	0	0	0	0	0	0	0	0
Sylvia communis	0	0	0	1	1	1	2	2	2	0	0	0
Tachymarptis melba	0	0	0	0	0	0	0	18	55	0	0	0
Tadorna tadorna	5	171	171	4	93	93	3	61	62	0	5	5
Thalasseus sandvicensis	8	92	92	8	145	145	0	0	0	1	16	19
Tringa erythropus	0	67	67	1	8	8	0	0	0	0	0	0
Tringa glareola	0	3	3	1	78	78	0	0	0	6	6	6
Tringa nebularia	0	1	1	1	2	2	0	0	2	1	5	5
Tringa ochropus	0	3	3	0	0	0	0	0	0	2	2	2
Tringa stagnatilis	0	14	14	0	0	0	0	0	0	0	0	0
Tringa totanus	0	6	6	0	8	8	0	9	9	0	69	69
Turdus merula	0	1	1	0	0	0	0	0	0	0	0	0
Upupa epops	1	9	9	1	1	1	1	9	11	0	0	0
Vanellus spinosus	3	11	11	1	17	17	2	26	35	40	58	58
Vanellus vanellus	0	0	0	0	0	0	0	3	4	0	0	0
Phasianus colchicus	0	0	0	0	2	2	0	0	0	0	0	0
Podiceps auritus	0	0	0	0	0	0	0	0	0	0	1	1
Somateria mollissima	0	0	0	0	0	0	0	3	3	0	1	1
Stercorarius parasiticus	1	3	3	2	4	4	0	0	0	0	3	3
Accipiter nisus all others	2	2	3	0	0	0	0	0	0	0	0	0
Athene noctua	0	0	0	0	0	0	0	0	1	0	0	0
Carduelis carduelis	33	46	52	14	41	41	3	4	5	0	0	0

Scientific name	26/03-02/04/2024			22/04-27/04/2024			24/05/2024-20/06/2024			22/09/2024-03/10/2024		
	FSA	EFSA	OUT	FSA	EFSA	OUT	FSA	EFSA	OUT	FSA	EFSA	OUT
Cettia cetti	28	39	48	36	51	58	5	26	42	1	1	1
Charadrius dubius	0	3	3	5	14	14	7	25	27	0	3	3
Chloris chloris	25	26	46	3	3	3	2	2	3	2	2	2
Cisticola juncidis	0	0	0	1	1	1	0	2	2	0	0	0
Coccothraustes coccothraustes	4	4	29	0	0	0	0	0	0	0	0	0
Columba livia	59	59	59	22	22	22	0	25	46	2	2	2
Corvus corax	1	2	2	0	0	0	0	3	3	0	0	0
Corvus corone	2	13	19	3	15	16	0	33	42	0	13	17
Corvus monedula	0	0	0	0	0	0	0	8	33	0	0	0
Cyanistes caeruleus s. str.	1	1	1	0	0	0	0	0	0	0	0	0
Delichon urbicum	9	14	14	9	15	15	8	10	19	0	0	0
Emberiza calandra	30	34	36	11	19	20	2	8	9	4	4	4
Emberiza cirlus	0	1	1	0	0	0	0	0	0	0	0	0
Falco tinnunculus	18	27	30	14	22	24	2	7	16	0	1	2
Galerida cristata	7	21	21	5	24	27	2	20	22	5	11	12
Gallinula chloropus	9	12	12	9	11	13	0	0	0	7	7	7
Garrulus glandarius	1	1	3	0	0	0	0	0	0	0	0	0
Larus fuscus all others	0	1	1	0	0	0	0	0	0	0	0	0
Larus michahellis	449	3342	3815	138	924	1021	100	4373	5347	3014	5810	5922
Parus major	3	4	5	0	0	0	0	0	1	0	0	0
Passer domesticus s. str.	29	61	76	67	126	133	2	38	62	20	20	22
Passer montanus	0	0	40	4	4	4	0	0	2	0	0	0
Pica pica	10	16	20	2	7	8	1	8	20	1	5	5
Psittacula krameri	0	0	0	0	1	1	0	0	0	0	0	0
Ptyonoprogne rupestris	0	2	2	0	0	0	0	3	11	0	0	0
Rallus aquaticus	1	4	4	0	0	0	0	0	0	2	8	8
Remiz pendulinus	0	1	1	0	1	2	0	4	6	0	0	0
Serinus serinus	0	0	1	0	0	0	0	0	0	0	0	0
Streptopelia decaocto	13	17	20	23	32	32	3	20	40	38	38	67
Sylvia atricapilla	0	0	0	2	3	3	0	0	1	0	0	0
Sylvia melanocephala	0	1	2	0	0	0	0	0	1	0	0	0
Tachybaptus ruficollis	3	43	43	1	1	1	1	1	3	7	41	41
Acrocephalus sp.	0	0	0	0	1	1	0	0	0	0	0	0
Anas sp.	25	63	63	0	0	0	0	0	0	0	75	75
Apus sp.	0	0	0	0	0	0	0	30	33	0	0	0
Calidris sp.	0	50	50	0	0	0	0	0	0	0	56	56
Charadrius sp.	0	0	0	1	4	4	1	4	4	0	0	0
Circus pygargus / Circus macrourus	1	1	1	0	0	0	0	0	0	0	0	0
Circus sp.	0	2	2	0	0	0	0	0	0	0	0	0
Falco sp.	0	0	0	0	1	1	0	1	1	0	0	0
Larus sp.	1	26	26	0	1	1	0	0	0	1270	1284	1377
Motacilla sp.	3	3	3	0	0	0	0	0	0	0	0	0
Passer sp.	7	8	9	0	0	0	0	0	0	0	0	0
Phalacrocorax sp.	6	7	7	2	2	2	0	0	0	2	11	11
Picus sp.	0	1	1	0	0	0	0	0	0	0	0	0
Stercorarius sp.	0	1	1	0	0	0	0	0	0	0	0	0
Sterna sp.	16	61	61	10	109	109	3	18	18	0	0	0
Tringa sp.	0	2	2	0	17	17	0	0	0	0	28	28
Tringa sp. & Pluvialis sp.	0	15	15	0	0	0	0	0	0	0	0	0

Legend: FSA = total recorded individuals of the species within the FSA per sampling period, EFSA = total recorded individuals of the species within the extended FSA per sampling period, Total = total recorded individuals of the species per sampling period within and outside the extended FSA

The protected avifauna objects of the Natura 2000 sites in the Study Area recorded within the extended REP that may be affected by the project under consideration and have been recorded during the fieldwork include:

- Seabirds, including gulls and gannets, that use the wider marine area or the coasts in the wider project area
- Waterfowl species (cormorants, grebes and anisiformes), that use the wider marine area or the coasts in the wider project area
- Waders, herons and gannets, that use the coasts and the coastal marine zone in the wider project area

1.1.B1.iii.1 Seabirds

Cormorant *(Phalacrocorax aristotelis desmarestii)*

The Common Shag is a permanent resident of the Study Area. It nests on uninhabited islets and steep coasts in the SPAs GR1150001 and GR1150012, while it uses the entire marine areas of the CAPs GR1150001, GR1150012 and GR1150014 for feeding and movement. The size of the breeding population in the Study Area is 168-180 pairs, while in the summer, after the breeding season, its population reaches up to 1,000 individuals, due to an influx of individuals from other areas.

In the context of the field work, the species was recorded in all pelagic and coastal marine areas as well as the coasts of the FRA and the extended FEA. Within the expanded RPE, the largest colonies of the species were located on uninhabited islets at the eastern and western ends of the expanded RPE. The species does not breed within the RPE. In the pelagic and coastal marine areas, the species was recorded either as single individuals or as concentrations of up to 46 individuals. Pelagic, the largest concentration of 46 individuals was observed 5 km west of the FRA, as they moved east towards Keramoti. Coastally, the largest concentrations within the FRA were recorded on ship mooring buoys at the “Prinos” platforms (30 individuals) and on ship mooring buoys southwest and southeast of the Sigma factory and on the coast southeast of the Sigma factory (33 individuals). Outside the FRA, the largest concentrations of the species were recorded in the commercial port of Kavala (44 individuals), off Skala Prinos, in mussel farms southeast of the Sigma factory (49 individuals) and on the islets of Thasopoula and Fidonisi. In general, most concentrations of the species were observed at the mooring buoys of ships or mussel farms, as they are floating platforms that offer a safe place for resting and perching. Due to the shallow depth of the sea in the Gulf of Kavala, both coastal and pelagic marine areas are used for feeding, however, most cases of feeding were observed in coastal areas, close to the perching/resting sites. The size of the recorded concentrations during the post-breeding period (autumn 2024) was approximately 50% larger than during the breeding season.

Based on the data of the program "Midwinter waterbird surveys in Greece" during the period 2014-2023, the abundance of the species in the marine area of the lagoons in the wider area of Keramoti (Vasova, Eratino, Agiasma and Keramoti) in winter is reduced compared to other seasons (see Table 32).

Table 32: Abundance of Phalacrocorax aristotelis desmarestii during winter (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird surveys in Greece" during the period 2014-2023)

Επιστημονική ονομασία	Kavala Oil	Λιμνο-θάλασσα Βάσοβας	Λιμνο-θάλασσα Ερατεινού	Λιμνο-θάλασσα Αγιάσματος	Λιμνο-θάλασσα Κεραμωτής	Θαλάσσια περιοχή λιμνο-θαλασσών	Σύνολο
Phalacrocorax aristotelis desmarestii						1 - 18	0-18 (2.2)

Mychos (*Puffinus yelkouan*)

The loggerhead sea turtle uses the marine areas, mainly of the Study Area, for feeding during the wintering, migration and breeding periods with the largest concentrations of the species (up to 2,000 individuals) recorded during the wintering/migration period. No colonies of the species have been identified within the MP.

During field work, the species was recorded mainly during the spring migration in March 2024 with the largest concentration of 285 individuals west of the Nestos estuary. Other concentrations of the species, consisting of a few dozen individuals, were recorded in the Keramoti-Thassos channel and west of the FRA. The largest concentrations of the species within the FRA were recorded 6.5km north of the “Prinos” platforms (17 individuals) and southeast of the Sigma factory (15 individuals). The abundance of the species was reduced during the pre-breeding period (April 2024, a total of 12 recorded individuals), the nesting period (May-June 2024, a total of 1 recorded individual) and the post-breeding period (September-October 2024, a total of 7 individuals within the expanded WIP).

Based on the data of the program "Midwinter waterbird surveys in Greece" during the period 2014-2023, the abundance of the species in the marine area of the lagoons in the wider Keramoti area in winter is very low (see Table 33).

Table 33: Abundance of Puffinus yelkouan during winter (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird surveys in Greece" during the period 2014-2023)

Scientific name	Energean	Vasova lagoon	Eratino lagoon	Agiasma lagoon	Keramoti Lagoon	Marine lake-sea area	Total
Puffinus yelkouan						1-2	0-3 (0.3)

Artemis (Calonectris diomedea)

Artemis is a summer visitor to the area and uses the marine area of the Study Area for feeding from its arrival in the Mediterranean from the wintering areas in the Atlantic, in late February, until its departure for wintering in late autumn. No colonies of the species have been identified within the Study Area.

During fieldwork, the species was recorded in the extended FRA from March onwards, with the highest recorded abundance during the spawning period from late May and June (total 302 individuals). The species was recorded in all parts of the Gulf of Kavala with the highest concentrations 3.5km west of the FRA (68 individuals), off Kavala (46 individuals), north of Skala Prinos (21 individuals) and 250m south of the FRA (11 individuals). Within the FRA, the largest concentrations of the species were recorded around the "Prinos"

platforms (up to 7 individuals). During the post-breeding period (September-October 2024) the species was recorded mainly in the central part of the Gulf of Kavala (as single individuals or groups of up to 5 individuals, with a total of 49 individuals recorded within the expanded FRA).

Great Black-backed Gull (*Stercorarius parasiticus*)

The Black-headed Gull is found in the Aegean Sea during spring migration (April-June) and autumn migration (July-October) between breeding grounds in Russia and wintering grounds in the southern hemisphere. It is the most common herring gull in the Mediterranean.

In the expanded FRA it was recorded in March, April and September/October 2024 both within the FRA south of the Sigma factory (1 and 2 individuals) and in the coastal marine zone around the FRA (single individuals).

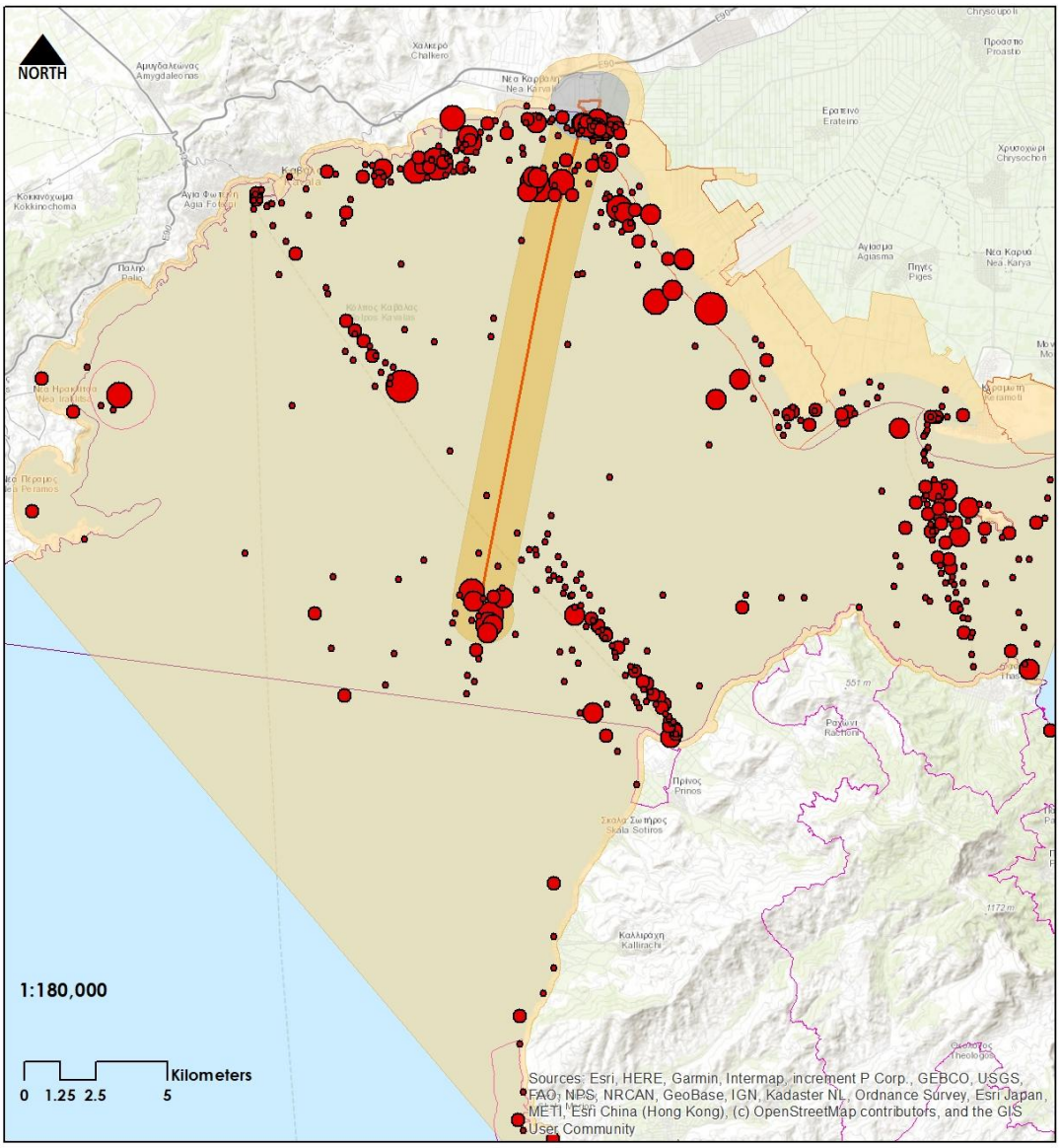


Figure 51: Locations of Phalacrocorax aristotelis desmarestii recordings during SEAS fieldwork

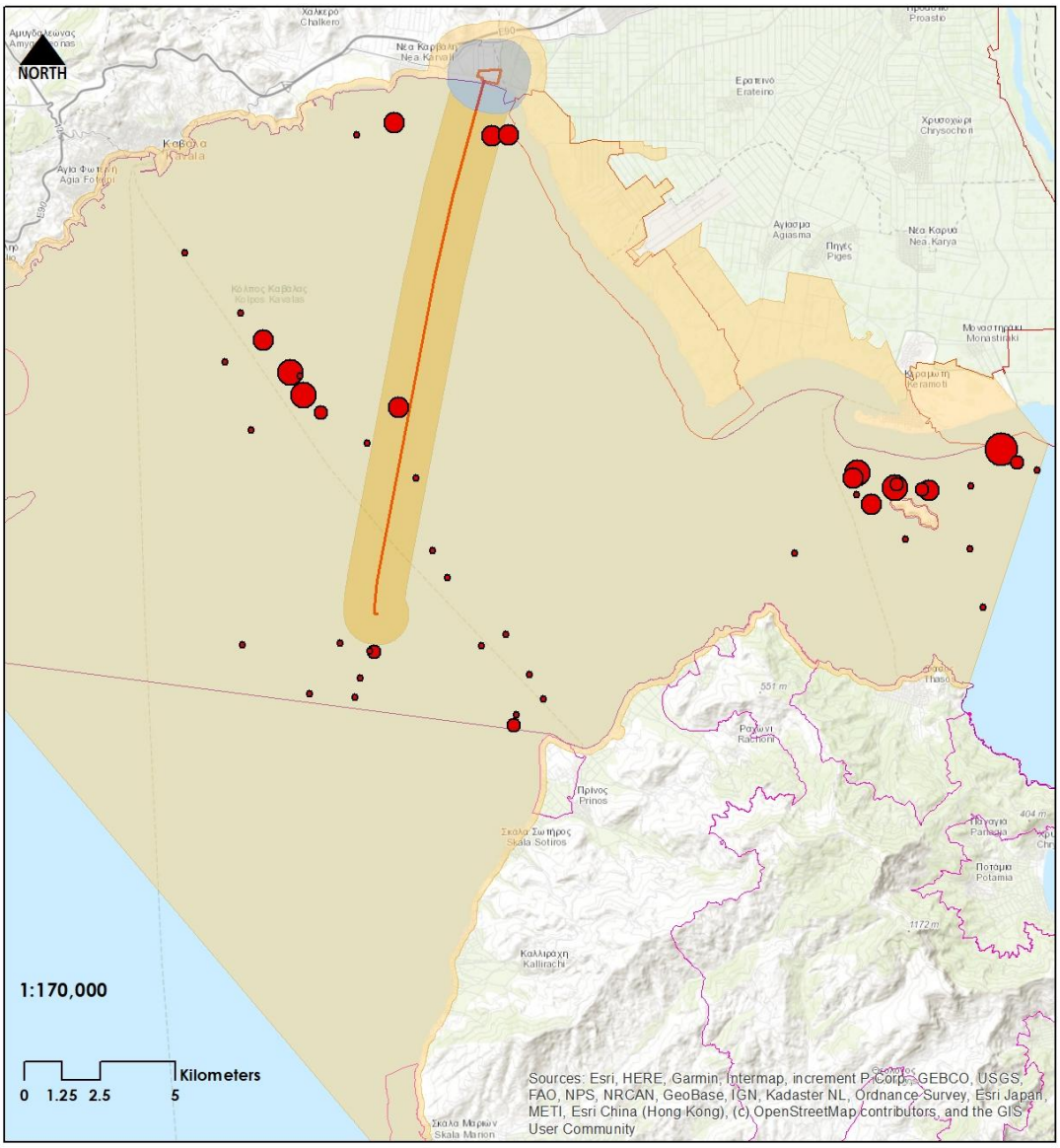


Figure 52: Locations of Puffinus yelkouan recordings during SEAS fieldwork

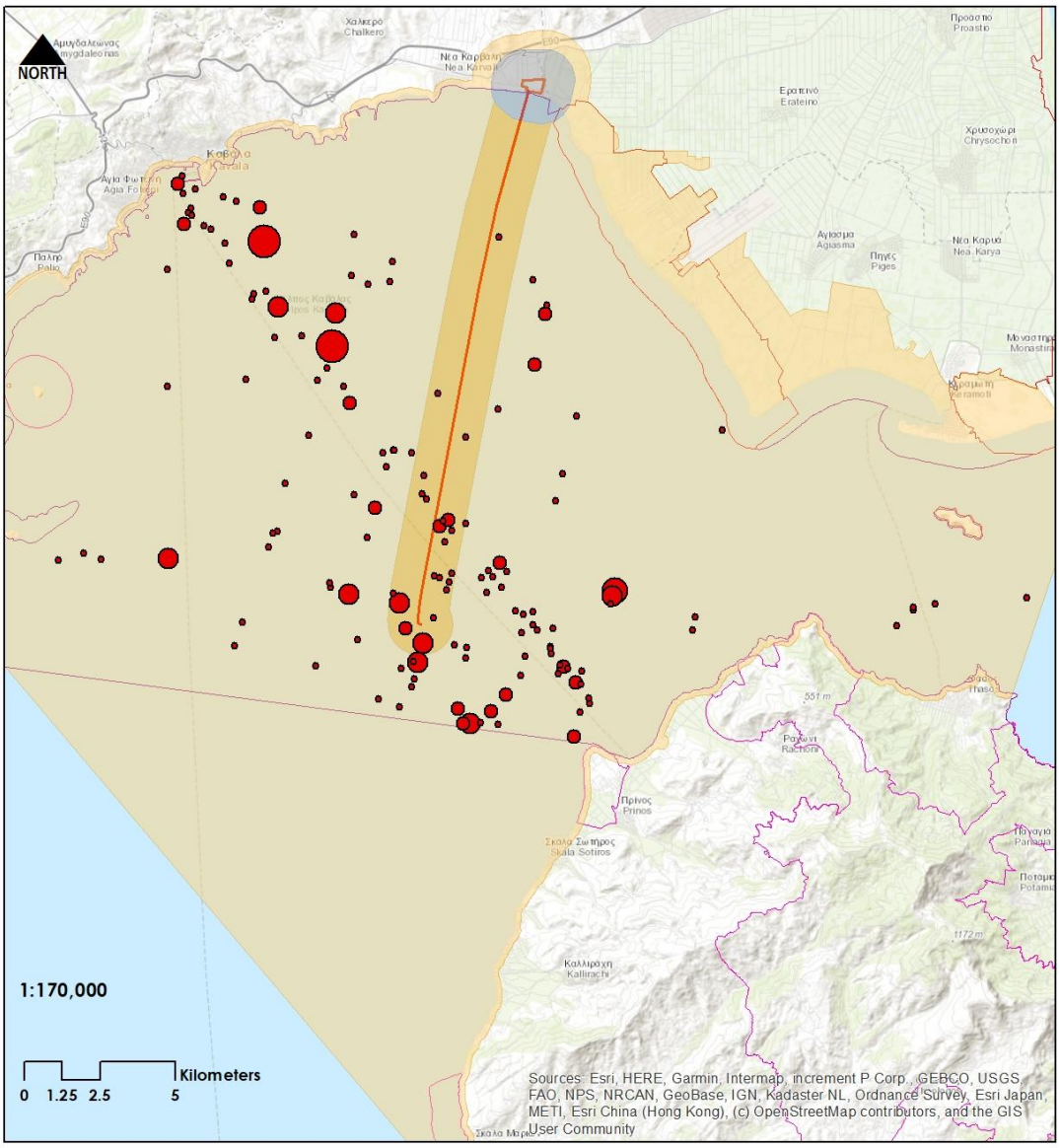




Figure 53: Locations of Calonectris diomedea recordings during MEOA fieldwork

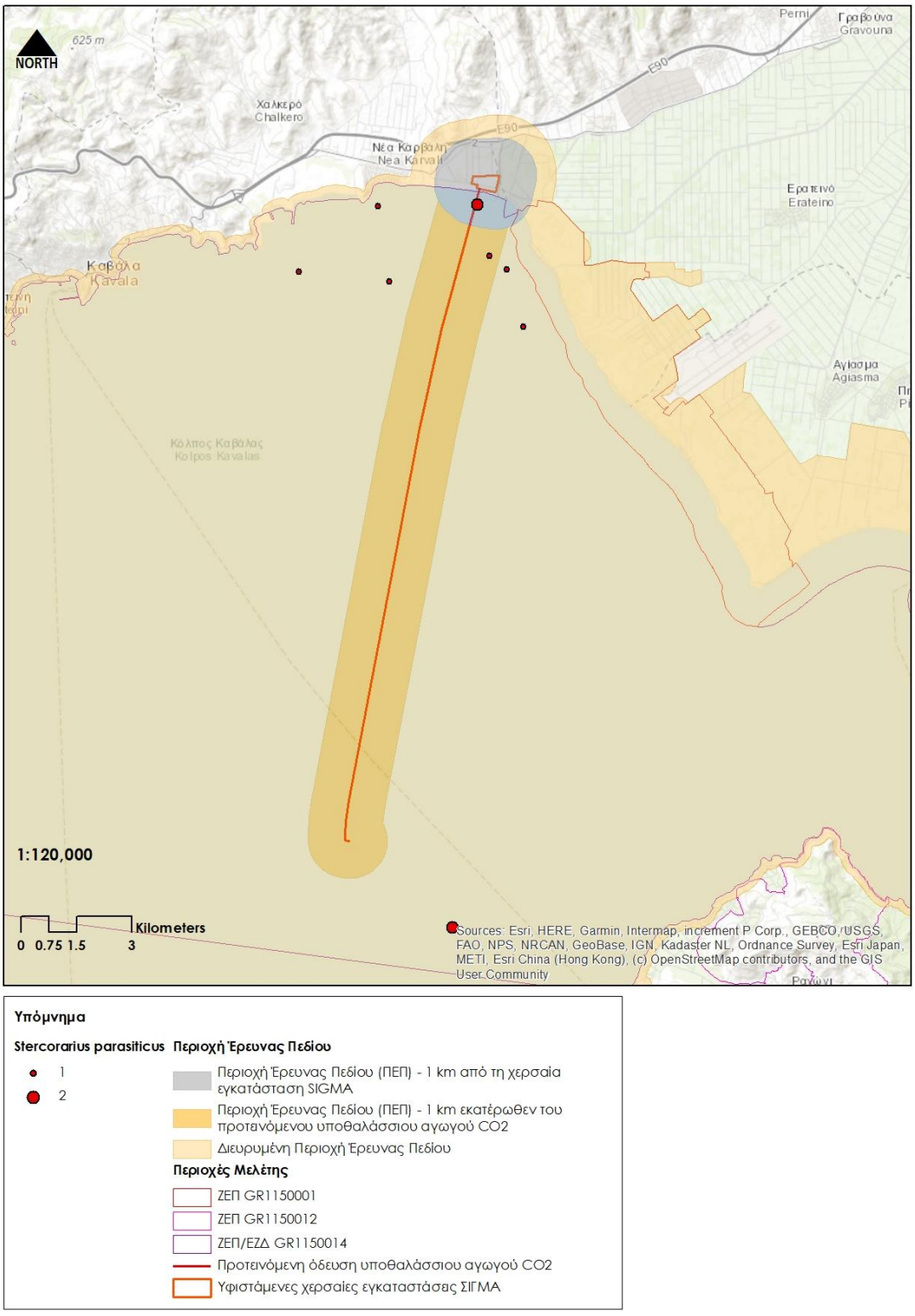


Figure 54: Locations of Stercorarius parasiticus recordings during SEAS fieldwork

1.1.B1.iii.2 Breeding Gulls

Black-headed gull (*Larus melanocephalus*)

The Black-headed Gull mainly uses the coasts and marine areas of the Study Area for foraging during migration and wintering. It breeds occasionally in the Nestos Delta (Chandrinos et al. 2009) with a maximum of 900 pairs in 1998 (Goutner et al. 1999), while 160 pairs breed in CAP GR1150001 (SDF). During wintering, a few hundred have been recorded in Keramoti and the Nestos Delta, with much fewer in the Gulf of Kavala (Christidis A. ed.). In Western Thassos, up to a thousand Black-headed Gulls winter (Markianos G. pers. ep.), while a large number winter in the Strymon Estuary (3700 on 28/1/2024 Gasteratos 2024).

The greatest abundance of the species in the FRA and the expanded FRA was recorded in September 2024 on the sea coasts of the Keramoti lagoons (775 individuals) and Agiasma (276). Within the FRA, the species was recorded in spring and autumn 2024 in the coastal sea zone up to 4 km away from the Sigma factory, either as single individuals or in groups of up to 9 individuals. In the wider area of the Sigma factory, the largest concentration of the species (25 individuals) was recorded in the Vasova lagoon.

Common Tern (*Sterna hirundo*)

The Common Tern feeds in the marine area and the lagoons of the area from late March to October. It breeds in the SPA GR1150001 with 5-21 pairs (TED), while 200-300 pairs bred in the Nestos Delta and the coastal lagoons in 2002-06 (Portolou et al. 2009). It nests on islets bare of vegetation and safe from predators and disturbance at a distance of 5 to 10 kilometers from the feeding areas, large areas of open water, preferably the sea (Dimalexis et al. 2009).

The highest abundance of the species in the PEP and the extended PEP was recorded in April and May 2024. Within the FRA, the species was recorded in the coastal marine zone up to 3.5 km from the Sigma factory either as single individuals or in groups of up to 7 individuals. In the wider area of the Sigma factory, the highest concentration of the species (23 individuals) was recorded in the Vasova lagoon. The highest concentration in the extended FRA, 57 individuals, was recorded in the Agiasma lagoon in May 2024. In the autumn of 2024, the presence of the species was not recorded within the extended FRA.

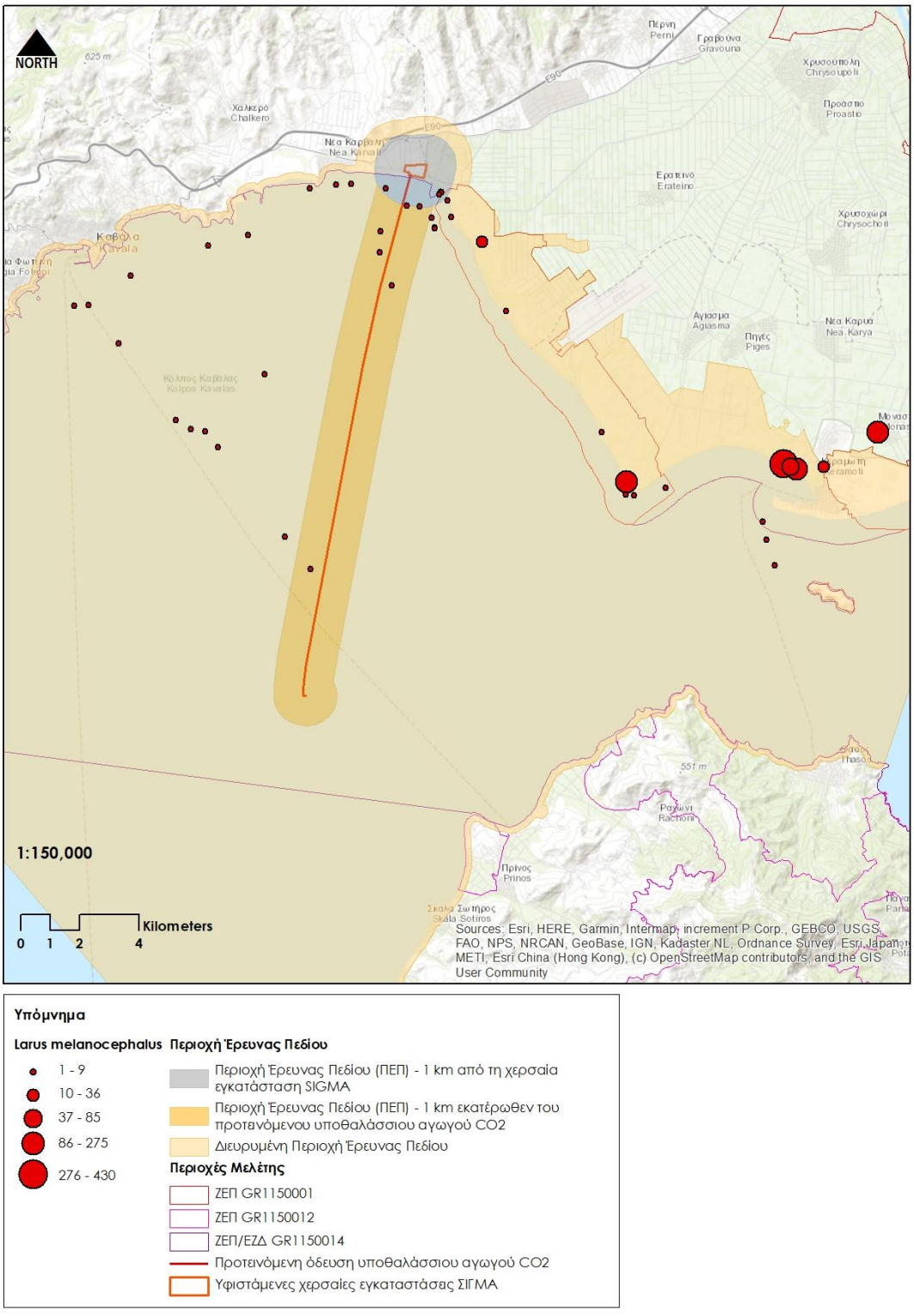


Figure 55: Locations of Larus melanocephalus recordings during SEAS fieldwork

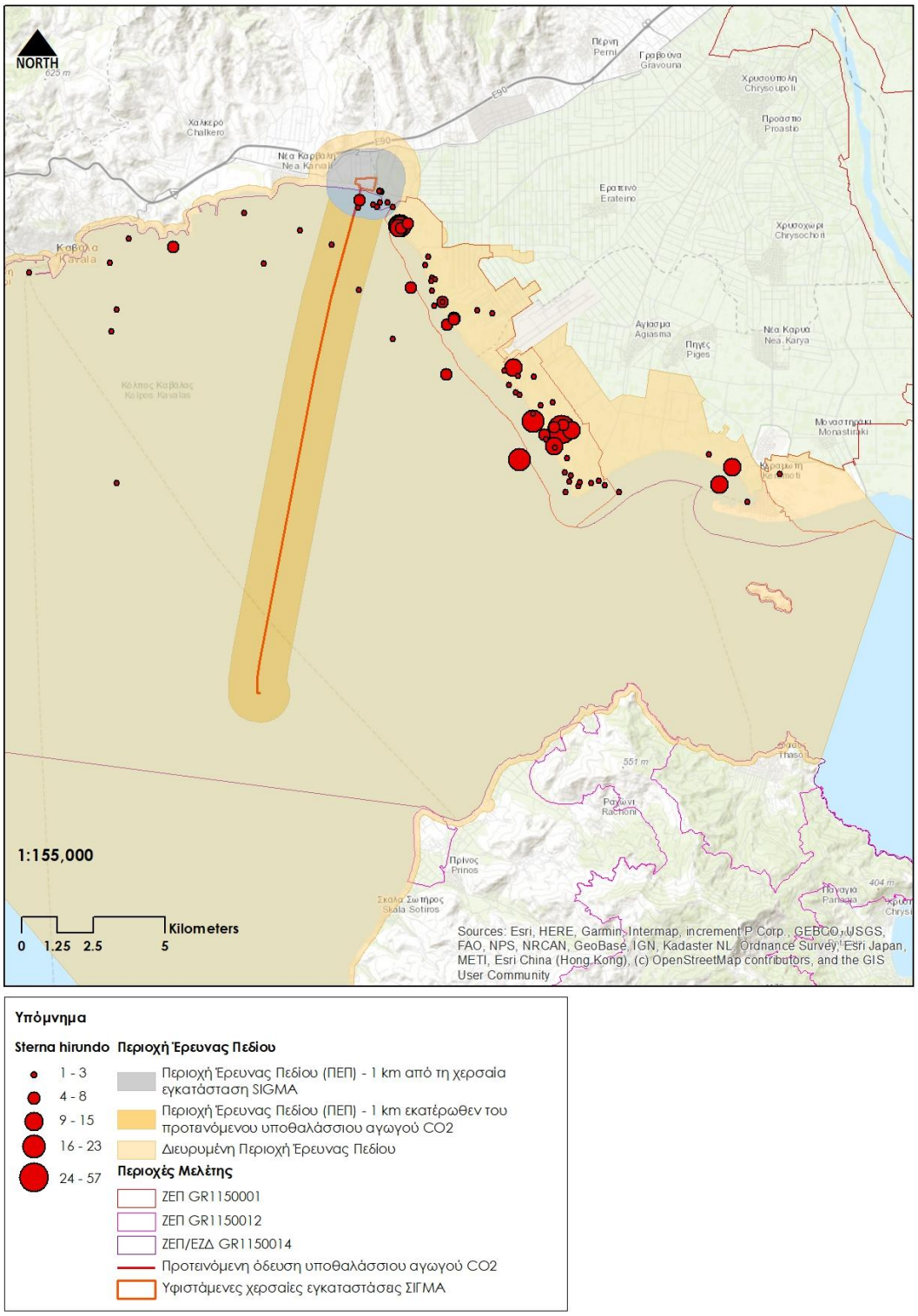


Figure 56: Sterna hirundo recording locations during SEAS fieldwork

1.1.B1.iii.3 Wintering and migratory Gulls

Black-headed gull (*Larus ridibundus*)

The Black-headed Gull uses the FRA and the Study Area during the wintering and migration period. During the Midwinter waterbird surveys in the Keramoti Lagoons, 0-523 Black-headed Gulls (A.E. 182 individuals) were recorded in the decade 2014-2023 (EEA unpublished data).

The highest abundance of the species in the FRA and the extended FRA was recorded in September and March 2024. Within the FRA, the species was recorded in the coastal marine zone up to 3.5 km from the Sigma plant (up to 26 individuals), on the coast in front of the plant (11 individuals) and in the wetland east of the plant (up to 23 individuals). In the expanded PEP, but outside the FRA, the largest concentrations of the species have been recorded in autumn 2024 on the coast in front of Vasova Lagoon (135 individuals) and in the Keramoti Lagoons (275 individuals).

Table 34: Abundance of Larus ridibundus during winter (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird surveys in Greece" during the period 2014-2023)

Scientific name	Energean	Vasova lagoon	Eratino lagoon	Agiasma lagoon	Keramoti Lagoon	Marine lake-sea area	Total
Larus ridibundus	25 - 70	3 - 174	2 - 256	2 - 480	1 - 40	3 - 15	13-523 (202.2)

Little Gull (*Hydrocoloeus minutus*)

The Little Gull uses the FRA and the marine areas of the Study Area for foraging during the wintering and migration period. The Little Gull uses the GR1150001 SAC during migration without any population estimate (PEA), while it is reported to be found in large numbers in the Nestos Delta and coastal lagoons during migration (Jerrentrup & Naziridis 1996).

The highest abundance of the species in the FRA and the extended FRA was recorded in March, April and October 2024. The species was recorded mainly in the marine area of the extended SAC either as single individuals or as flocks of up to 11 individuals, as well as within the SAC (1-4 individuals). The species was recorded mainly west of the FRA.

Winter tern (*Thalasseus sandvicensis*)

The Common Tern winters in the coastal marine area of the Study Area, with 1-10 individuals recorded in SPA GR1150001 (SDF). It is a transit migrant in Greece from late February to mid-May and during autumn migration mainly from mid-August to mid-October (Handrinos & Akriotis 1997). One of the largest recorded concentrations of Common Terns in Greece is 269 individuals in the Nestos Delta on 8/4/1987 (Handrinos & Akriotis 1997).

The species nested with 10-40 pairs in the Nestos Delta and coastal lagoons during the period 1990-96 (Jerrentrup & Naziridis 1996, Panagiotopoulou et al. 2012).

In the FRA and the extended FRA the species was recorded in March, April and September 2024. Within the FRA the species was recorded in the marine coastal zone up to 2.5 km from the Sigma factory (1-3 individuals). The largest concentrations of the species within the extended FRA were observed in spring on the coast and the coastal marine area of the Vasova lagoon (maximum recording of 52 individuals in April 2024, two of which were ringed), in the Keramoti lagoons and in the coastal marine zone southeast of the Sigma factory (flocks of up to 16 individuals). In autumn the recorded abundance of the species (total 19 individuals) was lower compared to spring.

Table 35: Abundance of Thalasseus sandvicensis during winter (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird surveys in Greece" during the period 2014-2023)

Scientific name	Energean	Vasova lagoon	Eratino lagoon	Agiasma lagoon	Keramoti Lagoon	Marine lake-sea area	Total
Thalasseus sandvicensis		2	1 - 3	1 - 2		15	0-15 (3.3)

Little Tern (*Sternula albifrons*)

The Little Tern feeds in the lagoons and marine area of the study area from April to September. It breeds in the SAC GR1150001 with 5-21 pairs (SAC), while in the Nestos Delta and coastal lagoons 200-300 pairs bred in 2002-06 (Portolou et al. 2009) and 80-450 pairs in 1990-96 (Bourdakis & Vareltzidou 2000).

The species was not recorded within the FRA, while in the extended FRA it was recorded on the shore of Vasova Lagoon (2 individuals in April 2024) and in Agiasma Lagoon (1 individual in May 2024). The presence of the species was not recorded in the autumn of 2024.

Black Tern (*Chlidonias niger*)

The Black-headed Tern is a passing migrant from the area in April - May, and during the autumn migration in July - October (Handrinos & Akriotis 1997). Up to 300 individuals have been recorded during migration in SAC GR1150001 (Natura 2000 database),

The species was recorded within the marine area of the SAC (1 individual in April 2024). The species was also recorded off the Agiasma Lagoon (1 individual in April 2024). The presence of the species was not recorded in the autumn of 2024.

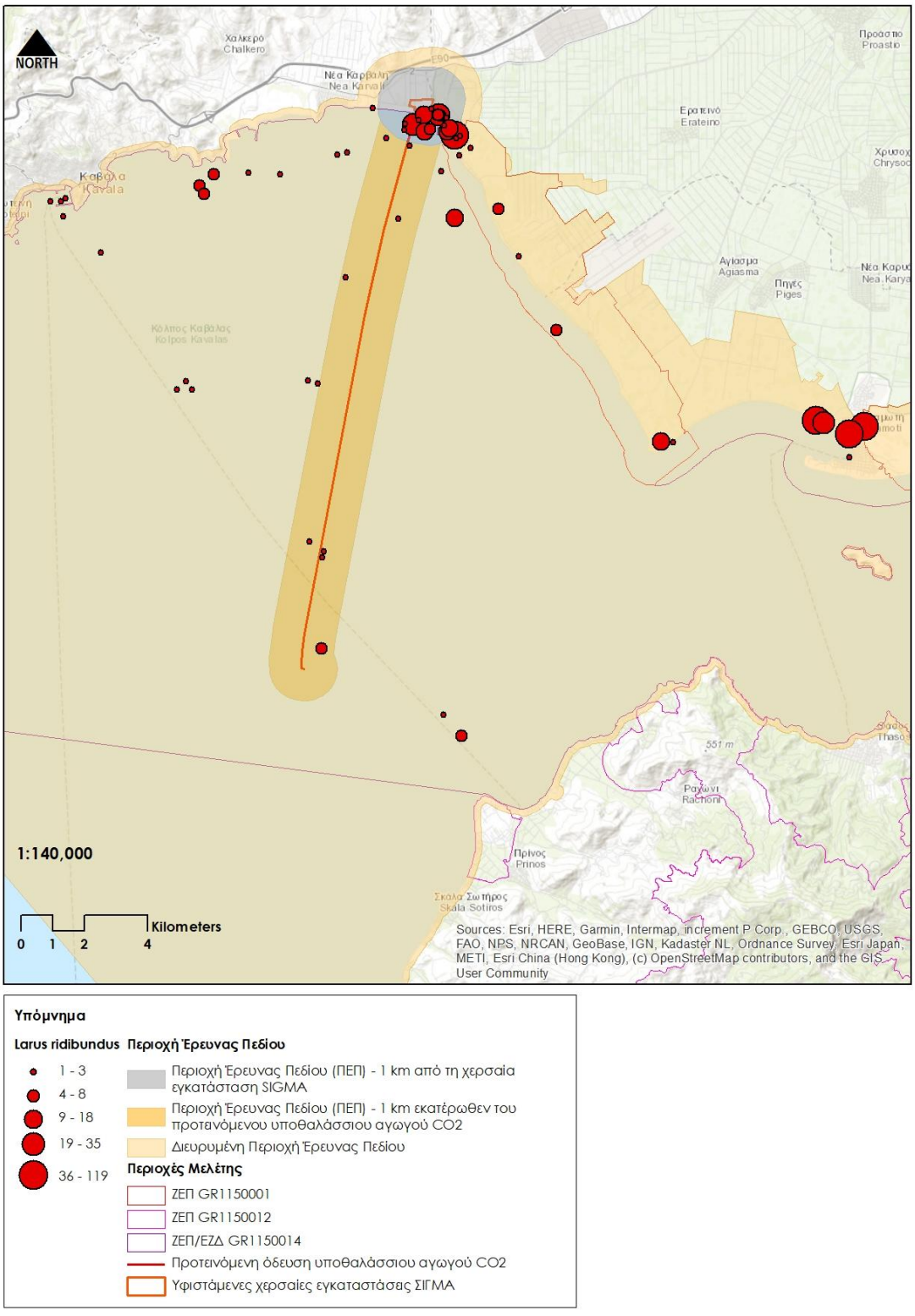


Figure 57: Locations of Larus ridibundus recordings during SEAS fieldwork

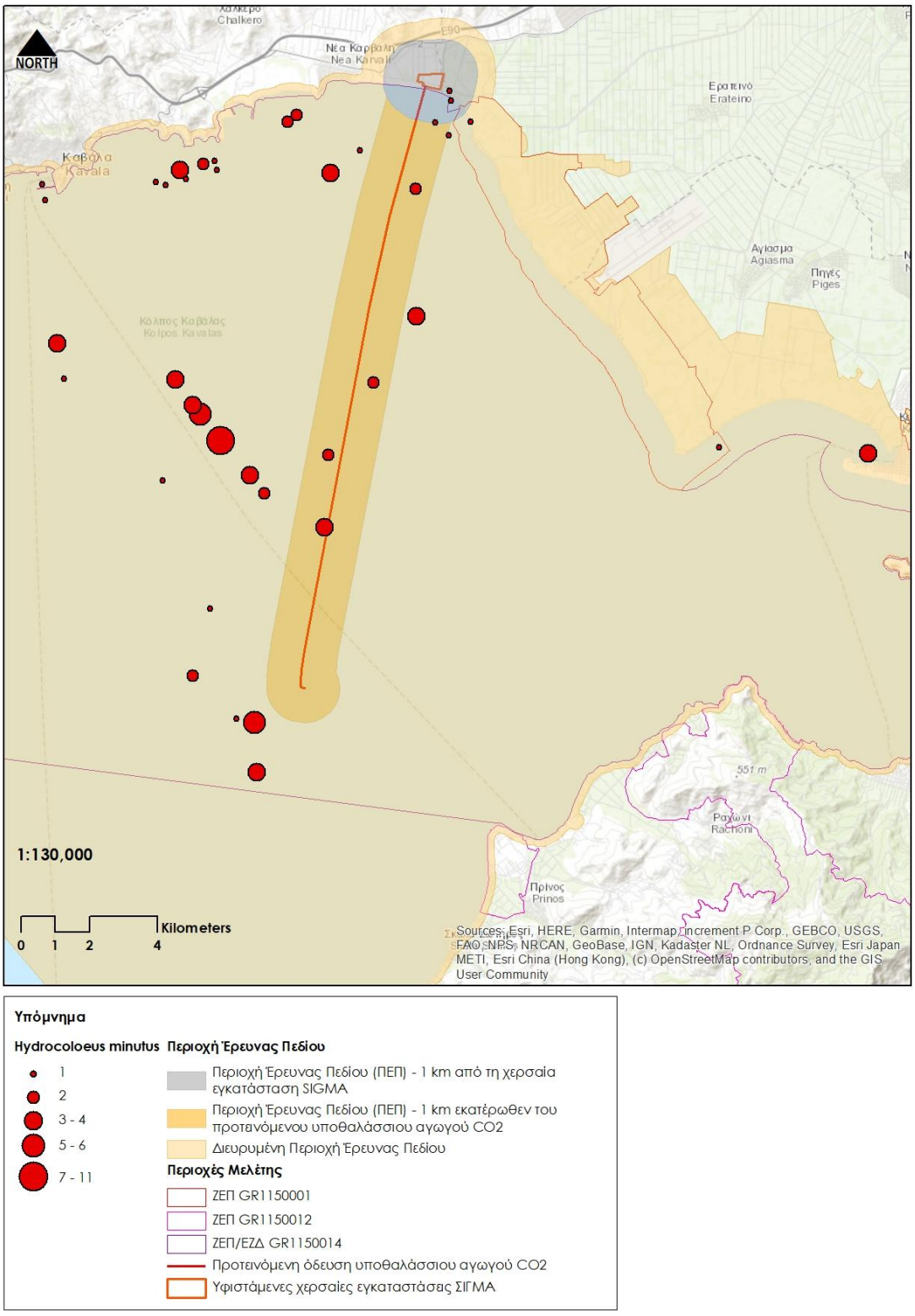
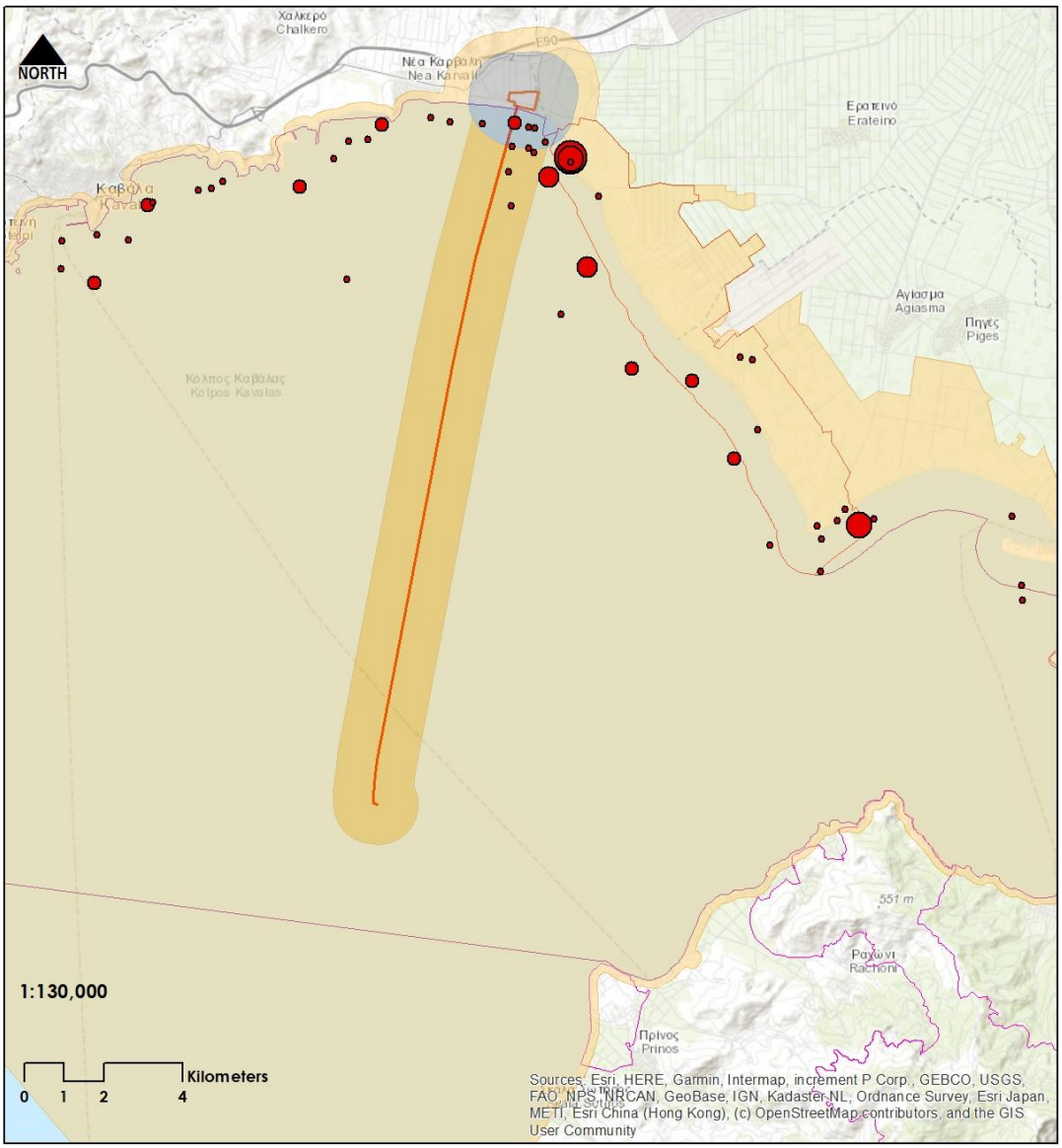


Figure 58: Hydrocoloeus minutus recording locations during SEAS fieldwork



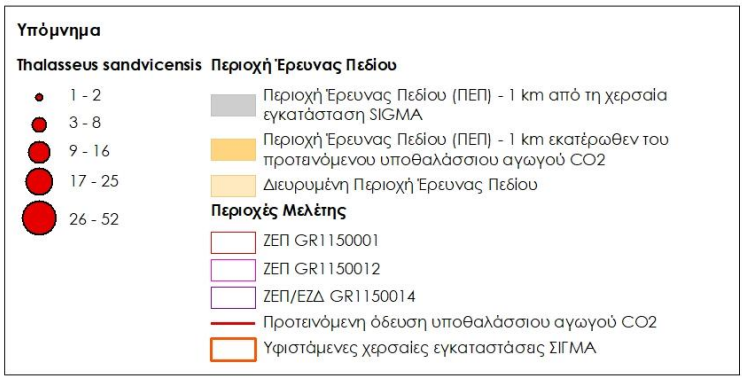


Figure 59: Thalasseus sandvicensis recording locations during SEAS fieldwork

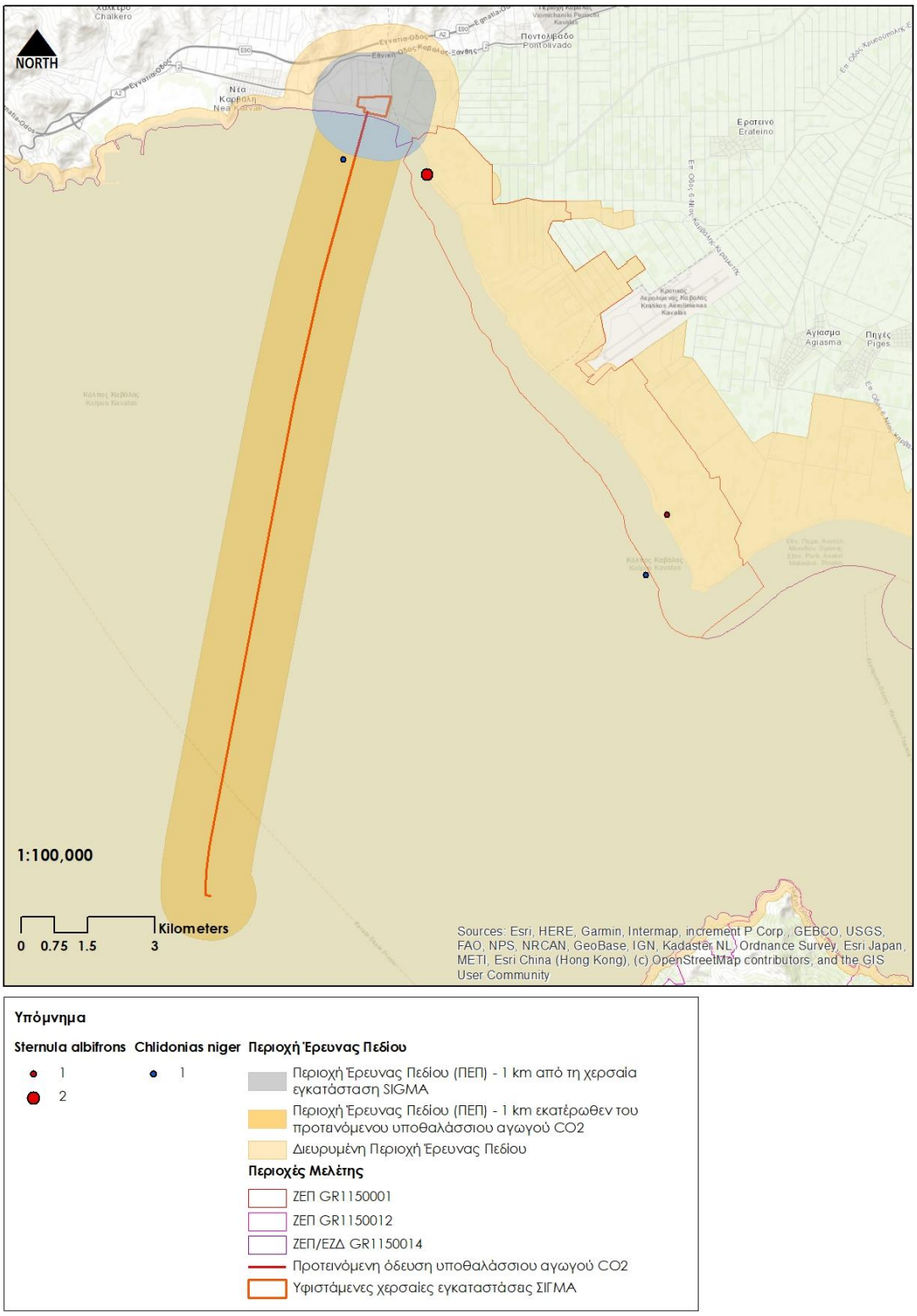


Figure 60: Locations of Sternula albifrons and Chlidonias niger records during SEAS fieldwork

Lambrovouti (*Gavia arctica*)

The Common Redshank winters in the coastal marine area of the Study Area, with 2-9 individuals in the GR1150001 SAC (SDF) and 5-26 individuals in 1990-96 in the Nestos Delta and coastal lagoons (Jerrentrup & Naziridis 1996). The largest recorded concentrations of Common Redshank in winter in the extended FRA include: 231 individuals in less than eight km of coastline west of Kavala on 17/1/1993 and 38 individuals on 22/1/1994, but systematic records are not made in all the coastal areas where the species winters (Handrinos & Akriotis 1997). During the Midwinter waterbird surveys in the Keramoti Lagoons, 0-21 Common Shearwaters (mean 5 individuals) were recorded in the decade 2014-2023 (EEA unpublished data).

In the Midwinter surveys, the numbers of Gavia (as well as other species that winter mainly at sea) are most likely an underestimate of their actual population (Chandrinos et al. 2015). In addition to the wintering population, pre-migratory concentrations of the species of international importance have been recorded in the coastal zone of the Thracian Sea in spring.

The species was recorded mainly in March 2024, while 3 individual individuals were also recorded in April 2024. Within the FRA the species was recorded in the coastal marine zone up to 2 km from the Sigma factory either as single individuals or in groups of up to 11 individuals. In the wider area of the Sigma factory and within the Study Area, the largest concentration of the species was recorded in the coastal marine area southeast of the factory (25 individuals) and southwest of the factory (up to 15 individuals). Other significant concentrations were observed off the Agiasma lagoon (7 individuals) and west of Skala Prinos (24 individuals). The presence of the species was not recorded in the autumn of 2024.

Table 36: Abundance of Gavia arctica during winter (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird surveys in Greece" during the period 2014-2023)

Scientific name	Energean	Vasova lagoon	Eratino lagoon	Agiasma lagoon	Keramoti Lagoon	Marine lake-sea area	Total
Gavia arctica	1	1 - 7	1		1	1 - 20	0-21 (5.4)

Spotted gull (*Gavia stellata*)

The Spotted Gull winters in the coastal marine area of the Study Area, with 2 individuals in SAC GR1150001 (TED). The species was not recorded during the Midwinter waterbird surveys in the Keramoti Lagoons in the decade 2014-2023 (EEA unpublished data).

The species was recorded in March 2024, 1 individual west of the factory at a distance of 2 km from the factory and 1 individual off the Keramoti Bay. The presence of the species was not recorded in the autumn of 2024.

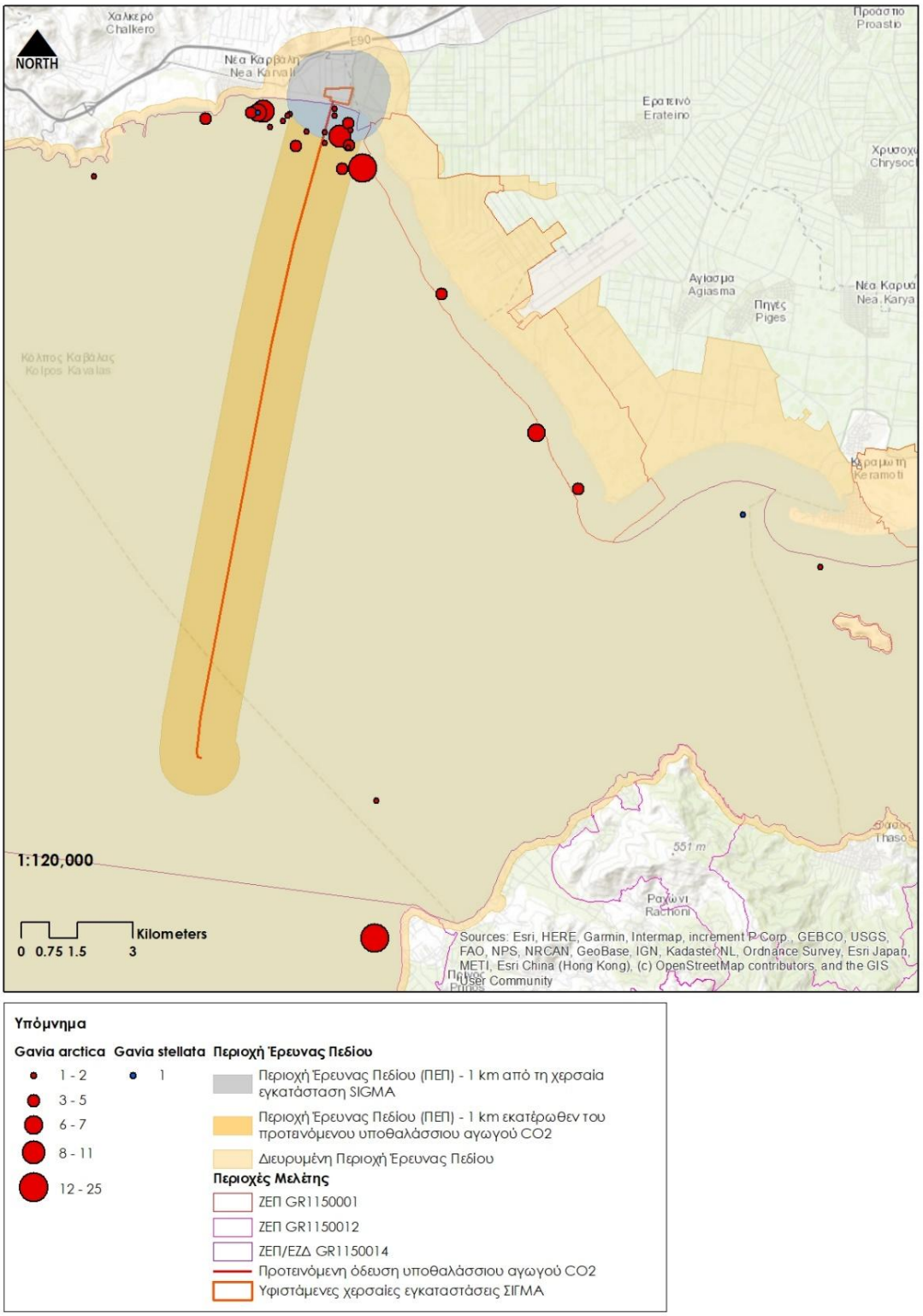


Figure 61: Locations of Gavia arctica and Gavia stellata recordings during SEAS fieldwork

1.1.B1.iii.5 Phalacrocoracidae (Cormorants)

Cormorant (*Phalacrocorax carbo*)

The Cormorant winters mainly in the wetlands and coastal marine area of the FRA and the Study Area, while it also passes through the area during migration. 60-2500 individuals have been recorded in the SAC GR1150001 (SDF), while in the Nestos Delta and coastal lagoons 1230 individuals have been recorded in 2013 (Kazantzidis et al. 2013), 2-1609 individuals in 2000-08 (Portolou et al. 2009) and 150-3300 individuals in 1996 (Bourdakis & Vareltzidou 2000). During the Midwinter waterbird surveys in the Keramoti Lagoons, 18-1004 Cormorants (A.E. 331 individuals) were recorded in the decade 2014-2023 (EEA unpublished data).

Within the FRA, the species was recorded mainly in the marine area (1-3 individuals) up to 2.5 km from the Sigma plant. The largest concentration of the species was recorded in the Agiasma Lagoon (38 individuals in March, 83 individuals in April, 46 individuals in May and 113 individuals in September 2024), in the Keramoti Lagoons (93 individuals in September 2024), in the Vasova Lagoon (51 individuals in September 2024) and in the Eratinos Lagoon (62 individuals in September 2024). The species was also observed in the pelagic area of the expanded FRA.

Table 37: Abundance of Phalacrocorax carbo during winter (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird surveys in Greece" during the period 2014-2023)

Scientific name	Energean	Vasova lagoon	Eratino lagoon	Agiasma lagoon	Keramoti Lagoon	Marine lake-sea area	Total
Phalacrocorax carbo sinensis	50 - 120	3 - 281	38 - 275	1 - 61	8 - 50	1 - 796	18-1004 (331.2)

Common Sandpiper (*Microcarbo pygmaeus*)

The Common Sandpiper winters in coastal and inland wetlands in the terrestrial part of the FRA and the Study Area. The main feeding habitats of the Common Sandpiper are areas around reed beds, permanent or temporary freshwater marshes, drainage ditches and irrigation canals, wet meadows, the Nestos riverbed and lagoons or the coastal zone especially in winter (Kazantzidis & Naziridis 1999).

50-170 individuals have been recorded in SAC GR1150001 (SDF), while in the Nestos Delta and coastal lagoons over 1000 individuals have been recorded in 1997-2008 (Portolou et al. 2009) and 250-1800 individuals in 1990-96 (Bourdakis & Vareltzidou 2000). During the Midwinter waterbird counts in the Keramoti Lagoons (without a specific count on the perches) 29-218 Sandpipers (A.E. 76 individuals) were recorded in the decade 2014-2023 (EEA unpublished data). On 18/11/1976, before the drainage works in the western part of the Nestos Delta were completed, 1650 Red-tailed Hawks were recorded flying towards their night roost in the Nestos Delta (Doherty P. 1976). Within the FRA the species was recorded in the terrestrial part of the FRA (1-4 individuals). The largest concentrations of the species were recorded in the Agiasma Lagoon (70 individuals and 55 individuals in March and September 2024, respectively) and in the Eratinos Lagoon (22 individuals in March 2024).

Table 38: Abundance of Microcarbo pygmaeus during winter (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird surveys in Greece" during the period 2014-2023)

Scientific name	Ener gean	Vasova lagoon	Eratino lagoon	Agiasma lagoon	Keramoti Lagoon	Marine lake-sea area	Total
Microcarbo pygmaeus	1 - 8	1 - 27	6 - 74	7 - 171	1 - 15	3	15-218 (84.6)

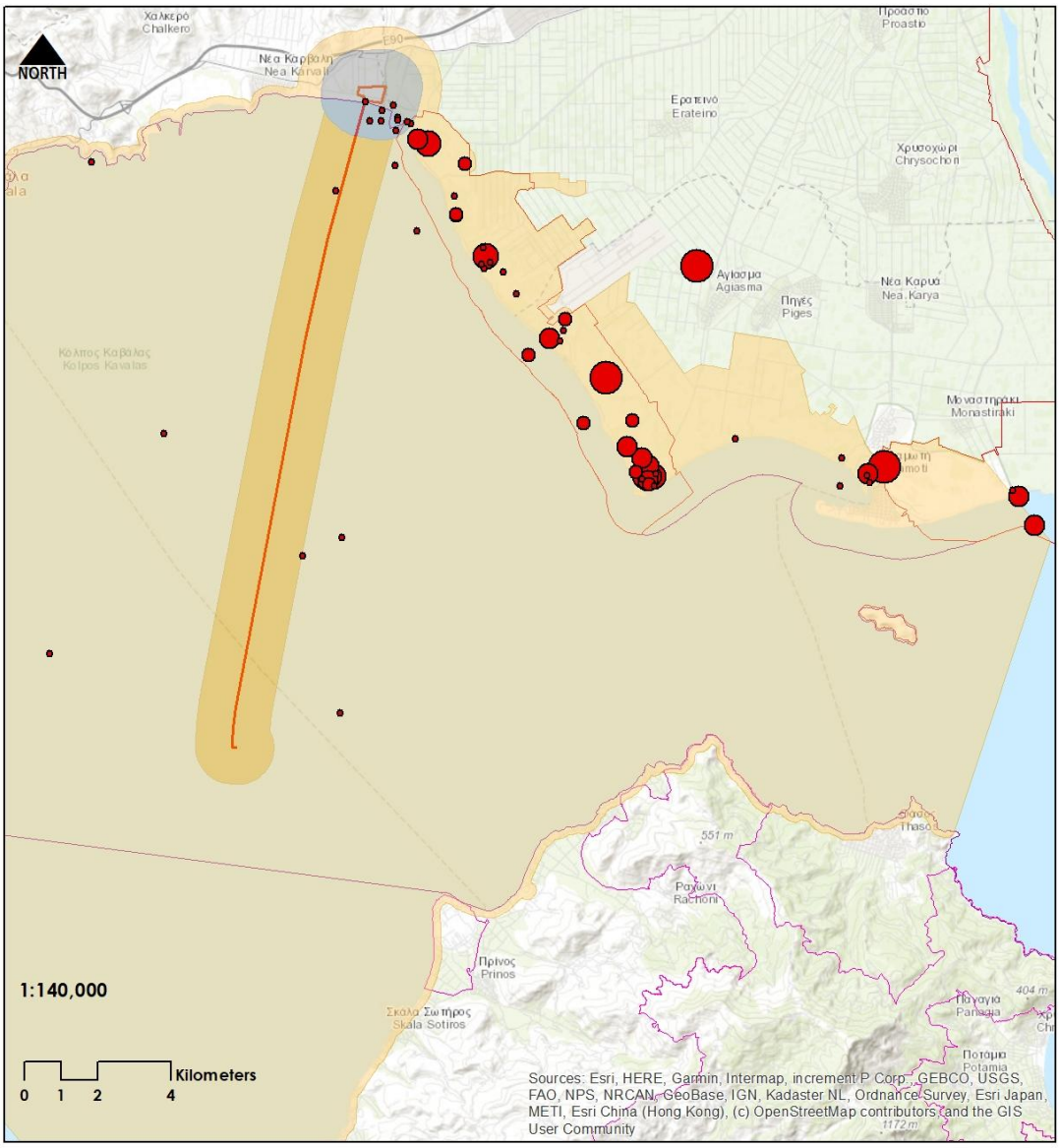
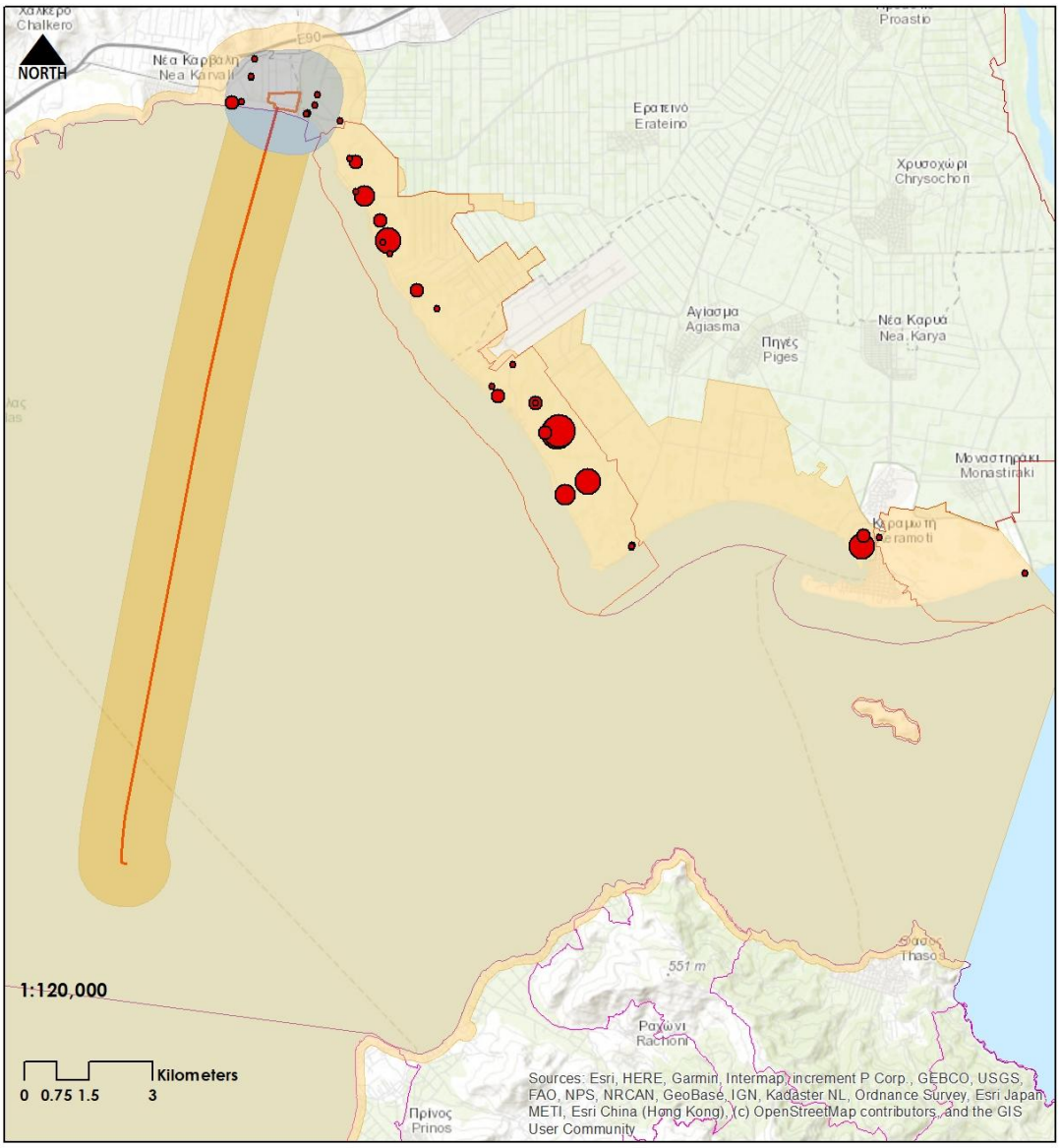


Figure 62: Locations of Phalacrocorax carbo sinensis recordings during SEAS fieldwork



Υπόμνημα

Microcarbo pygmaeus

- 1 - 2
- 3 - 4
- 5 - 7
- 8 - 22
- 23 - 55

Περιοχή Έρευνας Πεδίου

- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2
- Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

- ΖΕΠ GR1150001
- ΖΕΠ GR1150012
- ΖΕΠ/ΕΖΔ GR1150014
- Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
- Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ

Figure 63: Microcarbo pygmaeus recording locations during SEAS fieldwork

1.1.B1.iii.6 Podicipedidae

Great Crested Grebe (*Podiceps cristatus*)

The Great Crested Grebe winters in wetlands and the coastal marine area of the Study Area and the extended FRA. 50-300 individuals have been recorded in the winter in the GR1150001 SAC, where 1-2 breeding pairs (TEB). During the Midwinter waterbird surveys, 0-130 Great Crested Grebe (A.E. 57 individuals) were recorded in the Keramoti Lagoons in the decade 2014-2023 (EEA unpublished data).

The species was recorded mainly in March 2024 with the highest concentration being in the coastal marine zone within the FRA (24 individuals). Outside the FRA, the species was also recorded in the coastal marine zone west and southeast of the Sigma factory as well as in the Agiasma Lagoon. In the autumn, 1 individual was recorded in the Eratinos lagoon.

Table 39: Abundance of Podiceps cristatus during winter (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird surveys in Greece" during the period 2014-2023)

Scientific name	Energean	Vasova lagoon	Eratino lagoon	Agiasma lagoon	Keramoti Lagoon	Marine lake-sea area	Total
Podiceps cristatus	1	1 - 42	10 - 83	2 - 27	1 - 13	3 - 83	11-130 (57.0)

Black-backed Grebe (*Podiceps nigricollis*)

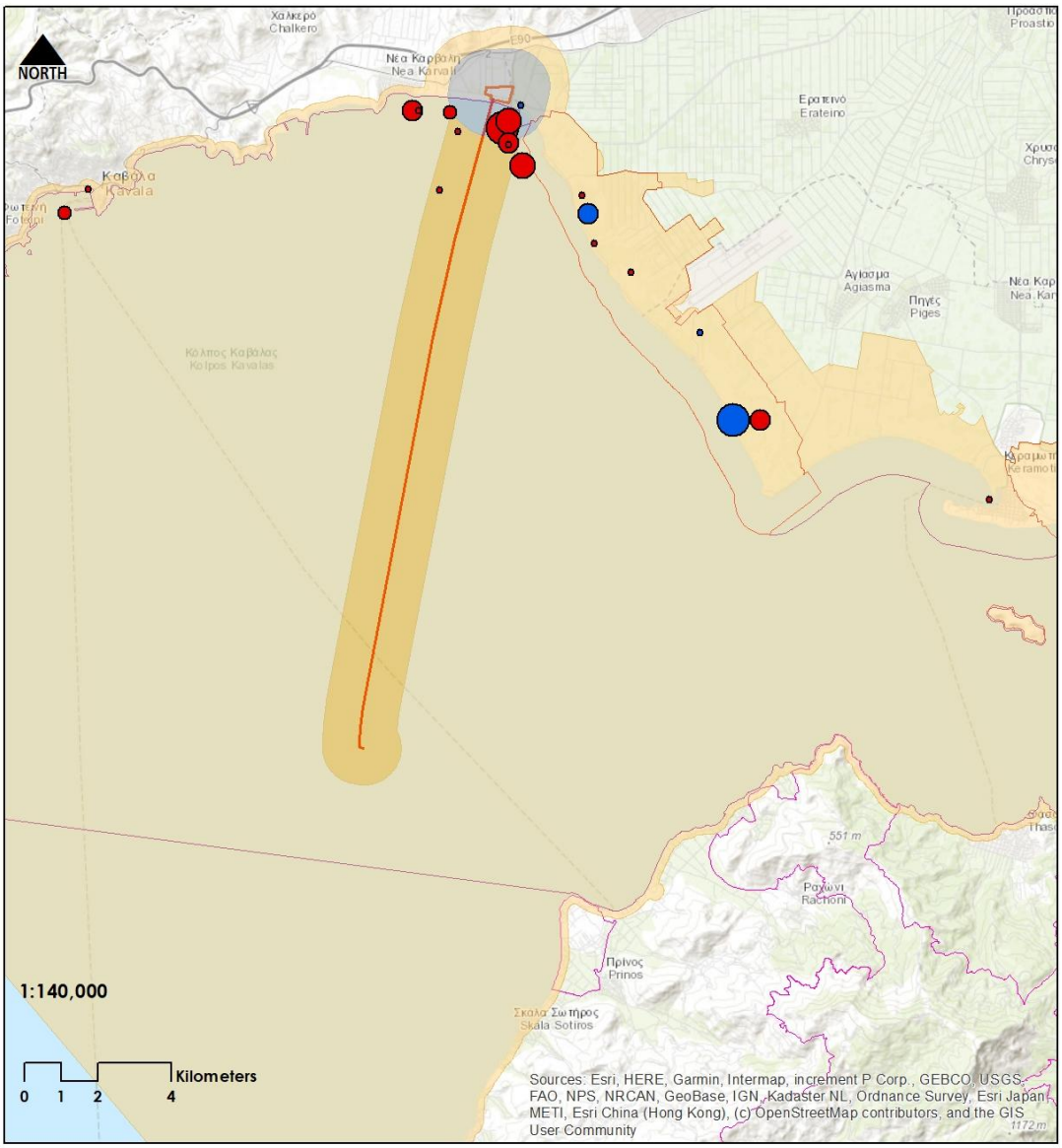
The Black-backed Grebe winters in wetlands and the coastal marine area of the Study Area.

20-70 individuals have been recorded in the winter in the SPA GR1150001 (TED). During the Midwinter waterbird surveys in the Keramoti Lagoons, 5-141 Black-backed Grebes (A.E. 53 individuals) were recorded in the decade 2014-2023 (EEA unpublished data).

The species was recorded in September 2024 in the Agiasma Lagoon (35 individuals) and in March 2024, 3 individuals within the FRA in the wetland east of the Sigma factory and 15 individuals in the Eratinos Lagoon.

Table 40: Abundance of Podiceps nigricollis during winter (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird surveys in Greece" during the period 2014-2023)

Scientific name	Energean	Vasova lagoon	Eratino lagoon	Agiasma lagoon	Keramoti Lagoon	Marine lake-sea area	Total
Podiceps nigricollis	1	2 - 26	2 - 43	7 - 105		5 - 64	5-141 (53.0)



Υπόμνημα

Podiceps cristatus	Podiceps nigricollis
1	1 - 3
2 - 3	4 - 15
4 - 6	16 - 34
7 - 9	
10 - 15	

Περιοχή Έρευνας Πεδίου

- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2
- Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

- ΖΕΠ GR1150001
- ΖΕΠ GR1150012
- ΖΕΠ/ΕΖΔ GR1150014
- Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
- Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ

Figure 64: Locations of Podiceps cristatus and Podiceps nigricollis records during SEAS fieldwork

1.1.B1.iii.7 Goshawks

(Common) Swan (*Cygnus olor*)

The Swan is found in all types of wetlands, coastal and inland, during the winter. It breeds in eutrophic wetlands (mainly freshwater lakes and marshes), with reed beds or other dense vegetation, more rarely in coastal wetlands with brackish waters (Dimalexis 2009). 37-266 individuals have been recorded in the winter in the SPA GR1150001, where 1-20 pairs breed (SDF). During the Midwinter waterbird censuses, 1-206 Swans (M.E. 91 Median 74 individuals) were recorded in the Keramoti Lagoons in the decade 2014-2023 (EEA unpublished data).

The species has been recorded in the Agiasma lagoon during all visits (up to 102 individuals in spring 2024 and 367 individuals in September 2024) and in the Keramoti lagoons (2 individuals in September 2024). In September, at least five family groups with young individuals were recorded, indicating possible reproduction of the species in the area.

Table 41: Winter abundance of Cygnus olor (source: Hellenic Ornithological Society, 2024, data from the programme "Mid-winter Waterbird Counts in Greece" for the period 2014–2023).

Scientific name	Energean	Vasova lagoon	Eratino lagoon	Agiasma lagoon	Keramoti Lagoon	Marine lake-sea area	Total
Cygnus olor		3 - 15	1 - 92	1 - 184			1-206 (90.8)

Mallard Duck (*Anas platyrhynchos*)

The Mallard breeds and overwinters in all types of wetlands, both coastal and inland, while in winter it also takes refuge in the sea when there is intense disturbance in the lagoons. 20-930 individuals have been recorded in the winter in the SPA GR1150001, where 1-29 pairs breed (SDF). During the Midwinter waterbird censuses, 7-987 Mallards (M.E. 2132, Median 52 individuals) were recorded in the Keramoti Lagoons in the decade 2014-2023 (EEA unpublished data).

The highest abundance of the species was recorded in September 2024 in Agiasma Lagoon (53 individuals), Keramoti Lagoons (4 individuals) and Eratinou Lagoon (2 individuals). In March 2024, 2 individuals were recorded within the FRA. Outside the FRA, the species was recorded in wetlands west of the factory (3-5 individuals), Vasova Lagoon (3-4 individuals), Eratinou Lagoon (1-11 individuals), Agiasma Lagoon (3 individuals) and Keramoti Lagoons (3 individuals).

Table 42: Abundance of Anas platyrhynchos during winter (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird surveys in Greece" during the period 2014-2023)

Scientific name	Energean	Vasova lagoon	Eratino lagoon	Agiasma lagoon	Keramoti Lagoon	Marine lake-sea area	Total
Anas platyrhynchos	30	1 - 37	8 - 218	4 - 215	2 - 12	800	7-987 (213.3)

Whistling Wren (*Mareca penelope*)

The Whistling Wren winters in all types of wetlands, coastal and inland, and is also found in the coastal zone at sea. 20-930 individuals have been recorded in the winter in the SPA GR1150001 (SDF). During the Midwinter waterbird censuses, 139-1430 Whistling Wrens (A.O. 650, Median 504 individuals) were recorded in the Keramoti Lagoons in the decade 2014-2023 (EEA unpublished data).

The species was recorded in March 2024 in Eratinos Lagoon (3 individuals) and in Agiasma Lagoon (18 individuals), as well as in September 2024 in Agiasma Lagoon (10 individuals).

Table 43: Abundance of Mareca penelope during winter (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird surveys in Greece" during the period 2014-2023)

Scientific name	Energean	Vasova lagoon	Eratino lagoon	Agiasma lagoon	Keramoti Lagoon	Marine lake-sea area	Total
Mareca penelope		2 - 59	2 - 315	139 - 1361		148	139-1430 (649.7)

Barbara *(Tadorna tadorna)*

The Common Sandpiper breeds and winters in coastal wetlands with lagoons, salt marshes, extensive mudflats, shallow sandy shores and enclosed sea bays, while it can nest in suitable locations away from wetlands (Chandrinos et al. 2009). 21-156 individuals have been recorded in the winter in SAC GR1150001, where 1-20 pairs breed (TD). During the Midwinter waterbird censuses, 0-138 Common Sandpipers (M.E. 37, Median 11 individuals) were recorded in the Keramoti Lagoons in the decade 2014-2023 (EEA unpublished data).

The species is widely distributed in the lagoons of the area, on the adjacent coasts as well as in the coastal marine zone. In the spring of 2024 within the FRA the species was recorded in the wetland east of the Sigma factory (2-3 individuals), in the Vasova lagoon (32-36 individuals), in the Eratinos lagoon and the adjacent coast (3-7 individuals), in the Agiasma lagoon and the adjacent coast (17-41 individuals), in the Keramoti lagoons (4-45 individuals), while 39 individuals were recorded in the marine area west of the Sigma factory in March 2024. In September 2024 5 individuals of the species were recorded in the marine area south-southwest west of the Sigma factory.

Table 44: Abundance of Tadorna tadorna penelope during winter (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird surveys in Greece" during the period 2014-2023)

Scientific name	Energean	Vasova lagoon	Eratino lagoon	Agiasma lagoon	Keramoti Lagoon	Marine lake-sea area	Total
Tadorna tadorna		4 - 29	6 - 78	2 - 37	1 - 5		0-138 (37.1)

Common Sandpiper (*Mergus serrator*)

The Common Sandpiper winters mainly at sea, frequenting both coastal and offshore waters, river estuaries, bays and brackish lagoons, but shows a preference for clear, shallow waters that are not affected by strong wave action (BirdLife International 2021). The increased numbers (42 individuals) of Common Sandpipers recorded in the Nestos Delta in late March, compared to early-mid March, are likely due to migration of the species from the Adriatic and Ionian coasts (Meininger 1990).

In SAC GR1150001, the wintering of one Common Sandpiper (SDF). In the Nestos Delta and coastal lagoons, wintering has been recorded as 0-150 individuals (Jerrentrup & Naziridis 1996).

During the Midwinter waterbird surveys in the Keramoti Lagoons, 0-2 Red-throated Divers were recorded in the decade 2014-2023 (EEA unpublished data).

One Red-throated Diver (female or immature) was observed in the Agiasma Lagoon during all visits in the spring of 2024. It was not observed in the autumn of 2024. A female individual had been observed in the Nestos Delta in August 1982 (Handrinos & Akriotis 1997).

Table 45: Abundance of Mergus serrator during winter (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird surveys in Greece" during the period 2014-2023)

Scientific name	Energean	Vasova lagoon	Eratino lagoon	Agiasma lagoon	Keramoti Lagoon	Marine lake-sea area	Total
Mergus serrator		2	2	2			0-2 (0.7)

Πουπουλόπαπια (*Somateria mollissima*)

The Common Duck usually winters in shallow coasts, bays and estuaries, especially where there are large abundances of benthic molluscs (BirdLife International. 2021). It is included in the other important species of SAC GR1150001 without presenting population data (SDF). Two individuals are reported to winter in the Nestos Delta and coastal lagoons (Jerrentrup & Naziridis 1996).

A male Common Duck (2nd cy) was recorded repeatedly in May and September 2024 along the beach of Agiasma. It is probably the same individual that was observed in the area on 27/1/2024. The species has been observed again in the marine area of Agiasma lagoon on 25/7/2007 (EAOP 2008).

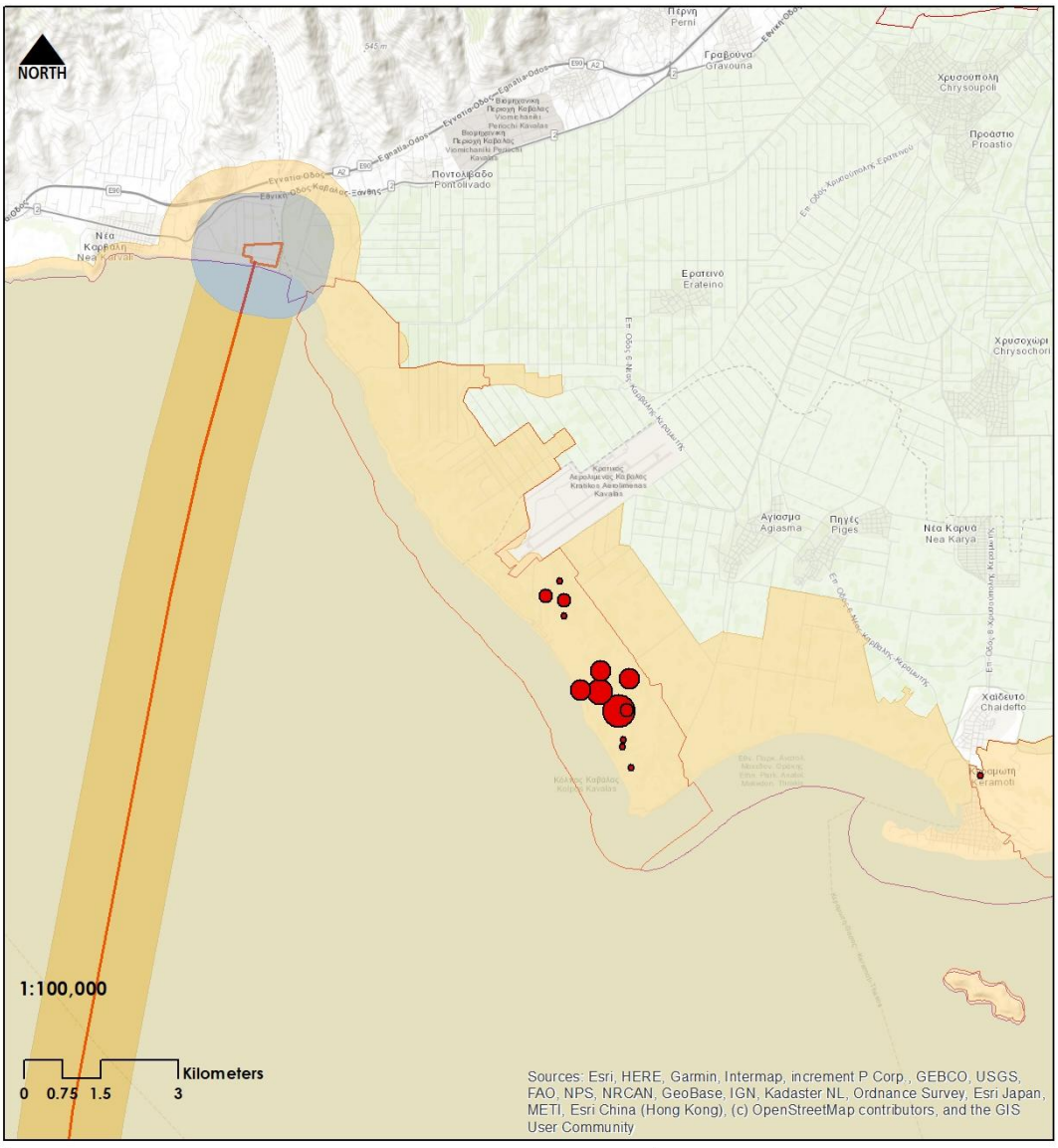
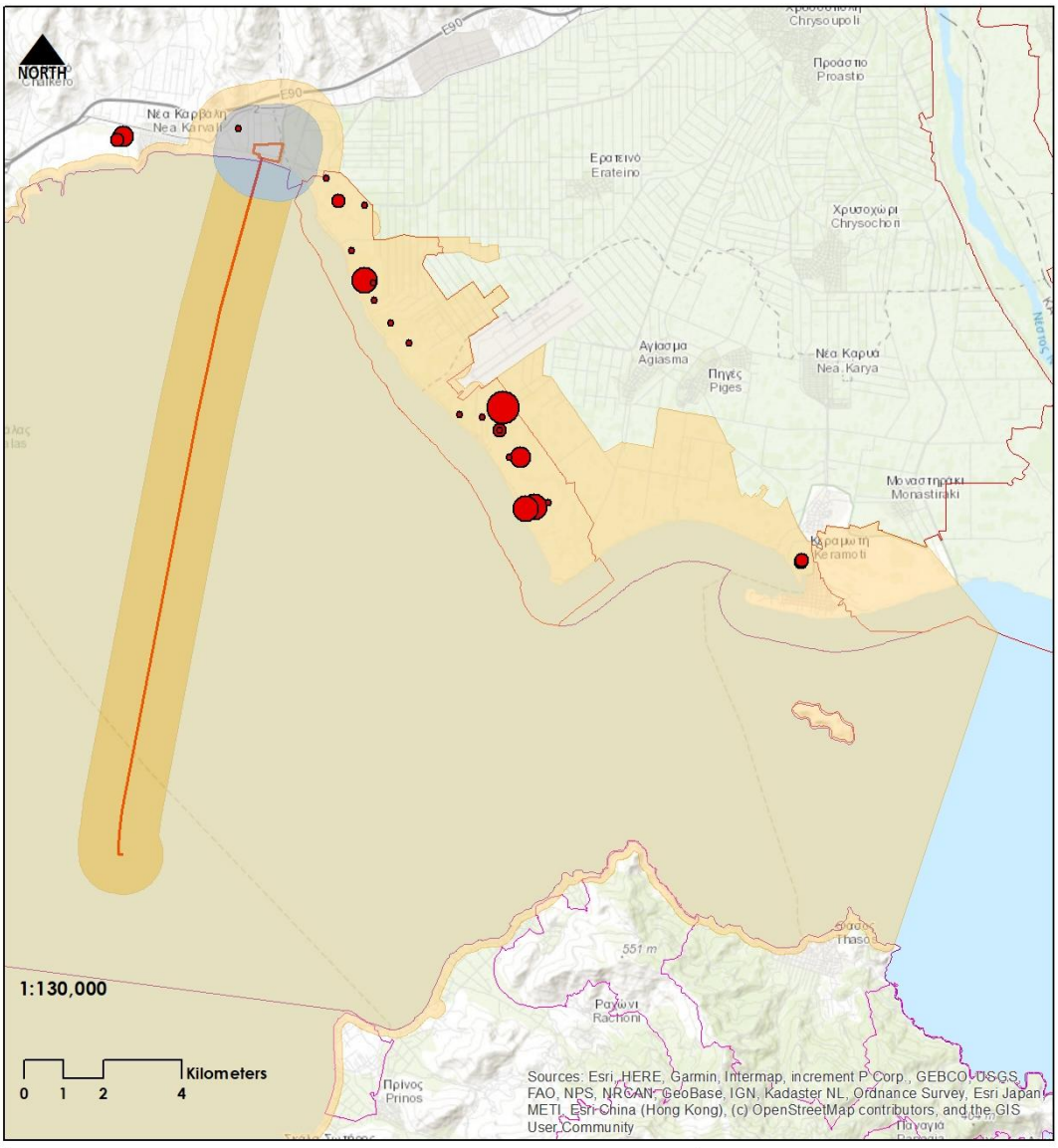


Figure 65: Cygnus olor recording locations during SEAS fieldwork



Υπόμνημα

Anas platyrhynchos
- 1 - 2
- 3 - 4
- 5 - 6
- 7 - 15
- 16 - 23

Περιοχή Έρευνας Πεδίου
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2
- Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης
- ΖΕΠ GR1150001
- ΖΕΠ GR1150012
- ΖΕΠ/ΕΖΔ GR1150014
- Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
- Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ

Figure 66: Anas platyrhynchos recording locations during SEAS fieldwork

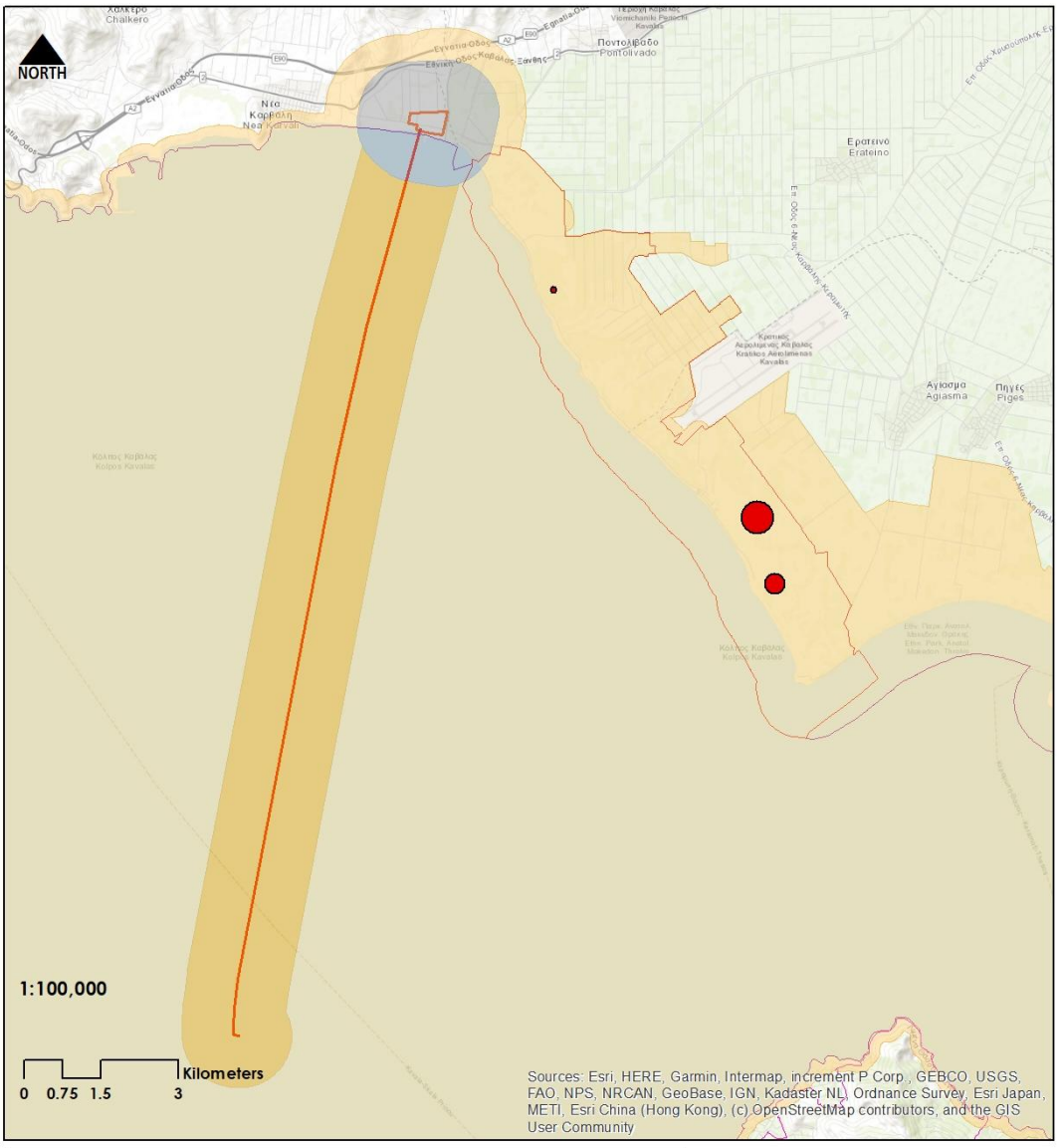
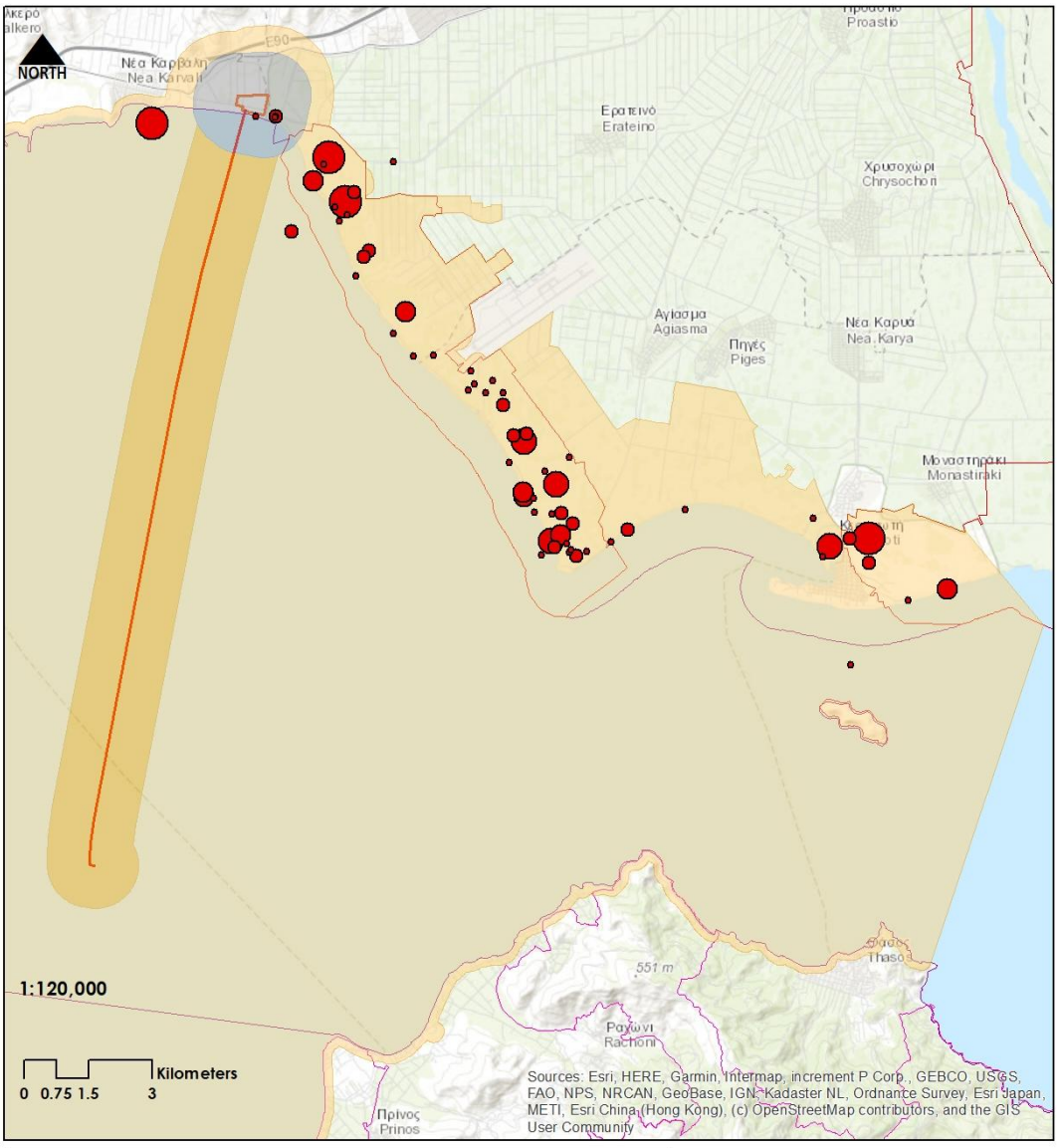


Figure 67: Mareca penelope recording locations during SEAS fieldwork



Υπόμνημα

Tadorna tadorna

- 1 - 2
- 3 - 5
- 6 - 9
- 10 - 14
- 15 - 39

Περιοχή Έρευνας Πεδίου

- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2
- Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

- ΖΕΠ GR1150001
- ΖΕΠ GR1150012
- ΖΕΠ/ΕΖΔ GR1150014
- Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
- Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ

Figure 68: Tadorna tadorna recording locations during SEAS fieldwork

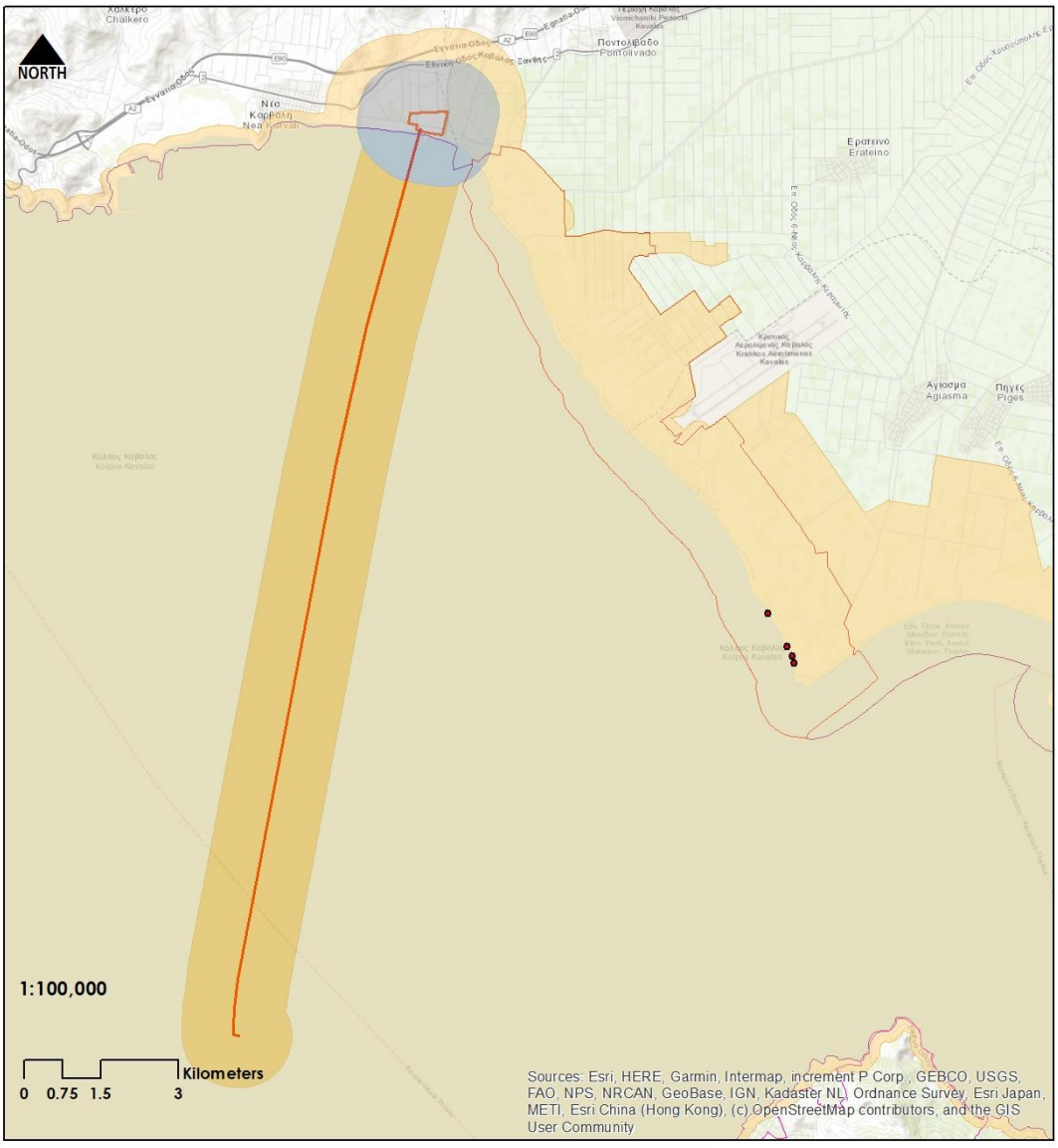


Figure 69: Locations of Somateria mollissima records during SEAS fieldwork

1.1.B1.iii.8 Pullets and moorhens

(Common) Coot (*Fulica atra*)

The Coot nests and overwinters in all types of wetlands, both coastal and inland. 3950-12660 individuals have been recorded in the winter in the SPA GR1150001, while the species reproduces with an unknown number of pairs (TIE). During the Midwinter waterbird censuses, 431-12496 Coots (M.E. 4628, Median 4001 individuals) were recorded in the Keramoti Lagoons in the decade 2014-2023 (EEA unpublished data). In March 2024, the species has been recorded in the Agiasma Lagoon (60 individuals) and in the Vasova Lagoon (32 individuals), while in September 7,180 individuals were recorded in the Agiasma Lagoon.

Table 46: Abundance of Fulica atra during winter (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird surveys in Greece" during the period 2014-2023)

Scientific name	Energean	Vasova lagoon	Eratino lagoon	Agiasma lagoon	Keramoti Lagoon	Marine lake-sea area	Total
Fulica atra	1 - 8	7 - 1601	105 – 1.934	90 – 12.093	3 - 205	5	431-12496 (4627.8)

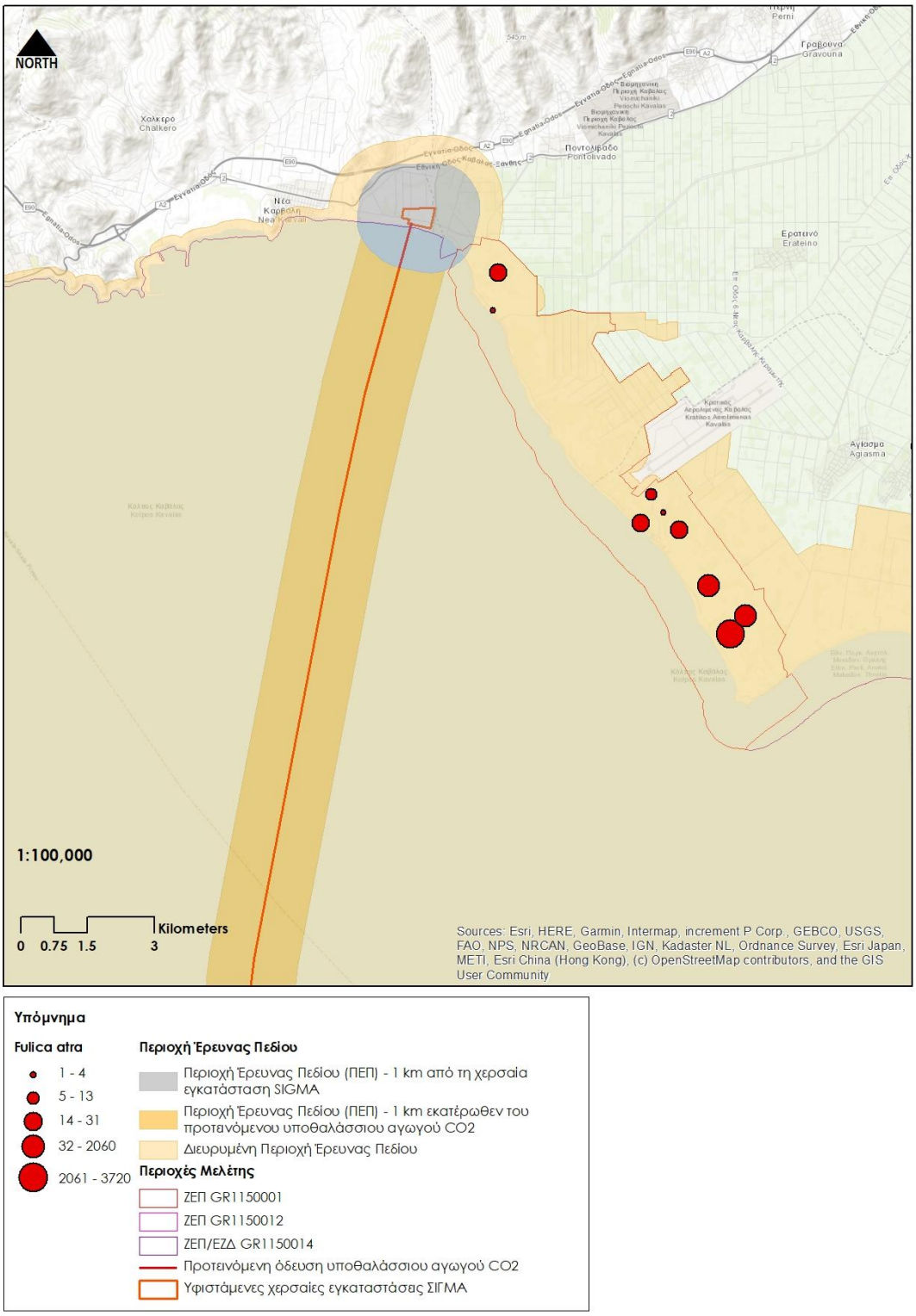


Figure 70: Fulica atra recording locations during SEAS fieldwork

1.1.B1.iii.9 Herons

Egret (*Ardea alba*)

The Silver Egret winters in all types of wetlands, coastal and inland and along the coasts. 10-60 individuals have been recorded in the SPA GR1150001 (SDF), while in the Nestos Delta and coastal lagoons 5-222 individuals have been recorded in 2000-08 (Portolou et al. 2009) and 120-500 individuals in 1996 (Bourdakis & Vareltzidou 2000). During the Midwinter waterbird surveys in the Keramoti Lagoons, 5-151 Silver Egrets (M.E. 55, Median 35 individuals) were recorded in the decade 2014-2023 (EEA unpublished data).

Within the FRA, individual individuals of the species were recorded in the marine coastal zone and in the terrestrial part of the FRA, west of the Sigma factory. The largest concentrations of the species were recorded in the Agiasma Lagoon (up to 22 individuals in spring 2024) and Eratinos Lagoon (19 individuals in autumn 2024).

Table 47: Abundance of Ardea alba during winter (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird surveys in Greece" during the period 2014-2023)

Scientific name	Energean	Vasova lagoon	Eratino lagoon	Agiasma lagoon	Keramoti Lagoon	Marine lake-sea area	Total
Ardea alba	1	3 - 26	1 - 145	2 - 55	1 - 14		5-151 (54.9)

Grey Heron (*Ardea cinerea*)

The Grey Heron winters in all types of wetlands with shallow water, both coastal and inland, and along the coasts. In winter, 64-192 individuals have been recorded in the SPA GR1150001 (SDF), while in the Nestos Delta and coastal lagoons 5-222 individuals have been recorded in 2000-08 (Portolou et al. 2009) and 120-500 individuals in 1996 (Bourdakis & Vareltzidou 2000). During the Midwinter waterbird surveys in the Keramoti Lagoons, 56-169 Grey Heron (M.E. 101, Median 81 individuals) were recorded in the decade 2014-2023 (EEA unpublished data). In the grove north of Keramoti there is a colony of Grey herons with 70-110 pairs (SDF).

During all visits within the FRA, 1-2 individuals of the species were recorded scattered in the marine coastal zone and in the terrestrial part of the FRA, east of the Sigma factory. The largest concentrations of the species were recorded in Vasova Lagoon (up to 17 individuals in autumn 2024), Eratinos Lagoon (up to 114 individuals in spring 2024), Agiasma Lagoon (up to 112 individuals in spring 2024) and Keramoti Bay (up to 40 individuals in spring 2024).

Table 48: Winter abundance of Ardea cinerea (source: Hellenic Ornithological Society, 2024, data from the programme "Mid-winter Waterbird Counts in Greece" for the period 2014–2023)

Scientific name	Energean	Vasova lagoon	Eratino lagoon	Agiasma lagoon	Keramoti Lagoon	Marine lake-sea area	Total
Ardea cinerea	2 - 3	10 - 57	33 - 86	1 - 62	3 - 33	3	56-169 (101.3)

White Stork (*Ciconia ciconia*)

The White Stork breeds in the neighboring settlements and passes during migration. It feeds in crops, pastures, wet meadows and wetlands. The breeding population of storks in the settlements around the Nestos Delta and the coastal lagoons that use the SPA GR1150001 is 120-146 pairs (EEA 2023). The area has recorded the largest decline of the species, due to the intensification of agriculture and the drainage of wetlands (Michailidou et al. 2015). Within the FRA, single individuals of the species were recorded east of the Sigma factory and groups of up to four individuals flying within the expanded FRA. The highest abundance of the species was recorded in settlements in the area, where the species nests. Three pairs of White Storks were recorded nesting in Nea Karvali, eight in Pontolivado, nine in Agiasma, one in Chaidefto and five in Monastiraki.

White-fronted Egret (*Egretta garzetta*)

The White-fronted Egret migrates, winters and breeds in the extended FRA. It feeds in shallow lakes, lagoons and smooth-flowing rivers or streams, in brackish estuaries and salty coastal waters. It also frequents flooded areas and ephemeral or fluctuating water bodies such as salt marshes and irrigated areas (Dimalexis et al. 2009).

In SPA GR1150001, 22-40 individuals overwinter, 200 individuals migrate and 90-190 pairs breed in the mixed heron colony in the grove north of Keramoti (SDF). In the Nestos Delta and coastal lagoons, 100+ pairs were breeding in the 1980s (EEA 1994) and 0-60 in 1998-2003 (Portolou et al. 2009). White-fronted Egret colonies have been recorded on the island of Thasopoula (Kazantzidis et al. 2024) and in the marsh west of Nea Karvali with 30-50 pairs in 1967 (Kraus et al. 1969).

During the Midwinter waterbird surveys in the Keramoti Lagoons, 8-35 White-fronted Egrets (mean 21, median 20 individuals) were recorded in the decade 2014-2023 (EEA unpublished data).

The species was widely distributed in the lagoons and wetlands of the area as well as on the adjacent coasts during all visits. The largest concentration of the species within the FRA was recorded in the wetland east of the Sigma factory (up to 13 individuals in spring 2024), while isolated individuals were recorded in different terrestrial sections and on the coast of the FRA. The species was also recorded in Vasova Lagoon (up to 11 individuals), Eratinos Lagoon (up to 29 individuals), Agiasma Lagoon (up to 14 individuals) and Keramoti Lagoons (up to 8 individuals).

Table 49: Abundance of Egretta garzetta during winter (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird surveys in Greece" during the period 2014-2023)

Scientific name	Energean	Vasova lagoon	Eratino lagoon	Agiasma lagoon	Keramoti Lagoon	Marine lake-sea area	Total
Egretta garzetta	8	1 - 15	1 - 17	1 - 18	1 - 3		8-35 (21.1)

Nightingale (*Nycticorax nycticorax*)

The Nightingale passes during migration and breeds in the wider FRA. It prefers wetlands (natural or artificial, inland or coastal) areas with dense vegetation, rice fields, etc., while during migration it can be observed in dry meadows, coasts and river estuaries (BirdLife International 2021).

In the SPA GR1150001, 20-50 individuals pass during migration (SDF), while Nightingales breed in the mixed heron colony in the grove north of Keramoti, 90-190 pairs (Kazantzidis et al. 2024). In the Nestos Delta and coastal lagoons, 15+ pairs of Nightingales were breeding in the 1980s (EEA 1994).

The species was not recorded within the FRA, however it was recorded in a wetland west of the Sigma factory (2 individuals), in the Eratinos lagoon (3 individuals), in the Agiasma lagoon (1 individual) and in the Keramoti lagoons (up to 10 individuals). In the grove north of Keramoti, there was a colony of Nightingales during the 2024 breeding season, but no census of the mixed heron colony was attempted to avoid disturbing the breeding herons, as a census had recently been conducted (in 2023) by the Nestos - Vistonida and Rodopi National Parks Management Unit (Patetsini prox.).

Silver Pelican (*Pelecanus crispus*)

Silver Pelicans winter in all types of wetland habitats, both inland (lakes, etc.) and coastal (lagoons, river deltas, etc.), sometimes at sea (Dimalexis et al. 2009).

100-350 individuals winter in SPA GR1150001, while 150-200 individuals pass through during migration (MET). During the Midwinter waterbird censuses in the Keramoti Lagoons, 2-85 Silver Pelicans (M.E. 31, Median 24 individuals) were recorded in the decade 2014-2023 (EEA unpublished data).

The species was recorded in Vasova Lagoon (2 and 7 individuals in early April and September 2024, respectively), Eratinos Lagoon (1 and 13 individuals in May and September 2024, respectively), Agiasma Lagoon (16 individuals in September 2024) and Keramoti Lagoons (4 individuals in September 2024).

Table 50: Abundance of Pelecanus crispus during winter (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird surveys in Greece" during the period 2014-2023)

Scientific name	Energean	Vasova lagoon	Eratino lagoon	Agiasma lagoon	Keramoti Lagoon	Marine lake-sea area	Total
Pelecanus crispus		1 - 23	4 - 46	1 - 29	2 - 4	4 - 35	2-85 (31.6)

Rhododendrons pelican (*Pelecanus onocrotalus*)

Rhododendrons, during migration, are often found at sea, but also over mountainous / hilly areas. The species is piscivorous and feeds mainly in freshwater wetlands (lakes), but also in coastal wetlands with lagoons, etc. (Dimalexis et al. 2009).

In SPA GR1150001, 100-150 individuals pass during migration (TED).

The species was recorded during spring migration crossing the FRA (32 individuals at the Sigma factory in March 2024 and 50 individuals in the marine area of the FRA in April 2024). Other observations of the species also concerned migration with flocks recorded in Vasova Lagoon (23 individuals in April 2024), Eratinos Lagoon (24 individuals in March 2024) and Agiasma Lagoon (19 individuals in September 2024).

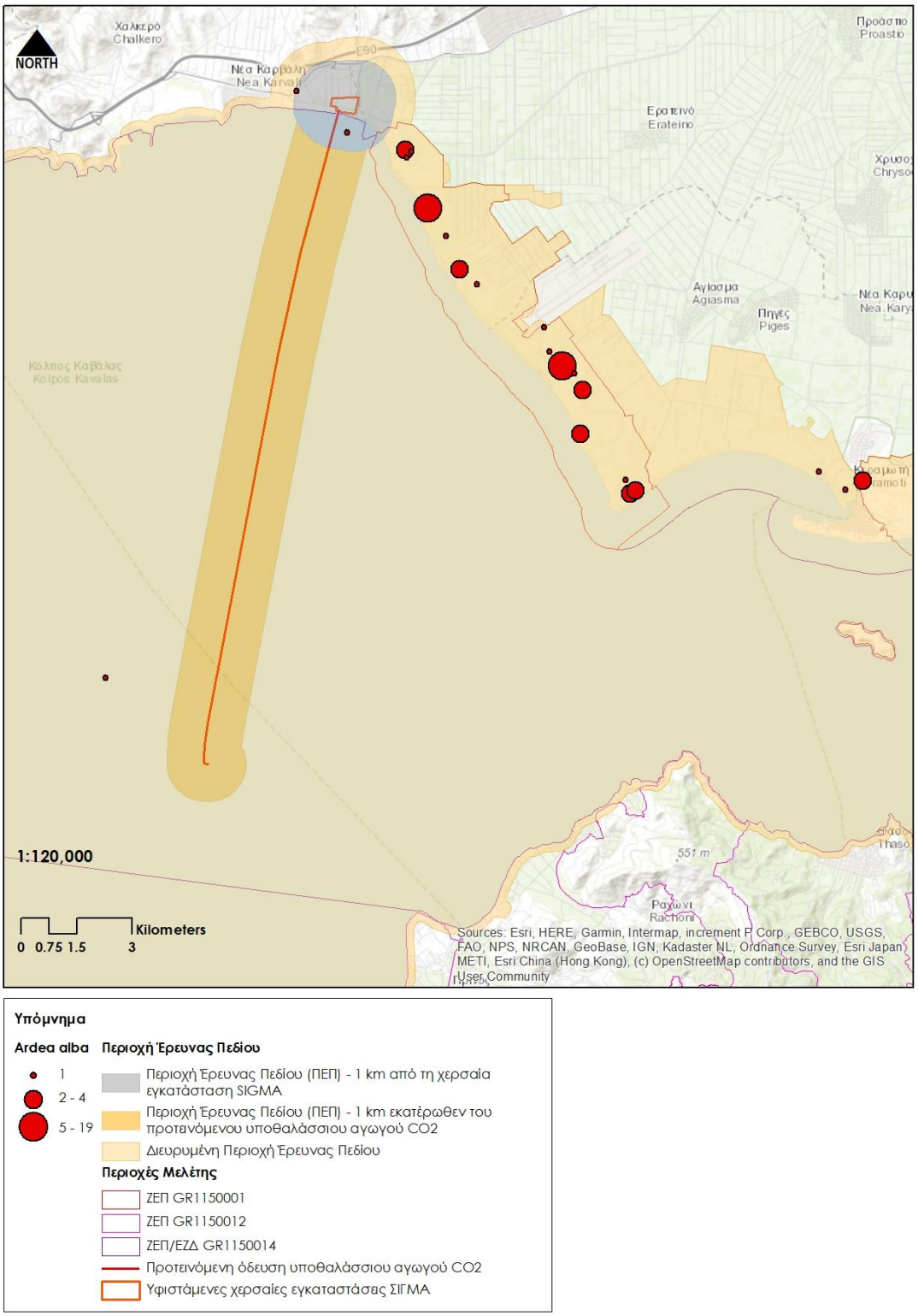


Figure 71: Ardea alba recording locations during SEAS fieldwork

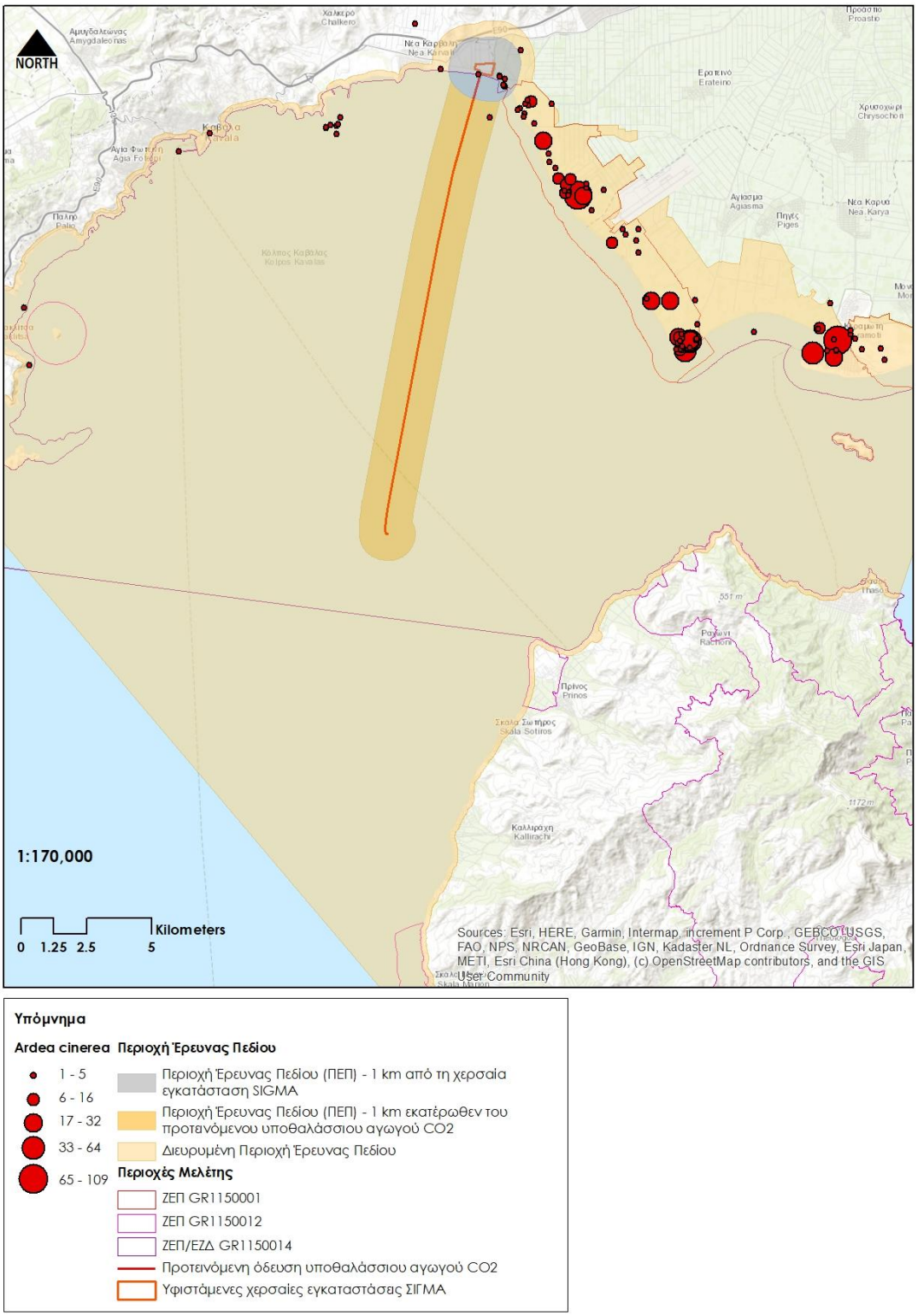


Figure 72: Ardea cinerea recording locations during SEAS fieldwork

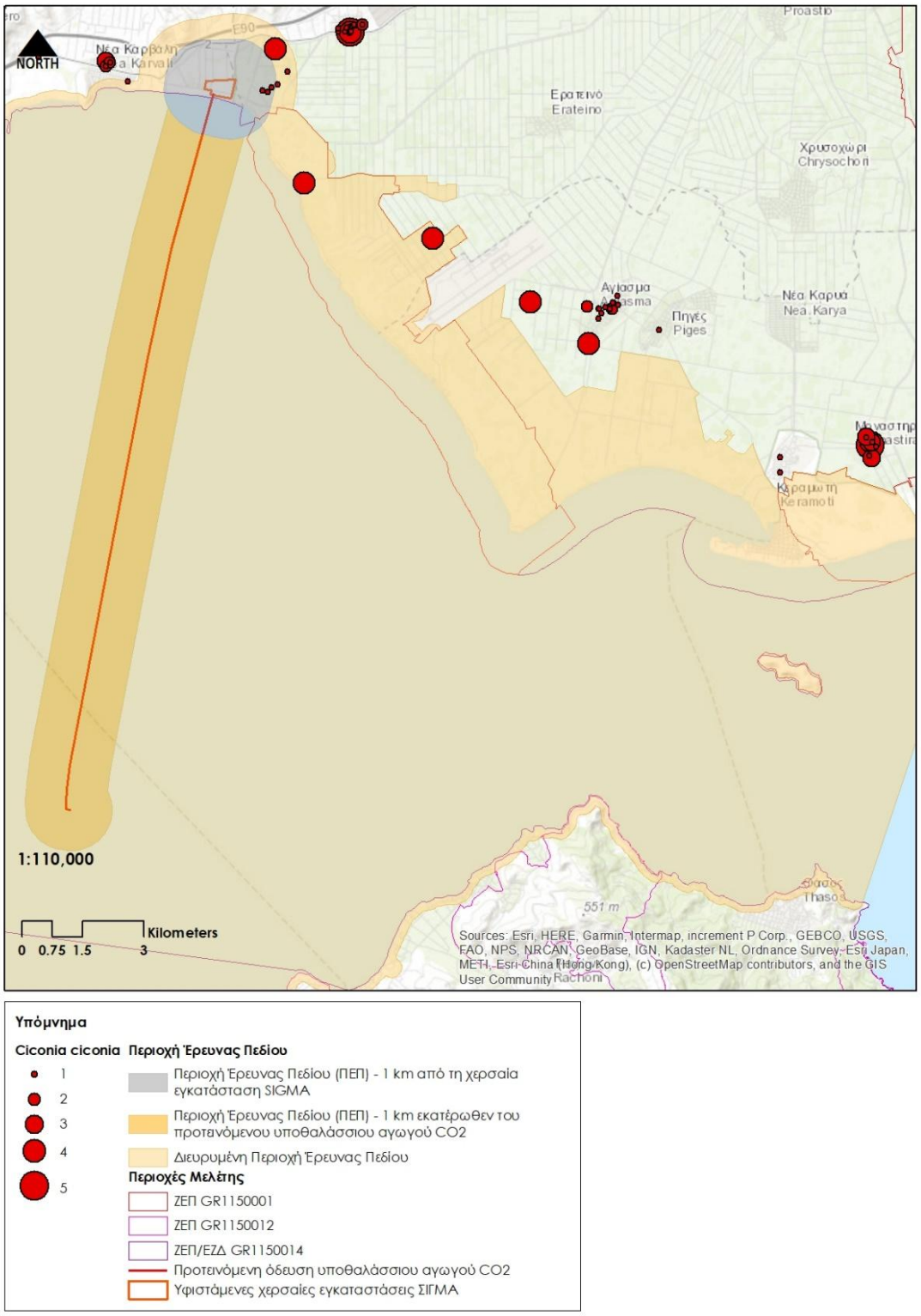


Figure 73: Ciconia ciconia recording locations during SEAS fieldwork

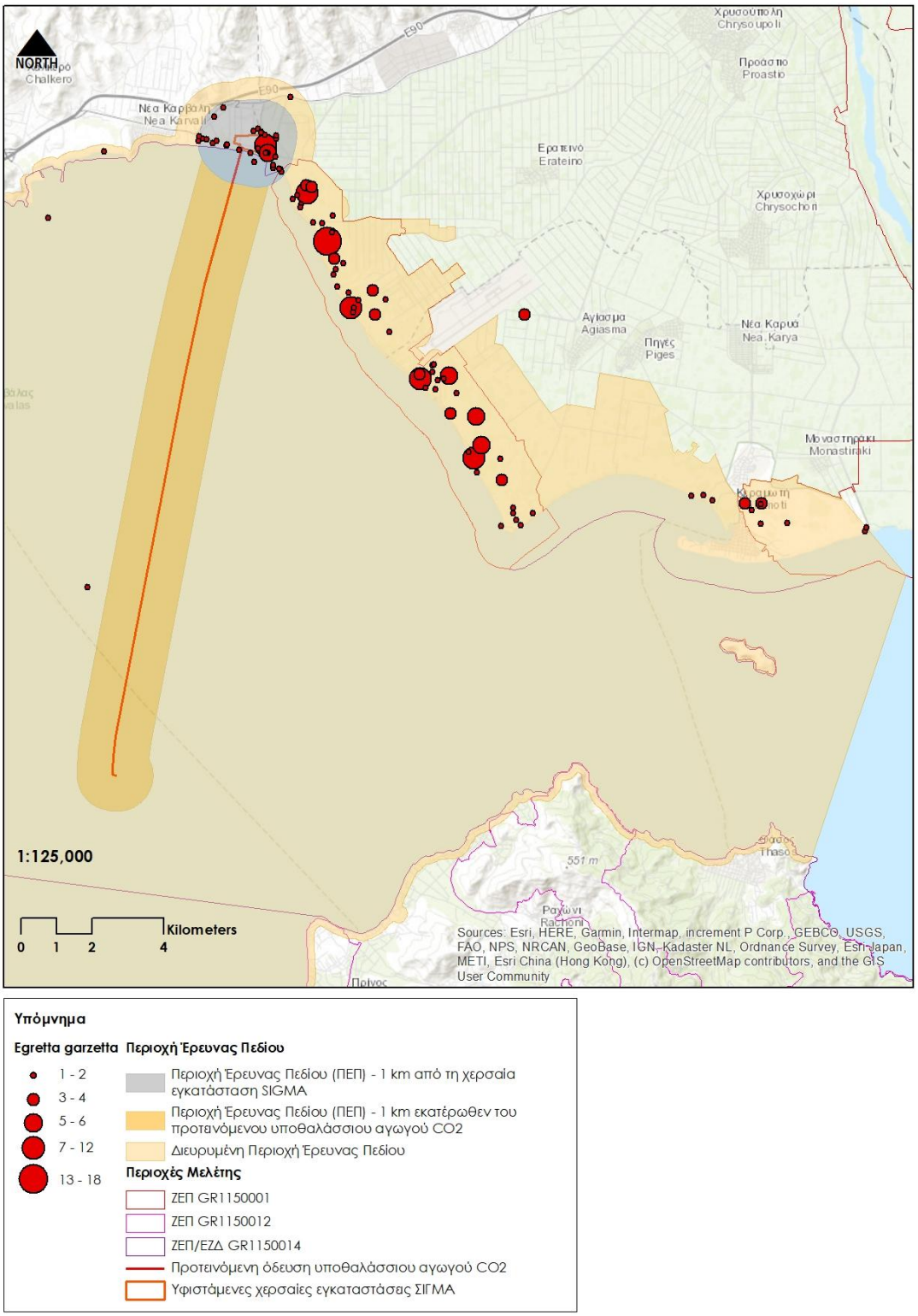


Figure 74: Egretta garzetta recording locations during SEAS fieldwork

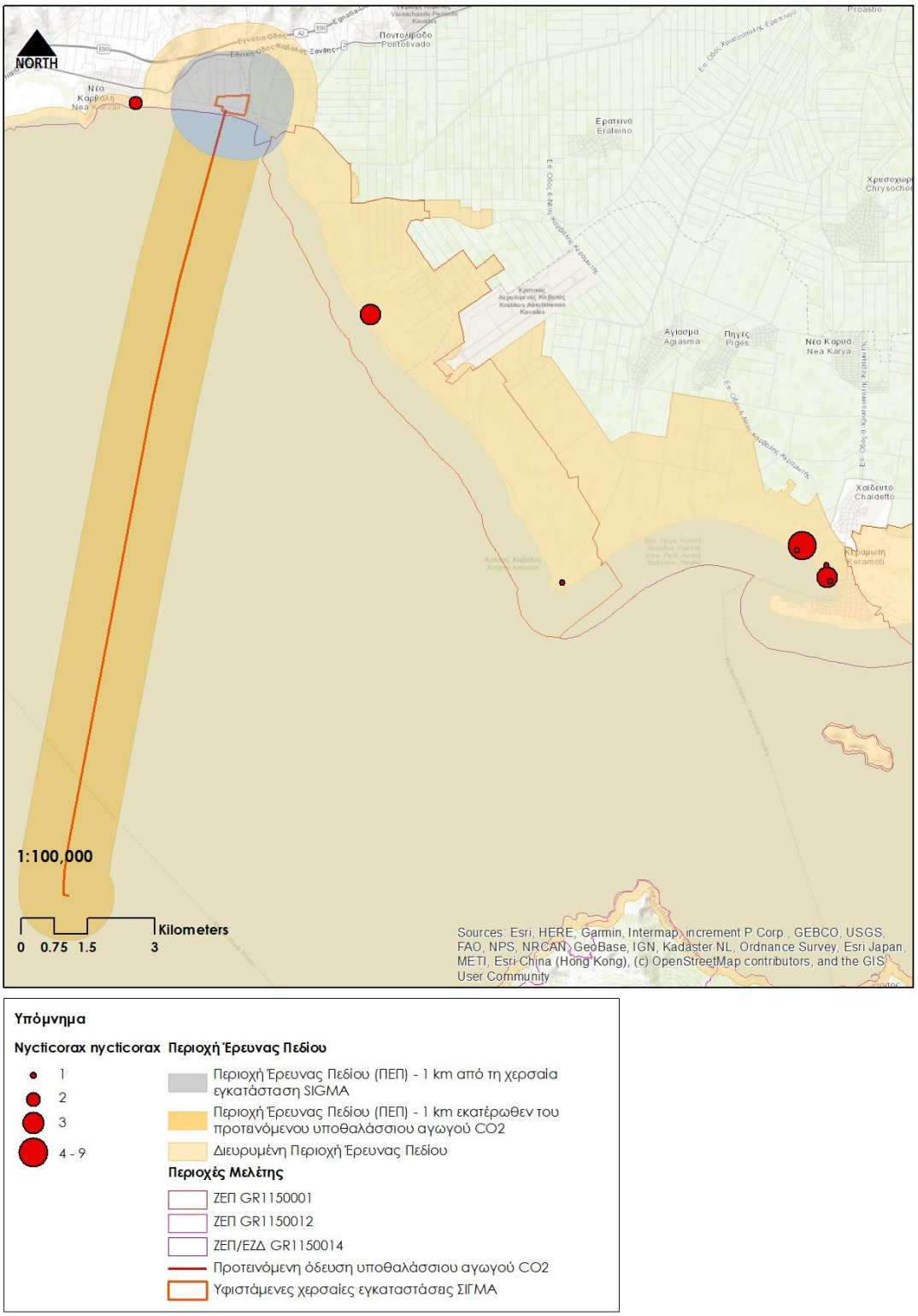
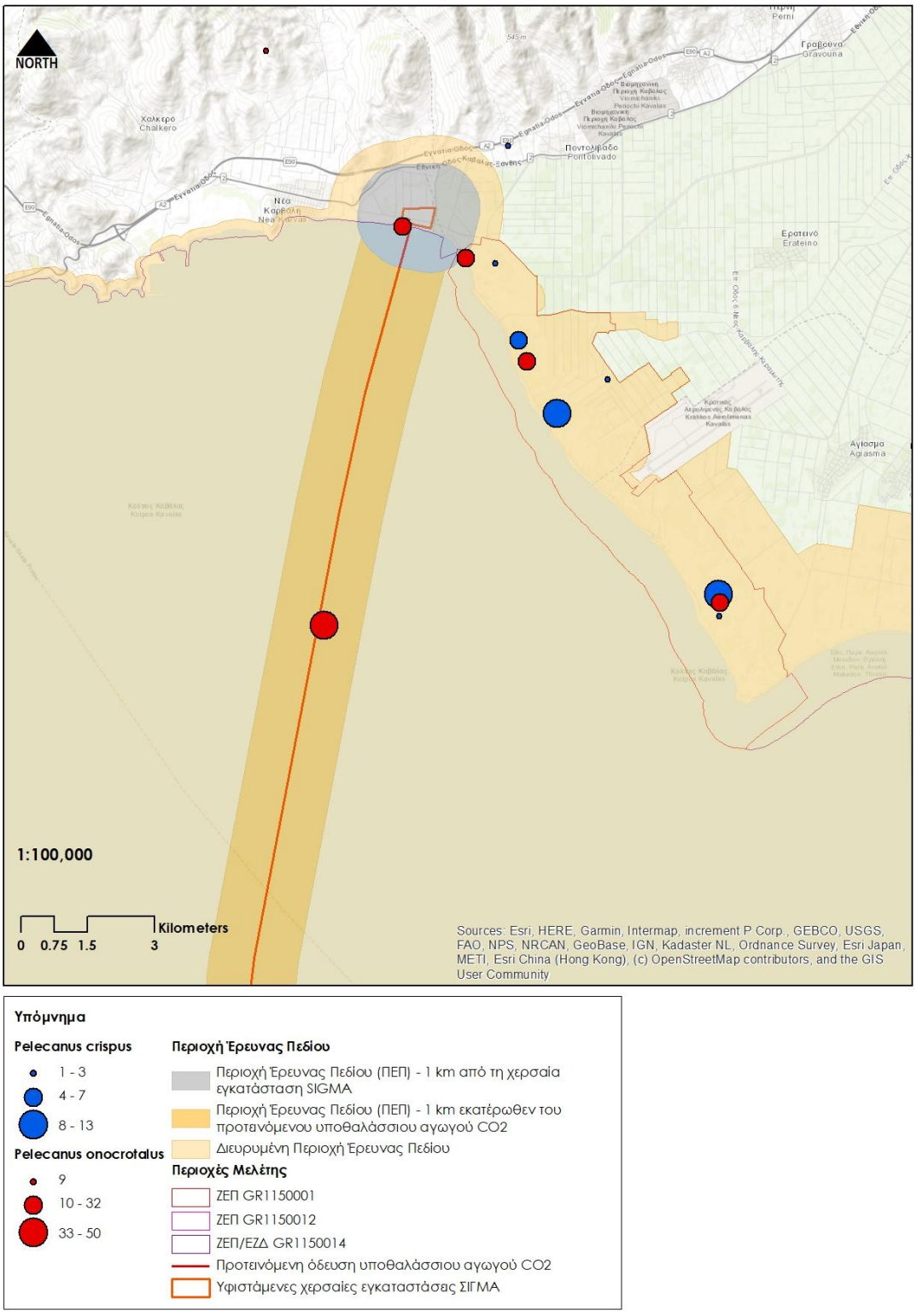


Figure 75: Locations of Nycticorax nycticorax recordings during SEAS fieldwork



Υπόμνημα

Pelecanus crispus
- 1 - 3
- 4 - 7
- 8 - 13

Pelecanus onocrotalus
- 9
- 10 - 32
- 33 - 50

Περιοχή Έρευνας Πεδίου
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2
- Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης
- ΖΕΠ GR1150001
- ΖΕΠ GR1150012
- ΖΕΠ/ΕΖΔ GR1150014
- Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
- Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ

Figure 76: Locations of Pelecanus crispus and Pelecanus onocrotalus records during SEAS fieldwork

1.1.B1.iii.10 Waders and kingfishers

Black-backed Gull (*Actitis hypoleucos*)

The Black-backed Gull is a common migratory species of the coastal zone, found in a variety of habitats, such as small lakes, ditches, river banks, streams, dam banks, marshes, river estuaries, freshwater spills on coastal shores and salt marshes, ports, docks and filtration tanks of sewage treatment plants, but generally avoids large coastal muddy areas.

The Black-backed Gull is common during migration in the SPA GR1150001 (TDE). During the Midwinter waterbird surveys in the Keramoti Lagoons, 0-1 Black-backed Gull was recorded per year, in the decade 2014-2023 (EEA unpublished data).

Within the FRA, the species was recorded around the Sigma factory, in the land part, on the coast and in the coastal marine zone (up to 10 individuals). The species was also recorded on the coast of Vasova Lagoon (up to 8 individuals), Eratinos Lagoon (1-2 individuals), in the Keramoti area (1-2 individuals) and on Monastiraki beach (5 individuals). The presence of the species in the area was recorded in the spring and autumn of 2024.

Table 51: Abundance of Actitis hypoleucos during winter (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird surveys in Greece" during the period 2014-2023)

Scientific name	Energean	Vasova lagoon	Eratino lagoon	Agiasma lagoon	Keramoti Lagoon	Marine lake-sea area	Total
Actitis hypoleucos	1	1	1			1	0-2 (0.6)

Northern Plover (*Charadrius alexandrinus*)

The Northern Plover nests singly or in loose colonies (5 to 80 m apart), sometimes with other species on sandy, muddy and gravelly shores, dunes, coastal lagoons, seasonally flooded marshes and deltas (Dimalexis et al. 2009). It breeds and winters on the coasts of the FRA and the Study Area. In the SPA GR1150001, 1-7 pairs breed, while 1-21 individuals winter (SDF). In the Nestos Delta and coastal lagoons, 40-70 pairs are reported to have bred before 1997 (Bourdakis & Vareltzidou 2000). During the Midwinter waterbird surveys in the Keramoti Lagoons, 0-1 Common Plover was recorded per year, in the decade 2014-2023 (EEA unpublished data).

The species was recorded along the coast from the commercial port of Kavala to Agiasma beach as well as on Monastiraki beach. Within the FRA, up to 15 individuals were recorded. On the beaches of the Vasova, Eratino and Agiasma lagoons, up to 9, 9 and 17 individuals were recorded, respectively, while on Monastiraki beach 1-3 individuals were recorded. The presence of the species in the area was recorded in the spring and autumn of 2024.

Table 52: Abundance of Charadrius alexandrinus during winter (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird surveys in Greece" during the period 2014-2023)

Scientific name	Energean	Vasova lagoon	Eratino lagoon	Agiasma lagoon	Keramoti Lagoon	Marine lake-sea area	Total
Charadrius alexandrinus				1			0-1 (0.1)

River Whistling Wren (*Charadrius dubius*)

The River Whistling Wren nests singly or in loose colonies (with a distance of 7 to 200 m between them) from the coastal zone to the semi-mountainous ravines. Typical nesting habitats are sandy, muddy and gravelly areas near water, i.e. the dry beds of river streams and seasonally flooded areas (seasonal island wetlands), the banks of lakes and the coasts (Dimalexis et al. 2009). It breeds on the coasts of the FRA and the extended FRA. In the SPA GR1150001, 2-21 pairs breed and 2 individuals of Oystercatchers (TID) overwinter. In the Nestos Delta and coastal lagoons, breeding of 20-40 pairs was reported in 1996 (Portolou et al. 2009).

Within the FRA, the species was recorded along the coast (up to 5 individuals). It was also recorded in the Nea Karvali area (up to 14 individuals), in the Vasova lagoon (4 individuals), on the beach of the Eratino lagoon (3 individuals), on the beach of Agiasma (1 individual) and on the beach of Monastiraki (5 individuals). The presence of the species in the area was recorded in the spring and autumn of 2024.

Oystercatcher (*Haematopus ostralegus*)

The Oystercatcher nests singly or in small scattered groups in coastal salt marshes, sandy shores, islets in lagoons and salt marshes. It feeds in muddy intertidal habitats, in estuaries and on rocky shores with molluscs (Dimalexis et al. 2009). There are indications that it breeds on the coasts of the extended FRA, beyond the Study Area. In the SAC GR1150001, 1-9 pairs breed (PE). In the Nestos Delta and coastal lagoons, 20-40 pairs were reported to breed in 1996 (Portolou et al. 2009). During the Midwinter waterbird surveys in the Keramoti Lagoons, 0-1 Oystercatchers were recorded per year, in the decade 2014-2023 (EEA unpublished data).

The species had a wide distribution mainly along the coast, but also inland in the lagoons from Nea Karvali to Monastiraki beach. On the coast, within the FRA, up to 27 individuals were recorded. Outside FRA, the species was recorded in Nea Karvali (1-2 individuals), on the coast west of the Sigma factory (up to 9 individuals), on the beach of Vasova lagoon (up to 21 individuals), on the Eratinos lagoon and its beach (up to 14 individuals), on the Agiasma lagoon and its beach (up to 18 individuals), on the beaches of Keramoti (up to 11 individuals), on the Keramoti lagoons (4 individuals), on Monastiraki beach and in neighboring rice fields (up to 8 individuals). The presence of the species in the area was recorded in the spring and autumn of 2024.

Table 53: Abundance of Haematopus ostralegus during winter (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird surveys in Greece" during the period 2014-2023)

Scientific name	Energean	Vasova lagoon	Eratino lagoon	Agiasma lagoon	Keramoti Lagoon	Marine lake-sea area	Total
Haematopus ostralegus			1				0-1 (0.2)

Black-winged stilt (*Himantopus himantopus*)

The Black-winged stilt nests in wetlands with shallow fresh, salt and brackish water and sparse vegetation, while during migration it is found in practically every wetland system and coast (Dimalexis et al. 2009). It breeds in the marsh east of Sigma in the FRA and in the Study Area. In the SPA GR1150001, 25 pairs breed (TED). In the Nestos Delta and coastal lagoons it is reported as a common breeding species before 1997 (Bourdakis & Vareltzidou 2000) and with 30 pairs earlier (EOE 1994).

Within the FRA, the species was recorded mainly in the wetlands east of the Sigma factory (up to 25 individuals). In the expanded FRA it was recorded in Vasova Lagoon (up to 14 individuals), Eratinos Lagoon (up to 24 individuals), Agiasma Lagoon (up to 31 individuals) and Keramoti Lagoons (5 individuals). The presence of the species in the area was recorded in the spring and autumn of 2024.

Flamingo (*Phoenicopterus roseus*)

Flamingos overwinter in the Study Area and the FRA. They prefer shallow (up to 1 m) eutrophic wetlands such as salt lakes, lagoons, shallow sea bays and salt marshes with a pH of up to 11 (Dimalexis et al. 2009).

In the SAC GR1150001, 380-1310 Flamingos (TID) overwinter. In the Nestos Delta and coastal lagoons, 211-1823 individuals overwintered in 2000-08 (Portolou et al. 2009). During the Midwinter waterbird surveys in the Keramoti Lagoons, 219-1169 Flamingos (M.E. 716, Median 611 individuals) were recorded in the decade 2014-2023 (EEA unpublished data).

Within the FRA, the species was recorded in the wetlands east of the Sigma factory (up to 28 individuals in spring 2024). In the expanded FRA, it was recorded in Vasova Lagoon (up to 90 individuals), Eratinos Lagoon (up to 1,170 individuals), Agiasma Lagoon (up to 736 individuals) and Keramoti Lagoons (30 individuals). In all the above areas, except for the Keramoti lagoons, the presence of the species was recorded in the spring and autumn of 2024, while in the Keramoti lagoons it was recorded only in the spring of 2024.

Table 54: Abundance of Phoenicopterus roseus during winter (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird surveys in Greece" during the period 2014-2023)

Scientific name	Energean	Vasova lagoon	Eratino lagoon	Agiasma lagoon	Keramoti Lagoon	Marine lake-sea area	Total
Phoenicopterus roseus	2 - 8	1 - 327	4 - 494	98 - 925	2 - 25		219-1169 (716.4)

Spur-winged lapwing (*Vanellus spinosus*)

The Spur-winged lapwing nests in coastal wetlands and mainly in bare, dry areas or in places with minimal halophytic vegetation, sand dunes, etc. (Chandrinos et al. 2009). It breeds in the wetland within the FRA and in the Study Area. In the SPA GR1150001, 2-21 pairs breed (TED). In the Nestos Delta and the coastal lagoons, 22-33 pairs were breeding in 1993 (Bourdakis & Vareltzidou 2000).

Within the FRA, the species was recorded in the wetlands east of the Sigma factory (1-2 individuals and 40 individuals in spring and autumn 2024, respectively). In the expanded FRA it was recorded in Vasova Lagoon (17 individuals in autumn 2024), Eratinos Lagoon (up to 5 individuals in spring 2024), Agiasma Lagoon (up to 8 individuals in spring 2024) and Keramoti Lagoons (5 individuals in spring 2024).

Kingfisher (*Alcedo atthis*)

The Kingfisher prefers still or gently flowing waters with many small fish and reeds, rushes or bushes on the banks for perching. Streams, small rivers, canals and ditches are preferred over open water bodies, but it also uses lakes and ponds. In winter it uses more the coastal marine zone, river estuaries, harbours and rocky shores (BirdLife International 2021).

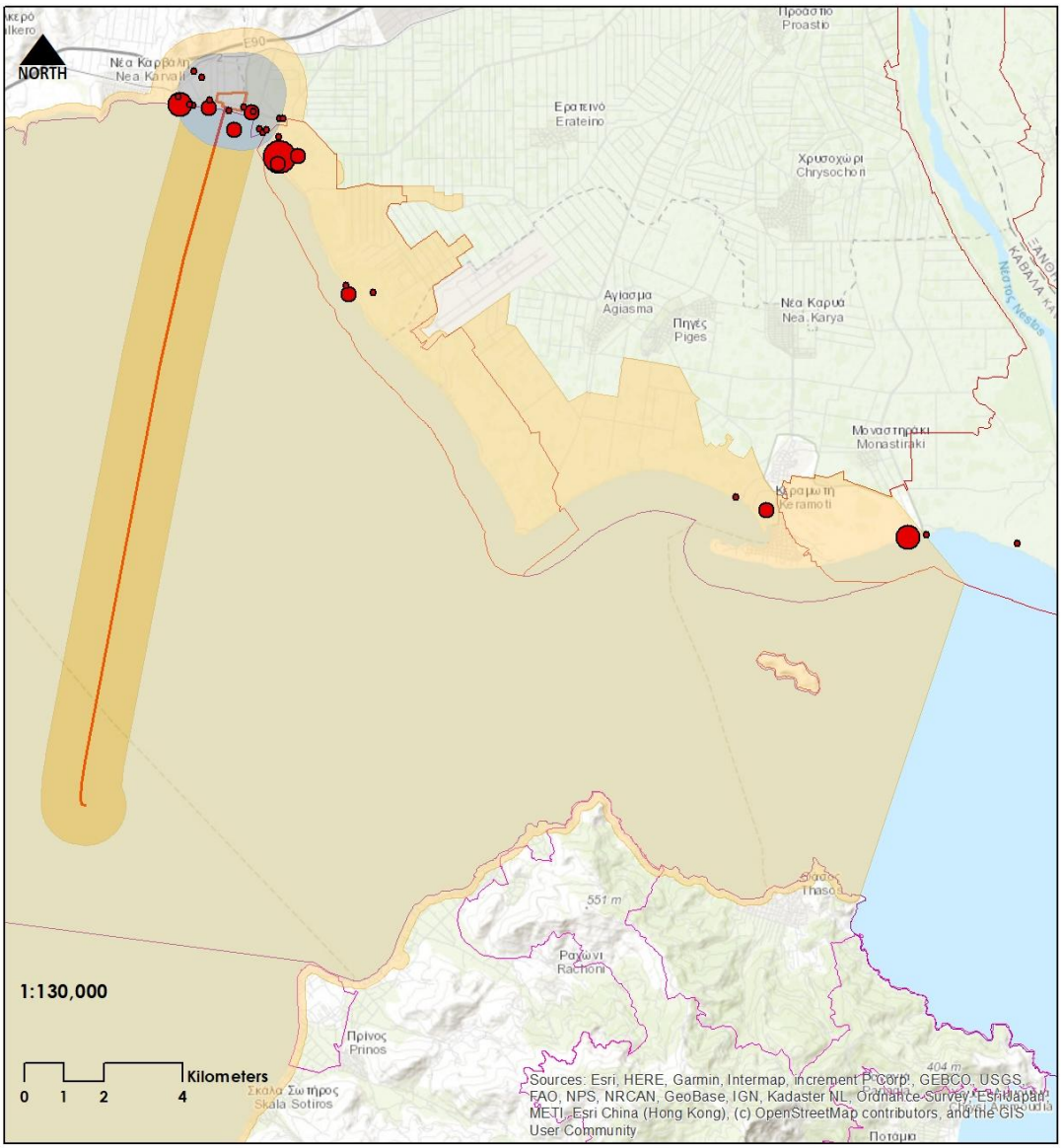
In SAC GR1150001 two pairs breed and 3-7 Kingfishers overwinter (SDF).

During the Midwinter waterbird surveys in the Keramoti Lagoons, 0-20 Kingfishers (M.E. 5, Median 2 individuals) were recorded in the decade 2014-2023 (EEA unpublished data).

It was observed three times by a Kingfisher in the coastal zone of FRA in April and May and twice in September 2024.

Table 55: Abundance of Alcedo atthis during winter (source: Hellenic Ornithological Society 2024, data from the program "Midwinter waterbird surveys in Greece" during the period 2014-2023)

Scientific name	Energean	Vasova lagoon	Eratino lagoon	Agiasma lagoon	Keramoti Lagoon	Marine lake-sea area	Total
Alcedo atthis	1	1 - 8	1 - 7	1 - 3	1 - 2	2	0-20 (4.6)



Υπόμνημα

Actitis hypoleucos

1
2
3
4 - 6

Περιοχή Έρευνας Πεδίου

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2

Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

ΖΕΠ GR1150001

ΖΕΠ GR1150012

ΖΕΠ/ΕΖΔ GR1150014

Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2

Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ

Figure 77: Actitis hypoleucos recording locations during SEAS fieldwork

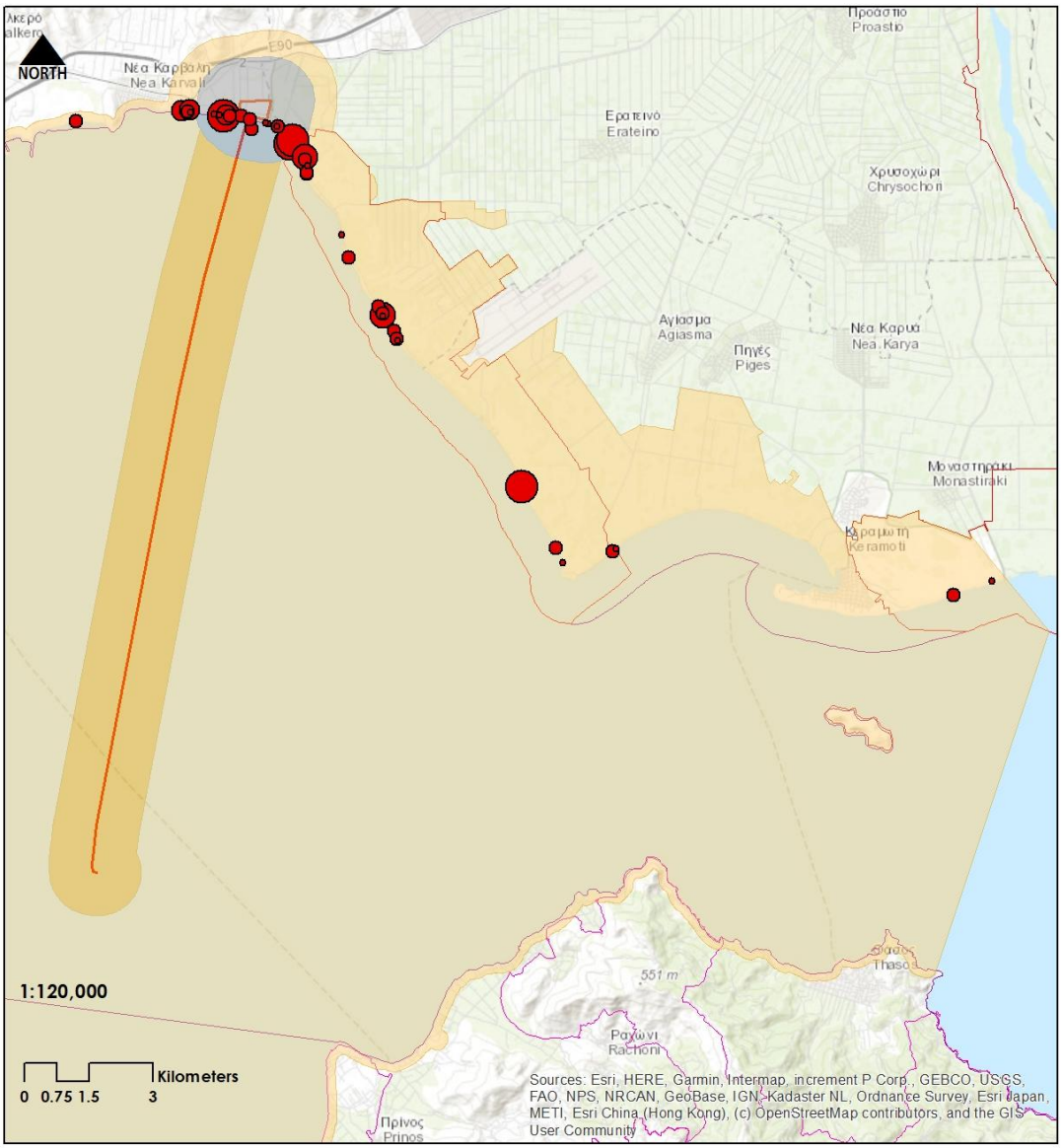




Figure 78: Charadrius alexandrinus recording locations during SEAS fieldwork

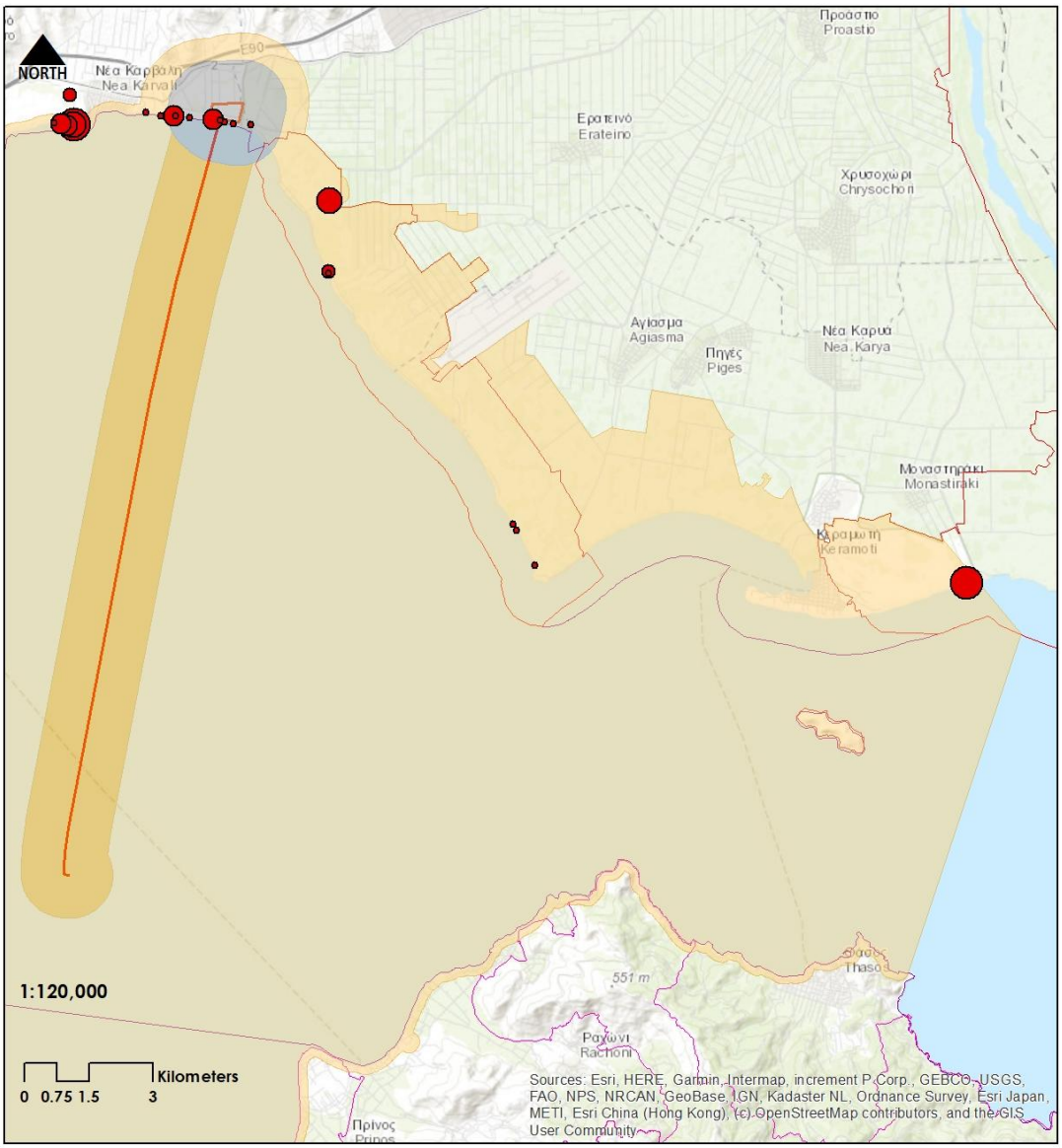
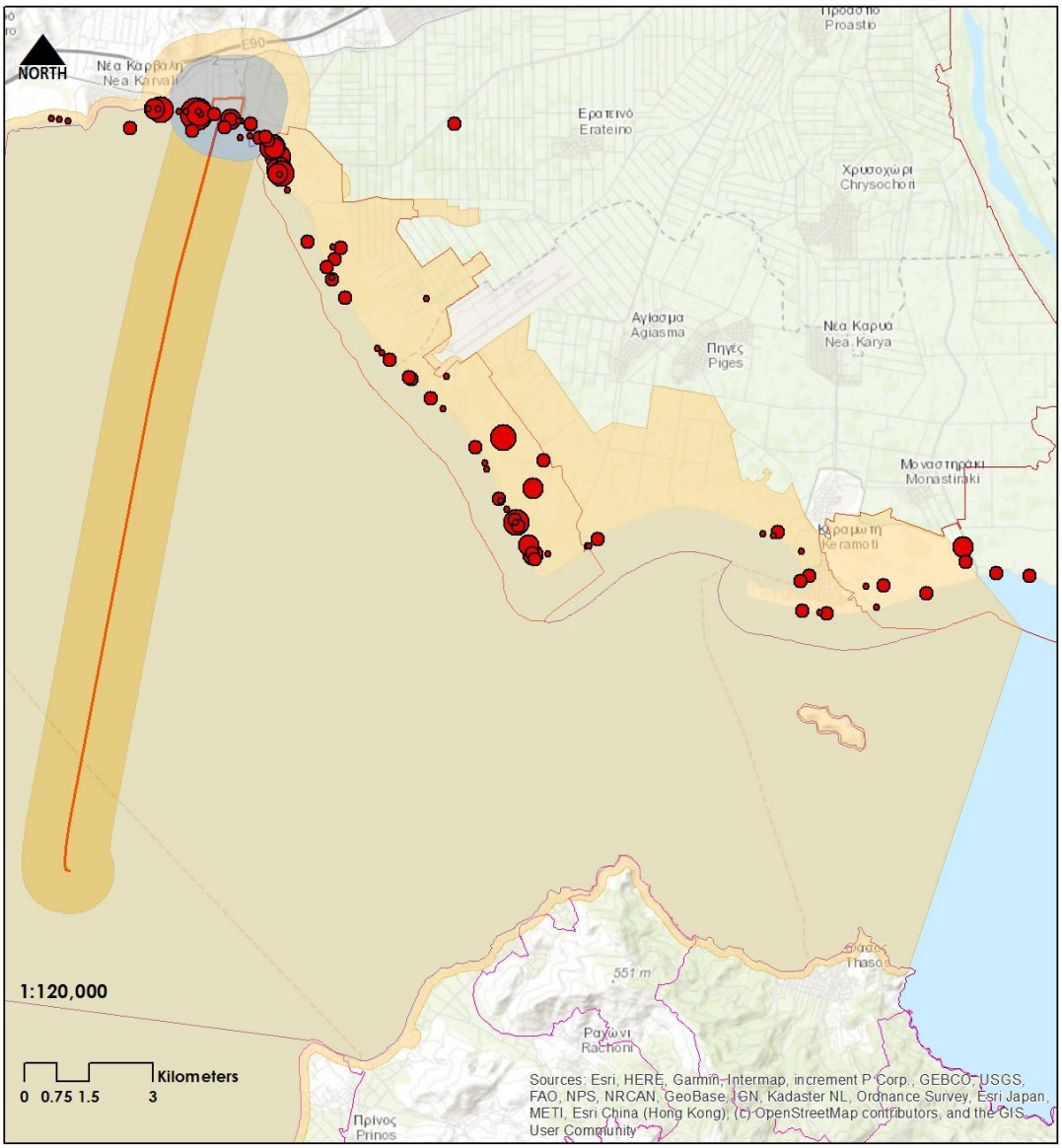


Figure 79: Charadrius dubius recording locations during SEAS fieldwork



Υπόμνημα

Haematopus ostralegus
- 1
- 2 - 3
- 4 - 7
- 8 - 14
- 15 - 27

Περιοχή Έρευνας Πεδίου
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2
- Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης
- ΖΕΠ GR1150001
- ΖΕΠ GR1150012
- ΖΕΠ/ΕΖΔ GR1150014
- Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
- Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ

Figure 80: Locations of Haematopus ostralegus recordings during SEAS fieldwork

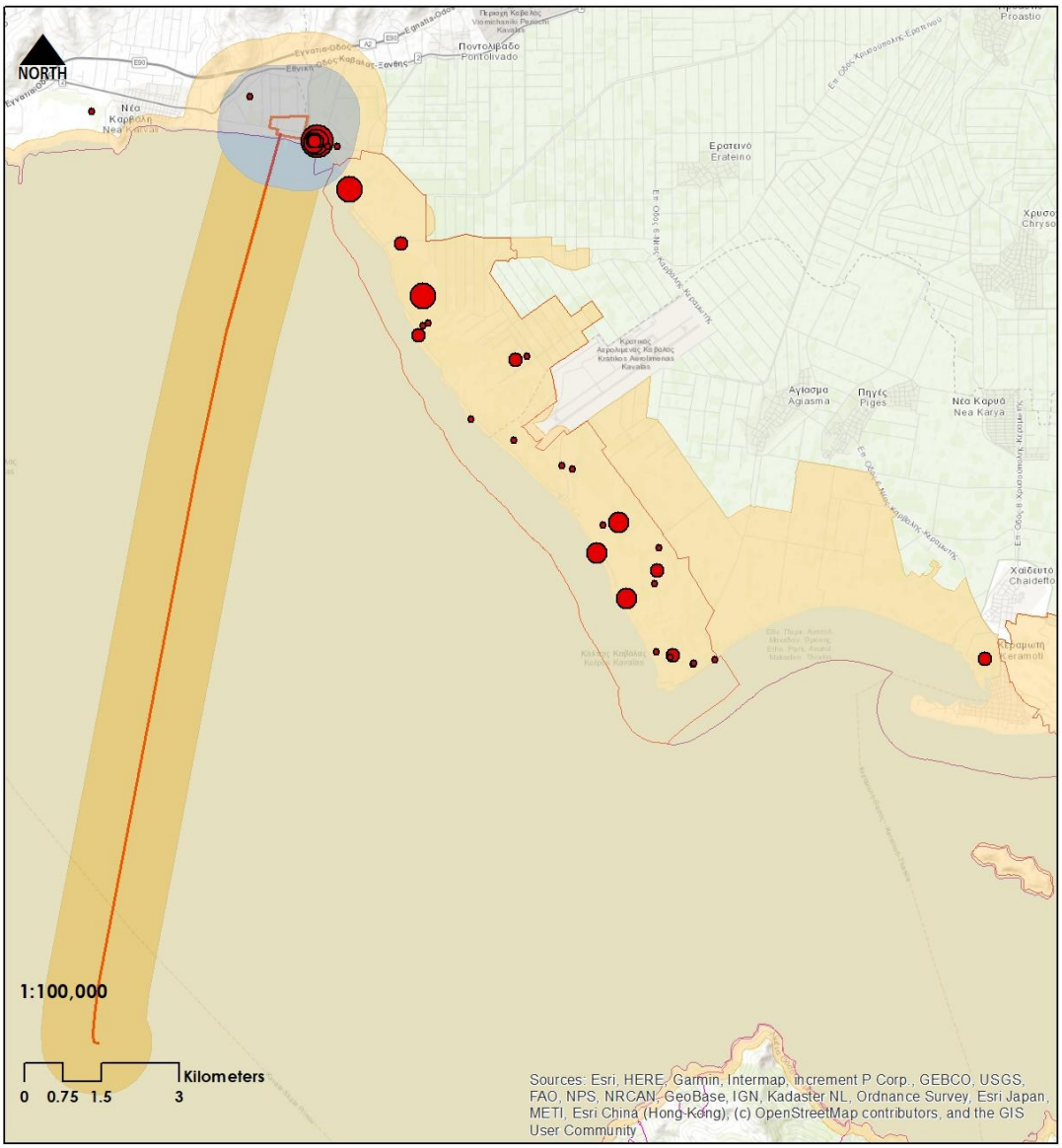




Figure 81: Locations of Himantopus himantopus recordings during SEAS fieldwork

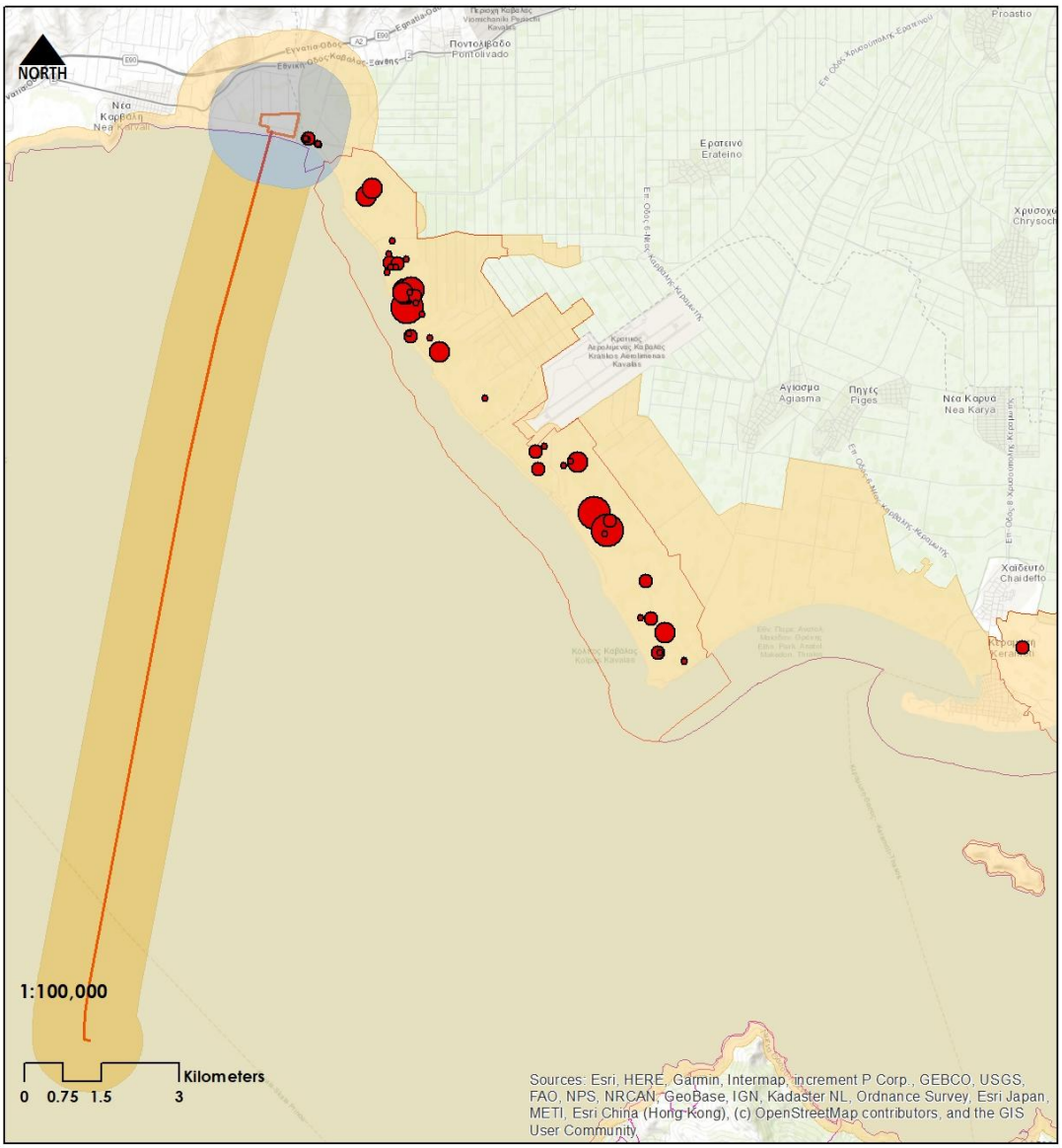




Figure 82: Phoenicopterus roseus recording locations during SEAS fieldwork

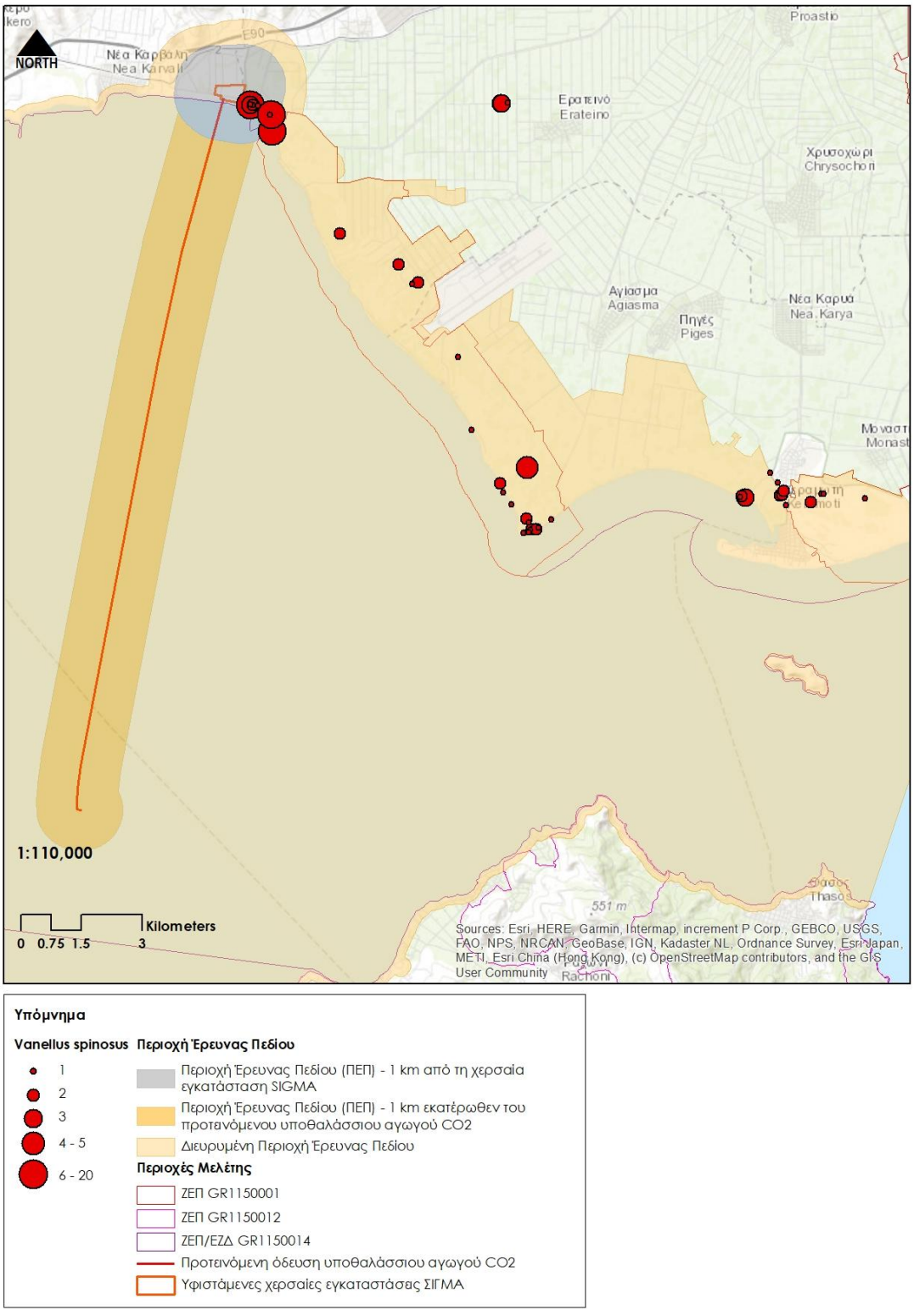


Figure 83: Locations of Vanellus spinosus recordings during SEAS fieldwork

1.1.B1.iii.11 Large predators

Reed Warbler (*Circus aeruginosus*)

The Reed Warbler nests on the ground, preferring extensive reed beds, and its foraging habitat includes almost all types of wetland ecosystems (Dimalexis et al. 2009). It breeds in the marsh west of Nea Karvali and in the GR1150001 SAC.

In the GR1150001 SAC, 10 pairs breed and 22-58 Reed Warblers (TDS) winter. In the Nestos Delta and coastal lagoons, 15-25 pairs breed and up to 80 individuals winter (Jerrentrup & Naziridis 1996).

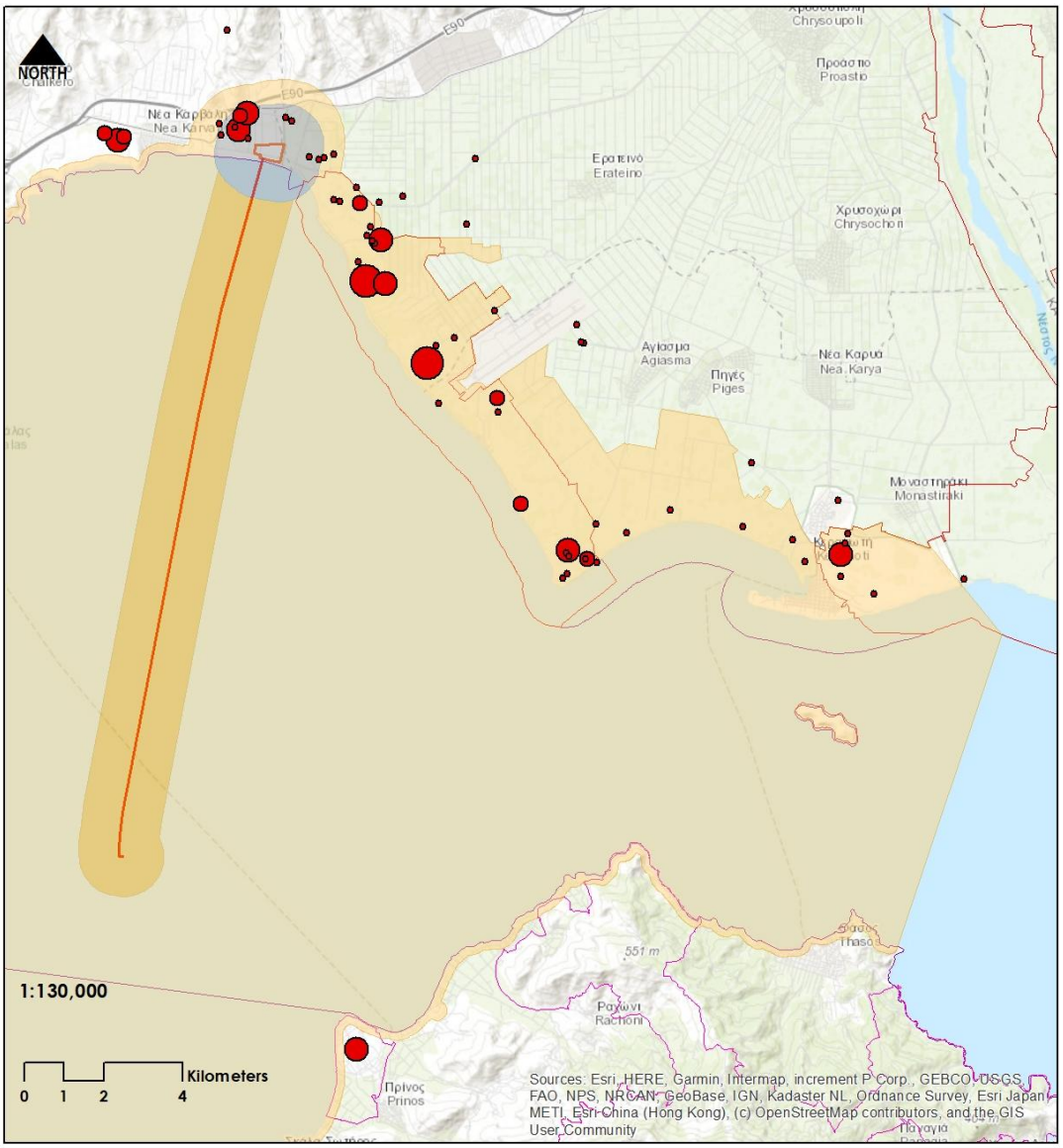
During the Midwinter waterbird surveys in the Keramoti Lagoons, 0-47 Sandpipers (mean 17, median 14 individuals) were recorded in the decade 2014-2023 (EEA unpublished data).

Within the FRA, the species was recorded in the wetlands east of the Sigma factory (1-2 individuals). In the expanded FRA it was recorded in Vasova Lagoon (up to 4 individuals in spring 2024 and 2 individuals in September 2024), Eratinos Lagoon (up to 10 individuals in spring 2024 and 2 individuals in September 2024), Agiasma Lagoon (up to 8 individuals in spring 2024 and 3 individuals in September 2024) and Keramoti Lagoons (up to 4 individuals).

Osprey (*Pandion haliaetus*)

The Osprey is observed during migration in coastal wetlands and islands and not so much in inland waters or rivers. The species' feeding habitat includes all types of natural or artificial wetlands (Dimalexis et al. 2009). The species is common during migration in SAC GR1150001 (SDF).

The species was not recorded within the FRA. In the expanded FRA it was recorded in Vasova Lagoon (1 individual in March and April 2024), in Eratinos Lagoon and the adjacent coastal marine zones. In autumn 2024 the species was not observed.



Υπόμνημα

Circus aeruginosus

1
2
3
4

Περιοχή Έρευνας Πεδίου

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2

Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

ΖΕΠ GR1150001

ΖΕΠ GR1150012

ΖΕΠ/ΕΖΔ GR1150014

Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2

Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ

Figure 84: Circus aeruginosus recording locations during SEAS fieldwork

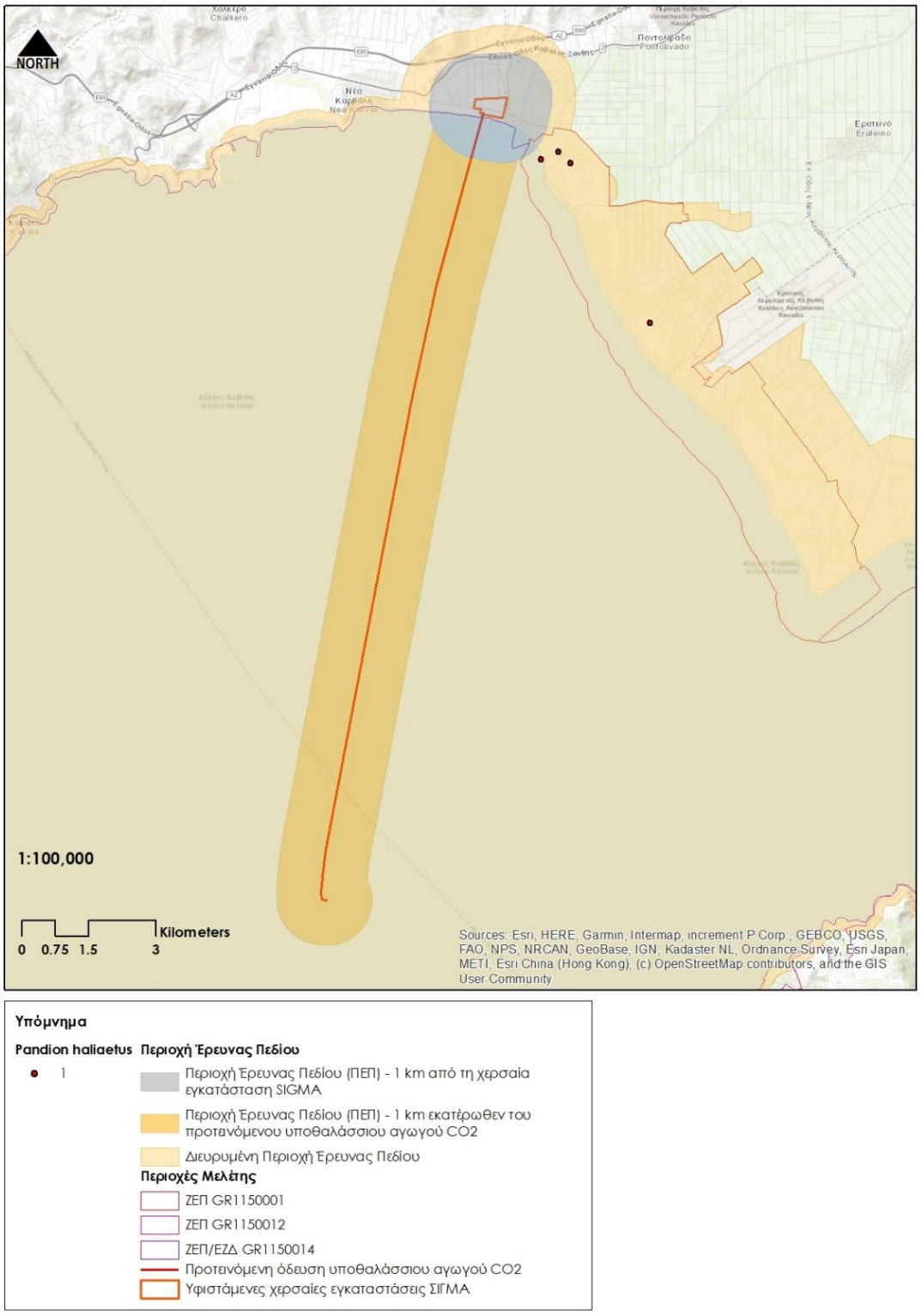


Figure 85: Locations of Pandion haliaetus recordings during SEAS fieldwork

1.1.B1.12 Main findings regarding the avifauna

The main findings from the field survey on the avifauna are summarized as follows:

Pelagic seabirds and Cormorants: The presence of both important species for the marine part of the Study Area, namely Cormorants and Eurasian Curlew, as well as the presence of Artemis, was recorded, both in the extended FRA and in the FRA. The FRA is considered to be of particular importance for the Cormorant, which uses the marine and coastal area of the FRA for roosting, resting, feeding and movement between the western and eastern parts of the Gulf of Kavala. Although a high abundance of Eurasian Curlew was not recorded during the fieldwork period, based on bibliographic data, the marine area of the Gulf of Kavala and the Keramoti-Thassos channel is an important area for the species, especially during the wintering and migration periods.

Coastal Seabirds: The presence and importance of the Study Area, the extended FRA and the FRA for coastal seabirds [Anatidae, Gaviidae, Podicipedidae, Sulidae, Phalacrocoracidae, Pelecanidae, Scolopacidae, Stercorariidae, Laridae, Sternidae] found in the area during the period of the field survey were recorded.

The coastal and wetland part of the FRA (and the extended FRA) is important for the breeding of Charadiomorphs [Oyster Shearwater (Haematopus ostralegus), Sandpiper (IHimantopus himantopus), Plover (Charadrius dubius), Sea Plover (Charadrius alexandrinus) and Spiny Lapwing (Vanellus spinosus), Geese (Anatidae, Cygnus), feeding and roosting Gaviidae (Gavia arctica), Podicipedidae (Podiceps cristatus), Ardeidae, Phoenicopteridae, Stercorariidae (Stercorarius parasiticus), Geese [Mute Swan (Cygnus olor)], Coot (Fulica atra), Scolopacidae, Stercorariidae, Laridae, Sternidae.

The importance of the SA for wetland species and migratory species was confirmed, as presented in the Standard Data Forms of the Natura sites overlapping with the extended FRA. The only exceptions are the absence of breeding of the Black-headed Gull Ichthyaetus melanocephalus in 2024 and the breeding of the Nightingale Nycticorax nycticorax in the Keramoti grove which is not present in the GR1150001 SDF.

The data collected during the surveys highlight the importance of GR110014 for other bird species of article 4 of Directive 2009/147/EC that are not included in the SDF, such as: Gavia arctica, Podiceps cristatus, Calonectris diomedea, Phalacrocorax carbo, Ichthyaetus melanocephalus, Larus ridibundus, Hydrocoloeus minutus, Thalasseus sandvicensis, Sterna hirundo and Stercorarius parasiticus. It is proposed that these species be added to the TED, along with any species found in the bibliography or those that will be collected in future field surveys, in order to complete the SDF of this SAC.

1.1.B1.iv Recording the main characteristics of all habitat types in Annex I and/or species in Annex II of Directive 92/34/EEC (if it is an SAC, SCI or SCI) and/or bird species in Annex I of Directive 2009/147/EC and migratory species with regular arrival (if it is an SPA), their value in relation to the rest of the Natura 2000 Network, as well as the main characteristics of endemic, endangered and protected species

The main features are described in Section 1.1.A2.

1.1.B2 Recording the above information on Documentation Maps

Documentation maps are presented in the corresponding paragraphs of this SEAS and in Annex 9.1.

1.2 Recording the state of the natural environment in the Natura 2000 network area

1.2.1 Conservation objectives of the Natura 2000 site concerned and the parameters that contribute to the conservation value of the site

For the protected areas of the Natura 2000 network, conservation objectives have been set in the legislation:

- MD YPEN/D ΦΦΠΒ/50146/1786/10.05.2023 "Definition and approval of conservation objectives for bird species of par. 1 and 2 of article 4, of Directive 2009/147/ΕΚ in the Special Protection Areas (SPAs) of the national ecological network NATURA 2000".
- MD YPEN/DΦΦΠΒ/24776/985/22.03.2023 "Definition of conservation objectives for natural habitat types of Annex I and species of Annex II of Directive 92/43/ΕΕ in Special Areas of Conservation and Sites of Community Importance of the national ecological network NATURA 2000".

1.2.1.1 SAC & SCI GR1150014 "Marine Area of Kavala Thassos"

Table 56 presents the conservation objectives for the protected area SAC & SCI GR1150014 based on the Ministry of Environment and Natural Resources MD ΦΦΠΒ/50146/1786/10.05.2023.

Table 56: Conservation objectives for the protected area SAC & SCI GR1150014 (Ministry of Environment and Natural Resources/D DFPB/50146/1786/10.05.2023)

Code	Name	Type	Parameter	Unit	Target value	Specialized target
A181	*Puffinus yelkouan*	c	Population	Individuals	Insufficient data	Insufficient data
A392	*Phalacrocorax aristotelis desmarestii*	r	Population	Couples	168	Conservation
A392	*Phalacrocorax aristotelis desmarestii*	c	Population	Individuals	Insufficient data	Insufficient data

1.2.1.2 SAC GR1150001 "Nestos Delta and Keramoti Lagoons and Thasopoula Island"

Table 57 presents the conservation objectives for SAC GR1150001 based on the Ministry of Environment and Natural Resources/D ΦΦΠΒ/50146/1786/10.05.2023.

Table 57: Conservation objectives for SAC GR1150001 (Ministry of Environment and Natural Resources MD ΦΦΠΒ/50146/1786/10.05.2023)

Code	Name	Type	Parameter	Unit	Target value	Specialized target	Remarks
A402	*Accipiter brevipes*	r	Population	Individuals	12	Conservation	

Code	Name	Type	Parameter	Unit	Target value	Specialized target	Remarks
A298	*Acrocephalus arundinaceus*	r	Population	Couples	Insufficient data	Insufficient data	
A293	*Acrocephalus melanopogon*	c	Population	Individuals	Insufficient data	Insufficient data	
A296	*Acrocephalus palustris*	c	Population	Individuals	Insufficient data	Insufficient data	
A295	*Acrocephalus schoenobaenus*	r	Population	Couples	Insufficient data	Insufficient data	
A297	*Acrocephalus scirpaceus*	r	Population	Couples	Insufficient data	Insufficient data	
A168	*Actitis hypoleucos*	c	Population	Individuals	Insufficient data	Insufficient data	
A247	*Alauda arvensis*	r	Population	Couples	Insufficient data	Insufficient data	
A247	*Alauda arvensis*	w	Population	Individuals	Insufficient data	Insufficient data	
A229	*Alcedo atthis*	r	Population	Couples	Insufficient data	Insufficient data	
A229	*Alcedo atthis*	w	Population	Individuals	5	Conservation	
A054	*Anas acuta*	w	Population	Individuals	380	Achievement	
A052	*Anas crecca*	w	Population	Individuals	203	Conservation	
A855	*Mareca penelope*	w	Population	Individuals	978	Conservation	
A053	*Anas platyrhynchos*	r	Population	Couples	20	Conservation	
A053	*Anas platyrhynchos*	w	Population	Individuals	336	Conservation	
A856	*Spatula querquedula*	c	Population	Individuals	Insufficient data	Insufficient data	
A856	*Spatula querquedula*	r	Population	Couples	11	Achievement	
A889	*Mareca strepera*	r	Population	Couples	3	Conservation	
A889	*Mareca strepera*	w	Population	Individuals	38	Conservation	
A394	*Anser albifrons albifrons*	w	Population	Individuals	398	Achievement	
A043	*Anser anser*	w	Population	Individuals	27	Conservation	
A042	*Anser erythropus*	w	Population	Individuals	6	Conservation	
A255	*Anthus campestris*	r	Population	Couples	Insufficient data	Insufficient data	
A258	*Anthus cervinus*	c	Population	Individuals	Insufficient data	Insufficient data	
A257	*Anthus pratensis*	c	Population	Individuals	Insufficient data	Insufficient data	
A259	*Anthus spinoletta*	w	Population	Individuals	Insufficient data	Insufficient data	
A256	*Anthus trivialis*	w	Population	Individuals	Insufficient data	Insufficient data	
A228	*Tachymarptis melba*	c	Population	Individuals	Insufficient data	Insufficient data	
A226	*Apus apus*	r	Population	Couples	Insufficient data	Insufficient data	
A227	*Apus pallidus*	r	Population	Couples	Insufficient data	Insufficient data	
A091	*Aquila chrysaetos*	r	Population	Couples	2	Achievement	
A859	*Clanga clanga*	w	Population	Individuals	5	Conservation	
A404	*Aquila heliaca*	c	Population	Individuals	Insufficient data	Insufficient data	
A773	*Ardea alba*	w	Population	Individuals	222	Achievement	
A858	*Clanga pomarina*	r	Population	Couples	4	Achievement	
A028	*Ardea cinerea*	r	Population	Couples	90	Conservation	
A028	*Ardea cinerea*	w	Population	Individuals	138	Conservation	
A029	*Ardea purpurea*	r	Population	Couples	10	Achievement	
A222	*Asio flammeus*	r	Population	Couples	Insufficient data	Insufficient data	
A222	*Asio flammeus*	w	Population	Individuals	Insufficient data	Insufficient data	
A221	*Asio otus*	r	Population	Couples	Insufficient data	Insufficient data	
A059	*Aythya ferina*	w	Population	Individuals	250	Achievement	
A061	*Aythya fuligula*	w	Population	Individuals	40	Achievement	
A060	*Aythya nyroca*	r	Population	Couples	5	Conservation	

Code	Name	Type	Parameter	Unit	Target value	Specialized target	Remarks
A021	Botaurus stellaris	r	Population	Couples	1	Conservation	
A215	Bubo bubo	p	Population	Couples	Insufficient data	Insufficient data	
A215	Bubo bubo	r	Population	Couples	Insufficient data	Insufficient data	
A133	Burhinus oedicnemus	r	Population	Couples	40	Achievement	
A087	Buteo buteo	r	Population	Couples	8	Conservation	
A087	Buteo buteo	w	Population	Individuals	55	Conservation	
A403	Buteo rufinus	c	Population	Individuals	Insufficient data	Insufficient data	
A403	Buteo rufinus	r	Population	Couples	1	Conservation	
A243	Calandrella brachydactyla	r	Population	Couples	Insufficient data	Insufficient data	
A149	Calidris alpina	c	Population	Individuals	Insufficient data	Insufficient data	
A149	Calidris alpina	w	Population	Individuals	216	Conservation	
A147	Calidris ferruginea	c	Population	Individuals	Insufficient data	Insufficient data	
A145	Calidris minuta	w	Population	Individuals	142	Conservation	
A146	Calidris temminckii	c	Population	Individuals	Insufficient data	Insufficient data	
A224	Caprimulgus europaeus	r	Population	Couples	Insufficient data	Insufficient data	
A479	Cecropis daurica	r	Population	Couples	Insufficient data	Insufficient data	
A857	Spatula clypeata	w	Population	Individuals	258	Conservation	
A138	Charadrius alexandrinus	r	Population	Couples	70	Achievement	
A138	Charadrius alexandrinus	w	Population	Individuals	10	Conservation	
A137	Charadrius hiaticula	c	Population	Individuals	Insufficient data	Insufficient data	
A734	Chlidonias hybrida	w	Population	Individuals	Insufficient data	Insufficient data	
A198	Chlidonias leucopterus	c	Population	Individuals	Insufficient data	Insufficient data	
A197	Chlidonias niger	c	Population	Individuals	Insufficient data	Insufficient data	
A031	Ciconia ciconia	r	Population	Couples	161	Achievement	
A030	Ciconia nigra	r	Population	Couples	3	Conservation	
A080	Circaetus gallicus	r	Population	Couples	4	Conservation	
A081	Circus aeruginosus	r	Population	Couples	10	Achievement	
A081	Circus aeruginosus	w	Population	Individuals	33	Conservation	
A082	Circus cyaneus	w	Population	Individuals	5	Conservation	
A084	Circus pygargus	c	Population	Individuals	Insufficient data	Insufficient data	
A231	Coracias garrulus	r	Population	Couples	Insufficient data	Insufficient data	
A113	Coturnix coturnix	c	Population	Individuals	Insufficient data	Insufficient data	
A113	Coturnix coturnix	r	Population	Couples	Insufficient data	Insufficient data	
A212	Cuculus canorus	r	Population	Couples	Insufficient data	Insufficient data	
A036	Cygnus olor	r	Population	Couples	10	Conservation	
A036	Cygnus olor	w	Population	Individuals	133	Conservation	
A738	Delichon urbicum (urbica)	r	Population	Couples	Insufficient data	Insufficient data	
A868	Leiopicus medius	p	Population	Couples	Insufficient data	Insufficient data	
A429	Dendrocopos syriacus	r	Population	Couples	Insufficient data	Insufficient data	
A236	Dryocopus martius	p	Population	Couples	Insufficient data	Insufficient data	
A236	Dryocopus martius	r	Population	Couples	Insufficient data	Insufficient data	
A026	Egretta garzetta	c	Population	Individuals	Insufficient data	Insufficient data	

Code	Name	Type	Parameter	Unit	Target value	Specialized target	Remarks
A026	*Egretta garzetta*	r	Population	Individuals	90	Conservation	
A026	*Egretta garzetta*	w	Population	Individuals	28	Conservation	
A447	*Emberiza caesia*	c	Population	Individuals	Insufficient data	Insufficient data	
A382	*Emberiza melanocephala*	r	Population	Couples	Insufficient data	Insufficient data	
A269	*Erithacus rubecula*	w	Population	Individuals	Insufficient data	Insufficient data	
A101	*Falco biarmicus*	w	Population	Individuals	Insufficient data	Insufficient data	
A098	*Falco columbarius*	w	Population	Individuals	3	Conservation	
A100	*Falco eleonorae*	c	Population	Individuals	Insufficient data	Insufficient data	
A095	*Falco naumanni*	c	Population	–	Insufficient data	Insufficient data	
A103	*Falco peregrinus*	w	Population	Individuals	3	Conservation	
A099	*Falco subbuteo*	r	Population	Couples	5	Conservation	
A097	*Falco vespertinus*	c	Population	Individuals	200	Achievement	
A321	*Ficedula albicollis*	c	Population	Individuals	Insufficient data	Insufficient data	
A322	*Ficedula hypoleuca*	c	Population	Individuals	Insufficient data	Insufficient data	
A442	*Ficedula semitorquata*	c	Population	Individuals	Insufficient data	Insufficient data	
A657	*Fringilla coelebs all others*	r	Population	Couples	Insufficient data	Insufficient data	
A125	*Fulica atra*	w	Population	Individuals	6456	Conservation	
A125	*Fulica atra*	r	Population	Couples	Insufficient data	Insufficient data	
A153	*Gallinago gallinago*	w	Population	Individuals	67	Achievement	
A002	*Gavia arctica*	w	Population	Individuals	5	Conservation	
A001	*Gavia stellata*	w	Population	Individuals	2	Conservation	
A135	*Glareola pratincola*	r	Population	Couples	100	Achievement	
A078	*Gyps fulvus*	c	Population	Individuals	Insufficient data	Insufficient data	
A130	*Haematopus ostralegus*	r	Population	Couples	10	Conservation	The conservation target at the SAC level is defined as a more realistic one, as it is estimated that the population records of the species are an underestimate due to the inaccessibility of the nesting sites.
A130	*Haematopus ostralegus*	w	Population	Individuals	2	Conservation	
A075	*Haliaeetus albicilla*	c	Population	Individuals	2	Conservation	
A075	*Haliaeetus albicilla*	r	Population	Couples	1	Conservation	
A707	*Hieraaetus fasciatus (Aquila fasciata)*	c	Population	Individuals	Insufficient data	Insufficient data	
A092	*Hieraaetus pennatus (Aquila pennata)*	c	Population	Individuals	Insufficient data	Insufficient data	
A131	*Himantopus himantopus*	r	Population	Couples	25	Conservation	
A299	*Hippolais icterina*	c	Population	Individuals	Insufficient data	Insufficient data	
A251	*Hirundo rustica*	r	Population	Couples	Insufficient data	Insufficient data	
A022	*Ixobrychus minutus*	r	Population	Couples	4	Conservation	
A233	*Jynx torquilla*	c	Population	Individuals	Insufficient data	Insufficient data	
A338	*Lanius collurio*	r	Population	Couples	Insufficient data	Insufficient data	
A339	*Lanius minor*	r	Population	Couples	Insufficient data	Insufficient data	
A341	*Lanius senator*	r	Population	Couples	Insufficient data	Insufficient data	

Code	Name	Type	Parameter	Unit	Target value	Specialized target	Remarks
A179	*Larus ridibundus*	w	Population	Individuals	Insufficient data	Insufficient data	
A181	*Larus audouinii*	c	Population	Individuals	Insufficient data	Insufficient data	
A180	*Larus genei*	w	Population	Individuals	30	Conservation	
A176	*Larus melanocephalus*	r	Population	Couples	232	Achievement	
A176	*Larus melanocephalus*	c	Population	Individuals	Insufficient data	Insufficient data	
A862	*Hydrocoloeus minutus*	c	Population	Individuals	Insufficient data	Insufficient data	
A292	*Locustella luscinioides*	r	Population	Couples	Insufficient data	Insufficient data	
A246	*Lullula arborea*	w	Population	Individuals	Insufficient data	Insufficient data	
A271	*Luscinia megarhynchos*	r	Population	Couples	Insufficient data	Insufficient data	
A242	*Melanocorypha calandra*	r	Population	Couples	Insufficient data	Insufficient data	
A069	*Mergus serrator*	w	Population	Individuals	1	Conservation	
A230	*Merops apiaster*	r	Population	Couples	Insufficient data	Insufficient data	
A073	*Milvus migrans*	r	Population	Couples	1	Achievement	
A073	*Milvus migrans*	w	Population	Individuals	4	Conservation	
A074	*Milvus milvus*	c	Population	Individuals	Insufficient data	Insufficient data	
A262	*Motacilla alba*	r	Population	Couples	Insufficient data	Insufficient data	
A261	*Motacilla cinerea*	w	Population	Individuals	Insufficient data	Insufficient data	
A260	*Motacilla flava*	r	Population	Couples	Insufficient data	Insufficient data	
A319	*Muscicapa striata*	c	Population	Individuals	Insufficient data	Insufficient data	
A319	*Muscicapa striata*	r	Population	Couples	Insufficient data	Insufficient data	
A077	*Neophron percnopterus*	c	Population	Individuals	Insufficient data	Insufficient data	
A159	Numenius tenuirostris	c	Population	_	_	_	Extinct species
A023	*Nycticorax nycticorax*	c	Population	Individuals	Insufficient data	Insufficient data	
A278	*Oenanthe hispanica*	r	Population	Couples	Insufficient data	Insufficient data	
A277	*Oenanthe oenanthe*	r	Population	Couples	Insufficient data	Insufficient data	
A337	*Oriolus oriolus*	r	Population	Couples	Insufficient data	Insufficient data	
A214	*Otus scops*	p	Population	Couples	Insufficient data	Insufficient data	
A214	*Otus scops*	r	Population	Couples	Insufficient data	Insufficient data	
A094	*Pandion haliaetus*	c	Population	Individuals	Insufficient data	Insufficient data	
A355	*Passer hispaniolensis*	r	Population	Couples	Insufficient data	Insufficient data	
A020	*Pelecanus crispus*	c	Population	Individuals	Insufficient data	Insufficient data	
A020	*Pelecanus crispus*	w	Population	Individuals	50	Conservation	
A019	*Pelecanus onocrotalus*	c	Population	Individuals	Insufficient data	Insufficient data	
A072	*Pernis apivorus*	r	Population	Couples	4	Conservation	
A392	*Phalacrocorax aristotelis desmarestii*	r	Population	Couples	50	Achievement	
A392	*Phalacrocorax aristotelis desmarestii*	w	Population	Individuals	22	Conservation	
A391	*Phalacrocorax carbo sinensis*	w	Population	Individuals	406	Conservation	

Code	Name	Type	Parameter	Unit	Target value	Specialized target	Remarks
A875	*Microcarbo pygmaeus*	w	Population	Individuals	119	Conservation	
A170	*Phalaropus lobatus*	c	Population	Individuals	Insufficient data	Insufficient data	
A663	*Phoenicopterus roseus*	w	Population	Individuals	708	Conservation	
A273	*Phoenicurus ochruros*	w	Population	Individuals	Insufficient data	Insufficient data	
A274	*Phoenicurus phoenicurus*	c	Population	Individuals	Insufficient data	Insufficient data	
A572	*Phylloscopus collybita s. str.*	w	Population	Individuals	Insufficient data	Insufficient data	
A314	*Phylloscopus sibilatrix*	c	Population	Individuals	Insufficient data	Insufficient data	
A316	*Phylloscopus trochilus*	c	Population	Individuals	Insufficient data	Insufficient data	
A234	*Picus canus*	p	Population	Couples	Insufficient data	Insufficient data	
A234	*Picus canus*	r	Population	Couples	Insufficient data	Insufficient data	
A034	*Platalea leucorodia*	w	Population	Individuals	11	Conservation	
A032	*Plegadis falcinellus*	c	Population	Individuals	Insufficient data	Insufficient data	
A140	*Pluvialis apricaria*	w	Population	Individuals	116	Conservation	
A141	*Pluvialis squatarola*	w	Population	Individuals	27	Conservation	
A005	*Podiceps cristatus*	r	Population	Couples	1	Conservation	
A005	*Podiceps cristatus*	w	Population	Individuals	138	Conservation	
A008	*Podiceps nigricollis*	w	Population	Individuals	123	Achievement	
A892	*Zapornia parva*	c	Population	Individuals	Insufficient data	Insufficient data	
A893	*Zapornia pusilla*	c	Population	Individuals	Insufficient data	Insufficient data	
A464	*Puffinus yelkouan*	w	Population	Individuals	850	Conservation	
A132	*Recurvirostra avosetta*	w	Population	Individuals	122	Conservation	
A249	*Riparia riparia*	r	Population	Couples	Insufficient data	Insufficient data	
A275	*Saxicola rubetra*	c	Population	Individuals	Insufficient data	Insufficient data	
A189	*Gelochelidon nilotica*	r	Population	Couples	1	Conservation	
A894	*Hydroprogne caspia*	w	Population	Individuals	3	Conservation	
A863	*Thalasseus sandvicensis*	w	Population	Individuals	5	Conservation	
A193	*Sterna hirundo*	r	Population	Couples	300	Achievement	
A210	*Streptopelia turtur*	r	Population	Couples	70	Achievement	
A351	*Sturnus vulgaris*	r	Population	Couples	Insufficient data	Insufficient data	
A351	*Sturnus vulgaris*	w	Population	Individuals	Insufficient data	Insufficient data	
A310	*Sylvia borin*	c	Population	Individuals	Insufficient data	Insufficient data	
A304	*Sylvia cantillans*	r	Population	Couples	Insufficient data	Insufficient data	
A309	*Sylvia communis*	r	Population	Couples	Insufficient data	Insufficient data	
A574	*Sylvia curruca*	c	Population	Individuals	Insufficient data	Insufficient data	
A397	*Tadorna ferruginea*	w	Population	Individuals	72	Conservation	
A048	*Tadorna tadorna*	r	Population	Couples	10	Conservation	Conservation of at least 10 pairs of the species is defined as a target at the SAC level as this specific target is considered sustainable and responds to the potential of the area for the species.
A048	*Tadorna tadorna*	w	Population	Individuals	67	Conservation	
A166	*Tringa glareola*	c	Population	Individuals	Insufficient data	Insufficient data	
A164	*Tringa nebularia*	w	Population	Individuals	55	Achievement	

Code	Name	Type	Parameter	Unit	Target value	Specialized target	Remarks
A165	*Tringa ochropus*	w	Population	Individuals	4	Achievement	
A163	*Tringa stagnatilis*	c	Population	Individuals	Insufficient data	Insufficient data	
A162	*Tringa totanus*	r	Population	Couples	1	Conservation	
A162	*Tringa totanus*	w	Population	Individuals	108	Achievement	
A285	*Turdus philomelos*	c	Population	Individuals	Insufficient data	Insufficient data	
A232	*Upupa epops*	r	Population	Couples	Insufficient data	Insufficient data	
A728	*Vanellus (Hoplopterus) spinosus*	r	Population	Couples	10	Conservation	
A142	*Vanellus vanellus*	r	Population	Couples	1	Conservation	
A142	*Vanellus vanellus*	w	Population	Individuals	220	Conservation	
A167	*Xenus cinereus*	c	Population	Individuals	Insufficient data	Insufficient data	

1.2.1.3 SPA GR1150012 «Thasos (Mount Ypsario and coastal zone)»

Table 58 presents the conservation objectives for SPA GR1150012, based on Ministerial Decision YPEN/DDFPB/50146/1786/10.05.2023.

Table 58: Conservation objectives for SPA GR1150012 (Ministerial Decision YPEN/DDFPB/50146/1786/10.05.2023)

Code	Name	Type	Parameter	Unit	Target value	Specialized target	Remarks
A402	*Accipiter brevipes*	r	Population	Couples	4	Διατήρηση	
A247	*Alauda arvensis*	c	Population	Individuals	Insufficient data	Insufficient data	
A229	*Alcedo atthis*	w	Population	Individuals	Insufficient data	Insufficient data	
A229	*Alcedo atthis*	p	Population	Individuals	Insufficient data	Insufficient data	
A226	*Apus Apus*	r	Population	Couples	Insufficient data	Insufficient data	
A215	*Bubo bubo*	p	Population	Couples	2	Διατήρηση	
A087	*Buteo buteo*	w	Population	Individuals	Insufficient data	Insufficient data	
A087	*Buteo buteo*	p	Population	Couples	5	Διατήρηση	
A224	*Caprimulgus europaeus*	r	Population	Couples	Insufficient data	Insufficient data	
A080	*Circaetus gallicus*	r	Population	Couples	2	Διατήρηση	
A738	*Delichon urbicum*	r	Population	Couples	Insufficient data	Διατήρηση	
A447	*Emberiza caesia*	c	Population	Individuals	Insufficient data	Insufficient data	
A447	*Emberiza caesia*	r	Population	Couples	Insufficient data	Insufficient data	
A379	*Emberiza hortulana*	c	Population	Individuals	Insufficient data	Insufficient data	
A379	*Emberiza hortulana*	r	Population	Couples	Insufficient data	Insufficient data	
A100	*Falco eleonorae*	c	Population	Individuals	30	Διατήρηση	
A103	*Falco peregrinus*	p	Population	Individuals	5	Διατήρηση	
A321	*Ficedula albicollis*	c	Population	Individuals	Insufficient data	Διατήρηση	
A320	*Ficedula parya*	c	Population	Individuals	Insufficient data	Insufficient data	

Code	Name	Type	Parameter	Unit	Target value	Specialized target	Remarks
A439	*Hippolais olivetorum*	c	Population	Individuals	Insufficient data	Insufficient data	
A251	*Hirundo rustica*	r	Population	Couples	Insufficient data	Insufficient data	
A022	*Ixobrychus minutus*	c	Population	Individuals	Insufficient data	Insufficient data	
A338	*Lanius collurio*	c	Population	Individuals	Insufficient data	Insufficient data	
A338	*Lanius collurio*	r	Population	Couples	Insufficient data	Insufficient data	
A339	*Lanius minor*	r	Population	Couples	Insufficient data	Insufficient data	
A339	*Lanius minor*	c	Population	Individuals	Insufficient data	Insufficient data	
A179	*Larus ridibundus*	w	Population	Individuals	Insufficient data	Insufficient data	
A246	*Lullula arborea*	r	Population	Couples	Insufficient data	Insufficient data	
A230	*Merops apiaster*	r	Population	Couples	Insufficient data	Insufficient data	
A260	*Motacilla flava*	r	Population	Couples	Insufficient data	Insufficient data	
A260	*Motacilla flava*	c	Population	Individuals	Insufficient data	Insufficient data	
A337	*Oriolus oriolus*	r	Population	Individuals	Insufficient data	Insufficient data	
A337	*Oriolus oriolus*	c	Population	Individuals	Insufficient data	Insufficient data	
A072	*Pernis apivorus*	r	Population	Couples	3	Διατήρηση	
A392	*Phalacrocorax aristotelis desmarestii*	r	Population	Couples	168	Διατήρηση	
A663	*Phoenicopterus roseus*	c	Population	Individuals	Insufficient data	Insufficient data	
A249	*Riparia riparia*	c	Population	Individuals	Insufficient data	Insufficient data	
A193	*Sterna hirundo*	c	Population	Individuals	Insufficient data	Insufficient data	
A885	*Sternula albifrons*	c	Population	Individuals	Insufficient data	Insufficient data	
A210	*Streptopelia turtur*	r	Population	Couples	Insufficient data	Insufficient data	
A440	*Sylvia ruppeli*	r	Population	Couples	Insufficient data	Insufficient data	
A228	*Tachymarptis melba*	r	Population	Individuals	Insufficient data	Insufficient data	
A091	*Aquila chrysaetos*	w	Population	Individuals	Insufficient data	Insufficient data	
A091	*Aquila chrysaetos*	p	Population	Couples	1	Επίτευξη	
A403	*Buteo rufinus*	r	Population	Couples	2	Διατήρηση	
A850	*Calonectris diomedea s.str.*	c	Population	Individuals	Insufficient data	Insufficient data	
A850	*Calonectris diomedea s.str.*	r	Population	Couples	Insufficient data	Insufficient data	
A231	*Caracias garrulus*	r	Population	Couples	1	Διατήρηση	
A231	*Caracias garrulus*	c	Population	Individuals	Insufficient data	Insufficient data	
A101	*Falco biarmicus*	p	Population	Couples	2	Διατήρηση	
A707	*Hieraaetus fasciatus (Aquila fasciata)*	p	Population	Individuals	Insufficient data	Insufficient data	
A092	*Hieraaetus pennatus (Aquila pennata)*	c	Population	Individuals	Insufficient data	Insufficient data	
A014	*Hydrobates pelagicus*	c	Population	Individuals	Insufficient data	Insufficient data	
A181	*Larus audouinii*	w	Population	Individuals	Insufficient data	Insufficient data	

Code	Name	Type	Parameter	Unit	Target value	Specialized target	Remarks
A176	*Larus melanocephalus*	c	Population	Individuals	Insufficient data	Insufficient data	
A464	*Puffinus yelkouan*	p	Population	Couples	Insufficient data	Insufficient data	
A863	*Thalasseus sandvicensis*	w	Population	Individuals	Insufficient data	Insufficient data	

1.2.1.4 SAC GR1150010 "Nestos Delta and Keramoti Lagoons – Wider Area"

Table 59 presents the conservation objectives for the SAC GR1150010 based on the Ministry of Environment and Natural Resources/DDFPB/24776/985/22.03.2023.

Table 59: Conservation objectives for the SAC GR1150010 (ΥΑ ΥΠΕΝ/ΔΔΦΠΒ/24776/985/22.03.2023)

		Parameter	Parameter unit of measurement	Target value	Specialized target	Remarks
Habitat types in Annex I of Directive 92/43/EEC						
1110	Sandbanks that are constantly covered by shallow seawater	Area	Hectares	Insufficient data	Insufficient data	
		Benthic soft substrate endofauna	Indicator (Bentix-EQR)	> 0,58	Insufficient data	
1130	River estuaries	Area	Hectares	Insufficient data	Insufficient data	
		Benthic soft substrate endofauna	Indicator (Bentix-EQR)	> 0,58	Insufficient data	
1140	Muddy and sandy flats revealed at low tide	Area	Hectares	Insufficient data	Insufficient data	
*1150**	Coastal lagoons	Area	Hectares	Insufficient data	Insufficient data	
		Benthic soft substrate endofauna	Indicator (Bentix-EQR)	Insufficient data	Insufficient data	
		Benthic soft substrate endofauna in transitional waters (leohaline and leothermal biocommunity LEE)	Indicator (M-AMBI)	≥0,82	Achievement	
		Restoration of plant communities	Indicator (EEI-c)	>0,48	Achievement	
1210	Annual vegetation between the high and low tide lines	Area	Hectares	341	Conservation	
		coverage of species characteristics	% coverage	Insufficient data	Insufficient data	
		coverage of alien and/or non-native invasive species	% coverage	<5% and in less than 25% of all selected habitat type assessment sites	Insufficient data	
1310	Primary vegetation with Salicornia and other annual species of muddy and sandy zones	Area	Hectares	25	Conservation	
		coverage of species characteristics	% coverage	Insufficient data	Insufficient data	Characteristic species: Salicornia spp.
		coverage of alien and/or non-native invasive species	% coverage	Insufficient data	Insufficient data	
		Water/soil salinity	microsiemens/centimetre (μS/cm)	Insufficient data	Insufficient data	
1410		Area	Hectares	1632,7	Conservation	

		Parameter	Parameter unit of measurement	Target value	Specialized target	Remarks
	Mediterranean salt flats (Juncetalia maritimi)	coverage of species characteristics	% coverage	>50%	Insufficient data	Characteristic species: Halophilic species (mainly Juncus spp., Bolboschoenus spp.).
		coverage of alien and/or non-native invasive species	% coverage	Insufficient data	Insufficient data	
		Water/soil salinity	microsiemens/centimetre (μS/cm)	Insufficient data	Insufficient data	
1420	Mediterranean and thermo-Atlantic halophilic thickets (Sarcocornetea fruticosi)	Area	Hectares	425	Conservation	
		coverage of species characteristics	% coverage	Insufficient data	Insufficient data	Characteristic species: Various halophilic species mainly Salicornia spp., Arthrocaulon spp., Halocnemum spp., Halimione spp.
		coverage of alien and/or non-native invasive species	% coverage	Insufficient data	Insufficient data	
		Water/soil salinity	microsiemens/centimetre (μS/cm)	Insufficient data	Insufficient data	
2110	Atypical moving dunes	Area	Hectares	85,4	Conservation	
		coverage of species characteristics	% coverage	Insufficient data	Insufficient data	Characteristic species: Various ammophilous species
		coverage of alien and/or non-native invasive species	% coverage	<5% and in less than 25% of all selected habitat type assessment sites	Insufficient data	
2120	Moving dunes of the coastline with Ammophila arenaria ("white dunes")	Area	Hectares	107,3	Conservation	
		coverage of species characteristics	% coverage	Insufficient data	Insufficient data	Characteristic species: Various ammophilous species, especially the species Ammophila arenaria.
		coverage of alien and/or non-native invasive species	% coverage	<5% and in less than 25% of all selected habitat type assessment sites	Insufficient data	
2190	Wet hollows between the dunes	Area	Hectares	13,6	Conservation	
		coverage of species characteristics	% coverage	Insufficient data	Insufficient data	
		coverage of alien and/or non-native invasive species	% coverage	<5% and in less than 25% of all selected habitat type assessment sites	Insufficient data	
2220	Dunes with Euphorbia terracina	Area	Hectares	80,2	Conservation	
		coverage of species characteristics	% coverage	Insufficient data	Insufficient data	

		Parameter	Parameter unit of measurement	Target value	Specialized target	Remarks
		coverage of alien and/or non-native invasive species	% coverage	<5% and in less than 25% of all selected habitat type assessment sites	Insufficient data	
3150	Eutrophic natural lakes with Magnopotamion or Hydrocharition type vegetation	Area	Hectares	11,2	Conservation	
		coverage of alien and/or non-native invasive species	% coverage	Insufficient data	Insufficient data	
		Water/soil salinity	microsiemens/centimetre (µS/cm)	Insufficient data	Insufficient data	
		Water/soil acidification status	Active acidity (pH)	Insufficient data	Insufficient data	
3170	Mediterranean seasonal backwaters	Area	Hectares	Insufficient data	Insufficient data	
		coverage of alien and/or non-native invasive species	% coverage	<5% and in less than 25% of all selected habitat type assessment sites	Insufficient data	
		Water/soil salinity	microsiemens/centimetre (µS/cm)	Insufficient data	Insufficient data	
		Water/soil acidification status	Active acidity (pH)	Insufficient data	Insufficient data	
3280	Mediterranean rivers with permanent flow of Paspalo-Agrostidion and dense vegetation in the form of a curtain of Salix and Populus alba on their banks	Area	Hectares	422,6	Conservation	
		coverage of alien and/or non-native invasive species	% coverage	Insufficient data	Insufficient data	
		Water/soil salinity	microsiemens/centimetre (µS/cm)	Insufficient data	Insufficient data	
		Water/soil acidification status	Active acidity (pH)	Insufficient data	Insufficient data	
62A0	Dry grassy formations of the eastern Mediterranean (Scorzoneratalia villosae)	Area	Hectares	332,5	Conservation	
		coverage of non-standard species (except alien & invasive)	% coverage	< 10 %	Insufficient data	Non-typical species: phanerophytes (trees and shrubs) and phrygian species.
		coverage of alien and/or non-native invasive species	% coverage	Insufficient data	Insufficient data	
6420	Wet Mediterranean grasslands with tall grasses from Molinio-Holoschoenion	Area	Hectares	1127,6	Conservation	
		coverage of non-standard species (except alien & invasive)	% coverage	< 10 %	Insufficient data	Non-typical species: phanerophytes (trees and shrubs) and phrygian species.
		coverage of alien and/or non-native invasive species	% coverage	Insufficient data	Insufficient data	
91E0		Area	Hectares	513,8	Conservation	

		Parameter	Parameter unit of measurement	Target value	Specialized target	Remarks
	Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)	coverage of species characteristics	% coverage	> 40%	Insufficient data	Characteristic species: Alnus glustinosa in the tree canopy. It is noted that the goal concerns dominance or co-dominance of the characteristic species in the tree canopy with species such as Populus spp., Salix spp. and Fraxinus spp.
		coverage of alien and/or non-native invasive species	% coverage	<5% and in less than 25% of all selected habitat type assessment sites	Insufficient data	It concerns tree or shrub alien and/or non-native invasive species.
91F0	Mixed forests with Quercus robur, Ulmus laevis, Ulmus minor, Fraxinus excelsior or Fraxinus angustifolia (Ulmenion minoris) along large rivers	Area	Hectares	At least 157.5	Conservation	
		coverage of species characteristics	% coverage	> 50%	Conservation	Characteristic species: Quercus robur and/or Ulmus laevis and/or Fraxinus excelsior and/or F. angustifolia in the tree layer.
		coverage of alien and/or non-native invasive species	% coverage	<5% and in less than 25% of all selected habitat type assessment sites	Insufficient data	It concerns tree or shrub alien and/or non-native invasive species.
		Presence of trees of great age/diameter	Number of people per hectare	Insufficient data	Insufficient data	
		Presence of dead wood	Cubic meters per hectare	Insufficient data	Insufficient data	
92A0	Forests – galleries with Salix alba and Populus alba	Area	Hectares	623,6	Conservation	
		coverage of species characteristics	% coverage	> 50%	Conservation	Characteristic species: Populus spp. and/or Salix spp. and/or Alnus glutinosa and/or Fraxinus spp. in the tree canopy.
		coverage of alien and/or non-native invasive species	% coverage	<5% and in less than 25% of all selected habitat type assessment sites	Achievement	It concerns tree or shrub alien and/or non-native invasive species.
92D0	Southern riparian forests - galleries and thickets (Nerio-Tamaricetea and Securinegion tinctoriae)	Area	Hectares	672,5	Conservation	
		coverage of species characteristics	% coverage	> 40%	Conservation	Characteristic species: Tamarix spp. and/or Nerium oleander and/or Vitex agnus-castus.
		coverage of alien and/or non-native invasive species	% coverage	<5% and in less than 25% of all selected habitat type assessment sites	Insufficient data	It concerns tree or shrub alien and/or non-native invasive species.
Είδη του Παραρτήματος ΙΙ της Οδηγίας 92/43/ΕΚ						

		Parameter	Parameter unit of measurement	Target value	Specialized target	Remarks
1043	*Lindenia tetraphylla*	Population	Number of people per square meter of dwelling	Insufficient data	Insufficient data	
		Habitat	sq.km.	Insufficient data	Insufficient data	Species habitat: Lakes with extensive reed beds or beds of aquatic macrophytes and more rarely in low-flow rivers
1060	*Lycaena dispar*	Population	Number of people per square meter of dwelling	Insufficient data	Insufficient data	
		Habitat	sq.km.	Insufficient data	Insufficient data	It is associated with habitats 3280 (Rivers with permanent flow of Paspalo-Agrostidion and dense vegetation in the form of a curtain of Salix alba and Populus alba), but also with agricultural lands.
		Presence of host plants	Number of people per sq.m.	Insufficient data	Insufficient data	The larvae feed on plants of the genus Rumex
		Average height of herbaceous vegetation in Habitat	εκ.	40-100	Insufficient data	
		Shrubby and arboreal vegetation in the Habitat	% coverage	< 20%	Insufficient data	
1037	*Ophiogomphus cecilia*	Population	Number of people per square meter of dwelling	Insufficient data	Insufficient data	
		Habitat	sq.km.	Insufficient data	Insufficient data	Species habitat: Rivers and streams with relatively sunny banks with sparse vegetation
1103	*Alosa fallax*	Population	Number of people per sq.m.	Insufficient data	Insufficient data	
		Significant Distribution Area	sq.km.	21,1	Conservation	
		Surface water status of a water body	Five-point rating scale according to Directive 2000/60/EC	Good	Achievement	
1152	*Aphanius fasciatus*	Population	Number of people per sq.m.	Insufficient data	Insufficient data	
		Significant Distribution Area	sq.km.	9,1	Conservation	
		Alien species	% participation in population samples	Insufficient data	Insufficient data	
		Surface water status of a water body	Five-point rating scale according to Directive 2000/60/EC	Good	Achievement	
5263	*Barbus strumicae*	Population	Number of people per sq.m.	Insufficient data	Insufficient data	

		Parameter	Parameter unit of measurement	Target value	Specialized target	Remarks
		Significant Distribution Area	sq.km.	22,5	Conservation	
		Alien species	% participation in population samples	Insufficient data	Insufficient data	
		Surface water status of a water body	Five-point rating scale according to Directive 2000/60/EC	Good	Achievement	
6963	*Cobitis teania Complex*	Population	Number of people per sq.m.	Insufficient data	Insufficient data	
		Significant Distribution Area	sq.km.	22,5	Conservation	
		Alien species	% participation in population samples	Insufficient data	Insufficient data	
		Surface water status of a water body	Five-point rating scale according to Directive 2000/60/EC	Good	Achievement	
5339	*Rhodeus amarus*	Population	Number of people per sq.m.	Insufficient data	Insufficient data	
		Significant Distribution Area	sq.km.	21,1	Conservation	
		Alien species	% participation in population samples	Insufficient data	Insufficient data	
		Surface water status of a water body	Five-point rating scale according to Directive 2000/60/EC	Good	Achievement	
1224	*Caretta caretta*	Population	Number of reproductive individuals	Insufficient data	Insufficient data	
		Population- Female reproductive Individuals	Number of female reproductive individuals	Insufficient data	Insufficient data	
		Marine Habitat	sq.km.	Insufficient data	Insufficient data	
		Number of nests	Number of nests per year	Insufficient data	Insufficient data	
		Breeding habitat	Useful area of spawning beaches (sq. km.)	Insufficient data	Insufficient data	
1279	*Elaphe quatuorlineata*	Population	Number of reproductive individuals	Insufficient data	Insufficient data	
		Spreading	Number of cells (1 km x 1 km)	Insufficient data	Insufficient data	
		Habitat	Hectares	Insufficient data	Insufficient data	
1220	*Emys orbicularis*	Population	Number of reproductive individuals	500	Conservation	
		Spreading	Number of cells (1 km x 1 km)	18	Conservation	

		Parameter	Parameter unit of measurement	Target value	Specialized target	Remarks
		Habitat	Hectares	Insufficient data	Insufficient data	Rivers, lakes, lagoons, ponds, canals and other bodies of water.
		Presence of invasive/alien species	Number of individuals of invasive/alien species	0	Conservation	It concerns the species Trachemys scripta.
2373	*Mauremys rivulata*	Population	Number of reproductive individuals	500	Conservation	
		Spreading	Number of cells (1 km x 1 km)	28	Conservation	
		Habitat	Hectares	Insufficient data	Insufficient data	Rivers, lakes, lagoons, ponds, canals and other bodies of water.
		Presence of invasive/alien species	Number of individuals of invasive/alien species	0	Conservation	It concerns the species Trachemys scripta.
1219	*Testudo graeca*	Population	Number of reproductive individuals	6000	Conservation	
		Spreading	Number of cells (1 km x 1 km)	70	Conservation	
		Habitat	Hectares	Insufficient data	Insufficient data	
		Population	Number of reproductive individuals	4000	Conservation	
1217	*Testudo hermanni*	Spreading	Number of cells (1 km x 1 km)	65	Conservation	
		Habitat	Hectares	Insufficient data	Insufficient data	
		Population	Number of cells (1 km x 1 km)	27	Conservation	
1355	*Lutra lutra*	Spreading	sq.km.	215,1	Conservation	
		Habitat	sq.km.	154,6	Conservation	

1.2.2 Conservation status of the habitat types and/or species for which the Natura 2000 site concerned has been designated

The conservation status of habitat types and species at the MP level was presented in Section 1.1.A2.

The conservation status of species at the national level has been determined only for habitat types and fauna other than avifauna and is presented in Tables 58 and 59.

Table 60: Conservation status of SDF species at the national level

Species type	Code	Scientific name	11.1 Range	11.2 Population	11.3 Habitat for the species	11.4 Future prospects	11.5 Overall Conservation Status Assessment	11.6 Overall Conservation Status Trend
I	1037	*Ophiogomphus cecilia*	FV	U1	XX	U1	U1	D
I	1043	*Lindenia tetraphylla*	FV	U1	XX	U1	U1	D
I	1060	*Lycaena dispar*	FV	U2	XX	U2	U2	D
F	1103	*Alosa fallax*	XX	XX	U2	U2	U2	D
F	1152	*Aphanius fasciatus*	FV	FV	U1	U1	U1	S
A	1171	*Triturus karelinii*	FV	XX	FV	FV	FV	Unk
A	1193	*Bombina variegata*	FV	FV	FV	FV	FV	S
R	1217	*Testudo hermanni*	FV	U1	U1	XX	U1	D
R	1219	*Testudo graeca*	FV	U1	U1	XX	U1	D
R	1220	*Emys orbicularis*	FV	XX	U1	XX	U1	D
R	1224	*Caretta caretta*	FV	U1	U1	U2	U2	D
R	1279	*Elaphe quatuorlineata*	FV	FV	FV	FV	FV	S
M	1304	*Rhinolophus ferrumequinum*	FV	XX	XX	U1	U1	Unk
M	1310	*Miniopterus schreibersii*	XX	XX	XX	U1	U1	Unk
M	1349	*Tursiops truncatus*	XX	XX	U1	XX	U1	Unk
M	1351	*Phocoena phocoena*	XX	XX	U2	U2	U2	D
M	1355	*Lutra lutra*	FV	FV	FV	FV	FV	S
R	2373	*Mauremys rivulata*	FV	XX	U1	XX	U1	D
F	5263	*Barbus strumicae*	FV	FV	FV	FV	FV	S
F	5339	*Rhodeus amarus*	FV	FV	FV	FV	FV	S
R	6095	*Zamenis situla*	FV	FV	FV	FV	FV	S
F	6963	*Cobitis taenia Complex*	FV	FV	FV	XX	FV	S

Memorandum: Species group: A: Amphibian, F: Ichthyofauna, I: Invertebrate, M: Mammal, R: Reptile, Conservation Status: FV: Satisfactory, U1: Unsatisfactory - Insufficient, U2: Unsatisfactory - Poor, XX: Unknown, Conservation Status Trend: D: Deteriorating (-), I: Improving (+), S: Stable (=), Unk: Unknown (x)

Table 61: Conservation status of SDF habitat types at national level

Code /	10.1. Range	10.2. Area	10.3. Specific structure and functions (incl. typical species)	10.4. Future prospects	10.5. Overall Conservation Status Assessment	10.6 Overall Conservation Status Trend
1130	FV	FV	U1	U1	U1	S
1210	FV	/U1	U1	U1	U1	S
1310	FV	U1	FV	FV	U1	S
1410	FV	U1	U1	FV	U1	I
1420	FV	U1	FV	FV	U1	S
2110	FV	U1	U1	FV	U1	S
2120	FV	U1	FV	FV	U1	S
2190	FV	U1	FV	U1	U1	S
2220	FV	FV	FV	FV	FV	S
3150	FV	FV	FV	FV	FV	S
3280	FV	FV	FV	FV	FV	S
62A0	FV	FV	FV	U1	U1	S
6420	FV	FV	U1	FV	U1	S
91F0	FV	U1	U2	U2	U2	S
92A0	FV	FV	FV	U1	U1	S
92D0	FV	FV	FV	FV	FV	S
1150	FV	U1	U1	U2	U2	D
91E0	FV	FV	FV	U1	U1	S
1110	FV	FV	U1	U1	U1	D
1140	FV	XX	U1	U1	U1	D
1170	FV	FV	U2	U2	U2	S
3170	FV	FV	FV	FV	FV	S

1.2.3 Main pressures and threats that exist

1.2.3.1 General

The categories of pollution sources are distinguished as follows:

- Point sources of pollution related to Wastewater Treatment Plants (WTP), Sewage network outlets to a natural recipient, Large hotel units, Industrial units, Livestock units, Aquaculture - Fish farming, Leaks from landfills and landfills.
- Diffuse sources of pollution: Agricultural activities, Urban wastewater that does not end up in WTP, Livestock farming (pastoral), Water pollution from other sources.
- Water flow regulation projects and hydromorphological alterations.
- Water abstractions.
- Other types of anthropogenic pressures.
- Water pollution from other sources.

The potential anthropogenic pressures on the environment of the wider study area (Kavala Regional Unit) are the following:

- Overexploitation of land, uncontrolled use of groundwater for irrigation, over-discharge of waste into the aquifer.
- Pollution from fertilizers and pesticides.
- Wastewater treatment plants.
- Landfills and dumps.
- Industries in the project area.
- Maritime traffic.
- Fishing activities and aquaculture.
- Tourism.
- Mining and quarries.
- Livestock farming.

As can be seen from the following Figure, the main sources of pressure in the immediate area of the Project are:

- Wastewater Treatment Plants (WTP).
- Industries and installations falling under the provisions of the SEVESO Directive (such as the industries "ENERGEAN Oil and Gas" and "Hellenic Fertilizers ELFE SA").
- Industries and installations falling under the requirements of the IPPC Directive (such as the livestock farm "Kioutsoukosta Bros. - Kreka SA" in Chrysoupoli, Kavala).
- WASTE DISPOSAL, LANDFILL.
- Other polluting installations, such as pig farms, poultry farms, slaughterhouses, etc.

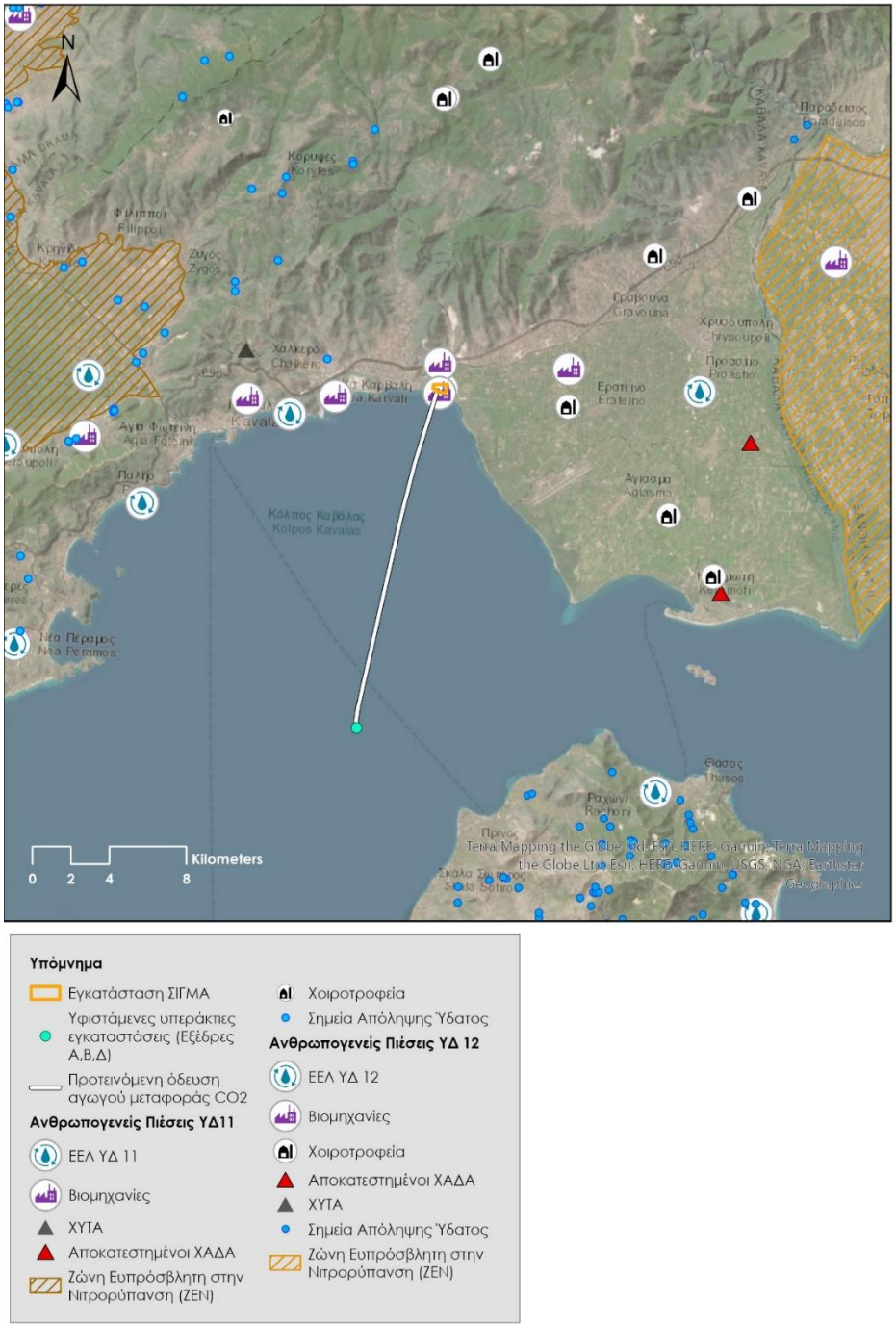


Figure 86: Main anthropogenic pressures in the wider Project area (source: 1st Revision of River Basin Management Plans / RBMP)

It is noted that this map has been created based on the spatial data of anthropogenic pressures of the 1st Revision of the River Basin Management Plans of the Thrace Regional Administration (EL12) and the Eastern Macedonia Regional Administration (EL11) as the data of the 2nd Revision have not yet been uploaded.

The treated liquid industrial waste of the Project's SIGMA onshore facility is disposed of in its immediate marine area. The final disposal of the treated liquid waste and rainwater to the marine recipient (Kavala Gulf) is carried out in accordance with the No. A.P. 6924/1987 Prefectural Decision (Government Gazette

475/3-9-1987) "Definition of the recipient of industrial waste and urban wastewater in the Prefecture of Kavala".

In addition to the Project's onshore industrial facilities, pressure on the immediate environment is caused by the fertilizer and chemical production industry (Hellenic Fertilizers ELFE SA), which disposes of its treated industrial wastewater in its immediate marine area.

The livestock facility "Kioutsoukosta Bros. - Kreka SA" in Chrysoupoli, Kavala is approximately 6km from the Project's onshore facilities and is subject to the IPPC Directive. This facility constitutes a polluting burden in the wider area, however, it has a secondary treatment unit with an adjacent drainage ditch as the recipient of its treated wastewater and the marine area as the final recipient.

1.2.3.2 SAC & SCI GR1150014 “Marine Area of Kavala Thassos”

Table 62 presents the main threats and pressures identified for the PM, as included in the SDF.

Table 62: Threats and pressures for the SCI and SPA GR1150014 (source: SDF)

CODE	Threat/Pressure	SUMMARY AT SAC	AREA	INTENSITY
A01	Cultivation		Outside	High
A07	Use of biocides, hormones and chemicals		Outside	High
A08	Use of fertilizers		Outside	High
D04.01	Airport		Outside	High
E02	Industrial or commercial areas		Outside	High
A01	Cultivation		Inside	Moderate
A04	Grazing		Inside	Moderate
A07	Use of biocides, hormones and chemicals		Inside	Moderate
A08	Use of fertilizers		Inside	Moderate
A09	Irrigation		Inside	Moderate
F02	Fishing and harvesting of aquatic resources	X	Inside	Moderate
F02.03	Recreational fishing		Inside	Moderate
G02.10	Other sports/recreation complexes		Inside	Moderate
G05	Other human-induced disturbances		Inside	Moderate
H3.01	Oil spills at sea		Inside	Moderate
I01	Invasive non-native species		Inside	Moderate
J02.03	Drainage and diversion of water		Inside	Moderate
J03.01.01	Reduced prey availability (including dead animals)		Inside	Moderate
J03.02	Anthropogenic reduction of habitat connectivity		Inside	Moderate
A04	Grazing		Outside	Moderate
A09	Irrigation		Outside	Moderate
E03.02	Disposal of industrial waste		Outside	Moderate
F03.01	Κυνήγι		Outside	Moderate

CODE	Threat/Pressure	SUMMARY AT SAC	AREA	INTENSITY
H	Pollution	X	Outside	Moderate
H06.01	Noise, noise pollution		Outside	Moderate
C01.01	Sand and gravel mining		Inside	Low
E01	Urban areas, human habitation		Inside	Low
E03.01	Household/recreational waste disposal		Inside	Low
F03.01	Hunting		Inside	Low

A more recent analysis of the pressures and threats to the area was carried out in the context of the preparation of the NRP for the area. According to the analysis carried out by OMIKRON S.A. (2022), the main threats/pressures associated with the main habitats of the species affected are presented below:

- "Sea": The main pressures/threats to the species and the T.O. are related to fishing (professional and/or amateur) in the Kavala - Thassos maritime area, the accidental killing of individuals due to fishing activities, the natural gas exploitation infrastructure in the maritime area, the production and transport of energy in the Kavala - Thassos maritime area causing marine pollution, coastal shipping lines and transport activities, the creation or development of sports, tourism and recreation infrastructure and the treatment of waste from industrial facilities in the area.

The pressures of the wider area of the Thasos - Kavala marine area are of moderate and low importance and are related to the practice of agriculture and cultivated areas, the deposition and treatment of waste from industrial units and the oil and natural gas transportation networks.

1.2.3.3 SAC GR1150010 "Nestos Delta and Keramoti Lagoons – Wider Area"

The main pressures and threats that exist in the region based on the SDF are summarized in Table 63.

Table 63: Main pressures and threats existing in the SAC GR1150010 "Nestos Delta and Keramoti Lagoons – Wider Area" based on the SDF

CODE	Threat/Pressure	AREA	INTENSITY
L09	Fire (natural causes)	Inside/Outside	Moderate
E01	Urbanization of areas, housing	Inside	Low
E02	Industrial or commercial areas	Outside	High
J03.02.01	Reduction in migration/migratory barriers	Inside/Outside	Low
F02.02.01	Bentrich or demersal trawling	Inside/Outside	Low
A07	Use of biocides, hormones and chemicals	Inside	Moderate
J02.03	Drainage and diversion of water bodies	Inside	Low
A08	Use of fertilizers	Inside	Moderate
J02.03.02	Drainage of water bodies	Inside/Outside	Moderate

CODE	Threat/Pressure	AREA	INTENSITY
J02.05.05	Small hydropower projects, dams	Inside/Outside	Moderate
E03.02	Disposal of industrial waste	Outside	Moderate
E01.01	Continuous urbanization	Inside/Outside	Moderate
D01.02	Discontinuous urbanization	Inside/Outside	Moderate
C01.01	Sand and gravel extraction	Inside	Low
A09	Irrigation	Outside	Moderate
J02.03	Canal & water diversion	Inside	Moderate
J03.01	Reduction or loss of specific habitat features	Inside	High
D04.01	Airport	Outside	High
K03.06	Competition with domestic animals	Inside/Outside	Moderate
A10.01	Removal of hedgerows and stands or shrubs	Inside/Outside	Moderate
H01	Surface water pollution (limestone, terrestrial, marine and brackish)	Inside/Outside	Moderate
H01.05	Diffuse pollution of surface water due to agricultural and forestry activities	Inside/Outside	High
A07	Use of biocides, hormones and chemicals	Inside	Moderate
E03.01	Disposal of domestic/recreational waste	Inside/Outside	Low
J03.02	Anthropogenic reduction of habitat connectivity	Inside/Outside	High
X	No threats or pressures	Inside/Outside	Low
G05.11	Death or injury from collision	Inside/Outside	Moderate
H	Pollution	Inside/Outside	Moderate
A08	Use fertilizers	Inside	High
A04	Grazing	Outside	Moderate
A04	Grazing	Outside	Moderate
H01.08	Diffuse pollution of surface waters due to domestic sewage and waste	Inside	Moderate
A07	Use of biocides, hormones and chemicals	Inside/Outside	High
H06.01	Noise nuisance, noise pollution	Outside	Moderate
A01	Cultivation	Inside	Moderate
A01	Cultivation	Outside	High
F03.01	Hunting	Inside/Outside	Low
G05	Other human interventions and disturbances	Outside	Moderate
F03.01	Hunting	Inside	Moderate
E03	Releases	Outside	Moderate
J02.12.02	Edges and flood protection in inland water systems	Inside	Low
J02.05	Modification of hydrographic function, general	Inside	High
A09	Irrigation	Inside	Moderate
A08	Use of fertilizers	Inside	Moderate

1.2.3.4 SAC GR1150001 “Nestos Delta and Keramoti Lagoons and Thasopoula Island”

Table 64 presents the main threats and pressures identified for the Study Area, as included in the SDF.

Table 64: Threats and pressures for SPA GR1150001 (source: SDF)

CODE	Threat/Pressure	SUMMARY AT SAC	AREA	INTENSITY
A07	Χρήση βιοκτόνων, ορμονών και χημικών	X	Outside	High
A08	Χρήση λιπασμάτων	X	Outside	High
A01	Καλλιέργεια	X	Outside	High
A04	Βόσκηση		Inside	Moderate
B	Δασοκομία		Inside	Moderate
B01.02	Τεχνητές φυτεύσεις σε ανοιχτό έδαφος (μη αυτοφυή είδη)		Inside	Moderate
F03.01	Κυνήγι	X	Inside	Moderate
G02.08	Κάμπινγκ και τροχόσπιτα		Inside	Moderate
G05	Άλλες οχλήσεις λόγω ανθρώπινων δραστηριοτήτων		Inside	Moderate
A04	Βόσκηση	X	Outside	Moderate
A09	Άρδευση	X	Outside	Moderate
D01.01	Μονοπάτια και ποδηλατόδρομοι		Outside	Moderate
E02	Βιομηχανικές ή εμπορικές περιοχές		Outside	Moderate
E03.02	Διάθεση βιομηχανικών αποβλήτων		Outside	Moderate
F03.01	Κυνήγι	X	Outside	Moderate
J01	Πυρκαγιά και καταστολή πυρκαγιάς		Outside	Moderate
A09	Άρδευση	X	Inside	Low
E01	Αστικές εκτάσεις, ανθρώπινη κατοίκηση		Inside	Low
E03.01	Διάθεση οικιακών/εγκαταστάσεων αναψυχής αποβλήτων		Inside	Low
J01	Πυρκαγιά και καταστολή πυρκαγιάς		Inside	Low
C01.01	Εξόρυξη άμμου και χαλικιού		Outside	Low
E03.01	Διάθεση οικιακών/εγκαταστάσεων αναψυχής αποβλήτων		Outside	Low
C03.03	Παραγωγή αιολικής ενέργειας		Outside	Low

A more recent analysis of the pressures and threats for the area was carried out in the context of the preparation of the NEP01B for the area. According to the analysis carried out by OMIKRON S.A. (2022), the main threats/pressures associated with the main habitats of the species affected are presented below:

- All habitat types are affected by the main pressures/threats related to the practice of agriculture and cultivated areas, hunting activity, poaching and the deliberate killing of birds.
- “Forests”: concerns a variety of forests such as broadleaf forests, coniferous forests, riparian forests, where mainly raptors and passerines are found. The main pressures/threats for are also related to the implementation of illegal logging and the extraction and exploitation of mineral resources and natural gas.
- “Marshes”: refers to areas with fresh or brackish water marshes. They are mainly inhabited by wading species and herons. The main pressures/threats are also related to the extraction and exploitation of mineral resources and natural gas as well as the degradation of habitats due to salinization.

- "Open areas": Refers mainly to open lowland areas such as open agricultural areas, meadows, crops as well as open areas with rocks, where raptors, ratites and wading species and herons are mainly found. The main pressures/threats are also related to the extraction of mineral resources and the development of settlements.
- "Lake": Refers to a variety of lake systems (including oligotrophic or eutrophic lakes). They are mainly inhabited by aquatic species and ducks. The main pressures/threats are related to the above and concern all habitats.
- "Coasts": It concerns the coasts of the region with a varied substrate (sandy, muddy, rocky). There, mainly wading species are found. The main pressures/threats are also related to fishing activity.
- "Wetlands": It concerns a variety of inland and coastal wetlands, usually with reed vegetation, where mainly herons, aquatic and wading species are found. The main pressures/threats are also related to pollution of mixed origin in the waters of the region.
- "Grasslands": It concerns agricultural areas with meadows and pastures, where mainly raptors and passerines and ducks are found. The main pressures/threats are related to the above and concern all habitats.
- "Lagoons": It concerns a variety of coastal lagoon systems, where mainly wading species and gulls are found. The main pressures/threats are also related to fishing activity and pollution of mixed origin in the waters of the area.
- "Reedbeds": It concerns areas with reedbeds and rushes in areas with mainly natural wetlands, where mainly aquatic birds, ratites and herons are found. The main pressures/threats are also related to the modification of hydrological flow, water pumping and the construction/operation of irrigation dams as well as the degradation of habitats due to salinization.
- "Crops": It mainly concerns agricultural areas with crops including cereal crops but also tree crops, where passerines are mainly found. The main pressures/threats are related to what was mentioned above and concern all habitats.
- The remaining habitats of the area concern areas with salt marshes, urban areas and settlements, rocky formations, areas with sparse vegetation, bushes, canals, rivers, river/lake banks and marine areas, bays and coastal waters, where mainly gulls, ducks, herons, waders and seabirds are found. The main pressures/threats are also related to the extraction and exploitation of mineral resources and natural gas.

The pressures of the wider SPA area concern the increased practice of livestock farming, while Moderate and Low importance are the pressures of the wider area related to the practice of agriculture and cultivated areas, transportation on the Thessaloniki - Gefyra Kipon National Road, photovoltaic parks and the electricity and natural gas transmission networks.

1.2.3.5 SAC GR1150012 "Thassos (Mount Ypsarios and coastal zone)"

Table 65 presents the main threats and pressures identified for the Study Area, as included in the SDF.

Table 65: Threats and pressures for SAC GR1150012 (source: SDF)

CODE	Threat/Pressure	SUMMARY AT SAC	AREA	INTENSITY
C03.03	Wind power generation		Inside/Outside	High
D01.02	Roads, Highways	X	Inside	
F03.02.02	Wildlife capture (e.g. hawks)			
E02	Industrial or commercial areas		Outside	
E03	Dropouts			
B01	Open-field forest plantations		Inside	Moderate
L09	Fire (natural causes)	X		
A04.03	Abandonment of livestock systems, lack of grazing	X	Outside	
A09	Irrigation			
D01	Roads, railways and trails	X	Inside/Outside	Low
K01.01	Erosion		Inside	

A more recent analysis of the pressures and threats for the area was carried out in the context of the preparation of the NEP01B for the area. According to the analysis carried out by OMIKRON S.A. (2022), the main threats/pressures associated with the main habitats of the species affected are presented below:

- "Open areas": It mainly concerns open lowland areas such as open agricultural areas, meadows, crops as well as open areas with rocks, where mainly passerine and raptor species are found. The main pressures/threats are related to the practice of agriculture and cultivated areas, poaching and deliberate killing of birds, the extraction of mineral resources, the abandonment of grazing land management in the area and the risk of natural fire.
- "Forests": refers to a variety of forests including forest clearings and forests adjacent to open areas or scrub, where mainly predatory species are found. The main pressures/threats for species found in Forests are related to agriculture and cultivated areas, poaching and deliberate killing of birds, mining, road transport and electricity transmission cables.
- "Sea": refers to marine areas in the southern part of the island of Thassos, where mainly seabirds and gulls are found. The main pressures/threats for species found in the sea are related to agriculture and cultivated areas and fishing activity.
- The remaining areas of the area concern urban areas and settlements, rock formations, marshes, shrubs, crops and meadows. The main pressures/threats for the species found in these NWOs are related to the practice of agriculture and cultivated areas, the risk of natural fire, fishing activity, road transport, the extraction of mineral resources and the development of settlements.

1.2.4 Existing reference values (baseline conditions)

The population of the species in the relevant Natura 2000 area and the assessment of each protected area in terms of the degree of conservation of the habitat characteristics that are important for the species and

restoration possibilities, the degree of isolation of the population present in the area in relation to the natural spreading of the species, and the overall assessment of the value of the site for the conservation of the species (where sufficient data exist) based on the TEN and the Database of the European Ecological Network 2000 sites in Greece (file N2000_descr_GR_2020_08_10_V31b.accdb), ΥΠΕΝ are presented in the corresponding tables of Chapter 1.1.

1.2.5 Ecological functions

Ecological function is the ability or potential of an ecosystem to provide a service as a result of its structural properties or the processes it supports. As the NM is a particularly complex ecosystem, with a multitude of ecological regulatory, supply and support functions, the main ones are listed below, which are directly related to the protected objects that may be affected.

It is considered that all the areas under consideration, due to their characteristics, contribute substantially to the regulation of bio-geochemical cycles (such as CO2/O2 balance), to the regulation of the microclimate, to the absorption of environmental disturbances (such as wind and wave energy), but also to the limitation of the dispersion of airborne and water-soluble pollutants and the propagation of noise. They also provide shelter and suitable living spaces for wildlife communities and individual species, with the presence of natural and semi-natural habitats, while vegetation and other structures improve extreme weather conditions and climate at a local scale. Vegetation and soil organisms contribute to the retention of soil and sediments, while organisms contribute to the transport of seeds and pollination.

SAC & SCI GR1150014 "Marine area of Kavala - Thassos" is one of the most productive marine areas in the Aegean. The deltas of the neighboring areas and the large plateau of the Thracian Sea contribute substantially to the High productivity of the marine environment. Consequently, it is an ideal Habitat for the marine megafauna of the wider area, which includes marine mammals, sea turtles and seabirds. The area is characterized by the presence of Posidonia meadows, which provide shelter for a multitude of organisms and constitute nurseries, while contributing to the retention of sediments.

The SAC GR1150010 “Nestos Delta and Keramoti Lagoons – Wider Area” and the SPA GR1150001 “Nestos Delta and Keramoti Lagoons and Thasopoula Island” are wetland complexes, which host a wide variety of organisms. They provide suitable habitats for feeding, breeding and resting for large populations of bird species, as well as other fauna species, while also contributing to the connectivity between populations. Coastal wetlands and river delta systems contribute substantially to the regulation of river inflow and outflow, the provision of inorganic and organic components, nutrients, and fresh water, which contribute greatly to the increased productivity of the marine zone. Coastal dunes contribute to the retention of coastlines.

SAC GR1150012 “Thassos (Mount Ypsarios and coastal zone)” hosts suitable habitats for the reproduction and resting of seabirds, as well as many other species.

1.2.6 Development trends of the study area (without the project)

The Special Framework for Spatial Planning and Sustainable Development for Industry (EPHSAA-B) approved by Joint Ministerial Decree 11508/2009 (Government Gazette 151/AAAP/13-4-2009) EPHSAA-B, considers the prefecture of Kavala as an important oil extraction area.

According to the General Urban Plan (GUP) of the Municipality of Kavala (Government Gazette 69/AAAP/11-03-2013), the area of the Project's onshore facilities falls inside the "Area of Organized Development of Productive Activities (POAPD) of the Secondary Sector. The said zone is defined as an area for urban development in accordance with Law 2742/1999 and the requirements of the Special Spatial Planning Plan for Industry (JMD 11508/2009 – Government Gazette 151/AAP/13-4-2009) and includes the area west of Nea Karvali, between Egnatia Motorway and the transport zone of the new port, through its characterization as a “General Character Receptor”.

The majority of the GIS Area of the Municipality of Kavala is dominated by general (56.2%) and pure (4.7%) residential uses, while further, significant areas are occupied by urban green areas (12.6%), education (5.6%) and local district-neighborhood centers (5.3%). The aforementioned uses occupy approximately 84.4% of the total area of the GIS of the Municipality of Kavala. The main land uses near and inside the Project's land installations according to the Land Use Map of the GIS of the Municipality of Kavala, are presented in the following Figure.

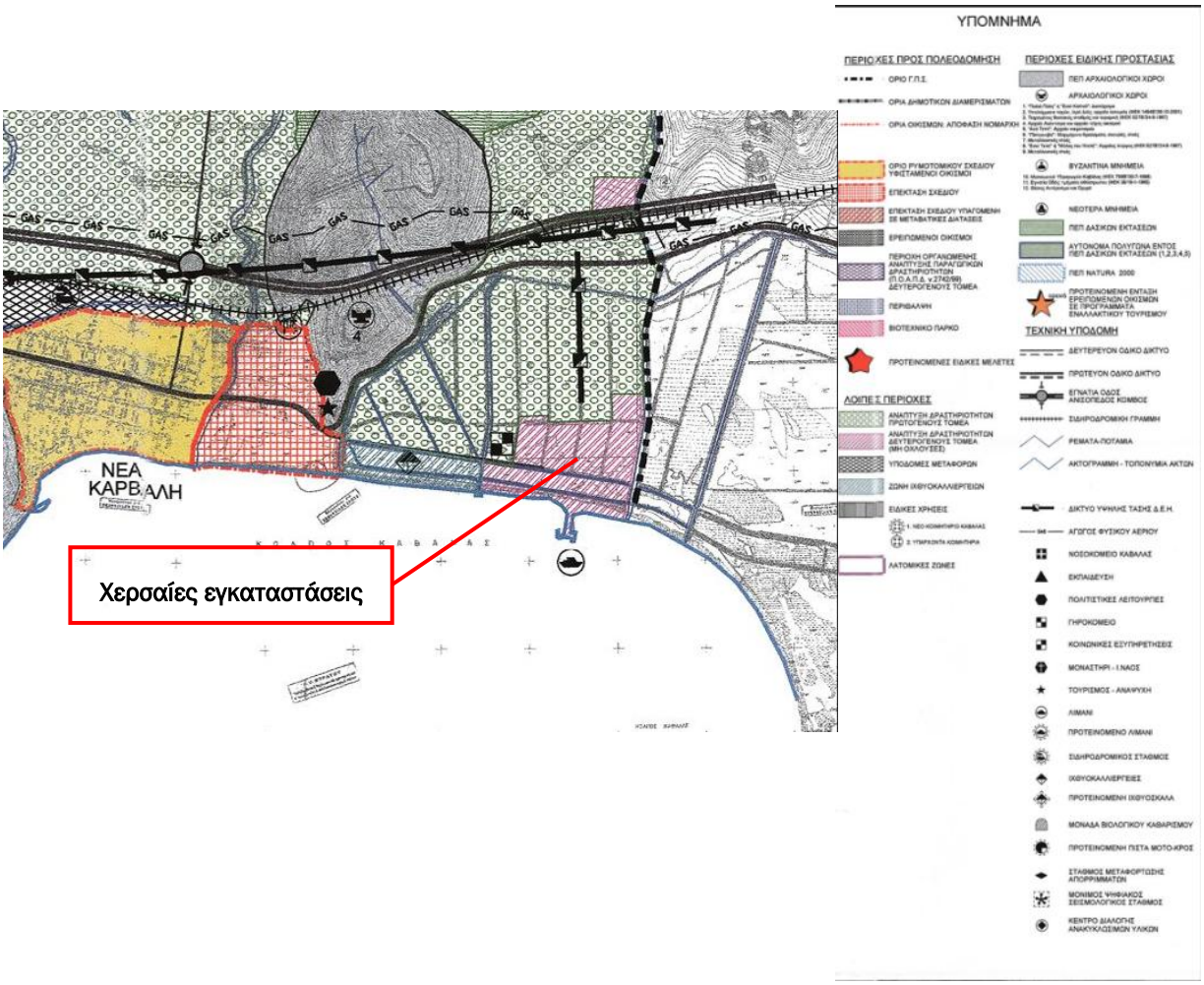


Figure 87: Institutionalized Land Uses near the Project's onshore facilities (source: Land Use Map, GIS of the Municipality of Kavala (Government Gazette 69/AAP/11-03-2013)

The Project's SIGMA onshore facilities are located Inside the Special Economic Zone of the Municipality of Kavala, which is determined by Government Gazette 437-D-1989, as shown in the following Figure.

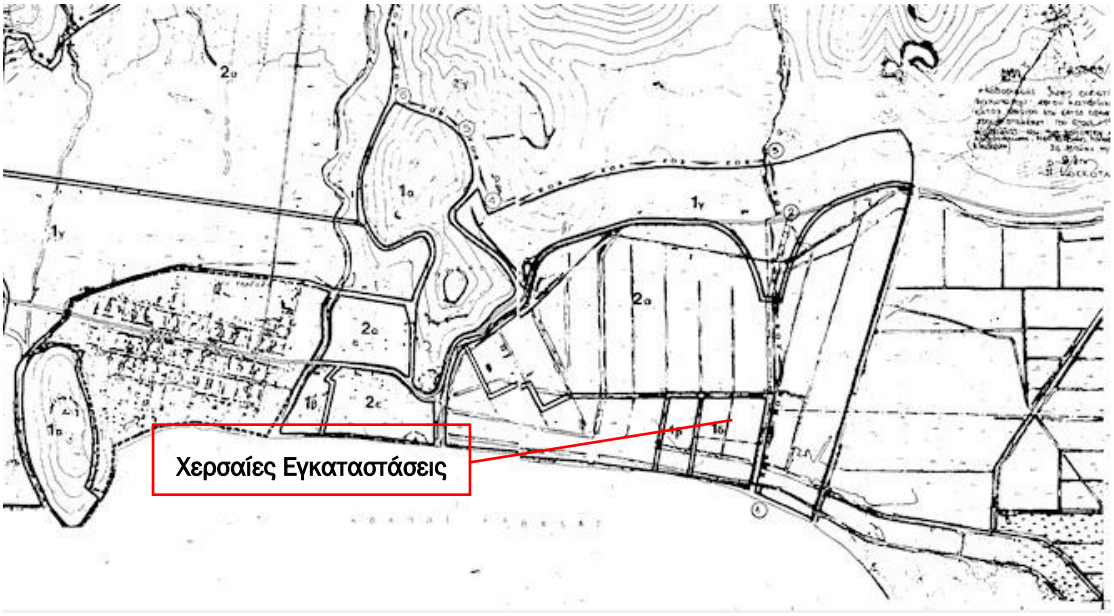


Figure 88: Areas of the ZOE of the Municipality of Kavala Inside the study area (source: Map P11-A of the ZOE of the Municipality of Kavala (Government Gazette 437-D-1989)

As can be seen from the above Figure, the Project's onshore facilities fall under Area 1d of the ZOE of the Municipality of Kavala, with use "existing disturbing uses".

The process has currently been initiated by the competent Ministry of Environment and Energy for the preparation of the Special Framework for Spatial Planning and Sustainable Development (SPSD) for Mineral Raw Materials. The purpose of this is to formulate policy guidelines for the spatial structure of the sector, in relation to existing land uses, on the basis of sustainable development, the promotion of the country's comparative advantages, the conservation and protection of cultural and natural heritage, as well as the formulation of a spatial organization model, which will promote and strengthen competitiveness and the enrichment of strategically important resources and will be harmonized with the national strategic planning for the exploitation of mineral wealth, offering legal certainty which is a prerequisite for attracting investments.

Given the absence of an established Specific Spatial Strategy (SSS) for the marine area and the corresponding Marine Spatial Frameworks (MSFs), the spatial planning in the marine area of the proposed project is shaped by the existing marine spatial planning, i.e. the corresponding applicable Specific and Regional Spatial Planning Frameworks, which concern specific economic sectors (RES, industry, aquaculture, etc.) and include spatial planning guidelines for the development of each sector in the terrestrial, coastal and marine areas (to a lesser extent).

According to the Plan of the Special Framework for Spatial Planning of the aquaculture activity (Government Gazette 2505 B/04.11.2011), part of the project falls within the Aquaculture Development Area (AWA) B14 "Agiasma-Keramoti-Erasmio" (fish farming, shellfish farming, other aquatic organisms) while it is 10.6 km away from the area B13 "Iraklitsa-Nea Peramos". These AWAs are classified as B, i.e. aquaculture development areas with room for further development. However, for the already operating project that is environmentally licensed (ΑΡ Εικ8413 / 24-04-18, ΑΔΑ: ΠΓΛ14653Π8-Ζ79 on the subject of "Approval of environmental conditions for the Prinos Offshore Development project"), a zone of 500 m on either side of the offshore installations (platforms, submarine pipelines and cables) is defined in which docking and any form of fishing is prohibited.

A more detailed description of the spatial planning regulations governing the Project area is presented in Chapter 5 of the Project's EIA.

In Special Environmental Survey 01B, the natural and development potential of the MM was assessed, focusing on the following sectors: agricultural crops, livestock farming, forestry, hunting/fishing, mining, urbanization and industry, transport and communication, and recreation - tourism, and are briefly presented below.

- The SAC & SCI GR1150014 "Marine area of Kavala – Thassos" is mainly characterized by fishing and shipping, as well as the existence of fish farms. In addition, the offshore development of Havnos, the onshore industrial unit Sigma and submarine oil pipelines and submarine power cables operate in the area. There are commercial and passenger ports, sewage treatment plants, as well as the Hellenic Fertilizers factory in the area.
- The SAC GR1150010 "Nestos Delta and Keramoti Lagoons – Wider Area" and the SPA GR1150001 "Nestos Delta and Keramoti Lagoons and Thasopoula Island" are characterized mainly by the practice of agriculture with the dominant type of cultivation being irrigated arable crops and livestock farming. The area is of great hunting interest, while amateur and professional coastal fishing is observed and aquaculture units operate. Regarding tourism, the area receives visitors with a naturalistic interest and the area has further potential for the development of gentle - alternative tourism. Regarding other human activities, natural gas pipelines pass through the area or are planned to pass through it. The Chrysoupolis Natural Gas Plant and the Chrysoupolis Marine Reservoir are located within the area.
- SAC GR1150012 "Thassos (Mount Ypsarios and coastal zone)" is mainly characterized by forestry, as the area is part of the public and private forests of Thassos, livestock farming and marble mining. There are cultivated areas with olive groves in the area. Both professional and amateur fishing is practiced in the marine area, while the area as a whole is an important tourist attraction. There have been significant incidents of forest fires in the wider area in previous years.

Based on the above analysis, it is estimated that in the relevant Natura 2000 areas no significant anthropogenic changes are expected in terms of the development of the area without the project. However, in GR1150014, possible anthropogenic pressure may be the development of new fish farms and in GR1150010 and GR1150001, the development of small photovoltaic power plants.

The possible development of management plans to regulate activities may in the future limit threats and pressures and improve the state of the ecosystems found in the areas under consideration.

2. Due Diligence and Impact Assessment

Section 2.3 provides an appropriate assessment of the impacts of the project under normal operating conditions. Section 2.4 describes the impacts on the marine ecosystem from an accidental CO2 leak according to the available literature.

2.1 Introduction

According to the European Commission Communication 2021/C437/01 "Assessment of plans and projects in relation to Natura 2000 sites Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC", the appropriate impact assessment includes the assessment of the implications of the plan or project (either individually or in combination with other plans or projects) in the light of the site's conservation objectives, and the determination of whether it will affect the integrity of the Natura 2000 site, taking into account any mitigation measures.

In particular, the appropriate assessment includes:

- identification of the conservation objectives of the Natura 2000 sites affected by the plan or project;
- identification and assessment of the effects of the plan or project in light of the sites' conservation objectives;
- examination of cumulative effects with other plans or projects.

2.2 Methodology

2.2.1 Indicators for quantifying the significance of impacts

In accordance with European Commission Communication 2021/C437/01, the indicators for quantifying the significance of the impacts, which were also taken into account in this study, are presented below.

Table 66: Indicators for quantifying the significance of impacts (source: European Commission Communication 2021/C437/01)

Impact type	Impact type description	Importance indicator
Habitat Area Loss	Reduction in habitat coverage as a result of its natural destruction (i.e. due to the removal or placement of building materials or sediments); loss of breeding, foraging or resting areas for species.	Hectares of habitat loss, rate of habitat loss.
Downgrade	Degradation of habitat quality, resulting in a reduction in the abundance of characteristic species or a change in the structure of communities (species composition). Degradation can be caused	Area (in absolute values and as a percentage) in which the characteristics used to determine the conservation status of the

Impact type	Impact type description	Importance indicator
	by changes in abiotic conditions (e.g. water levels or increased suspended sediment, pollutants or dust deposition); degradation of breeding, foraging or resting areas for species.	species or habitat have deteriorated, as well as the scale of degradation for each of the characteristics.
Annoyances	Change in existing environmental conditions (e.g. increased noise or light pollution, increased traffic and vehicles). Disturbance can cause, among other things, displacement of individuals of the species, changes in the behavior of the species or the risk of morbidity or mortality.	Degree of intensity, duration or permanent nature of the nuisance factor, and its distance from breeding zones
Fragmentation	It results in the modification of the distribution segments of the relevant habitats and species, e.g. through the creation of natural or ecological barriers in areas that are physically or functionally connected, or their separation into smaller, more isolated units.	Change compared to the initial and desired state [e.g. creation of many small habitat patches instead of one large one, Hectares of habitat exposed to edge effect].
Indirect impacts	Indirect change in environmental quality (arising for example from a change in the availability of nutrients and light or from an increase in the vulnerability of the site to other new threats, such as invasive alien species, human or animal intrusion).	Degree to which the area is exposed to other threats (invasive alien species, human and animal intrusion, additional interventions).

The impacts should be quantified or recorded using parameters that make it possible to assess the scale and severity of the impacts on the specific conservation objectives of the habitats and species with a significant presence on the site.

When impacts on the condition of natural features approach or exceed the threshold for a specific property set out in the Conservation objectives for that feature, the impacts are significant.

2.2.2 Method for predicting potential impacts

According to the European Commission Communication 2021/C437/01, each aspect of the plan or project should be examined in turn and the potential effects should be taken into account in accordance with the site's conservation objectives. Then, the effects of all the habitats and species affected should be considered together, and in relation to each other, so that interactions between them can also be taken into account.

2.3 Appropriate assessment of project impacts (normal operation)

The three steps presented in the following boxes have been followed for the appropriate assessment. It is noted that the appropriate impact assessment is not applicable for emergency incidents.

STEP 1 ->
TABLE 65

The aspects of the project are presented and their potential (or not) impact on general categories of protected objects of the relevant Natura 2000 areas is determined.

STEP 2 ->
TABLES 66

Identify the impacts of the aspects of the project noted in STEP 1 on the specific protected objects for each Natura 2000 site concerned.

The analysis is carried out not only in terms of the current status of the habitats and species with a significant presence in the protected area, but also in terms of their desired status, as defined by the conservation objectives.

STEP 3 ->
TABLE 66

The impacts of STEP 2 are assessed for their significance taking into account the conservation objectives. The conservation objectives for the protected objects of the Natura 2000 sites concerned are presented in Section 1.2.1.

Cumulative impacts that may arise as a result of the combined action of the project under assessment with other plans or projects are also examined.

The possibility of mitigating impacts from taking measures is recorded.

Table 67: Recording the aspects of the project and determining their possible or not impact on general categories of protected objects of the relevant Natura 2000 areas

Project phase (construction, operation, decommissioning)	General Project activity	AA	Project Aspect (technical characteristics)	Birdlife GR1150014	Birdlife GR1150012	Birdlife GR1150001 (for the species Phalacrocorax aristotelis desmerastii and Puffinus yelkouan the notes in GR1150014 apply)	Marine mammals GR1150014 and GR1150010	Fish fauna GR1150014	Fish fauna GR1150010	Marine habitat types GR1150010	Sea turtles GR1150010	Chiroptera GR1150010	Terrestrial reptiles and amphibians GR1150010	Terrestrial mammals GR1150010	Terrestrial habitat types GR1150010
CONSTRUCTION STAGE	**Human, material and natural resources**	**K1**	Mobilization (recruitment, employment, engagement) of the workforce.	-	-	-	-	-	-	-	-	-	-	-	-
		K2	Supply chain and procurement issues of required construction materials, resources and services related to the implementation of the project.	-	-	-	-	-	-	-	-	-	-	-	-
	Onshore facilities (CO2 capture and management infrastructure and equipment, onshore section of CO2 pipeline) **WORK DURATION 3 MONTHS**	**K3**	Geotechnical surveys and data collection work at the installation sites of the project's land infrastructure.	-	-	-	-	-	-	-	-	-	-	-	-
		K4	Ground preparation for the equipment foundation, earthworks for the location of the new land infrastructure and facilities. → The excavation area will be limited to the points where the bases of the land equipment will be placed and is estimated at approximately 50 m^2. The estimated excavation area for the land section of the pipeline is 200 m2, 3 m deep. → Once the pipeline is installed, the area will be backfilled with the same material.	-	-	LOW	-	-	-	-	-	-	LOW	INSIGNIFICANT	-
		K5	Concreting works and placement of 0.5 m thick concrete for the foundation of base slabs.	-	-	INSIGNIFICANT	-	-	-	-	-	-	-	-	-
		K6	Installation of the final section of onshore pipelines (laying, welding), which will be installed in the ground on the new foundations, without protective covers.	-	-	INSIGNIFICANT	-	-	-	-	-	-		-	-

Project phase (construction, operation, decommissioning)	General Project activity	AA	Project Aspect (technical characteristics)	Birdlife GR1150014	Birdlife GR1150012	Birdlife GR1150001 (for the species Phalacrocorax aristotelis desmerastii and Puffinus yelkouan the notes in GR1150014 apply)	Marine mammals GR1150014 and GR1150010	Fish fauna GR1150014	Fish fauna GR1150010	Marine habitat types GR1150010	Sea turtles GR1150010	Chiroptera GR1150010	Terrestrial reptiles and amphibians GR1150010	Terrestrial mammals GR1150010	Terrestrial habitat types GR1150010
		K7	Works and activities for the installation and testing of the electrical interconnection and related equipment.	-	-	INSIGNIFICANT	-	-	-	-	-	-	-	-	-
		K8	Movement of heavy vehicles, construction machinery, transport vehicles and trucks, as well as support vehicles during construction, emitting: Dust (PM10, PM2.5), Air pollutants (CO, VOC and NOX), Noise. → **The noise from mobile and fixed construction machinery is expected to be 67 dB(A) at an average distance of 50 m from the construction works and equal to 60 dB(A) at an average distance of 100 m**	-	-	LOW	-	-	-	-	-	LOW	-	-	-
		K9	Temporary storage of building/construction materials and surplus excavation materials.	-	-	INSIGNIFICANT	-	-	-	-	-	-	-	-	-
		K10	Water use during construction: Wetting of site areas: approximately 10-20 m3/day for each main site area, Personnel living needs: approximately 60 l/day per worker.	-	-	-	-	-	-	-	-	-	-	-	-
		K11	Waste generation, management and disposal from construction activities of the project's onshore facilities. → An appropriate Waste Management Plan will be implemented.	-	-	-	-	-	-	-	-	-	-	-	-
		K12	Traffic - Daily movement of vehicles related to the construction of the land facilities (including worker transportation and support vehicle movements).	-	-	INSIGNIFICANT	-	-	-	-	-	-	-	-	-
		K13	Water discharge - Water present in trenches or excavations will be removed with appropriate	-	-	LOW	-	-	-	-	-	INSIGNIFICANT	-	-	-

Project phase (construction, operation, decommissioning)	General Project activity	AA	Project Aspect (technical characteristics)	Birdlife GR1150014	Birdlife GR1150012	Birdlife GR1150001 (for the species Phalacrocorax aristotelis desmerastii and Puffinus yelkouan the notes in GR1150014 apply)	Marine mammals GR1150014 and GR1150010	Fish fauna GR1150014	Fish fauna GR1150010	Marine habitat types GR1150010	Sea turtles GR1150010	Chiroptera GR1150010	Terrestrial reptiles and amphibians GR1150010	Terrestrial mammals GR1150010	Terrestrial habitat types GR1150010
			systems (pumps or wells) and released into water bodies present in the project area (after their characterization).												
	Offshore CO2 Pipeline **WORK DURATION 9 MONTHS**	**K14**	**Phase 1** Geophysical Survey A small vessel (15 m long) with seabed scanning equipment will be used to provide basic data Inside the pipeline corridor. Geotechnical Survey After processing the results of the geophysical survey, soil samples will be taken with a grab and a BoX-corer, which will be sent to laboratories for analysis. → Duration of work 1 month	-	-	-	INSIGNIFICANT	-	-	-	INSIGNIFICANT	-	-	-	-
		K15	**Phase 2** Works for the approach of the pipeline to the shore (placement of the specific section of the pipeline in a trench approximately 500 m long, approximately 5 m wide and 3 m deep). The equipment used for the excavation of the trench will be the usual dredging equipment for port works, grab type on a barge and buck type for the deeper parts of the trench. The volume of excavated materials from the seabed is expected to be approximately 7,500 m3. The excavated materials will be kept at the side of the trench, for subsequent backfilling after the pipeline is placed in the trench, so that the pipeline is fully covered in its final state. → No coverage with concrete slabs is expected. → Duration of works 6 months	LOW		LOW	-	LOW	-	-	-	-	-	-	-

Project phase (construction, operation, decommissioning)	General Project activity	AA	Project Aspect (technical characteristics)	Birdlife GR1150014	Birdlife GR1150012	Birdlife GR1150001 (for the species Phalacrocorax aristotelis desmerastii and Puffinus yelkouan the notes in GR1150014 apply)	Marine mammals GR1150014 and GR1150010	Fish fauna GR1150014	Fish fauna GR1150010	Marine habitat types GR1150010	Sea turtles GR1150010	Chiroptera GR1150010	Terrestrial reptiles and amphibians GR1150010	Terrestrial mammals GR1150010	Terrestrial habitat types GR1150010
		K16	**Phase 3** Installation of a 20 km long subsea pipeline (using the S-lay method) by a dedicated pipelay vessel, together with 2 support supply vessels/tugs. → The "S-lay" method of laying the pipeline is the oldest and most commonly used method of installing offshore pipelines. It is so called because the pipeline takes on a Figure S shape during installation → Duration of work 2- 3 weeks	INSIGNIFICANT	INSIGNIFICANT	INSIGNIFICANT	LOW	LOW	-	-	LOW	-	-	-	-
		K17	**Phase 4** Installation of a riser pipe on the Beta platform and connection works. After installation, the pipe will be connected to the riser on the existing Beta platform. → Duration of work 1 week	-	-	-	INSIGNIFICANT	-	-	-	INSIGNIFICANT	-	-	-	-
		K18	**Phase 5** Final location and testing Trenching and hydrotesting A trenching excavator (plough) will be used for trenching (after the pipeline has been placed on the seabed), driven by a support vessel, passing over the pipeline axis and creating the trench. The pipeline will be buried 1.5 – 2 m from the seabed surface. Due to the nature of the soils and the very strong seabed currents in the area, the pipeline trench will be backfilled without additional work. In places where trenching after the pipeline is placed is not possible due to accessibility or proximity to other structures or the platform, the exposed sections of the pipeline will be covered with a layer of	LOW	LOW	LOW	LOW	LOW		-	LOW	-	-	-	-

Project phase (construction, operation, decommissioning)	General Project activity	AA	Project Aspect (technical characteristics)	Birdlife GR1150014	Birdlife GR1150012	Birdlife GR1150001 (for the species Phalacrocorax aristotelis desmerastii and Puffinus yelkouan the notes in GR1150014 apply)	Marine mammals GR1150014 and GR1150010	Fish fauna GR1150014	Fish fauna GR1150010	Marine habitat types GR1150010	Sea turtles GR1150010	Chiroptera GR1150010	Terrestrial reptiles and amphibians GR1150010	Terrestrial mammals GR1150010	Terrestrial habitat types GR1150010
			concrete for additional protection. Once the pipeline is installed, it will be filled with chemically treated water and hydrotested at a pressure determined by best practice, typically 1.2 to 1.5 times the maximum design pressure of the pipeline. The pipeline will be drained of water using a series of pumps from shore and the remaining moisture will be removed using chemicals (monoethylene glycol – MEG) so that it is completely dry and ready for commissioning. This is a common practice in the industry, where the pipeline is filled with seawater and environmentally friendly anti-corrosion and anti-bacterial chemicals are added (PLONOR list). The filling is carried out by pumping water and passing pig trains from shore to sea and the water is discharged into the sea at the pipeline's termination point. The volume of water introduced is exactly the volume of water that the pipeline can contain, e.g. for a 20 km long pipeline with an internal diameter of 16", the maximum volume is 2500 m3 and for a 12" pipeline it is 1400 m3. This volume of water will remain in the pipeline until the hydrotesting is carried out. → Duration of work 1 month												
		K19	**Marine traffic** - Daily movement of vessels for the installation of the CO2 pipelines (including the transport of workers and	LOW	LOW	LOW	LOW	-	-	-	LOW	-	-	-	-

Project phase (construction, operation, decommissioning)	General Project activity	AA	Project Aspect (technical characteristics)	Birdlife GR1150014	Birdlife GR1150012	Birdlife GR1150001 (for the species Phalacrocorax aristotelis desmerastii and Puffinus yelkouan the notes in GR1150014 apply)	Marine mammals GR1150014 and GR1150010	Fish fauna GR1150014	Fish fauna GR1150010	Marine habitat types GR1150010	Sea turtles GR1150010	Chiroptera GR1150010	Terrestrial reptiles and amphibians GR1150010	Terrestrial mammals GR1150010	Terrestrial habitat types GR1150010
			the movements of support vessels).												
		K20	**Marine traffic** - Emissions caused by the daily movement of vessels for the installation of the CO2 pipelines (including the transport of workers and the movements of support vessels), which generate: Air pollutants (CO, VOC and NOX), Noise. → The pipeline construction vessel and the escort/support vessels will generate underwater noise during the works. The main sources of underwater noise are categorized as follows: Propellers and thrusters: Noise from propellers and thrusters caused mainly by cavitation around the propellers during the movement of the vessel or during the operation of the thrusters for Conservation/stabilization of the position of the support vessel during the refueling of the research vessel (OSPAR 2009, Richardson et al., 1995). The underwater noise generated by propellers and thrusters includes: Relatively broadband acoustic signals with free-field source levels of approximately 160-175 dB (re 1 µPa), produced by small vessels and ships (up to 50 m in length), although these emissions depend greatly on vessel speed and other operational characteristics. Typical broadband source levels, ranging between 165-180 dB (re 1 µPa) from more complex propulsion systems that typically include	-	-	-	LOW	-	-	-	LOW	-	-	-	-

Project phase (construction, operation, decommissioning)	General Project activity	AA	Project Aspect (technical characteristics)	Birdlife GR1150014	Birdlife GR1150012	Birdlife GR1150001 (for the species Phalacrocorax aristotelis desmerastii and Puffinus yelkouan the notes in GR1150014 apply)	Marine mammals GR1150014 and GR1150010	Fish fauna GR1150014	Fish fauna GR1150010	Marine habitat types GR1150010	Sea turtles GR1150010	Chiroptera GR1150010	Terrestrial reptiles and amphibians GR1150010	Terrestrial mammals GR1150010	Terrestrial habitat types GR1150010
			submersible thrusters on tugs, crew boats, supply vessels and many research vessels (50 to 100 m in length). Relatively loud and predominantly low-frequency noise (the strongest energy is usually concentrated at frequencies below several hundred Hz), with broadband source levels of about 180-190 dB (re 1 µPa) from large vessels (> 100 m in length). Engines and E/M equipment: Engine noise is often dominant when vessels are stationary or moving at low speeds. The main sources of mechanical noise include large mechanical equipment, such as large power plants (diesel engines or gas turbines), compressors and pumps. Mechanical noise is usually low-frequency and tonal in character.												
		K21	**Marine traffic** - Definition of access exclusion zones due to CO2 transmission pipeline installation works (and related works/activities).	-	-	-	-	-	-	-	-	-	-	-	-
		K22	**Operation of the pipeline laying vessel (accommodating 200 individuals). Waste/sewage generation.** → *Appropriate management according to MARPOL is expected.*	-	-	-	-	-	-	-	-	-	-	-	-
	Offshore facilities, (excluding the Offshore CO2 Pipeline)	K23	**Preparation of the existing pilot borehole.** A permanent mechanical barrier (bridge plug) will be placed at a predetermined depth inside the production tubing after the well is killed.	-	-	-	-	-	-	-	-	-	-	-	-

Project phase (construction, operation, decommissioning)	General Project activity	AA	Project Aspect (technical characteristics)	Birdlife GR1150014	Birdlife GR1150012	Birdlife GR1150001 (for the species Phalacrocorax aristotelis desmerastii and Puffinus yelkouan the notes in GR1150014 apply)	Marine mammals GR1150014 and GR1150010	Fish fauna GR1150014	Fish fauna GR1150010	Marine habitat types GR1150010	Sea turtles GR1150010	Chiroptera GR1150010	Terrestrial reptiles and amphibians GR1150010	Terrestrial mammals GR1150010	Terrestrial habitat types GR1150010
	DURATION OF WORK FOR THE SURVEY 8 MONTHS **DURATION OF WORKS FOR THE MODIFICATION OF THE OFFSHORE FACILITIES OF PRINOS FOR CO2 STORAGE 3 MONTHS**	**K24**	The 9 5/8" production casing will be retrieved up to approximately 1200 m to create sufficient space for lateral drilling. A mechanical barrier will be placed over the cut 9 5/8" casing. The "Christmas tree" and associated head components will be removed from the 9 5/8" casing.	-	-	-	-	-	-	-	-	-	-	-	-
		K25	**Drilling wells** Drilling of 4 wells to a depth of approximately 3,700 m (2 wells will be used as CO2 injection wells and 2 as water production wells for the relative equalization of the reservoir pressure). All four new wells will be constructed with a TDS (Top Drive system) drilling unit and will be directed with a combination of mud motors and rotary drilling units. → The new wells will be diverted using the existing wells on the Beta platform. Prior to diversion, the existing wells will be sealed and abandoned. → The primary section of the well will be 16 inches and will be drilled from approximately 350 m to a depth of 2,200 m. In this section, a slurry based on seawater and lime will be used as drilling fluid, which will be biodegradable, without negative impacts on the environment. The geological formation in this section is uniform and consists of sandstone and clay layers and from all the wells that have been drilled in the area, no traces of hydrocarbons have ever	INSIGNIFICANT	INSIGNIFICANT	-	LOW	LOW	-	-	LOW	-	-	-	-

Project phase (construction, operation, decommissioning)	General Project activity	AA	Project Aspect (technical characteristics)	Birdlife GR1150014	Birdlife GR1150012	Birdlife GR1150001 (for the species Phalacrocorax aristotelis desmerastii and Puffinus yelkouan the notes in GR1150014 apply)	Marine mammals GR1150014 and GR1150010	Fish fauna GR1150014	Fish fauna GR1150010	Marine habitat types GR1150010	Sea turtles GR1150010	Chiroptera GR1150010	Terrestrial reptiles and amphibians GR1150010	Terrestrial mammals GR1150010	Terrestrial habitat types GR1150010
			been observed at these depths. The cuttings from this section will be deposited on the seabed, while below a depth of approximately 2,200m, the drilling fluids will return to the surface where the cuttings will be removed and the slurry will be processed. → A typical drilling for the CO2 storage project produces approximately 650 m^3 of cuttings, therefore in the four (4) well program, approximately 2,700 m^3 of solid waste will be produced. The drilling operations at the Project produce small volumes of waste, as all planned drillings are of small diameter and lateral drilling. → The spacer fluid (CaCl2 brine) that may be used during the concreting phase is estimated at approximately 20-30m^3 per drilling, while the excess cement is approximately 20m^3 per drilling. → The management of mining waste is carried out in accordance with KYA 39624/2209/Ε103 (ΦΕΚ Β/2076/25.9.2009). → Based on literature, a noise level of 117 dB was recorded at 125 m from the drilling rig. → During unloading activities from support vessels, noise levels reached 134 dB. → Significant water demand is expected to arise in offshore facilities during the construction												

Project phase (construction, operation, decommissioning)	General Project activity	AA	Project Aspect (technical characteristics)	Birdlife GR1150014	Birdlife GR1150012	Birdlife GR1150001 (for the species Phalacrocorax aristotelis desmerastii and Puffinus yelkouan the notes in GR1150014 apply)	Marine mammals GR1150014 and GR1150010	Fish fauna GR1150014	Fish fauna GR1150010	Marine habitat types GR1150010	Sea turtles GR1150010	Chiroptera GR1150010	Terrestrial reptiles and amphibians GR1150010	Terrestrial mammals GR1150010	Terrestrial habitat types GR1150010
			period of new wells. Water consumption for a well is estimated at approximately 3,200 m3 and may reach 3,700 m3												
		K26	**Completion of drilling** The protective pipeline will be cemented with a 200 m cement column, above the base of the previous protective pipeline and along the entire length of the open geological formation.	-	-	-	-	-	-	-	-	-	-	-	-
		K27	**Waste** - Production, management and disposal of mining waste (drilling mud and cuttings). During the drilling of the 16-inch diameter section to a depth of 2,200 m, a seawater/lime-based slurry will be used as the drilling fluid. Cuttings from this section will be deposited on the seabed. Below this depth, the drilling fluids return to the surface where the cuttings are removed and the slurry is processed. → An appropriate Waste Management Plan will be implemented.	INSIGNIFICANT	INSIGNIFICANT	-	LOW	LOW	-	-	LOW	-	-	-	-
		K28	**Marine traffic** - Daily movement of vessels to carry out drilling operations (including the transport of workers and the movement of support vessels).	INSIGNIFICANT	INSIGNIFICANT	-	LOW	-	-	-	LOW	-	-	-	-
		K29	**Marine traffic** - **Emissions** caused by the daily movement of ships to carry out drilling operations (including the transport of workers and the movements of support ships), which create: Air pollutants (CO, VOC and NOX), Noise.	INSIGNIFICANT	INSIGNIFICANT	-	LOW	-	-	-	LOW	-	-	-	-
		K30	**Marine traffic** - Definition of access exclusion zones due to drilling operations.	-	-	-	-	-	-	-	-	-	-	-	-

Project phase (construction, operation, decommissioning)	General Project activity	AA	Project Aspect (technical characteristics)	Birdlife GR1150014	Birdlife GR1150012	Birdlife GR1150001 (for the species Phalacrocorax aristotelis desmerastii and Puffinus yelkouan the notes in GR1150014 apply)	Marine mammals GR1150014 and GR1150010	Fish fauna GR1150014	Fish fauna GR1150010	Marine habitat types GR1150010	Sea turtles GR1150010	Chiroptera GR1150010	Terrestrial reptiles and amphibians GR1150010	Terrestrial mammals GR1150010	Terrestrial habitat types GR1150010
OPERATION STAGE	**Physical presence and operation of the project**	**Λ1**	Physical presence and location of the project's land infrastructure	-	-	-	-	-	-	-	-	INSIGNIFICANT	-	-	-
		Λ2	Physical presence and location of the project's offshore infrastructure	-	-	-	-	-	-	-	-	-	-	-	-
	Human, material and natural resources	**Λ3**	Mobilization (recruitment, employment, engagement) of workforce	-	-	-	-	-	-	-	-	-	-	-	-
		Λ4	Supply chain issues and procurement of required materials, resources and services related to the operation of the project.	-	-	-	-	-	-	-	-	-	-	-	-
		Λ5	Consumption of energy, fuel and materials	-	-	-	-	-	-	-	-	-	-	-	-
	Onshore CO2 reception facilities and unloading operations	**Λ6**	**CO2 reception by pipeline (bulk processing)** CO2 from remote producers will enter the facility via an onshore pipeline. → Assuming a quantity of 400 tons from Pilot Project 1, 19 trips by a 21,375 kg truck (indicatively, 18 trips at 100% load capacity, 1 trip at 71% load capacity) will be required to deliver the total quantity of CO2 cargo. A frequency of 1 truck per week is assumed for a duration of 5 months. - Assuming a quantity of 40 tons from Pilot Project 2, 2 trips by a 21,375 kg truck (indicatively, 1 trip at 100% load capacity, 1 trip at 87% load capacity) will be required to deliver the total quantity of CO2 cargo. A frequency of 1 truck per 3 months is assumed.	-	-	-	-	-	-	-	-	-	-	-	-
		Λ7	**CO2 receipt with containers (CO2 parcels)** CO2 cargoes from pilot projects will be transported to the Sigma facility dock using ISO container trucks with pressure vessels,	-	-	-	-	-	-	-	-	-	-	-	-

Project phase (construction, operation, decommissioning)	General Project activity	AA	Project Aspect (technical characteristics)	Birdlife GR1150014	Birdlife GR1150012	Birdlife GR1150001 (for the species Phalacrocorax aristotelis desmerastii and Puffinus yelkouan the notes in GR1150014 apply)	Marine mammals GR1150014 and GR1150010	Fish fauna GR1150014	Fish fauna GR1150010	Marine habitat types GR1150010	Sea turtles GR1150010	Chiroptera GR1150010	Terrestrial reptiles and amphibians GR1150010	Terrestrial mammals GR1150010	Terrestrial habitat types GR1150010
			insulated to minimize losses.												
	CO2 transport to the Prinos offshore storage facilities	**Α8**	The CO2 is provided in suitable conditions for injection and is routed to the head, from which it is exported to the Prinos complex through a 12-16" pipeline, 20 km long.	-	-	-	-	-	-	-	-	-	-	-	-
		Α9	The CO2 cargo vessel will be connected to the pipeline on the rig via a flexible pipe system. From there, the CO2 cargo will be further processed to the correct specifications/conditions for injection into the well. → It is estimated that the frequency of container transport to BETA by Energean vessel will be equivalent to that of the trucks delivering the cargoes on land. Specifically, assuming a quantity of 400 tons from Pilot Program 1, 19 trips by a truck with a capacity of 21,375 kg will be required (indicatively, 18 trips with 100% loading capacity, 1 trip with 71% loading capacity) to deliver the total quantity of CO2 cargoes. A frequency of 1 truck per week for a duration of 5 months is assumed. - Assuming a quantity of 40 tons from Pilot Program 2, it will be necessary to make 2 trips by a truck with a capacity of 21,375kg (indicatively, 1 time with 100% loading capacity, 1 time with 87% loading capacity) to deliver the total quantity of CO2 loads. A frequency of 1 truck every 3 months is assumed.	-	-	-	-	-	-	-	-	-	-	-	-
	CO_2 Injection	**Α10**	The main processing equipment on the Beta	-	-	-	-	-	-	-	-	-	-	-	-

Project phase (construction, operation, decommissioning)	General Project activity	AA	Project Aspect (technical characteristics)	Birdlife GR1150014	Birdlife GR1150012	Birdlife GR1150001 (for the species Phalacrocorax aristotelis desmerastii and Puffinus yelkouan the notes in GR1150014 apply)	Marine mammals GR1150014 and GR1150010	Fish fauna GR1150014	Fish fauna GR1150010	Marine habitat types GR1150010	Sea turtles GR1150010	Chiroptera GR1150010	Terrestrial reptiles and amphibians GR1150010	Terrestrial mammals GR1150010	Terrestrial habitat types GR1150010
			platform will include a pumping and heating station for the required injection conditions, installed on the open deck of the platform. → During start-up, to avoid low temperatures in the pipeline and the formation of hydrates/halites in the area near the well, it is planned to install an electric start-up heater and a methanol injection system. No discharge to the marine environment is expected from the electric heater – it is a closed system. → For Phase 1a, the required injection conditions in the well are a pressure of 101 barg and a temperature of 20° C.												
	Water pumping from the reservoir and discharge of the treated water into the marine environment	**A11**	The two water production wells on the Beta platform will be equipped with electric submersible pumps (ESP) and will extract water from the reservoir. They will operate with a production of up to 7500 bwpd each during the period 2025-2031 and the water production will gradually increase to 9000 bwpd per well in 2031 and until the end of the project. → It is expected that the produced water from the storage project will undergo the same treatment as that of the current operation through oil separators on the DELTA platform. The appropriate treated water will be discharged to the sea. However, the treatment that will be required will be further investigated after the collection and analysis of	INSIGNIFICANT	INSIGNIFICANT	-	LOW	LOW	-	-	LOW	-	-	-	-

Project phase (construction, operation, decommissioning)	General Project activity	AA	Project Aspect (technical characteristics)	Birdlife GR1150014	Birdlife GR1150012	Birdlife GR1150001 (for the species Phalacrocorax aristotelis desmerastii and Puffinus yelkouan the notes in GR1150014 apply)	Marine mammals GR1150014 and GR1150010	Fish fauna GR1150014	Fish fauna GR1150010	Marine habitat types GR1150010	Sea turtles GR1150010	Chiroptera GR1150010	Terrestrial reptiles and amphibians GR1150010	Terrestrial mammals GR1150010	Terrestrial habitat types GR1150010
			water samples from the aquifer in the storage complex.												
	Infrastructure and equipment maintenance and repair activities	**Λ12**	Maintenance and repair activities of onshore infrastructure and equipment	-	-	-	-	-	-	-	-	-	-	-	-
		Λ13	Maintenance and repair activities of offshore infrastructure and equipment	-	-	-	-	-	-	-	-	-	-	-	-
	Waste	**Λ14**	Generation, management and disposal of waste from the operation of the onshore and offshore facilities of the project. → An appropriate Waste Management Plan will be implemented.	-	-	-	-	-	-	-	-	-	-	-	-
	Marine traffic	**Λ15**	Daily vessel movement due to project operation (including worker transportation and support vessel movements).	INSIGNIFICANT	INSIGNIFICANT	INSIGNIFICANT	INSIGNIFICANT	-	-	-	INSIGNIFICANT	-	-	-	-
		Λ16	Emissions caused by the daily movement of ships due to the operation of the project (including the transportation of workers and the movements of support ships), which create: Air pollutants (CO, VOC and NOX), Noise.	INSIGNIFICANT	INSIGNIFICANT	INSIGNIFICANT	INSIGNIFICANT	-	-	-	INSIGNIFICANT	-	-	-	-
		Λ17	Definition/Conservation of a no-anchoring and fishing zone during project operation.	MAINTAINING THE STATUS WITH POSITIVE IMPACTS	MAINTAINING THE STATUS WITH POSITIVE IMPACTS	MAINTAINING THE STATUS WITH POSITIVE IMPACTS	MAINTAINING THE STATUS WITH POSITIVE IMPACTS	MAINTAINING THE STATUS WITH POSITIVE IMPACTS	-	-	MAINTAINING THE STATUS WITH POSITIVE IMPACTS	-	-	-	-
DISENGAGEMENT STAGE	**Human, material and natural resources**	**Π1**	Mobilization (recruitment, employment, engagement) of workforce	-	-	-	-	-	-	-	-	-	-	-	-
		Π2	Supply chain issues and procurement of required materials, resources and services related to the project shutdown/decommissioning	-	-	-	-	-	-	-	-	-	-	-	-
		Π3	Energy, fuel and material consumption	-	-	-	-	-	-	-	-	-	-	-	-

Project phase (construction, operation, decommissioning)	General Project activity	AA	Project Aspect (technical characteristics)	Birdlife GR1150014	Birdlife GR1150012	Birdlife GR1150001 (for the species Phalacrocorax aristotelis desmerastii and Puffinus yelkouan the notes in GR1150014 apply)	Marine mammals GR1150014 and GR1150010	Fish fauna GR1150014	Fish fauna GR1150010	Marine habitat types GR1150010	Sea turtles GR1150010	Chiroptera GR1150010	Terrestrial reptiles and amphibians GR1150010	Terrestrial mammals GR1150010	Terrestrial habitat types GR1150010
	Human, material and natural resources	**П4**	Equipment dismantling and facility dismantling	-	-	-	-	-	-	-	-	-	-	-	-
		П5	Removal of concrete and foundation slabs, as well as earthworks to restore the onshore Project installation area	-	-	-	-	-	-	-	-	-	-	-	-
		П6	Movement of heavy vehicles, construction machinery, transport vehicles and trucks, as well as support vehicles during the shutdown / decommissioning of the project, emitting: Dust (PM10, PM2.5), Air pollutants (CO, VOC and NOX), Noise.	-	-	-	-	-	-	-	-	INSIGNIFICANT	-	-	-
		П7	Generation of solid and liquid waste. → An appropriate Waste Management Plan will be implemented.	-	-	-	-	-	-	-	-	-	-	-	-
		П8	Traffic - Daily vehicle movement related to the shutdown / decommissioning of the project (including the transportation of workers and the movements of support vehicles).	-	-	-	-	-	-	-	-	-	-	-	-
		П9	The Inside pipelines of the onshore section of the CO2 pipeline transport system will be decompressed, cleaned and evacuated with nitrogen to ensure safety in accordance with international guidelines and best practices. The infrastructure will be isolated from the offshore pipeline with a sealed flange and demolished.	-	-	-	-	-	-	-	-	-	-	-	-
		П10	Restoration of the Project's onshore installation area.	-	-	-	-	-	-	-	-	-	-	-	-
	Decommissioning of the offshore CO2 pipeline	**П11**	The offshore pipeline and riser will be depressurized, cleaned with standard blasting operations and	INSIGNIFICANT	INSIGNIFICANT	-	INSIGNIFICANT	INSIGNIFICANT	-	-	INSIGNIFICANT	-	-	-	-

Project phase (construction, operation, decommissioning)	General Project activity	AA	Project Aspect (technical characteristics)	Birdlife GR1150014	Birdlife GR1150012	Birdlife GR1150001 (for the species Phalacrocorax aristotelis desmerastii and Puffinus yelkouan the notes in GR1150014 apply)	Marine mammals GR1150014 and GR1150010	Fish fauna GR1150014	Fish fauna GR1150010	Marine habitat types GR1150010	Sea turtles GR1150010	Chiroptera GR1150010	Terrestrial reptiles and amphibians GR1150010	Terrestrial mammals GR1150010	Terrestrial habitat types GR1150010
			then inertized by introducing nitrogen. The pipeline will then be isolated from the offshore platform, sealed with welded caps or flanges and left in place, in accordance with international standards.												
		П12	The piping from the top of the riser to the wellheads will be depressurized and filled with nitrogen to inactivate the system. The piping will be disconnected from the wellheads, capped and left in place.	-	-	-	-	-	-	-	-	-	-	-	-
		П13	**Marine traffic**- Daily movement of vessels to implement the decommissioning work of offshore infrastructure (including the transportation of workers and the movement of support vessels).	INSIGNIFICANT	INSIGNIFICANT	-	INSIGNIFICANT	-	-	-	INSIGNIFICANT	-	-	-	-
		П14	**Marine traffic** - **Emissions** caused by the implementation of offshore pipeline decommissioning works (including the transport of workers and the movements of support vessels), which create: Air pollutants (CO, VOC and NOX), Noise.	INSIGNIFICANT	INSIGNIFICANT	-	INSIGNIFICANT	-	-	-	INSIGNIFICANT	-	-	-	-
		П15	**Marine traffic** - Definition of access exclusion zones due to implementation of offshore pipeline removal works.	-	-	-	-	-	-	-	-	-	-	-	-
	Decommissioning/decommissioning of offshore facilities (excluding the offshore CO2 pipeline).	**П16**	**Leading barrier** - If cement is used as a barrier, a column of cement of at least 30 m is required to provide a permanent barrier. Where possible, 152 m cement caps are placed to overlie this 30 m of cement.	-	-	-	-	-	-	-	-	-	-	-	-
		П17	**Secondary barrier**- A combined cap of at least	-	-	-	-	-	-	-	-	-	-	-	-

Project phase (construction, operation, decommissioning)	General Project activity	AA	Project Aspect (technical characteristics)	Birdlife GR1150014	Birdlife GR1150012	Birdlife GR1150001 (for the species Phalacrocorax aristotelis desmerastii and Puffinus yelkouan the notes in GR1150014 apply)	Marine mammals GR1150014 and GR1150010	Fish fauna GR1150014	Fish fauna GR1150010	Marine habitat types GR1150010	Sea turtles GR1150010	Chiroptera GR1150010	Terrestrial reptiles and amphibians GR1150010	Terrestrial mammals GR1150010	Terrestrial habitat types GR1150010
			60 m of cement is required to form a secondary barrier. Where possible, 244 m of cement is placed to overlie this 60 m of cement												
		Π18	Dismantling of equipment and dismantling of facilities	INSIGNIFICANT	INSIGNIFICANT	-	INSIGNIFICANT	INSIGNIFICANT	INSIGNIFICANT	-	INSIGNIFICANT	-	-	-	-
		Π19	Generation of solid and liquid waste. → An appropriate Waste Management Plan will be implemented.	-	-	-	-	-	-	-	-	-	-	-	-
		Π20	**Marine traffic**- Daily movement of vessels to carry out the decommissioning work of the offshore facilities other than the submarine pipeline (including the transport of workers and the movements of support vessels).	INSIGNIFICANT	INSIGNIFICANT	INSIGNIFICANT	INSIGNIFICANT	-	-	-	INSIGNIFICANT	-	-	-	-
		Π21	**Marine traffic**- Emissions caused by the implementation of offshore installation decommissioning works (including the transport of workers and the movements of support vessels), which create gaseous pollutants (CO, VOC and NOX), noise.	INSIGNIFICANT	INSIGNIFICANT	INSIGNIFICANT	INSIGNIFICANT	-	-	-	INSIGNIFICANT	-	-	-	-
		Π22	**Marine traffic**- Definition of access exclusion zones due to the implementation of the removal works of offshore installations.	-	-	-	-	-	-	-	-	-	-	-	-

Υπόμνημα

Critical	Unacceptable. No compensation is required, alternatives need to be developed.
High	Significant. Impacts of “major” significance are likely to disrupt the function and value of the receptor/resource, and may have wider systemic impacts (e.g. ecosystem or social well-being). These impacts are a priority for compensation to avoid or reduce the significance of the impact.
Moderate	Significant. Impacts of “moderate” significance are likely to be apparent and lead to lasting changes to baseline conditions, which may cause impairment or degradation of the receptor/resource, although the overall function and value of the receptor/resource is not disrupted. These impacts are a priority for compensation to avoid or reduce the significance of the impact.
Low	Detectable but not significant. “Minor” impacts are expected to cause noticeable changes in baseline conditions, beyond natural variation, but are not expected to cause impairment, degradation, or impair the function and value of the receptor/resource. However, these impacts are of concern to decision makers, and should be avoided or mitigated where possible.
Insignificant	Not significant. Any impacts are expected to be indistinguishable from baseline conditions or within natural variation levels. These impacts do not require compensation and are not of concern in the decision-making process.

-		*No impact of any aspect of the project on environmental parameters is expected.*

Table 68: Identification and assessment of impacts caused by the aspects of the project identified in Table 65 Table 67 on the protected objects of the relevant Natura 2000 areas taking into account their conservation objectives.

Project stage	Project aspect	Protected objects	Potential impact	Conservation Goals	Negative impact of the project alone on the characteristic (overall characterization per stage)	Negative impact of the project in combination with other plans or projects on the affected feature	Possible avoidance or mitigation of negative impacts (YES / NO / PARTIAL / UNCERTAIN)	Conclusion: negative impacts on the integrity of the site: YES / NO / UNCERTAIN / LONG-TERM / SHORT-TERM
CAP and CPI GR1150014								
Construction stage	K15, K16, K18, K19, K20, K25, K27, K28, K29	*Phalacrocorax aristotelis desmarestii*	The Gulf of Kavala is the main foraging habitat of the species, while the adjacent coasts and uninhabited islets are the main breeding, resting and roosting habitat. According to the results of the field work, part of the individuals using the marine and coastal area at the project site come from the species' colonies in Thasopoula and Fidonisi. Disturbance: According to the MMO (2018), the shag exhibits a high level of displacement from areas where there is vessel traffic. In the study area, the species is accustomed to the passage of vessels, however, it is expected to be disturbed in the short term due to the movement of the pipeline laying vessel, support vessels and activities. The species is likely to avoid the area until the works are completed. Taking into account the short duration of the works per site/area, it is estimated that the impact will be limited. Habitat degradation: Construction work will take place on the seabed and no habitat loss is expected. However, the works may lead to habitat degradation, particularly in the water column where the species feeds. The degradation is related to increased turbidity and potential agitation of pollutants, mainly during the pipeline burial phase (using a plough) and drilling operations in the area of the existing Beta platform. Fish may avoid the work zone and adjacent areas during the works. If the works are carried out in the summer months, suspended sediments may affect the reproduction of fish fauna, affecting eggs and larvae in the project area, and consequently the feeding of the shag at a short distance from the works. However, the works are spatially localized to a small portion of the species' habitat in the area, and the impact will be short-term.	See. Table 56	LOW	Synergistic activities include fishing, coastal shipping and offshore oil and gas extraction facilities. The degree of impact caused by the project alone is not exacerbated by taking into account cumulative impacts with other existing projects/activities.	NO	NO
Operation stage	Λ11, Λ15, Λ16, Λ17	*Phalacrocorax aristotelis desmarestii*	Habitat Degradation: At the point of discharge of treated water from the pumping wells, limited degradation of the species' foraging area is expected. However, this area is spatially limited and constitutes a very small part of the species' habitat in the area, and the impact is considered negligible. Positive Impact on Habitat: The access exclusion zone already exists due to the presence of the existing subsea pipelines and platforms. Consequently, a positive impact is expected, as the fishing and anchoring ban remains in place.	See. Table 56	INSIGNIFICANT Λ17: POSITIVE / MAINTAINING THE STATUS	Synergistic activities include fishing, coastal shipping and offshore oil and gas extraction facilities. The degree of impact caused by the project alone is not exacerbated by taking into account cumulative impacts with other existing projects/activities.	NO	NO
Decommissioning stage	Π11, Π13, Π14, Π18, Π20, Π21	*Phalacrocorax aristotelis desmarestii*	Disturbance: The species is expected to be disturbed in the short term due to human presence and activities in the area, resulting in it avoiding it until the completion of the works. Habitat degradation: Given that the subsea pipeline will remain backfilled and no dismantling works will be carried out, impacts are only expected from the dismantling works of facilities on the Beta/Delta platform, which will be local and will affect a very small part of the species' habitat in the area, with the impact considered negligible.	Βλ. Table 56	INSIGNIFICANT	Synergistic activities include fishing, coastal shipping and offshore oil and gas extraction facilities. The degree of impact caused by the project alone is not exacerbated by taking into account cumulative impacts with other existing projects/activities.	NO	NO
Construction stage	K15, K16, K18, K19, K20, K25, K27, K28, K29	*Puffinus yelkouan*	The Gulf of Kavala and the coastal zone constitute the main habitat for feeding and movement of the species. The Common Sandpiper has not been recorded within 1.25 km of the Complex Prinos offshore platforms and the SIGMA onshore facility, generally avoiding human settlements.	See. Table 56	LOW	Synergistic activities include fishing, coastal shipping and offshore oil and gas extraction facilities.	NO	NO

Project stage	Project aspect	Protected objects	Potential impact	Conservation Goals	Negative impact of the project alone on the characteristic (overall characterization per stage)	Negative impact of the project in combination with other plans or projects on the affected feature	Possible avoidance or mitigation of negative impacts (YES / NO / PARTIAL / UNCERTAIN)	Conclusion: negative impacts on the integrity of the site: YES / NO / UNCERTAIN / LONG-TERM / SHORT-TERM
			Disturbance: According to the MMO (2018), the Common Sandpiper exhibits a low level of displacement from areas where excavation works are taking place. The species is expected to be disturbed in the short term due to the movement of the pipeline installation vessel, support vessels and activities, and to avoid the area until the works are completed. Considering the short duration of the pipeline installation works and the continuous movement of the work site, the impact is estimated to be limited. Habitat degradation: Construction works will take place on the seabed and no habitat loss is expected. However, the works may lead to habitat degradation, particularly in the water column where the species feeds. The degradation is related to increased turbidity and potential agitation of pollutants, mainly during the pipeline burial phase (using a plough) and drilling operations in the area of the existing Beta platform. Fish may avoid the work zone and adjacent areas during the works. If the works are carried out in the summer months, suspended sediments may affect the reproduction of fish fauna, affecting eggs and larvae in the project area, and consequently the feeding of the Mychos in nearby areas. However, the works are spatially localized to a small part of the species' habitat in the area, and the impact will be short-term. Also, as the species feeds in the upper layer of the water column, the impact is expected to be more limited compared to the shag examined above.			The degree of impact caused by the project alone is not exacerbated by taking into account cumulative impacts with other existing projects/activities.		
Operation stage	Λ11, Λ15, Λ16, Λ17	*Puffinus yelkouan*	Habitat Degradation: At the point of discharge of treated water from the pumping wells, limited degradation of the species' foraging area is expected. However, this area is spatially limited and constitutes a very small part of the species' habitat in the area, and the impact is considered negligible. Positive Impact on Habitat: The access exclusion zone already exists due to the presence of the existing subsea pipelines and platforms. Consequently, a positive impact is expected, as the fishing and anchoring ban remains in place.	See. Table 56	INSIGNIFICANT Λ17: POSITIVE / MAINTAINING THE STATUS	Synergistic activities include fishing, coastal shipping and offshore oil and gas extraction facilities. The degree of impact caused by the project alone is not exacerbated by taking into account cumulative impacts with other existing projects/activities.	NO	NO
Decommissioning stage	Π11, Π13, Π14, Π18, Π20, Π21	*Puffinus yelkouan*	Nuisance: The species is expected to be disturbed in the short term due to human presence and activities in the area, resulting in it avoiding it until the completion of the works. Habitat degradation: Given that the subsea pipeline will remain backfilled and no dismantling works will be carried out, impacts are only expected from the dismantling works of facilities on the Beta/Delta platform, which will be local and will affect a very small part of the species' habitat in the area, with the impact considered negligible.	See. Table 56	INSIGNIFICANT	Synergetic activities include fishing, coastal shipping and offshore oil and gas extraction facilities. The degree of impact caused by the project alone is not exacerbated by taking into account cumulative impacts with other existing projects/activities.	NO	NO
Construction stage	K15, K16, K18, K25, K27	*Alosa fallax*	During the construction of the project, the main sources of impacts on the fish fauna will be noise and increased turbidity, mainly during drilling and burial of the pipeline. From these aspects, the following could be observed on the fish fauna: (a) Noise from the works may cause fish to avoid the area. (b) Many fish species use sounds to communicate, especially during reproduction. Increased noise may affect this communication, reducing fecundity and reproductive success. (c): Continuous noise may cause stress to fish, with impacts on their growth, health and behaviour. (d) Reduced visibility: Increased turbidity may make it difficult to find food, as many fish rely on vision to locate their prey. This may affect their growth and survival. (e) Reproduction: Turbidity may affect spawning areas, especially for species that lay their eggs in specific areas of the seabed. Egg laying may be negatively affected, reducing fecundity. g) Respiration: High turbidity may affect gill function, making breathing more difficult and increasing the energy cost for survival. Considering the short duration of the works per location/area, it is estimated that the impact will be limited and short-term and fish will avoid the work zone. According to the distribution maps of the 4th national implementation report of Directive 92/43/EEC (10 x 10 km grid areas), the Spreading (distribution) of the species does not fall Inside the project area.	See. Table 56	LOW	Synergetic activities include fishing, coastal shipping and offshore oil and gas extraction facilities. The degree of impact caused by the project alone is not exacerbated by taking into account cumulative impacts with other existing projects/activities.	NO	NO

Project stage	Project aspect	Protected objects	Potential impact	Conservation Goals	Negative impact of the project alone on the characteristic (overall characterization per stage)	Negative impact of the project in combination with other plans or projects on the affected feature	Possible avoidance or mitigation of negative impacts (YES / NO / PARTIAL / UNCERTAIN)	Conclusion: negative impacts on the integrity of the site: YES / NO / UNCERTAIN / LONG-TERM / SHORT-TERM
Operation stage	Λ11, Λ17	*Alosa fallax*	During normal operation of the project, the main sources of impacts on fish fauna will be noise from the well pumps and the discharge of treated seawater. Underwater noise from the pumps may result in: (a) Continuous noise may cause fish to avoid the area. (b) Noise may affect communication between fish, which is important for reproduction. Reduced communication may lead to lower fertilization rates and reproductive success. (c) Continuous noise may cause stress to fish, with potential consequences for their health and development. Stress may also affect their immune response, making them more vulnerable to disease. From the discharge of treated seawater, which will meet the quality and salinity limits, the impacts may be related to: (a) Temperature changes: If the treated water has a different temperature than the seawater, it can create temperature zones that affect the behavior and distribution of fish. (b) Changes in the ecosystem: The discharge of large quantities of water can affect the structure and functioning of marine ecosystems, affecting the habitats of fish and other marine organisms. Overall, the negative impact during the operational phase is expected to be local to the Beta and Delta platforms, and therefore of Low significance, as fish will move to areas with lower disturbance. According to the distribution maps of the 4th national implementation report of Directive 92/43/EEC (10 x 10 km grid areas), the Spreading (distribution) of the species does not fall inside the project area.	See. Table 56	LOW Λ17: POSITIVE / MAINTAINING THE STATUS	Synergetic activities include fishing, coastal shipping and offshore oil and gas extraction facilities. The degree of impact caused by the project alone is not exacerbated by taking into account cumulative impacts with other existing projects/activities.	NO	NO
Decommissioning stage	Π18	*Alosa fallax*	The above applies to the construction phase. However, the impact is expected to be of lower intensity as no decommissioning of the submarine pipeline is foreseen. In particular, the impact will be local and short-term, since no decommissioning of the submarine pipeline is expected. Decommissioning works will be limited only to the area of the offshore installations on the Delta and Beta platforms. According to the distribution maps of the 4th national implementation report of Directive 92/43/EEC (10 x 10 km grid areas), the Spreading (distribution) of the species does not fall Inside the project area.	See. Table 56	INSIGNIFICANT	Synergetic activities include fishing, coastal shipping and offshore oil and gas extraction facilities. The degree of impact caused by the project alone is not exacerbated by taking into account cumulative impacts with other existing projects/activities.	NO	NO
Construction stage	K14, K16, K17, K18, K19, K20, K25, K27, K28, K29	*Phocoena phocoena*	These aspects/works may cause limited displacement of the porpoise population especially in case the area of the works is a feeding ground for the species. The causes of the displacement of the porpoise are related (directly) to the disturbance from the generated underwater noise and (indirectly) to the possible displacement of fish that are a food source for the species. The data of the present study do not highlight the area as important for the species but the rarity of the porpoise in the Mediterranean, the classification of the species as “critically endangered”, the limited area of spreading of the species in the northern Aegean and the difficulty of visual observation of the porpoise make the overall impact of the works related to the construction phase LOW. The positive impacts of aspects K21 and K30 are mainly related to the exclusion of fishing vessels and the cessation of fishing in the exclusion zones which may lead to an increase in fish stocks locally.	See. Table 56	LOW	Synergetic activities include fishing, coastal shipping and offshore oil and gas extraction facilities. The degree of impact caused by the project alone is not exacerbated by taking into account cumulative impacts with other existing projects/activities.	PARTIAL	NO
Operation stage	Λ11, Λ15, Λ16, Λ17	*Phocoena phocoena*	These aspects/works may cause limited displacement of the porpoise population especially in the event that the area of the works is a feeding ground for the species. The causes of the displacement of the porpoise are related (directly) to the disturbance from the generated underwater noise and (indirectly) to the possible displacement of fish that are a food source for the species. The data of this study do not highlight the area as important for the species. The possibility of displacement during the stage of the works/features related to the operational stage is considered unlikely and the overall impact is classified as INSIGNIFICANT. The positive impact of aspect Λ17 is mainly related to the exclusion of fishing vessels and the cessation of fishing in the exclusion zones which may lead to an increase in fish stocks locally.	See. Table 56	LOW Λ17: POSITIVE / MAINTAINING THE STATUS	Synergetic activities include fishing, coastal shipping and offshore oil and gas extraction facilities. The degree of impact caused by the project alone is not exacerbated by taking into account cumulative impacts with other existing projects/activities.	NO	NO

Project stage	Project aspect	Protected objects	Potential impact	Conservation Goals	Negative impact of the project alone on the characteristic (overall characterization per stage)	Negative impact of the project in combination with other plans or projects on the affected feature	Possible avoidance or mitigation of negative impacts (YES / NO / PARTIAL / UNCERTAIN)	Conclusion: negative impacts on the integrity of the site: YES / NO / UNCERTAIN / LONG-TERM / SHORT-TERM
Decommissioning stage	П11, П13, П14, П18, П20, П21	*Phocoena phocoena*	These aspects/works may cause limited displacement of the porpoise population especially in the event that the area of the works is a feeding ground for the species. The causes of the displacement of the porpoise are related (directly) to the disturbance from the generated underwater noise and (indirectly) to the possible displacement of fish that are a food source for the species. The data of this study do not highlight the area as important for the species. The possibility of displacement during the stage of the works/features related to the decommissioning stage is considered unlikely and the overall impact is classified as INSIGNIFICANT. The positive impact of aspects P15 and P20 is mainly related to the exclusion of fishing vessels and the cessation of fishing in the exclusion zones which may lead to an increase in fish stocks locally.	See. Table 56	INSIGNIFICANT	Synergetic activities include fishing, coastal shipping and offshore oil and gas extraction facilities. The degree of impact caused by the project alone is not exacerbated by taking into account cumulative impacts with other existing projects/activities.	NO	NO
Construction stage	K14, K16, K17, K18, K19, K20, K25, K27, K28, K29	*Tursiops truncatus*	These aspects/works may cause limited displacement of the bottlenose dolphin population especially as the works area is a feeding area for the species. The causes of bottlenose dolphin displacement are related (directly) to the disturbance from the underwater noise generated and (indirectly) to the possible displacement of fish that are a food source for the species. The impact could be considered negligible but according to the data of this study where bottlenose dolphins were regularly found Inside or in close proximity to the area of the planned works in feeding processes. These data make the overall impact of the works related to the construction phase LOW. The positive impact of aspects K21 and K30 is mainly related to the exclusion of fishing vessels and the cessation of fishing in the exclusion zones which may lead to an increase in fish stocks locally.	See. Table 56	LOW	Synergetic activities include fishing, coastal shipping and offshore oil and gas extraction facilities. The degree of impact caused by the project alone is not exacerbated by taking into account cumulative impacts with other existing projects/activities.	PARTIAL	NO
Operation stage	Λ11, Λ15, Λ16, Λ17	*Tursiops truncatus*	These aspects/works may cause limited displacement of the bottlenose dolphin population especially as the area of the works is a feeding ground for the species. The causes of the displacement of the bottlenose dolphin are related (directly) to the disturbance from the underwater noise generated and (indirectly) to the possible displacement of fish that are a food source for the species. The possibility of displacement during the works/aspects related to the operational phase is considered unlikely and the overall impact is classified as INSIGNIFICANT. The positive impact of aspect Λ17 is mainly related to the exclusion of fishing vessels and the cessation of fishing in the exclusion zones which may lead to an increase in fish stocks locally.	See. Table 56	LOW Λ17: POSITIVE / MAINTAINING THE STATUS	Synergetic activities include fishing, coastal shipping and offshore oil and gas extraction facilities. The degree of impact caused by the project alone is not exacerbated by taking into account cumulative impacts with other existing projects/activities.	NO	NO
Decommissioning stage	П11, П13, П14, П18, П20, П21	*Tursiops truncatus*	These aspects/works may cause limited displacement of the bottlenose dolphin population especially as the work area is a feeding ground for the species. The causes of bottlenose dolphin displacement are related (directly) to the disturbance from the underwater noise generated and (indirectly) to the possible displacement of fish that are a food source for the species. The possibility of displacement during the works/aspects related to the decommissioning stage is considered unlikely and the overall impact is classified as INSIGNIFICANT. The positive impact of aspects P15 and P20 is mainly related to the exclusion of fishing vessels and the cessation of fishing in the exclusion zones which may lead to an increase in fish stocks locally.	See. Table 56	INSIGNIFICANT	Synergetic activities include fishing, coastal shipping and offshore oil and gas extraction facilities. The degree of impact caused by the project alone is not exacerbated by taking into account cumulative impacts with other existing projects/activities.	NO	NO
SAC GR1150001								
Construction / operation / decommissioning stages	Refer to GR1150014 in this table.	*Phalacrocorax aristotelis desmarestii*	Refer to GR1150014 in this table.	See. Table 57	Refer to GR1150014 in this table.	Refer to GR1150014 in this table.	Refer to GR1150014 in this table.	Refer to GR1150014 in this table.

Project stage	Project aspect	Protected objects	Potential impact	Conservation Goals	Negative impact of the project alone on the characteristic (overall characterization per stage)	Negative impact of the project in combination with other plans or projects on the affected feature	Possible avoidance or mitigation of negative impacts (YES / NO / PARTIAL / UNCERTAIN)	Conclusion: negative impacts on the integrity of the site: YES / NO / UNCERTAIN / LONG-TERM / SHORT-TERM
Construction / operation / decommissioning stages	Refer to GR1150014 in this table.	*Puffinus yelkouan*	Refer to GR1150014 in this table.	See. Table 57	Refer to GR1150014 in this table.	Refer to GR1150014 in this table.	Refer to GR1150014 in this table.	Refer to GR1150014 in this table.
Construction stage	K4, K5, K6, K7, K8, K9, K12, K13, K15, K16, K18, K19, K20	Waders	The project activities that will take place during the construction and decommissioning stages at Sigma's land facilities and in front of them (dunes, coast, coastal zone) and are 1100 meters from the boundaries of GR1150001, will cause indirect temporary impacts on Individuals (or part of the single population) of wading species of the protected object of GR1150001 that feed or roost and Outside the SPA, in the coastal zone, coast and dunes, in front of and in close proximity to the infrastructure and the land section of the CO2 pipeline. Habitat degradation: These impacts are related to temporary (for the duration of the works and the restoration of the area) loss or degradation of foraging, shelter/resting habitats, for the species in the construction zone. The small population of the species (Charadrius alexandrinus, Charadrius dubius and Haematopus ostralegus) that breed in the dunes of FRA and in front of Sigma, which are part of the single population that breeds in GR1150001 and is one of the reasons why the eastern part of FRA was included in the National Park of Eastern Macedonia - Thrace, will also be temporarily affected. Disturbance: there will be temporary displacement due to disturbance of the above species that use the dunes and the coast in front of the SIGMA land facilities, which will be affected by the works.	See. Table 57	LOW to the species of waders that breed in the dunes and coast near the factory	Industrial facilities are a synergistic activity. However, the degree of impact caused by the project alone is not exacerbated by taking into account cumulative impacts with other existing projects/activities.	MEPIKH	NO
Operation stage	Λ15, Λ16, Λ17	Waders	During the operational phase there will be no impact as long as the dune vegetation above the pipeline is restored. Conservation of the isolation of the dune zone, in front of the plant and on either side of it, without intense human presence may lead to the future use of the dunes as a breeding ground.	See. Table 57	INSIGNIFICANT Λ17: POSITIVE / MAINTAINING THE STATUS	Industrial facilities are a synergistic activity. However, the degree of impact caused by the project alone is not exacerbated by taking into account cumulative impacts with other existing projects/activities.	NAI	NO
Decommissioning stage	Π20, Π21	Waders	Nuisance: there will be temporary displacement due to disturbance of species using the FRA coast.	See. Table 57	INSIGNIFICANT	Industrial facilities are a synergistic activity. However, the degree of impact caused by the project alone is not exacerbated by taking into account cumulative impacts with other existing projects/activities.	NO	NO
Construction stage	K4, K5, K6, K7, K8, K9, K12, K13, K15, K16, K18, K19, K20	Storiformes – Pinnipeds	The project activities that will take place during the construction and decommissioning stages at and in front of the Sigma onshore facilities (dunes, coast, marine coastal zone) and are 1100 meters from the boundaries of GR1150001, will cause negligible indirect temporary impacts on individuals of stork-like species of the protected object of GR1150001 that feed outside the SPA, on the coast, the small artificial pond and the mouths of the drainage ditches, in front of and in close proximity to the infrastructure and the onshore section of the CO2 pipeline. Habitat degradation: These impacts are related to temporary (for the duration of the works and the restoration of the area) loss or degradation of foraging habitats for the species in the construction zone. Disturbance: there will be temporary displacement due to disturbance of the above species that use the dunes and the shore in front of the SIGMA onshore facilities, which will be affected by the works.	See. Table 57	LOW	Industrial facilities are a synergistic activity. However, the degree of impact caused by the project alone is not exacerbated by taking into account cumulative impacts with other existing projects/activities.	NO	NO

Project stage	Project aspect	Protected objects	Potential impact	Conservation Goals	Negative impact of the project alone on the characteristic (overall characterization per stage)	Negative impact of the project in combination with other plans or projects on the affected feature	Possible avoidance or mitigation of negative impacts (YES / NO / PARTIAL / UNCERTAIN)	Conclusion: negative impacts on the integrity of the site: YES / NO / UNCERTAIN / LONG-TERM / SHORT-TERM
Operation stage	-	Storiformes – Pinnipeds	No impact on storks and finches of GR1150001 is expected during the operational phase.	See. Table 57	No effect is expected.	No effect is expected.	No effect is expected.	No effect is expected.
Decommissioning stage	-	Storiformes – Pinnipeds	No impact on storks and finches of GR1150001 is expected during the operational phase.	See. Table 57	No effect is expected.	No effect is expected.	No effect is expected.	No effect is expected.
Construction stage	K4, K5, K6, K7, K8, K9, K12, K13, K15, K16, K18, K19, K20,	Aquatic	Habitat degradation: The coastal zone works may lead to the degradation of a minimal portion of the foraging habitat for a short period of time. The degradation is mainly related to the increase in turbidity and the possible remobilization of pollutants present in the sediment. Disturbance: The coastal zone works are expected to have negligible impacts on a minimal portion of the foraging habitat of the species populations.	See. Table 57	LOW	Industrial facilities are a synergistic activity. However, the degree of impact caused by the project alone is not exacerbated by taking into account cumulative impacts with other existing projects/activities.	NO	NO
Operation stage	-	Aquatic	No impact on aquatic life is expected in GR1150001 during the operational phase.	See. Table 57	No effect is expected.	No effect is expected.	No effect is expected.	No effect is expected.
Decommissioning stage	-	Aquatic	No impact on aquatic life is expected in GR1150001 during the operational phase.	See. Table 57	No effect is expected.	No effect is expected.	No effect is expected.	No effect is expected.
Construction stage	K4, K5, K6, K7, K8, K9, K12, K13, K15, K16, K18, K19, K20	Gulliformes	Species that use the coastal part of the FRA as a feeding habitat, Outside the boundaries of GR1150001 and Inside GR1150014, with the most numerous during reproduction being Sterna hirundo and Ichtyaetus melanocephalus (in the years it reproduces in the SAC), during wintering Chroicocephalus ridibundus, and during wintering and migration Ichthyaetus melanocephalus, Hydrocoloeus minutus Thalasseus sandvicensis and Chroicocephalus genei. Habitat degradation: The works in the coastal zone may lead to the degradation of a minimal part of the feeding habitat for a short period of time. The degradation is mainly related to the increase in turbidity and the possible remobilization of pollutants present in the sediment. Disturbance: The works in the coastal zone are expected to have negligible impacts on a minimal portion of the foraging habitat of the species populations.	See. Table 57	LOW	Industrial facilities are a synergistic activity. However, the degree of impact caused by the project alone is not exacerbated by taking into account cumulative impacts with other existing projects/activities.	NO	NO
Operation stage	-	Gulliformes	No impact on gulliformes is expected in GR1150001 during the operational phase.	See. Table 57	No effect is expected.	No effect is expected.	No effect is expected.	No effect is expected.
Decommissioning stage	-	Gulliformes	No impact on gulliformes is expected in GR1150001 during the operational phase.	See. Table 57	No effect is expected.	No effect is expected.	No effect is expected.	No effect is expected.
Construction / operation / decommissioning stages	-	Predators (diurnal - nocturnal)	No impact on predators is expected in GR1150001 during the operational phase.	See. Table 57	No effect is expected.	No effect is expected.	No effect is expected.	No effect is expected.
Construction / operation / decommissioning stages	-	Ostrichiformes	No impact on the passerines of GR1150001 is expected during the decommissioning stage.	See. Table 57	No effect is expected.	No effect is expected.	No effect is expected.	No effect is expected.
CAP GR1150010								

Project stage	Project aspect	Protected objects	Potential impact	Conservation Goals	Negative impact of the project alone on the characteristic (overall characterization per stage)	Negative impact of the project in combination with other plans or projects on the affected feature	Possible avoidance or mitigation of negative impacts (YES / NO / PARTIAL / UNCERTAIN)	Conclusion: negative impacts on the integrity of the site: YES / NO / UNCERTAIN / LONG-TERM / SHORT-TERM
Construction stage	K14, K16, K17, K18, K19, K20, K25, K27, K28, K29	*Caretta caretta*	The movement of boats and construction machinery can have impacts on sea turtles, with the following main ones: Injuries and deaths: Sea turtles are often injured or killed by boat propellers. However, the most common cause of death is in fishing nets. Disturbance of natural behavior and use of space: The presence of boats and noise from machinery during the construction phase can disrupt the natural behavior of turtles, such as foraging and reproduction. No reproduction has been observed in the area, but individuals have been present for feeding. Acoustic stress during geophysical research: Sea turtles have auditory abilities and can perceive sounds in the water. Sonar, especially high-intensity military systems, can cause acoustic stress, which can affect their behavior. Changes to the seabed: The works and the various changes to the seabed can affect ecosystems and vegetation types and benthic species on which the turtle feeds. However, these works will take place for a short period of time and then there will be restoration.	See. Table 59	LOW	Synergistic activities include fishing, coastal shipping and offshore oil and gas extraction facilities. The degree of impact caused by the project alone is not exacerbated by taking into account cumulative impacts with other existing projects/activities.	NO	NO
Operation stage	Λ11, Λ15, Λ16, Λ17	*Caretta caretta*	Positive impact on Habitat: The access exclusion zone already exists, due to the presence and operation of existing submarine pipelines and platforms. Consequently, a positive impact is expected due to the restriction of fishing and maritime traffic in the zone.	See. Table 59	LOW Λ17: POSITIVE / MAINTAINING THE STATUS	Synergistic activities include fishing, coastal shipping and offshore oil and gas extraction facilities. The degree of impact caused by the project alone is not exacerbated by taking into account cumulative impacts with other existing projects/activities.	NO	NO
Decommissioning stage	Π11, Π13, Π14, Π18, Π20, Π21	*Caretta caretta*	Limited temporary disruption during the works phase. No impact on the future.	See. Table 59	INSIGNIFICANT	Synergistic activities include fishing, coastal shipping and offshore oil and gas extraction facilities. The degree of impact caused by the project alone is not exacerbated by taking into account cumulative impacts with other existing projects/activities.	NO	NO
Construction / operation / decommissioning stages	Refer to GR1150014 in this table.	Marine mamals *(Phocoena phocoena, Tursiops truncatus)*	Refer to GR1150014 in this table.	See. Table 59	Refer to GR1150014 in this table.	Refer to GR1150014 in this table.	Refer to GR1150014 in this table.	Refer to GR1150014 in this table.
Construction / operation / decommissioning stages	-	Marine area	The project does not pass through GR1150010 and due to its distance from it (approximately 1 km) no impact on the marine life of the area is expected.	See. Table 59	No effect is expected.	No effect is expected.	No effect is expected.	No effect is expected.
Construction / operation / decommissioning stages	Refer to GR1150014 in this table.	Fish fauna	The project does not cross GR1150010 and due to its distance from it (approximately 1 km) no impact on the fish fauna species of the area in question is expected. However, the impacts on fish fauna are examined in GR1150014.	See. Table 59	No effect is expected. Refer to GR1150014 in this table in the corresponding ichthyofauna field.	No effect is expected. Refer to GR1150014 in this table in the corresponding ichthyofauna field.	No effect is expected. Refer to GR1150014 in this table in the corresponding	No effect is expected. Refer to GR1150014 in this table in the corresponding ichthyofauna field.

Project stage	Project aspect	Protected objects	Potential impact	Conservation Goals	Negative impact of the project alone on the characteristic (overall characterization per stage)	Negative impact of the project in combination with other plans or projects on the affected feature	Possible avoidance or mitigation of negative impacts (YES / NO / PARTIAL / UNCERTAIN)	Conclusion: negative impacts on the integrity of the site: YES / NO / UNCERTAIN / LONG-TERM / SHORT-TERM
							ichthyofauna field.	
Construction stage	-	Terrestrial area.	On land, the project will take place Outside NATURA sites and no impact on terrestrial area of GR1150010 is expected. However, it is important to note that the most significant element in the terrestrial Area is the sand dune zone through which the pipeline will pass. During the construction phase, the structure of the dunes, the sand dune flora such as the endemic Silene grisebachii and other sand dune species, and the significant populations of land turtles that feed and breed in the dunes will be affected.	See. Table 59	No impact is expected on the terrestrial t.o. of GR1150010, however the impact on the sand dune zone in front of the SIGMA terrestrial facilities, which during the construction stage is LOW, is being examined.	Synergistic activity is industrial facilities or agricultural activity. However, the degree of impact caused by the project alone is not aggravated by taking into account cumulative impacts with other existing projects / activities.	PARTIAL	NO
Operation stage	-	Terrestrial area	On land, the project will take place Outside NATURA sites and no impact is expected on the terrestrial area of GR1150010. Regarding the sand dunes observed in front of the SIGMA onshore facility, there will be no impact as long as the pipeline is covered and conditions are created for the development of sand dune flora, which is not deep-rooted enough to create a problem for the buried pipeline.	See. Table 59	No impact is expected on the terrestrial t.o. of GR1150010, however the impact on the sand dune zone in front of the SIGMA terrestrial facilities is being examined, which during the operational stage is INSIGNIFICANT.	Synergistic activity is industrial facilities or agricultural activity. However, the degree of impact caused by the project alone is not aggravated by taking into account cumulative impacts with other existing projects / activities.	NO	NO
Decommissioning stage	-	Terrestrial area	On land, the project will take place Outside NATURA sites and no impact is expected on the terrestrial area of GR1150010. As the pipeline will not be removed and no earthworks will be carried out, there will be no change to the sand dune zone in front of the SIGMA onshore facilities.	See. Table 59	No impact is expected on the terrestrial facilities of GR1150010, however the impact on the sand dune zone in front of the SIGMA terrestrial facilities is being examined, which during the decommissioning stage is INSIGNIFICANT.	Synergistic activity is industrial facilities or agricultural activity. However, the degree of impact caused by the project alone is not aggravated by taking into account cumulative impacts with other existing projects / activities.	NO	NO
Construction stage	K8, K13	Χειρόπτερα	The emission of dust, air pollutants and noise is expected to temporarily reduce the quality of the bat feeding areas around the land-based facilities, however the impact is expected to be minor. Also, no significant vehicle traffic is expected during the night. The coastal area affected constitutes a small part of the bat feeding areas in the area and therefore the impact will be limited. It is noted as a general comment that the activities on the land and in the coastal section do not fall within the main bat Habitat.	See. Table 59	LOW	Industrial facilities are a synergistic activity. However, the degree of impact caused by the project alone is not exacerbated by taking into account cumulative impacts with other existing projects/activities.	NO	NO
Operation stage	Λ1	Chiroptera	Light pollution and noise during the night due to vehicle traffic are expected to be limited. The impact is expected to be minor.	See. Table 59	INSIGNIFICANT	Industrial facilities are a synergistic activity. However, the degree of impact caused by the project alone is not exacerbated by taking into account cumulative impacts with other existing projects/activities.	NO	NO

Project stage	Project aspect	Protected objects	Potential impact	Conservation Goals	Negative impact of the project alone on the characteristic (overall characterization per stage)	Negative impact of the project in combination with other plans or projects on the affected feature	Possible avoidance or mitigation of negative impacts (YES / NO / PARTIAL / UNCERTAIN)	Conclusion: negative impacts on the integrity of the site: YES / NO / UNCERTAIN / LONG-TERM / SHORT-TERM
Decommissioning stage	П6	Chiroptera	The emission of dust, air pollutants and noise is expected to temporarily reduce the quality of the bat feeding areas around the land-based facilities, however the impact is expected to be minor. Also, no significant vehicle traffic is expected during the night. The coastal area affected constitutes a small part of the bat feeding areas in the area and therefore the impact will be limited. It is noted as a general comment that the activities on the land and in the coastal section do not fall within the main bat Habitat.	See. Table 59	INSIGNIFICANT	Industrial facilities are a synergistic activity. However, the degree of impact caused by the project alone is not exacerbated by taking into account cumulative impacts with other existing projects/activities.	NO	NO
Construction stage	K4	Terrestrial mammals	The most important terrestrial mammal species (otter and jackal) will not be negatively affected during the construction phase. The otter is found at some distance and only in aquatic habitats, while the jackal also moves in the dunes as there is a group in the Outside CAP area with a large territory, which moves within a radius of a few km. During the construction phase, the jackals will avoid movement near the project, at least during the day. As they are already approaching disturbing installations, they are not expected to move away.	See. Table 59	INSIGNIFICANT	Industrial facilities are a synergistic activity. However, the degree of impact caused by the project alone is not exacerbated by taking into account cumulative impacts with other existing projects/activities.	NO	NO
Operation stage	-	Terrestrial mammals	There will be no impact from the operational phase.	See. Table 59	No effect is expected.	No effect is expected.	No effect is expected.	No effect is expected.
Decommissioning stage	-	Terrestrial mammals	There will be no impact from the restoration phase since no earthworks will be carried out.	See. Table 59	No effect is expected.	No effect is expected.	No effect is expected.	No effect is expected.
Construction stage	K4	Amphibians and reptiles	Of the reptiles in the terrestrial zone of the dunes, Outside of SAC 1150010, in the pipeline installation zone, the terrestrial tortoises that maintain a significant population will only be affected by accident during the pipeline installation phase. The careful and short duration of the installation work and the limited movement on the dunes can limit the chances of tortoises being trampled by vehicles.	See. Table 59	LOW	Industrial facilities are a synergistic activity. However, the degree of impact caused by the project alone is not exacerbated by taking into account cumulative impacts with other existing projects/activities.	NO	NO
Operation stage	-	Amphibians and reptiles	During the operational phase there will be no impact as long as the dune vegetation above the pipeline is restored. Conservation of the isolation of the dune zone, in front of the plant and on either side of it, without intense human presence may lead to the future use of the dunes as a nesting site for sea turtles.	See. Table 59	No effect is expected.	No effect is expected.	No effect is expected.	No effect is expected.
Decommissioning stage	-	Amphibians and reptiles	There will be no impact from the restoration phase since no earthworks will be carried out.	See. Table 59	No effect is expected.	No effect is expected.	No effect is expected.	No effect is expected.
ΖΕΠ GR1150012								
Construction stage	K15, K16, K18, K19, K20, K25, K27, K28, K29	Birdlife – Pelagic	Although all project activities are carried out Outside of GR1150012, the marine area of the Gulf of Kavala, together with the coastal marine zone south of Thassos, constitute the main habitat for feeding and movement of pelagic species. The Common Redshank was not recorded at a distance of less than 1.25 km from the site and generally avoids human settlements, while the Redshank was recorded at a distance of >500m from the platforms. In particular, during the field work, Individuals and flocks of Redshank were recorded Inside of the FRA mainly Inside of a radius of 5 km from the platforms, while a few small flocks of Common Redshank were recorded Inside of the FRA along the pipeline route. No Individuals of Redshank were recorded. Disturbance: The species is expected to be disturbed in the short term due to the movement of the pipeline laying vessel, support vessels and activities, and to avoid the area until the works are completed. Considering the short duration of the pipeline installation works and	See. Table 58	LOW	Synergistic activities include fishing, coastal shipping and offshore oil and gas extraction facilities. The degree of impact caused by the project alone is not exacerbated by taking into account cumulative impacts with other existing projects/activities.	NO	NO

Project stage	Project aspect	Protected objects	Potential impact	Conservation Goals	Negative impact of the project alone on the characteristic (overall characterization per stage)	Negative impact of the project in combination with other plans or projects on the affected feature	Possible avoidance or mitigation of negative impacts (YES / NO / PARTIAL / UNCERTAIN)	Conclusion: negative impacts on the integrity of the site: YES / NO / UNCERTAIN / LONG-TERM / SHORT-TERM
			the continuous movement of the work area, the impact is estimated to be limited. Habitat degradation: The construction works will take place on the seabed and no habitat loss is expected. However, the works may lead to habitat degradation, in particular of the water column where the species feeds. The degradation is related to the increase in turbidity and the possible agitation of pollutants, mainly during the pipeline burial phase (using a plough) and the drilling operations in the area of the existing Beta platform. Fish may avoid the work zone and adjacent areas during the works. If the works are carried out during the summer months, suspended sediments may affect the reproduction of fish fauna, affecting eggs and larvae in the project area, and consequently the feeding of the species in nearby areas. However, the works are spatially localized to a small part of the species' habitat in the area, and the impact will be short-term. Also, as the species feeds in the upper layer of the water column, the impact is expected to be more limited compared to the shag examined above.					
Operation stage	Λ11, Λ15, Λ16, Λ17	Birdlife – Pelagic	Habitat Degradation: At the point of discharge of treated water from the pumping wells, limited degradation of the species' foraging area is expected. However, this area is spatially limited and constitutes a very small part of the species' habitat in the area, and the impact is considered negligible. Positive Impact on Habitat: The access exclusion zone already exists due to the presence of the existing subsea pipelines and platforms. Consequently, a positive impact is expected, as the fishing and anchoring ban remains in place.	See. Table 58	INSIGNIFICANT Λ17: POSITIVE	Synergistic activities include fishing, coastal shipping and offshore oil and gas extraction facilities. The degree of impact caused by the project alone is not exacerbated by taking into account cumulative impacts with other existing projects/activities.	NO	NO
Decommissioning stage	Π11, Π13, Π14, Π18, Π20, Π21	Birdlife – Pelagic	Disturbance: The species are expected to be disturbed in the short term due to human presence and activities in the area, resulting in them avoiding it until the completion of the works. Habitat Degradation: Given that the subsea pipeline will remain backfilled and no dismantling works will be carried out, impacts are only expected from the dismantling works of facilities on the Beta/Delta platform, which will be local and will affect a very small part of the species' habitat in the area, with the impact considered negligible.	See. Table 58	INSIGNIFICANT	Synergistic activities include fishing, coastal shipping and offshore oil and gas extraction facilities. The degree of impact caused by the project alone is not exacerbated by taking into account cumulative impacts with other existing projects/activities.	NO	NO
Construction stage	K15, K16, K18, K19, K20, K25, K27, K28, K29	Birdlife – Gulliformes	Although all project activities are carried out Outside GR1150012, the marine area of the Gulf of Kavala, together with the coastal zone south of Thassos, constitute the species' feeding habitat. Consequently, impacts on the Gulf of Kavala are expected to also affect the population of the Study Area. It is noted that most gulls use the Gulf of Kavala during migration, so their stay in the area is estimated to be of limited duration, while some terns are also found in particularly small populations (D). Exceptions are: Larus audouinii, Larus ridibundus, Thalasseus sandvicensis, which winter in the PM. Nuisance: According to the MMO (2018), gulls and terns present a low level of displacement from areas where there is boat traffic. The species is accustomed to the passage of vessels, however, it is expected that they will be disturbed in the short term, due to the movement of the laying vessel and support vessels and activities and will avoid the area until the works are completed. Considering the short duration of the pipeline installation works and the continuous movement of the work area, the impact is estimated to be limited. Habitat degradation: The construction works will take place on the seabed and no habitat loss is expected. However, the works may lead to habitat degradation, in particular of the water column where the species feeds. The degradation is related to the increase in turbidity and the possible agitation of pollutants, mainly during the pipeline burial phase (using a plough) and the drilling works in the area of the existing Beta platform. Fish may avoid the work zone and adjacent areas during the works. If the works are carried out in the summer months, suspended sediments may affect the reproduction of fish fauna, affecting eggs and larvae in the project area, and consequently the feeding of species in nearby areas. However, the works are spatially localized to a small part of the species' habitat in the area, and the impact will be short-term.	See. Table 58	LOW	Synergistic activities include fishing, coastal shipping and offshore oil and gas extraction facilities. The degree of impact caused by the project alone is not exacerbated by taking into account cumulative impacts with other existing projects/activities.	NO	NO

Project stage	Project aspect	Protected objects	Potential impact	Conservation Goals	Negative impact of the project alone on the characteristic (overall characterization per stage)	Negative impact of the project in combination with other plans or projects on the affected feature	Possible avoidance or mitigation of negative impacts (YES / NO / PARTIAL / UNCERTAIN)	Conclusion: negative impacts on the integrity of the site: YES / NO / UNCERTAIN / LONG-TERM / SHORT-TERM
			As the species feed in the upper layer of the water column, the impact is expected to be more limited. Also, as the species are not permanent residents, the potential impact will mainly concern the wintering period, and to a lesser extent the migration period, and is estimated to be negligible. The works are spatially localized to a small part of the species' habitat in the area and the impact is short-term. It is noted that during the field work, individuals of gulls and terns migrating in the Gulf of Kavala were recorded, while individuals of terns breeding in the area were recorded mainly in the coastal zone of the Nestos wetlands area, which are, however, related to the populations of SPA GR1150001. An impact is expected only if the work coincides with the period of presence of the species in the area and mainly the wintering period, when the species remain in the area for a longer period.					
Operation stage	Λ11, Λ15, Λ16, Λ17	Birdlife – Gulliformes	Habitat Degradation: At the point of discharge of treated water from the pumping wells, limited degradation of the species' foraging area is expected. However, this area is spatially limited and constitutes a very small part of the species' habitat in the area, and the impact is considered negligible. Positive Impact on Habitat: The access exclusion zone already exists due to the presence of the existing subsea pipelines and platforms. Consequently, a positive impact is expected, as the fishing and anchoring ban remains in place.	See. Table 58	INSIGNIFICANT Λ17: POSITIVE	Synergistic activities include fishing, coastal shipping and offshore oil and gas extraction facilities. The degree of impact caused by the project alone is not exacerbated by taking into account cumulative impacts with other existing projects/activities.	NO	NO
Decommissioning stage	Π11, Π13, Π14, Π18, Π20, Π21	Birdlife – Gulliformes	Disturbance: The species are expected to be disturbed in the short term due to human presence and activities in the area, resulting in them avoiding it until the completion of the works. Habitat Degradation: Given that the subsea pipeline will remain backfilled and no dismantling works will be carried out, impacts are only expected from the dismantling works of facilities on the Beta/Delta platform, which will be local and will affect a very small part of the species' habitat in the area, with the impact considered negligible.	See. Table 58	INSIGNIFICANT	Synergistic activity Synergistic activities include fishing, coastal shipping and offshore oil and gas extraction facilities. The degree of impact caused by the project alone is not exacerbated by taking into account cumulative impacts with other existing projects/activities.	NO	NO
Construction / operation / decommissioning stages	-	Birdlife - Wading Birds / Egrets / Aquatic Birds / Raptors / Ratites	NO IMPACT IS EXPECTED DUE TO THE DISTANCE OF THE PROJECT FROM THE COASTAL AREA OF GR1150012 (approximately 6.9 km)	See. Table 58	No effect is expected.	No effect is expected.	No effect is expected.	No effect is expected.

2.4 Impacts on the marine ecosystem from an accidental CO2 leak

The capture, transport and storage of CO2, a greenhouse gas, aims to reduce the impacts of climate change.

Carbon dioxide is a naturally occurring component of the atmosphere/ocean system and is produced by natural biological processes, such as respiration and decomposition, as well as by anthropogenic activities.

As reported in the scientific article Turrel et al. 2022, the release of CO2 into the atmosphere from the combustion of fossil fuels and other anthropogenic activities has resulted in the dissolution of more CO2 in the sea than before the industrial revolution. It is estimated that the sea has absorbed about 48% of the CO2 emitted from anthropogenic sources since the beginning of the industrial era (Artioli et al., 2012). Adding large amounts of CO2 to the sea lowers its pH, i.e. it becomes more acidic. Due to the increase in atmospheric CO2 and the absorption of CO2 by the oceans, the average pH at the ocean surface has decreased by 0.1 (Humphreys et al., 2020), a phenomenon referred to as ocean acidification.

In the event of a CO2 leak from offshore CO2 storage development, the CO2 will enter the sea as a gas or dissolved in the pore water of the sediments. The CO2 as a gas will dissolve in the seawater and/or escape as a gas to the atmosphere, depending on the initial conditions of the leak.

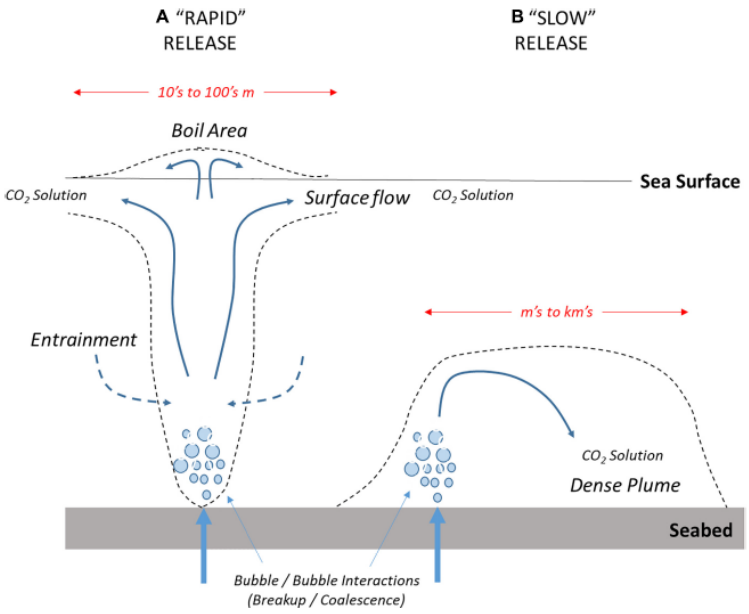


Figure 89: Simulation models of the CO2 leakage path. (A) A "fast" CO2 leakage where CO2 reaches the surface of the water column as a gas (from Chen et al., 2005). (B) A "slow" CO2 leakage where CO2 dissolves in the sea before reaching the surface (from Dewar et al., 2013; Dewar, 2016)

In case of CO2 leakage, Outside of the aforementioned pH reduction, it is also expected:

- increased dissolution of CaCO3,

• lower carbonate saturation in seawater, which negatively affects the structure of organisms with calcareous shells,

• changes in microbial communities in sediments, both in terms of species composition and respiratory activity, which also has implications for the biogeochemical cycle of carbon and other elements,

• change in the activity and bioavailability of various chemical elements, not only those essential for marine organisms, such as Ca, Mn and nutrients, such as Si and Fe, but also those that present toxic biological effects, e.g. heavy metals,

• reduction in the efficiency of P burial in marine sediments, which contributes to an increase in P concentration in the water column and enhances eutrophication phenomena, especially in shallow areas.

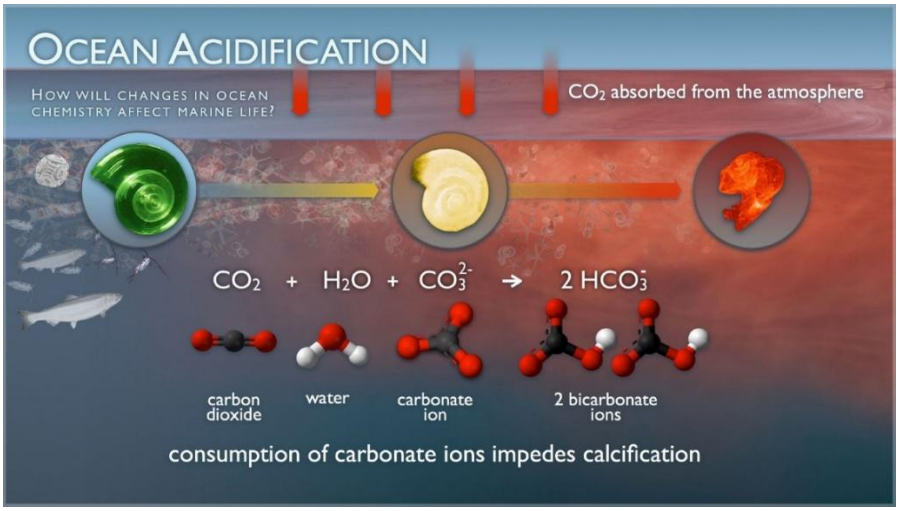


Figure 90: A pteropod shell appears to dissolve over time in seawater with a lower pH. (from the US National Oceanic and Atmospheric Administration website)

- In modeling studies attempting to predict the impact of CO2 leaks from carbon capture and storage (CCS), changes in pH are often used as a simple measure of biological impact. For example, Blackford et al. 2008 suggested that pH provides an indicator of the "strength of the total ecosystem effects." Different authors have used different criteria for pH change to describe varying degrees of ecological impact. However, a general consensus is as follows:
- <0.01 Disturbance zero or below detection levels, no ecological significance
- <0.1 Likely zero or minimal impact, disturbance less than natural variability
- to 0.3 Disturbance of the order of natural variability, likely minor impacts without systemic significance
- to 0.4 Some species and processes are significantly impacted
- More widespread and significant to severe impacts are predicted
- Significantly detrimental impact

Impact on Marine Life – Phytoplankton and Microbes

Plankton and microbial communities may be affected by changes in the carbonate system. Previous studies examining the effects of a controlled CO2 release on the microbial community have identified changes in the relative abundance of both major and minor bacterial taxa (Tait et al., 2015). The effect of increased pCO2 on phytoplankton is complex (Sommer et al., 2015; Wells et al., 2015). Some phytoplankton species are poor absorbers of dissolved inorganic carbon (DIC), and while the response to increases in pCO2 may differ between groups and species, it is likely to lead to significant changes in phytoplankton community structure (Mackey et al., 2015; Bach and Taucher, 2019). Some harmful species can increase toxin production under conditions of increased DIC, which could pose a potential risk to fish in the area around a CO2 leak (Riebesell et al., 2018).

Impact on Marine Life – Zooplankton

The erosive conditions associated with increased CO2 are likely to have a significant impact on zooplankton calcifying species. Short-term exposure to extreme acidification conditions is sufficient to cause significant shell damage and mortality in marine gastropods (Bednaršek et al., 2014; Gardner et al., 2018) and larvae of commercially important bivalve molluscs (Wijsman et al., 2019), resulting in reduced recruitment (Parker et al., 2013).

Impact on Marine Life – Benthic Organisms

Benthic organisms, including some associated with commercial fishing activities, are likely to suffer mortality under extreme acidification scenarios near a spill area, while mortality will be reduced for organisms that have the ability to move away from the spill area. The QICS (Quantification and Monitoring of Potential Ecosystem Impacts from Geological Carbon Storage) project (e.g., Blackford et al., 2014) reported rapid recovery of the benthic community once a small-scale spill was stopped. However, impacts on coral habitats and rhodolithic bottoms (craganes) and bivalve reefs may cause long-term damage with recovery likely taking decades.

Impact on Marine Life – Marine Mammals and Seabirds

Marine mammals and seabirds may be indirectly affected by CO2 leakage through disruption of the food chain.

3. Mitigation measures for potential impacts

3.1 Prevention and mitigation measures

According to the European Commission Communication 2021/C437/01, mitigation measures are measures aimed at minimising, or even eliminating, the negative impacts that are likely to arise from the implementation of a plan or project, so as not to harm the integrity of the site. Also, monitoring of mitigation measures is important to check their successful and timely implementation, as well as to identify any unforeseen impacts for which additional measures are required.

According to the assessment carried out in Chapter 2, no significant impacts on the integrity of the relevant Natura 2000 sites are expected from the development of the Project and are therefore assessed as Not Significant. However, in accordance with the precautionary principle, the following best practices and mitigation/response measures are proposed to prevent and/or minimize potential impacts with emphasis on the protected objects of the survey area.

- **CO2 Monitoring Plan and Corrective Measures Plan** based on Paragraph 2 of Article 14 of Joint Ministerial Decision 48416/2037/E.103/2011[1].
- Compliance with international guidelines and the IMO International Safety Management Code (ISM), for the safe operation of ships and the prevention of environmental pollution, as well as strict compliance with navigation, communication and safety procedures.
- Compliance with MARPOL requirements for waste and sewage, with emphasis on the following: Annex I Regulations for the Prevention of Pollution by Oil, Annex III Regulations for the Prevention of Pollution by Harmful Substances Carried by Sea in Packaged Form, Annex IV Regulations for the Prevention of Pollution by Sewage from Ships, Annex V Regulations for the Prevention of Pollution by Solid Wastes from Ships.
- The vessels to be used for the purposes of the project will comply with the International Regulations for Preventing Collisions at Sea 1972 (IRCS).
- All necessary measures shall be taken to avoid pollution of the sea during the construction phase, as well as any additional measures that may be indicated by the relevant Port Authority, in accordance with Law 743/77 (Government Gazette A 319), as codified by Presidential Decree 55/98 (A' 58) and in force from time to time.
- Implementation of fuel supply procedures in accordance with applicable national regulations and vessel specifications.
- During construction work, any maintenance work on the construction site of the mechanical equipment (construction vehicles and machinery, vehicles for transporting personnel and materials) that will be used in the construction of the project is prohibited. These works, if required, shall be carried out at the facilities of appropriately licensed companies. Avoid carrying out earthworks during high rainfall in the area or strong waves.

- Implement a "Waste Management Plan" during the construction / operation / decommissioning stages, examining all aspects of the project and the waste generated with the aim of ensuring that the waste generated (hazardous, non-hazardous) is managed properly. Submit the annual waste report electronically through the Electronic Waste Registry (EWR) platform (http://wrm.ypeka.gr/). (i) quantification and coding of the waste generated. The Waste Management Plan should include at least the following: (ii) method of collection, marking and temporary storage (including instructions to personnel), (iii) method of packaging and transport from the point of activity to the onshore waste reception and management facilities, (iv) waste reception and management facilities (the relevant permits of these facilities should be attached in accordance with the Waste Law of 2011, L. 185(I)/2011). (v) final disposal.
- The water pumped from the wells will be directed for treatment in appropriate systems on the Delta platform, which will have an efficiency that will achieve the applicable discharge limits. In particular, the treatment that will be required will be further investigated after the collection and analysis of water samples from the aquifer in the storage complex.
- Water from the surfaces of the platforms (cleaning and rainwater) will be led to disposal through appropriate cleaning systems, in accordance with the International Convention for the Prevention of Pollution from Ships (MARPOL).
- The speed of all vessels involved in the implementation of the new sub-projects should not exceed 20 knots, in order to minimize the possibility of collision with marine mammals.
- The support vessel for the installation of the 20 km long submarine pipeline using the S-lay method (Phase 3) and its backfilling (Phase 5) will carry 2 certified marine mammal observers (MMOs). Before the start of construction work, the presence of marine mammals Inside 500 m from the point of activity should be examined by the MMOs. Noisy operations should not commence if marine mammals have been sighted Inside this radius or until at least 20 minutes have passed since the last sighting. For periods of darkness or poor visibility (such as fog) mariners should use night vision goggles or passive acoustic monitoring devices.
- An Environmental and Social Management and Monitoring Plan (ESMP) shall be implemented during the construction / operation / decommissioning stages of the Project.
- A Biodiversity and Wildlife Management Plan and an Environmental Monitoring Program (EMP) shall be implemented with specific actions and indicators, frequency and methodology for conducting recordings / fieldwork / measurements per environmental parameter.
- The project facilities and activities shall comply with the environmental requirements of the "Protocol for the Protection of the Mediterranean Sea against Pollution Resulting from Exploration and Exploitation of the Seabed and its Subsoil" of the Barcelona Convention. Protocol for the Protection of the Mediterranean Sea against Pollution Resulting from Exploration and Exploitation of the Seabed and its Subsoil (OJ L 4 09.01.2013, p. 15, ELI: http://data.europa.eu/eli/prot/2013/5/oj).
- A Chemicals Use Plan shall be implemented which shall include: (i) The chemicals which the operator intends to use during the operations. An inventory of the ecotoxicity of those chemicals.

(ii) The purpose or purposes for which the operator intends to use the chemicals. (iii) The maximum concentrations of the chemicals which the operator intends to use Inside any other substances, as well as the maximum quantities intended to be used in any specified period. (iv) The area within which the chemical substance may escape into the marine environment.

- Use approved biocides and anti-corrosion agents that meet the requirements of applicable national and EU legislation and comply with international marine protection conventions, in particular the Barcelona Convention. The substances to be used for the above purposes should be selected from the "OSPAR List of Substances Used and Discharged Offshore which Are Considered to Pose Little or No Risk to the Environment (PLONOR)" in its current version. The use of substances belonging to the "OSPAR List of Substances of Possible Concern (LSPC)" is not permitted.
- A "Facility Contingency Plan – F.C.P." compatible with the Local Contingency Plan of the relevant Port Authority shall be implemented, which shall be applied when dealing with marine pollution incidents that may be caused by the project's facilities and activities.
- In the event of a collision between a project vessel and marine mammals, the incident should be reported to the competent Directorate of Natural Environment and Biodiversity of the Ministry of Environment and Natural Resources and to the relevant Management Unit of the Ministry of Environment and Natural Resources.
- It is recommended to avoid implementing the construction phase in the marine environment during the breeding season of the cormorant (February – May).
- During the construction phase in the onshore section, which is located in an Outside Natura site zone but with sand dunes, it is recommended: (A) Avoiding disturbance and interventions in the sand dune zone during the turtle and wading bird breeding season. In particular, it is recommended to avoid the period from mid-April to the end of June for the excavation and installation of the pipeline in the sand dune zone. This restriction will avoid disturbance during the breeding season and the possible destruction/abandonment of bird or turtle nests. (B) For the conservation in good condition of the sand dunes during the excavation phase for the installation of the pipeline, the 20 cm deep surface layer (surface zone with seeds) should be removed and placed in a special zone separately (appropriately marked) from the sand of the deeper layers. After the installation of the pipeline, this layer should be placed again on the surface. In this way, the seeds are preserved and the dunes will regenerate. (C) No construction site or material storage area should be formed on the dunes to avoid soil compaction and the destruction of the flora on the dunes.
- It is recommended to limit vehicle traffic to and from the land facilities from sunset to sunrise to limit disturbance to the fauna of the area.
- The water that will arise in the trenches or excavations during the works for the installation of the land infrastructure will be removed with appropriate systems (pumps or wells) and after their characterization, their intended treatment / discharge into water bodies existing in the project area will be determined.

- From the pipeline approach works (placement of the specific section of the pipeline in a trench approximately 500 m long, approximately 5 m wide and 3 m deep), the volume of excavated materials from the seabed is expected to be approximately 7,500 m3. The excavated materials will be kept on the side of the trench, for its subsequent backfilling. Concrete slab coverage is not expected.
- During CO2 injection on the Beta platform and to avoid low temperatures in the pipeline and the formation of hydrates/halites in the area near the well, the installation of an electric start-up heater and a methanol injection system is planned. No discharge to the marine environment is expected from the electric heater as it is a closed system and any waste should be managed appropriately.
- According to the technical description of the project, no cooling systems are expected that could cause thermal pollution to the marine environment.

3.2 Specific measures to prevent and mitigate potential risks and emergencies related to a possible CO2 leak

The following box lists the prevention and mitigation measures for potential risks and emergencies. The implementation of these measures has been taken into account to derive the proposed mitigation measures for potential impacts within the framework of the SEAS.

BOX 1: Prevention and mitigation measures for potential risks and emergencies related to a potential CO2 leak

The Project under study, due to its nature, is associated with potential risks and emergency conditions throughout its life cycle, which require meticulous risk identification and assessment (Risk Assessment).

During construction, potential risks include structural failures, equipment malfunctions and accidents during pipeline installation and facility construction, while during operation, risks arise from CO2 leakage, pipeline ruptures and equipment failures, leading to environmental damage and risk to personnel. Unforeseen events such as natural disasters and extreme weather conditions amplify these risks.

Even during the decommissioning phase, careful planning is necessary to mitigate residual risks, including the possibility of CO2 migration after closure. Furthermore, the interaction between the injection process and existing hydrocarbon facilities introduces complexities, including potential interference with well integrity and operational outages. Throughout the project lifecycle, diligent monitoring and mitigation strategies are imperative to prevent adverse impacts. Comprehensive risk assessment methodologies are essential to ensure the safety and sustainability of the Project, while meeting regulatory requirements and environmental standards.

The critical risks associated with the development of the Project are described below.

I. Pipeline integrity and transportation risks: leakage or rupture of pipelines during the transportation of CO2 from remote producers to the offshore facility, due to corrosion, fatigue or mechanical damage to the pipeline or leaks during the loading/unloading of CO2 from transport vessels to the offshore facility.

- Prevention: Regular inspection and maintenance of pipelines for early detection and treatment of corrosion or mechanical damage.

- Mitigation: Implementation of leak detection systems along the pipeline route and emergency response protocols to rapidly contain and mitigate leaks.

II. CO2 injection process hazards: failure to achieve the desired injection pressure and temperature can lead to inadequate CO2 storage or leakage, corrosion or degradation of injection equipment due to high CO2 pressure, inadequate monitoring and control measures leading to over-injection or low CO2 injection, hazards associated with equipment failure or malfunction during injection operations, leading to inefficiency or safety hazards.

- Prevention: Ensure robust design and selection of injection equipment capable of withstanding high pressures and temperatures.

- Mitigation: Implement real-time monitoring and control systems to identify deviations from desired injection parameters and initiate corrective actions in a timely manner.

III. Reservoir integrity and containment risks related to:

i. possibility of geological faults, fractures or dykes that compromise the containment integrity of the reservoir layers leading to CO2 migration,

ii. poor sealing properties of the reservoir layers allowing CO2 to escape,

iii. seismic activity causing geological events that compromise containment,

iv. seismic events that cause geological disturbances that could compromise the containment/sealing properties of the reservoir layers, leading to CO2 leakage.

- Prevention: Conduct geological surveys and characterize reservoir strata to identify potential leakage pathways or geological hazards.

- Mitigation: Implement zone isolation techniques, such as cementing or geomechanical barriers, to enhance the integrity of the reservoir strata seal and regularly monitor for signs of leakage.

IV. Hydrocarbon production risks: interference with hydrocarbon production due to CO2 migration into hydrocarbon reservoirs, increased pressure in hydrocarbon reservoirs due to CO2 injection, which may lead to well integrity issues (e.g. blowouts) or other operational disruptions or hazards.

- Prevention: Conduct reservoir modeling and simulation studies to assess the potential impacts of CO2 injection in hydrocarbon producing zones.

- Mitigation: Implement pressure management strategies, such as adjusting injection rates or using sub-hole barriers, to mitigate the risk of CO2 migration into hydrocarbon reservoirs.

V. Environmental risks: CO2 leakage into the marine environment, threats to marine ecosystems and biodiversity, possible acidification of seawater due to CO2 leakage with impacts on marine life and habitat viability, impacts on air quality and greenhouse gas emissions if mitigation measures fail.

- Prevention: Conduct geological surveys and characterize reservoir layers to identify potential leakage pathways or geological hazards and minimize the risk of CO2 leakage into the marine environment.

- Mitigation: Develop robust monitoring and emergency plans to rapidly detect and contain leaks.

VI. Health and safety risks: worker exposure to high-pressure CO2 during handling and pressurization processes and maintenance activities, fire, explosion or toxic gas hazards associated with CO2 handling and storage operations. Strong safety protocols and emergency response measures are required, preparedness for accidents or leaks, including evacuation procedures and medical assistance.

- Prevention: Provide comprehensive training programs and personal protective equipment to personnel involved in CO2 handling and injection activities.

- Mitigation: Establish emergency response protocols, including evacuation procedures and medical facilities, to promptly respond to potential accidents or exposure incidents.

VII. Technical and operational risks: malfunction or failure of equipment, such as pumps, valves or monitoring systems, insufficient training or expertise in CO2 capture and storage technologies among staff, inadequate contingency plans to deal with unforeseen technical challenges or emergencies.

- Prevention: Investing in strong design and engineering practices, including redundancy and reliability features, to minimize the risk of equipment failure or malfunction.

- Mitigation: Developing comprehensive maintenance and contingency plans to address unforeseen technical challenges in a timely manner and minimize operational disruptions.

4. Compensatory measures

According to Annex 3.2 of Ministerial Decision 170225/2014, compensatory measures are proposed in cases where:

«i) there are no alternative solutions for the implementation of the project or activity and, despite the consideration of mitigation measures, it is assessed that the integrity of the respective Natura 2000 site and its conservation objectives, in accordance with paragraph 4 of Article 10 of Law 4014/2011, continue to be adversely affected,

and

ii) it is substantiated that the reasons of paragraph 4 of Article 10 of Law 4014/2011 apply."

Paragraph 4 of Article 10 states the following:

"If, despite the negative conclusions of the impact assessment based on the procedure of paragraphs 1 and 2 of this Article, and in the absence of alternative solutions, a project or activity must be carried out for other imperative reasons of overriding public interest, including reasons of a social or economic nature, all necessary compensatory measures shall be taken to ensure the protection of the overall coherence of the Natura 2000 network. Within two months from the issuance of the Environmental Terms Approval (ETA) for the project or activity, the Minister of Environment, Energy and Climate Change shall inform the European Commission of the potential impacts and the compensatory measures adopted."

"When, in the specific area, a priority natural habitat type or a priority species is present, only arguments relating to human health and public safety, or to beneficial consequences of primary importance for the environment, or, following the opinion of the European Commission, other imperative reasons of overriding public interest, may be invoked. The decision as to whether a project or activity must be carried out for imperative reasons of overriding public interest, within the meaning of this paragraph, shall be taken by the Minister of Environment, Energy and Climate Change."

According to the SEAS and the appropriate impact assessment, the two aforementioned conditions were not identified, and therefore no compensatory measures are proposed.

5. Monitoring program

Table 70 presents the draft Environmental Monitoring Program (EPP draft) that focuses on the protection and monitoring of the protected objects of the relevant Natura 2000 areas. In a next stage, the EPP draft will be specified in terms of the methodology of the surveys and field work, the locations of the measurement / sampling / observation stations, the number of samples, the duration of the field work, etc.

It is noted that Energean will implement a Monitoring Plan of Paragraph 2 of Article 14 of JMD 48416/2037/E.103/2011 which is prepared in accordance with the requirements of Annex II of the above JMD. Monitoring will be carried out of the injection wells, the storage complex (including, whenever possible, the CO2 plume), and, where applicable, the surrounding environment. The CO2 Monitoring Plan and Corrective Measures Plan are presented in Annex 16.2 of the EIA.

As already presented, the project schedule is that of Table 69.

Table 69: Construction schedule

Project Activity during the construction stage	Duration
Onshore facilities: modification of a certain area Inside the existing Area at the Sigma plant for the construction of the collector and an unloading and compression area.	3 months
Offshore pipeline: a subsea pipeline connecting the Sigma plant area to the Beta offshore platform, approximately 20 km long. The pipeline works will be carried out in several phases:	9 months
Phase 1 Geophysical and Geotechnical surveys along the pipeline route	1 month
Phase 2 Works to bring the pipeline closer to the shore, by dredging a 500 m section of the coastline, in the area of the pipeline head at the Sigma plant. The trench will be approximately 3 m deep throughout its length and will terminate at seabed level at the end of the 500 m zone	6 months
Phase 3 Installation of subsea pipeline and hydrotesting using a specialized pipeline laying vessel	2 – 3 weeks
Phase 4 Installation of a riser on the existing Beta platform and work with divers to connect the riser to the end of the subsea pipeline	1 week
Phase 5 Final commissioning and testing	1 month
Offshore platform: modification of the existing Prinos offshore facilities to receive CO2 from the new subsea CO2 pipeline and injection into the new wells.	4 months
Wells: 2 CO2 injection wells and 2 water production wells on the existing Beta platform of the Prinos offshore complex.	8 months

Table 70: Environmental Monitoring Plan (EMP), with emphasis on the protected features of the respective Natura 2000 areas.

	Monitoring actions related to the protected objects of the relevant Natura 2000 areas	General category	Monitoring frequency / Project aspect
	Construction phase		
Κ-ΠΠΠ 01	Water quality that will arise in the trenches or excavations during the works for the installation of land infrastructure. Based on the results of the analyses, their characterization will result and the intended appropriate treatment / discharge into water bodies will be determined. Indicatively, parameters to be controlled are Polycyclic Aromatic Hydrocarbons (PAH - 16 USEPA PAHs) and (heavy) metals (to be determined based on the sources of potential pollution in the area).	Water quality monitoring in trenches	Once in the waters that will arise in the trenches / excavations (during the installation of land infrastructure).
Κ-ΠΠΠ 02	Seawater quality with measurements of pH, turbidity, dissolved oxygen (DO), total dissolved solids (TDS), temperature, salinity / electrical conductivity at the bottom and on the surface of the water column with a portable instrument.	Seawater quality monitoring	Weekly during Phase 3 and Phase 5 of the offshore pipeline installation and burial works.
Κ-ΠΠΠ 03	Seawater quality with measurements of Polycyclic Aromatic Hydrocarbons (16 PAHS USEPA) at the bottom and surface of the water column (in an accredited laboratory)	Seawater quality monitoring	Bimonthly during the implementation of the remaining Inside the marine environment works.
Κ-ΠΠΠ 04	Monitoring and recording the appearance of marine mammals (Phocoena phocoena, Tursiops truncates) which are protected objects of the Natura 2000 SPA – SCI with code GR1150014 and name "Marine Area of Kavala – Thassos".	Marine mammal monitoring	Bimonthly during the Inside the marine environment works.
Κ-ΠΠΠ 05	Monitoring and recording the appearance of the sea turtle Caretta caretta which is a protected object of GR1150010 and is expected in the marine area where the projects are carried out. Observation also for the other species of sea turtles Chelonia mydas, Dermochelys coriacea.	Sea turtle monitoring	Continuous monitoring during Phase 3 and Phase 5 of the offshore pipeline installation and burial works.
Κ-ΠΠΠ 06	Monitoring and recording of the bird species Phalacrocorax aristotelis desmarestii, Puffinus yelkouan which are protected objects of the Natura 2000 marine area SAC – SCI with code GR1150014 and name "Marine Area of Kavala – Thassos" as well as other bird species which are protected objects of the neighboring SPA areas of the Natura 2000 network and regularly use GR1150014.	Bird monitoring	With regular frequency, during the implementation of the remaining Inside the marine environment works.
Κ-ΠΠΠ 07	Identification of benthic macroinvertebrates as an indicator of the ecological status of the marine environment (application of statistical analysis and the BENTIX ecological index). At the sediment sampling points for benthic macroinvertebrates, a sediment sample should be taken for physicochemical analyses so that the results can be correlated (indicative parameters to be measured: granulometric analysis, pH, total organic carbon (TOC), total nitrogen (TN), 16 USEPA PAHs, metals (Fe, Mg, Ca), calcium carbonate (CaCO3-).	Παρακολούθηση βιολογικού δείκτη βενθικών μακροασπονδύλων	With regular frequency.

	Monitoring actions related to the protected objects of the relevant Natura 2000 areas	General category	Monitoring frequency / Project aspect
Κ-ΠΠΠ 08	Monitoring and recording of breeding wading bird species and land turtles (protected objects of GR1150001 and GR1150010) in the sand dune zone / on either side of the Sigma factory.	Monitoring of wading bird species and land turtles	Before the construction phase.
Κ-ΠΠΠ 09	Monitoring of noise emissions.	Noise emissions	Monthly, on the front line of work.
	Operation phase		
Λ-ΠΠΠ 01	Quality characteristics of the treated water from the pumping wells before its discharge into the marine environment. The parameters to be monitored will be determined based on the characteristics of the water to be pumped from the reservoir. The pumped water is expected to have a higher salinity than that of seawater and may contain oil impurities. In addition to the parameters to be determined, the temperature of the treated water should be monitored before its discharge into the sea.	Monitoring of quality characteristics of treated water from pumping wells before its discharge into the marine environment	Regular
Λ-ΠΠΠ 02	Bottom quality with sediment analyses in an accredited laboratory for the parameters (indicatively: granulometric analysis, pH, total organic carbon (TOC), total nitrogen (TN), total phosphorus (TP), 16 USEPA PAHs, metals (Ca, Mn, Si, Fe), calcium carbonate (CaCO3), sulfates SO42-, VOCs). → Take into account the locations of the sampling points studied in the context of the environmental monitoring of the offshore installations of Prinos (AEPO DIPA/8413/24.04.2018), as well as the methodology applied so that the results are comparable. Also take into account the historical data that have emerged in the context of the environmental monitoring of the offshore installations.	Monitoring of physicochemical parameters on the seabed	Every 3 years.
Λ-ΠΠΠ 03	Seawater quality with measurements with a portable instrument (pH, turbidity, dissolved oxygen (DO) total dissolved solids (TDS), temperature, salinity and electrical conductivity) at the bottom and at the surface of the water column. Analyses in an accredited laboratory (indicatively: total dissolved carbon (TIC), total nitrogen (TN), total phosphorus (TP), 16 USEPA PAHs) on water samples from the bottom and surface. → Take into account the locations of the sampling points studied in the context of the environmental monitoring of the offshore facilities of Prinos (AEPO DIPA/8413/24.04.2018), as well as the methodology applied so that the results are comparable. Also take into account the historical data that has emerged in the context of the environmental monitoring of the offshore facilities.	Monitoring of physicochemical parameters in seawater	Every 3 years.
Λ-ΠΠΠ 04	Identification of benthic macroinvertebrates as an indicator of the ecological status of the marine environment (application of statistical analysis and the BENTIX ecological index). At the sediment sampling points for benthic macroinvertebrates, a sediment sample should be taken for physicochemical analyses so that the results can be correlated (See. Λ-ΠΠΠ 02).	Monitoring of benthic macroinvertebrates	Every 3 years.

	Monitoring actions related to the protected objects of the relevant Natura 2000 areas	General category	Monitoring frequency / Project aspect
	→ Take into account the locations of the sampling points studied in the context of the environmental monitoring of the offshore installations of Prinos (AEPO DIPA/8413/24.04.2018), as well as the methodology applied so that the results are comparable. Also take into account the historical data that has emerged in the context of the environmental monitoring of the offshore installations.		
Λ-ΠΠΠ 05	Monitoring and recording the occurrence of marine mammals (Phocoena phocoena, Tursiops truncates) which are protected objects of the Natura 2000 SPA – SCI with code GR1150014 and name “Marine Area of Kavala – Thassos”.	Marine mammal monitoring	Every 3 years.
Λ-ΠΠΠ 06	Monitoring and recording the occurrence of the sea turtle Caretta caretta which is a protected object of GR1150001. Observation also for the other species of sea turtles Chelonia mydas, Dermochelys coriacea.	Sea turtle monitoring	Every 3 years.
Λ-ΠΠΠ 07	Monitoring and recording of the bird species Phalacrocorax aristotelis desmarestii, Puffinus yelkouan which are protected objects of the marine area Natura 2000 SPA – SCI with code GR1150014 and name "Marine Area of Kavala – Thassos" as well as other bird species which are protected objects of the neighboring SPA areas of the Natura 2000 network and regularly use GR1150014.	Bird monitoring	Every 3 years.
Λ-ΠΠΠ 08	Monitoring and recording of breeding wading bird species and land turtles (protected objects of GR1150001 and GR1150010) in the sand dunes zone / on either side of the Sigma factory.	Wave monitoring, land turtles.	Every 3 years.
Λ-ΠΠΠ 09	Monitoring of noise emissions.	Noise emissions	Every 6 months for the first 2 years of operation of the new platform, every two years thereafter.
	Construction stage & operation stage		
	ANNUAL REPORT The summary of the final results of the environmental monitoring will be reflected in an annual report which should be formulated in a way that is understandable to the public and made public via the internet. The report will be communicated to the Ministry of Environment which exercises responsibilities for environmental licensing, environmental inspection and control, as well as management of biodiversity and protected areas.	Report & comparative analysis of all monitoring parameters in relation to previous data	On an annual basis
	Decommissioning stage		
	To be examined at the appropriate time, taking into account the results of the observations that will have arisen by then and will concern the construction and operation stages of the Project.		

6. Summary of conclusions

Based on the information collected on the current status of the Natura 2000 sites (SAC & SCI GR1150014, SAC GR1150001, SPA GR1150010 and SPA GR1150012), the potential impacts of the Prinos CO2 Storage Project were assessed, taking into account the Conservation objectives of the protected objects of these Natura 2000 sites. The appropriate impact assessment was carried out on the basis of Article 6, paragraph 3 of Directive 92/43/EEC, and it was assessed that the Project will not have a negative impact on the integrity of the Natura 2000 sites and the Conservation objectives of the protected objects, either individually or in combination with other projects and plans. Appropriate mitigation measures were proposed, where possible, as well as a draft Environmental Monitoring Program.

7. References

2007 Ornithological Records Evaluation Committee (2008). Annual Report – 2007.

3.RLTS.T22680405A166206891.en

4th National Implementation Report of Directive 92/43/EEC

4th six-year report for the period 2013 - 2018, Report on the main results of the surveillance under article 17 for annex I habitat types (ANNEX D).

4th six-year report for the period 2013 - 2018, Report on the main results of the surveillance under Article 11 for Annex II, IV and V species (ANNEX B).

ACCOBAMS, 2021. Conserving Whales, Dolphins and Porpoises in the Mediterranean Sea, Black Sea and adjacent areas: an ACCOBAMS status report, (2021). By: Notarbartolo di Sciara G.,Tonay A.M.Ed. ACCOBAMS, Monaco.160 p. https://accobams.org/.

Adamantopoulou, S., Karamanlidis, A. A., Dendrinos, D. and Olivier, J. 2022. Citizen science indicatessignificant range recovery and defines new conservation priorities for Earth's most endangered Pinnipedin Greece. Animal Conservation 26(1): 115-125. https://doi.org/10.1111/acv.12806

Artioli, Y., Blackford, J. C., Butenschön, M., Holt, J. T., Wakelin, S. L., Thomas, H., et al. (2012). The carbonate system in the North Sea: sensitivity and model validation. J. Mar. Syst. 102-104, 1–13. doi: 10.1016/j.jmarsys.2012.04.006

Bach, L. T., and Taucher, J. (2019). CO2 effects on diatoms: a synthesis of more than a decade of ocean acidification experiments with natural communities. Ocean Sci. 15, 1159–1175. doi: 10.5194/os-15-1159-2019

Barataud, M., 2015. Acoustic ecology of European bats. Species identification and studies of their habitats and foraging behaviour. Biotope Editions, Mèze.

Bednaršek, N., Feely, R. A., Reum, J. C. P., Peterson, B., Menkel, J., Alin, S. R., et al. (2014). Limacina helicina shell dissolution as an indicator of declining habitat suitability owing to ocean acidification in the California Current Ecosystem. Proc. R. Soc. B Biol. Sci. 281:20140123. doi: 10.1098/rspb.2014.0123

BirdLife International. 2021. *Somateria mollissima*. The IUCN Red List of Threatened Species 2021: e.T22680405A166206891. https://dNAI.doi.org/10.2305/IUCN.UK.2021-

Blackford J., Bull J.M., Cevatoglu M., Connelly D., Hauton C., James R.H., Lichtschlag A., Stahl H., Steve Widdicombe S., Wright I.C., 2015. Marine baseline and monitoring strategies for carbon dioxide capture and storage (CCS), International Journal of Greenhouse Gas Control 38(2015)221–229, http://dx.doi.org/10.1016/j.ijggc.2014.10.004.

Blackford, J. C., Jones, N., Proctor, R., and Holt, J. (2008). Regional scale impacts of distinct CO2 additions in the North Sea. Mar. Pollut. Bull. 56, 1461–1468. doi: 10.1016/j.marpolbul.2008.04.048

Blackford, J., Stahl, H., Bull, J. M., Bergès, B. J. P., Cevatoglu, M., Lichtschlag, A., et al. (2014). Detection and impacts of leakage from sub-seafloor deep geological carbon dioxide storage. Nat. Clim. Change 4, 1011–1016. doi: 10. 1038/nclimate2381

Bourdakis S. & Vareltzidou S., 2000. Greece. Pp 261-333. In Heath M.F. and Evans M.I. (eds). Important Bird Areas in Europe: Priority Sites for conservation. 2: Southern Europe. Cambridge, UK: BirdLife International (BirdLife International Conservation Series No. 8).

Bousbouras, D. (ed.), 2015. Monitoring and assessment of the conservation status of amphibian and reptile species of Community interest within the jurisdiction of the Management Body of the National Park of Eastern Macedonia and Thrace. Amphibian and Reptile Monitoring Programme in the NPEMAT area (2012–2015). Management Body of the National Park of Eastern Macedonia and Thrace. (2015: Phases C & D, 40 pp. + annexes / 2014: Phase B, 58 pp. + annexes / 2013: Phase A, 60 pp. + annexes).

Bousbouras, D., 2023. Final monitoring report on the effectiveness of management interventions, evaluation of findings, and submission of proposals for improving the conservation status of the dune ecosystem (64 pp. + annexes). "Services for the monitoring and evaluation of the effectiveness of management measures in the dune ecosystems within SAC GR1250004 Alyki Kitrous." Management Authority of the Protected Areas of Thermaikos Gulf (OFYPEKA – Management Unit of Protected Areas of Central Macedonia).

Camphuysen, C.J. and S. Garthe, 2004. Recording foraging seabirds at sea: standardised recording and coding of foraging behaviour and multi-species foraging associations. Atlantic Seabirds 6:1-32.

Chatzimeros A., V. Almpanidous, A. DoNAla, Ch. Dimitriadis, A. Mazaris 2021. Projected redistribution of sea turtle foraging areas reveals important sites for conservation. Climate Change Ecology 2 (2021) 100038

Chen, B., Song, Y., Nishio, M., Someya, S., and Akai, M. (2005). Modeling near-field dispersion from direct injection of carbon dioxide into the ocean. J. Geophys. Res. Oceans 110:e002567. doi: 10.1029/2004JC002567

Cucknell, A-C., Frantzis, A., Boisseau, O., Romagosa, M., Ryan, C., A. M. Tonay, A.M., Alexiadou, P., A. A. Öztürk, A.A., and Moscrop, A. 2016. Harbour porpoises in the Aegean Sea,Eastern Mediterranean: the species' presence is confirmed. Marine Biodiversity Records (2016) 9:72. DOI 10.1186/s41200-016-0050-5

Dendrinos, P., Karamanlidis, A.A., Kotomatas, S., Legakis, A., Tounta, E. and Matthiopoulos, J. 2007. Pupping habitat use in the Mediterranean monk seal: a long-term study. Marine Mammal Science 23(3):615-628.

Dewar, M. (2016). Modelling the Two Phase Plume Dynamics of CO2 Leakage into Open Shallow Waters. Edinburgh: Heriot-Watt University.

Dewar, M., Wei, W., McNeil, D., and Chen, B. (2013). Small-scale modelling of the physiochemical impacts of CO2 leaked from sub-seabed reservoirs or pipelines within the North Sea and surrounding waters. Mar. Pollut. Bull. 73, 504–515. doi: 10.1016/j.marpolbul.2013.03.005

Dimalexis, A., Xirouchakis S., Portolou D., Latsoudis P., Karris G., Fric J., Georgiakakis P., Barboutis C., Bourdakis S., Ivovič M., Kominos T. & E. Kakalis, 2008. The Status of Eleonora's Falcon (Falco Eleonorae) in Greece. Journal of Ornithology 149, no. 1 (January 2008): 23–30.

Dimalexis, T. et al., 2009a. Determination of compatible activities in relation to the qualifying species of the Special Protection Areas for birds. Deliverable 2: Grouping of qualifying species according to their ecological requirements. Ministry of Environment, Physical Planning and Public Works.

Dimalexis, T. et al., 2009b. Determination of compatible activities in relation to the qualifying species of the Special Protection Areas for birds. Deliverable 8: Guide to ecological requirements, threats and

recommended measures for the qualifying species. Ministry of Environment, Physical Planning and Public Works.

Dimalexis, T., Kasstritis, Th., Manolopoulos, A., & Grivas, K. (2009). Determination of compatible activities in relation to the qualifying species of the Special Protection Areas for birds. Final Report, Ministry of Environment, Physical Planning and Public Works.

Doherty P. 1976 Keramoti 18.11.1976 eBird Checklist: https://ebird.org/checklist/S158684131 . eBird: An online database of bird distribution and abundance [web application]. eBird, Ithaca, New York. Available: http://www.ebird.org. (Accessed: Date [e.g., July 17, 2024]).

Ecologically or Biologically Significant Marine Areas, https://www.cbd.int/ebsa/

Fric J., Portolou D., Manolopoulos A. and T. Kastritis, 2012. Important Areas for Seabirds in Greece. LIFE07 NAT/GR/000285 - Hellenic Ornithological Society (HOS/BirdLife Greece), Athens

Fric, J. & Gaganis, K., 2009. Methodology for Seabird Recording in the Marine Environment (ESAS). Implementation of conservation actions for the European Shag and the Audouin's Gull and identification of marine IBAs (LIFE07 NAT/GR/000285). Hellenic Ornithological Society.

Gasteratos G. 2024 Strymonas river estuary (Εκβολές Ποταμού Στρυμόνα) 28.1.2024 eBird Checklist: https://ebird.org/checklist/S159969385. eBird: An online database of bird distribution and abundance [web application]. eBird, Ithaca, New York. Available: http://www.ebird.org. (Accessed: Date [e.g., July 17, 2024]).

Geographic and altitudinal distribution, acoustic identification and ecology of the bats of Crete (Doctoral dissertation, University of Crete. Faculty of Science and Technology).

Gioulatos, D. et al., 2015. Mammal Monitoring Programme in the NPEMAT area (2012–2015). Deliverables Report, Phase D.

Goutner, V., H. Jerrentrup, S. Kazantzidis & K. Poirazidis 1999 Population trends, distribution, ring recoveries and conservation of Mediterranean Gull (Larus melanocephalus) in Greece. In: MEININGER, P.L., W. HOOGENDOORN, R. FLAMANT & P. RAEVEL (eds.) Proc. of the 1st Intern. Mediterranean Gull Meeting, Le Portel, Pas-de-Calais, France, 4-7 Sept. 1998. Econum. Bailleul. pp.: 31-37.

Handrinos, G., Kasstritis, Th., Alivizatos, H., Kazantzidis, S., Katsadorakis, G., Xirouchakis, S., & Bourdakis, S. (2009). Birds. In: A. Legakis & P. Maragou (Eds.), The Red Data Book of the Threatened Animals of Greece. Athens, pp. 213–353.

Handrinos, G., Kazantzidis, S., Alivizatos, H., Akriotis, T. & Portolou, D., 2015. Mid-winter Counts of Waterbirds in Greece (1968–2006). Analysis of the populations of Anseriformes and the Eurasian Coot (Fulica atra). Hellenic Ornithological Society – Hellenic Bird Ringing Centre, Athens.

Heinemann, D., 1981. A Range Finder for Pelagic Bird Censusing. The Journal of Wildlife Management 45, no. 2 (April 1981): 489–93.

Hellenic Ornithological Society. Mid-winter Waterbird Counts in the Keramoti lagoons and the Nestos Delta, 2014–2023 (unpublished data).

Humphreys, M. P., Artioli, Y., Bakker, D. C. E., Hartman, S. E., León, P., Wakelin, S., et al. (2020). Air–sea CO2 exchange and ocean acidification in UK seas and adjacent waters. MCCIP Sci. Rev. 2020, 54–75. doi: 10.14465/2020.arc03.oac

Important Marine Mammal Areas (IMMAs), https://www.marinemammalhabitat.org/immas/

Jerrentrup H. & Naziridis T. 1996 Important Bird Area Nestos Delta bird data (unpublished data)

Kazantzidis S., Naziridis T., Bourdakis E. & I. Vasiliadis 2013 Numbers, distribution and roosting site characteristics of wintering Great Cormorants Phalacrocorax carbo sinensis

Kazantzidis, S., Naziridis, T., Katrana, E., Bukas, N., Kazantzidis, G., Christidis, A., Astaras, C., 2024. Population Trend of Colonially Nesting Heron Species in Greece. Birds 2024, 5, 217–239. https://doi.org/10.3390/birds5020015

Konstantinos Topouzelis, Despina Makri, Nikolaos Stoupas, Apostolos Papakonstantinou, Stelios Katsanevakis "Seagrass mapping in Greek territorial waters using Landsat-8 satellite images" Int J Appl Earth Obs Geoinformation 67 (2018) 98–113.

Mackey, K. R., Morris, J. J., Morel, F. M., and Kranz, S. A. (2015). Response of photosynthesis to ocean acidification. Oceanography 28, 74–91. doi: 10.5670/oceanog.2015.33

Milani, C.B., Vella, A., Vidoris, P., Christidis, A. & Koutrakis, E. Abundance, distribution and diet of the common dolphin, Delphinus delphis, in the northern Aegean Sea (Greece). Aquatic Conserv: Mar Freshw Ecosyst. 2019;1–11

Milani, C.B., Vella, A., Vidoris, P., Christidis, A., Koutrakis, E., Sylaios, G. & Kallianiotis, A. 2017. Encounter rate and relative abundance of bottlenose dolphins and distribution modelling of main cetacean species in the North Aegean Sea (Greece). J. Black Sea/Mediterranean Environment. 23(2), 101-120

National Action Plan for the Marine Turtle (Caretta caretta) in Greece – Regulations for reducing anthropogenic impacts at nesting sites.

OMIKRON S.A., 2022. Study 1: Preparation of the Special Environmental Study (SES) and Management Plan (MP) for the Natura 2000 sites of the Region of Eastern Macedonia and Thrace – Deliverable G3.3 "Final Draft SES for the 2nd Group of Sites – Ch. 2". Hellenic Ministry of Environment and Energy, Athens, 486 pp.

Panagiotopoulou M., Kazantzidis S., Katrana E. & L. Alvanou 2012 The importance of Axios-Loudias-Aliakmonas wetland complex for nesting of threatened species of gulls and terns. 12th ICZEGAR, Athens, Greece.

Panayotidis Panayiotis, Papathanasiou Vasillis, Gerakaris Vasilis, Fakiris Elias, Orfanidis Sotiris, Papatheodorou Georgios, Kosmidou Maria, Georgiou Nikos, Drakopoulou Paraskevi, Loukaidi Vasiliki (2022). Seagrass Meadows in The Greek Seas. SEANOE. https://doi.org/10.17882/87740.

Papadatou, E., Butlin, R.K. and Altringham, J.D., 2008. Identification of bat species in Greece from their echolocation calls. Acta Chiropterologica, 10(1), pp.127-143.

Papazacharias, A., 1991. Ecological study of the macrofauna of the mobile substrate of the infralittoral and circalittoral zone of the Gulf of Kavala. Doctoral Dissertation, Aristotle University of Thessaloniki, Department of Biology, Section of Zoology, Thessaloniki.

Parker, L. M., Ross, P. M., O'Connor, W. A., Pörtner, H. O., Scanes, E., and Wright, J. M. (2013). Predicting the response of molluscs to the impact of ocean acidification. Biology 2, 651–692. doi: 10.3390/biology2020651

Portolou, D., Bourdakis, S., Vlachos, H., Kastritis, Th. & Dimalexis, T. (eds.), 2009. Important Bird Areas of Greece: Priority Sites for Biodiversity Conservation. Hellenic Ornithological Society, Athens.

Riebesell, U., Aberle-Malzahn, N., Achterberg, E. P., Algueró-Muñiz, M., Alvarez-Fernandez, S., Arístegui, J., et al. (2018). Toxic algal bloom induced by ocean acidification disrupts the pelagic food web. Nat. Clim. Change 8, 1082–1086.

Sommer, U., Paul, C., and Moustaka-Gouni, M. (2015). Warming and ocean acidification effects on phytoplankton: from species shifts to size shifts within species in a mesocosm experiment. PLoS One 10: e0125239. doi: 10.1371/journal.pone.0125239

Tait, K., Stahl, H., Taylor, P., and Widdicombe, S. (2015). Rapid response of the active microbial community to CO2 exposure from a controlled sub-seabed CO2 leak in Ardmucknish Bay (Oban, Scotland). Int. J. Greenhouse Gas Control 38, 171–181.

Tasker, M.L., Jones, P.H., DiNAlon, T.J. and B.F. Blake, 1984. Counting seabirds at sea from ships: a review of methods employed and a suggestion for a standardised approach. Auk 101: 567- 577.

Turrell WR, Berx B, Bresnan E, León P, Rouse S, Webster L, Walsham P, Wilson J and Wright P (2022) A Review of National Monitoring Requirements to Support Offshore Carbon Capture and Storage. Front. Mar. Sci. 9:838309. doi: 10.3389/fmars.2022.838309

Wells, M. L., Trainer, V. L., Smayda, T. J., Karlson, B. S., Trick, C. G., Kudela, R. M., et al. (2015). Harmful algal blooms and climate change: learning from the past and present to forecast the future. Harmful Algae 49, 68–93. doi: 10.1016/j.hal.2015.07.009

Wijsman, J. W. M., Troost, K., Fang, J., and Roncarati, A. (2019). "Global production of marine bivalves. Trends and challenges," in Goods and Services of Marine Bivalves, eds Ø Strand, J. G. Ferreira, and J. K. Petersen (Cham: Springer), 7–26.

8. Study Team

Constantinos Nikolopoulos. MSc Environmental Engineer, Head of Environmental Department at LDK Consultants S.A.

Eleni Avramidi, MSc Environmental Engineer. Researcher in the Department of Marine Biology, University of Aberdeen

Jakob Fric, Physicist, Ornithologist

Margarita Tzali, MSc Environmental Engineer

Stratis Bourdakis, Forester, Ornithologist

Panagiotis Dendrinos, PhD Biologist, Marine Mammal Specialist

Kimon Koemtzopoulos, MSc Biologist, Marine Mammal Specialist

Odysseas Paxinos, MSc Oceanographer, Marine Mammal Specialist

Dimitris Bousbouras, Biologist, Amphibian, Reptile and Terrestrial Mammal Specialist

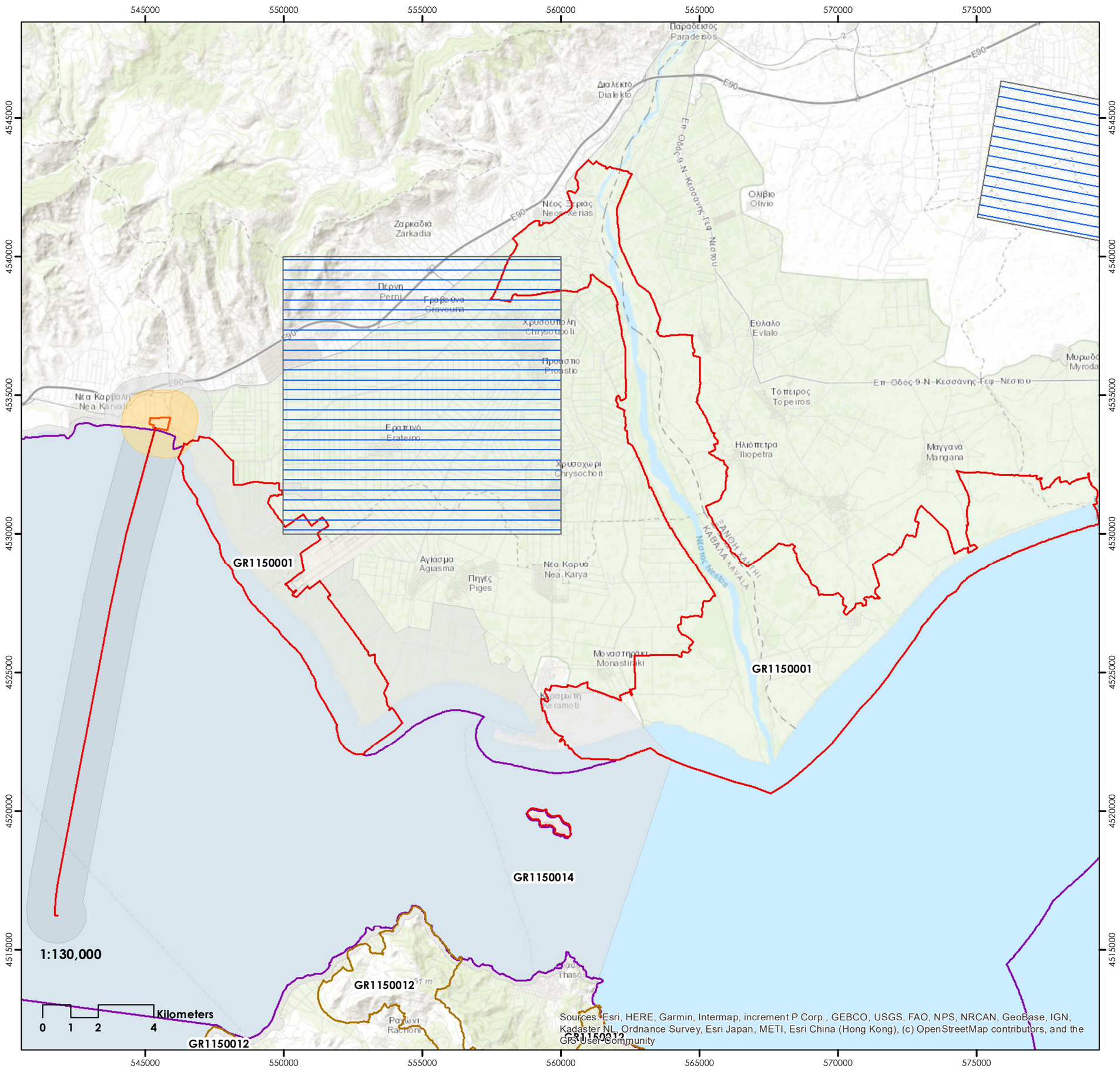
Elena Ioannaki, MSc Environmental Engineer

Petros Vitalis, Environmentalist

9. Annexes

9.1 Annex I: Map Documentaion

Spreading (distribution) maps of the species that constitute protected objects of the relevant Natura 2000 areas.



Υπόμνημα

Κατανομή ορνιθοπανίδας (ΕΡΓΟ: Εποπτεία και αξιολόγηση της ορνιθοπανίδας στην περιοχή αρμοδιότητας ου Φορέα Διαχείρισης Δέλτα Νέστου - Βιστωνίδας - Ισμαρίδας)

Coturnix coturnix

Κατανομή αναπαραγόμενων πουλιών (Πηγή: Άτλαντας Αναπαραγόμενων Πουλιών της Ελλαδας, Ελληνική Ορνιθολογική Εταιρεία)

Coturnix coturnix

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2

Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

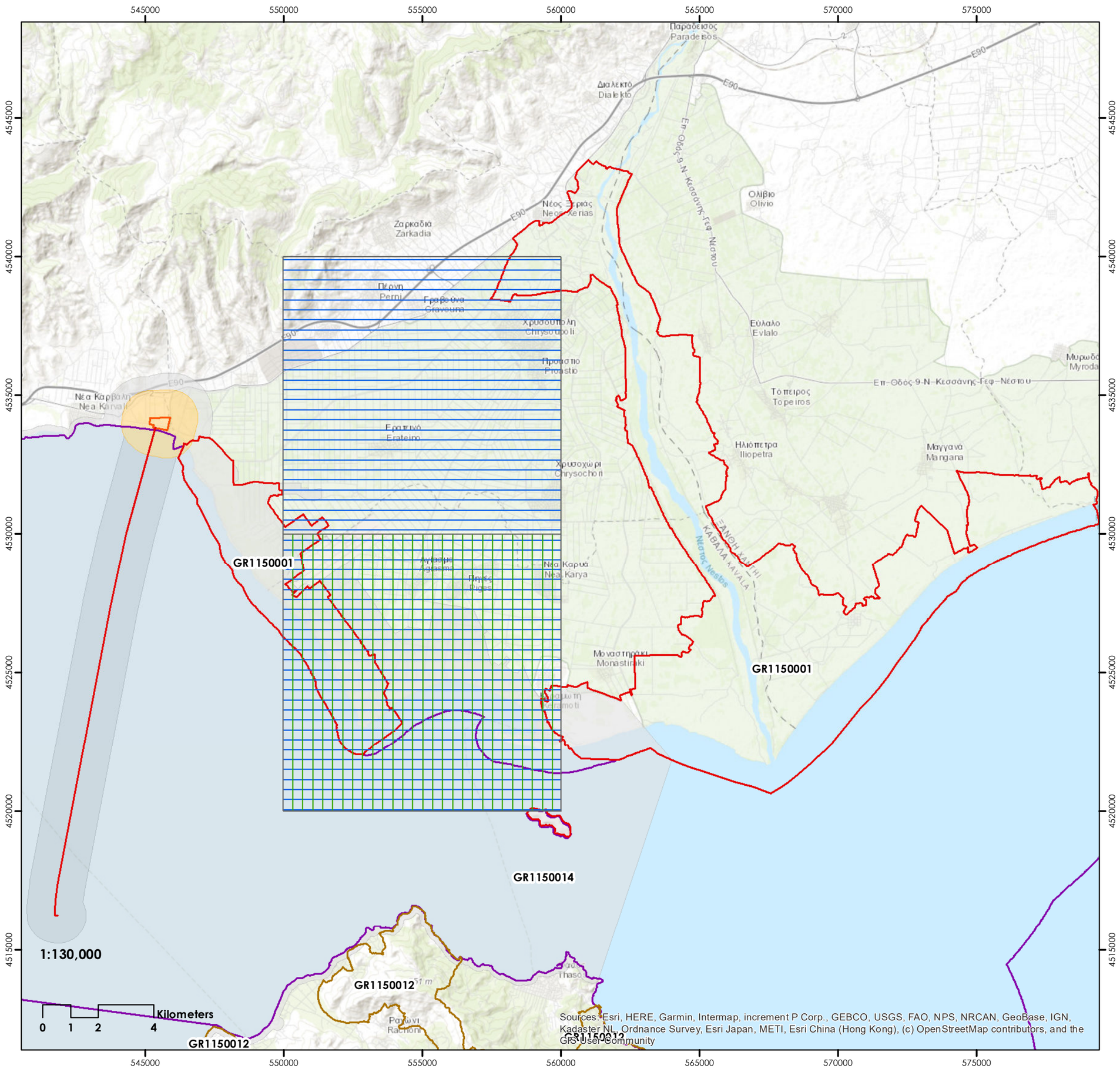
ΖΕΠ GR1150001

ΖΕΠ GR1150012

ΖΕΠ/ΕΖΔ GR1150014

Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2

Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ



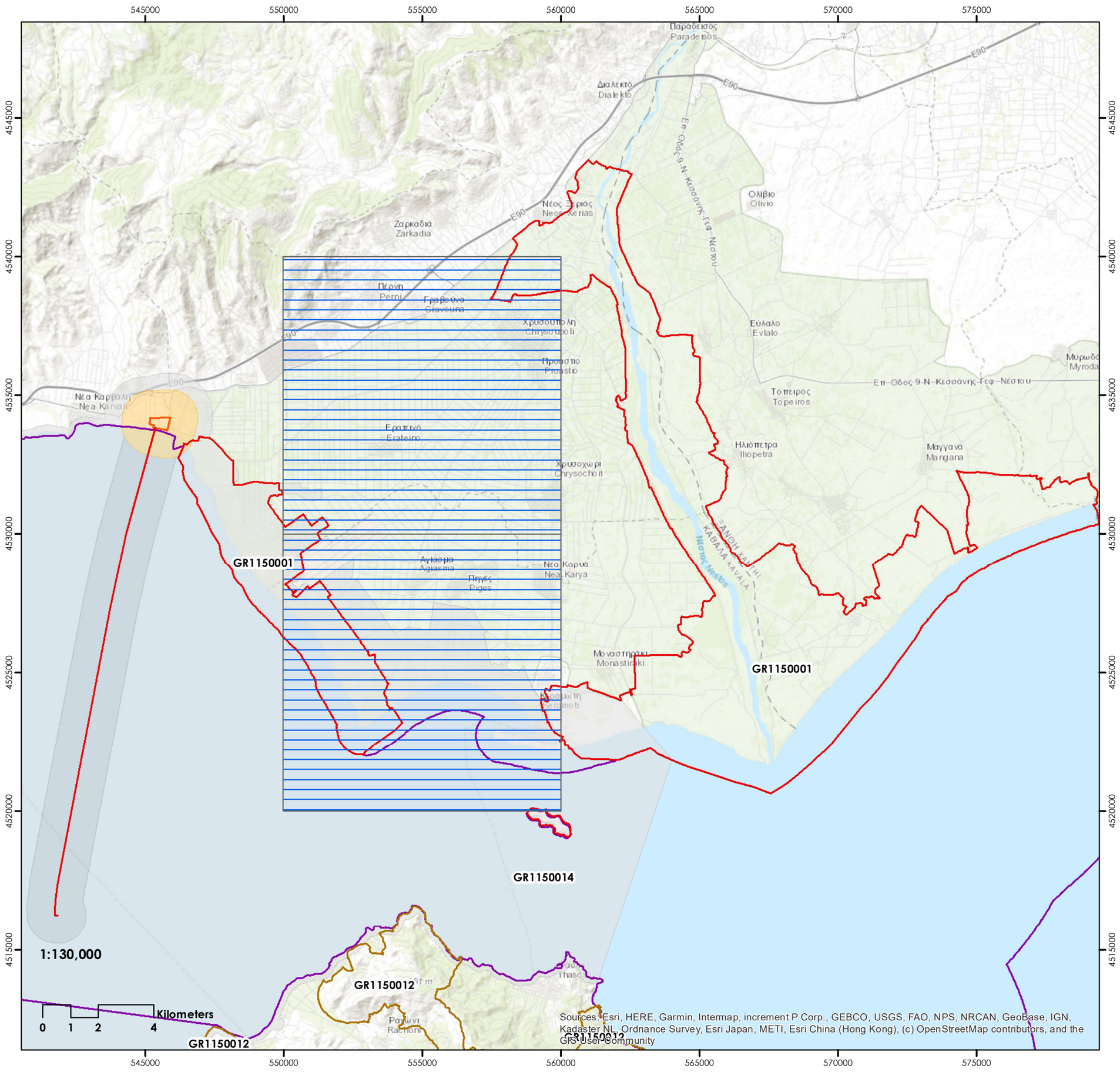
Υπόμνημα

Κατανομή αναπαραγόμενων πουλιών (Πηγή: Άτλαντας Αναπαραγόμενων Πουλιών της Ελλαδας, Ελληνική Ορνιθολογική Εταιρεία)

- ***Anas platyrhynchos***
- ***Cygnus olor***
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2
- Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

- ΖΕΠ GR1150001
- ΖΕΠ GR1150012
- ΖΕΠ/ΕΖΔ GR1150014
- Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
- Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ



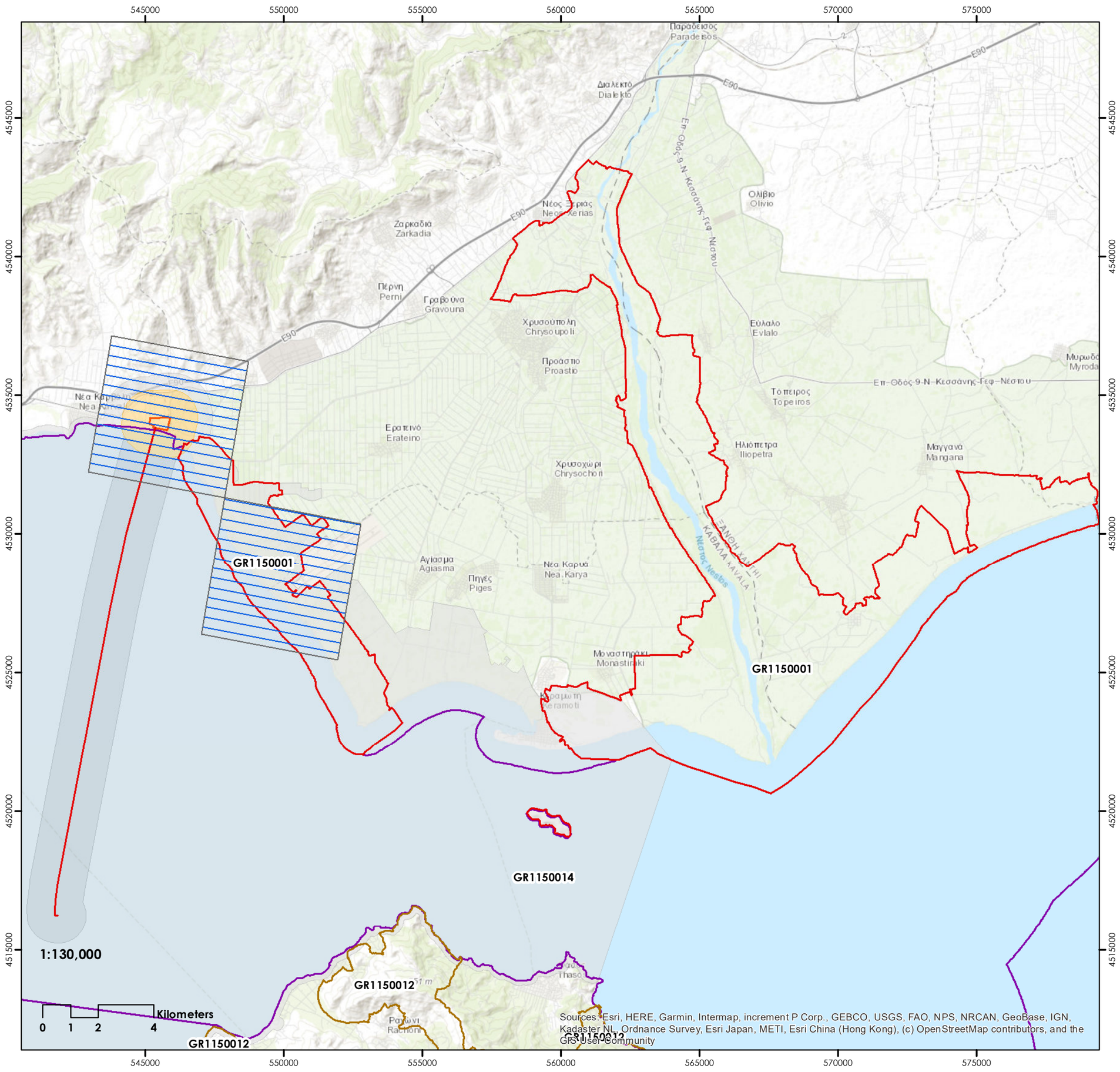
Υπόμνημα

Κατανομή αναπαραγόμενων πουλιών (Πηγή: Άτλαντας Αναπαραγόμενων Πουλιών της Ελλαδας, Ελληνική Ορνιθολογική Εταιρεία)

- ***Tadorna tadorna***
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2
- Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

- ΖΕΠ GR1150001
- ΖΕΠ GR1150012
- ΖΕΠ/ΕΖΔ GR1150014
- Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
- Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ



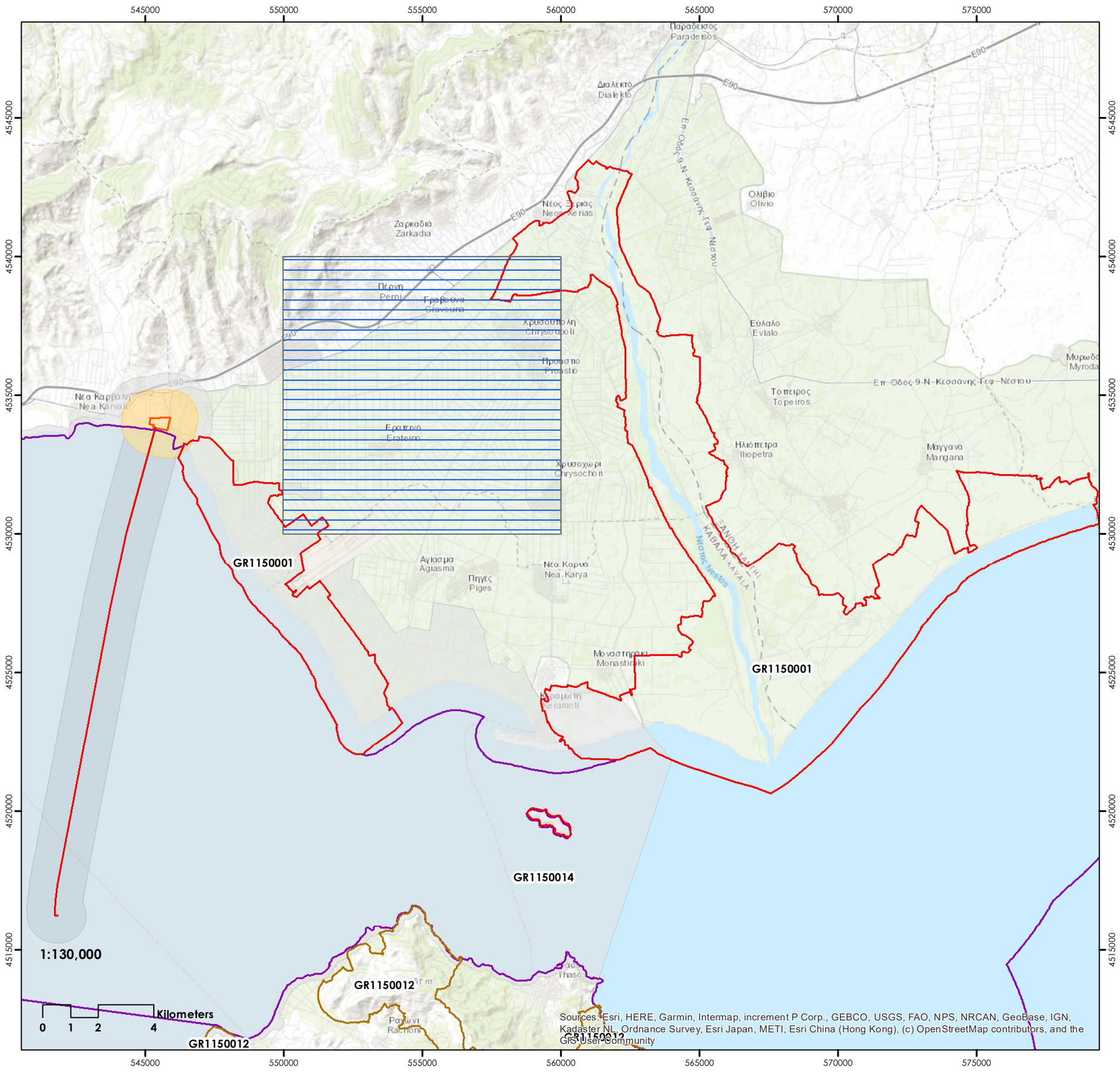
Υπόμνημα

Κατανομή ορνιθοπανίδας (ΕΡΓΟ: Εποπτεία και αξιολόγηση της ορνιθοπανίδας στην περιοχή αρμοδιότητας ου Φορέα Διαχείρισης Δέλτα Νέστου - Βιστωνίδας - Ισμαρίδας)

- ***Phoenicopterus roseus***
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2
- Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

- ΖΕΠ GR1150001
- ΖΕΠ GR1150012
- ΖΕΠ/ΕΖΔ GR1150014
- Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
- Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ



Υπόμνημα

Κατανομή αναπαραγόμενων πουλιών (Πηγή: Άτλαντας Αναπαραγόμενων Πουλιών της Ελλαδας, Ελληνική Ορνιθολογική Εταιρεία)

- ***Streptopelia turtur***

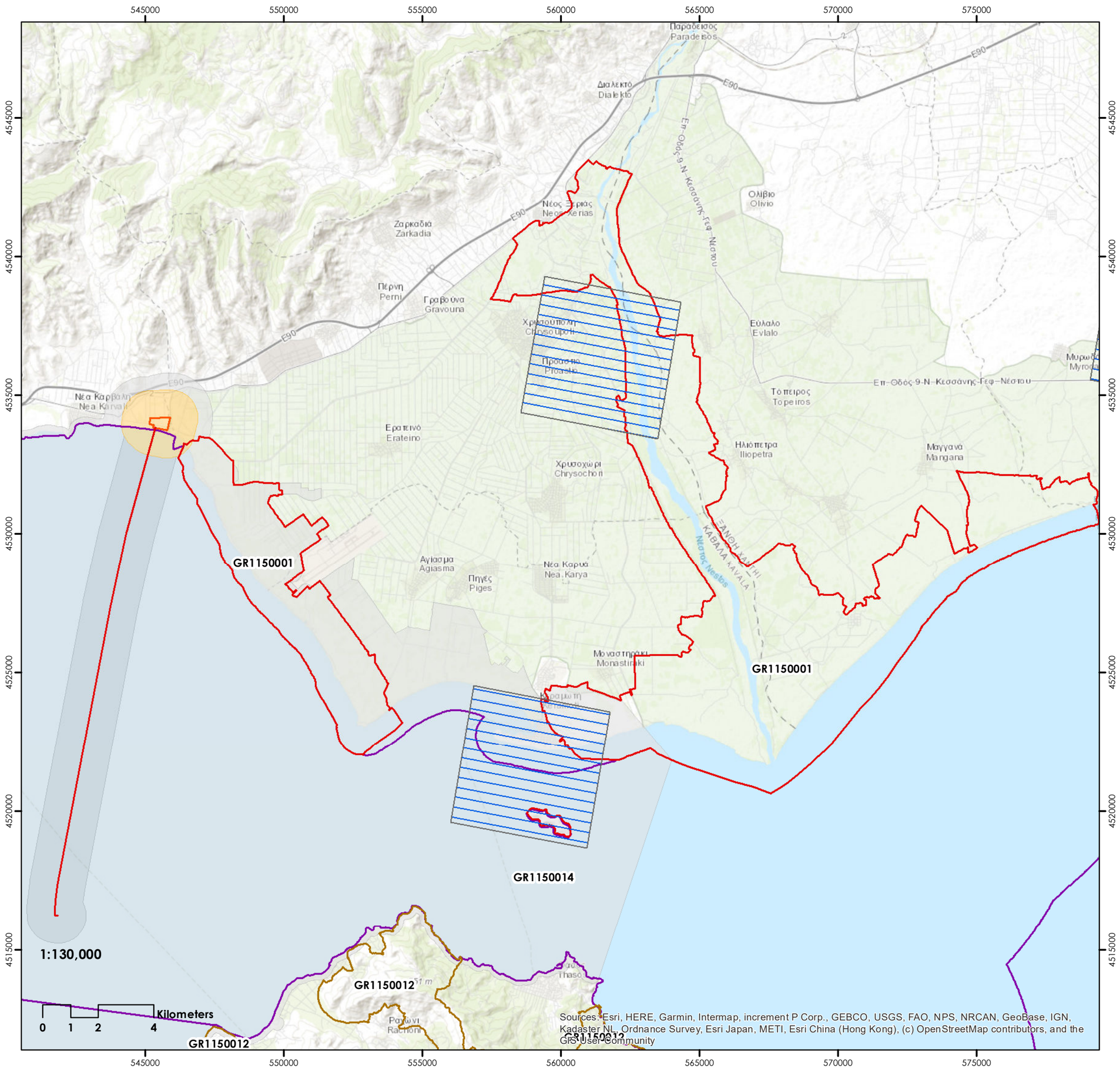
Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2

Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

- ΖΕΠ GR1150001
- ΖΕΠ GR1150012
- ΖΕΠ/ΕΖΔ GR1150014
- Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
- Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ



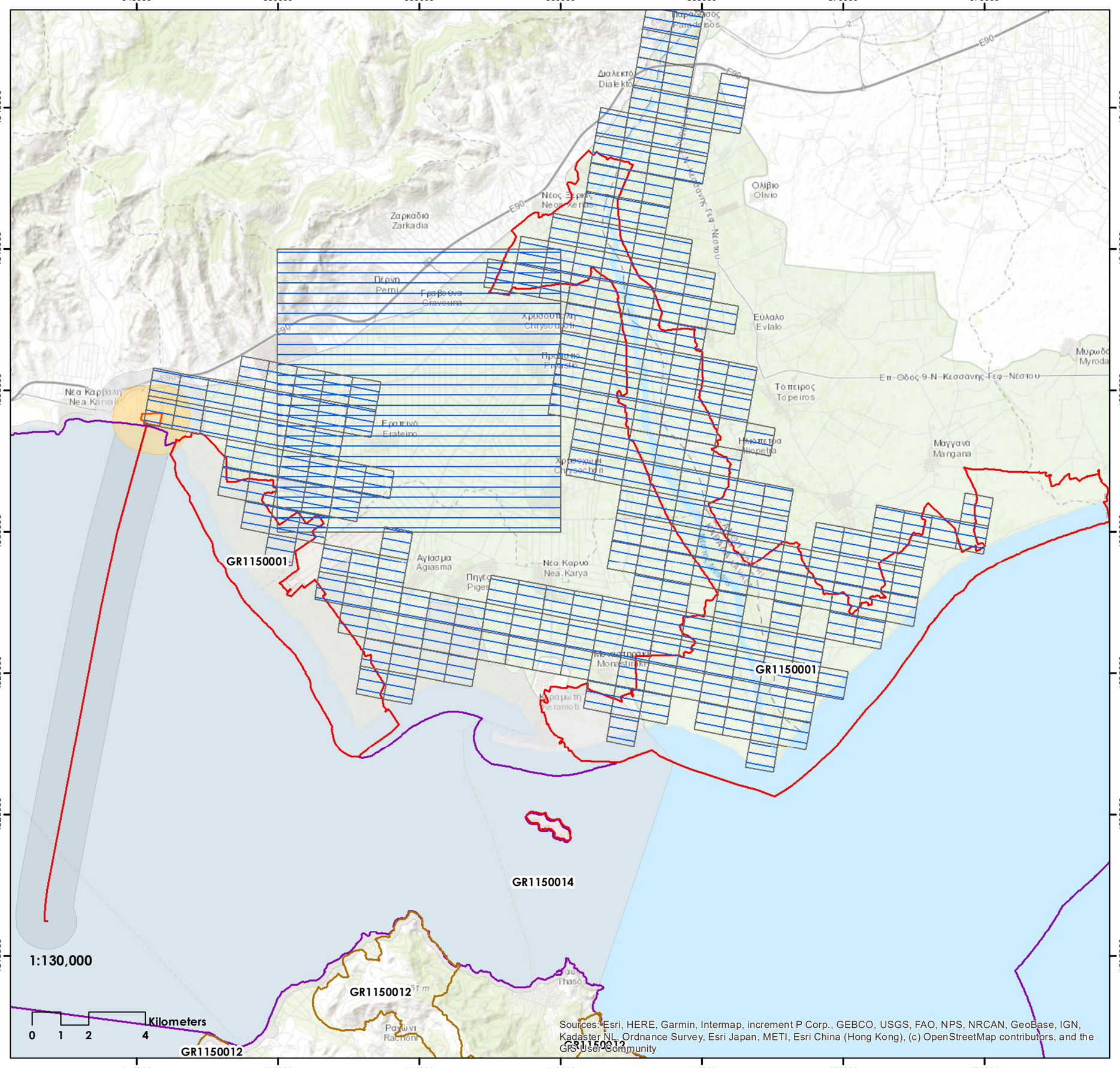
Υπόμνημα

Κατανομή ορνιθοπανίδας (ΕΡΓΟ: Εποπτεία και αξιολόγηση της ορνιθοπανίδας στην περιοχή αρμοδιότητας ου Φορέα Διαχείρισης Δέλτα Νέστου - Βιστωνίδας - Ισμαρίδας)

- ***Caprimulgus europaeus***
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2
- Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

- ΖΕΠ GR1150001
- ΖΕΠ GR1150012
- ΖΕΠ/ΕΖΔ GR1150014
- Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
- Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ



Υπόμνημα

Κατανομή ορνιθοπανίδας (ΕΡΓΟ: Εποπτεία και αξιολόγηση της ορνιθοπανίδας στην περιοχή αρμοδιότητας ου Φορέα Διαχείρισης Δέλτα Νέστου - Βιστωνίδας - Ισμαρίδας)

Apus apus

Κατανομή αναπαραγόμενων πουλιών (Πηγή: Άτλαντας Αναπαραγόμενων Πουλιών της Ελλαδας, Ελληνική Ορνιθολογική Εταιρεία)

Apus apus

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2

Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

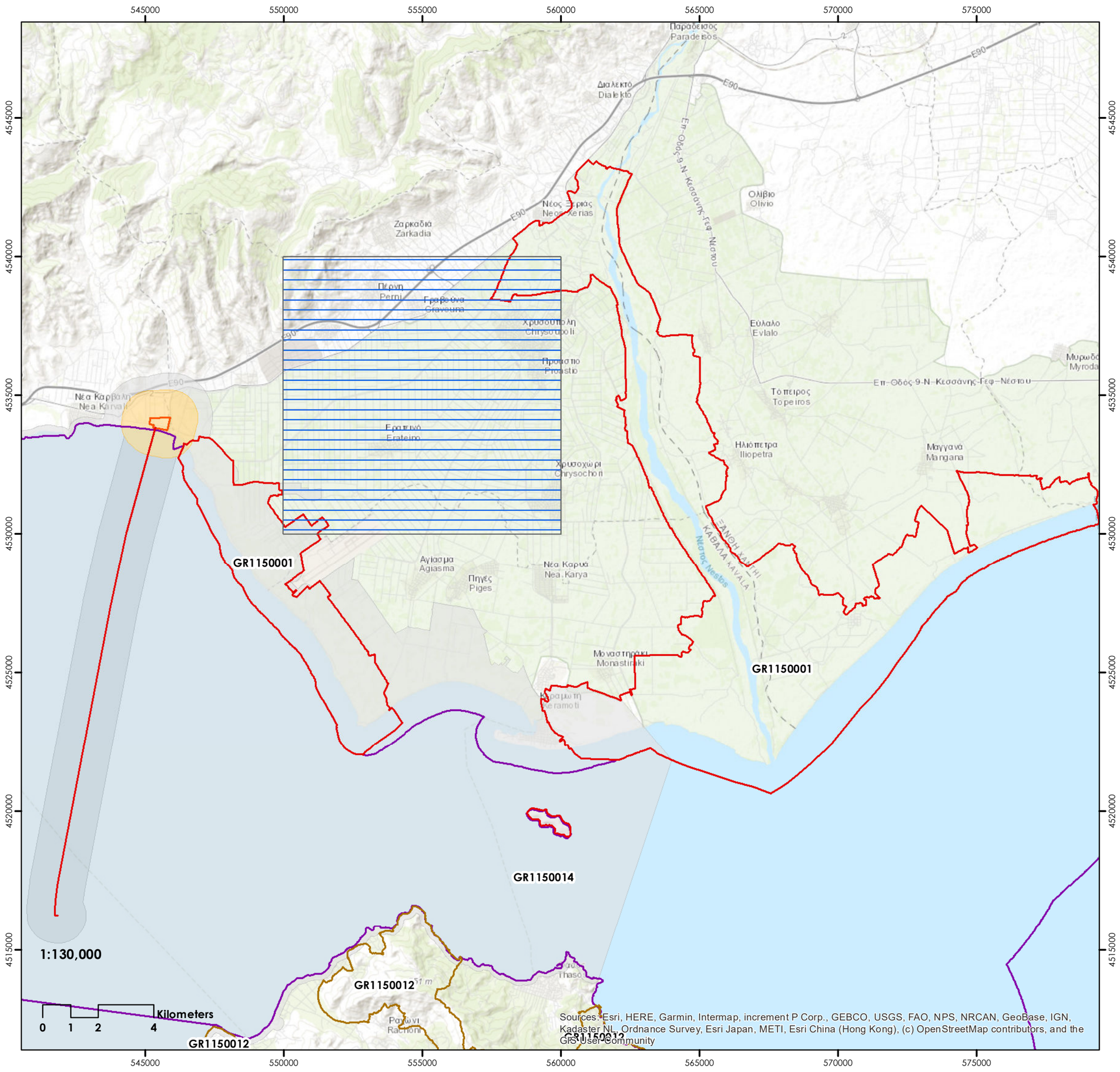
ΖΕΠ GR1150001

ΖΕΠ GR1150012

ΖΕΠ/ΕΖΔ GR1150014

Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2

Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ



Υπόμνημα

Κατανομή αναπαραγόμενων πουλιών (Πηγή: Άτλαντας Αναπαραγόμενων Πουλιών της Ελλαδας, Ελληνική Ορνιθολογική Εταιρεία)

- ***Cuculus canorus***

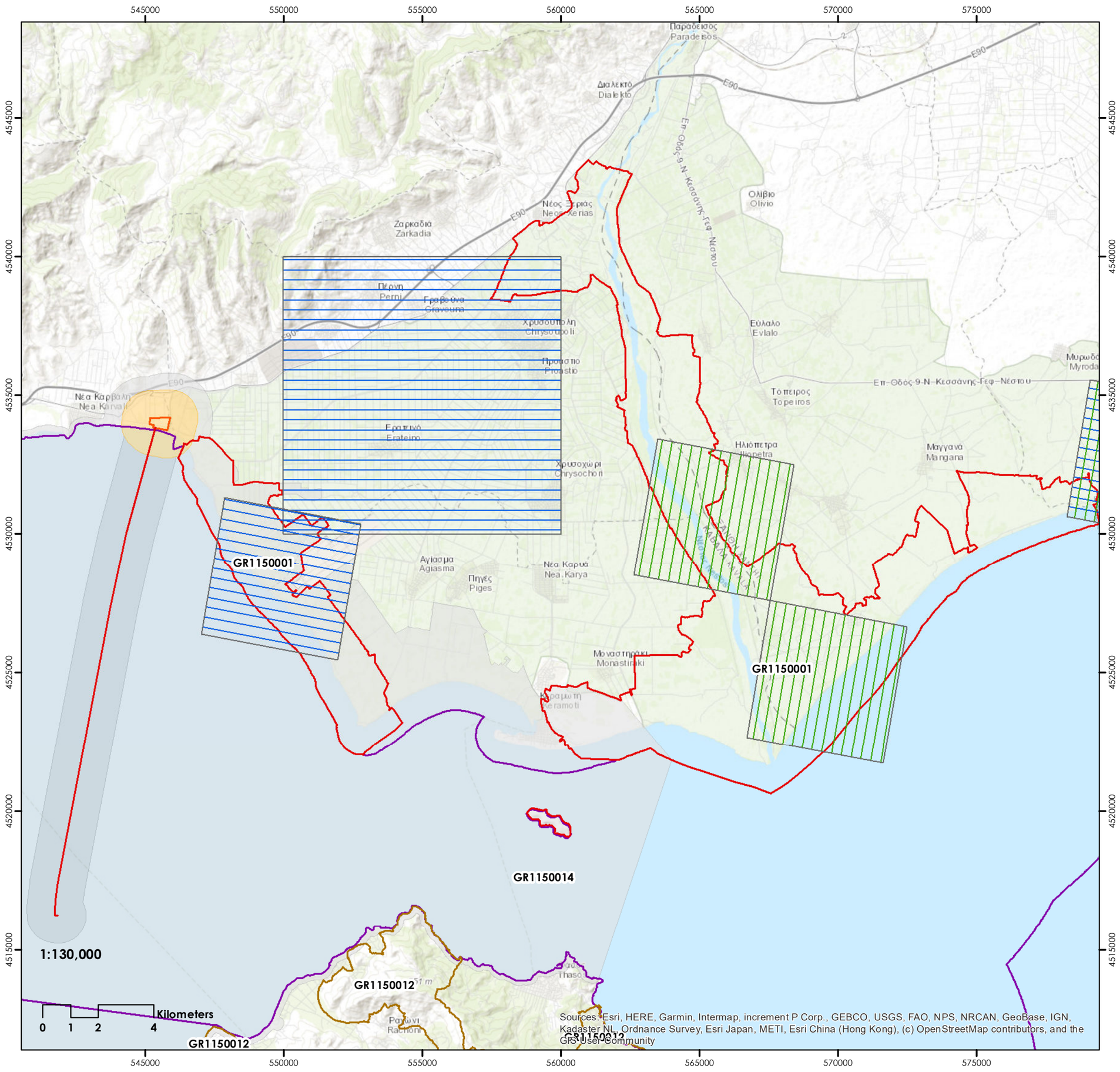
Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2

Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

- ΖΕΠ GR1150001
- ΖΕΠ GR1150012
- ΖΕΠ/ΕΖΔ GR1150014
- Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
- Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ



Υπόμνημα

Κατανομή ορνιθοπανίδας (ΕΡΓΟ: Εποπτεία και αξιολόγηση της ορνιθοπανίδας στην περιοχή αρμοδιότητας ου Φορέα Διαχείρισης Δέλτα Νέστου - Βιστωνίδας - Ισμαρίδας)

- *Fulica atra*
- *Gallinula chloropus*

Κατανομή αναπαραγόμενων πουλιών (Πηγή: Άτλαντας Αναπαραγόμενων Πουλιών της Ελλαδας, Ελληνική Ορνιθολογική Εταιρεία)

- *Fulica atra*
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2
- Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

- ΖΕΠ GR1150001
- ΖΕΠ GR1150012
- ΖΕΠ/ΕΖΔ GR1150014
- Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
- Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ

530000 535000 540000 545000 550000 555000 560000 565000 570000 575000

4540000 4535000 4530000 4525000 4520000 4515000 4510000 4505000 4500000

Υπόμνημα

Κατανομή θαλασσοπουλιών (πηγή: Καστρίτης et al. 2023. Τελική αναφορά. Σ' Φάση του έργου «Δειγματοληψίες, αναλύσεις και σύνθεση δεδομένων για τον προσδιορισμό της Καλής Περιβαλλοντικής Κατάστασης (GES) του Περιγραφέα 1 της ΟΠΘΣ (βιοποικιλότητα)

Puffinus yelkouan

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2

Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

ΖΕΠ GR1150001

ΖΕΠ GR1150012

ΖΕΠ/ΕΖΔ GR1150014

Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2

Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ

GR1150001

GR1150001

GR1150014

GR1150012

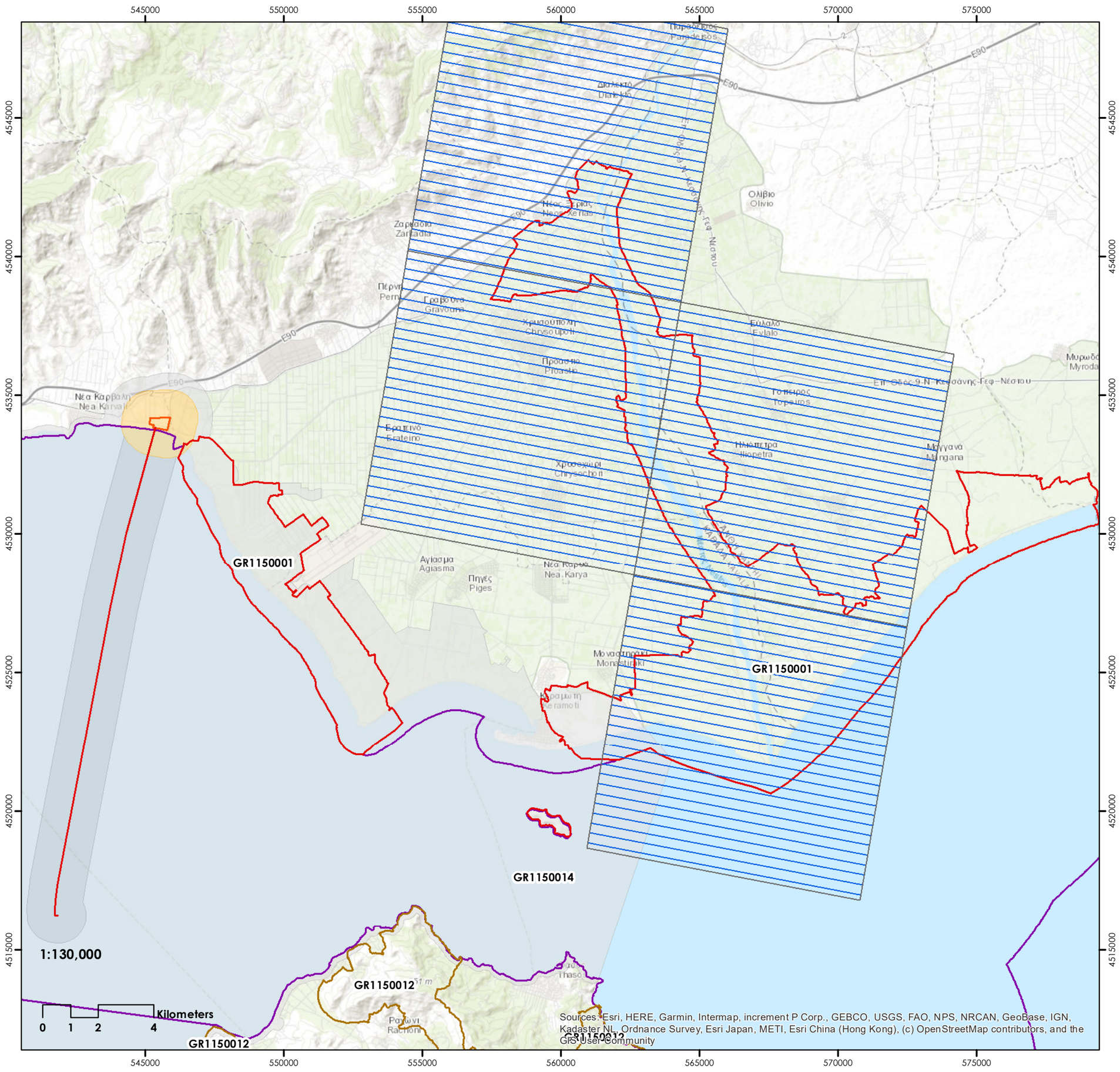
GR1150012

Φίλιπποι Filippoi
Κρυονέρι Kryoneri
Ζυγός Zygos
625 m
Χαλκερό Chalkero
Αμυγδαλεώνας Amygdaleonas
Νέα Καρβάλη Nea Karvali
Καβάλα Kavala
Αγία Φωτεινή Agia Fotini
Παλιό Palio
Κόλπος Καβάλας Kolpos Kavalas
Ζαρκαδία Zarkadia
Περνή Perni
Γραβούνα Gravouna
Χρυσούπολη Chrysoupoli
Νέος Σούλι Neo Souli
Προάστιο Proastio
Ερατεινό Erateino
Χρυσοχώρι Chrysochori
Αγίασμα Agiasma
Πηγές Piges
Νέα Καρυά Nea Karya
Μοναστηράκι Monastiraki
Ολίβιο Olivio
Εύλαλο Evlalo
Τόπειρος Topeiros
Ηλιόπετρα Iliopetra
Μαγγανά Mangana
Εθν. Οδός 9 Ν. Κεσσάνης-Εφ. Νέστου
Νέστος Nestos
ΔΙΩΡΥΓΑ ΚΑΒΑΛΑ ΚΑΒΑΛΑ
551 m
Ραψωνί Rapsoni
Πρίνος Prinos
Σκάλα Σωτήρος Skala Sotiros
404 m
Παρορεία Parorea
Χρυσή Αμμουδιά Chrysi Ammoudia
Ποτάμια Potamia
1172 m
Καλλιράχη Kallirachi
Θεολόγος Theologos
Σκάλα Μαρίων Skala Marion
Λιμενάρια Limenaria

1:170,000

0 1.25 2.5 5 Kilometers

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community



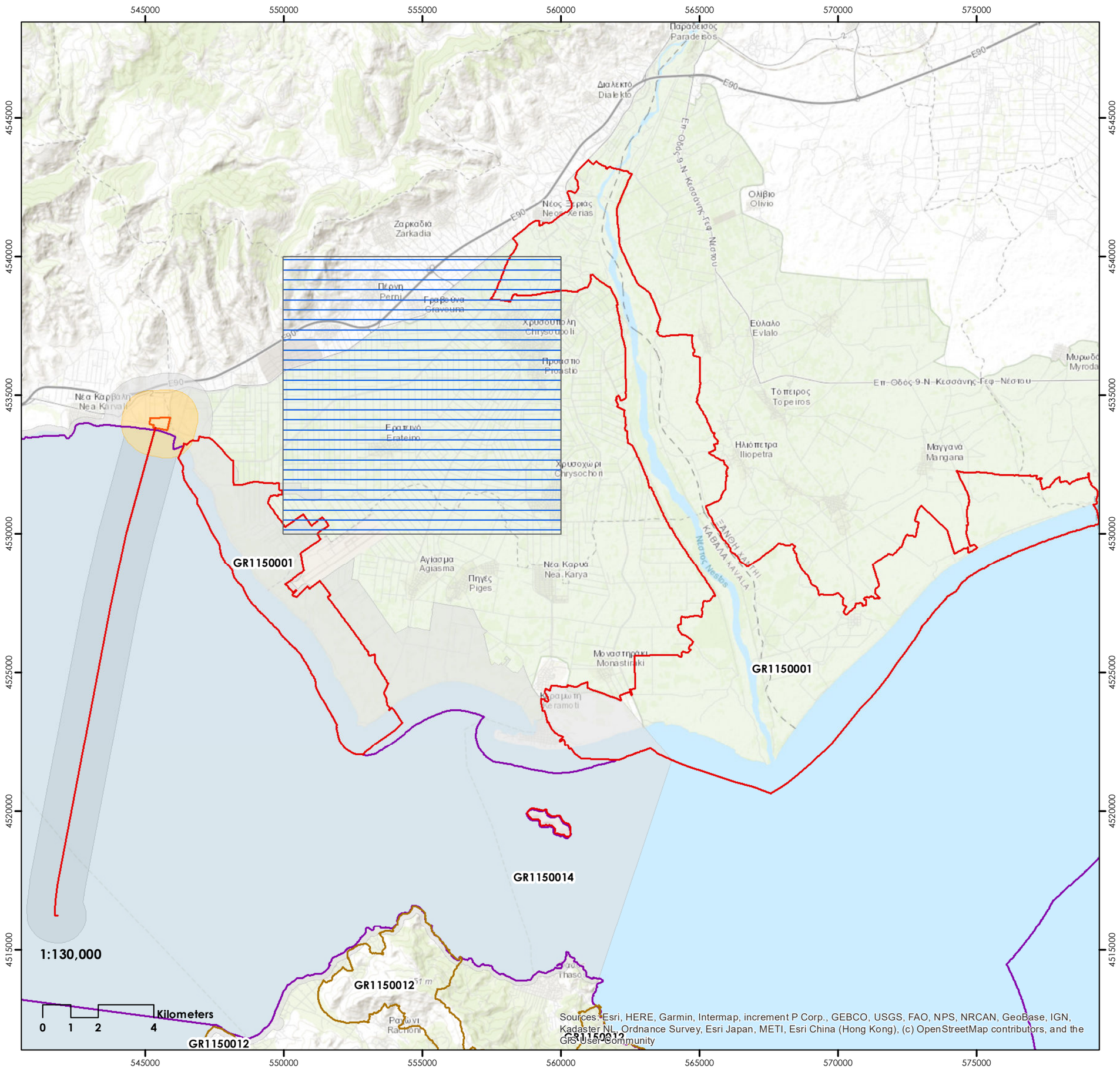
Υπόμνημα

Κατανομή ορνιθοπανίδας (ΕΡΓΟ: Εποπτεία και αξιολόγηση της ορνιθοπανίδας στην περιοχή αρμοδιότητας ου Φορέα Διαχείρισης Δέλτα Νέστου - Βιστωνίδας - Ισμαρίδας)

- ***Ciconia nigra***
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2
- Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

- ΖΕΠ GR1150001
- ΖΕΠ GR1150012
- ΖΕΠ/ΕΖΔ GR1150014
- Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
- Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ



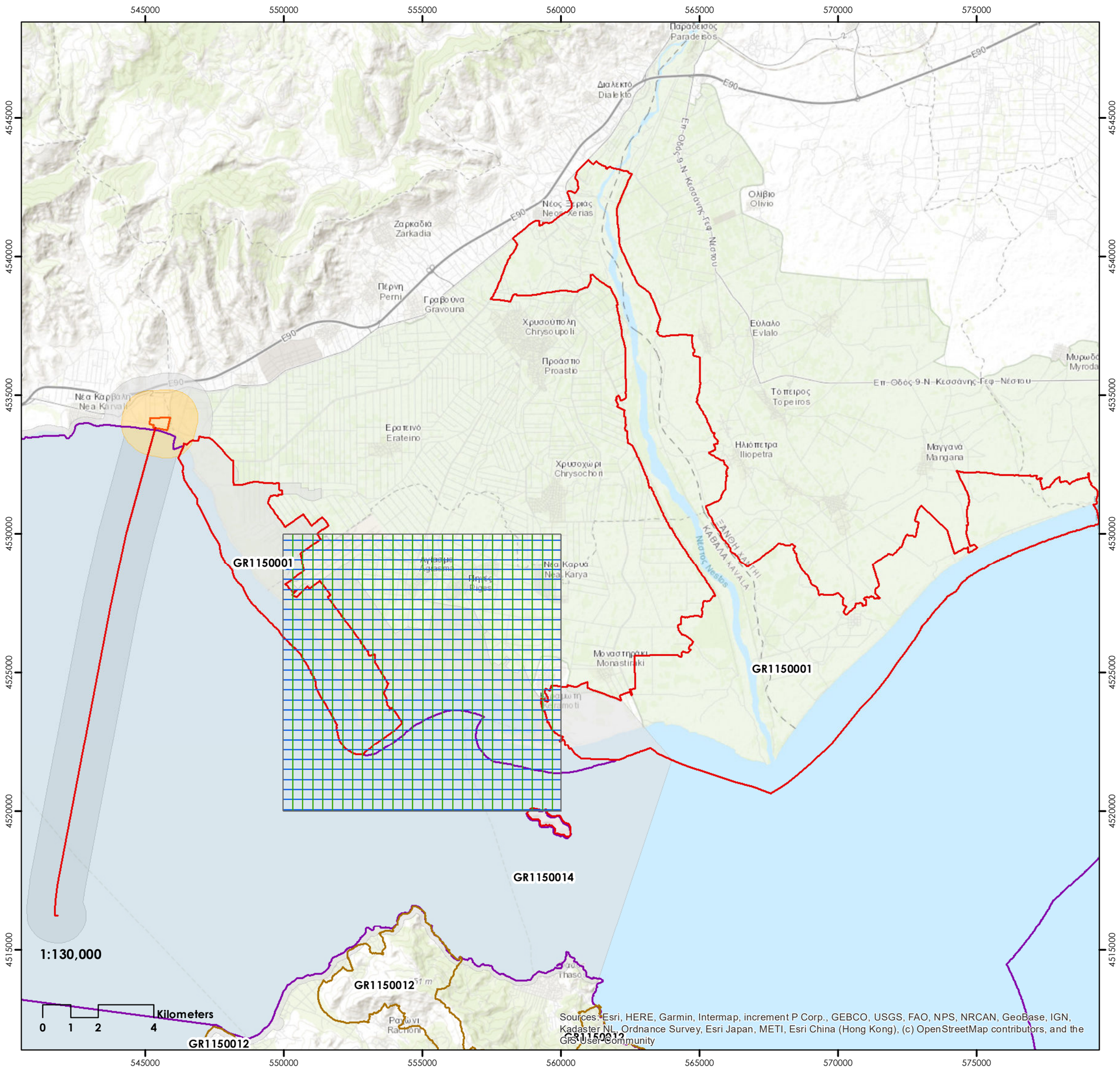
Υπόμνημα

Κατανομή αναπαραγόμενων πουλιών (Πηγή: Άτλαντας Αναπαραγόμενων Πουλιών της Ελλαδας, Ελληνική Ορνιθολογική Εταιρεία)

- ***Plegadis falcinellus***
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2
- Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

- ΖΕΠ GR1150001
- ΖΕΠ GR1150012
- ΖΕΠ/ΕΖΔ GR1150014
- Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
- Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ



Υπόμνημα

Κατανομή αναπαραγόμενων πουλιών (Πηγή: Άτλαντας Αναπαραγόμενων Πουλιών της Ελλαδας, Ελληνική Ορνιθολογική Εταιρεία)

- ***Ixobrychus minutus***
- ***Nycticorax nycticorax***

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2

Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

- ΖΕΠ GR1150001
- ΖΕΠ GR1150012
- ΖΕΠ/ΕΖΔ GR1150014
- Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
- Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ

Υπόμνημα

Κατανομή αναπαραγόμενων πουλιών (Πηγή: Άτλαντας Αναπαραγόμενων Πουλιών της Ελλαδας, Ελληνική Ορνιθολογική Εταιρεία)

- ***Ardea cinerea***
- ***Ardea purpurea***
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2
- Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

- ΖΕΠ GR1150001
- ΖΕΠ GR1150012
- ΖΕΠ/ΕΖΔ GR1150014
- Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
- Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ

GR1150001

GR1150001

GR1150014

GR1150012

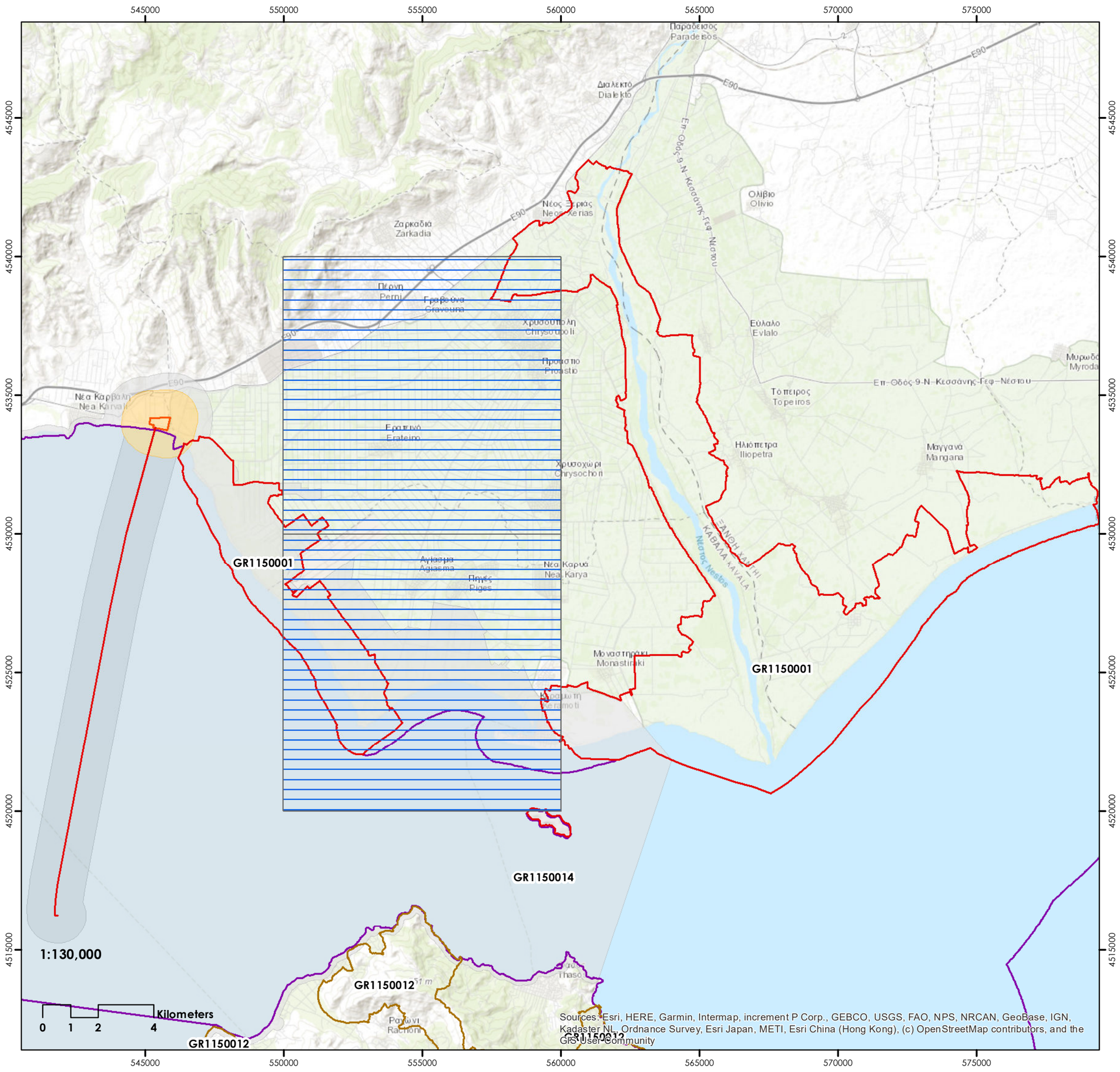
GR1150012

1:130,000

Kilometers

0 1 2 4

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community



Υπόμνημα

Κατανομή αναπαραγόμενων πουλιών (Πηγή: Άτλαντας Αναπαραγόμενων Πουλιών της Ελλαδας, Ελληνική Ορνιθολογική Εταιρεία)

- ***Egretta garzetta***
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2
- Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

- ΖΕΠ GR1150001
- ΖΕΠ GR1150012
- ΖΕΠ/ΕΖΔ GR1150014
- Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
- Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ

525000 530000 535000 540000 545000 550000 555000 560000 565000 570000 575000

4535000 4530000 4525000 4520000 4515000 4510000 4505000 4500000 4495000 4490000 4485000

GR1150001

GR1150001

GR1150014

GR1150012

GR1150012

1:190,000

0 1.5 3 6 Kilometers

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Υπόμνημα

Κατανομή ορνιθοπανίδας (ΕΡΓΟ: Εποπτεία και αξιολόγηση της ορνιθοπανίδας στην περιοχή αρμοδιότητας ου Φορέα Διαχείρισης Δέλτα Νέστου - Βιστωνίδας - Ισμαρίδας)

Phalacrocorax aristotelis desmarestii

Κατανομή θαλασσοπουλιών (πηγή: Καστρίτης et al. 2023. Τελική αναφορά. Σ' Φάση του έργου «Δειγματοληψίες, αναλύσεις και σύνθεση δεδομένων για τον προσδιορισμό της Καλής Περιβαλλοντικής Κατάστασης (GES) του Περιγραφέα 1 της ΟΠΘΣ (βιοποικιλότητα)

Phalacrocorax aristotelis desmarestii

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2

Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

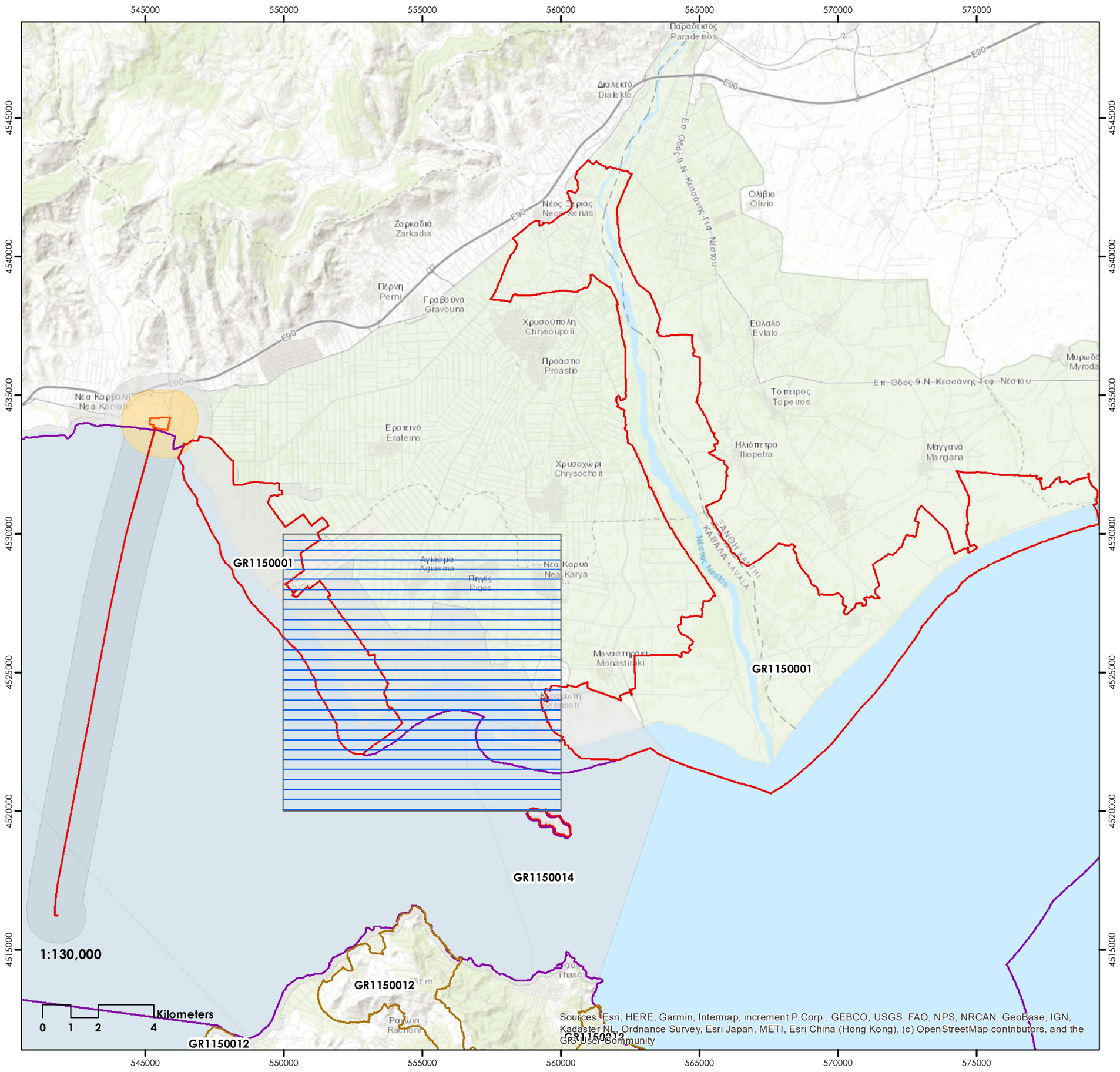
ΖΕΠ GR1150001

ΖΕΠ GR1150012

ΖΕΠ/ΕΖΔ GR1150014

Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2

Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ



Υπόμνημα

Κατανομή αναπαραγόμενων πουλιών (Πηγή: Άτλαντας Αναπαραγόμενων Πουλιών της Ελλαδας, Ελληνική Ορνιθολογική Εταιρεία)

- ***Phalacrocorax carbo sinensis***
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2
- Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

- ΖΕΠ GR1150001
- ΖΕΠ GR1150012
- ΖΕΠ/ΕΖΔ GR1150014
- Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
- Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ

Υπόμνημα

Κατανομή αναπαραγόμενων πουλιών (Πηγή: Άτλαντας Αναπαραγόμενων Πουλιών της Ελλαδας, Ελληνική Ορνιθολογική Εταιρεία)

- ***Burhinus oedicnemus***
- ***Glareola pratincola***
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2
- Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

- ΖΕΠ GR1150001
- ΖΕΠ GR1150012
- ΖΕΠ/ΕΖΔ GR1150014
- Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
- Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ

GR1150001

GR1150001

GR1150014

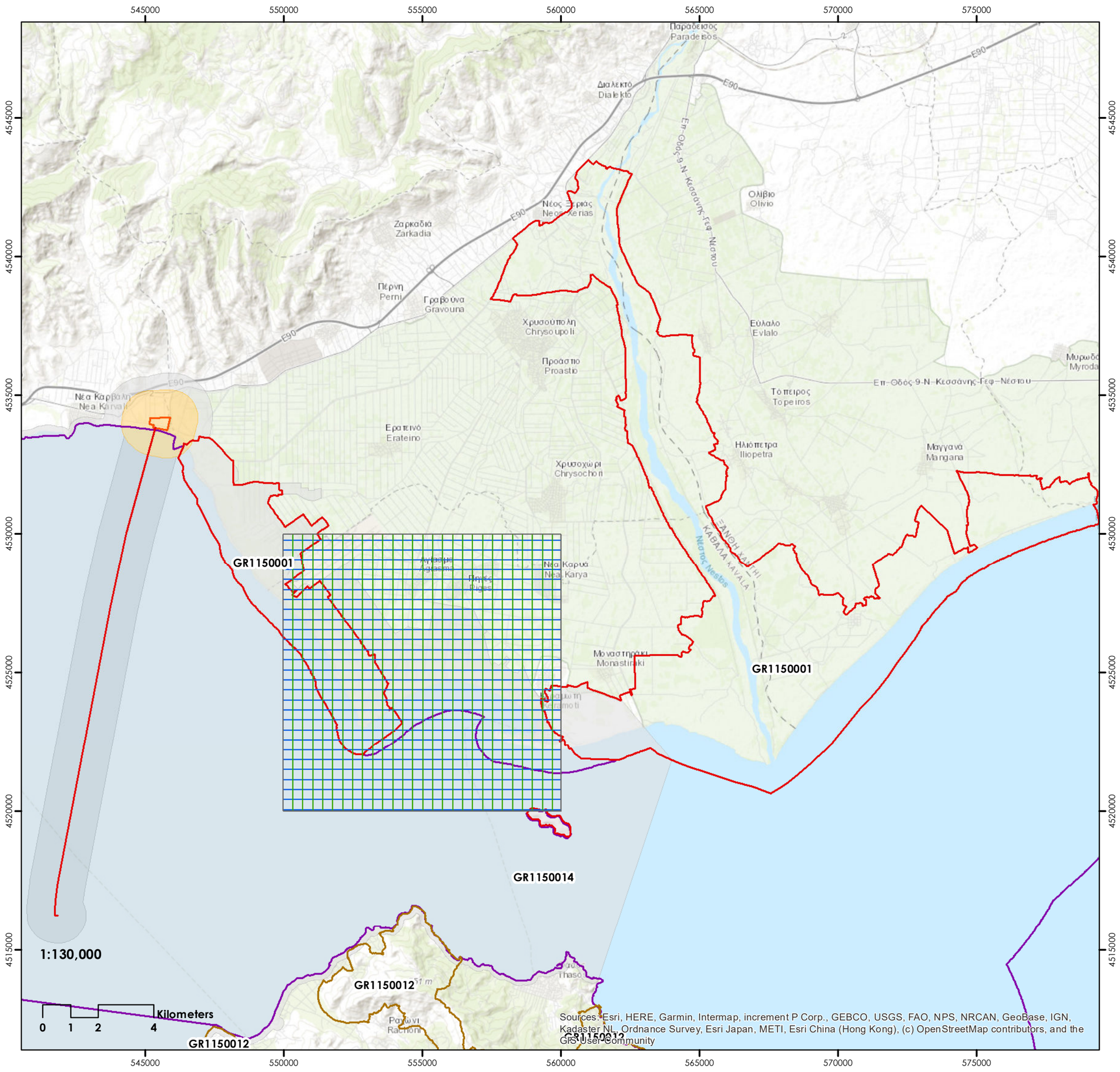
GR1150012

GR1150012

1:130,000

0 1 2 4 Kilometers

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community



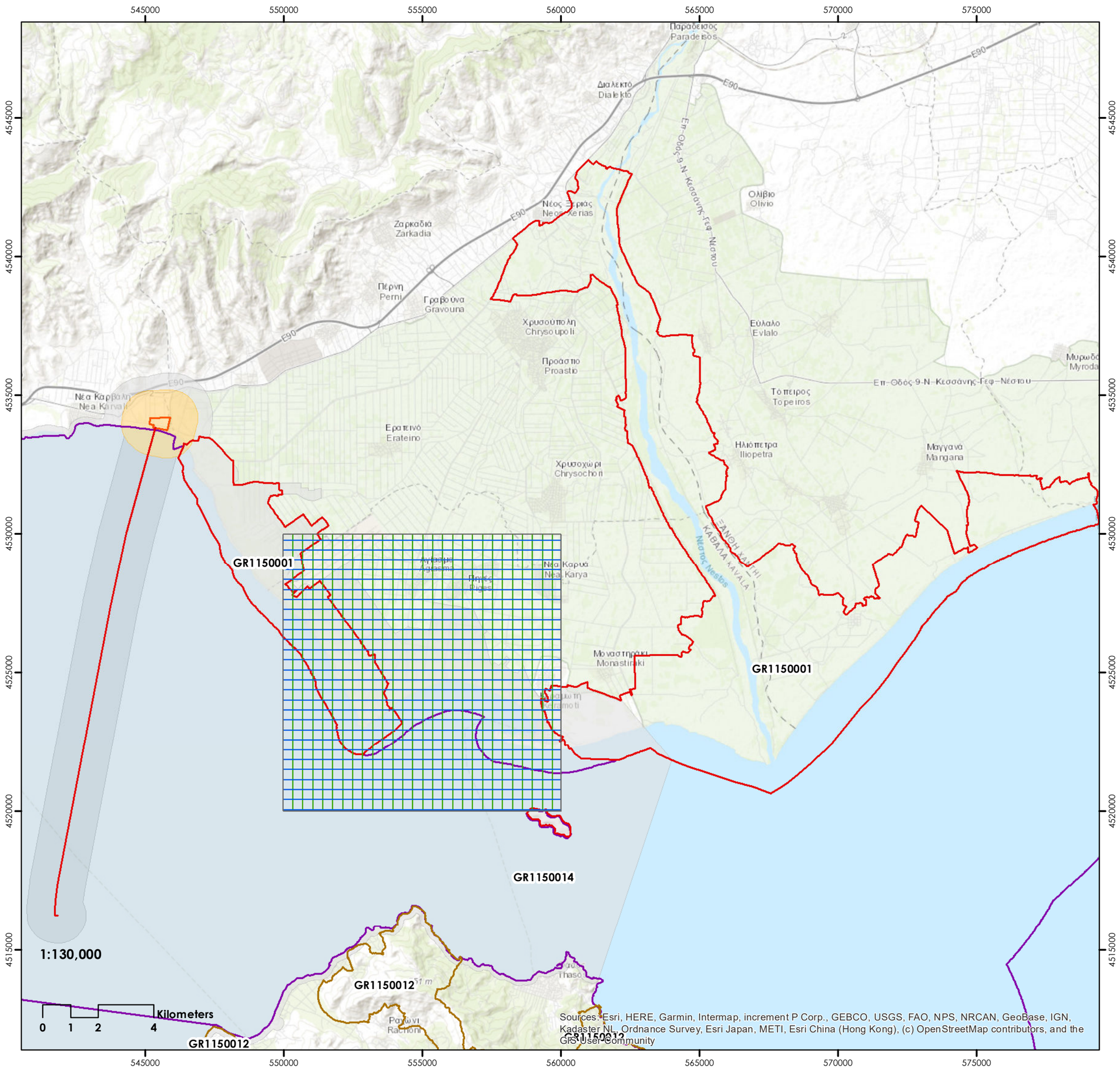
Υπόμνημα

Κατανομή αναπαραγόμενων πουλιών (Πηγή: Άτλαντας Αναπαραγόμενων Πουλιών της Ελλαδας, Ελληνική Ορνιθολογική Εταιρεία)

- ***Haematopus ostralegus***
- ***Himantopus himantopus***
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2
- Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

- ΖΕΠ GR1150001
- ΖΕΠ GR1150012
- ΖΕΠ/ΕΖΔ GR1150014
- Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
- Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ



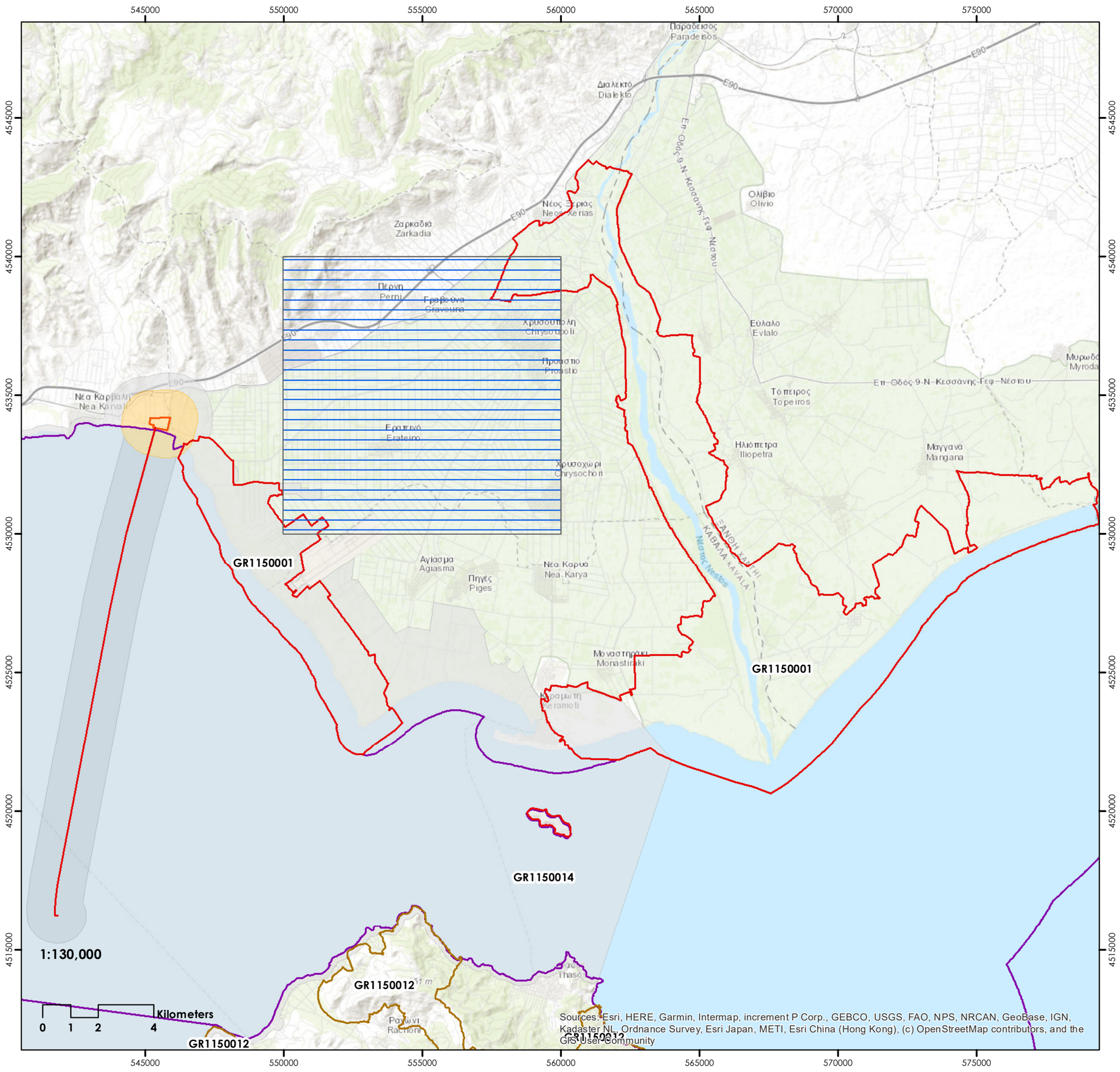
Υπόμνημα

Κατανομή αναπαραγόμενων πουλιών (Πηγή: Άτλαντας Αναπαραγόμενων Πουλιών της Ελλαδας, Ελληνική Ορνιθολογική Εταιρεία)

- ***Tringa totanus***
- ***Vanellus spinosus***
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2
- Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

- ΖΕΠ GR1150001
- ΖΕΠ GR1150012
- ΖΕΠ/ΕΖΔ GR1150014
- Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
- Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ



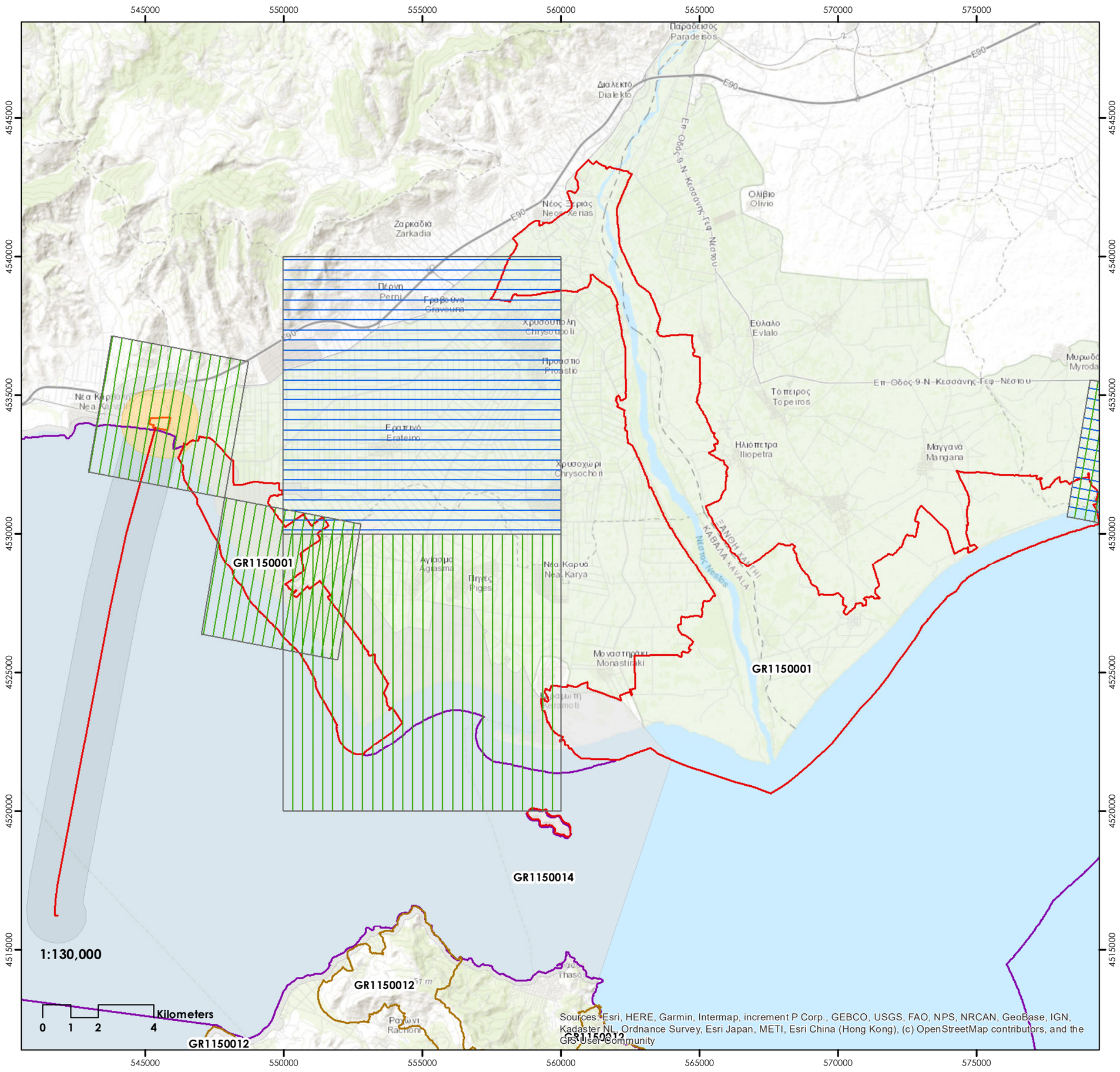
Υπόμνημα

Κατανομή αναπαραγόμενων πουλιών (Πηγή: Άτλαντας Αναπαραγόμενων Πουλιών της Ελλαδας, Ελληνική Ορνιθολογική Εταιρεία)

- ***Larus melanocephalus***
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2
- Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

- ΖΕΠ GR1150001
- ΖΕΠ GR1150012
- ΖΕΠ/ΕΖΔ GR1150014
- Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
- Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ



Υπόμνημα

Κατανομή ορνιθοπανίδας (ΕΡΓΟ: Εποπτεία και αξιολόγηση της ορνιθοπανίδας στην περιοχή αρμοδιότητας ου Φορέα Διαχείρισης Δέλτα Νέστου - Βιστωνίδας - Ισμαρίδας)

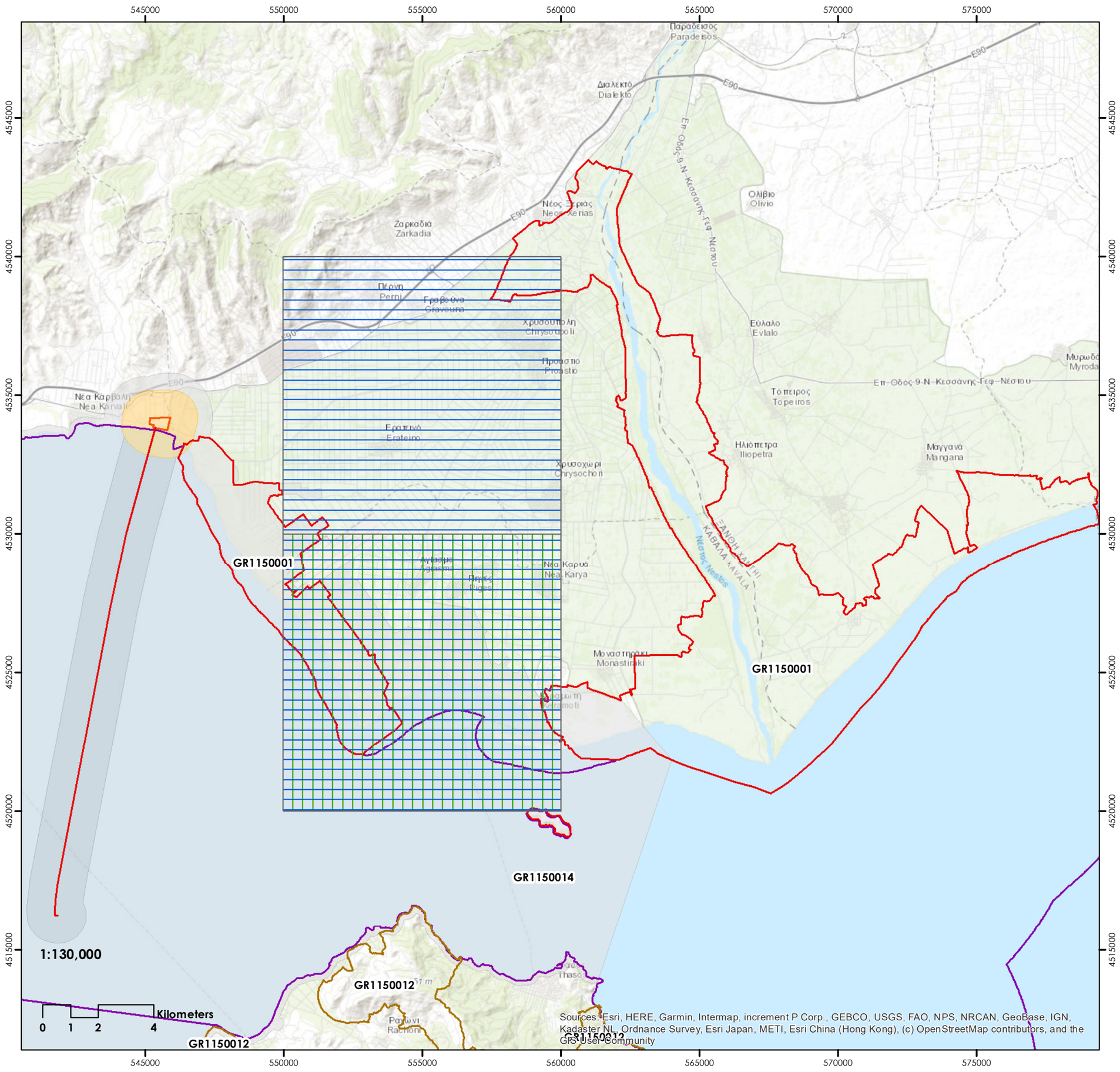
- ***Chlidonias hybrida***
- ***Chlidonias niger***

Κατανομή αναπαραγόμενων πουλιών (Πηγή: Άτλαντας Αναπαραγόμενων Πουλιών της Ελλαδας, Ελληνική Ορνιθολογική Εταιρεία)

- ***Chlidonias hybrida***
- ***Chlidonias niger***
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2
- Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

- ΖΕΠ GR1150001
- ΖΕΠ GR1150012
- ΖΕΠ/ΕΖΔ GR1150014
- Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
- Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ



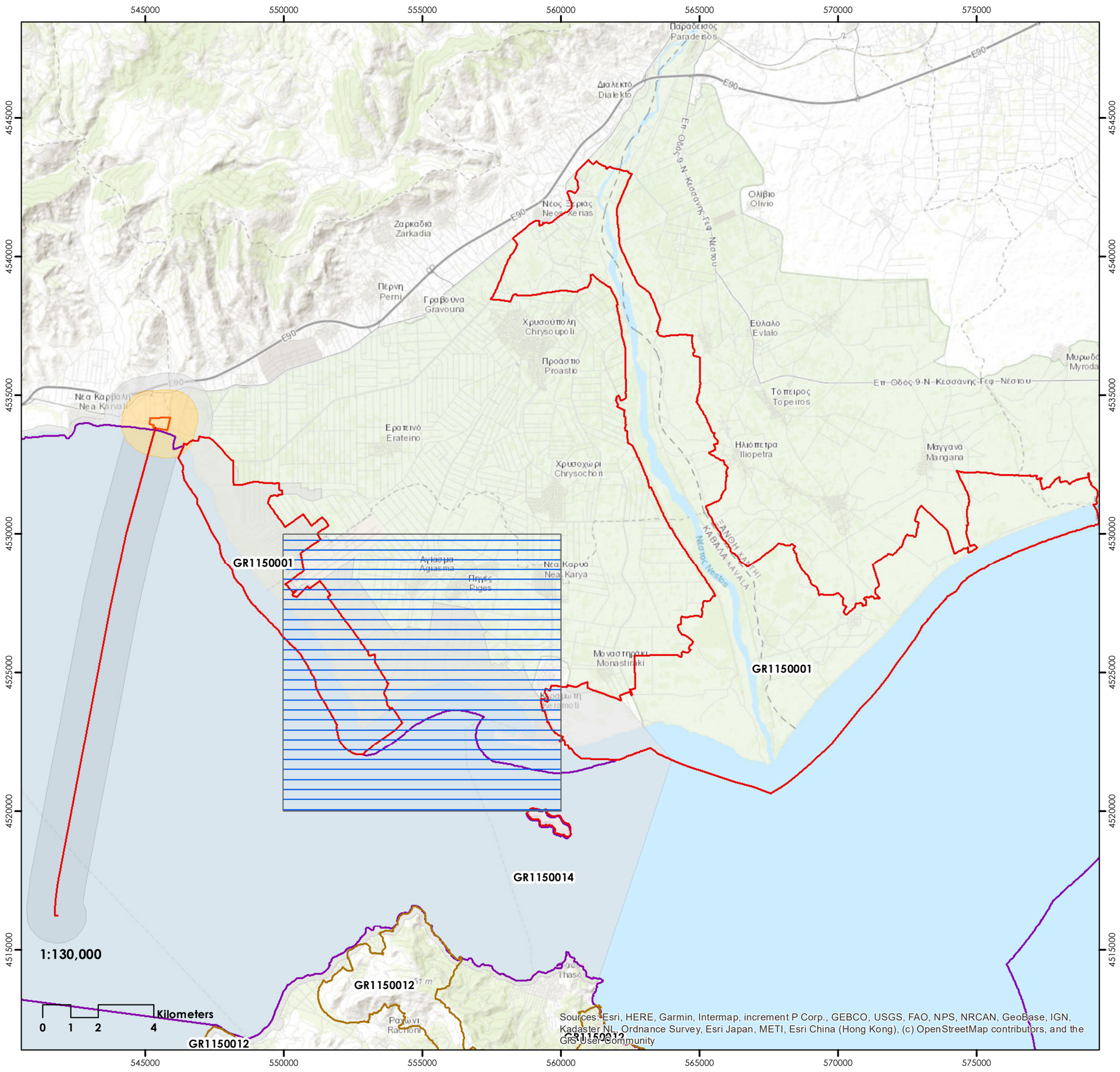
Υπόμνημα

Κατανομή αναπαραγόμενων πουλιών (Πηγή: Άτλαντας Αναπαραγόμενων Πουλιών της Ελλαδας, Ελληνική Ορνιθολογική Εταιρεία)

- ***Chlidonias leucopterus***
- ***Sterna hirundo***
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2
- Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

- ΖΕΠ GR1150001
- ΖΕΠ GR1150012
- ΖΕΠ/ΕΖΔ GR1150014
- Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
- Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ



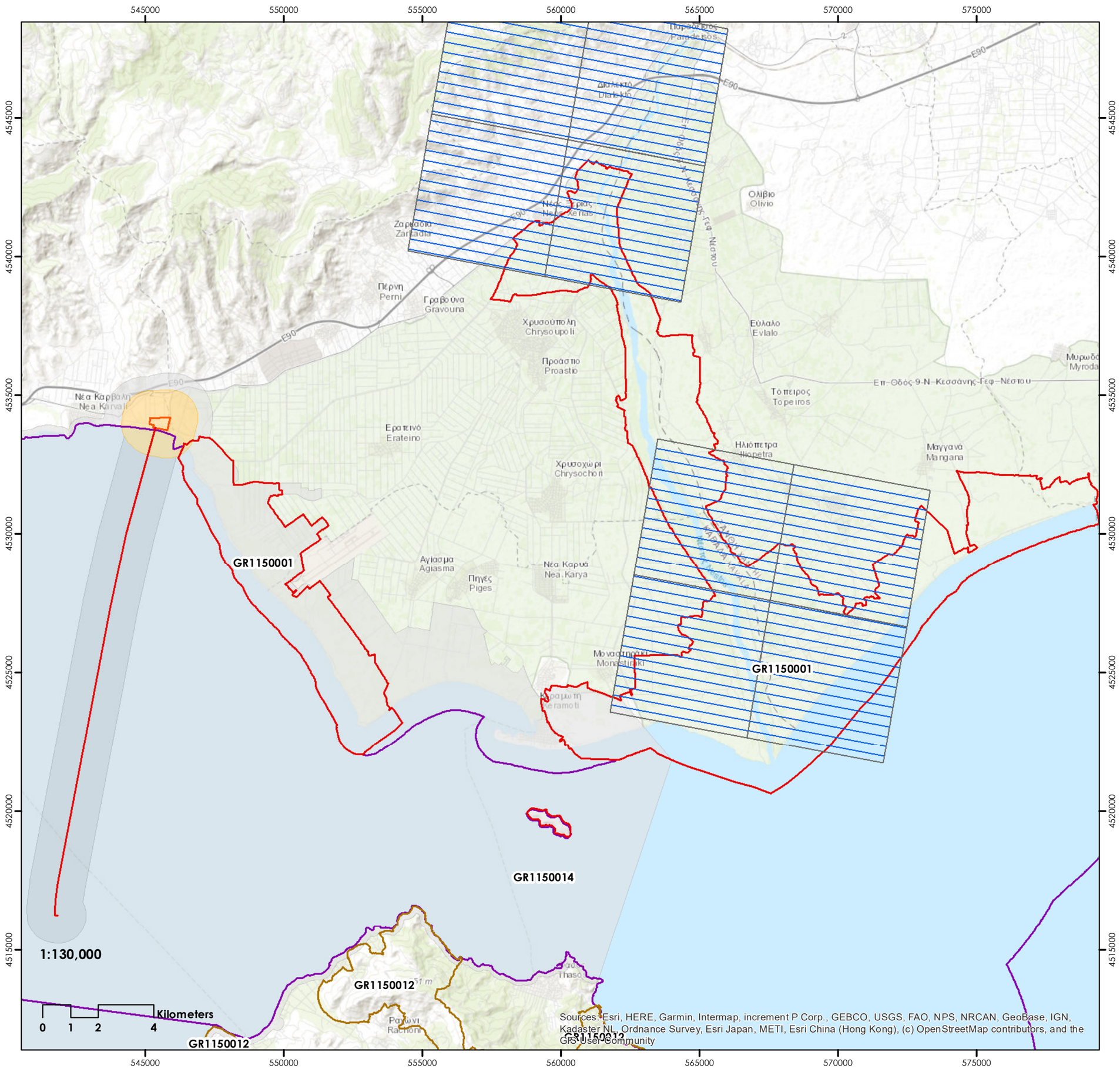
Υπόμνημα

Κατανομή αναπαραγόμενων πουλιών (Πηγή: Άτλαντας Αναπαραγόμενων Πουλιών της Ελλαδας, Ελληνική Ορνιθολογική Εταιρεία)

- ***Asio otus***
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2
- Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

- ΖΕΠ GR1150001
- ΖΕΠ GR1150012
- ΖΕΠ/ΕΖΔ GR1150014
- Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
- Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ



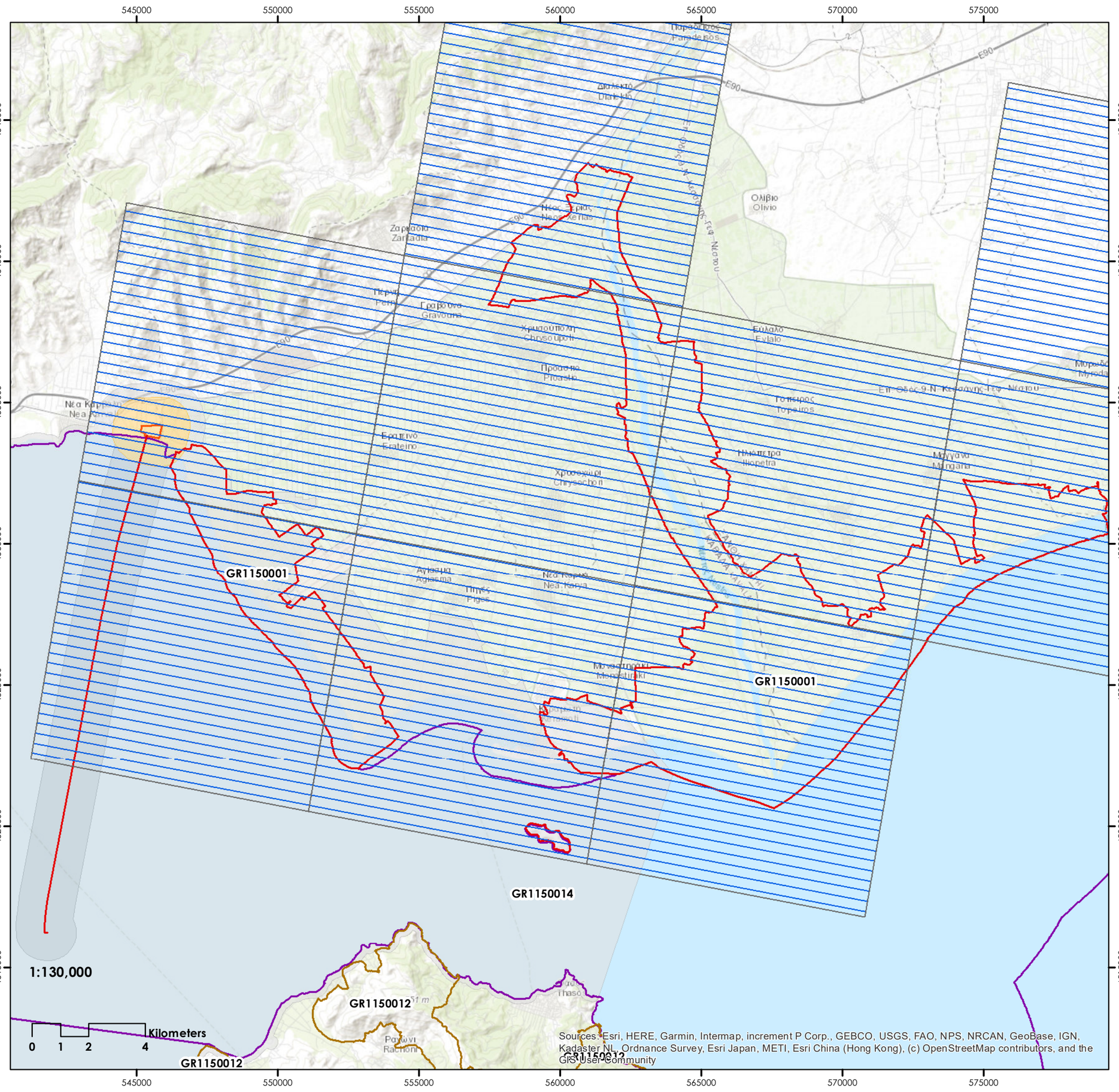
Υπόμνημα

Κατανομή ορνιθοπανίδας (ΕΡΓΟ: Εποπτεία και αξιολόγηση της ορνιθοπανίδας στην περιοχή αρμοδιότητας ου Φορέα Διαχείρισης Δέλτα Νέστου - Βιστωνίδας - Ισμαρίδας)

- ***Pernis apivorus***
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2
- Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

- ΖΕΠ GR1150001
- ΖΕΠ GR1150012
- ΖΕΠ/ΕΖΔ GR1150014
- Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
- Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ



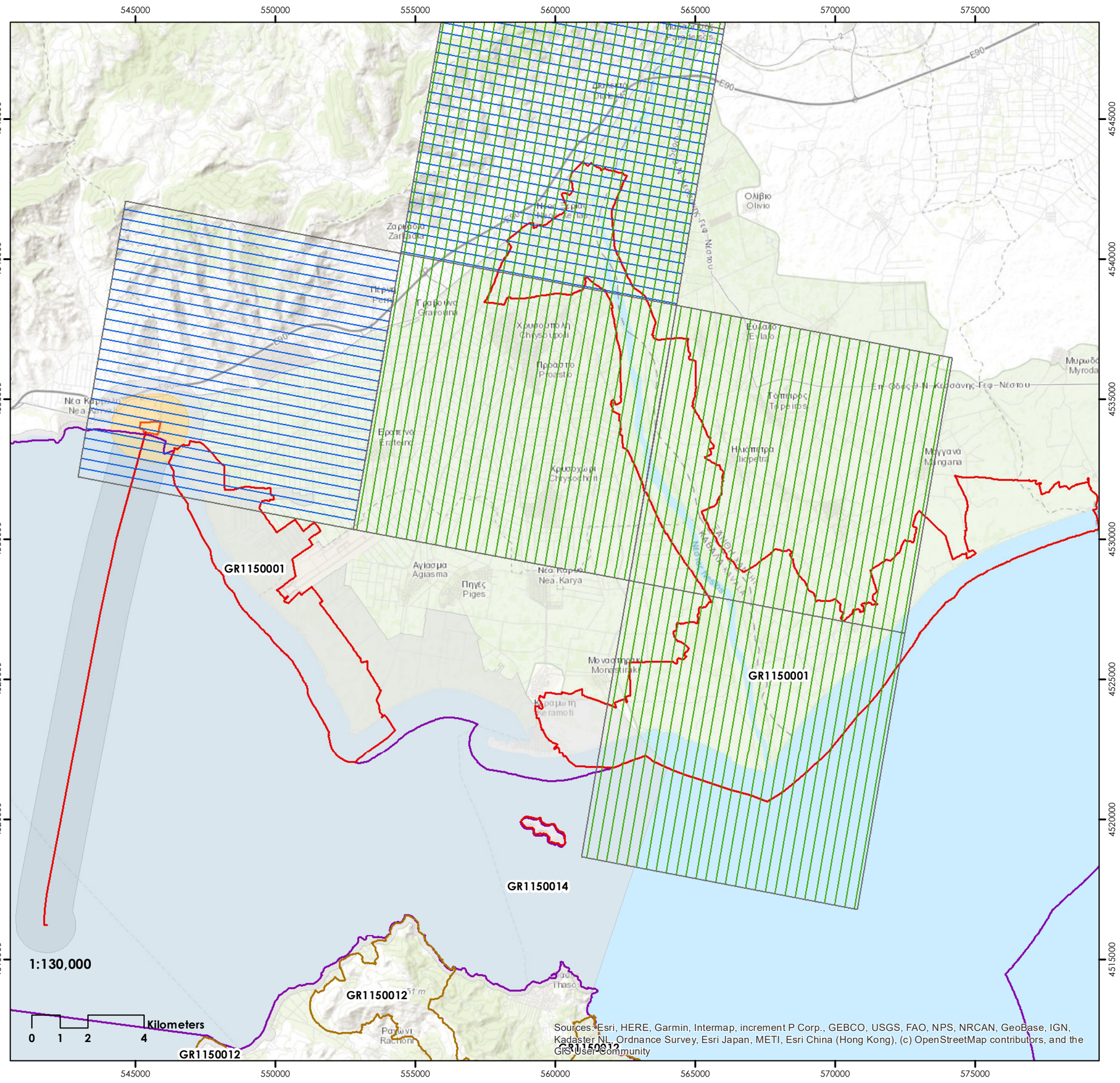
Υπόμνημα

Κατανομή ορνιθοπανίδας (ΕΡΓΟ: Εποπτεία και αξιολόγηση της ορνιθοπανίδας στην περιοχή αρμοδιότητας ου Φορέα Διαχείρισης Δέλτα Νέστου - Βιστωνίδας - Ισμαρίδας)

- ***Circaetus gallicus***
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2
- Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

- ΖΕΠ GR1150001
- ΖΕΠ GR1150012
- ΖΕΠ/ΕΖΔ GR1150014
- Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
- Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ



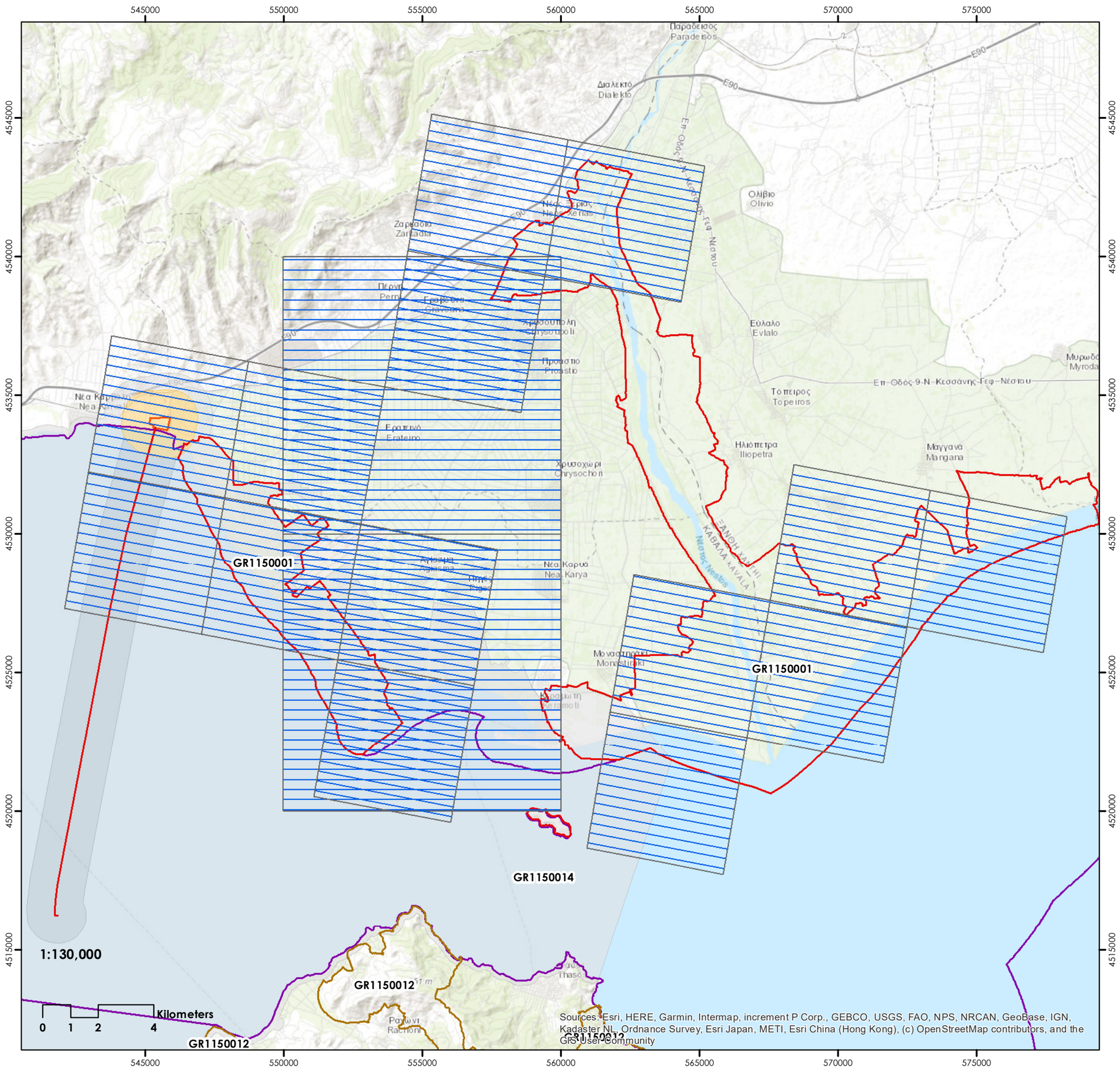
Υπόμνημα

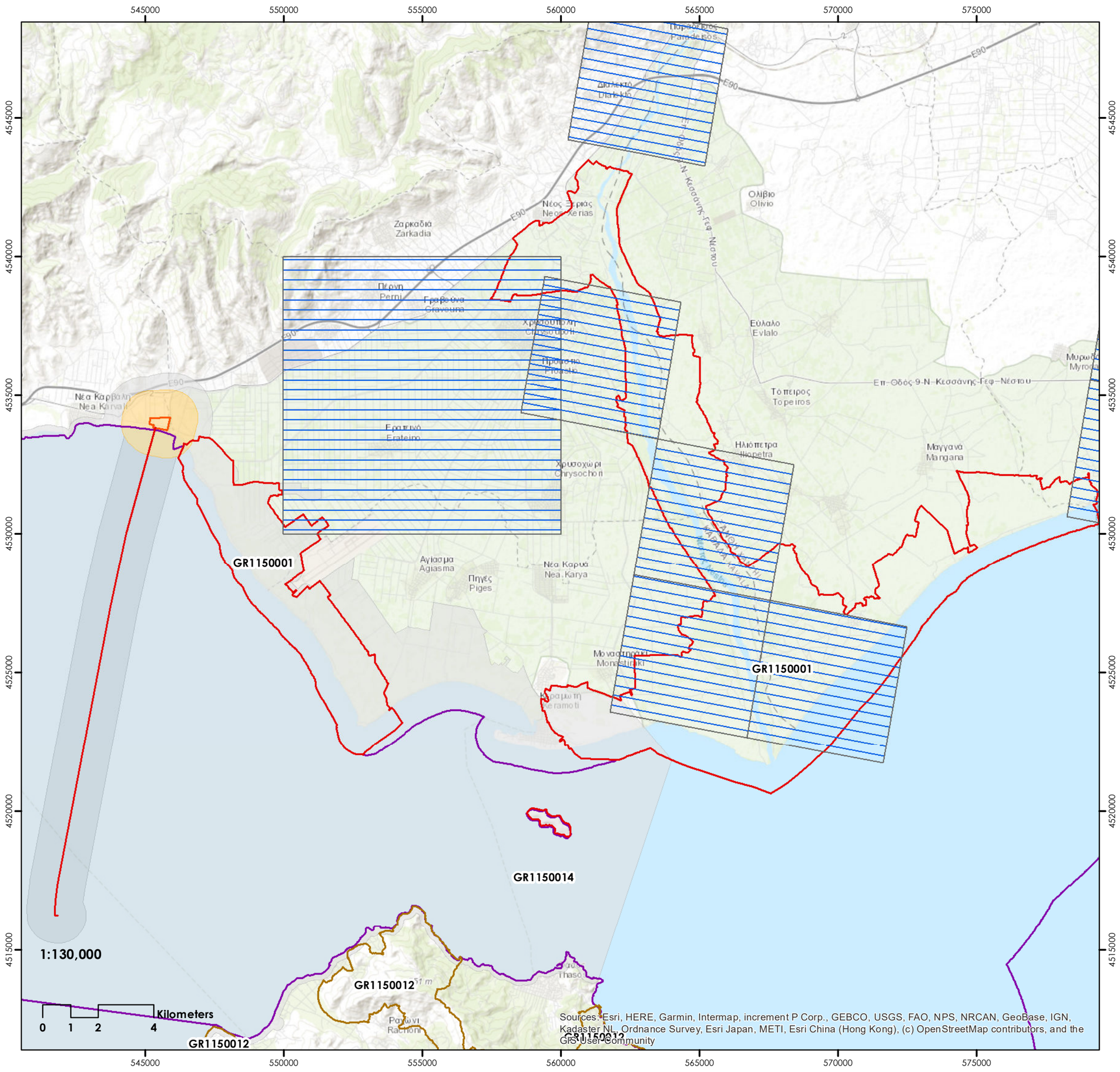
Κατανομή ορνιθοπανίδας (ΕΡΓΟ: Εποπτεία και αξιολόγηση της ορνιθοπανίδας στην περιοχή αρμοδιότητας ου Φορέα Διαχείρισης Δέλτα Νέστου - Βιστωνίδας - Ισμαρίδας)

- ***Aquila chrysaetos***
- ***Clanga pomarina***
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2
- Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

- ΖΕΠ GR1150001
- ΖΕΠ GR1150012
- ΖΕΠ/ΕΖΔ GR1150014
- Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
- Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ


545000
550000
555000
560000
565000
570000
575000
4545000
4540000
4535000
4530000
4525000
4520000
4515000
Παράδεισος
Paradeisos
Διαλεκτό
Dialekto
Ολίβιο
Olivio
Ζαρκάδια
Zarkadia
Πέρνη
Perni
Χρυσούπολη
Chrysoupoli
Εύλαλο
Evlalo
Προάστιο
Proastio
Τόπειρος
Topeiros
Ερατεινό
Erateino
Ηλιόπετρα
Iliopetra
Μαγγανά
Mangana
Χρυσοχώρι
Chrysochori
Νέα Καρυά
Nea Karya
Μοναστηράκι
Monastiraki
Ραχώνι
Rachoni
Θάσος
Thasos
Ε90
Επ-Οδός-9-Ν-Κεσσάνης-Γεφ-Νέστου
GR1150001
GR1150012
GR1150014
Υπόμνημα
Κατανομή ορνιθοπανίδας (ΕΡΓΟ: Εποπτεία και αξιολόγηση της ορνιθοπανίδας στην περιοχή αρμοδιότητας ου Φορέα Διαχείρισης Δέλτα Νέστου - Βιστωνίδας - Ισμαρίδας)
Circus aeruginosus
Κατανομή αναπαραγόμενων πουλιών (Πηγή: Άτλαντας Αναπαραγόμενων Πουλιών της Ελλαδας, Ελληνική Ορνιθολογική Εταιρεία)
Circus aeruginosus
Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA
Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2
Διευρυμένη Περιοχή Έρευνας Πεδίου
Περιοχές Μελέτης
ΖΕΠ GR1150001
ΖΕΠ GR1150012
ΖΕΠ/ΕΖΔ GR1150014
Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ
1:130,000
Kilometers
0 1 2 4
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community



Υπόμνημα

Κατανομή ορνιθοπανίδας (ΕΡΓΟ: Εποπτεία και αξιολόγηση της ορνιθοπανίδας στην περιοχή αρμοδιότητας ου Φορέα Διαχείρισης Δέλτα Νέστου - Βιστωνίδας - Ισμαρίδας)

Accipiter brevipes

Κατανομή αναπαραγόμενων πουλιών (Πηγή: Άτλαντας Αναπαραγόμενων Πουλιών της Ελλαδας, Ελληνική Ορνιθολογική Εταιρεία)

Accipiter brevipes

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2

Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

ΖΕΠ GR1150001

ΖΕΠ GR1150012

ΖΕΠ/ΕΖΔ GR1150014

Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2

Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ

Υπόμνημα

Κατανομή ορνιθοπανίδας (ΕΡΓΟ: Εποπτεία και αξιολόγηση της ορνιθοπανίδας στην περιοχή αρμοδιότητας ου Φορέα Διαχείρισης Δέλτα Νέστου - Βιστωνίδας - Ισμαρίδας)

- ***Haliaeetus albicilla***
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2
- Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

- ΖΕΠ GR1150001
- ΖΕΠ GR1150012
- ΖΕΠ/ΕΖΔ GR1150014
- Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
- Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ

GR1150001

GR1150001

GR1150014

GR1150012

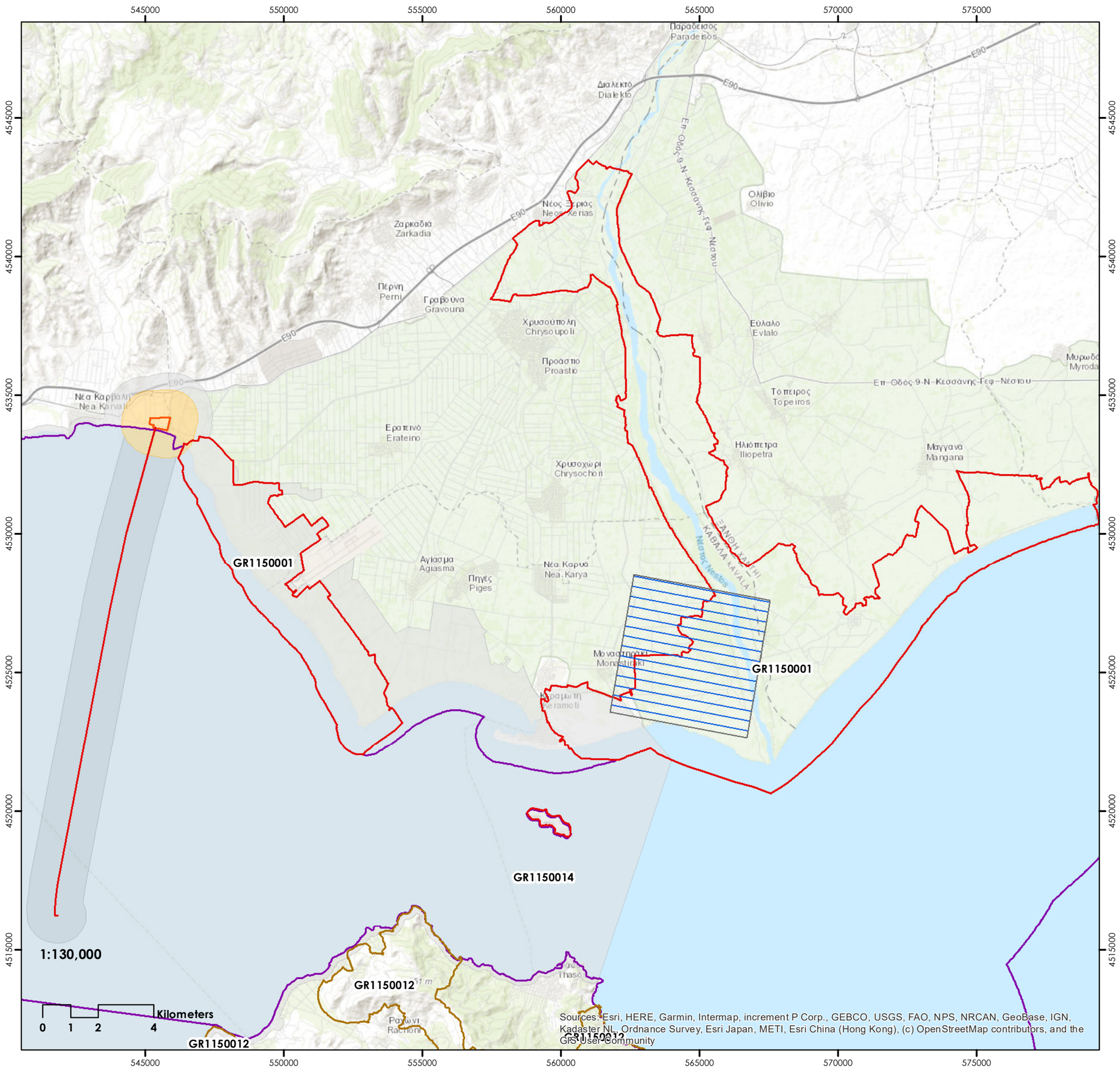
GR1150012

1:130,000

Kilometers

0 1 2 4

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community



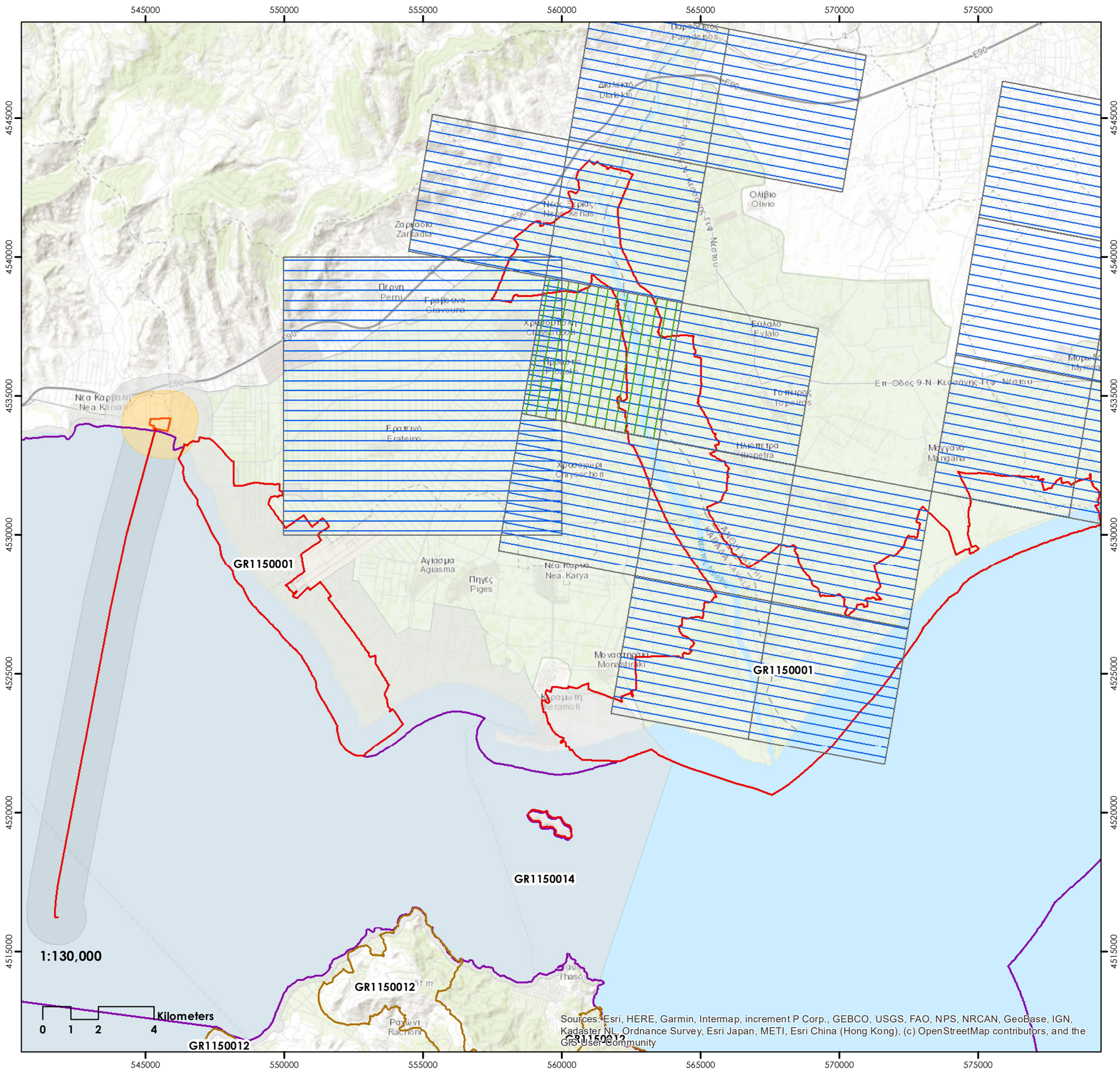
Υπόμνημα

Κατανομή ορνιθοπανίδας (ΕΡΓΟ: Εποπτεία και αξιολόγηση της ορνιθοπανίδας στην περιοχή αρμοδιότητας ου Φορέα Διαχείρισης Δέλτα Νέστου - Βιστωνίδας - Ισμαρίδας)

- ***Milvus migrans***
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2
- Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

- ΖΕΠ GR1150001
- ΖΕΠ GR1150012
- ΖΕΠ/ΕΖΔ GR1150014
- Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
- Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ



Υπόμνημα

Κατανομή ορνιθοπανίδας (ΕΡΓΟ: Εποπτεία και αξιολόγηση της ορνιθοπανίδας στην περιοχή αρμοδιότητας ου Φορέα Διαχείρισης Δέλτα Νέστου - Βιστωνίδας - Ισμαρίδας)

- ***Buteo buteo***
- ***Buteo rufinus***

Κατανομή αναπαραγόμενων πουλιών (Πηγή: Άτλαντας Αναπαραγόμενων Πουλιών της Ελλαδας, Ελληνική Ορνιθολογική Εταιρεία)

- ***Buteo buteo***

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2

Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

- ΖΕΠ GR1150001
- ΖΕΠ GR1150012
- ΖΕΠ/ΕΖΔ GR1150014
- Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
- Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ

Υπόμνημα

Κατανομή αναπαραγόμενων πουλιών (Πηγή: Άτλαντας Αναπαραγόμενων Πουλιών της Ελλαδας, Ελληνική Ορνιθολογική Εταιρεία)

Upupa epops

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2

Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

ΖΕΠ GR1150001

ΖΕΠ GR1150012

ΖΕΠ/ΕΖΔ GR1150014

Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2

Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ

GR1150001

GR1150014

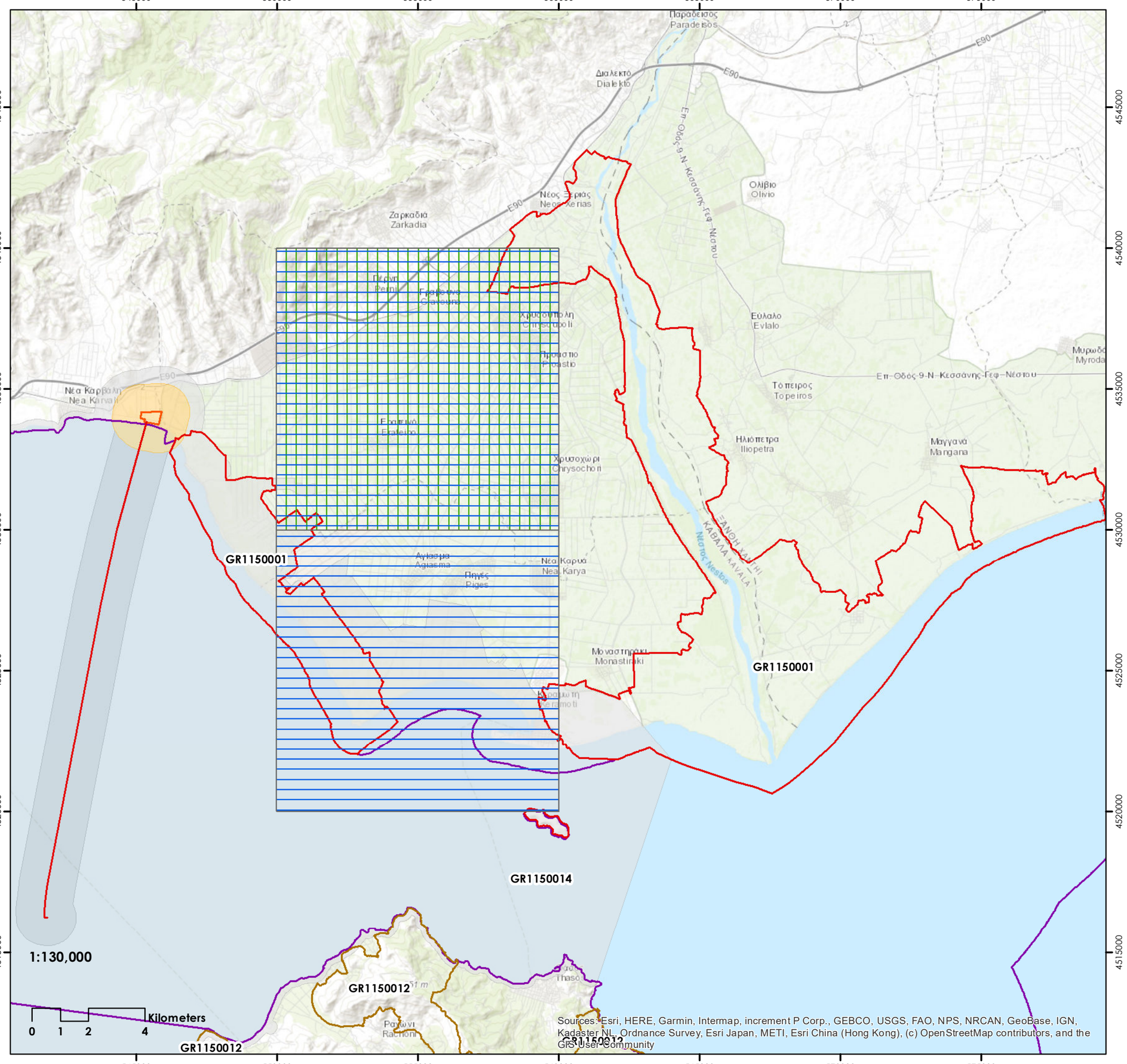
GR1150012

1:130,000

Kilometers

0 1 2 4

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community



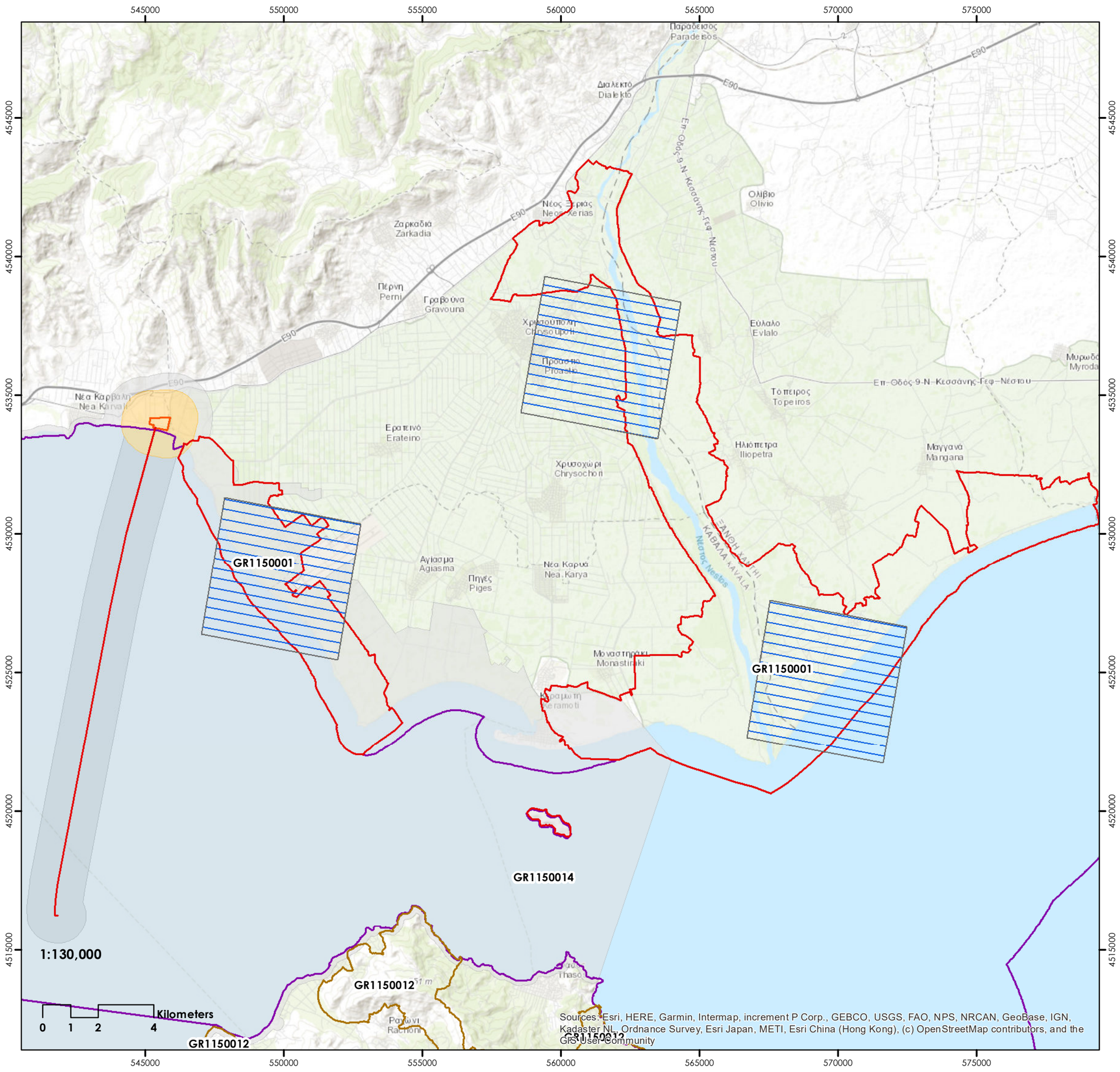
Υπόμνημα

Κατανομή αναπαραγόμενων πουλιών (Πηγή: Άτλαντας Αναπαραγόμενων Πουλιών της Ελλαδας, Ελληνική Ορνιθολογική Εταιρεία)

- ***Coracias garrulus***
- ***Merops apiaster***
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2
- Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

- ΖΕΠ GR1150001
- ΖΕΠ GR1150012
- ΖΕΠ/ΕΖΔ GR1150014
- Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
- Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ



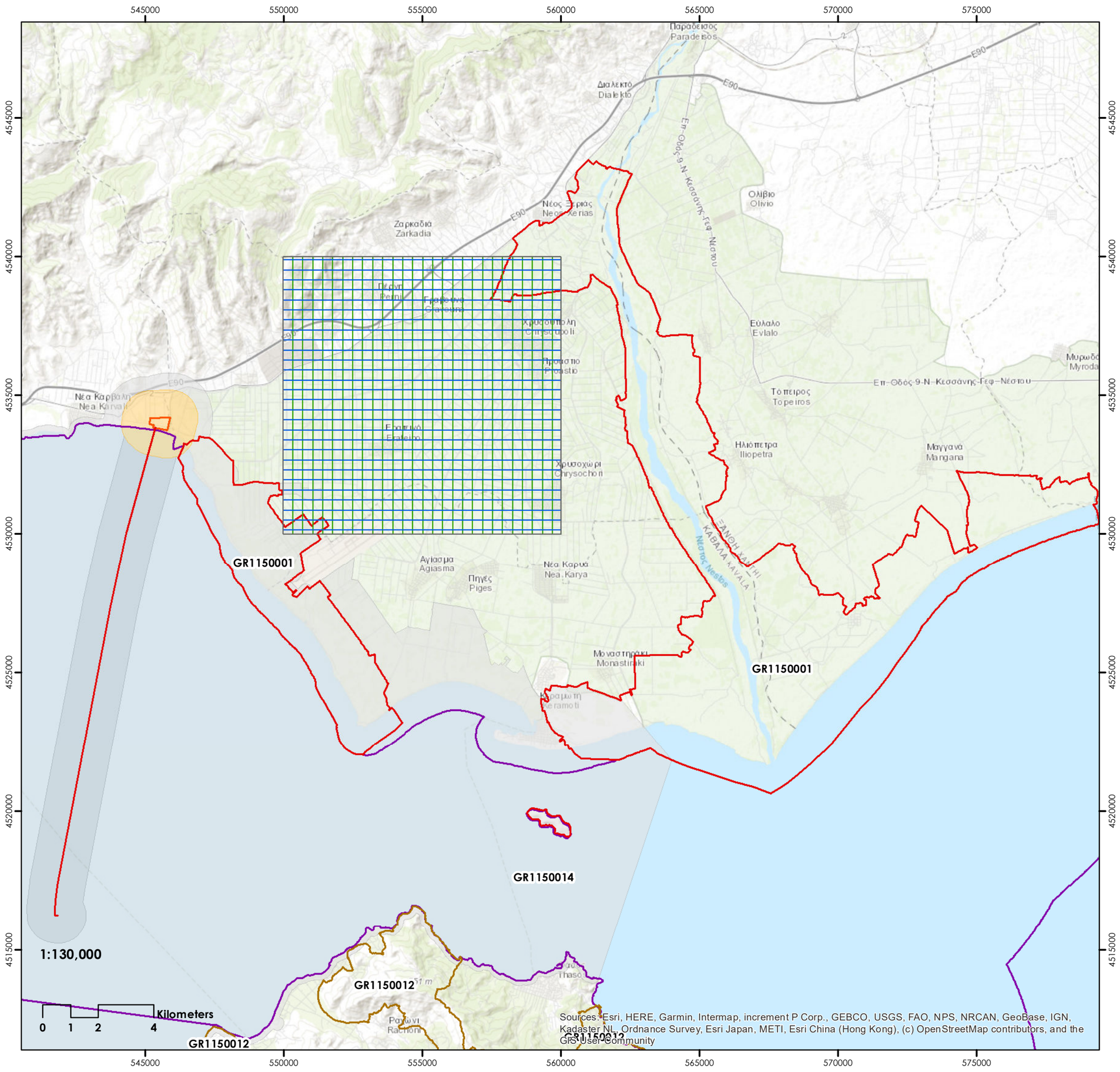
Υπόμνημα

Κατανομή ορνιθοπανίδας (ΕΡΓΟ: Εποπτεία και αξιολόγηση της ορνιθοπανίδας στην περιοχή αρμοδιότητας ου Φορέα Διαχείρισης Δέλτα Νέστου - Βιστωνίδας - Ισμαρίδας)

- ***Leiopicus medius***
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2
- Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

- ΖΕΠ GR1150001
- ΖΕΠ GR1150012
- ΖΕΠ/ΕΖΔ GR1150014
- Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
- Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ



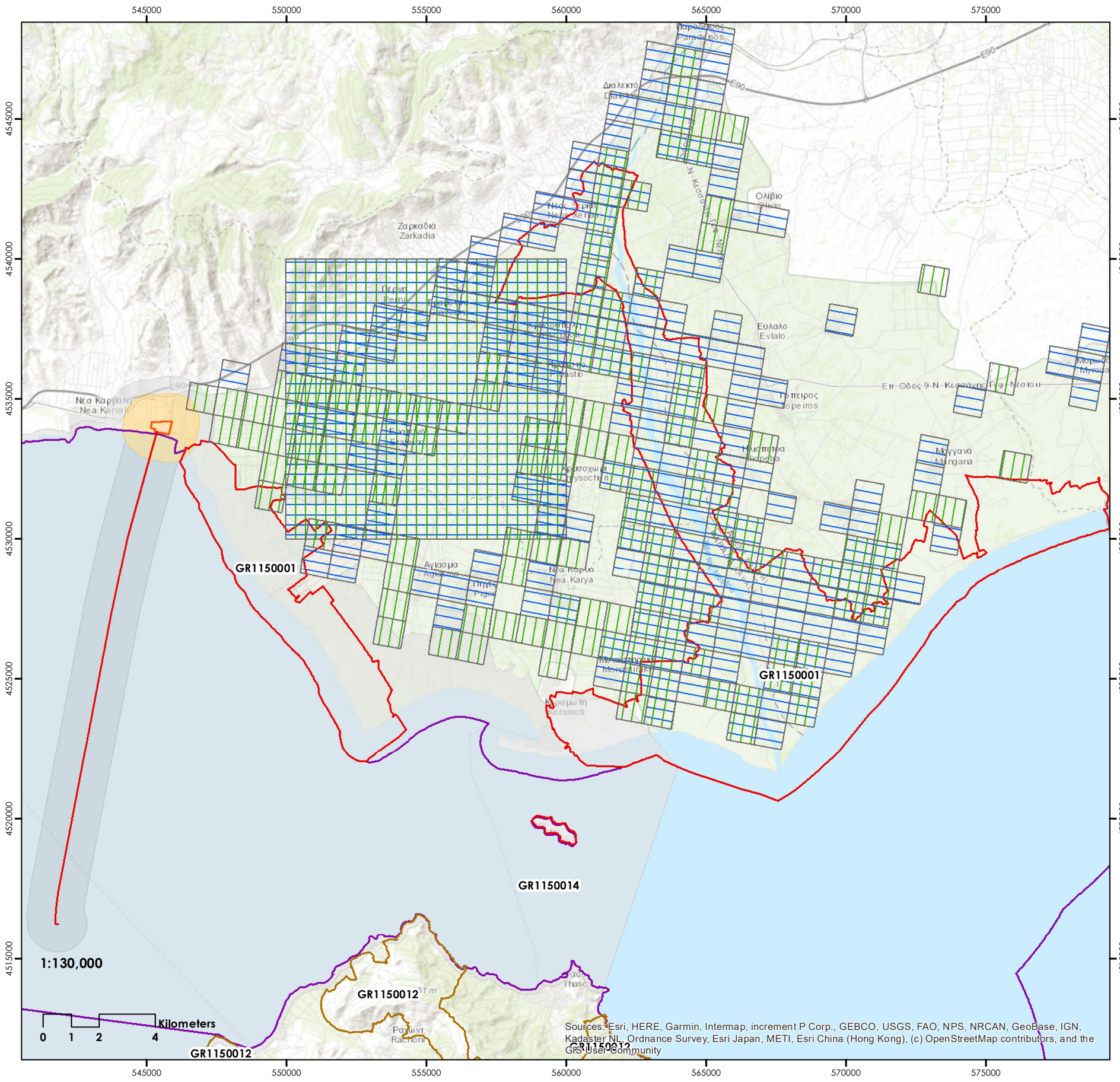
Υπόμνημα

Κατανομή αναπαραγόμενων πουλιών (Πηγή: Άτλαντας Αναπαραγόμενων Πουλιών της Ελλαδας, Ελληνική Ορνιθολογική Εταιρεία)

- ***Falco subbuteo***
- ***Falco vespertinus***
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2
- Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

- ΖΕΠ GR1150001
- ΖΕΠ GR1150012
- ΖΕΠ/ΕΖΔ GR1150014
- Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
- Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ



Υπόμνημα

Κατανομή ορνιθοπανίδας (ΕΡΓΟ: Εποπτεία και αξιολόγηση της ορνιθοπανίδας στην περιοχή αρμοδιότητας ου Φορέα Διαχείρισης Δέλτα Νέστου - Βιστωνίδας - Ισμαρίδας)

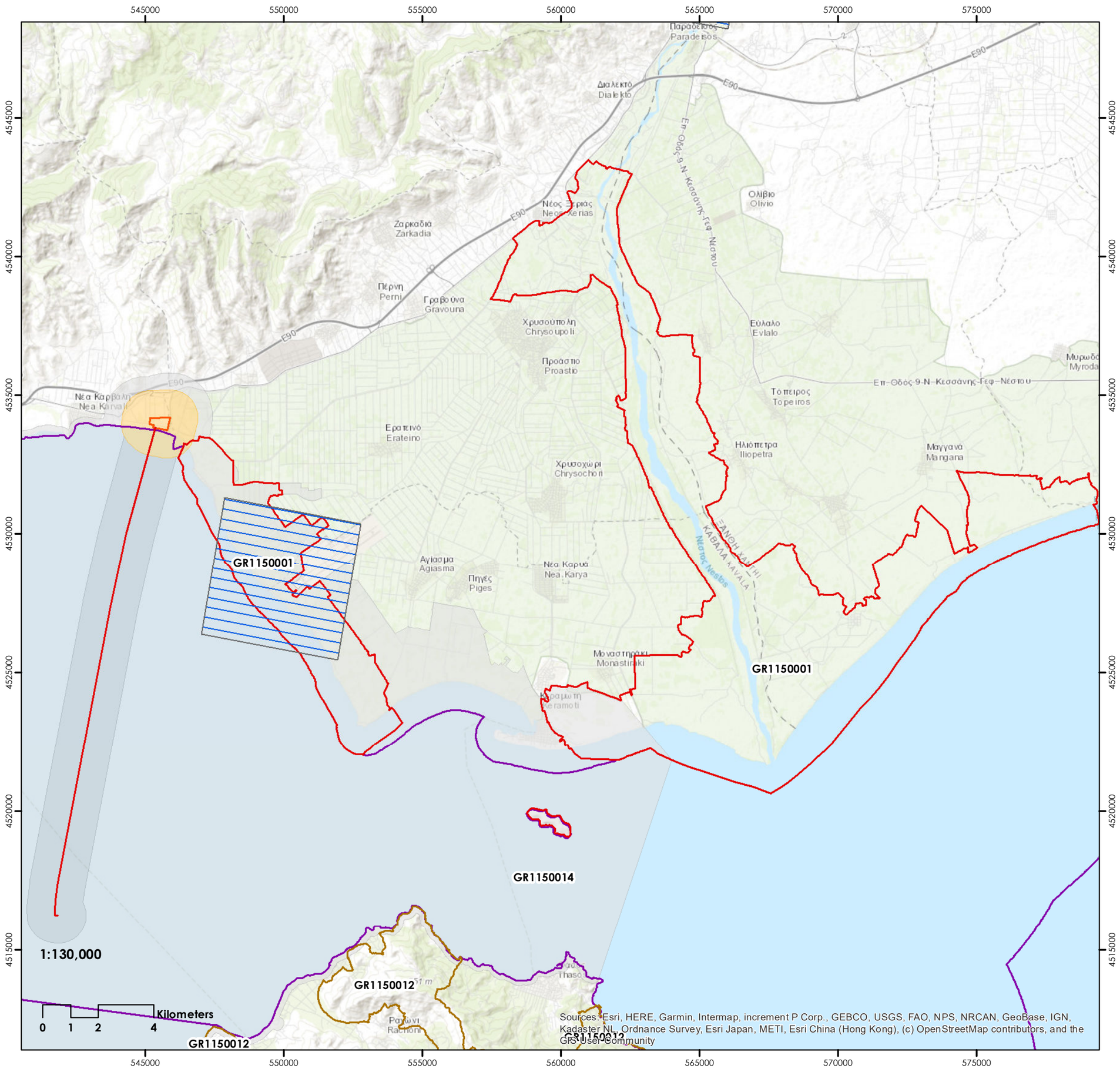
- ***Lanius collurio***
- ***Lanius senator***

Κατανομή αναπαραγόμενων πουλιών (Πηγή: Άτλαντας Αναπαραγόμενων Πουλιών της Ελλαδας, Ελληνική Ορνιθολογική Εταιρεία)

- ***Lanius collurio***
- ***Lanius senator***
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2
- Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

- ΖΕΠ GR1150001
- ΖΕΠ GR1150012
- ΖΕΠ/ΕΖΔ GR1150014
- Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
- Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ



Υπόμνημα

Κατανομή ορνιθοπανίδας (ΕΡΓΟ: Εποπτεία και αξιολόγηση της ορνιθοπανίδας στην περιοχή αρμοδιότητας ου Φορέα Διαχείρισης Δέλτα Νέστου - Βιστωνίδας - Ισμαρίδας)

- ***Lullula arborea***
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2
- Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

- ΖΕΠ GR1150001
- ΖΕΠ GR1150012
- ΖΕΠ/ΕΖΔ GR1150014
- Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
- Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ

545000 550000 555000 560000 565000 570000 575000

4545000 4540000 4535000 4530000 4525000 4520000 4515000

Παράδεισος
Paradeisos

Διαλεκτό
Dialekto

Ελιβιο
Olivio

Ζαρκαδιά
Zarkadia

Νέα Καρβάλη
Nea Karvali

Περνή
Perni

Γραμμένα
Gravouna

Χρυσούπολη
Chrysoupoli

Εύλαλο
Evlalo

Προάστιο
Proastio

Τόπειρος
Topeiros

Μαγγανά
Mangana

Μυρωδ
Myroda

Ελαιώνα
Elaiona

Ηλιούπολη
Iliopoli

Χρυσοχώρι
Chrysochori

Νέα Καρβα
Nea Karva

Μοναστηράκι
Monastiraki

Ραχώνι
Rachoni

Θάσος
Thasos

Ε90

Επ-Οδός 9-Ν-Κεσσάνης-Γεφ-Νέστου

GR1150001

GR1150012

GR1150014

1:130,000

0 1 2 4 Kilometers

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Υπόμνημα

Κατανομή ορνιθοπανίδας (ΕΡΓΟ: Εποπτεία και αξιολόγηση της ορνιθοπανίδας στην περιοχή αρμοδιότητας ου Φορέα Διαχείρισης Δέλτα Νέστου - Βιστωνίδας - Ισμαρίδας)

- ***Acrocephalus schoenobaenus***
- ***Acrocephalus scirpaceus***

Κατανομή αναπαραγόμενων πουλιών (Πηγή: Άτλαντας Αναπαραγόμενων Πουλιών της Ελλαδας, Ελληνική Ορνιθολογική Εταιρεία)

- ***Acrocephalus scirpaceus***

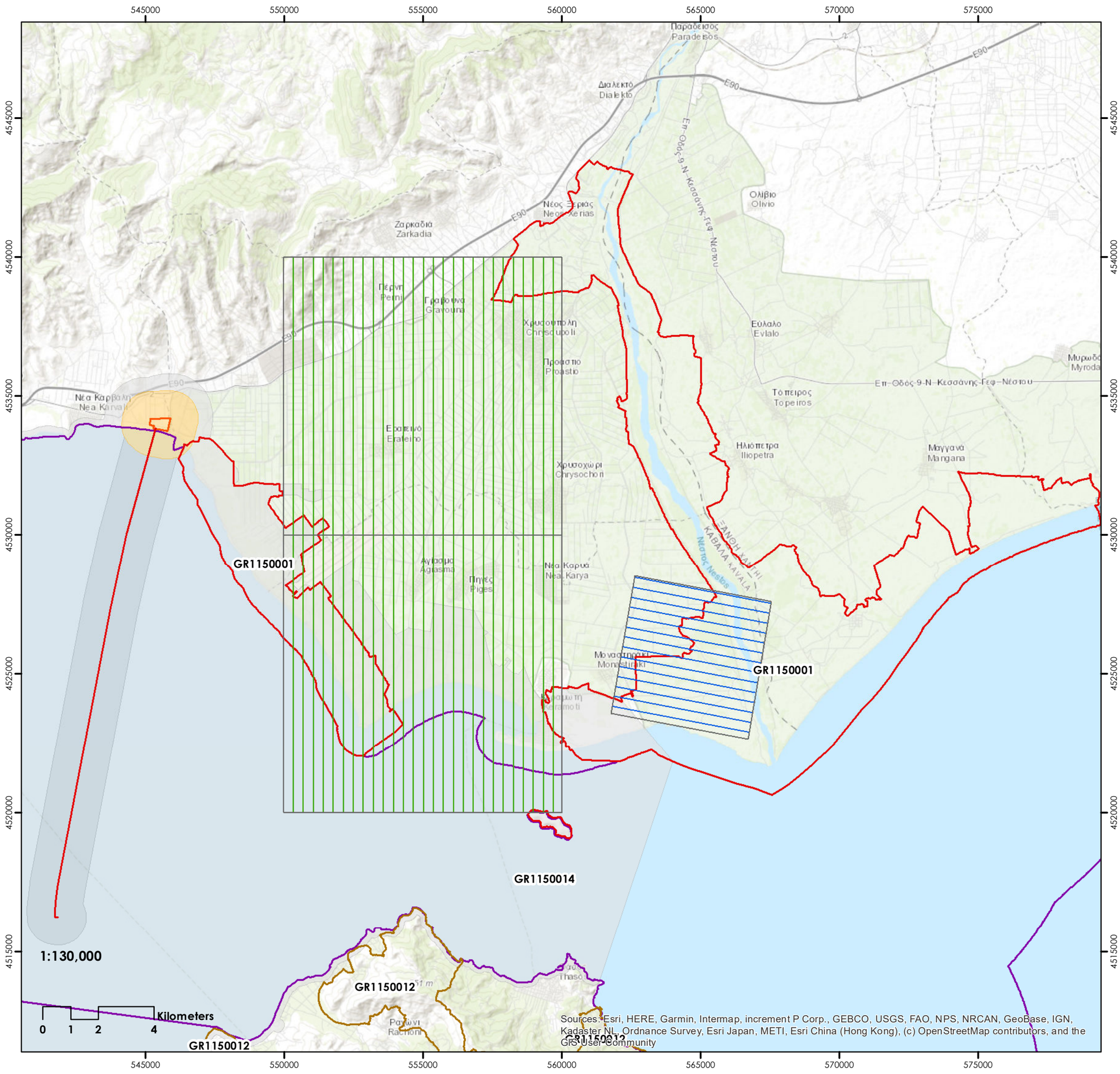
Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2

Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

- ΖΕΠ GR1150001
- ΖΕΠ GR1150012
- ΖΕΠ/ΕΖΔ GR1150014
- Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
- Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ



Υπόμνημα

Κατανομή ορνιθοπανίδας (ΕΡΓΟ: Εποπτεία και αξιολόγηση της ορνιθοπανίδας στην περιοχή αρμοδιότητας ου Φορέα Διαχείρισης Δέλτα Νέστου - Βιστωνίδας - Ισμαρίδας)

Acrocephalus palustris

Κατανομή αναπαραγόμενων πουλιών (Πηγή: Άτλαντας Αναπαραγόμενων Πουλιών της Ελλαδας, Ελληνική Ορνιθολογική Εταιρεία)

Acrocephalus arundinaceus

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2

Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

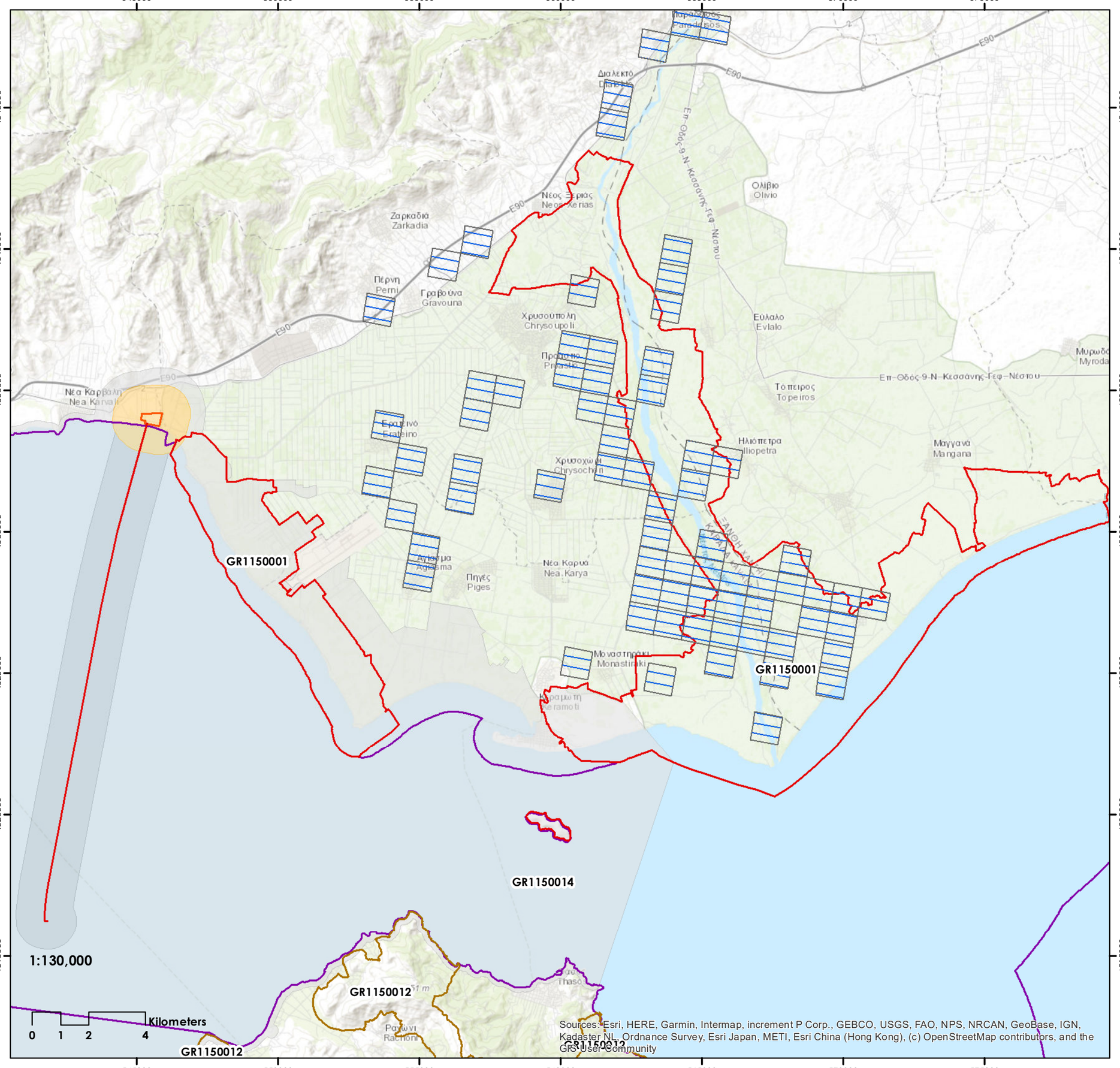
ΖΕΠ GR1150001

ΖΕΠ GR1150012

ΖΕΠ/ΕΖΔ GR1150014

Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2

Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ



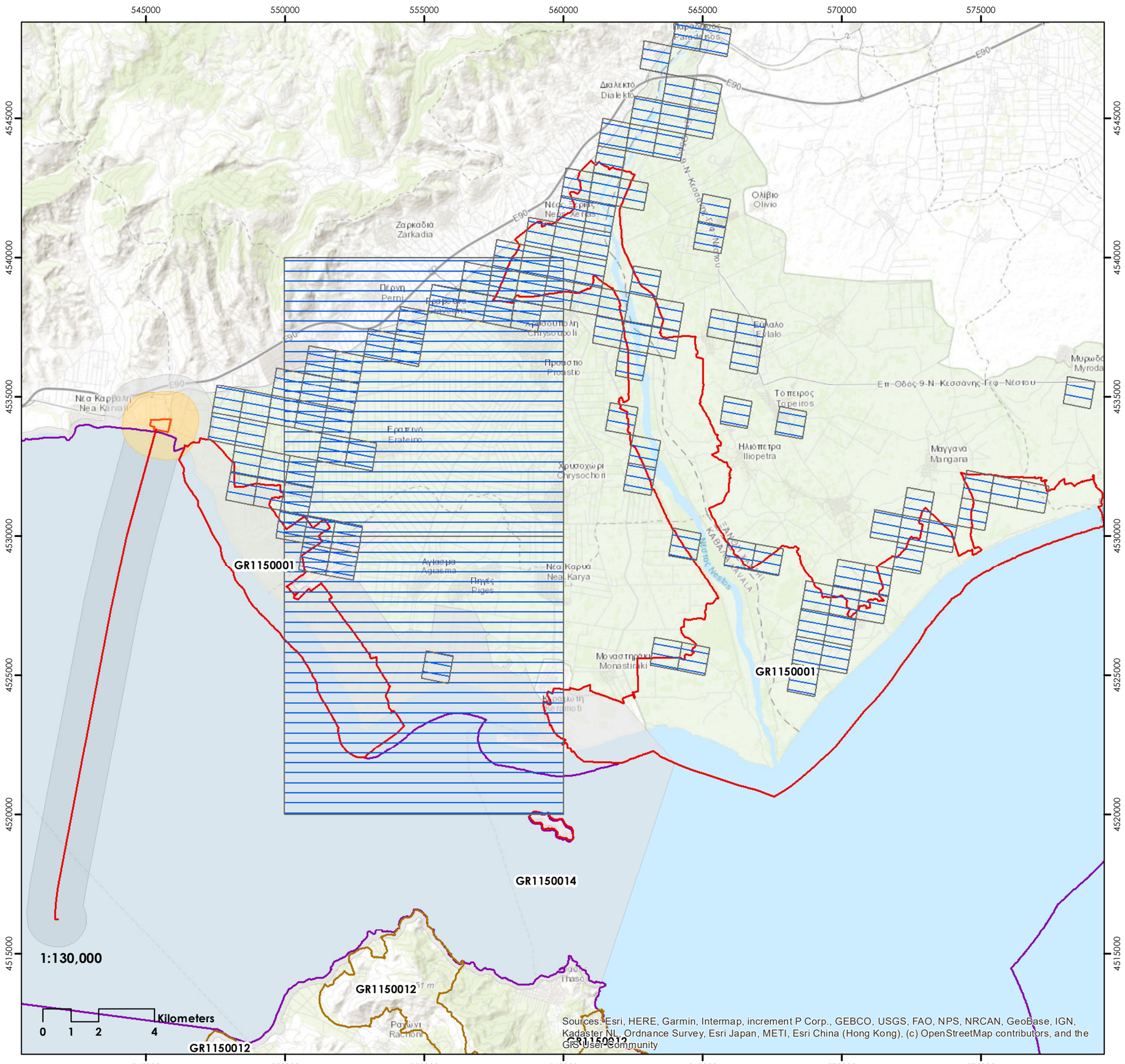
Υπόμνημα

Κατανομή ορνιθοπανίδας (ΕΡΓΟ: Εποπτεία και αξιολόγηση της ορνιθοπανίδας στην περιοχή αρμοδιότητας ου Φορέα Διαχείρισης Δέλτα Νέστου - Βιστωνίδας - Ισμαρίδας)

- ***Locustella luscinioides***
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2
- Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

- ΖΕΠ GR1150001
- ΖΕΠ GR1150012
- ΖΕΠ/ΕΖΔ GR1150014
- Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
- Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ



Υπόμνημα

Κατανομή ορνιθοπανίδας (ΕΡΓΟ: Εποπτεία και αξιολόγηση της ορνιθοπανίδας στην περιοχή αρμοδιότητας ου Φορέα Διαχείρισης Δέλτα Νέστου - Βιστωνίδας - Ισμαρίδας)

Delichon urbicum

Κατανομή αναπαραγόμενων πουλιών (Πηγή: Άτλαντας Αναπαραγόμενων Πουλιών της Ελλαδας, Ελληνική Ορνιθολογική Εταιρεία)

Delichon urbicum

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2

Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

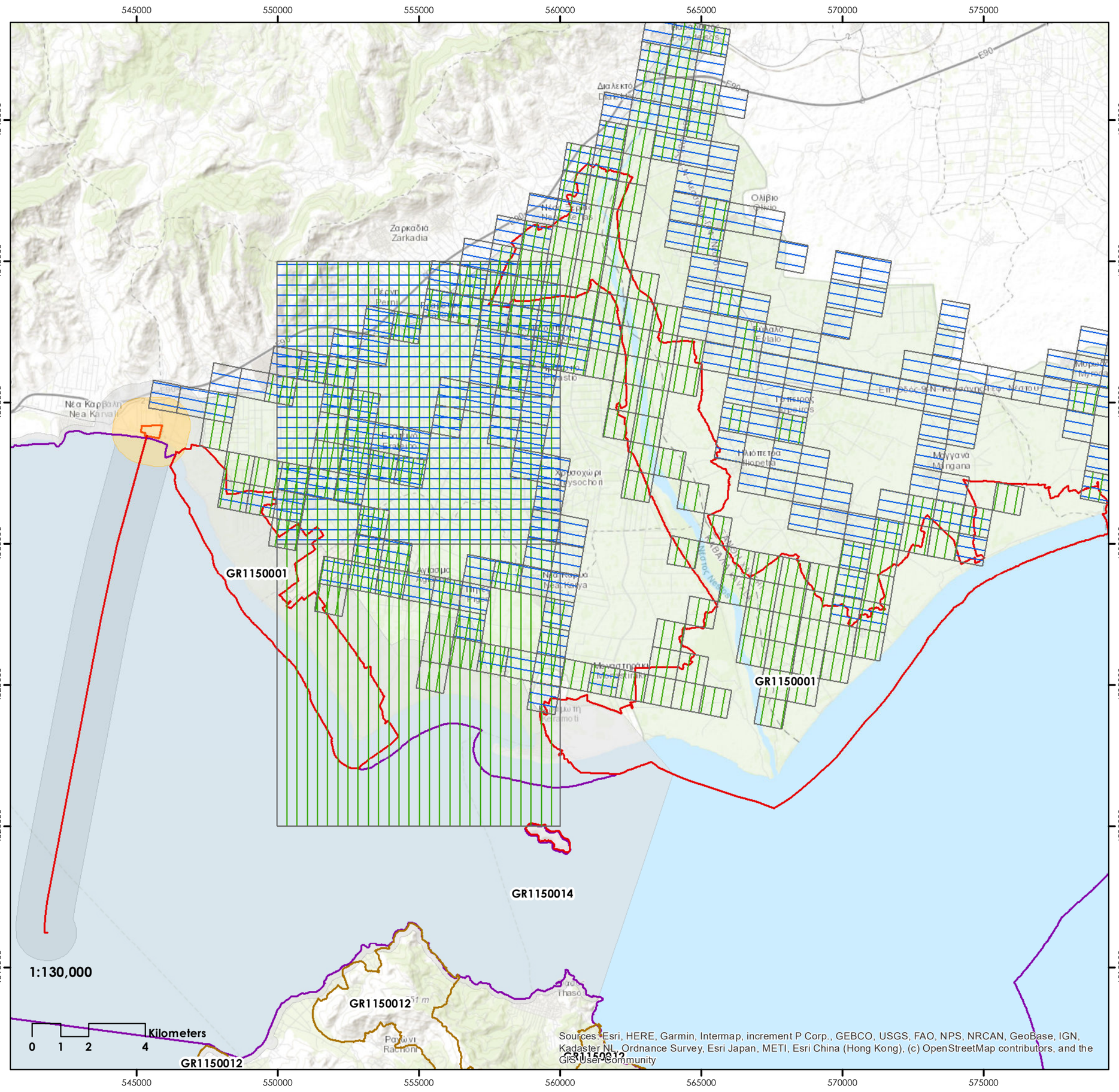
ΖΕΠ GR1150001

ΖΕΠ GR1150012

ΖΕΠ/ΕΖΔ GR1150014

Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2

Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ



Υπόμνημα

Κατανομή ορνιθοπανίδας (ΕΡΓΟ: Εποπτεία και αξιολόγηση της ορνιθοπανίδας στην περιοχή αρμοδιότητας ου Φορέα Διαχείρισης Δέλτα Νέστου - Βιστωνίδας - Ισμαρίδας)

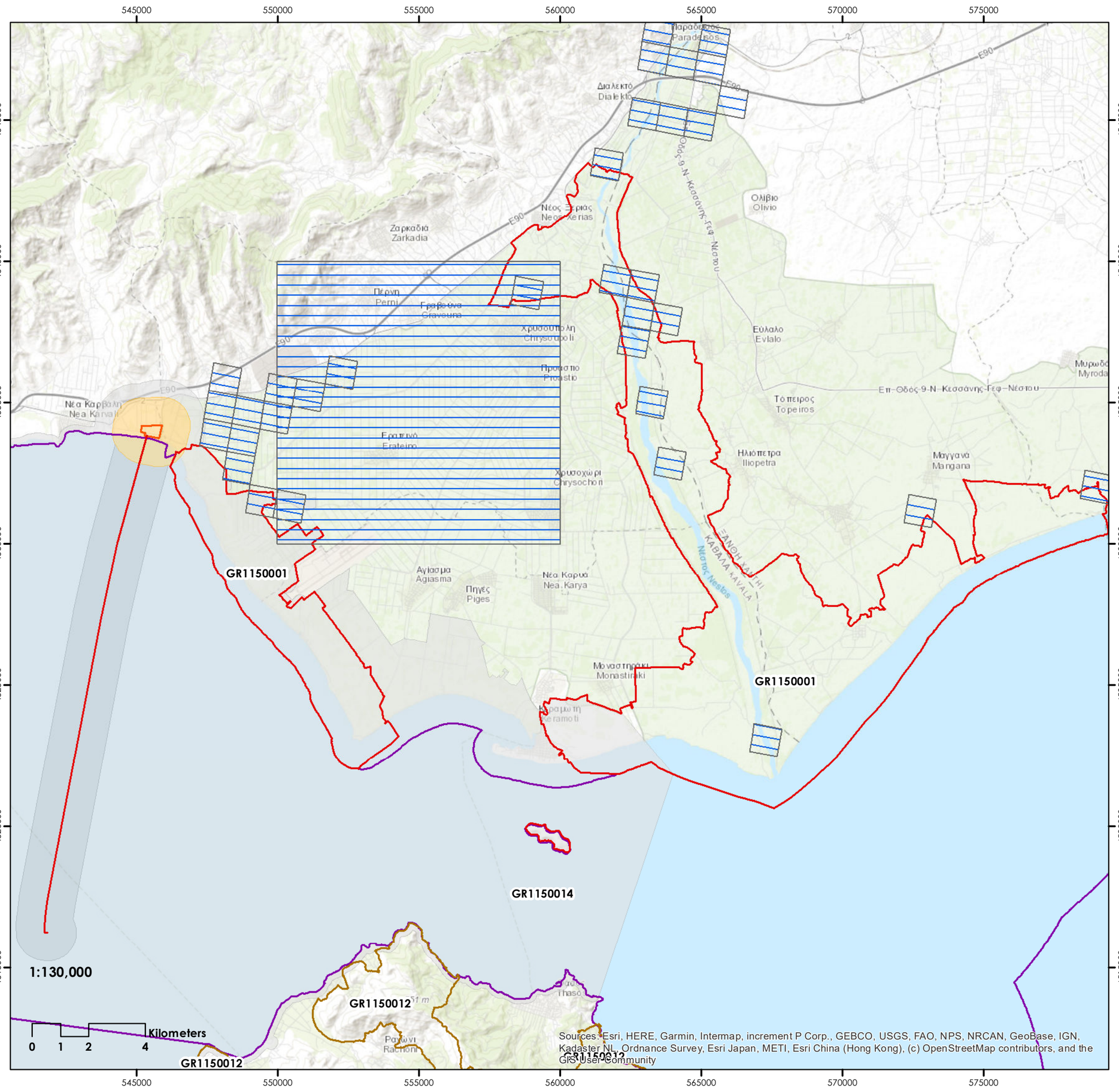
- ***Cecropis daurica***
- ***Hirundo rustica***

Κατανομή αναπαραγόμενων πουλιών (Πηγή: Άτλαντας Αναπαραγόμενων Πουλιών της Ελλαδας, Ελληνική Ορνιθολογική Εταιρεία)

- ***Cecropis daurica***
- ***Hirundo rustica***
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2
- Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

- ΖΕΠ GR1150001
- ΖΕΠ GR1150012
- ΖΕΠ/ΕΖΔ GR1150014
- Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
- Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ



Υπόμνημα

Κατανομή ορνιθοπανίδας (ΕΡΓΟ: Εποπτεία και αξιολόγηση της ορνιθοπανίδας στην περιοχή αρμοδιότητας ου Φορέα Διαχείρισης Δέλτα Νέστου - Βιστωνίδας - Ισμαρίδας)

Riparia riparia

Κατανομή αναπαραγόμενων πουλιών (Πηγή: Άτλαντας Αναπαραγόμενων Πουλιών της Ελλαδας, Ελληνική Ορνιθολογική Εταιρεία)

Riparia riparia

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2

Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

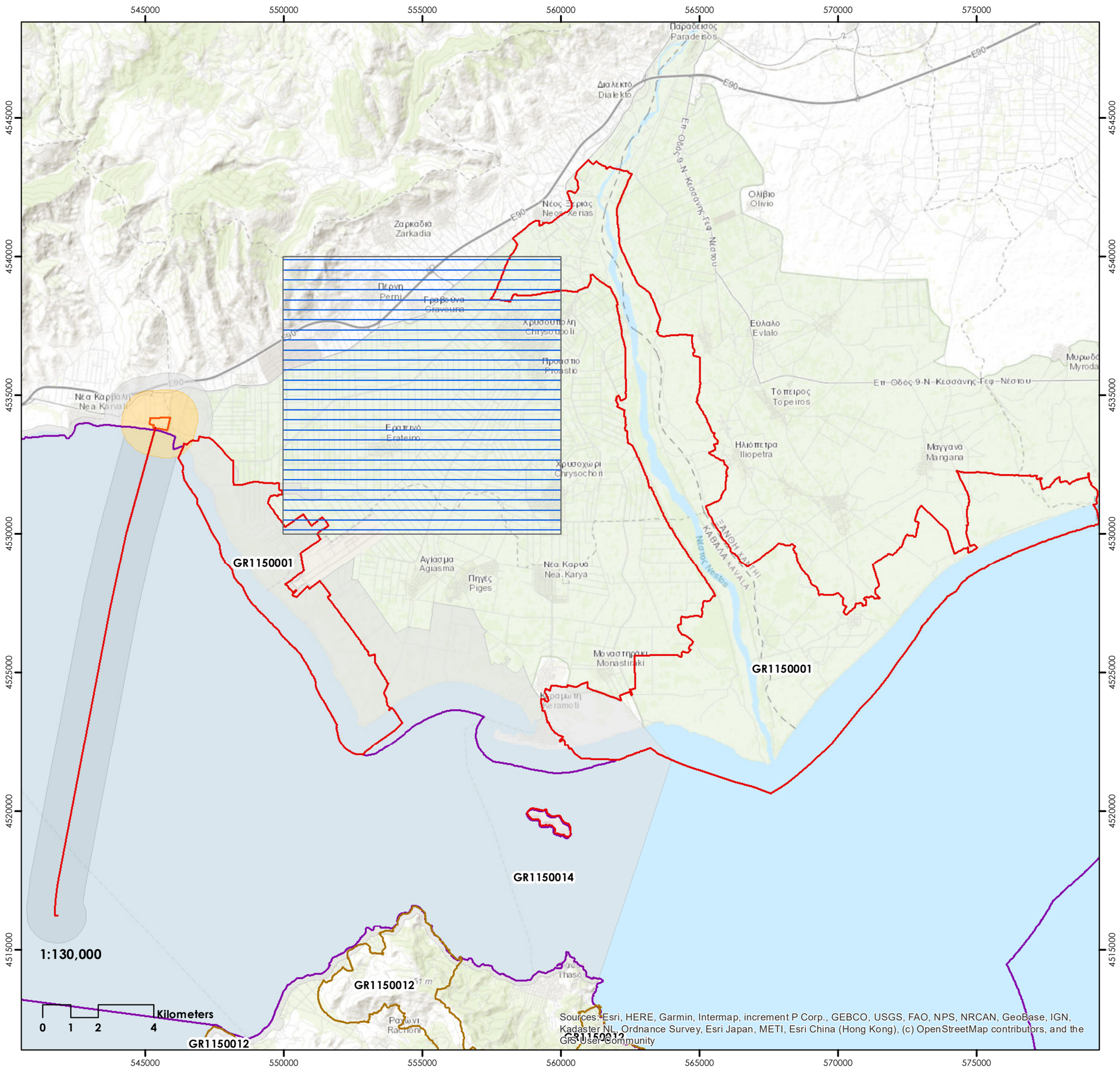
ΖΕΠ GR1150001

ΖΕΠ GR1150012

ΖΕΠ/ΕΖΔ GR1150014

Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2

Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ



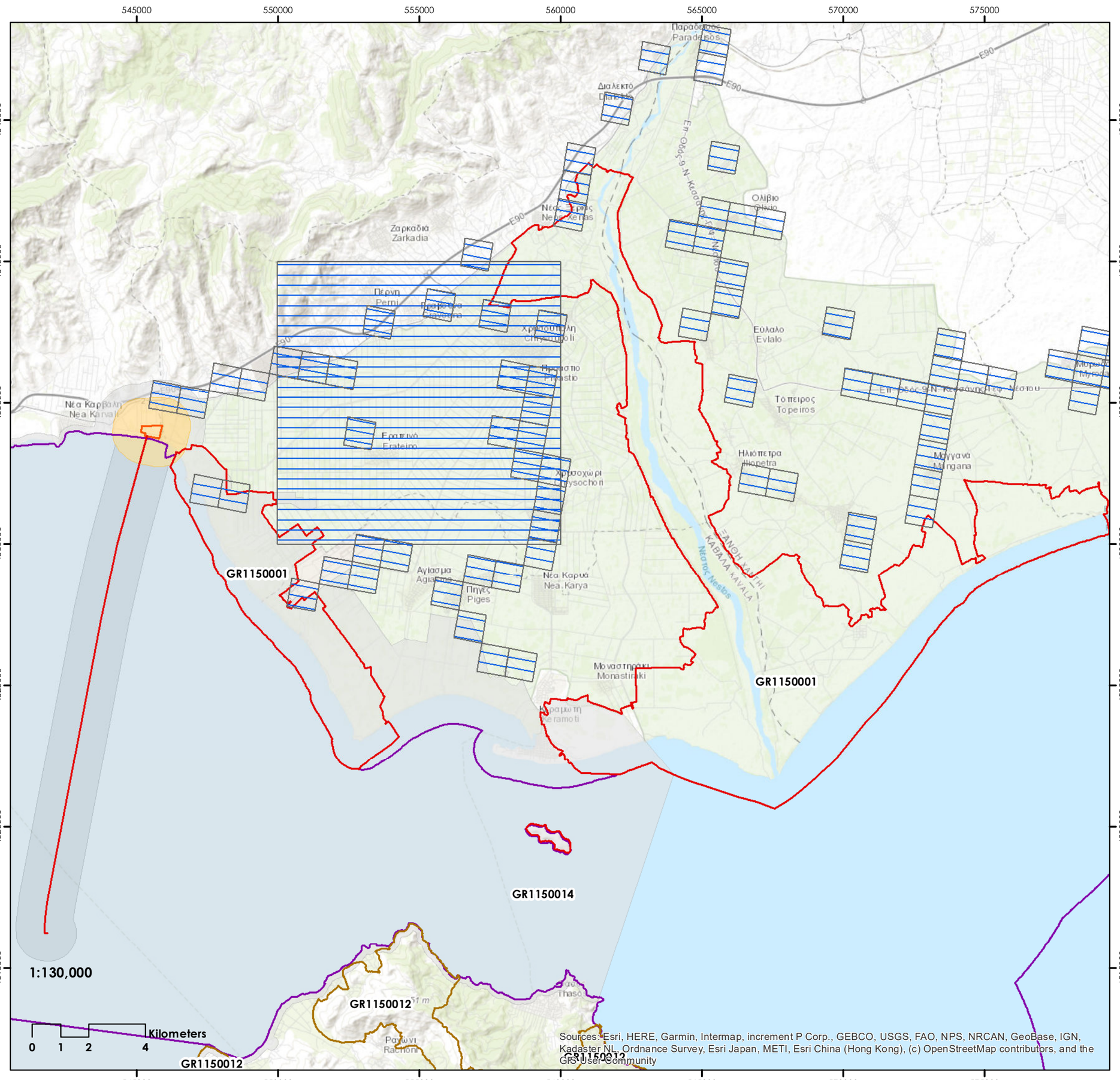
Υπόμνημα

Κατανομή αναπαραγόμενων πουλιών (Πηγή: Άτλαντας Αναπαραγόμενων Πουλιών της Ελλαδας, Ελληνική Ορνιθολογική Εταιρεία)

- ***Sylvia communis***
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2
- Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

- ΖΕΠ GR1150001
- ΖΕΠ GR1150012
- ΖΕΠ/ΕΖΔ GR1150014
- Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
- Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ



Υπόμνημα

Κατανομή ορνιθοπανίδας (ΕΡΓΟ: Εποπτεία και αξιολόγηση της ορνιθοπανίδας στην περιοχή αρμοδιότητας ου Φορέα Διαχείρισης Δέλτα Νέστου - Βιστωνίδας - Ισμαρίδας)

Sturnus vulgaris

Κατανομή αναπαραγόμενων πουλιών (Πηγή: Άτλαντας Αναπαραγόμενων Πουλιών της Ελλαδας, Ελληνική Ορνιθολογική Εταιρεία)

Sturnus vulgaris

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2

Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

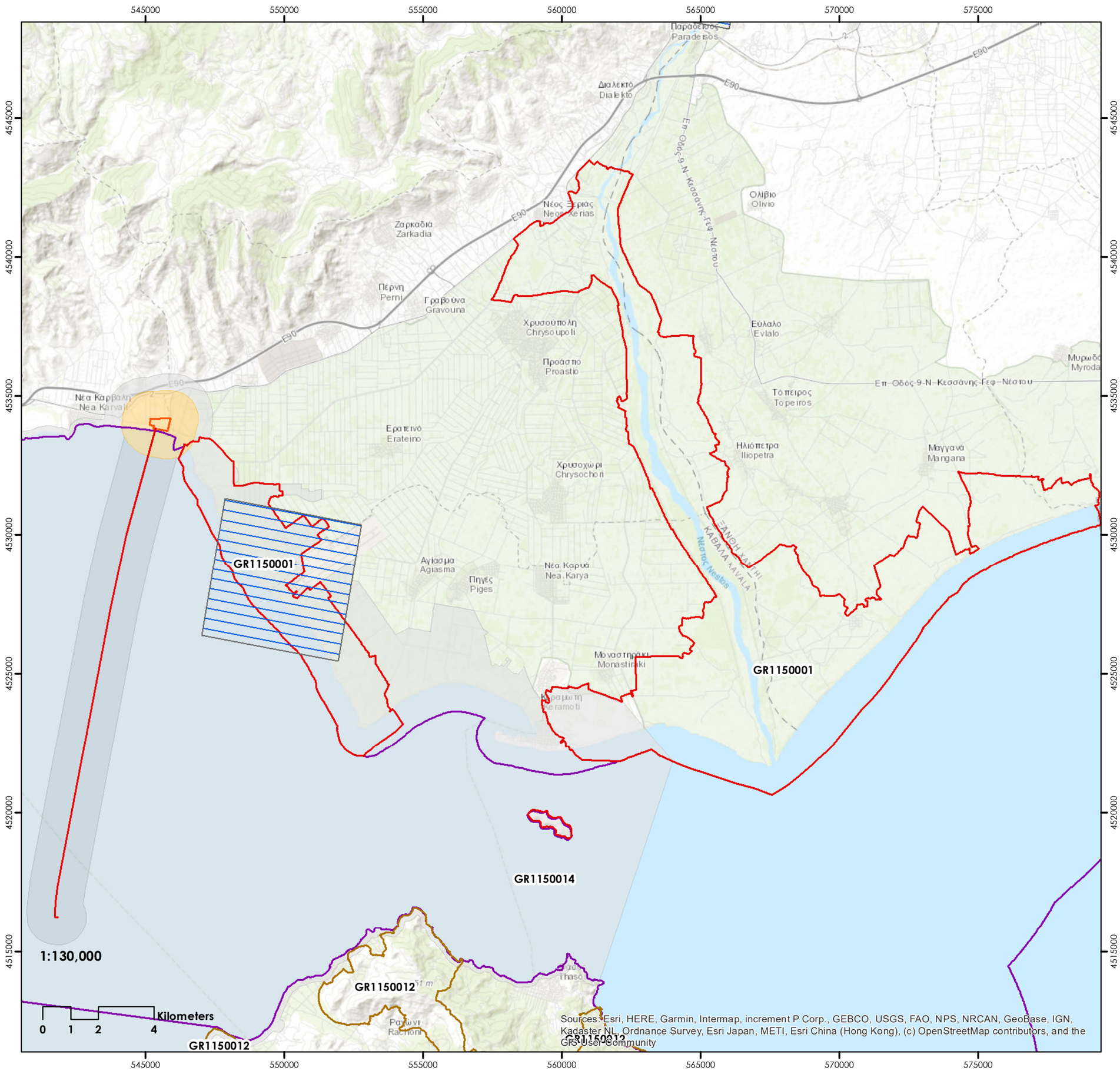
ΖΕΠ GR1150001

ΖΕΠ GR1150012

ΖΕΠ/ΕΖΔ GR1150014

Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2

Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ



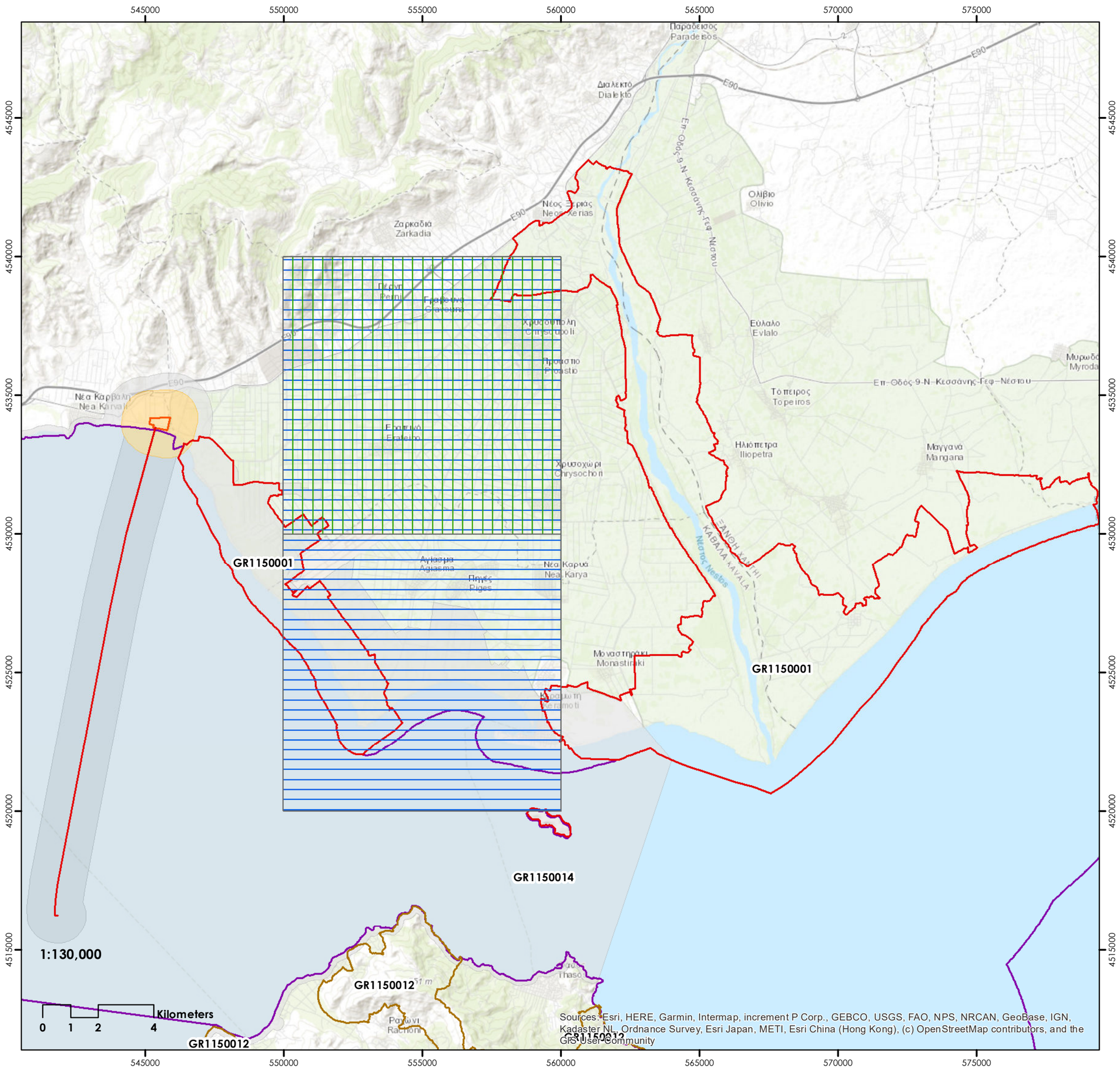
Υπόμνημα

Κατανομή ορνιθοπανίδας (ΕΡΓΟ: Εποπτεία και αξιολόγηση της ορνιθοπανίδας στην περιοχή αρμοδιότητας ου Φορέα Διαχείρισης Δέλτα Νέστου - Βιστωνίδας - Ισμαρίδας)

- ***Erithacus rubecula***
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2
- Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

- ΖΕΠ GR1150001
- ΖΕΠ GR1150012
- ΖΕΠ/ΕΖΔ GR1150014
- Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
- Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ



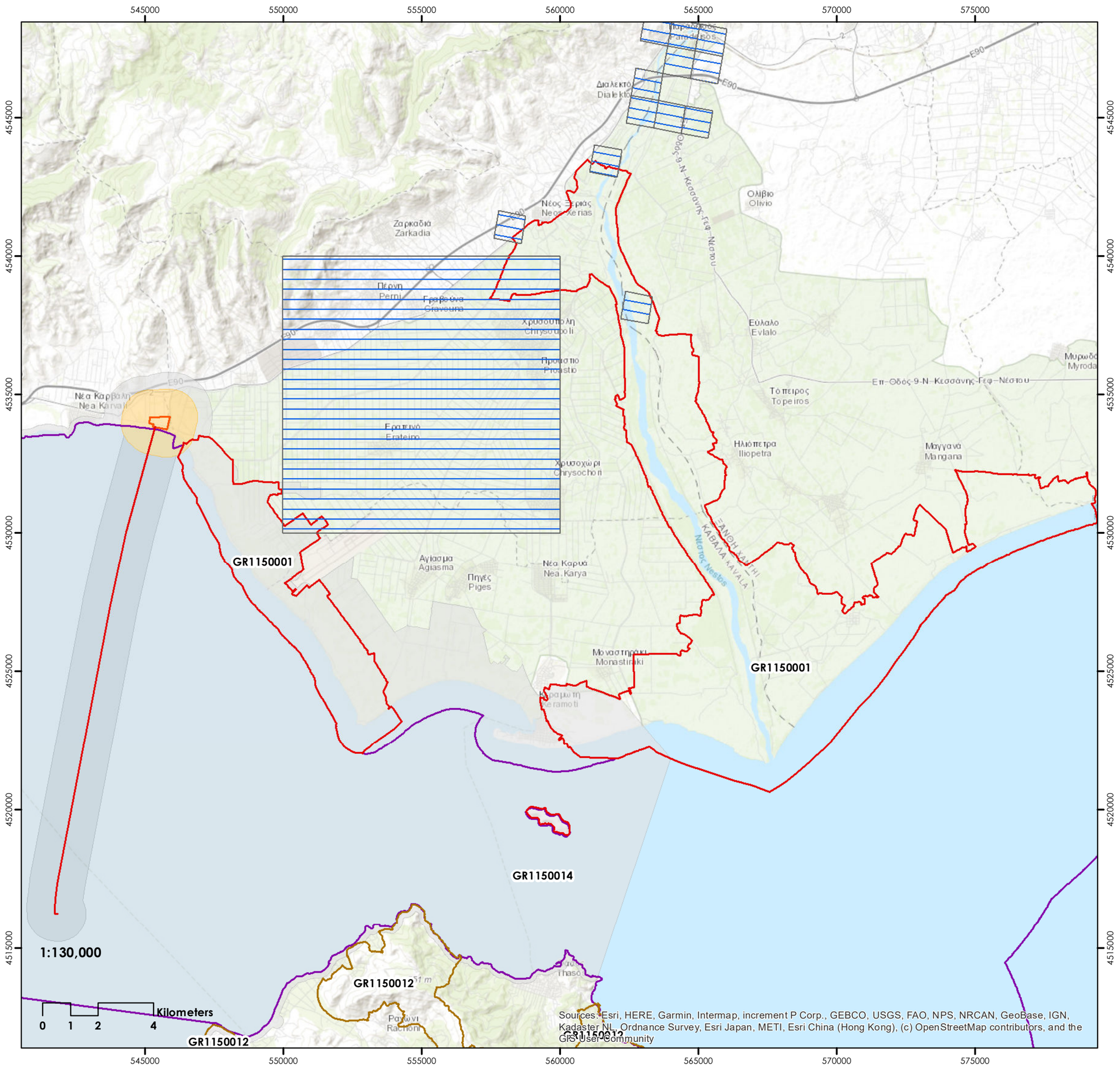
Υπόμνημα

Κατανομή αναπαραγόμενων πουλιών (Πηγή: Άτλαντας Αναπαραγόμενων Πουλιών της Ελλαδας, Ελληνική Ορνιθολογική Εταιρεία)

- ***Luscinia megarhynchos***
- ***Saxicola rubetra***
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2
- Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

- ΖΕΠ GR1150001
- ΖΕΠ GR1150012
- ΖΕΠ/ΕΖΔ GR1150014
- Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
- Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ



Υπόμνημα

Κατανομή ορνιθοπανίδας (ΕΡΓΟ: Εποπτεία και αξιολόγηση της ορνιθοπανίδας στην περιοχή αρμοδιότητας ου Φορέα Διαχείρισης Δέλτα Νέστου - Βιστωνίδας - Ισμαρίδας)

Passer hispaniolensis

Κατανομή αναπαραγόμενων πουλιών (Πηγή: Άτλαντας Αναπαραγόμενων Πουλιών της Ελλαδας, Ελληνική Ορνιθολογική Εταιρεία)

Passer hispaniolensis

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2

Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

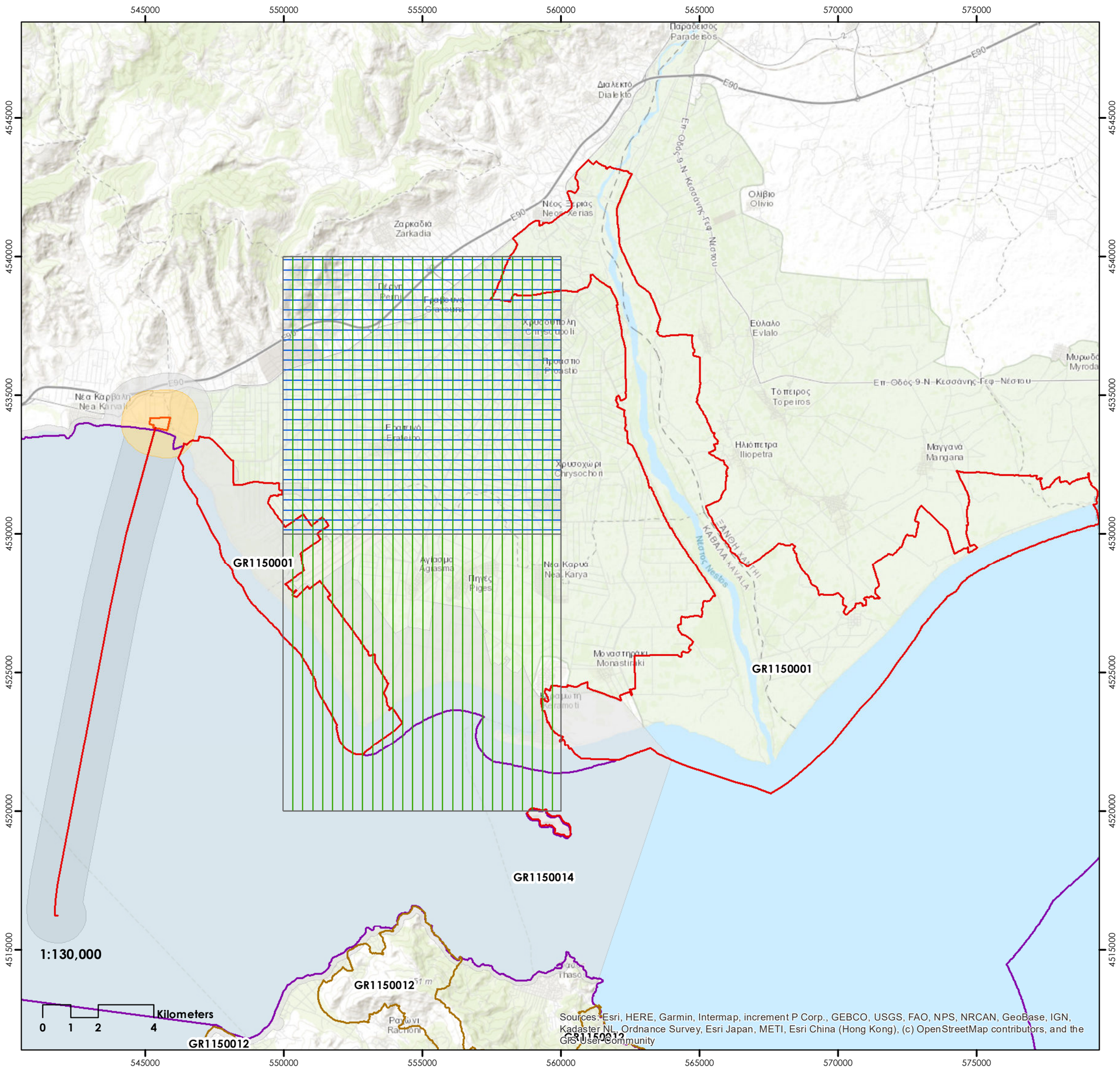
ΖΕΠ GR1150001

ΖΕΠ GR1150012

ΖΕΠ/ΕΖΔ GR1150014

Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2

Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ



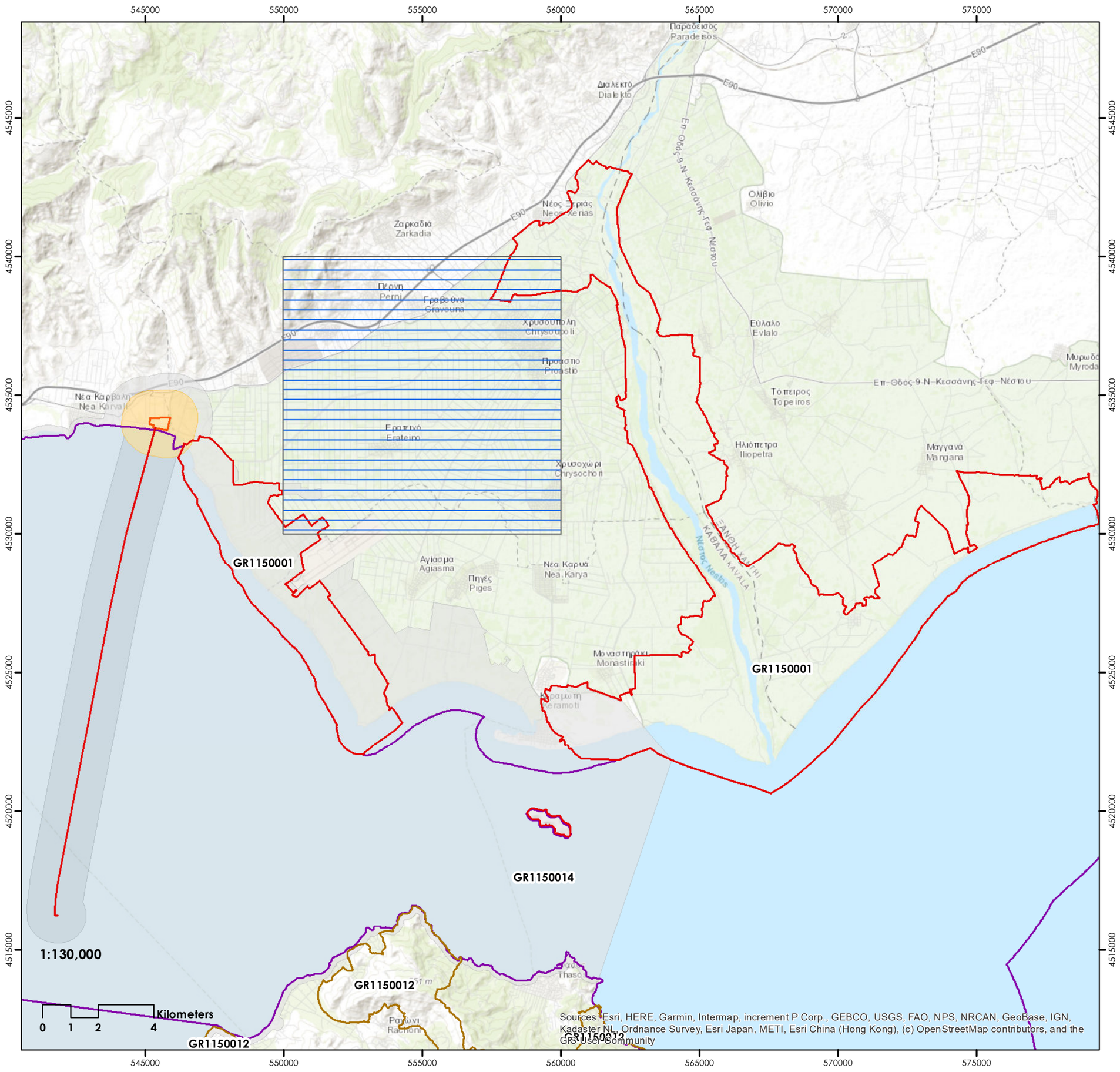
Υπόμνημα

Κατανομή αναπαραγόμενων πουλιών (Πηγή: Άτλαντας Αναπαραγόμενων Πουλιών της Ελλαδας, Ελληνική Ορνιθολογική Εταιρεία)

- ***Anthus pratensis***
- ***Motacilla flava***
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA
- Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2
- Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

- ΖΕΠ GR1150001
- ΖΕΠ GR1150012
- ΖΕΠ/ΕΖΔ GR1150014
- Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
- Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ



Υπόμνημα

Κατανομή αναπαραγόμενων πουλιών (Πηγή: Άτλαντας Αναπαραγόμενων Πουλιών της Ελλαδας, Ελληνική Ορνιθολογική Εταιρεία)

Emberiza melanocephala

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2

Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

ΖΕΠ GR1150001

ΖΕΠ GR1150012

ΖΕΠ/ΕΖΔ GR1150014

Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2

Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ

525000 530000 535000 540000 545000 550000 555000 560000

4535000 4530000 4525000 4520000 4515000 4510000 4505000 4500000

N

Αμυγδαλεώνας
Amygdaleonas

Χαλκερό
Chalkero

Νέα Καρβάλη
Nea Karvali

E90

Proastio

GR1150001

Ερατεινό
Erateino

Χρυσοχώρι
Chrysochori

Κοκκινόχωμα
Kokkinochoma

Αγία Φωτεινή
Agia Fotini

Καβάλα
Kavala

Παλιό
Palio

Αγίασμα
Agiasma

Πηγές
Piges

Νέα Καρυά
Nea Karya

GR1150001

Κόλπος Καβάλας
Kolpos Kavalas

Μοναστηράκι
Monastiraki

Ανδρέας
Andreas

Νέα Ηράκλεια
Nea Iraklitsa

Περαμωτή
Peramoti

GR1150001

GR1150014

Νέα Πέραμος
Nea Peramos

551 m

Ραχώνι
Rachoni

Πρίνος
Prinos

Σκάλα Σωτήρος
Skala Sotiros

Παναγιά
Panagia

Ποταμιά
Potamia

1172 m

Καλλιράχη
Kallirachi

GR1150012

Θεολόγος
Theologos

1:130,000

Kilometers
0 1 2 4

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Υπόμνημα

Phalacrocorax aristotelis desmarestii

- 1 - 2
- 3 - 7
- 8 - 16
- 17 - 32
- 33 - 49

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2

Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

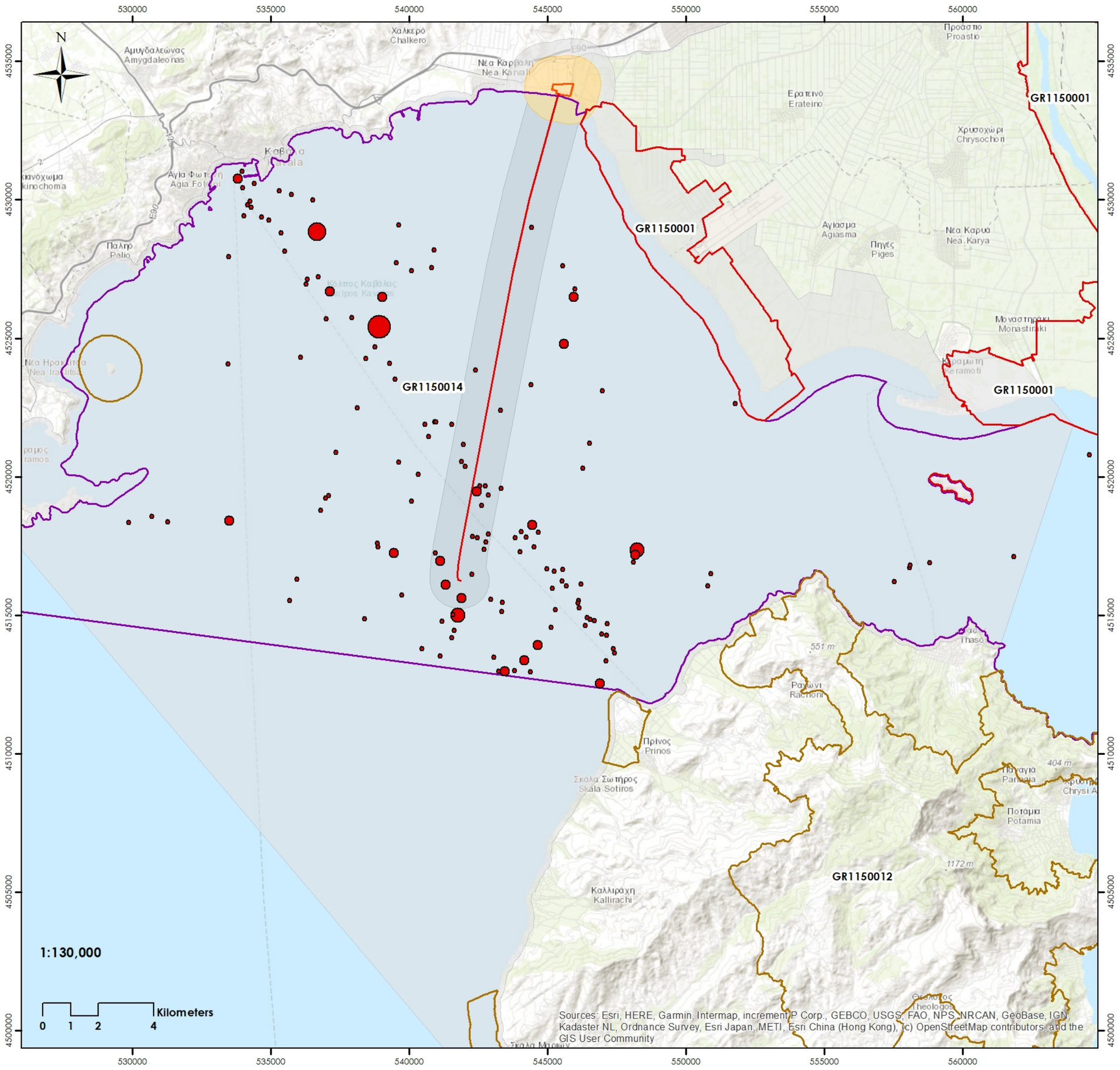
ΖΕΠ GR1150001

ΖΕΠ GR1150012

ΖΕΠ/ΕΖΔ GR1150014

Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2

Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ



Υπόμνημα

Puffinus yelkouan

- 1 - 3
- 4 - 9
- 10 - 31
- 32 - 58
- 59 - 285

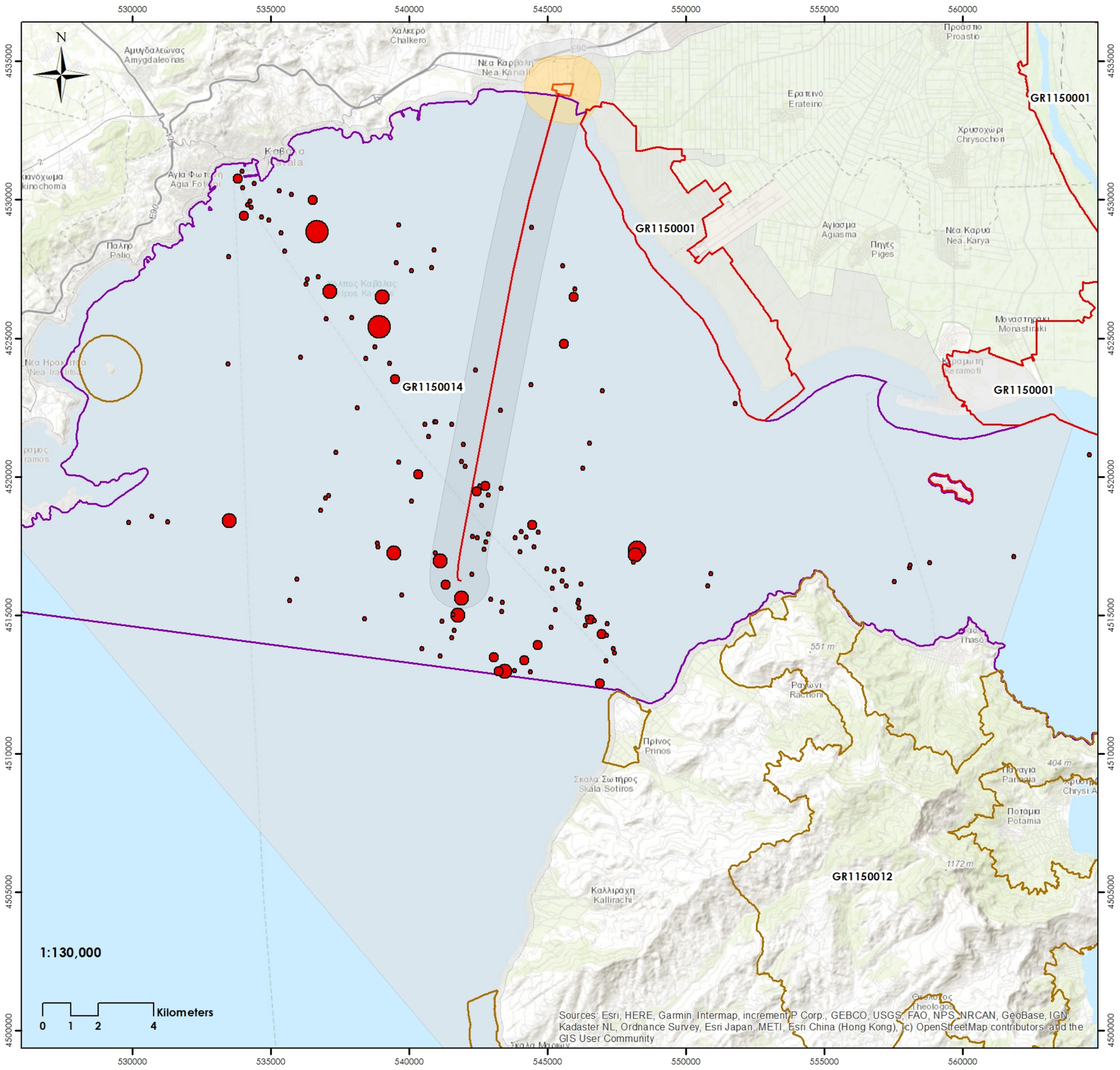
Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2

Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

- ΖΕΠ GR1150001
- ΖΕΠ GR1150012
- ΖΕΠ/ΕΖΔ GR1150014
- Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2
- Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ



Υπόμνημα

Calonectris diomedea s. str.

- 1 - 2
- 3 - 5
- 6 - 11
- 12 - 21
- 22 - 68

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2

Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

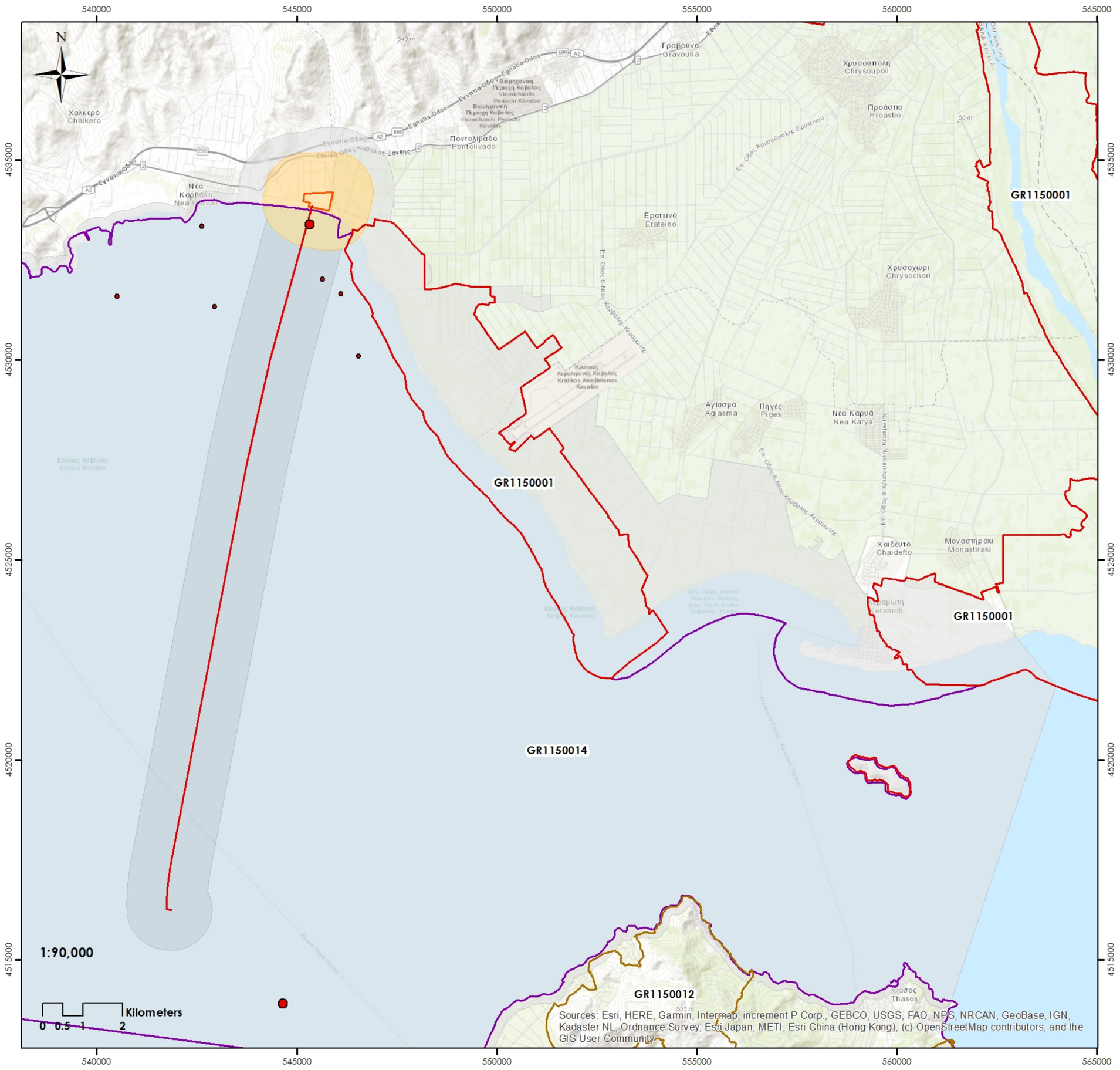
ΖΕΠ GR1150001

ΖΕΠ GR1150012

ΖΕΠ/ΕΖΔ GR1150014

Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2

Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ



Υπόμνημα

Stercorarius parasiticus

- 1
- 2

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2

Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

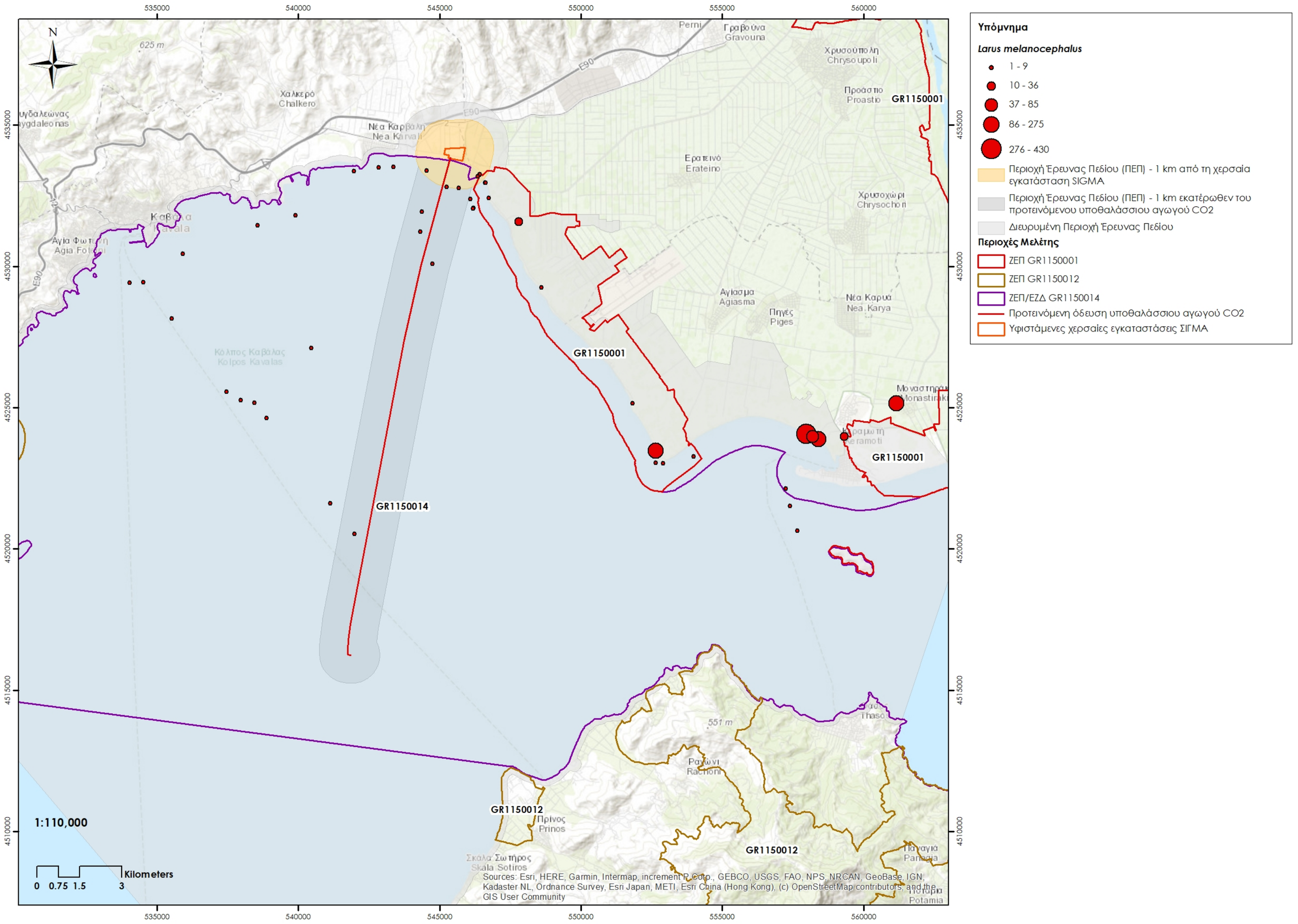
ΖΕΠ GR1150001

ΖΕΠ GR1150012

ΖΕΠ/ΕΖΔ GR1150014

Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2

Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ



Υπόμνημα

Larus melanocephalus

- 1 - 9
- 10 - 36
- 37 - 85
- 86 - 275
- 276 - 430

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2

Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

ΖΕΠ GR1150001

ΖΕΠ GR1150012

ΖΕΠ/ΕΖΔ GR1150014

Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2

Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ

535000 540000 545000 550000 555000 560000

4535000 4530000 4525000 4520000 4515000 4510000

N

625 m

Περνί
Γραβούνα
Gravouna
Χρυσούπολη
Chrysoupoli
Προάστιο
Proastio
E90
Χαλκερό
Chalkero
λεώνας
aleonas
Νέα Καρβάλη
Nea Karvali
Ερατεινό
Erateino
Χρυσοχώρι
Chrysochori
Καβάλα
Kavala
Αγία Φωτεινή
Agia Fotini
Αγίασμα
Agiasma
Πηγές
Piges
Νέα Καρυά
Nea Karya
Μοναστηράκι
Monastiraki
Κόλπος Καβάλας
Kolpos Kavalas
GR1150001
GR1150014
GR1150012
Θάσος
Thasos
551 m
Ραχώνι
Rachoni
Πρίνος
Prinos
Σκάλα Σωτήρος
Skala Sotiros
Παναγιά
Panagia
404
Potamia

1:110,000

0 0.75 1.5 3 Kilometers

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Υπόμνημα

Sterna hirundo

- 1 - 3
- 4 - 8
- 9 - 15
- 16 - 23
- 24 - 57

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2

Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

ΖΕΠ GR1150001

ΖΕΠ GR1150012

ΖΕΠ/ΕΖΔ GR1150014

Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2

Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ

535000 540000 545000 550000 555000 560000

4535000 4530000 4525000 4520000 4515000

N

625 m

GR1150001

GR1150014

GR1150012

1:90,000

0 0.5 1 2 Kilometers

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Υπόμνημα

Larus ridibundus

- 1 - 3
- 4 - 8
- 9 - 18
- 19 - 35
- 36 - 119

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km από τη χερσαία εγκατάσταση SIGMA

Περιοχή Έρευνας Πεδίου (ΠΕΠ) - 1 km εκατέρωθεν του προτεινόμενου υποθαλάσσιου αγωγού CO2

Διευρυμένη Περιοχή Έρευνας Πεδίου

Περιοχές Μελέτης

ΖΕΠ GR1150001

ΖΕΠ GR1150012

ΖΕΠ/ΕΖΔ GR1150014

Προτεινόμενη όδευση υποθαλάσσιου αγωγού CO2

Υφιστάμενες χερσαίες εγκαταστάσεις ΣΙΓΜΑ