LIST OF SPECIES IDENTIFIED IN BIOTIC MONITORING IN THE AREA OF INFLUENCE OF THE PUERTO BOLIVAR PROJECT

Terminology IUCN Red List Review

NOT EVALUATED	**NE**
DATA DEFICIENTE	**DD**
LAST CONCERN	**LC**
NEAR THREATENED	**NT**
VULNERABLE	**VU**
ENDANGERED	**EN**
CRITICALLY EDANGERED	**CR**
EXTINCT IN THE WILD	**EW**
EXTINCT	**EX**
NOT ASSIGNED	NA

IDENTIFICATION OF SPECIES AT BOLIVAR

BENTHOS OF SOFT BOTTOMS

	Phyllum	**Clase**	Family/Gender/specie	**Categoria Red List**
1	Artrópoda	Crustacea	*Camaron Sergestidae*	NA
2			*Callianassidae*	NA
3			*Ampelisca sp.*	NA
4			*Caprellidae*	NA
5			*Xanthidae*	NA
6			*Amphilocus sp.*	NA
7			*Alpheus sp.*	NA
8			*Cancer johngarthi*	NA
9			*Cronius ruber*	NA
10			*Diogenidae*	NA
11			*Cancridae*	NA
12	Mollusca	Scaphopoda	*Cadulus sp.*	NA
13		Bivalvia	*Crassinella pacifica*	NA
14			*Nuculana sp.*	NA
15			*Nuculana acrita*	NA
16			*Chione sp.*	NA
17			*Cardita laticostata*	NA
18			*Tellina insculpta*	NA
19			*Pitar helenae*	NA
20			*Cyclinella ulloana*	NA
21			*Tellina sp.*	NA
22			*Tellina esmeralda*	NA
23			*Crasinella varians*	NA
24			*Crasinella divaricata*	NA
25			*Mytilidae*	NA
26			*Corbula amethystina*	NA

27	Mollusca	Bivalvia	*Modiolus sp.*	NA
28			*Crassostrea sp.*	NA
29		Gastropoda	*Polinices gray*	NA
30			*Kurtzia sp.*	NA
31			*Nassarius versicolor*	NA
32			*Nudibranquio*	NA
33			*Cosmiconcha redheri*	NA
34			*Olivella sp.*	NA
35			*Acteocina infrequens*	NA
36			*Olivella redheri*	NA
37			*Erato sp.*	NA
38			*Polinices uber*	NA
39			*Anachis sp.*	NA
40			*Acteon sp.*	NA
41	Echinodermata	Holoturidae	*Holoturia*	NA
42		Ophiuroidea	*Ophioderma panamense*	NA
43			*Ophiothrix sp.*	NA
44	Cnidaria	Anthozoa	*Actinia*	NA
45	Nemertea		*Nemertino*	NA
46	Anellida	Polychaeta	*Sabellidae*	NA
47			*Hesionidae*	NA
48			*Capitellidae*	NA
49			*Nereidae sp 1*	NA
50			*Nereidae sp 2*	NA
51			*Paraonidae*	NA
52			*Gonionidae*	NA
53			*Sternaspidae*	NA
54	Anellida	Polychaeta	*Cossura sp*	NA
55			*Nephthys singularis*	NA
56			*Nereis succinea*	NA
57			*Nephthys sp.*	NA
58			*Syllis elongata*	NA
59			*Diopatra tridentata*	NA
60			*Glyceridae*	NA
61			*Notomastus magnus*	NA
62			*Prionospio*	NA
63			*Sthenelais fusca*	NA
64			*Lumbrineridae*	NA
65			*Phillodocidae*	NA
66			*Euclimene sp.*	NA
67	Sipuncuda		*Sipuncula*	NA
68	Priapulia		*Priapulus*	NA
69	Plathelmintes		*Turbellaria*	NA

IDENTIFICATION OF SPECIES AT BOLIVAR

PHYTOPLANKTON

	specie		Category Red List
1	Bacillariophyta, Diatomeas	*Achnantes longipes*	NA
2		*Actinoptychus splendes*	NA
3		*Amphipleura sp*	NA
4		*Amphora sp*	NA
5		*Amphorelopsis sp*	NA
6		*Asterionella kariana*	NA
7		*Asterionellopsis sp*	NA
8		*Atheta sp*	DD
9		*Aulacodiscus sp*	NA
10		*Aulacodiscus kittoni*	NA
11		*Bacteriastrum elegans*	NA
12		*Bacteriastrum hyalinum*	NA
13		*Bacteriastrum sp*	NA
14		*Bacteristrum elegans*	NA
15		*Bidulphia alternans*	NA
16		*Bidulphia longicruris*	NA
17		*Bidulphia mobiliensis*	NA
18		*Bidulphia regia*	NA
19		*Bidulphia sinensis*	NA
20		*Bidulphia sp*	NA
21		*Caloneis sp*	NA
22		*Cerataulina sp*	NA
23		*Chaetoceros affinis*	NA
24		*Chaetoceros costatus*	NA
25		*Chaetoceros curvisetus*	NA
26	Bacillariophyta, Diatomeas	*Chaetoceros eibenu*	NA
27		*Chaetoceros gracilis*	NA
28		*Chaetoceros peruvianus*	NA
29		*Chaetoceros sp*	NA
30		*Chaetoceros subsecundus*	NA
31		*Ciclotella sp*	NA
32		*Cylindrotheca sp*	NA
33		*Climacodium sp*	NA
34		*Coconeis sp*	NA
35		*Corethron sp*	NA
36		*Coscinodiscus centralis*	NA
37		*Coscinodiscus excentricus*	NA
38		*Coscinodiscus granii*	NA
39		*Coscinodiscus granu*	NA
40		*Coscinodiscus lineatus*	NA
41		*Coscinodiscus nitidus*	NA
42		*Coscinodiscus radiatus*	NA
43		*Coscinodiscus sp*	NA
44		*Coscinosira polychorda*	NA

46		*Cymbella sp*	NA
47		*Detonulla sp*	NA
48		*Dictyocha octonaria*	NA
49		*Dictyota fibula*	NA
50		*Diploneis bombus*	NA
51		*Diploneis sp*	NA
52		*Diploneis sp2*	NA
53		*Ditylum sp*	NA
54		*Dytilum brigthwellu*	NA
55		*Ebria antigua*	NA
56		*Eucampia sp*	NA
57		*Eucampia zodiacus*	NA
58		*Eunotia sp*	NA
59		*Fragilaria sp*	NA
60		*Girosigma sp*	NA
61		*Gosleriella tropica*	NA
62		*Guinardia sp*	NA
63		*Guinardia delicatula*	NA
64		*Hemiaulus sinensis*	NA
65		*Hemiaulus sp*	NA
66	Bacillariophyta, Diatomeas	*Hemiaulus sp 2*	NA
68		*Lauderia borealis*	NA
70		*Leptocilindricum danicum*	NA
72		*Lithodesmiun undulatum*	NA
73		*Melosira sp*	NA
74		*Melosira sp2*	NA
75		*Navicula sp1*	NA
76		*Navicula gravilleana*	NA
77		*Navicula sp2*	NA
78		*Navicula sp3*	NA
79		*Nitzschia closterium*	NA
81		*Nitzschia longissima*	NA
82		*Nitzschia pungens*	NA
83		*Nitzschia sp1*	NA
84		*Nitzschia sp2*	NA
85		*Nitzschia sp3*	NA
86		*Nitzschia sp4*	NA
87		*Nitzschia sp5*	NA
88		*Octaria sp*	NA
89		*Odontella sp*	NA
90		*Ophephora pacifica*	NA
91		*Pinnularia sp*	NA
92		*Pinnularia sp2*	NA
93		*Pixidicula cruciata*	NA
94		*Pixidicula sp*	NA
95		*Pleurosigma angulatum*	NA
96		*Pleurosigma sp1*	NA
97		*Pleurosigma sp2*	NA
98	Bacillariophyta, Diatomeas	*Pseudonitzschia sp*	NA
99		*Pseudonitzschia sp2*	NA

100		*Pseudonoetia doliolus*	NA
101		*Rhizosolenia acuminata*	NA
102		*Rhizosolenia alata*	NA
103		*Rhizosolenia calcar*	NA
104		*Rhizosolenia delicatula*	NA
105		*Rhizosolenia hebetata*	NA
106		*Rhizosolenia hyalina*	NA
107		*Rhizosolenia imbricata*	NA
108		*Rhizosolenia setigera*	NA
109		*Rhizosolenia stotelforthu*	NA
110		*Skeletonema costatum*	NA
111		*Stauroneis sp*	NA
112		*Stephanopixis turris*	NA
113	Bacillariophyta, Diatomeas	*Synedra sp*	NA
114		*Surirella sp*	NA
115		*Tabellaria sp*	NA
116		*Thallasionema nitzschoides*	NA
117		*Thallasiosira subtilis*	NA
118		*Thallasiotrix fraenfeldu*	NA
119		*Thallasiotrix heteromorpha*	NA
120		*Thallasiotrix mediterranea*	NA
121		*Trachineis sp*	NA
122		*Triceratium sp*	NA
123	Myozoa, Dinoflagellata	*Tropidoneis sp*	NA
124		*Amphisolenia sp*	NA
125		*Ceratiom trichoceros*	NA
126		*Ceratium breve*	NA
127		*Ceratium candelabrum*	NA
128		*Ceratium dens*	NA
129		*Ceratium deflexum*	NA
130		*Ceratium declinatum*	NA
131		*Ceratium falcatiforme*	NA
132		*Ceratium furca*	NA
133		*Ceratium fusus*	NA
134		*Ceratium gravidum*	NA
135		*Ceratium gibberum*	NA
136		*Ceratium massiliense*	NA
137		*Ceratium sp*	NA
138		*Ceratium teres*	NA
139		*Ciliado nn*	NA
140		*Dinophisis caudata*	NA
141		*Dinophysis sp*	NA
142		*Favella sp*	NA
143		*Foraminifero 1*	NA
144		*Gonyaulux diagoses*	NA
145		*Mesodinium rubrum*	NA
146		*Noctiluca scintillnas*	NA
147		*Prorocentrum lima*	NA
148		*Prorocentrum micans*	NA
149		*Prorocentrum sp*	NA

150	Myozoa, Dinoflagellata	*Protoperidinium brochi*	NA
151		*Protoperidinium claudicans*	NA
152		*Protoperidinium conicum*	NA
153		*Protoperidinium divergens*	NA
154		*Protoperidinium latispinum*	NA
155		*Protoperidinium oblongum*	NA
156		*Protoperidinium oceanicum*	NA
157		*Protoperidinium pentagonum*	NA
158		*Protoperidinium quarenense*	NA
159		*Protoperidinium simulum*	NA
160		*Protoperidinium sp*	NA
161		*Protoperidinium sp2*	NA
162		*Protoperidinium sp3*	NA
164		*Protoperidinium steinii*	NA
165		*Pyrophacus steini*	NA
166		*Radiolario*	NA
167		*Spx*	NA
168	Myozoa, Dinoflagellata	*Sp z*	NA
169		*Sp y*	NA
170	Cyanophyta	*Anabaena sp*	NA
171		*Aphanizomenon sp*	NA
172		*Cosmarium*	NA
173		*Cyanophyta 1*	NA
174		*Cyanophyta 2*	NA
175		*Melosira sp*	NA
177		*Monoraphidium sp*	NA
178		*Noctiluca*	NA
179		*Noctiluca scintillans*	NA
180		*No identificado (espirales)*	NA
181		*Oscillatoria sp*	NA
182	Protozoa	*Closterium sp*	NA
183		*Amphorelopsis sp*	NA
184		*Ciliophora*	NA
185		*Cibidus sp*	NA
186		*Cocolitoforido*	NA
187		*Cocolitoforido 2*	NA
188		*Codolenopsis sp*	NA
189		*Eutintinus sp*	NA
190		*Favella*	NA
191		*Globoquadrina sp*	NA
192		*Hemicostonella longa*	NA
194		*No identificado 1*	NA
195		*No identificado 2*	NA
196		*Nonionella sp*	NA
197		*Uvigerina (cocolitoforido)*	NA

IDENTIFICATION OF SPECIES AT BOLIVAR

ICTIOFAUNA

	Comon Name	Scientific name	Category Red List
1	Aguja	*Strongilurus scapularis*	NA
2	Anchoa amarilla	*Anchoa eingenmannia*	NA
3	Anguila	*Echiopis brunneus*	NA
4	Bagre	*Arius sp*	NA
5	Bagre Boquilla	*Cathrorops steindachneri*	NA
6	Bagre colorado	*Sciadeops troschelii*	NA
7	Bagre nangui	*Arius keslerii*	NA
8	Bagre Picalon	*Arius platypogon*	NA
9	Bagre Plumero	*Bagre pinnimaculatus*	NA
10	Burro	*Caranx caballus*	LC
11	Caballito de mar	*Hippocampus ingens*	VU
12	Cabezudo	*Caulolatilus affinis*	LC
13	Camotillo fino	*Diplectrum pacificum*	LC
14	Canchimala	*Arius seemanni*	LC
15	Carduma	*Cetengraulis mysticetus*	LC
16	Carita	*Selene peruviana*	LC
17	Carita jorobada	*Selene brevoortii*	LC
18	Chaparra ojona	*Opisthopterus macrops*	LC
19	Chaparra machete	*Ilisha fuerthii*	LC
20	Chaparra pelada	*Pliotestoma lutipinnis*	NA
21	Chaparra plateada	*Opishtoperus dovii*	NA
22	Chavela/Leonor	*Chaetodipterus zonatus*	LC
23	Chuhueco amarillo	*Anchoa spinifer*	LC
24	Corvina amarilla	*Cynoscion albus*	DD
25	Corvina cachema	*Scinoscion analis*	NA
26	Corvina cajero	*Larimus pacificus*	LC
27	Corvina negra	*Odontoscion xanthops*	LC
28	Corvina Paiteña	*Cynoscion nortoni*	DD
29	Corvinilla	*Corvula macrops*	DD
30	Gallinazo cholo	*Peprilus snyderi*	LC
31	Gallinazo común	*Peprilus medius*	LC
32	Gallineta Alilarga ojona	*Prionotus stephanophrys*	LC
33	Gallineta Erizada	*Prionotus horrens*	LC
34	Gallineta rojiverde	*Prionotus ruscarius*	LC
35	Guapuro amarillo	*Polydactylus opercularis*	LC
36	Guapuro azul	*Polydactylus approximans*	LC
37	Guaraboya tapadera	*Trinectes foncesencis*	NA
38	Guardaboya mulata	*Achirus mazatlanus*	LC
39	Guardaboya pintada	*Achirus scutum*	LC
40	Guavina cañadulce	*Synodus scituliceps*	LC
41	Guitarra plana	*Rhinobatos planiceps*	VU
42	Hojita	*Chloroscombrus orqueta*	LC
43	Jaiba roja		NA
44	Jaivas	*Callinectes sp*	NA

45	Langosta verde	*Panulirus gracilis*	DD
46	Langostino	*Peneaus vanamei*	NA
47	Lenguado cuatro ojos	*Hippoglossina tetraphthalma*	NA
48	Lenguado Alimanchado	*Cyclopsetta panamensis*	LC
49	Lenguado tres ojos	*Ancylopsetta dendritica*	LC
50	Lenguado zapata	*Cyclopsetta querna*	LC
51	Lengüeta morena	*Symphurus chabanauide*	NA
52	Lisa	*Mugil cephalus*	NA
53	Lisa saltona	*Albula vulpes*	NT
54	Mero cabrilla	*Epinephelus analogus*	LC
55	Mojarra leiro	*Eucinostomus gracilis*	LC
56	Mojarra pedorra	*Diapterus peruviana*	NA
57	Mojarra rayada	*Gerres cinereus*	LC
58	Mulatillo Ronco peña	*Abudefduf concolor*	LC
59	Ñato con barba	*Ctenosciaena peruviana*	DD
60	Pampano chazo	*Trachinotus paitensis*	LC
61	Pejerrey	*Membras gilberti*	LC
62	Pejesapo	*Lophiodis caulinaris*	NA
63	Pinchagua	*Ophistonema libertate*	NA
64	Polla negra	*Ophioscion vermicularis*	LC
65	Posonga	*Chronis intercrusma*	NA
66	Ratón negro	*Menticirrhus panamensis*	LC
67	Raton ñato	*Paralonchurus peruanus*	LC
68	Ratón rayado	*Paralonchurus dumerilii*	LC
69	Raya espinosa	*Utrigon rogersi*	NA
70	Raya espinuda	*Raja equatorialis*	VU
71	Raya pecosa	*Raja sp2*	NA
72	Roncador	*Hemiaulus sp*	NA
73	Roncador Rayado	*Anisostremos dovi*	NA
74	Roncador ruco	*Pomadasys macracanthus*	LC
75	Roncador sol	*Microlepidotus brevipinni*	LC
76	Sierra	*Scomberomorus sierra*	LC
77	Suela	*Solea sp*	NA
78	Tamborero	*Spheroides annulatus*	NA
79	Tilapia	*Oreochromis sp*	LC
80	Voladora mascapalo	*Oligopites saurus*	NA
81	Voladora paloma	*Oligoplites altus*	NA

IDENTIFICATION OF SPECIES AT BOLIVAR

INTERTIDAL INVERTEBRATES

	Comon Name	Scientific name	Category
1	Bivalvia	*Anadara tuberculosa*	NA
2		*Mytella guyanensis*	NA
3		*Anadara similis*	NA
4		*Protothaca asperrima*	NA
5		*Ostra*	NA
6		*Anadara grandis*	NA
7		*Chione subrugosa*	NA
8		*Nuculana sp*	NA
9		*Macoma grandis*	NA
10		*Tellina insculpta*	NA
11		*Phlyctiderma sp*	NA
12		*Pitar paytensis*	NA
13		*Almeja #5*	NA
14		*Phlyctiderma sp*	NA
15		*Strigila disjuncta*	NA
16		*Donax dentifer*	NA
17		*Solecurtus ap*	NA
18		*Corbula amethysina*	NA
19		*Anadara adamsi*	NA
20		*Donax mancorensis*	NA
21		*Tellina sp*	NA
22		*Pitar rosada*	NA
23		*Polymesoda sp*	LC
24		*Cichynella*	NA
25		*Tellina esmeralda*	NA
26		*Crasinella sp*	NA
27		*Barbatia sp*	NA
28	Gasteropoda	*Kurtziella*	NA
29		*Polinices uber*	NA
30		*Nassarius versicolor*	NA
31		*Nassarius sp*	NA
32		*Crucibulum*	NA
33		*Anachis sp*	NA
34		*Natica sp*	NA
35	Sipunculida	*Sipunculida*	NA
36	Asteroidae	*Encope*	NA
37	Echinidae	*Echinus melo*	NA
38	Ophiuridae	*ophiuridae1*	NA
39		*ophiuridae 2*	NA
40		*Arenicola*	NA
41		*Capitellidae*	NA
42		*Poliqueto 3 gliceridae*	NA
43		*Poliqueto 4*	NA
44		*Poliqueto 2*	NA

45	Polichaeta	*Gliceridae*	NA
46		*Tubo poliqueto quitinoso*	NA
47		*Onuphidae*	NA
48		*Poliqueto 6*	NA
49		*Poliqueto 8*	NA
50		*Pharaonidae*	NA
51		*Nereidae*	NA
52	Cnidaria	*Anthozoa*	NA
53	Malacostraca	*Hippidae*	NA
54		*Hermitaño*	NA
55	Malacostraca	*Uca sp1*	NA
56		*Calichirus major*	NA
57		*Callaniasidae*	NA
58		*Menipe sp*	NA
59		*Parthenopidae*	NA
60		*Cangrejo 1*	NA
61		*Isopoda*	CR
62		*Cangrejo 2*	NA
63		*Petrolisthes*	NA
64		*Callinectes sp*	NA
65		*Goniopsis pulchra*	NA
66		*Camaron sp1*	NA
67		*Alphaeus sp*	NA
68		*Ucides occidentalis*	NA
69	Brachiopoda	*Lingulidae*	NA
70	Plathelminthes	*Planaria*	NA
71	Nemertea	*Nemertino*	NA

IDENTIFICATION OF SPECIES AT BOLIVAR

ZOOPLANCTON 300

	Phyllum	Superclass/Class	***Tipe***	**Categ. Red list**
1	Arthopoda	Maxillopoda	*Copépoda calanoidea*	NA
2			*Copépoda sp 2*	NA
3			*Copépoda sp 3*	NA
4			*Copépodo sp 4*	NA
5			*Larva cipris (cirripedia)*	NA
6			*Cirripedia*	NA
7		Malacostraca	*Larva decapoda*	NA
8			*Larva de camarón*	NA
9			*Amphipoda sp1*	NA
10			*Amphipoda sp2*	NA
11			*Amphipoda sp3*	NA
12			*Amphipoda sp4*	NA
13			*arva Stomatopoda (Hoplocarida*	NA
14			*Larva Brachiura (cangrejo)*	NA
15			*Mysidasea*	NA
16			*Juvenil Brachiura*	NA
17			*Euphausiacea*	NA
18			*Larva Sergestidae*	NA
19		Ostracoda	*Ostracodos*	NA
20	Chaetognata	Sagittoidea	*Chaetognato 1*	NA
21			*Chaetognato 2*	NA
22			*Chaetognato 3*	NA
23	Chordata	Appendicularia	*Appendicularia*	NA
24		Thaliacea	*Salpida*	NA
25			*Doliolida*	NA
26			*no identificado*	NA
27		Actinopterygii	*Larva de pez 1 Carangidae*	NA
28			*Larva de pez 2*	NA
29			*Larva de pez 3*	NA
30			*Larva de pez 4*	NA
31			*Huevo pez tipo 1*	NA
32			*Huevo pez tipo 2*	NA
33			*Huevo pez tipo 3*	NA
34			*Huevo pez tipo 4*	NA
35	Cnidaria	Hydrozoa	*Hidromedusa 1*	NA
36			*Hidromedusa 2*	NA
37			*Hidromedusa 3*	NA
38			*Hidromedusa 4*	NA
39	Annellida	Polychaeta	*Poliqueto 1*	NA
40			*Poliqueto 2*	NA
41			*Larva de poliqueto 1*	NA
42			*Larva de poliqueto 2*	NA
43			*Larva poliqueto 3*	NA
44			*Larva poliqueto 4*	NA

45	Mollusca	Gastropoda	*Juvenil Gastropodo*	NA
46		Bivalvia	*Juvenil bivalvo*	NA
47		Cephalopoda	*Juvenil pulpo*	NA
48	Echinodermata	Echinidae	*Larva equinopluteus*	NA

IDENTIFICATION OF SPECIES AT BOLIVAR

ZOOPLANCTON 500

	Phyllum	Superclass/Class	***Tipe***	**Categ. Red List**
1	Arthropoda	Maxillopoda	*Copépodo 1*	NA
2			*Copépodo 2*	NA
3			*Copépodo 3*	NA
4			*Copépodo 4*	NA
5			*Balanidae*	NA
6			*Larva cipris*	NA
7		Malacostraca	*Larva decapoda*	NA
8			*Larva de camarón*	NA
9			*Amphipoda sp1*	NA
10			*Amphipoda sp2*	NA
11			*Ampelisca sp*	NA
12			*Larva Stomatopoda*	NA
13			*Larva de Brachiuro*	NA
14			*Larva Mysidasea*	NA
15			*Juvenil camaron 2*	NA
16			*Juvenil Brachiuro*	NA
17			*Larva Alphaeus*	NA
18			*Larva Sergestidae*	NA
19			*Larva Eufausido*	NA
20	Chaetognata	Saggitoidea	*Chaetognato 1*	NA
21			*Chaetognato 2*	NA
22			*Chaetognato 3*	NA
23	Annellida	Polychaeta	*Poliqueto*	NA
24			*larva Poliqueto*	NA
25			*larva poliqueto 2*	NA
26	Cordata	Appendicularia	*Appendicularia*	NA
27		Thaliacea	*Doliolida*	NA
28			*Bráctea*	NA
29			*Salpida*	NA
30		Actinopterygii	*Larva de pez 1*	NA
31			*Larva de pez 2*	NA
32			*Larva de pez 3*	NA
33			*Larva de pez 4*	NA
34			*Larva de pez 5*	NA
35			*Larva de pez 6*	NA
36			*Huevo pez tipo 1*	NA
37			*Huevo pez tipo 2*	NA
38			*Huevo pez tipo 3*	NA
39			*Huevo pez tipo 4*	NA
40			*Embrión pez tipo 3*	NA
41			*Larva pez suela*	NA
42	Ctenofora	Scleroptenophora	*Ctenoforo*	NA
43			*Hidromedusa 1*	NA
44			*Hidromedusa 2*	NA

45	Cnidaria	Hydrozoa	*Hidromedusa 3*	NA
46			*Hidromedusa 4*	NA
47			*Hidromedusa 5*	NA
48		Sciphozoa	*Stomolophus meleagris*	NA
49	Annellida	Polychaeta	*Poliqueto 1*	NA
50			*Poliqueto 2*	NA
51			*Poliqueto 3*	NA
52			*Poliqueto 4*	NA
53			*Larva de poliqueto*	NA
54			*Larva de poliqueto 2*	NA
55	Mollusca	Gastropoda	*Juvenil Gastropodo*	NA
56		Bivalvia	*Juvenil bivalvo*	NA
57		Cephalopoda	*Juvenil pulpo*	NA
58	Echinodermata	Echinidae	*Larva equinopluteus*	NA
59		Ophiuroidae	*Juvenil ofiuro*	NA
60		Asteroidea	*Asteroideo*	NA

Integrated Biodiversity Assessment Tool

World Bank Group Biodiversity Risk Screen

EXPANSIÓN PUERTO BOLÍVAR - FASE 1

- **Country:** Ecuador
- **Location:** [-3.2, -80]
- **Created by:** Natalia Ponton

Overlaps with:

Protected Areas	1 km: **0**	10 km: **0**	50 km: **6**	**6**
World Heritage (WH)	1 km: **0**	10 km: **0**	50 km: **0**	**0**
Key Biodiversity Areas	1 km: **1**	10 km: **0**	50 km: **5**	**6**
Alliance for Zero Extinction (AZE)	1 km: **0**	10 km: **0**	50 km: **0**	**0**
IUCN Red List				35
Critical Habitat				Likely

Displaying project location and buffers: 1 km, 10 km, 50 km

WORLD BANK GROUP

This report is based on IFC Performance Standard 6 (PS6) but applies to World Bank Environmental and Social Standard 6 (ESS6)

About this report

The recommendations stated alongside any Protected Areas and Key Biodiversity Areas identified in this report are determined by the following:

Protected Areas:

- 'Highest risk. Seek expert help' is stated if the report identifies a designation that includes either 'natural' or 'mixed world heritage site'.
- 'Assess for Critical Habitat' is stated if the report identifies a Strict Nature Reserve, Wilderness Area or National Park as coded by IUCN protected area categories Ia, Ib and II.
- 'Assess for biodiversity risk' is stated if the report identifies any other type of protected area.

Key Biodiversity Areas:

- 'Highest risk. Seek expert help' is stated if the report identifies an Alliance for Zero Extinction site.
- 'Assess for Critical Habitat' is stated if the report identifies Critically Endangered or Endangered species OR species with restricted ranges OR congregatory species as coded in the IUCN Red List of Threatened Species.
- 'Assess for biodiversity risk' is stated if the report identifies any other type of Key Biodiversity Area.

IBAT provides initial screening for Critical Habitat values. Performance Standard 6 (PS6) defines these values for Critical Habitat (PS6: para. 16) and legally protected and internationally recognized areas (PS6: para. 20). PS6 will be triggered when IFC client activities are located in modified habitats containing "significant biodiversity value," natural habitats, Critical Habitats, legally protected areas, or areas that are internationally recognized for biodiversity. References to PS6 and Guidance Note 6 (GN6) are provided to guide further assessment and detailed definitions where necessary. Please see https://www.ifc.org/ps6 for full details on PS6 and GN6.

The report screens for known risks within a standard 50km buffer of the coordinates used for analysis. This buffer is not intended to indicate the area of impact. The report can be used to:

- Scope risks to include within an assessment of risks and impacts
- Identify gaps within an existing assessment of risks and impacts
- Prioritize between sites in a portfolio for further assessment of risks and impacts
- Inform a preliminary determination of Critical Habitat
- Assess the need for engaging a biodiversity specialist
- Identify additional conservation experts or organizations to inform further assessment or planning

WARNING: IBAT aims to provide the most up-to-date and accurate information available at the time of analysis. There is however a possibility of incomplete, incorrect or out-of-date information. All findings in this report must be supported by further desktop review, consultation with experts and/or on-the-ground field assessment as described in PS6 and GN6. Please consult IBAT for any additional disclaimers or recommendations applicable to the information used to generate this report.

Please note, sensitive species data are currently not included in IBAT reports in line with the Sensitive Data Access Restrictions Policy for the IUCN Red List. This relates to sensitive Threatened species and KBAs triggered by sensitive species.

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Priority Species

Habitat of significant importance to priority species will trigger Critical Habitat status (See PS6: para 16). IBAT provides a preliminary list of priority species that could occur within the 50km buffer. This list is drawn from the IUCN Red List of Threatened Species (IUCN RL). This list should be used to guide any further assessment, with the aim of confirming knownor likely occurrence of these species within the project area. It is also possible that further assessment may confirm occurrence of additional priority species not listed here. It is strongly encouraged that any new species information collected by the project be shared with species experts and/or IUCN wherever possible in order to improve IUCN datasets.

IUCN Red List of Threatened Species - CR & EN

The following species are potentially found within 50km of the area of interest.
For the full IUCN Red List please refer to the associated csv in the report folder.

Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Cebus aequatorialis	Ecuadorian White-fronted Capuchin	MAMMALIA	CR	Decreasing	Terrestrial
Sphyrna lewini	Scalloped Hammerhead	CHONDRICHTHYES	CR	Decreasing	Marine
Sphyrna mokarran	Great Hammerhead	CHONDRICHTHYES	CR	Decreasing	Marine
Squatina armata	Chilean Angelshark	CHONDRICHTHYES	CR	Decreasing	Marine
Sphyrna corona	Scalloped Bonnethead	CHONDRICHTHYES	CR	Decreasing	Marine
Sphyrna media	Scoophead Shark	CHONDRICHTHYES	CR	Decreasing	Marine
Tantilla insulamontana	Mountain Centipede Snake	REPTILIA	CR	Unknown	Terrestrial
Pristis pristis	Largetooth Sawfish	CHONDRICHTHYES	CR	Decreasing	Marine, Freshwater

Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Pterodroma phaeopygia	Galapagos Petrel	AVES	CR	Decreasing	Terrestrial, Marine
Phoebastria irrorata	Waved Albatross	AVES	CR	Decreasing	Terrestrial, Marine
Amazona lilacina	Lilacine Amazon	AVES	CR	Decreasing	Terrestrial
Disterigma micranthum		MAGNOLIOPSIDA	CR	Unknown	Terrestrial
Carcharhinus cerdale	Pacific Smalltail Shark	CHONDRICHTHYES	CR	Decreasing	Marine
Cetorhinus maximus	Basking Shark	CHONDRICHTHYES	EN	Decreasing	Marine
Chelonia mydas	Green Turtle	REPTILIA	EN	Decreasing	Terrestrial, Marine
Rhincodon typus	Whale Shark	CHONDRICHTHYES	EN	Decreasing	Marine
Sphyrna tiburo	Bonnethead Shark	CHONDRICHTHYES	EN	Decreasing	Marine
Rhaebo caeruleostictus	Blue-spotted Toad	AMPHIBIA	EN	Decreasing	Terrestrial, Freshwater
Mobula thurstoni	Bentfin Devilray	CHONDRICHTHYES	EN	Decreasing	Marine
Nasolamia velox	Whitenose Shark	CHONDRICHTHYES	EN	Decreasing	Marine
Alopias pelagicus	Pelagic Thresher	CHONDRICHTHYES	EN	Decreasing	Marine

Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Isostichopus fuscus	Brown Sea Cucumber	HOLOTHUROIDEA	EN	Decreasing	Marine
Mobula birostris	Giant Manta Ray	CHONDRICHTHYES	EN	Decreasing	Marine
Penelope albipennis	White-winged Guan	AVES	EN	Stable	Terrestrial
Pyrrhura orcesi	El Oro Parakeet	AVES	EN	Decreasing	Terrestrial
Brotogeris pyrrhoptera	Grey-cheeked Parakeet	AVES	EN	Decreasing	Terrestrial
Metallura baroni	Violet-throated Metaltail	AVES	EN	Decreasing	Terrestrial
Sternula lorata	Peruvian Tern	AVES	EN	Decreasing	Terrestrial, Marine
Pseudastur occidentalis	Grey-backed Hawk	AVES	EN	Decreasing	Terrestrial
Scytalopus robbinsi	Ecuadorian Tapaculo	AVES	EN	Decreasing	Terrestrial
Mobula mobular	Spinetail Devil Ray	CHONDRICHTHYES	EN	Decreasing	Marine
Ceratostema pubescens		MAGNOLIOPSIDA	EN	Unknown	Terrestrial
Ceratostema ventricosum		MAGNOLIOPSIDA	EN	Unknown	Terrestrial
Macleania dodsonii		MAGNOLIOPSIDA	EN	Unknown	Terrestrial
Ginglymostoma unami	Pacific Nurse Shark	CHONDRICHTHYES	EN	Decreasing	Marine

Restricted Range Species

Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Amazona lilacina	Lilacine Amazon	AVES	CR	Decreasing	Terrestrial
Penelope albipennis	White-winged Guan	AVES	EN	Stable	Terrestrial
Pyrrhura orcesi	El Oro Parakeet	AVES	EN	Decreasing	Terrestrial
Brotogeris pyrrhoptera	Grey-cheeked Parakeet	AVES	EN	Decreasing	Terrestrial
Metallura baroni	Violet-throated Metaltail	AVES	EN	Decreasing	Terrestrial
Sternula lorata	Peruvian Tern	AVES	EN	Decreasing	Terrestrial, Marine
Pseudastur occidentalis	Grey-backed Hawk	AVES	EN	Decreasing	Terrestrial
Scytalopus robbinsi	Ecuadorian Tapaculo	AVES	EN	Decreasing	Terrestrial
Gastrotheca lateonota	El Tambo Marsupial Frog	AMPHIBIA	VU	Decreasing	Terrestrial, Freshwater
Ceratophrys stolzmanni	Pacific Horned Frog	AMPHIBIA	VU	Decreasing	Terrestrial, Freshwater
Leptodactylus peritoaktites	Coastal Ecuador Smoky Jungle Frog	AMPHIBIA	VU	Decreasing	Terrestrial, Freshwater
Thomasomys hudsoni		MAMMALIA	VU	Unknown	Terrestrial
Ortalis erythroptera	Rufous-headed Chachalaca	AVES	VU	Decreasing	Terrestrial

Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Hapalopsittaca pyrrhops	Red-faced Parrot	AVES	VU	Decreasing	Terrestrial
Leptotila ochraceiventris	Ochre-bellied Dove	AVES	VU	Decreasing	Terrestrial
Onychorhynchus occidentalis	Pacific Royal Flycatcher	AVES	VU	Decreasing	Terrestrial, Freshwater
Attila torridus	Ochraceous Attila	AVES	VU	Decreasing	Terrestrial
Myiarchus semirufus	Rufous Flycatcher	AVES	VU	Decreasing	Terrestrial
Pachyramphus spodiurus	Slaty Becard	AVES	VU	Decreasing	Terrestrial
Phytotoma raimondii	Peruvian Plantcutter	AVES	VU	Decreasing	Terrestrial, Freshwater
Ampelornis griseiceps	Grey-headed Antbird	AVES	VU	Decreasing	Terrestrial
Synallaxis tithys	Blackish-headed Spinetail	AVES	VU	Decreasing	Terrestrial
Syndactyla ruficollis	Rufous-necked Foliage-gleaner	AVES	VU	Decreasing	Terrestrial, Freshwater
Spinus siemiradzkii	Saffron Siskin	AVES	VU	Decreasing	Terrestrial
Glaucidium nubicola	Cloudforest Pygmy-owl	AVES	VU	Decreasing	Terrestrial
Crypturellus transfasciatus	Pale-browed Tinamou	AVES	NT OR LR/NT	Decreasing	Terrestrial

Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Penelope barbata	Bearded Guan	AVES	NT OR LR/NT	Decreasing	Terrestrial
Thalasseus elegans	Elegant Tern	AVES	NT OR LR/NT	Stable	Terrestrial, Marine
Grallaria watkinsi	Watkins's Antpitta	AVES	NT OR LR/NT	Stable	Terrestrial
Conothraupis speculigera	Black-and-white Tanager	AVES	NT OR LR/NT	Decreasing	Terrestrial
Engystomops randi		AMPHIBIA	LC OR LR/LC	Stable	Terrestrial, Freshwater
Lithobates bwana	Rio Chipillico Frog	AMPHIBIA	LC OR LR/LC	Stable	Terrestrial, Freshwater
Picumnus sclateri	Ecuadorian Piculet	AVES	LC OR LR/LC	Stable	Terrestrial
Leptosittaca branickii	Golden-plumed Parakeet	AVES	LC OR LR/LC	Decreasing	Terrestrial
Leucippus baeri	Tumbes Hummingbird	AVES	LC OR LR/LC	Unknown	Terrestrial
Coeligena wilsoni	Brown Inca	AVES	LC OR LR/LC	Decreasing	Terrestrial
Heliangelus strophianus	Gorgeted Sunangel	AVES	LC OR LR/LC	Decreasing	Terrestrial
Heliangelus viola	Purple-throated Sunangel	AVES	LC OR LR/LC	Stable	Terrestrial
Aglaiocercus coelestis	Violet-tailed Sylph	AVES	LC OR LR/LC	Stable	Terrestrial

Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Phaethon aethereus	Red-billed Tropicbird	AVES	LC OR LR/LC	Decreasing	Terrestrial, Marine
Myiophobus phoenicomitra	Orange-crested Flycatcher	AVES	LC OR LR/LC	Decreasing	Terrestrial
Thamnophilus zarumae	Chapman's Antshrike	AVES	LC OR LR/LC	Decreasing	Terrestrial
Asthenes griseomurina	Mouse-colored Thistletail	AVES	LC OR LR/LC	Decreasing	Terrestrial
Thripadectes ignobilis	Uniform Treehunter	AVES	LC OR LR/LC	Stable	Terrestrial
Rhynchospiza stolzmanni	Tumbes Sparrow	AVES	LC OR LR/LC	Stable	Terrestrial, Freshwater
Basileuterus trifasciatus	Three-banded Warbler	AVES	LC OR LR/LC	Decreasing	Terrestrial
Habia stolzmanni	Ochre-breasted Tanager	AVES	LC OR LR/LC	Stable	Terrestrial
Chlorochrysa phoenicotis	Glistening-green Tanager	AVES	LC OR LR/LC	Decreasing	Terrestrial
Tangara rufigula	Rufous-throated Tanager	AVES	LC OR LR/LC	Decreasing	Terrestrial
Piezorina cinerea	Cinereous Finch	AVES	LC OR LR/LC	Stable	Terrestrial
Sicalis taczanowskii	Sulphur-throated Finch	AVES	LC OR LR/LC	Stable	Terrestrial
Pseudocolaptes johnsoni	Pacific Tuftedcheek	AVES	LC OR LR/LC	Stable	Terrestrial

Species Name	Common Name	Taxonomic Group	IUCN Category	Population Trend	Biome
Tachycineta stolzmanni	Tumbes Swallow	AVES	LC OR LR/LC	Stable	Terrestrial, Marine, Freshwater
Synallaxis stictothorax	Necklaced Spinetail	AVES	LC OR LR/LC	Stable	Terrestrial
Atlapetes crassus	Choco Brush-finch	AVES	LC OR LR/LC	Decreasing	Terrestrial
Conirostrum fraseri	Ochraceous Conebill	AVES	LC OR LR/LC	Stable	Terrestrial
Tangara lunigera	Yellow-faced Tanager	AVES	LC OR LR/LC	Decreasing	Terrestrial
Pheugopedius paucimaculatus	Speckle-breasted Wren	AVES	LC OR LR/LC	Decreasing	Terrestrial
Ichthyomys tweedii	Tweedy's Crab-eating Rat	MAMMALIA	DD	Unknown	Terrestrial, Freshwater
Oreoryzomys balneator	Peruvian Rice Rat	MAMMALIA	DD	Unknown	Terrestrial
Chibchanomys orcesi	Las Cajas Ichthyomyine	MAMMALIA	DD	Unknown	Terrestrial, Freshwater
Lagidium ahuacaense	Ecuadorean Viscacha	MAMMALIA	DD	Unknown	Terrestrial
Eumops wilsoni		MAMMALIA	DD	Unknown	Terrestrial
Rhogeessa velilla		MAMMALIA	DD	Unknown	Terrestrial

Biodiversity features which are likely to trigger Critical Habitat

Protected Areas

The following protected areas are found within 1 km and 10 km and 50 km of the area of interest.
For further details please refer to the associated csv file in the report folder.

Area name	Distance	IUCN Category	Status	Designation	Recommendation
Arenillas	50 km	Not Reported	Designated	Ecological Reserve	Assess for biodiversity risk
Isla Santa Clara	50 km	Not Reported	Designated	Wildlife Refuge	Assess for biodiversity risk
La Tembladera	50 km	Not Reported	Designated	Ramsar Site, Wetland of International Importance	Assess for biodiversity risk
Refugio de Vida Silvestre Isla Santa Clara	50 km	Not Reported	Designated	Ramsar Site, Wetland of International Importance	Assess for biodiversity risk
Santuario Nacional Los Manglares de Tumbes	50 km	Not Reported	Designated	Ramsar Site, Wetland of International Importance	Assess for biodiversity risk
los Manglares de Tumbes	50 km	III	Designated	National Sanctuary	Assess for biodiversity risk

Key Biodiversity Areas

The following key biodiversity areas are found within 1 km and 10 km and 50 km of the area of interest.
For further details please refer to the associated csv file in the report folder.

Area name	Distance	IBA	AZE	Recommendation
Archipiélago de Jambelí	1 km	Yes	No	Assess for critical habitat
Daucay	50 km	Yes	No	Assess for critical habitat
Isla Santa Clara	50 km	Yes	No	Assess for critical habitat
Manglares del golfo de Guayaquil	50 km	Yes	No	Assess for critical habitat
Reserva Buenaventura	50 km	Yes	No	Assess for critical habitat
Reserva Ecológica Arenillas	50 km	Yes	No	Assess for critical habitat

Species with potential to occur

Area Taxonomic group	Total assessed species	Total (CR, EN & VU)	CR	EN	VU	NT	LC	DD
MAMMALIA	142	6	1	0	5	11	115	10
CHONDRICHTHYES	64	37	7	9	21	13	13	1
REPTILIA	60	15	1	1	13	4	39	2
AVES	581	37	3	7	27	24	519	1
MAGNOLIOPSIDA	196	7	1	3	3	4	185	0
AMPHIBIA	27	4	0	1	3	4	19	0
HOLOTHUROIDEA	12	1	0	1	0	0	5	6
ACTINOPTERYGII	596	4	0	0	4	4	551	37

Area Taxonomic group	Total assessed species	Total (CR, EN & VU)	CR	EN	VU	NT	LC	DD
INSECTA	46	0	0	0	0	1	44	1
LILIOPSIDA	22	0	0	0	0	0	22	0
MALACOSTRACA	20	0	0	0	0	0	17	3
GASTROPODA	29	0	0	0	0	0	23	6
BIVALVIA	5	0	0	0	0	0	3	2
MYXINI	2	0	0	0	0	0	2	0
ARACHNIDA	1	0	0	0	0	0	1	0

Recommended citation

IBAT PS6 & ESS6 Report. Generated under licence 7188-15846 from the Integrated Biodiversity Assessment Tool on 22 April 2021 (GMT). www.ibat-alliance.org

Recommended Experts and Organizations

For projects located in Critical Habitat, clients must ensure that external experts with regional expertise are involved in further assessment (GN6: GN22). Clients are encouraged to develop partnerships with recognized and credible conservation organizations and/or academic institutes, especially with respect to potential developments in natural or Critical Habitat (GN6: GN23). Where Critical Habitats are triggered by priority species, species specialists must be involved. IBAT provides data originally collected by a large network of national partners, while species information is sourced via the IUCN Red List and affiliated Species Specialist Groups. These experts and organizations are listed below. **Please note that this is not intended as a comprehensive list of organizations and experts. These organizations and experts are under no obligation to support any further assessment and do so entirely at their discretion and under their terms. Any views expressed or recommendations made by these stakeholders should not be attributed to the IFC or IBAT for IFC partners.**

Birdlife Partners

URL: https://www.birdlife.org/worldwide/partnership/birdlife-partners

Directory for Species Survival Commission (SSC) Specialist Groups and Red List Authorities

URL: https://www.iucn.org/commissions/ssc-groups

Annex 2. Final Report Format

[There are three stamps reading: Ministry of the Environment, "An entire lifetime" and "The government of all"]	**UNDERSECRETARY OF NATURAL PATRIMONY**	[There is a stamp reading: Wildlife]

NATIONAL DIRECTORATE OF BIODIVERSITY
WILDLIFE DEPARTMENT

FINAL REPORT ON THE RESEARCH PROJECT WITH AUTHORIZATION No. 002-2019-IC-FLORA/FAUNA-DPAEO-MAE

SPECIMEN COLLECTION OF WILDLIFE SPECIES FOR ENVIRONMENTAL STUDIES AND OTHER INSTRUMENTS FOR ENVIRONMENTAL REGULARIZATION.

1. GENERAL INFORMATION ON THE INSTITUTION OR CONSULTANT

Name or corporate name of applicant: YILPORT TERMINAL OPERATIONS YILPORTECU S.A.

Identity card/Ruc: 0992982047001

Province: El Oro

Canton: Machala

Parish/Town: Puerto Bolivar

Name of representative/proxy: Alfredo Jurado Von Buchwald

Email: Alexandra.valverde@yilport.com | Telephone: 0989576178

2. GENERAL INFORMATION

Component to be collected:

Plant		Animal	**X**	Fungi		Phytoplankton	**X**	Zooplankton	**X**

Area of Study:

BIOTIC MONITORING OF THE DISPOSAL TANK FROM DREDGING CONDUCTED OFFSHORE AND IN THE SANTA ROSA SWAMP MANGROVES, ASSOCIATED WITH YILPORT'S DREDGING OF THE SANTA ROSA MARSH

Overall objective:

- To characterize the state of the main marine communities (plankton, nekton and benthos) present in the offshore disposal area of dredged sediments, and a control station located at a similar depth, between the disposal quadrant and the Santa Clara island. Ecological descriptors are offered to permit the temporal comparison of the effects observed concerning the different dredging phases.

Specific objectives:

- Planktonic monitoring
- Benthonic monitoring
- Fish production monitoring
- Description of activities of the protected marine fauna
- Monitoring of productivity in the Santa Rosa marsh AUSCM in the area of influence of the dredging sector

Background information:

Via Resolution no. MAE-DPAEO-2017-009 of 19 December 2017, and based on Technical Report No. 007857-DPAEO-2017 of 16 November 2017, the El Oro Provincial Department of the Environment grants Environmental License No. MAE-RA-2017-297974 for the company YILPORT TERMINAL OPERATIONS (YILPORTECU) S.A., for the project "Dredging of Piers 1, 2, 3, 4, 5 and 6, MANEUVERING AREA AND ACCESS CHANNEL TO PUERTO BOLIVAR", specifying the technical and legal conditions to be complied with by the Project's Promotor, based on current laws.

According to the measures adopted in the Environmental Management Plan, the following monitoring sub-plans have been established in the Monitoring and Follow-up Plan (PMS):

- PMS-06 MONITORING PROGRAM FOR PHYTOPLANKTON AND ZOOPLANKTON SPECIES: Monitoring the quantities of phytoplankton and zooplankton in the marine area of influence through sample collection. Quarterly measurements will be taken, comparing them to those obtained from the project's environmental baseline.
- PMS-07 MONITORING PROGRAM FOR BIOAQUATIC SPECIES: Monitoring mollusks and crustaceans in marshlands located within the project's area of influence: - Vikingos del Mar artisanal fishing production cooperative – *Asociación de Mujeres Artesanas Estero Porteño* – La Playita Tourism Services Community Organization.
- PMS-08 FLORA AND FAUNA MONITORING PROGRAM: Monitoring the planktonic and benthonic flora and fauna species, reporting marine and ichthyofauna mammal sightings in the offshore disposal area, including a monitoring point at the border of the Santa Clara island marine reserve.

In February of 2019, the Scientific Research Authorization **No. 002-2019-IC-FLORA/FAUNA-DPAEO-MAE** was obtained for the implementation of biotic monitoring.

From its onset and until the present date, the project's activities have been carried out as follows:

i. The first dredging period was carried out between March 29 and May 31 of 2018 and the Environmental Authority was notified via procedure no. YPTO-GG-0178-18 of June 8, 2018.

ii. On April 10, 2019, the second dredging phase was initiated using the *Pedro Alvares Cabral* vessel, a TSHD-type dredger. The Ministry of the Environment was notified of this via procedure no. YPTO-GG-0088-19 of April 10, 2019. This phase was completed on May 31, 2019, notifying the Ministry of the Environment via procedure no. YPTO-GG-0115-19, delivered on June 10, 2019.

Currently, no new dredging activities have been undertaken.

3. PROFILES OF PROFESSIONALS CREATING THE REPORT

Biological group object of the study	First and last names	Record no. of Senescyt title	Environmental MAE Consultant Record
Birds	--	--	--
Herpetofauna	--	--	--
Mammals	--	--	--
Fish	Eduardo Rebolledo Monsalve	4228R-11-1676 1014-13-86033979	MAE-SUIA-1086-CI
Macroinvertebrates	--	--	--
Phytoplankton	Eduardo Rebolledo Monsalve	4228R-11-1676 1014-13-86033979	MAE-SUIA-1086-CI
Zooplankton	Eduardo Rebolledo Monsalve	4228R-11-1676 1014-13-86033979	MAE-SUIA-1086-CI
Benthos	Eduardo Rebolledo Monsalve	4228R-11-1676 1014-13-86033979	MAE-SUIA-1086-CI
Macrophytes	--	--	--
Land vegetation	..	--	--

4. RESULTS BY COMPONENT

FISH

Methodology

Description of catches made with standardized effort, using a net consisting of two 3.5" electro-welded monofilament cloths, irrigated for 30 minutes, in the Santa Clara island vicinity and 3 sectors in the dredging disposal tank quadrant. All individuals caught were counted and subsequently weighed in the laboratory, noting the following descriptors: richness and abundance of the species caught, the total biomass of each catch, and the CPUE (kg/hour of fishing). Descriptors were compared with those of other monitoring campaigns.

Species considered vulnerable or that are protected by international conventions, such as batoids, were released.

Net used for fishing; extreme clarity of the Santa Clara water; captures made in the dredging deposit tank sector and shrimp caught in the of the Alvarez Cabral dredger during the dredging maneuvers

Preservation methods and mobilization of samples and specimens

Cold storage of catches using ice in a container with flake ice.

Center for biodiversity documentation where the biological material is deposited

It was not considered necessary to preserve duplicates, given that: 1) by volume, an ichthyologic collection would demand considerable space; and 2) all of the collected specimens already existed in collections from Esmeraldas and Quito (formal collections exist).

The studied fish were identified according to Jiménez Prado P and P. Bearez (2004). *Marine fishes of continental Ecuador.* SIMBIOE/NAZCA/IFEA. Volume II. Quito and the confirmation of taxonomy using digital databases https://www.fishbase.se/search.php and http://www.catalogueoflife.org, updated every year.

Results

Detailed results from each sampling campaign are presented in the annexed documents of reports by bimonthly sampling campaigns, which have been attached to this report. The annexed fishing document (Excel), presents the ecological descriptors of the 8 monitoring campaigns conducted between December 2018 and February 202.

Figures 1 and 2 show the evolution of the abundance of fish caught in 30-minute hauls, using different colors to distinguish between the sample corresponding to the period when the dredging maneuvers were carried out (Figure 1) as well as the sampling period (prior, during and following dredging) in a box plot chart (Figure 2). In both figures, a production increase is seen in June 2019 with an exceptional catch taking place in the vicinity of Santa Clara island. The smaller catches were found in the sampling from 2018 and 2019.

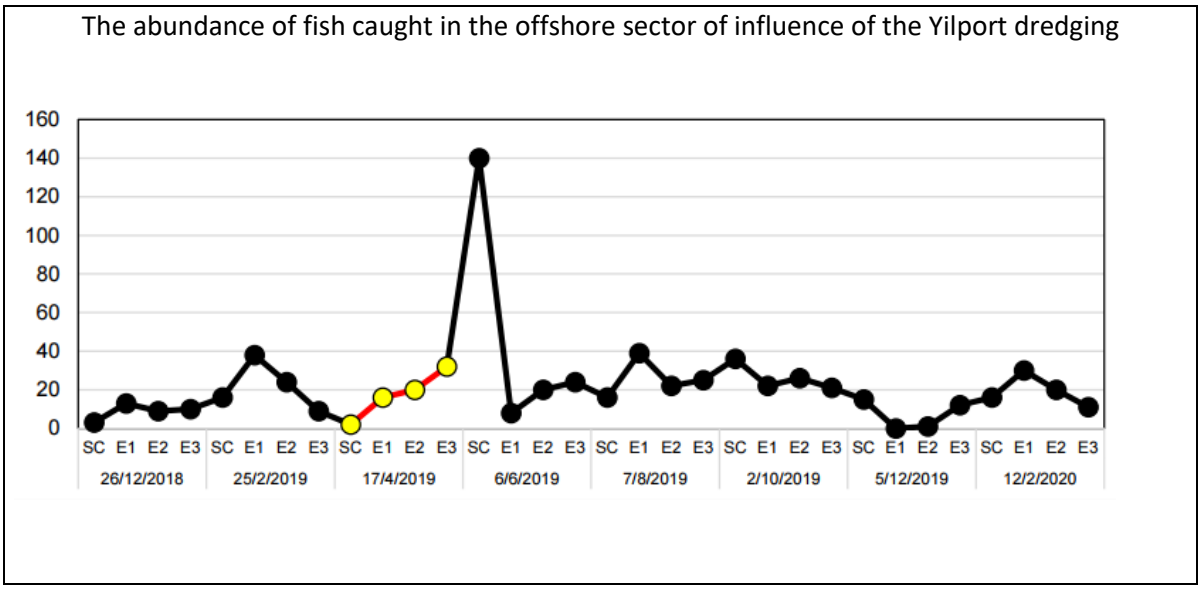


Figure 1: Evolution of the abundance of fish caught during the study period

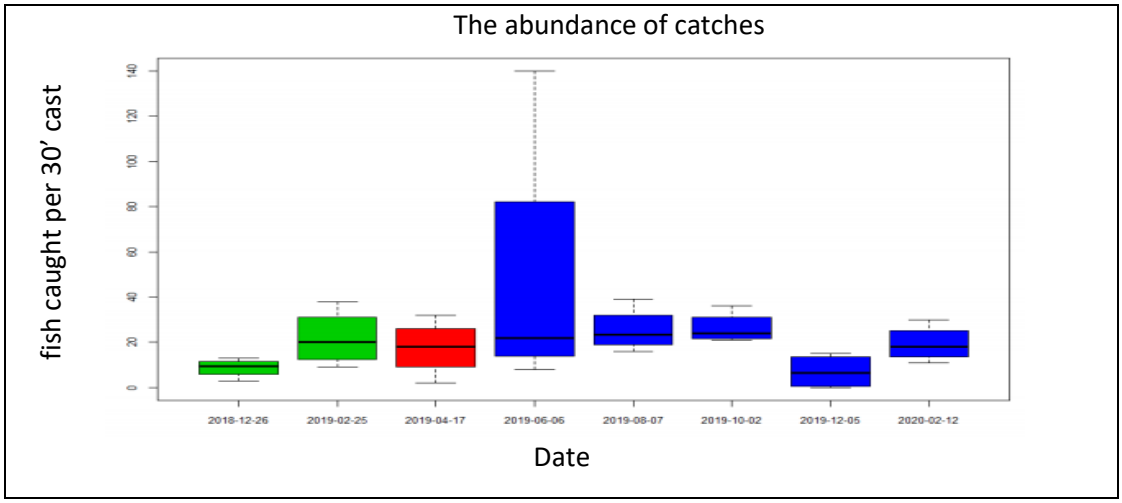


Figure 2: Seasonal differences in the abundance of fish caught using identical effort.

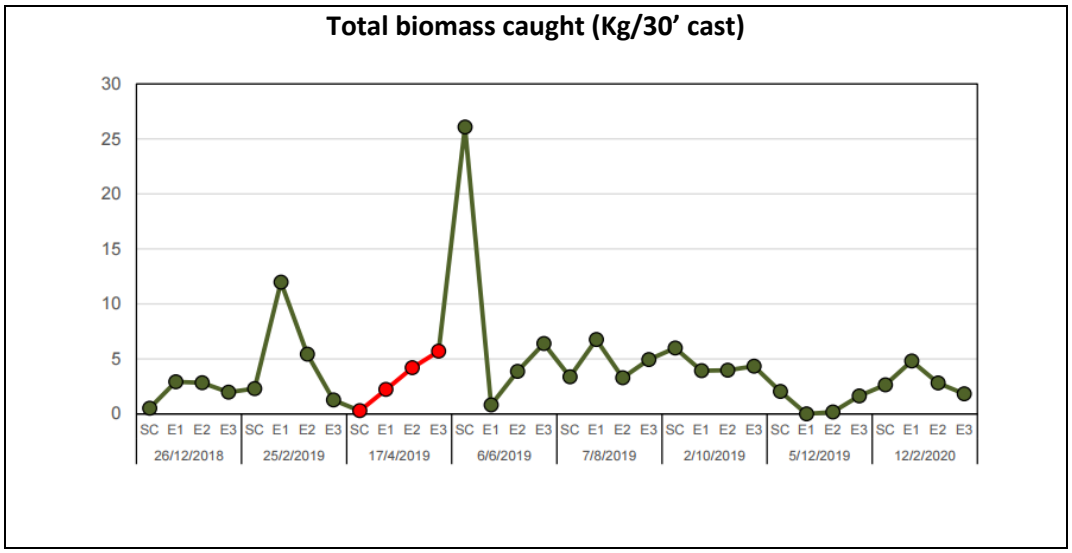


Figure 3: Evolution of the biomass caught

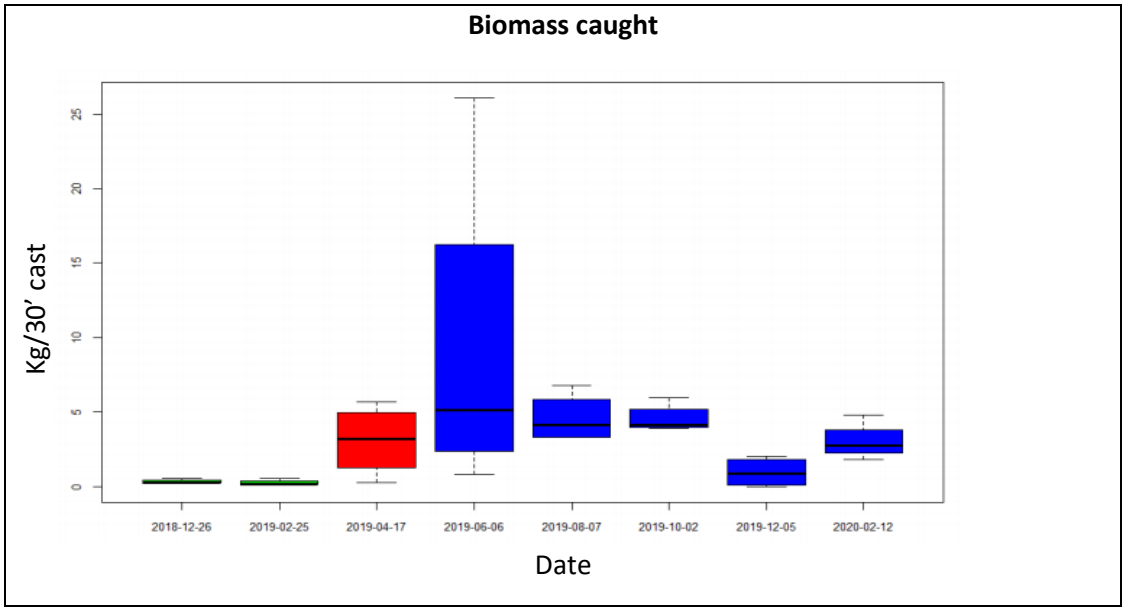


Figure 4: Total biomass caught (Kg/cast)

The differences in biomass caught increase in terms of the numeric abundance of fish caught, since productive cycles appear to exist in the area, associated with the change from the winter-summer season and no decrease in fishing has been observed in the dredging disposal tank, as seen in Figure 5.

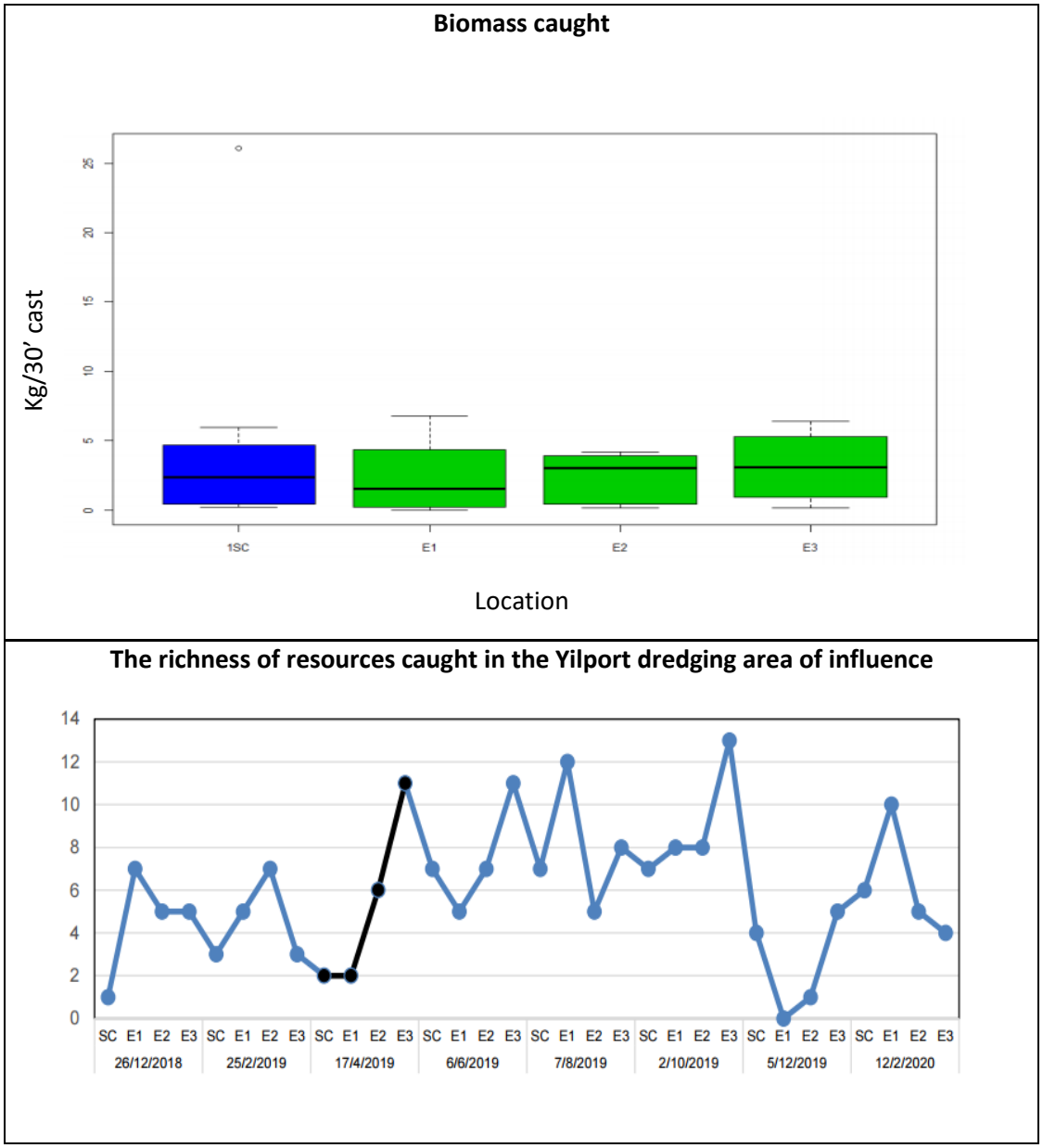


Figure 6: The richness of fishing resources caught in the Yilport dredging area of influence

Figure 6 reveals that during the dredging period, evasion of fish species did not take place. In fact, of the 32 catches made, the sampling from station 3 on April 17, 2019 revealed the fourth greatest amount of fish diversity of the entire study period. Catches having the lowest number of resources were found from December 5, 2019, 6 months after the dredging maneuvers. In Figure 8, we see that more resources were caught in the dredging disposal tank than in the control point in the vicinity of Santa Clara island.

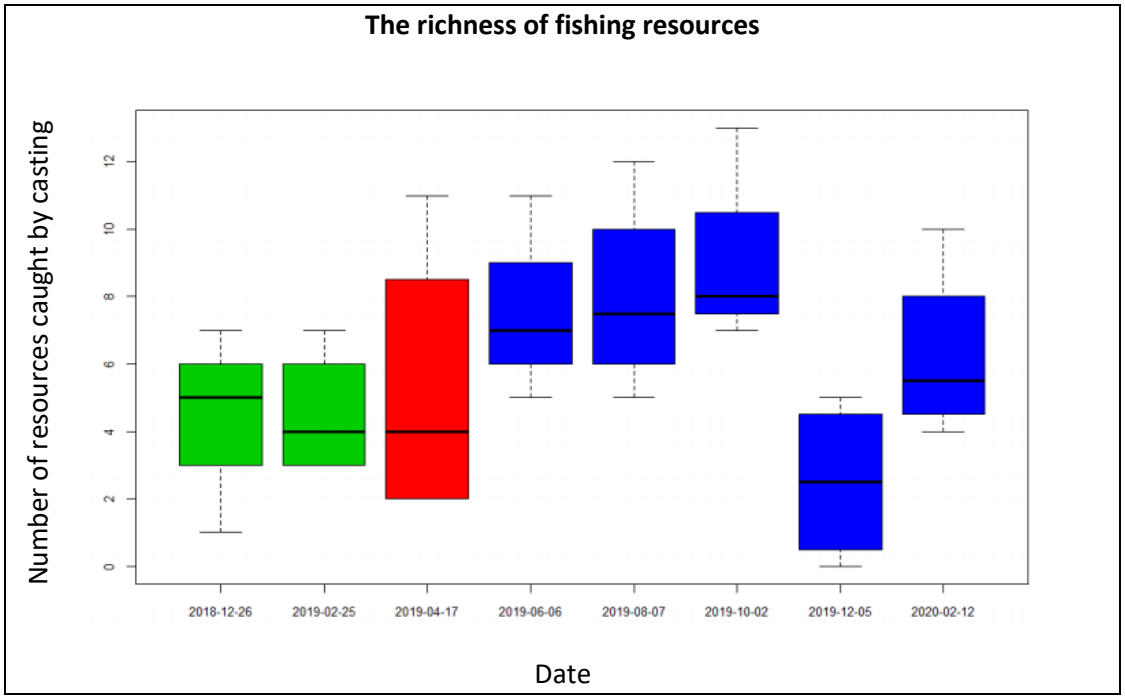


Figure 7: Evolution of the richness of fishing resources caught

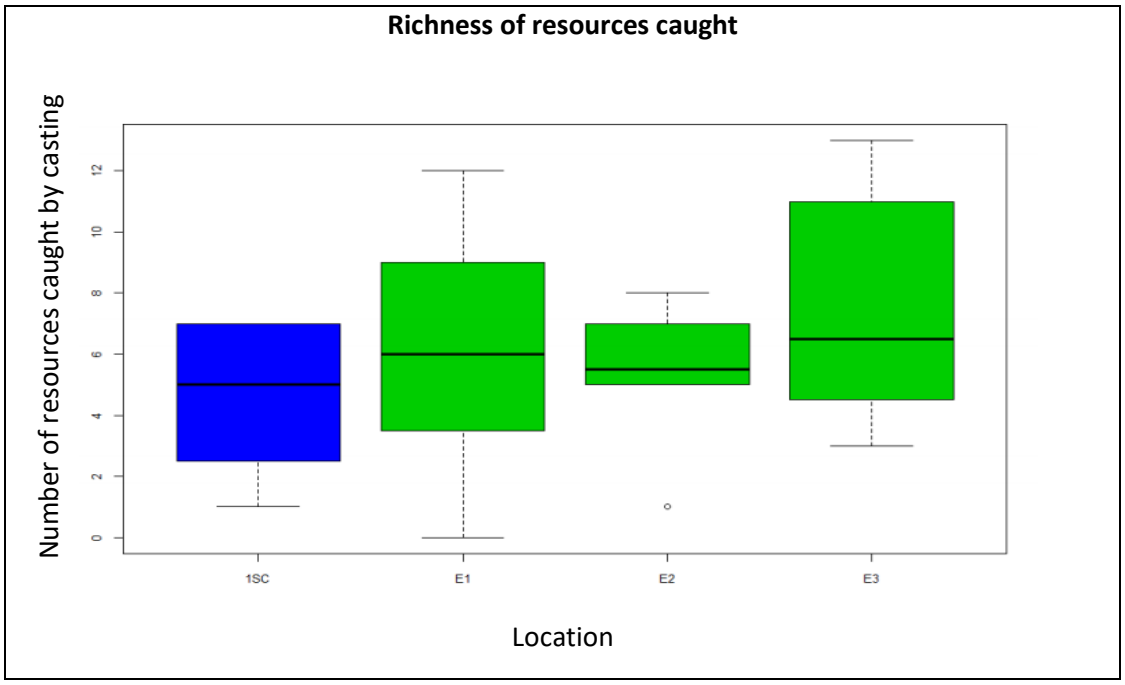


Figure 8: Sectorial differences in the number of resources caught during the monitoring period

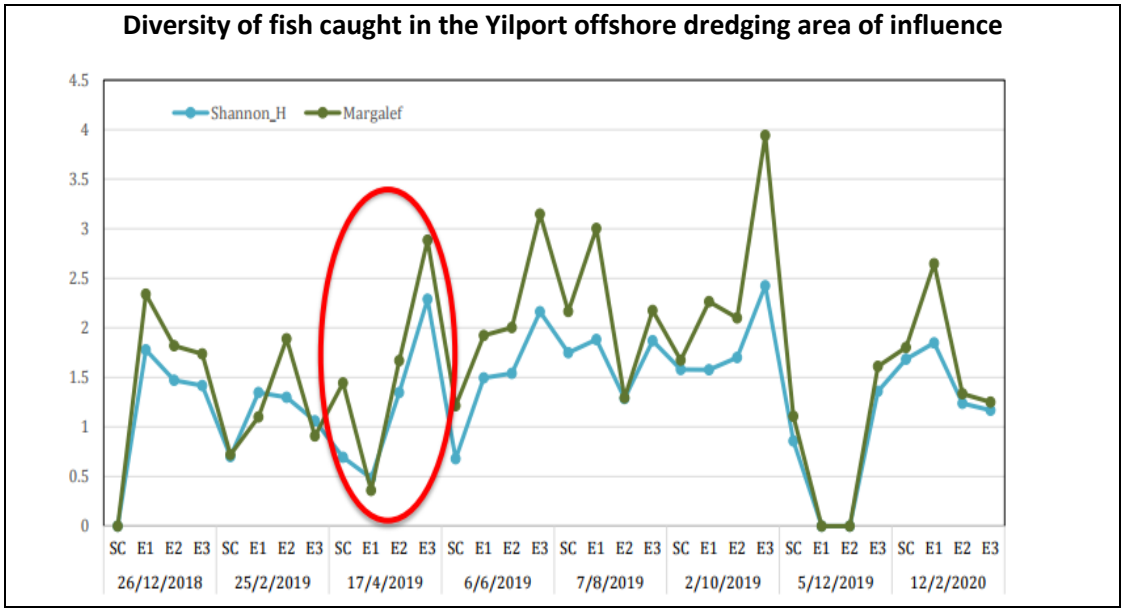


Figure 9: evolution of the diversity of the fishing resources caught

Considering the ecological descriptors used and the *abundance*, *biomass*, *richness of species caught* and *diversity of catches* indicators, no evidence was found for any effect on fishing productivity in the Yilport dredging disposal sector for the 2018-2020 period.

The most abundant resources caught were: *Prionotus stephanophrys* and *Coragyps atratus* in the Santa Clara sector and *Coragyps atratus,* striped mice, *Selene* and *Cyclopsetta panamensis* and in the dredging disposal tank.

FISH CAUGHT USING FISHING NETS IN THE SANTA ROSA MARSH AUSCM

In the bodies of water associated with the Vikingos del Mar and La Playita de Jambeli **AUSCM**, the abundance of juvenile fish caught using fishing nets was monitored, launching 10 casts in each AUSCM, assessing their catches and proceeding to release the fish after they were counted.

Catches made with fishing nets

In Figure 10, the composition of the catches made in both locations during the monitoring period is shown. It should be noted that this began during the dredging maneuvering period and was subsequently systemized, through coordination with the competent AUSCM. The following general patterns were found: larger catches in the la Playita sector, due to a greater habitat diversity (swamp branch, open sea) and the ease of sampling from the land, whereas in Vikingos del mar, sampling was conducted from the branch of the swamp, in a small-sized vessel. In these samplings, a total of 24 marine resources were captured and identified.

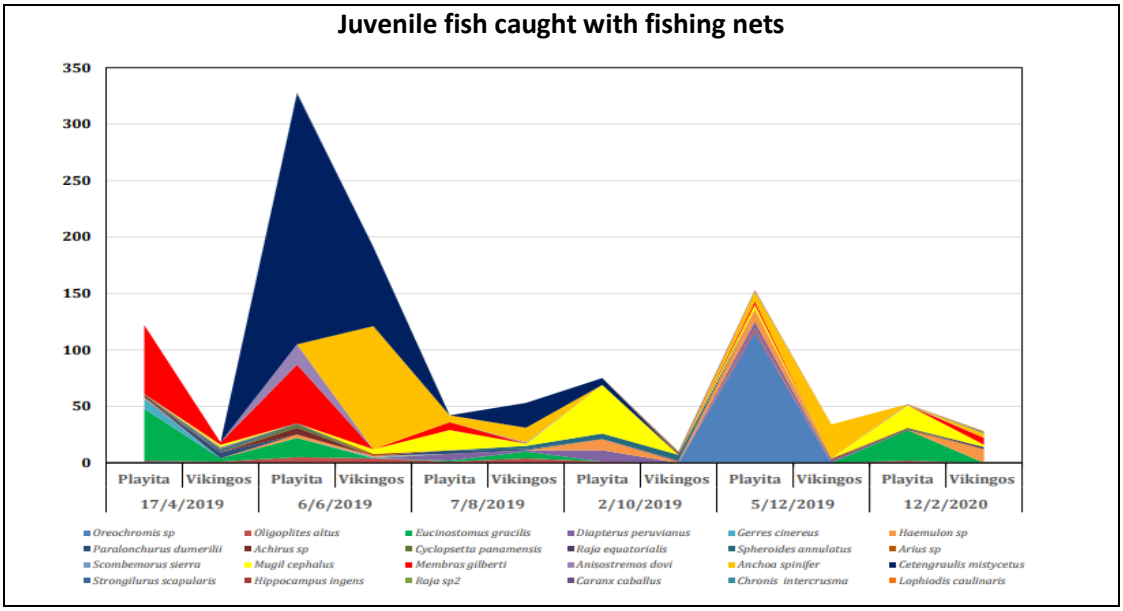


Figure 10: Description of fish caught with fishing nets

PHYTOPLANKTON

The reports from each monitoring have been annexed to this report, as well as tables of species, which, given their volume, cannot be included in this report.

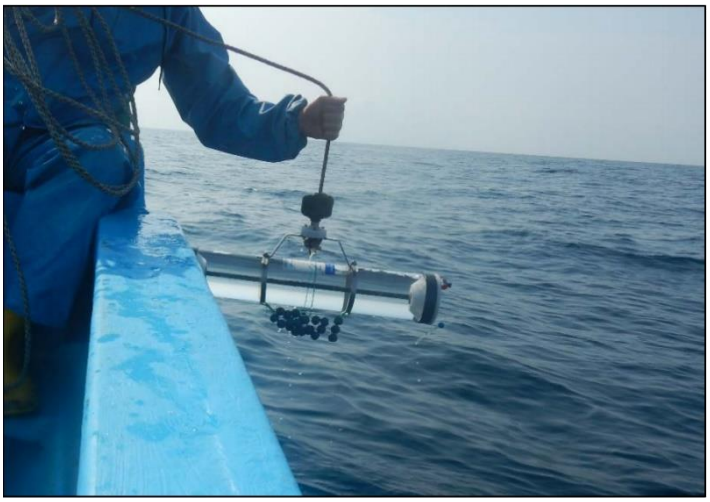
The methodology used to collect, handle and gather data on specimens or species.

PHYTOPLANKTON, QUANTITATIVE SAMPLES FOR UTERMÖHL ANALYSIS

In the Santa Clara Station and the 3 stations inside the dredging disposal tank, water samples were collected at three distinct depths (subsurface, 15m and 30m); in the Puerto Bolivar maneuvering sector, a surface sample was collected as well as one that was taken close to the sea bed (14m), for a total of 14 water samples for phytoplankton analysis from each sampling.

Samples were collected with a 4.2 l Van Dorn bottle of the Aquatic biotechnology, to which constant weight was applied using fishing weights, to ensure a more effective sinking and to prevent the bottles from being swept away by local currents. Each sampling consisted of one liter of raw water, which was taken in plastic coffee containers with a safety seal. The containers were rinsed 3 times with water from their sampling

location. A funnel was used to ease the filling and upon collection, 3 ml of 37% formalin was added as a fixing agent.



Van Dorn Bottle used

ESTIMATION OF ALGAE IN THE UTERMÖHL CHAMBERS

The samples collected with the Van Dorn bottle were analyzed according to the guidelines of the Standard Operating Procedures for Phytoplankton Analysis document, LG401 of the US Environmental Protection Agency (EPA). These guidelines specify that microalgae should be estimated using an inverted microscope, according to the Utermohl methodology. To do so, the bottles containing the seawater were agitated while rotating smoothly for 2 minutes, and subsequently, 50 ml decanting tubes were filled, allowing the suspended solids to decant over a thin glass plate for direct observation with an inverted microscope. The samples remained in the decanting for 24 hours and were observed at a 600x magnification, using an Italian Optika XDS-3 microscope, identifying the genres based on the following guides:

- *Acta Oceanográfica del Pacífico Volumen 19*, N.1, 2014 ISSN N° 1390-129X, of the Instituto Oceanográfico de la Armada del Ecuador which includes descriptions of diatoms, Silicoflagellates and coccolithophores of the phytoplankton of the Gulf of Guayaquil, by Roberto Jiménez; *Dinoflagelados del fitoplancton del Golfo de Guayaquil*, *Por Flor Pesantes y Tinntinidos del Golfo de Guayaquil*, by Iván Zambrano
- Identifying marine Diatoms and Dinoflegellates. Carmelo R. Tomas, Grethe R. Hasle, Karen A. Steidinger, Erick, E. Syvertsen, Karl Jangen, 1995. Academic Press, Inc.
- Digital online catalog at www.algaebase.org.
- Phytoplankton identification, Kudela lab Biological Oceanography, University of California Santa Cruz. http://oceandatacenter.ucsc.edu

Upon observing the phytoplankton in the inverted microscope, the juvenile algae and zooplankton present in diametric observation sweeps or strips were calculated based on the Utermohl decanting plate. Then, the abundance or concentration of algae present per milliliter was calculated, using the following formula:

$$Cells/ml_1 = (C*TA) / (L*W*V*S)$$

In which:
C= Cells counted
TA= surface area of the base of the decanting chamber in mm^2
L= Length of the strip counted in mm
W= Width of the transept in mm
V= Volume of the decanting in the chamber in milliliters
S= number of strips counted

The width of the observation strip was estimated using a microscopic calibrator and magnifiers to adjust the clarity of the images captured by a digital camera. This width was 0.08 mm at a 600x magnification. The counts for each sample are digitalized and exported to PAST3X software, resulting in multiple ecological descriptors, of which the following were analyzed: the richness of phytoplankton, the abundance of elements and Shannon and Margalef diversity indices. Furthermore, from the mean sampling values, it was possible to observe differences between sampling, and graphs were created to show the differences between the distinct stations and samples.

Results

Table 1 shows the number of samples analyzed.

Table 1: Quantity of samples analyzed by type of sampling

Date	Phytoplankton	
	Quantitative phytoplankton	60-micron dragging
26 Dec '18	14	5
25 Feb '19	14	5
17 April '19	14	5
6 June '19	14	5
7 Aug '19	14	5
2 Oct '19	14	5
5 Dec '19	14	5
12 Feb '20	14	5
Total	112	40

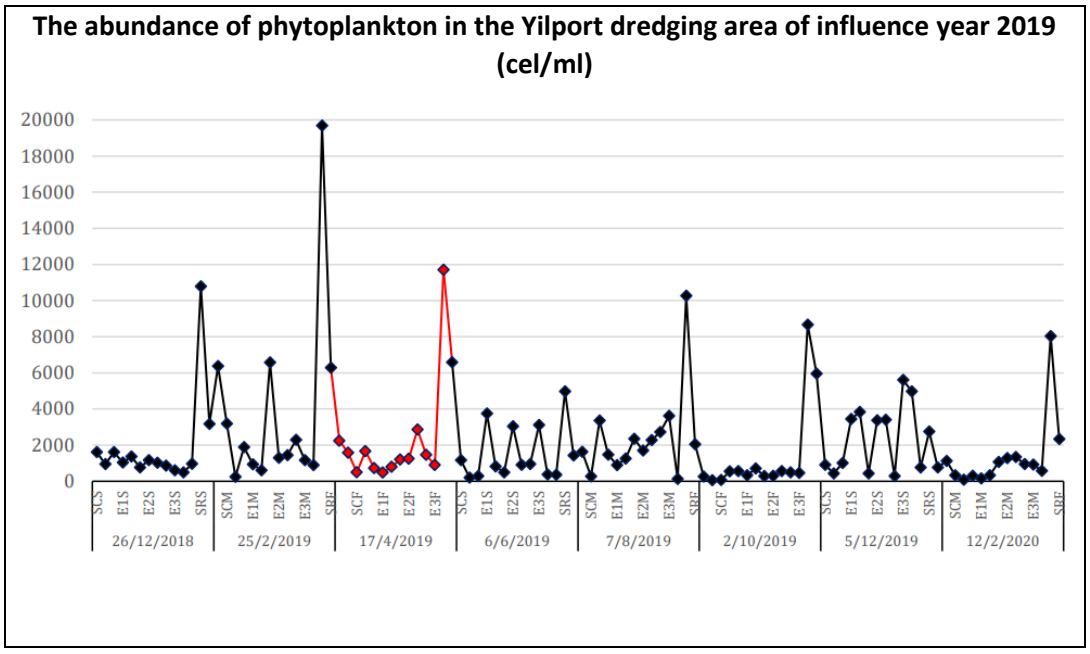


Figure 11: Evolution of the abundance of phytoplankton in the Yilport dredging area of influence during the 2019 period. In red, the values corresponding to sampling taking place during the dredging maneuvers

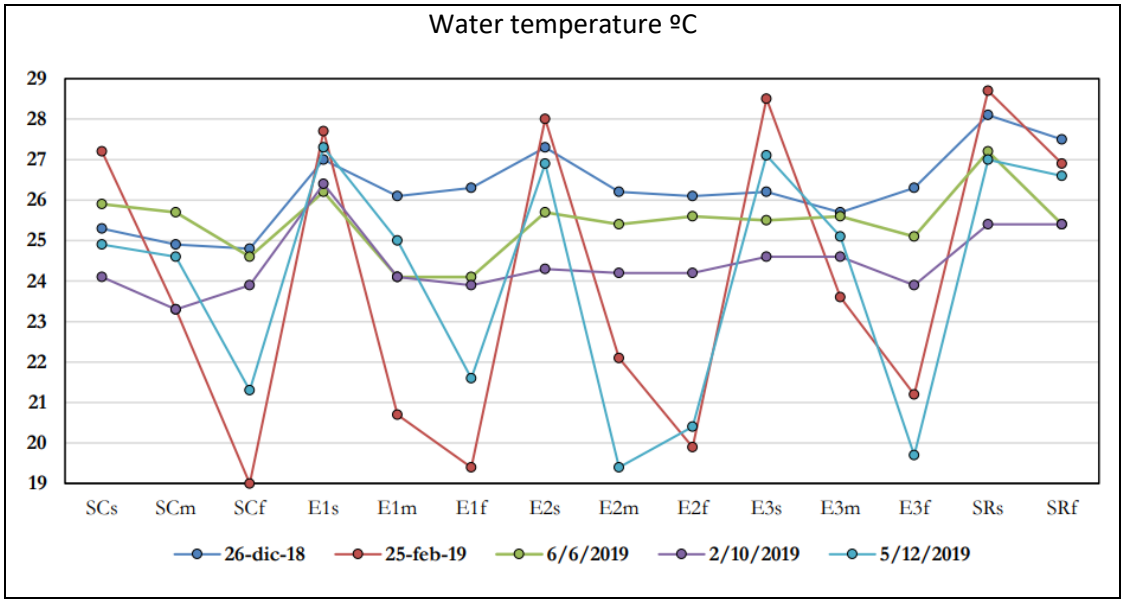


Figure 12: Water temperature (SC= Santa Clara, E= season, SR= Santa Rosa, S= surface area, m= mean of water and f= depth)

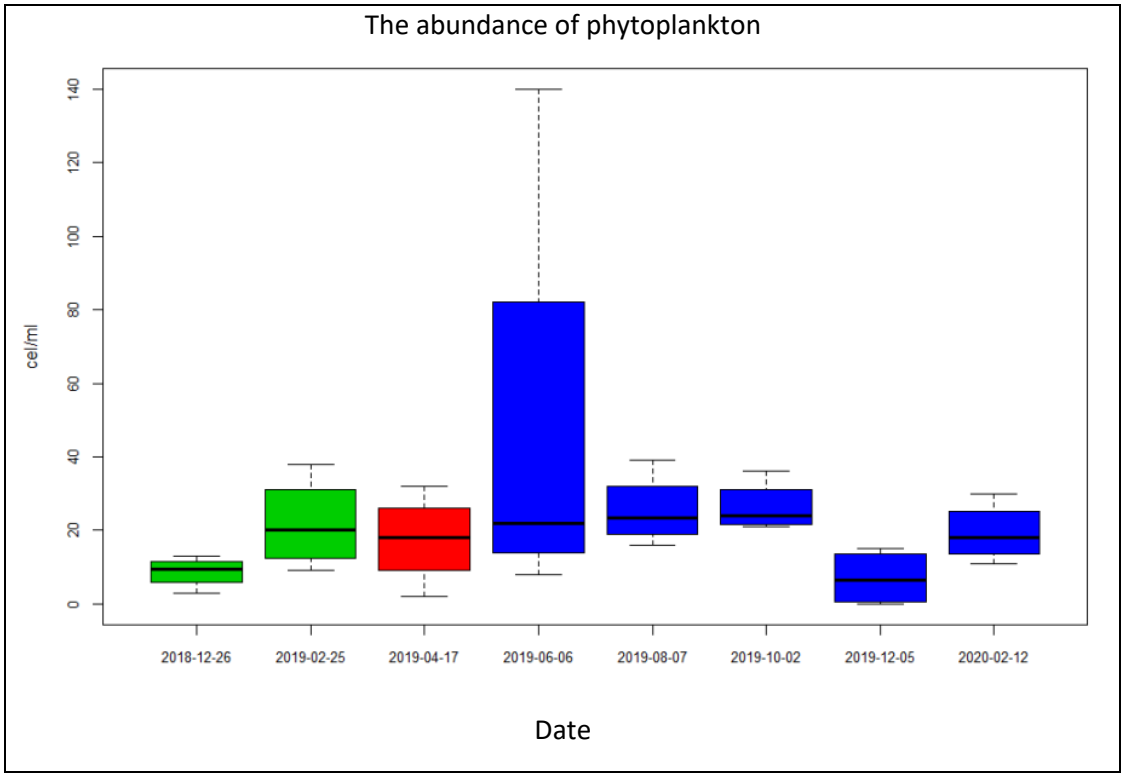


Figure 13: The abundance of phytoplankton (cel/ml) in the 2019 period. In green, samples collected prior to the dredging maneuvers; in red, samples collected during the dredging maneuvers; and in blue, samples collected following the dredging of the Santa Rosa marsh

Table 2: Mean abundance of algae by location and depths in this study

Indicator	SCs	SCm	SCf	E1s	E1m	E1f	E2s	E2m	E2f	E3s	E3m	E3f	SRs	SRf
Mean abundance (cel/ml)	2025 ± 2018	951 ± 1117	1011 ± 1164	1972 ± 1198	1304 ± 3451	617± 310	2570± 2062	1399 ± 980	1053 ± 693	2536 ± 1712	1796 ± 1797	633 ± 321	9832 ± 5426	3746 ± 2483

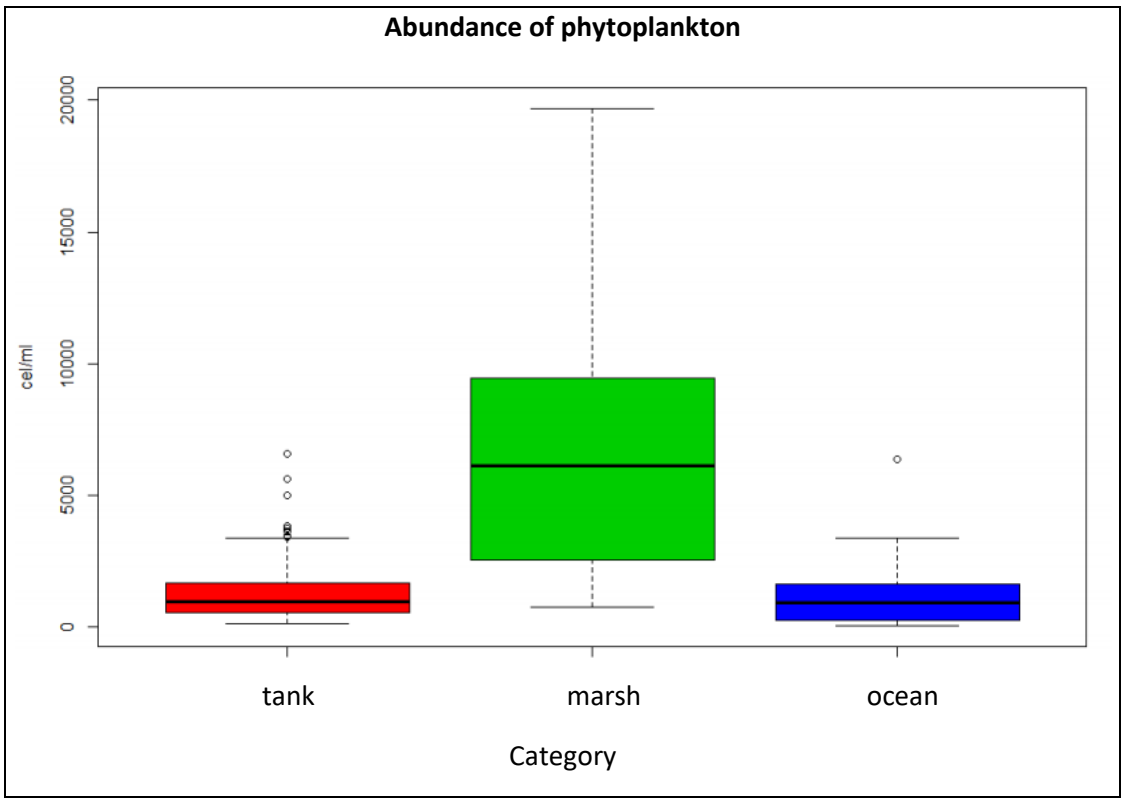


Figure 14: Sectorial differences in abundance of phytoplankton. Note the larger amount of phytoplankton collected from within the Santa Rosa marsh. Samples collected from inside the tank appear in red and those from the vicinity of the Santa Clara island appear in blue.

During the 2018-2020 period, a total of 166 planktonic species were recorded in the study area (see annexed table, Phytoplankton species). The ten most abundant species were: *Skeletonema costatum, Anabaena sp, Thallasiosira subtilis, Chaetoceros curvisetus, Nitzschia pungens, Lauderia sp, Guinardia sp, Protoperidinium sp, leptocilindrus sp* and *Thallasionema nitschoides.*

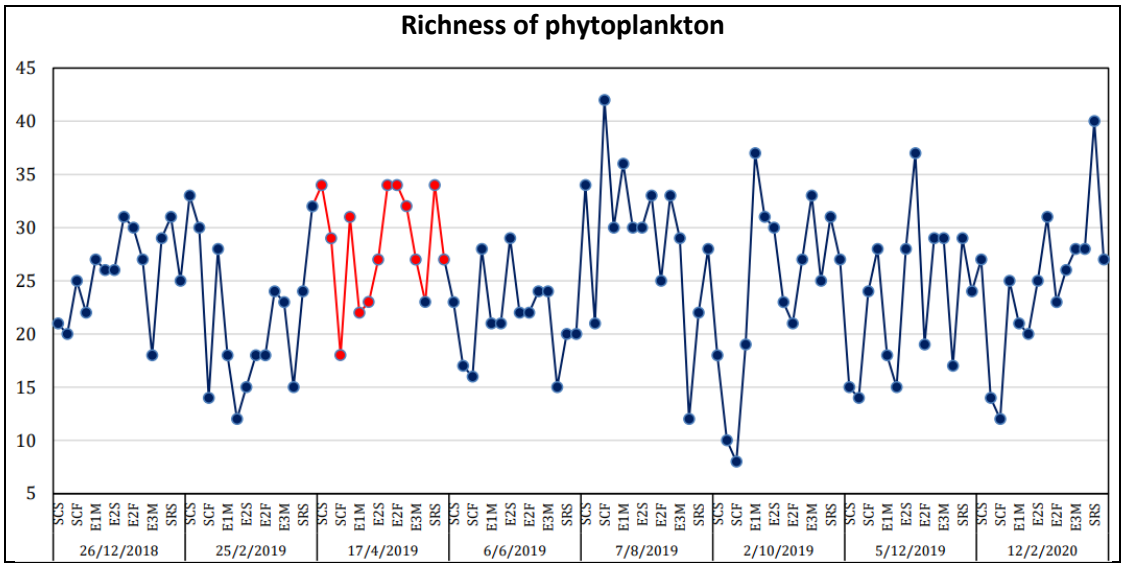


Figure 15: Evolution of richness of phytoplankton

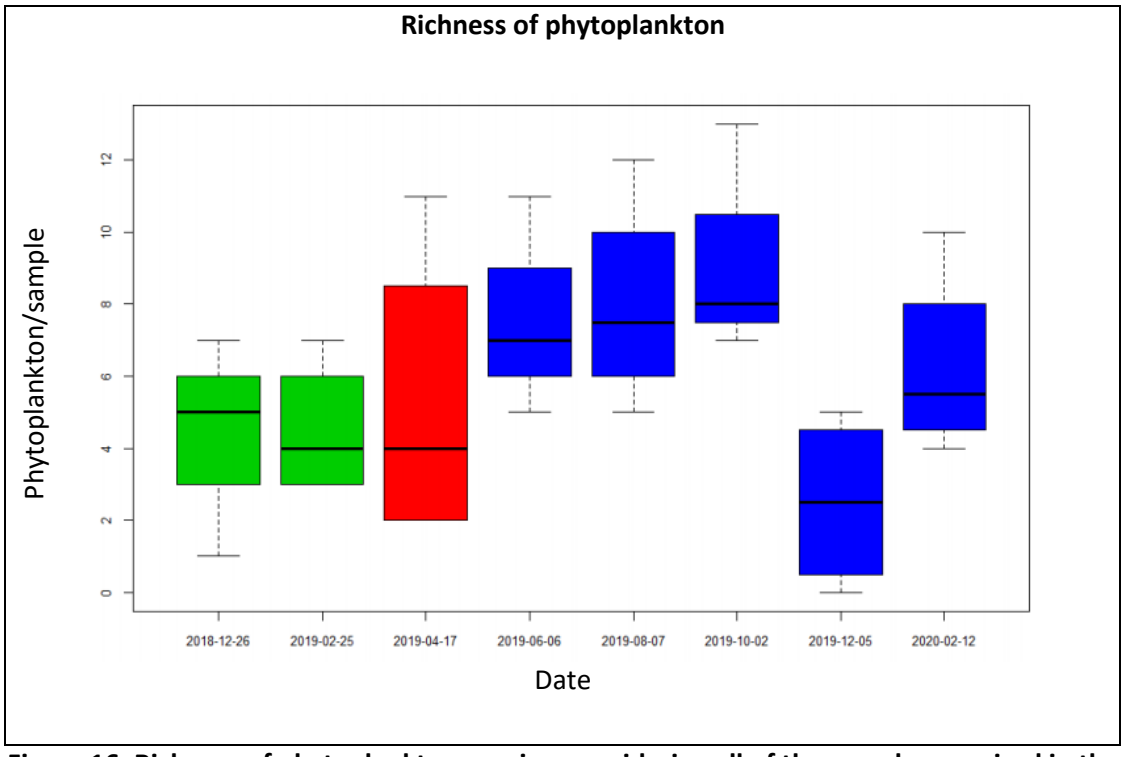


Figure 16: Richness of phytoplankton species, considering all of the samples acquired in the area of influence of distinct sampling dates

Table 3: Mean phytoplankton richness

Date	26 Dec 18	25 Feb 19	17 Apr 19	6 June 19	8 Aug 19	2 Oct 19	5 Dec 19	12 Feb 20
No. of different phytoplankton	26±4	22±4	28±5	22±4	29±7	24±8	23±7	25±7

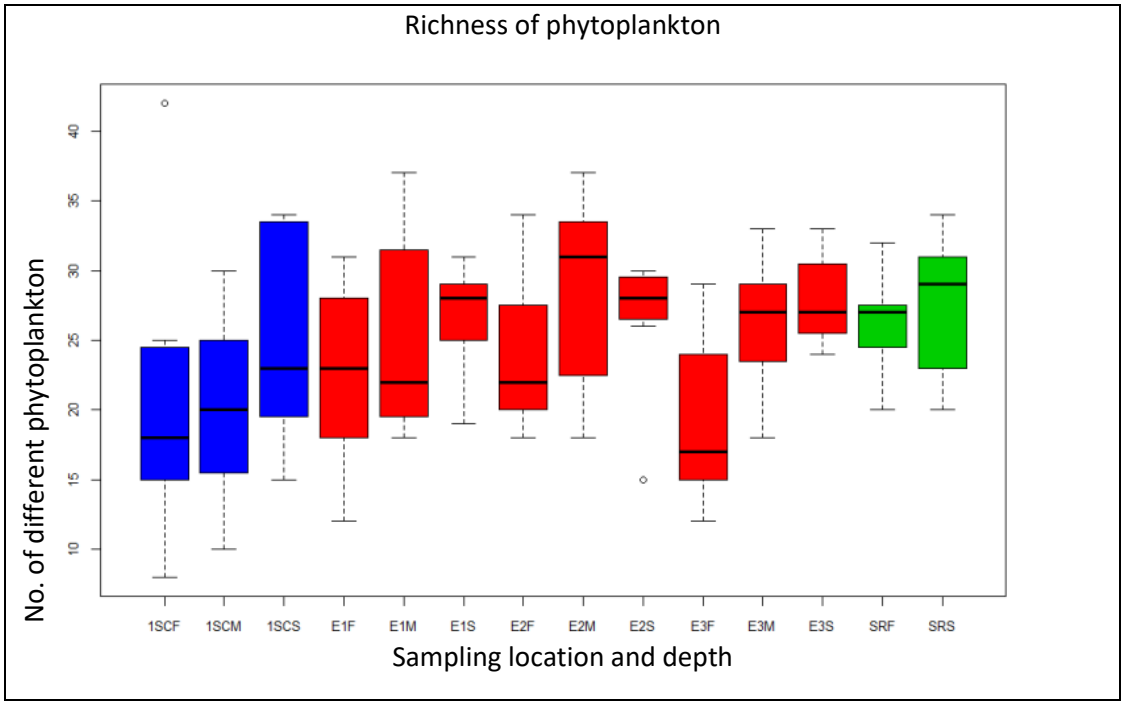
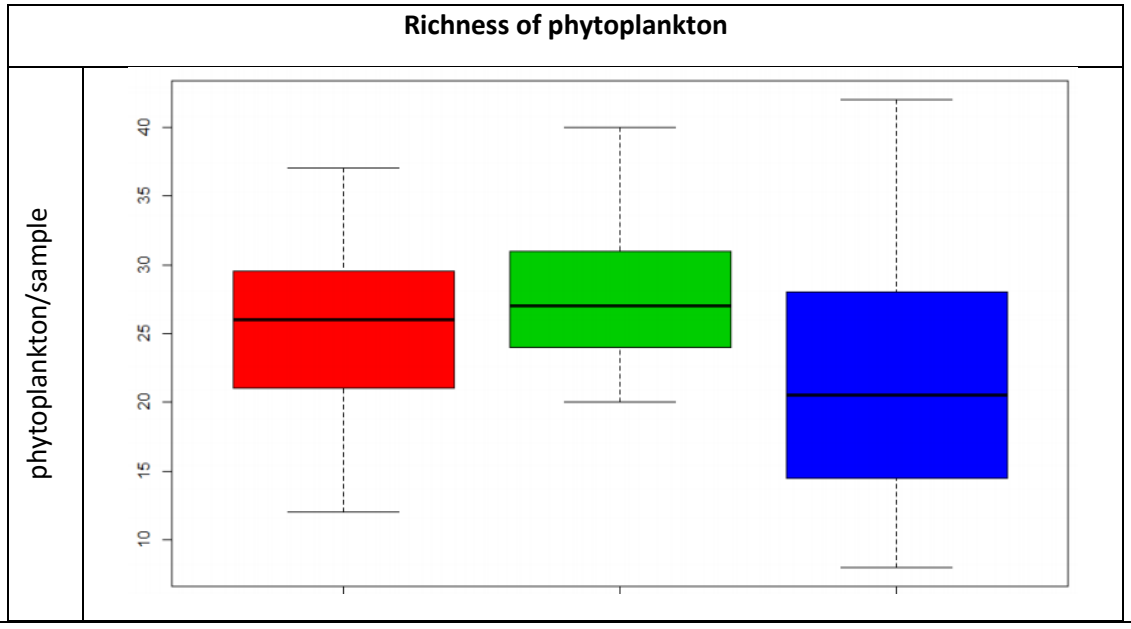


Figure 17: Sectorial comparison of the richness of the phytoplankton during the 2019 period

Table 4: Richness of phytoplankton in the different sampling locations and depths

	SCs	SCm	SCf	E1s	E1m	E1f	E2s	E2m	E2f	E3s	E3m	E3f	SRs	SRf
Number of different phytoplankton	25±8	20±7	21±11	27±4	26±8	23±7	26±5	28±7	24±6	28±4	26±5	19±6	27±5	26±4



tank marsh ocean

Category

Figure 18: Difference in richness of phytoplankton between main sectors

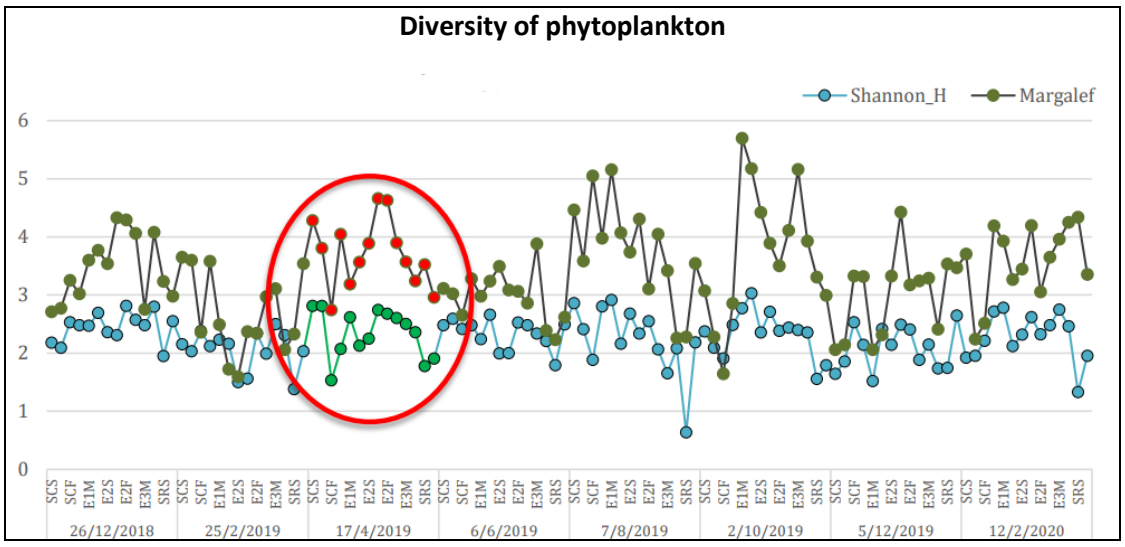


Figure 19: Differences in diversity of phytoplankton during the 2018-2020 period

As occurred with the fish community, no evidence suggests that the dredging maneuvers were related to changes in diversity of the phytoplankton community. A notable difference was observed in the samples from the Santa Rosa marsh as compared to the offshore samples. However, these differences in the main sectors are corrected for when considering richness of species.

ZOOPLANKTON (like phytoplankton, partial reports and tables of species appear as annexes to this report)

Methodology used to gather, handle and collect specimens or species data

QUALITATIVE PLANKTONIC ANALYSIS, CATCHES WITH FISHING NETS (PHYTOPLANKTON, ZOOPLANKTON AND ICHTHYOPLANKTON)

In the vicinity of each sampling station, in addition to the Santa Rosa marsh in front of the YILPORT (pier 1) port facilities, a Tribongo net was cast with a 3-minute lapse. This net has 3 mouths, measuring 0.38cm in diameter (0.113 m^2 of the filtering area) and filtering cloths measuring 1.6 m in length. The mesh size of the nets varies in microns. One is 60 microns in size, to obtain a sestonic portion that is predominantly phytoplankton with scarce zooplankton. A second mesh measures 300 microns and is intended to catch a sestonic portion with a predominance of zooplankton. And a third mesh measures 500 microns and is intended to catch a sestonic portion with a predominance of larger-sized ichthyoplankton and zooplankton. Each mesh end has a threaded plastic cup that holds up to 0.75 l, in which the samples are stored when the

net is hoisted, as the excess water is eliminated. Samples are subsequently removed from the net and fixed with 5ml of 37% formalin and 10ml of 96% alcohol. Each container was previously labeled for its subsequent laboratory analysis.

Tribongo net used and sample concentration

Center of documentation on biodiversity in which the biological material is deposited

EGA Museo Faunístico y Herbario PUCESE.

Results

1) Fluctuations in sestonic masses

During the 2019 monitoring period, in the Yilport dredging area of influence, considerable fluctuations were observed in sestonic biomasses, as shown in Figures 17 (corresponding to the sum of the fractions of 60, 300 and 500 microns appearing in figures 18, 19 and 20, respectively).

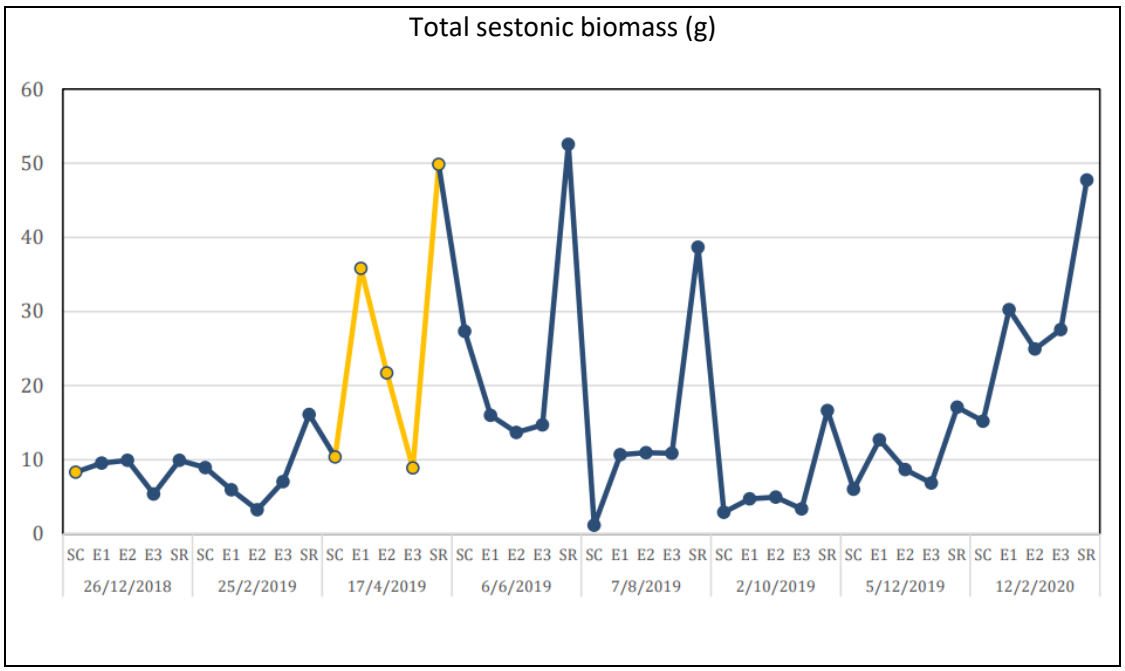


Figure 20: Evolution of the total sestonic biomass in the Yilport dredging area of influence

Broadly speaking, a tendency is found for an increase in sestonic biomass between the second and third quarter of the year. Trawling corresponding to the dredging maneuvers is shown in orange. In February 2020, a new productive cycle is observed.

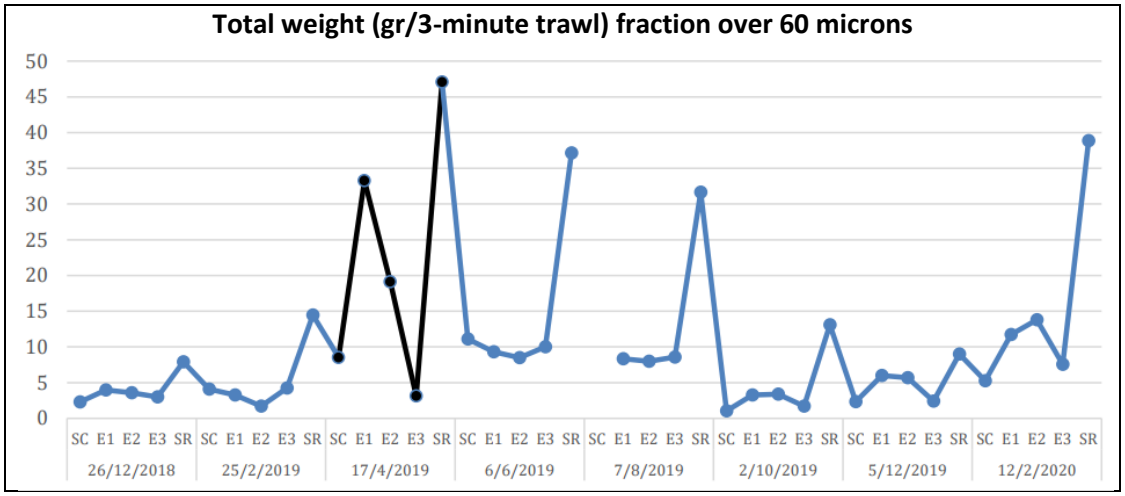


Figure 21: Evolution of sestonic biomass over 60 microns in the Yilport dredging area of influence

Figure 21 reveals that the greatest sestonic mass of the fraction greater than 60 microns was found in the Santa Rosa marsh during the dredging maneuvering operations. It should be noted that at the time of the sampling, the dredger was not operating in the vicinity and no unusual color was observed, which would indicate that fine sediments were being collected in suspension. Values exceeding 30 g at 3 minutes of trawling have been found in the Santa Rosa marsh on four different occasions.

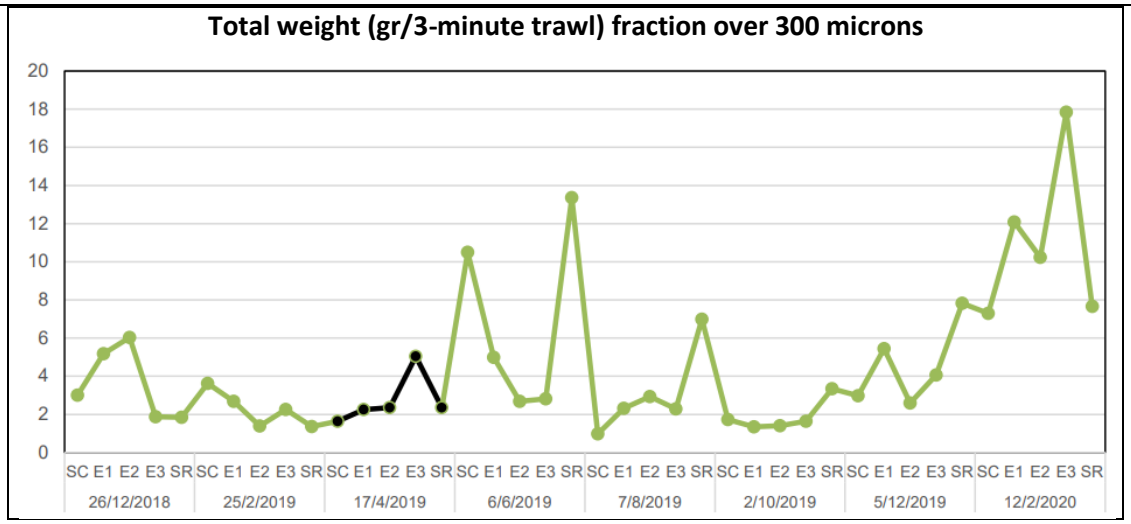


Figure 22: Evolution of sestonic biomass over 300 microns

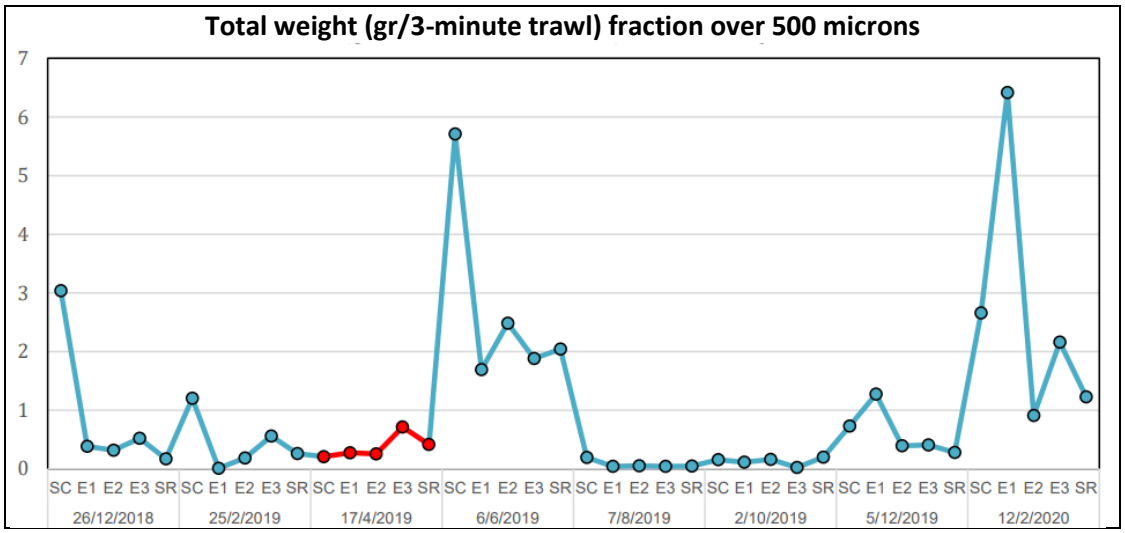


Figure 23: Evolution of sestonic biomass over 500 microns during the 2018-2020 period

Figures 22 and 23 reveal that, although there were low levels of sestonic biomass greater than 300 and 500 microns during the dredging period, this was not a result of the dredging maneuvers, but rather, was caused by the fact that these are resources increase notably during specific periods. Some major declines also take place, with the lowest sestonic biomasses (mainly for zooplankton and ichthyoplankton) occurring during August and October of 2019.

Abundance of zooplankton with a fraction over 300 microns: Figure 24 shows the abundance of zooplankton (total individuals estimated by 3-minute trawling) between the distinct trawling locations, not considering the season.

Abundance of zooplankton over 500 microns

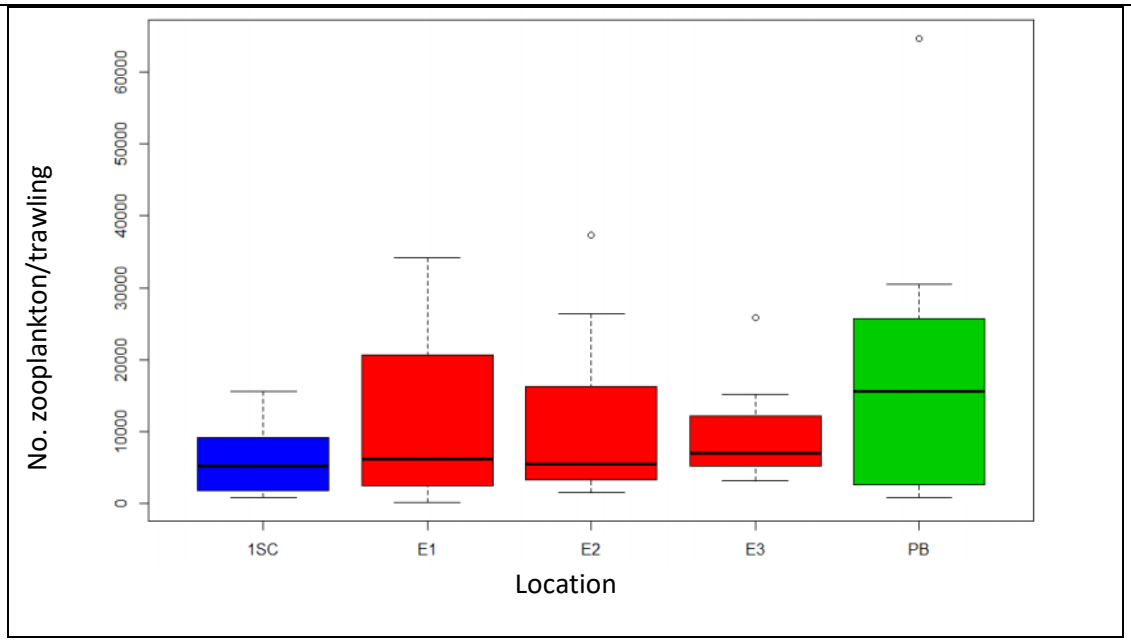


Figure 24: Sectorial differences in abundance of zooplankton over 300 microns in the Port Bolivar dredging area of influence

Table 5: Abundance of zooplankton over 300 microns

Mean abundance	**SC**	**E1**	**E2**	**E3**	**PB**
Zooplankton / trawling	6057±5197	11600±13566	11105±13243	9689±7477	19156±21083

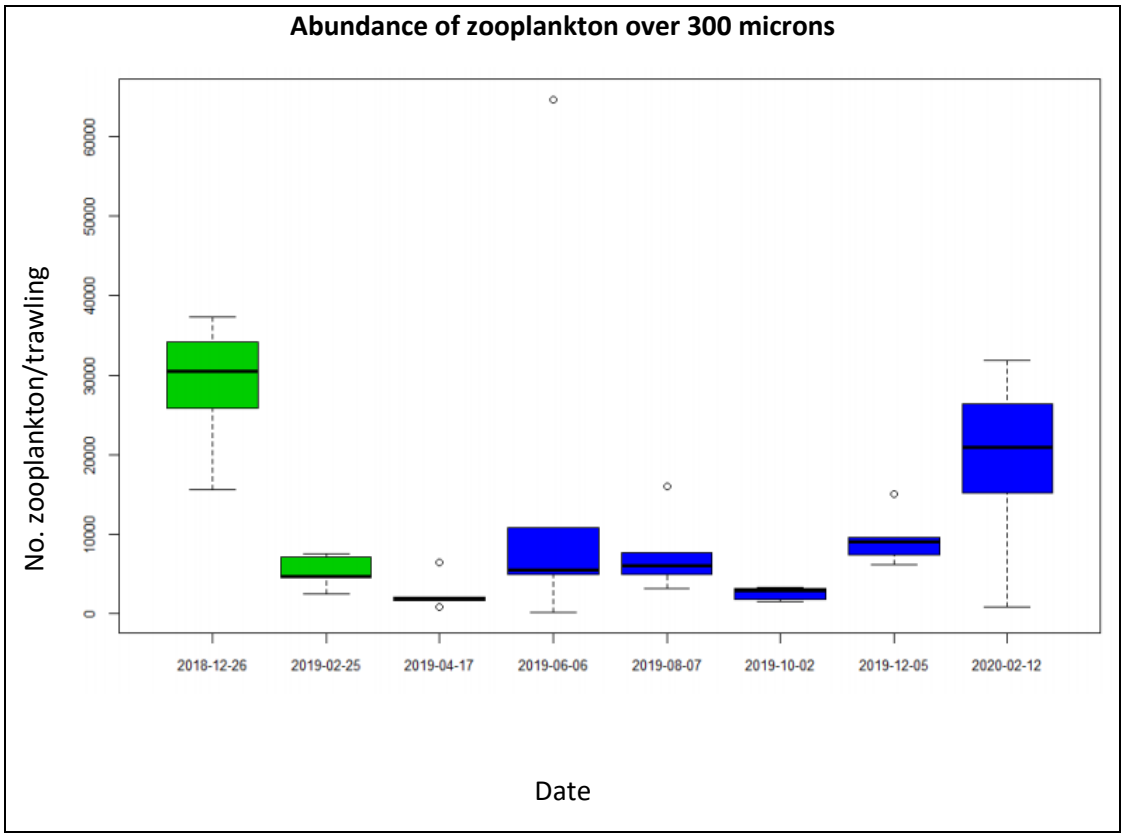


Figure 25: Overall abundance of zooplankton on the distinct monitoring dates

In Figure 25, it is possible to observe the productive cycles associated mainly with seasonal changes. Note the extreme data associated with June 2019.

Table 6: Abundance of zooplankton over 300 microns on the distinct sampling dates

Date	26 Dec 18	25 Feb 19	17 Apr 19	6 June 19	8 Aug 19	2 Oct 19	5 Dec 19	12 Feb 20
No. of different zooplankton	28664± 8451	5227±208 7	2519±2 194	17211± 26797	7526±4 999	2522±816	9438±343 5	19063±11 948

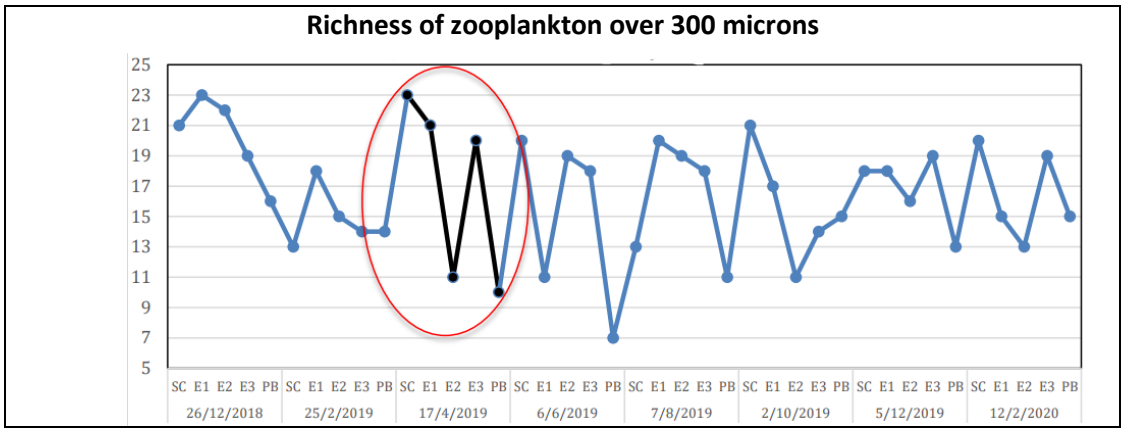


Figure 26: Fluctuations of richness of zooplankton over 300 microns by dates and sampling locations

Table 7: Mean richness of zooplankton over 300 microns on the distinct sampling dates

Date	26 Dec 18	25 Feb 19	17 Apr 19	6 June 19	8 Aug 19	2 Oct 19	5 Dec 19	12 Feb 20
No. of zooplankton	20±3	15±2	17±6	15±6	16±4	16±4	17±2	16±3

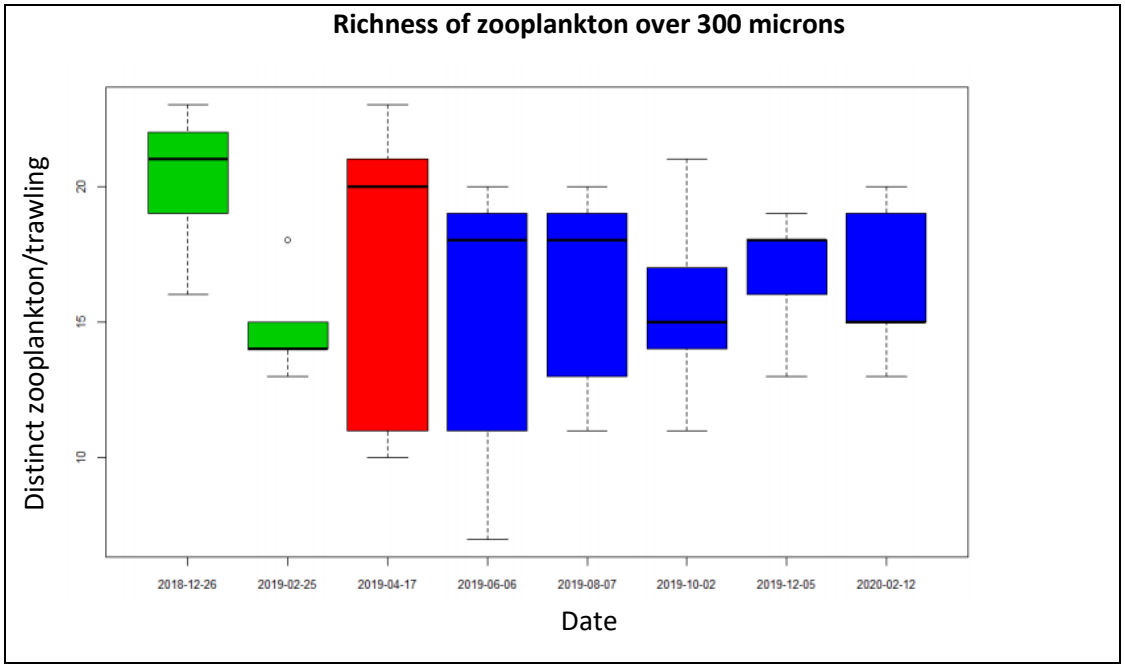


Figure 27: Richness of zooplankton over 300 microns during the monitoring period

Richness of zooplankton over 300 microns

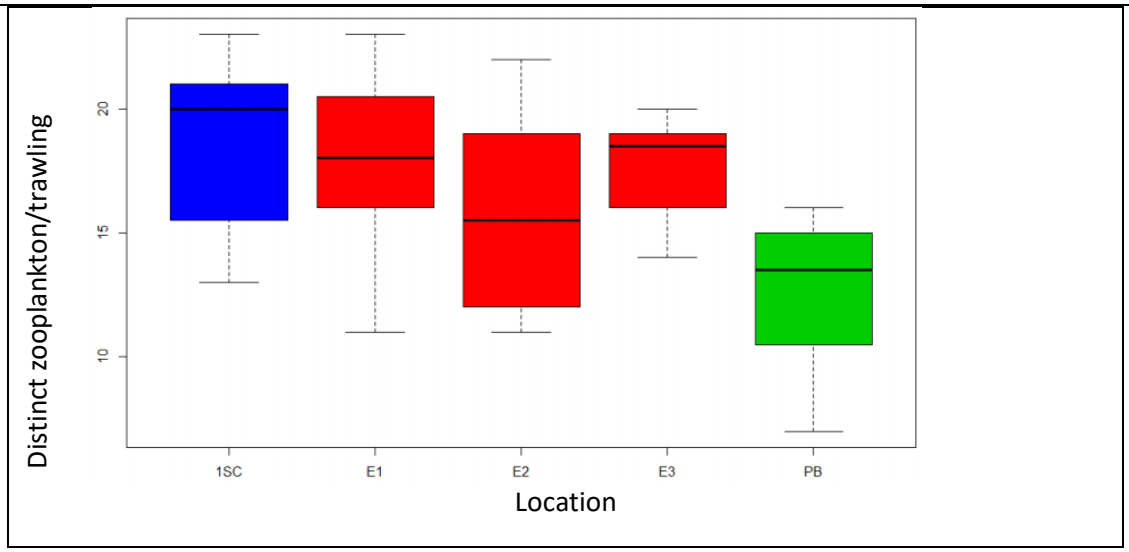


Figure 28: Richness of zooplankton over 300 microns collected during trawling

Table 8: Mean richness of zooplankton over 300 microns by trawling location

Location	SC	E1	E2	E3	PB
Mean richness	19±4	18±4	16±4	18±2	13±3

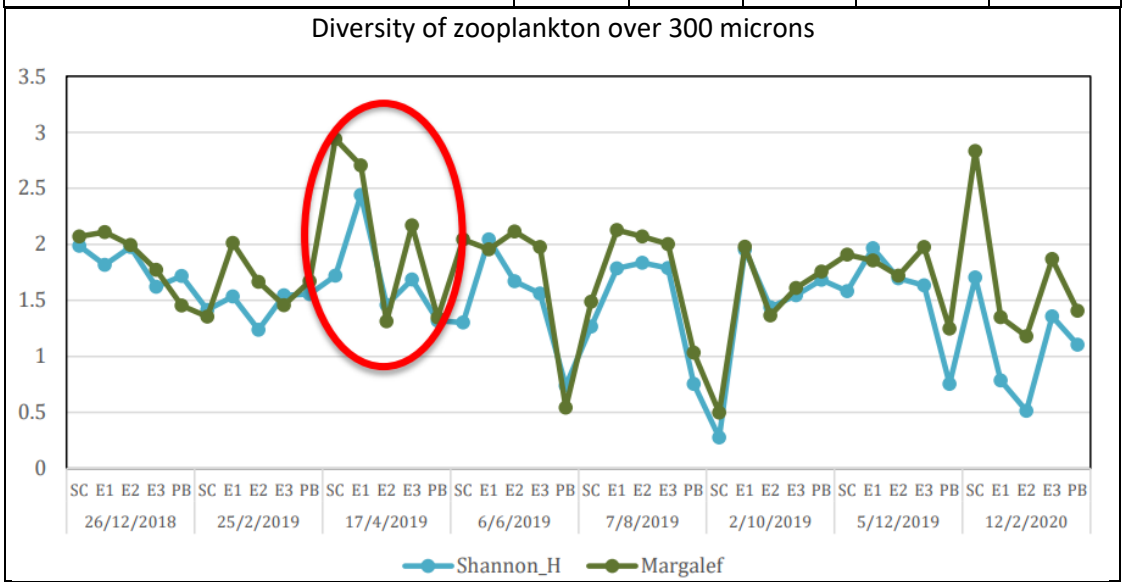


Figure 29: Evolution of the diversity of zooplankton over 300 microns

The ecological indicators do not reveal any relationship between the fluctuations in zooplankton larger than 300 microns and the dredging maneuver operations. A decreased richness of the species is observed in the Santa Rosa marsh, which has a greater abundance as compared to the other sampling locations.

Zooplankton, larger than 500 microns. Zooplankton that is greater than 500 microns in size corresponds to individuals having a larger species development as compared to those greater than 300 microns and other adult zooplankton. In Figure **30**, it is possible to observe the evolution of the abundance of the adult zooplankton during the monitoring period. A decrease can be noted during the dredging maneuver period, which is not caused by these maneuvers, but rather, seasonal differences. The abundance values of stations E1 and E2 were larger than the values recorded at the same locations in June and August of 2019.

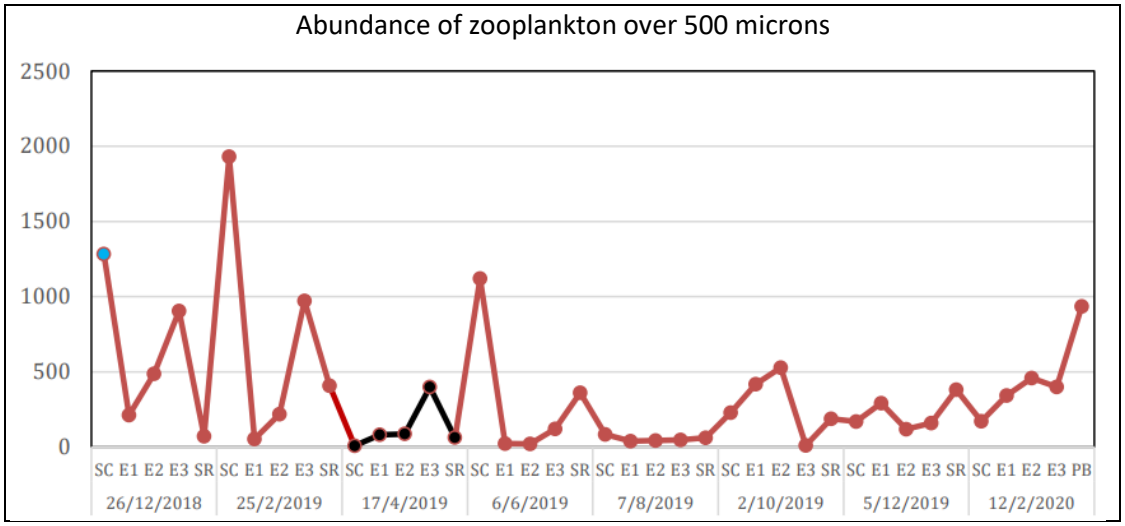


Figure 30: Abundance of zooplankton over 500 microns

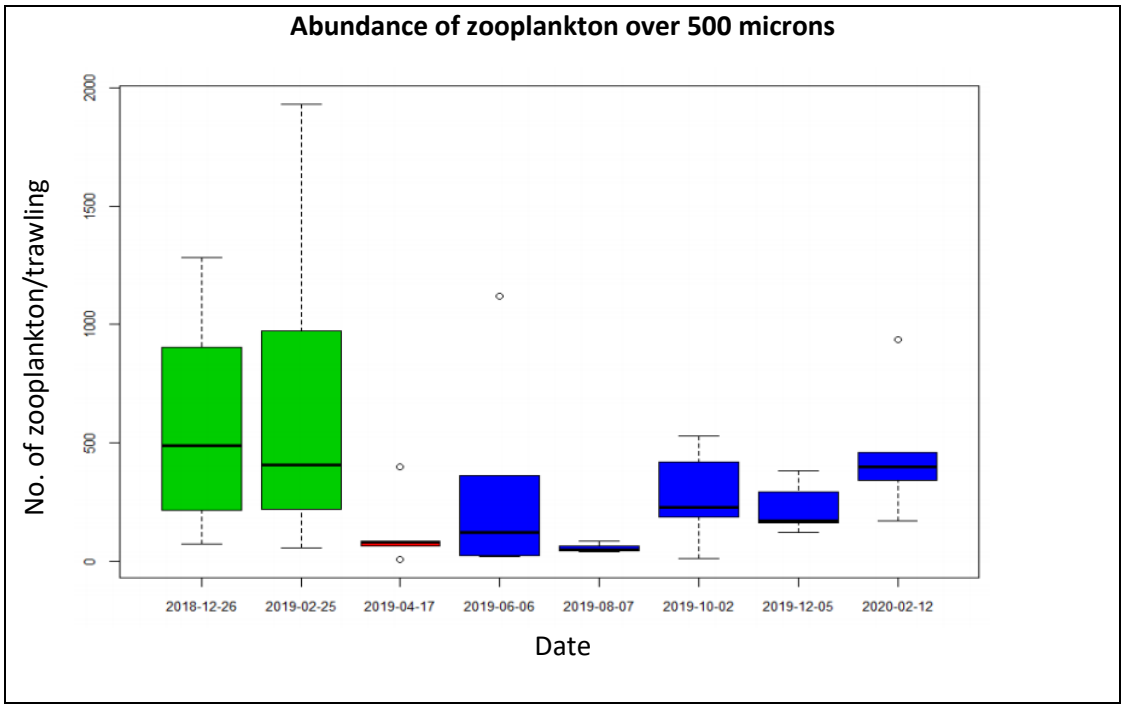


Figure 31: Overall abundance of zooplankton over 500 microns by trawling date

Table 9: Mean abundance of zooplankton over 500 microns, area of influence of the 2019 period Yilport dredging

Date	26 Dec 18	25 Feb 19	17 Apr 19	6 June 19	8 Aug 19	2 Oct 19	5 Dec 19	12 Feb 20
Abundance of zooplankton	592±500	717±762	127±155	329±464	55±18	274±202	224±109	461±286

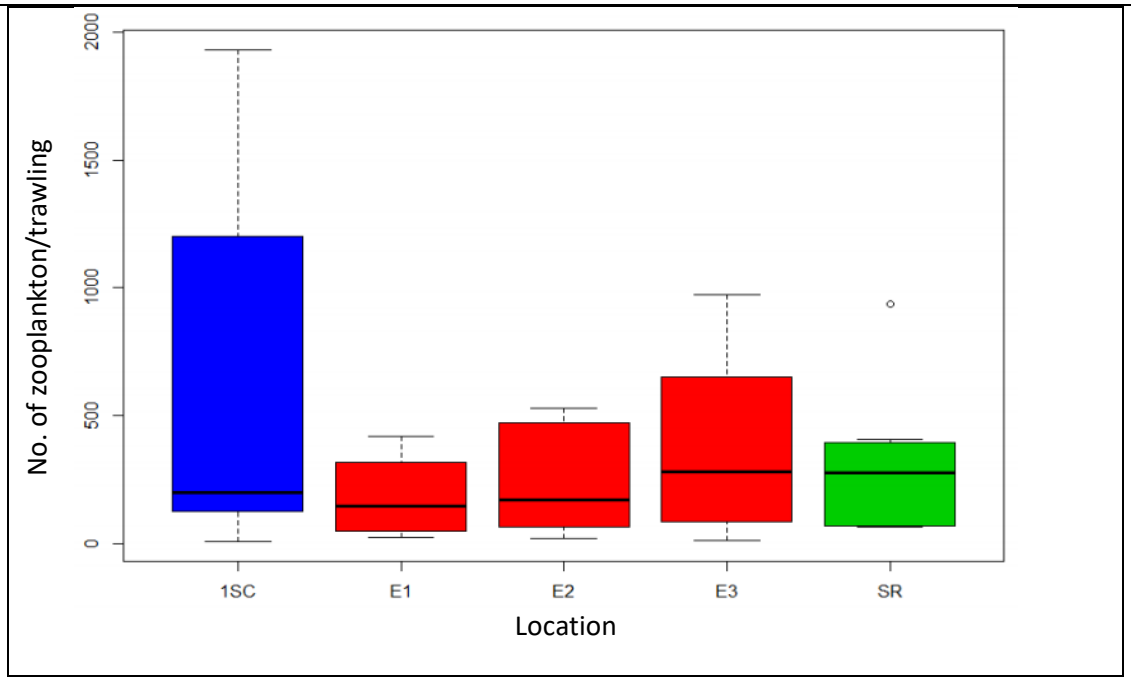


Figure 32: Abundance of zooplankton over 500 microns between distinct sampling locations with no consideration of season

Table 10: Abundance of zooplankton over 500 microns in the distinct trawling locations

Location	SC	E1	E2	E3	PB
Abundance of zooplankton	**624±720**	**182±154**	**245±213**	**376±376**	**308±293**

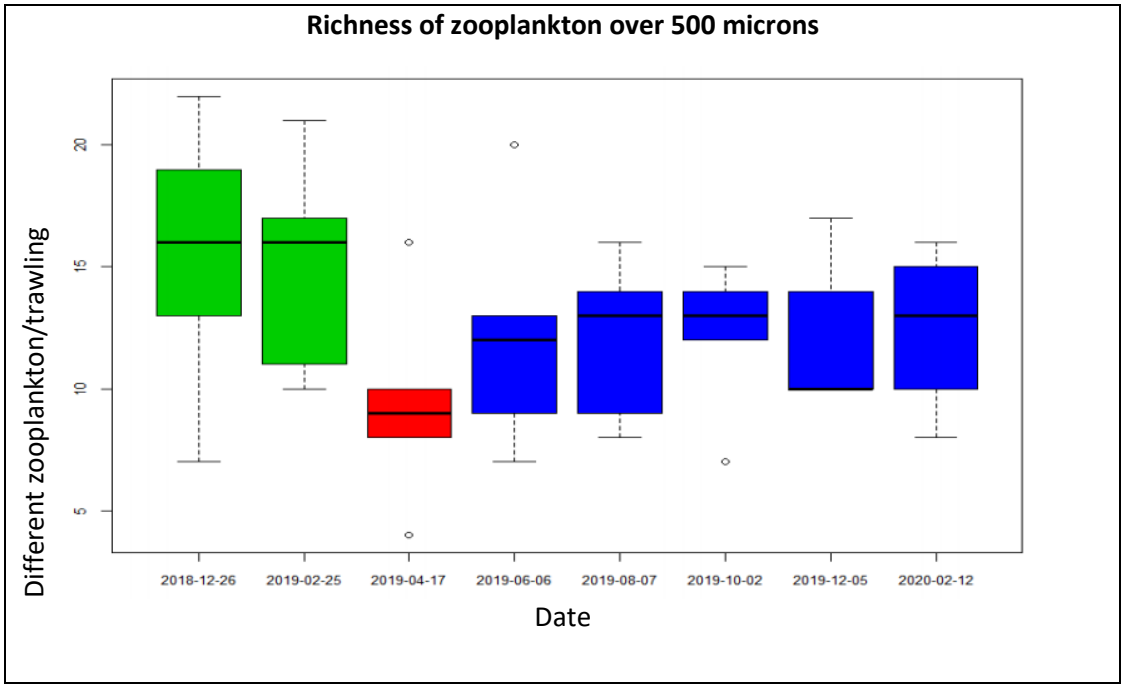


Figure 33: Mean richness of zooplankton over 500 microns on distinct sampling dates

Table 11: Richness of zooplankton over 300 microns on distinct sampling dates

Date	26 Dec 18	25 Feb 19	17 Apr 19	6 June 19	8 Aug 19	2 Oct 19	5 Dec 19	12 Feb 20
Abundance of zooplankton	15±6	15±5	9±4	12±5	12±3	12±3	12±3	12±3

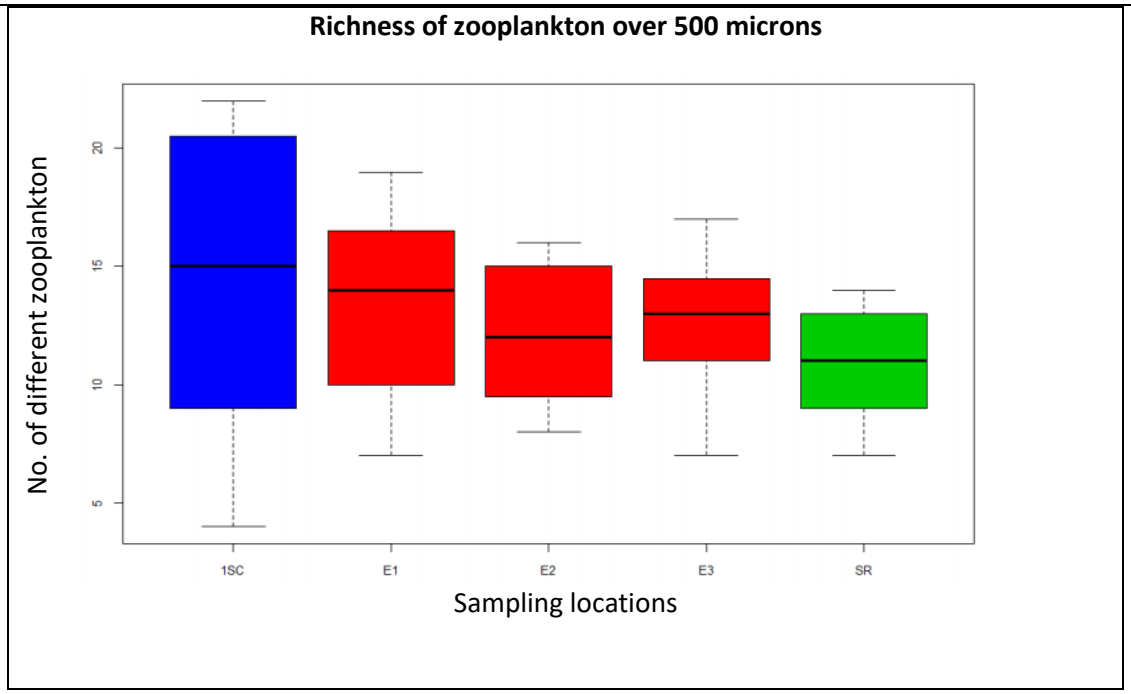


Figure 34: Richness of zooplankton over 500 microns at distinct sampling locations

Table 12: Richness of zooplankton over 500 microns considering distinct sampling dates

Location	SC	E1	E2	E3	PB
Richness of zooplankton	14±7	13±4	13±3	13±3	11±3

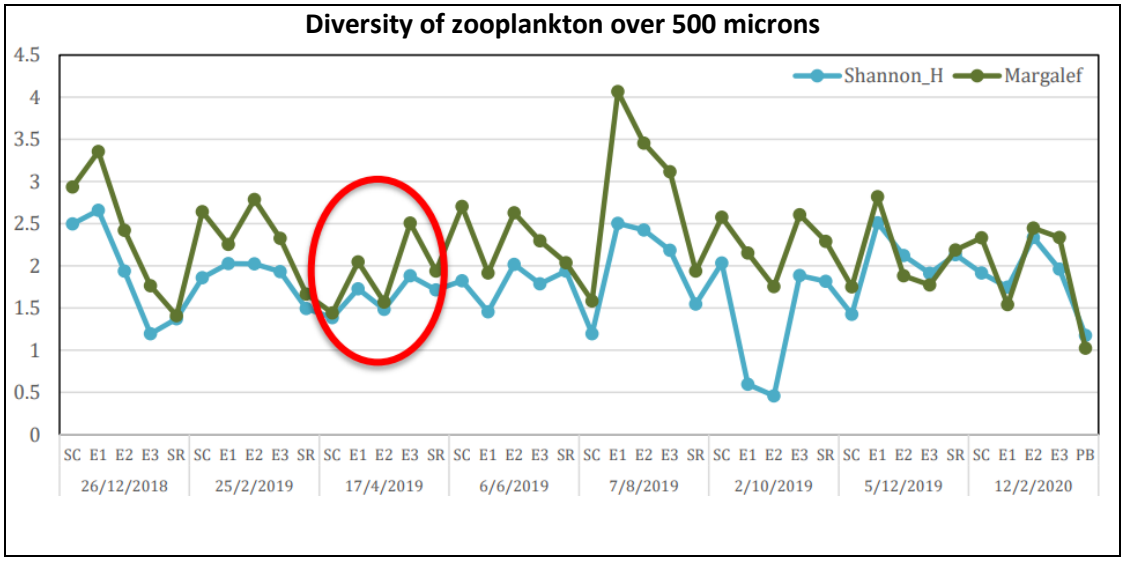
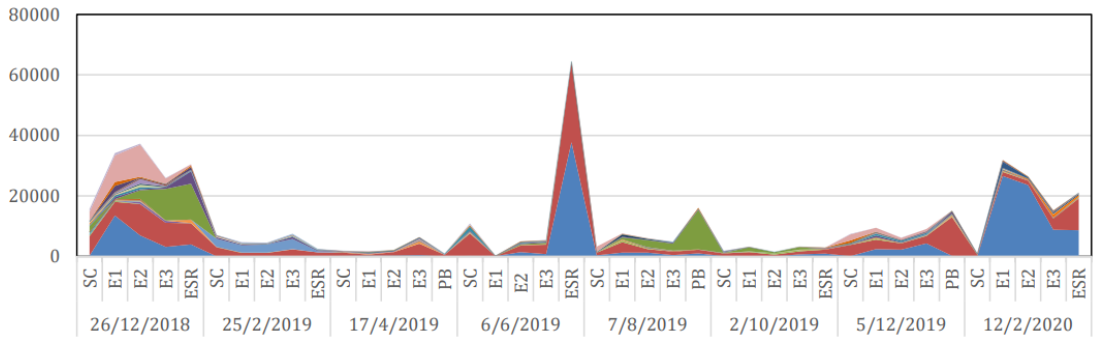


Figure 35: Diversity of zooplankton over 500 microns

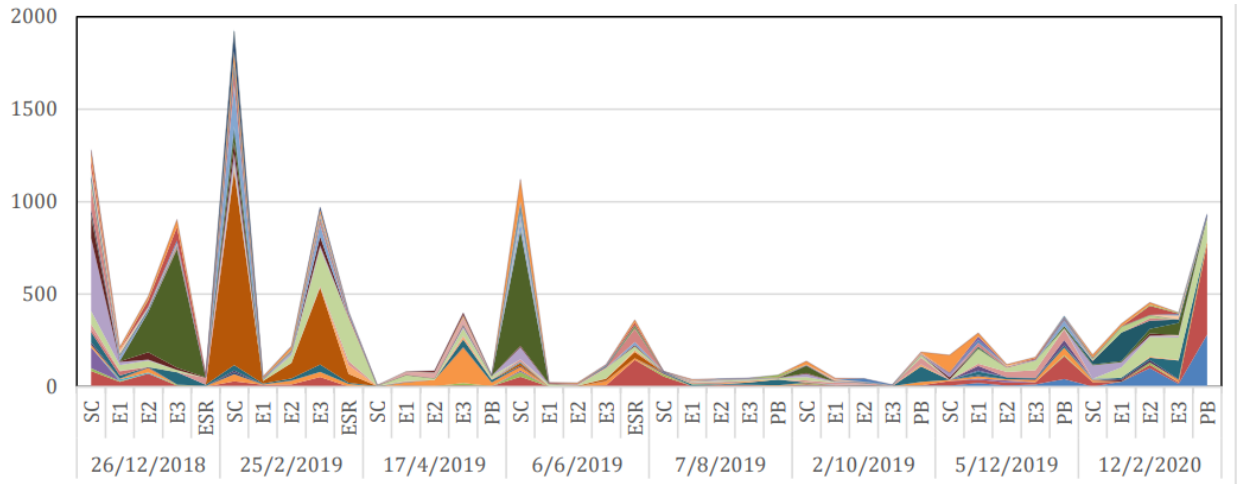
Surges in abundance of zooplankton (over 300 microns)



-Bulk decapod larvae
-Copepod 1
-Copepod 2
-Copepod 4
-Shrimp larvae
-Amphipod 1
-Amphipod 3
-Amphipod 4
-Stomatopod larvae
-Brachyuran larvae
-Cirripede
-Mysidacea
-Juvenile crab
-Sergestidae larvae
-Ostracodes
-Cyprid larvae
-Chaetognatha 1
-Chaetognatha 2
-Polychaeta larvae
-Appendicularia
-Doliolids
-Salp
-Hydrozoa 1
-Hydrozoa 2
-Hydrozoa 4
-Bract
-Polychaeta 1

Figure 36: Surges in abundance of zooplankton over 300 microns, associated with seasonal changes

Abundance of zooplankton greater than 500 microns in the Yilport dredging sector of influence



-Bulk decapod larvae
-Copepod 1
-Copepod 2
-Copepod 3
-Copepod 4
-Shrimp larvae
-Amphipod 1
-Amphipod 2
-Amphipod 3
-Stomatopod larvae
-Crab larvae
-Brachionus larvae
-Cyprid
-Decapod larvae
-Mysidacea larvae
- Mysidacea
-Juvenile shrimp 2
-Juvenile crab
-Alphaeus larvae
-Sergestidae larvae
-Ostracods
-Euphausiidae larvae
-Ampelisca amphipod
-Balanidae
-Cypris larvae
-Chaetognatha 1
-Chaetognatha 2
-Chaetognatha 3
-Polychaeta
-Polychaeta larvae
-Polychaeta larvae 2
-Appendicularia
-Doliolids
-Bract
-Salpa
-Ctenophores
-Hydrozoa 1-
-Hydrozoa 2
-Hydrozoa 3
-Hydrozoa 4
-Hydrozoa 5
-Medusozoa
-Polychaeta 1
-Polychaeta 2
-Polychaeta larvae
-Polychaeta 2
-Juvenile gastropod
-Juvenile bivalve
-Juvenile octopus
-Echinopluteus larvae

Figure 37: Changes in abundance of zooplankton over 500 microns

Figures 24 and 25 show the changes in abundance of the zooplankton over 300 and 500 microns, with no well-defined patterns being observed. However, there was a greater abundance of zooplankton over 500 microns in the winter months. However, in the sampling corresponding to the development of dredging maneuvers, it decreases, only to have a peak of abundance two months later in the vicinity of Santa Clara island, as well as the Santa Rosa marsh. The sampling will probably coincide with that of the dredging disposal tank in the tidal changes. The lowest zooplankton and ichthyofauna abundances were found in August and October, corresponding to the summer period of the coast of Ecuador. However, there is insufficient evidence to relate this decrease with the dredging maneuvers.

BENTHOS

Methodology

In each offshore analysis station, a sample was collected from the sea bed using a 10 kg dry weight Van Been-type dredger with a sampling capacity of 4 liters. Its sampling surface area is 0.08 m^2 at one end. The dredger sinks, swinging from the vessel and once it reaches mid-water depth and approaches the sea bed, it falls. This maneuver is coordinated with the vessel's captain to prevent the dredger from dragging. Once impact is made, the dredger activates a mechanism to close itself. Once aboard the vessel, it deposits its content in a rectangular 500-micron mesh, eliminating any excess sediment and reducing the sample, concentrating the benthos individuals and sediment residue towards wide-mouth containers that are fixed with 96% industrial alcohol. The fixed and labeled samples are kept in the shade until their transfer to the EGA PUCESE laboratory.

Dredger used; sample reduction; fixed benthonic sample, ready for laboratory analysis

In the laboratory, the samples are scattered on white trays for scrutiny under good lighting and the use of manual magnifiers. All benthonic individuals that are observed are removed from each sample and are deposited in 60 ml wide-mouth containers, replacing the 96% industrial alcohol with 70% potable alcohol. For identification and counting, the individuals found in each sample are separated into main groups in Petri dishes. They are then observed and counted using a DINOLITE digital microscope with a magnification of 200x.

For species identification, the following guides were used:

- Sea tropical shells of Western America de **Myra A. Keen**, re-edited in 1971. Stanford University Press
- Poliquetos (Annelida: Polychaeta) de México y América Tropical" (**De León-González et al., 2009**)
- Volumen 1, **Guía FAO para la identificación de especies para fines de pesca, Pacifico Centro Oriental, 1995**. Algas e Invertebrados marinos
- Acta Oceanográfica del Pacifico Volumen 19, N.1, 2014 ISSN N° 1390-129X, del Instituto Oceanográfico de la Armada del Ecuador, Bivalvos del golfo de Guayaquil
- The World digital database register of marine species WoRMS[2]
- The Catalogue of life digital database[3]
- **Ángel de Leon,2017**. Estado del conocimiento de poliquetos en el Ecuador en Díaz-Díaz, O., D. Bone, C.T. Rodríguez & V.H. Delgado-Blas (Eds.) 2017. Poliquetos de Sudamérica. Volumen Especial del Boletín del Instituto Oceanográfico de Venezuela. Cumaná, Venezuela, 149pp.
- **Francisco Villamar, 2013**. Estudio de los poliquetos (gusanos marinos) en la zona inter mareal y submareal de la bahía de manta (ecuador), y su relación con algunos factores ambientales, durante marzo y agosto del 2011 acta oceanográfica del pacífico vol. 18 Nº 1, 2013

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[2] http://www.marinespecies.org/
[3] http://www.catalogoflife.org/

Once the data on abundance and distribution of the collected species were digitalized, they were exported to the PAST 3X processor, obtaining the main ecological descriptors for each analyzed station. In addition, a sampling mean was provided for making seasonal comparisons. The database was exported to the AZTI AMBI software, which has been accepted by the European watermark. A marine quality rating was established based on the distribution of benthonic individuals, using 5 categories related to the sensitivity of these individuals, in terms of organic material. Stations were qualified from 0 (pristine quality) to 7 (azoic). Impact thresholds were established.

Once the samples were analyzed, the specimens were deposited in 250 ml wide-mouth containers containing 70% alcohol, stored in the collection of the Museo Faunístico y Herbario PUCESE.

Cleaning and observation of the benthic samples

Results

The benthic community of the dredging tank received the most impact upon depositing the dredged sediment in the disposal tank, burying the existing community which is considerably decreased in terms of benthonic abundance and richness. These individuals are unable to emerge appropriately and are suffocated, as revealed by the evolution of the benthic abundance, richness and diversity, whose seasonal evolution appears in Figures 26, 27 and 28.

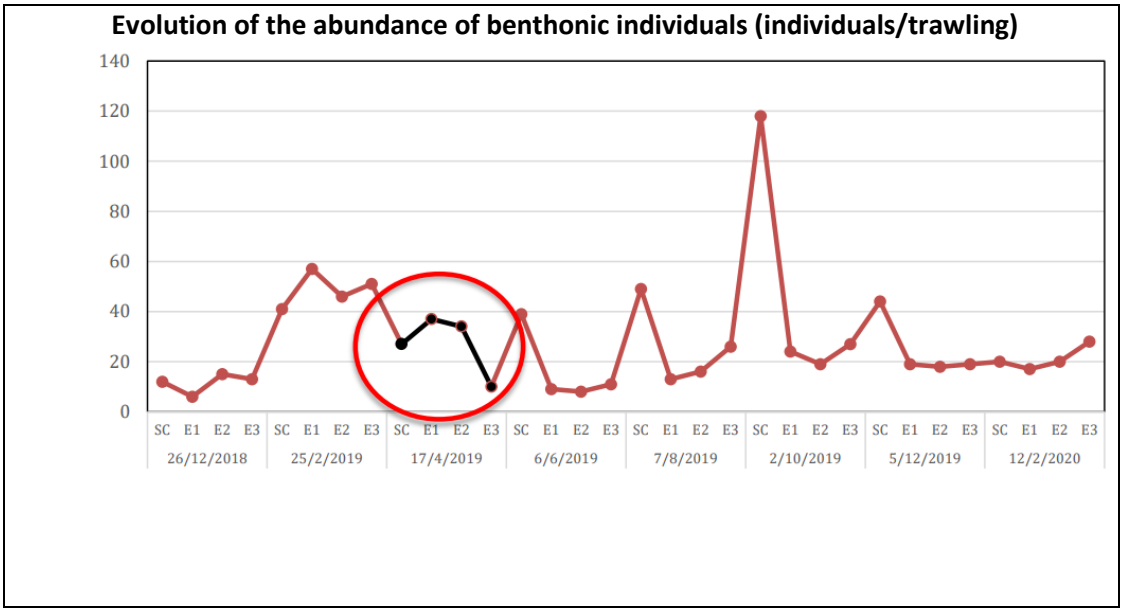


Figure 38: Evolution of benthonic abundance offshore

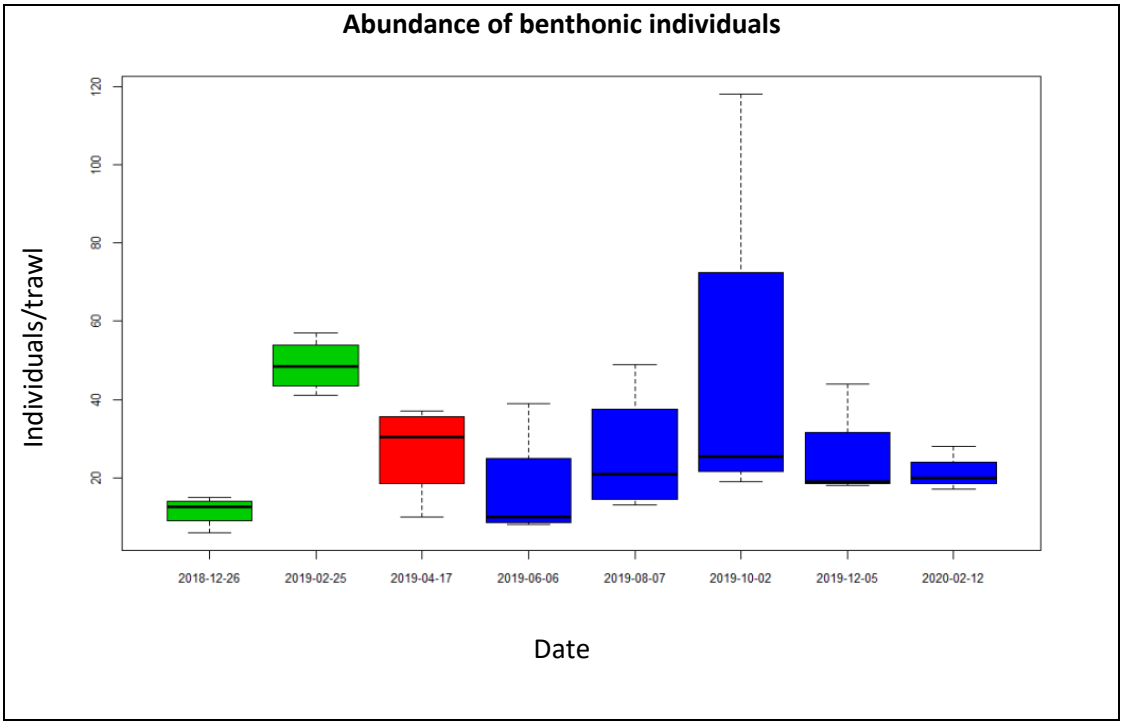


Figure 39: Temporal fluctuations of benthonic abundance

Abundance of benthonic individuals

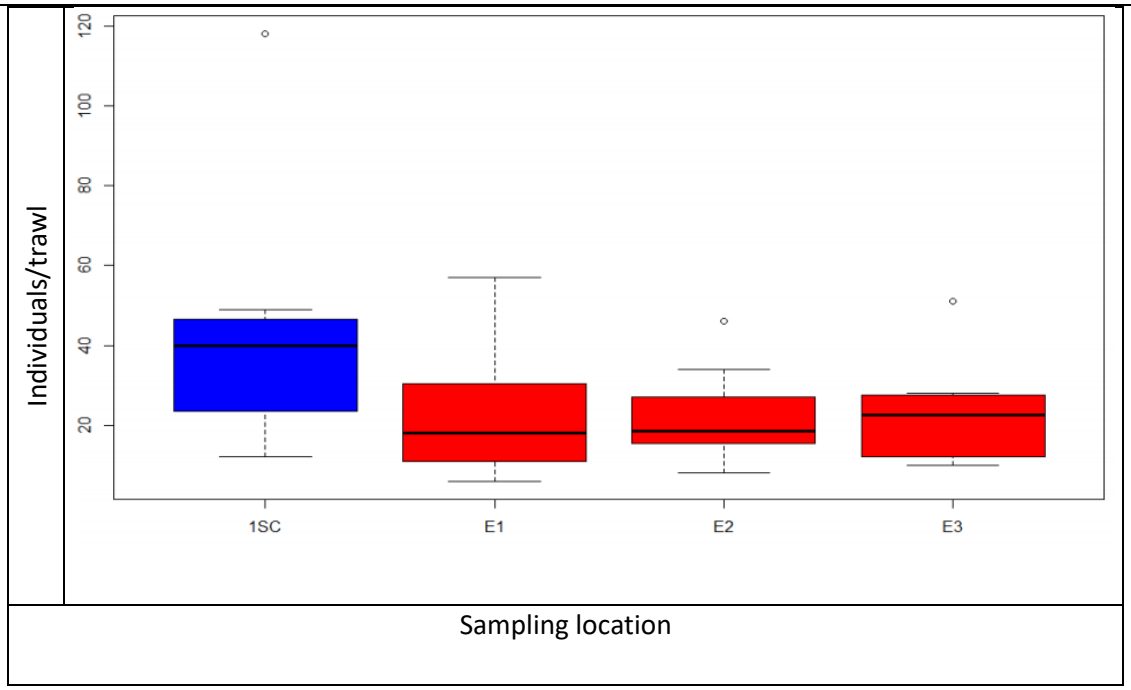


Figure 40: Abundance of individuals in sampling, with no consideration of seasonality

Figure 40 reveals a lower benthonic abundance in the 3 analyzed stations located within the dredging disposal tank.

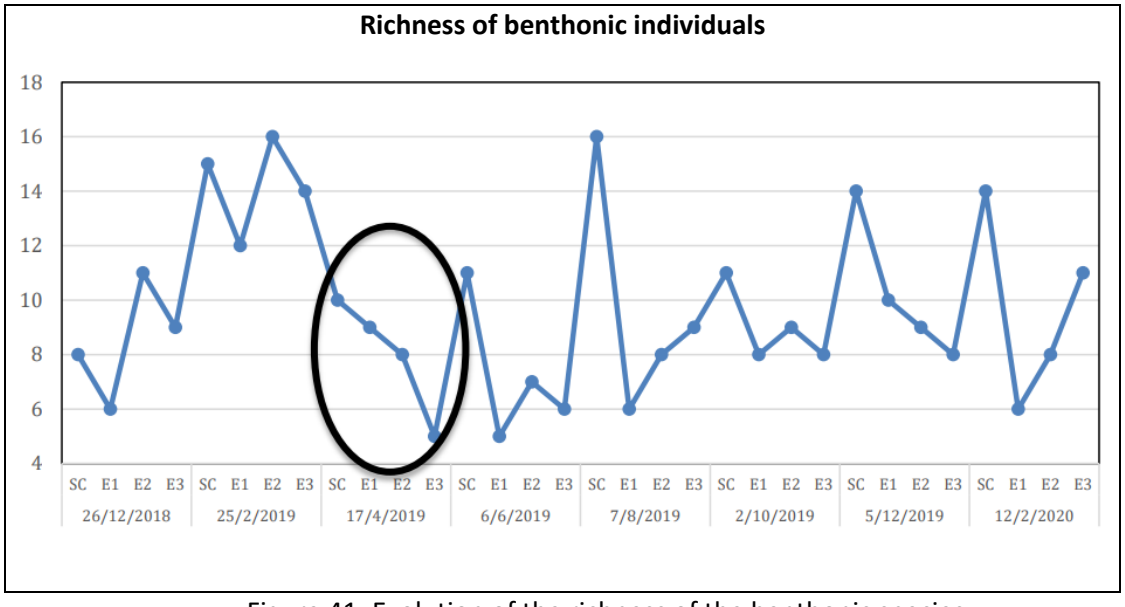


Figure 41: Evolution of the richness of the benthonic species

Figure 41 shows the decrease that took place in the richness of the species during the dredging maneuvers. Two months later, the number of benthonic species inhabiting the soft sea-bed began to increase.

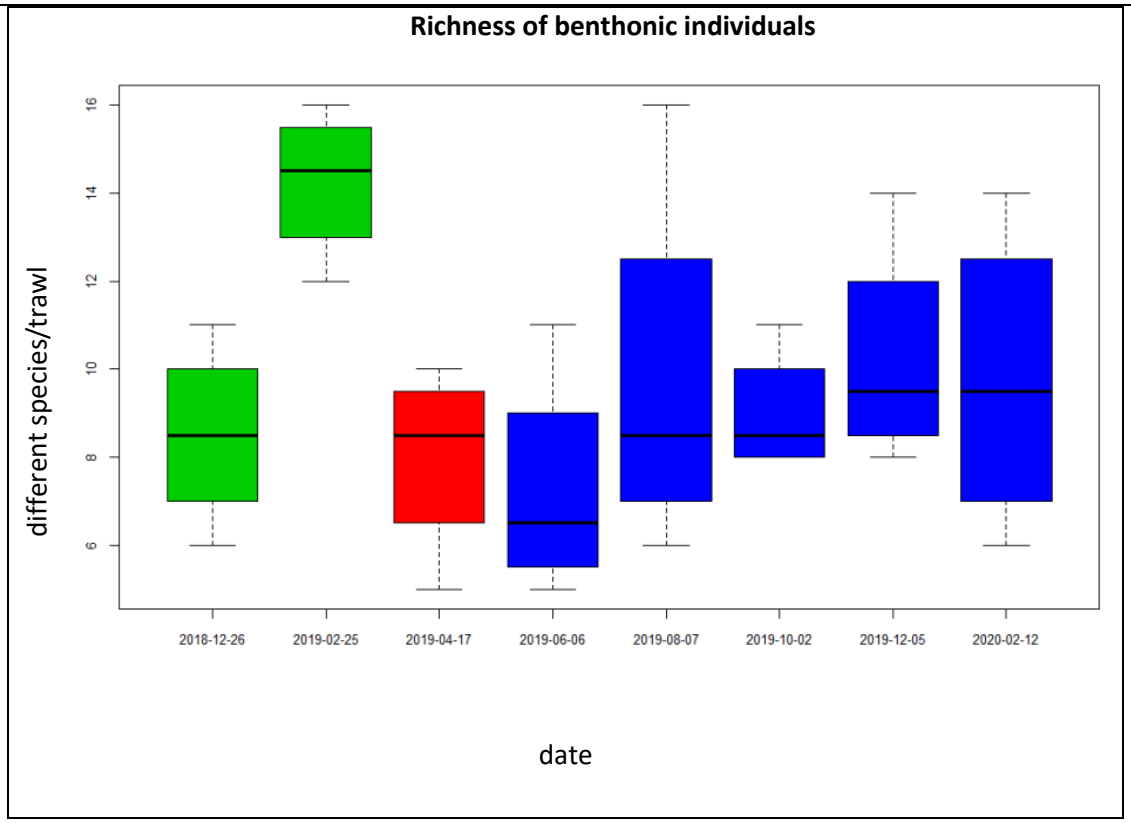


Figure 42: Fluctuations in benthonic richness in the 4 offshore stations analyzed

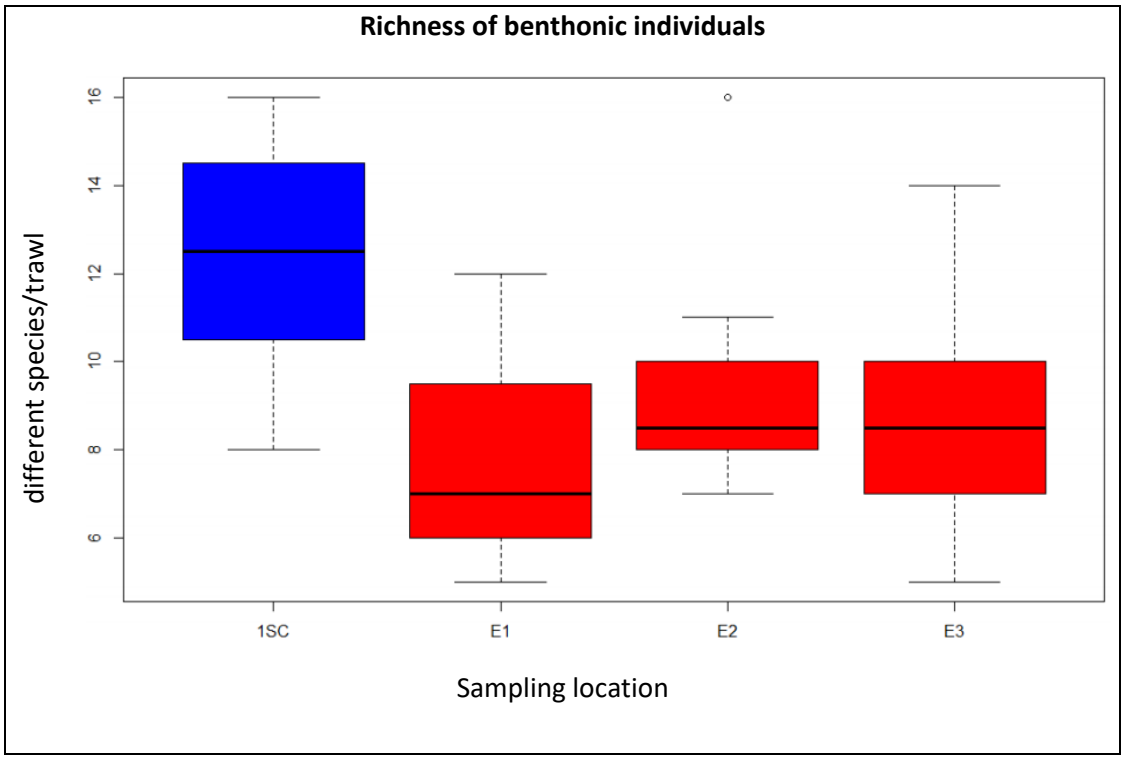


Figure 43: Richness of benthonic individuals categorized by location of sampling without considering seasonality

Figure 43 shows the greater richness of benthonic resources in the Santa Clara station. It should be noted, however, that this station has a mixed sea bed, offering more habitats to host a greater number of species. The stations within the dredging disposal tank are made up of only slit, sludge and fine sand. Therefore, it is logical that there will be fewer forms of life in this much more homogenous habitat.

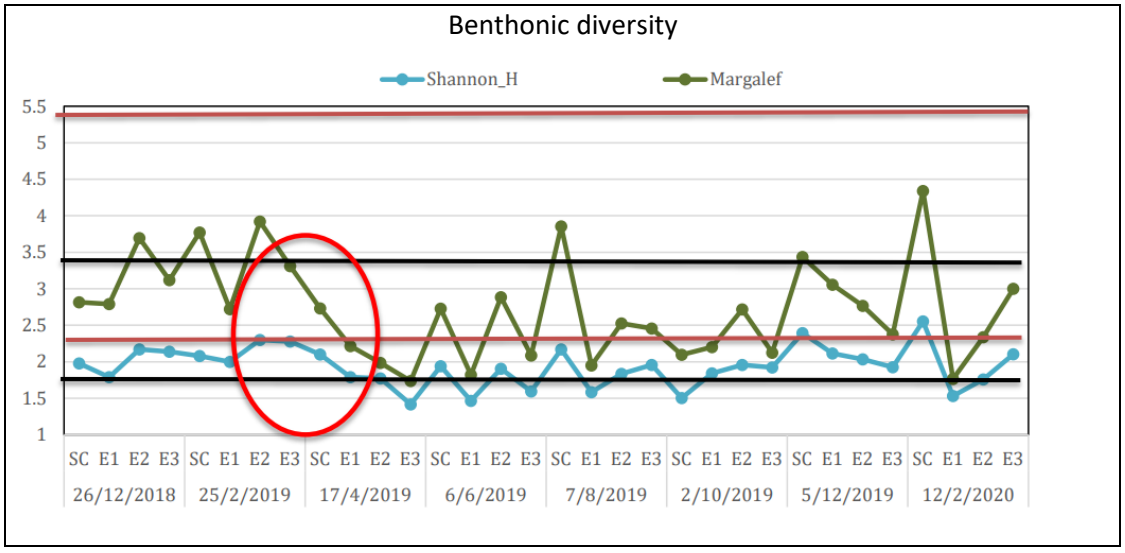
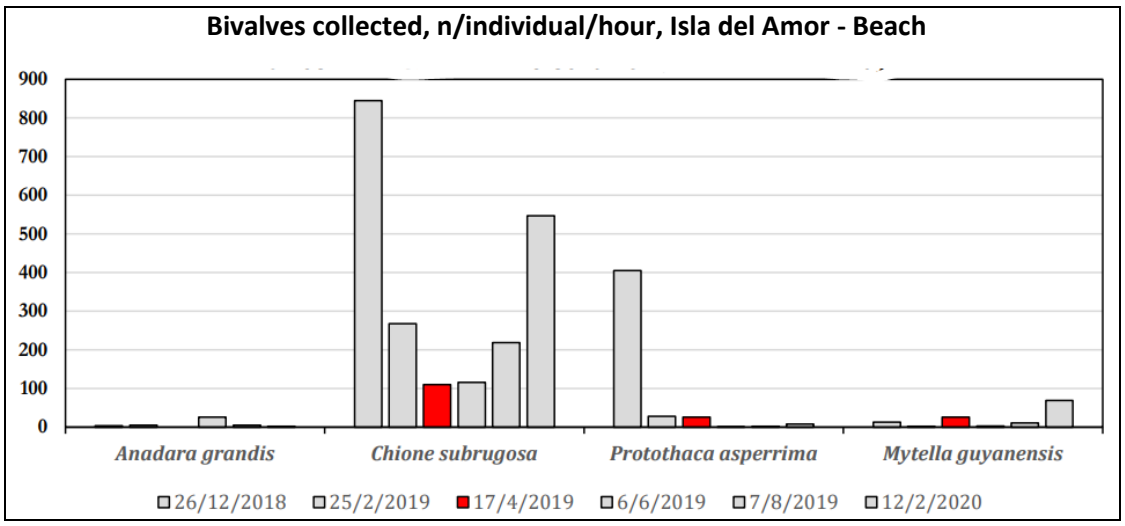


Figure 44: Benthonic diversity

Figure 44 reveals that, although the dredging maneuvers decreased the population and richness of the benthonic species, the Shannon's (H) and Margalef diversity index (intermediate diversity limits between the black lines) did not significantly decrease, with natural fluctuations occurring inside the tank base.

Productivity of pedestrian extraction resources in mangroves near the dredging sector of the Santa Rosa marsh

In the AUSCMs of Vikingos del Mar (entry sector to Jambelí), La Playita (El Faro sector) and Porteño marsh (Isla del Amor sector, beach and shell mound), the abundance and main characteristics of the pedestrian extraction resources were monitored, standardizing the sampling effort to 1 hour and with the same individual serving as the collector, to limit potential errors due to the factors of age and ability to collect.



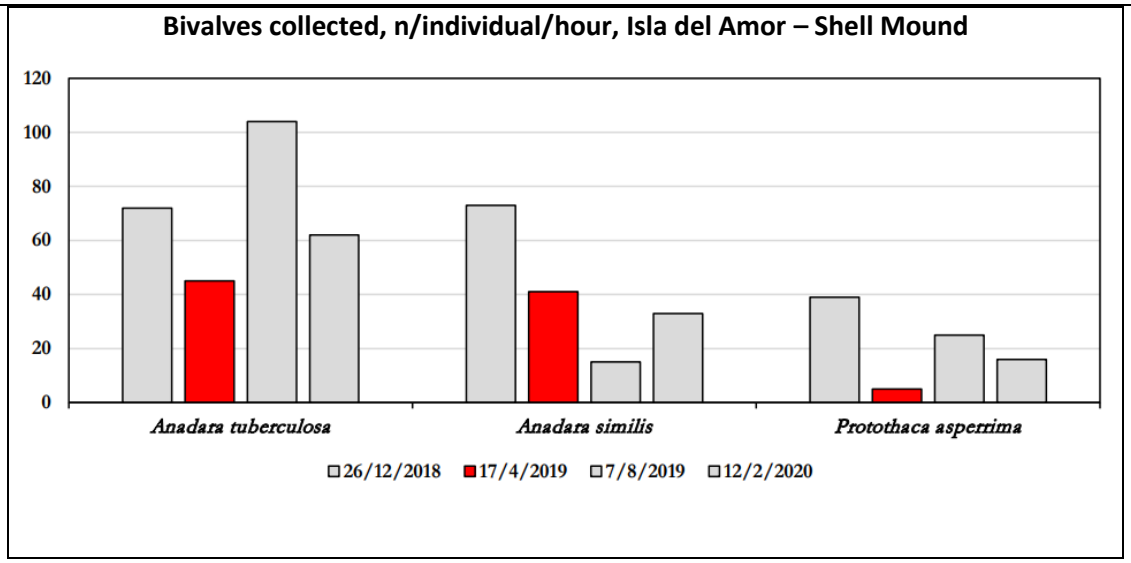


Figure 45: Abundance of bivalves collected by one person in one hour in the AUSCM Isla del Amor

In Figure 45, the fluctuation of the number of bivalves collected by one person with a one-hour effort is shown. The red column corresponds to the sampling during the dredging maneuvers. It appears that there was a considerable decrease in this period, however, in fact, the difference is attributed to the change of collector. In December 2018, the collector was a 27-year old man who earned a record in collection for the monitoring period, gathering 1400 specimens in one hour. In April, the individual in charge of sample collection was a woman over the age of 50 who did not surpass 200 specimens per hour, given that her mobility was reduced.

Within the reforested mangrove, it is not possible to determine if the dredging had an impact on these resources since the sector lacks proper surveillance and is regularly exploited, in addition to the direct influence of the marsh that supplies water from the north of the Machala Puerto Bolivar conurbation.

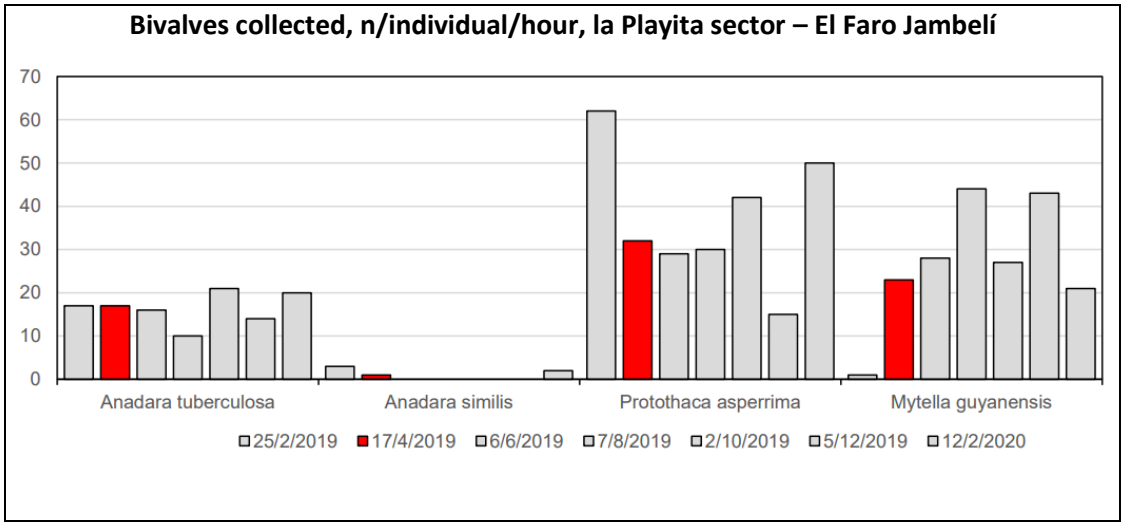


Figure 46: Evolution of the number of bivalves collected by one person in one hour, sector la Playita

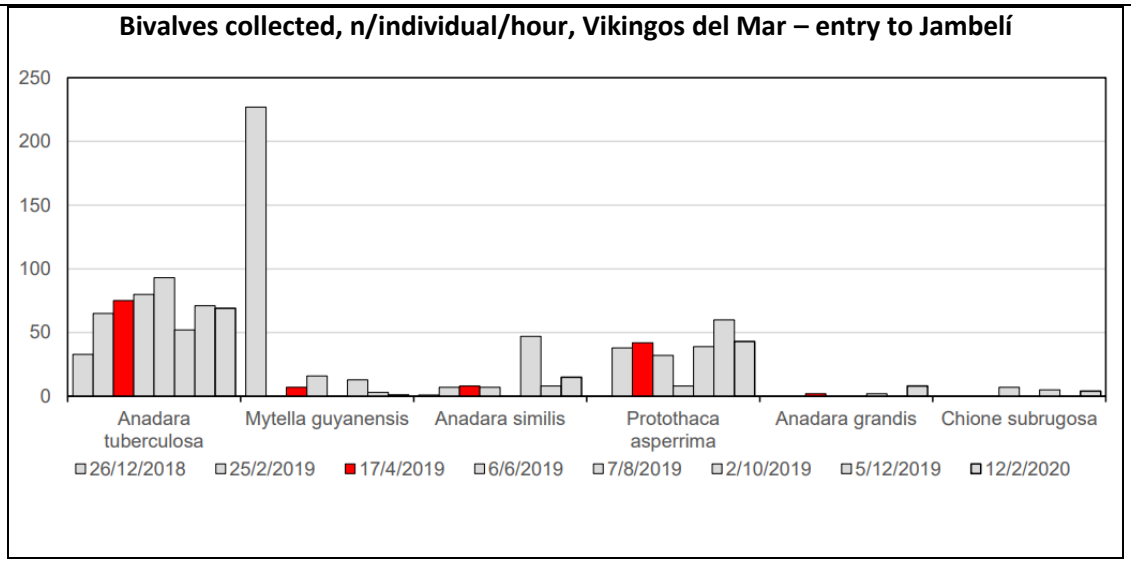


Figure 47: Evolution of the number of bivalves collected by one person in one hour in the Vikingos del Mar AUSCM

Figures 46 and 47 show that the levels of bivalve collection in these two AUSCM locations (Playita and Vikingos del Mar) were quite stable as compared to the fluctuations taking place in the Isla del Mar AUSCM. The same collector was used for all of the campaigns and it is evident that in the sampling corresponding to the dredging maneuvers, collections were more abundant. This suggests that the dredging maneuvers did not have an impact on bivalve abundance.

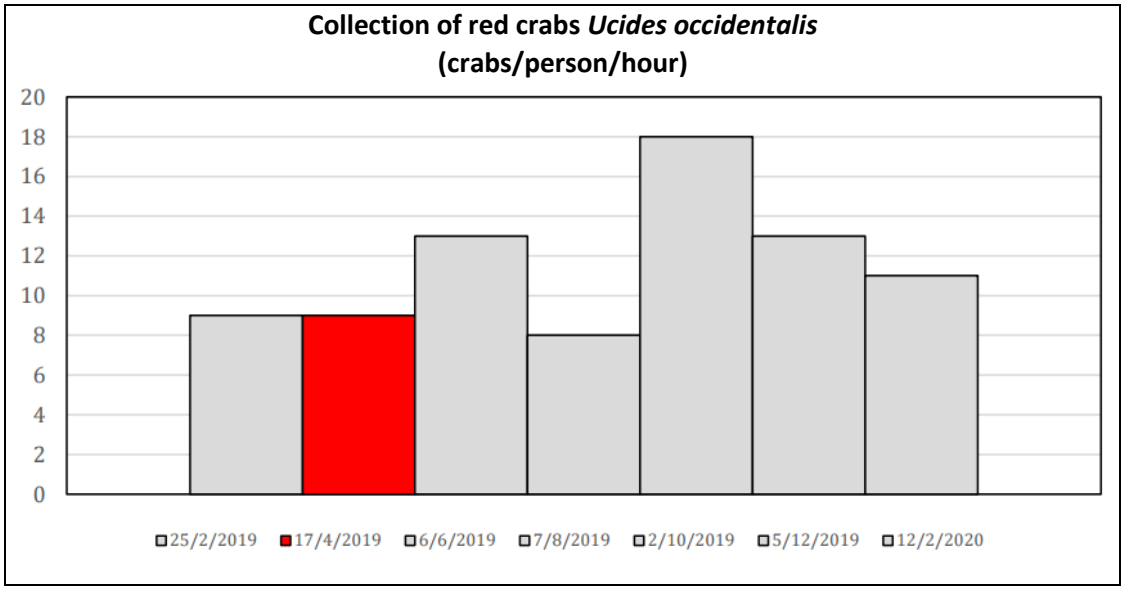


Figure 48: Evolution of the collection of red crabs in the Vikingos del Mar AUSCM

Figure 48 reveals that the red crab population was not affected by the dredging maneuvers. The increase observed during October corresponds to the work carried out in the AUSCM sector, given that sites were rotated to prevent the collapse of resources.

Resource size (mean valve diameter) is another indicator revealing that there was no impact on the resources collected by individuals in the AUSCMs adjacent to the dredging sector of the Santa Rosa marsh. If impact had taken place, a smaller mean size would be expected to be found. However, this was not the case in any of the AUSCMs, as seen in the comparison of mean diameter of the bivalves collected in the Santa Rosa marsh.

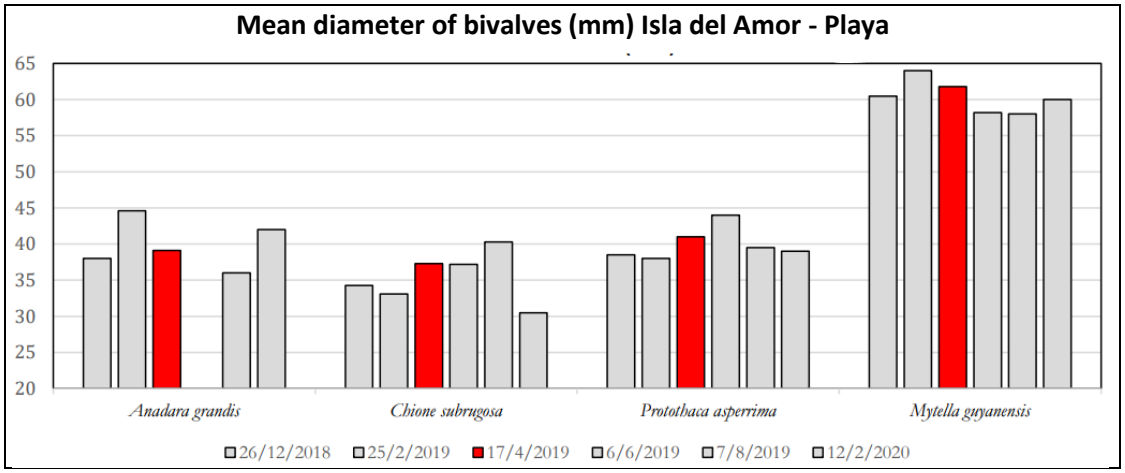


Figure 49: Evolution of the mean diameter of the bivalves collected in the beach of the Isla del Amor AUSCM

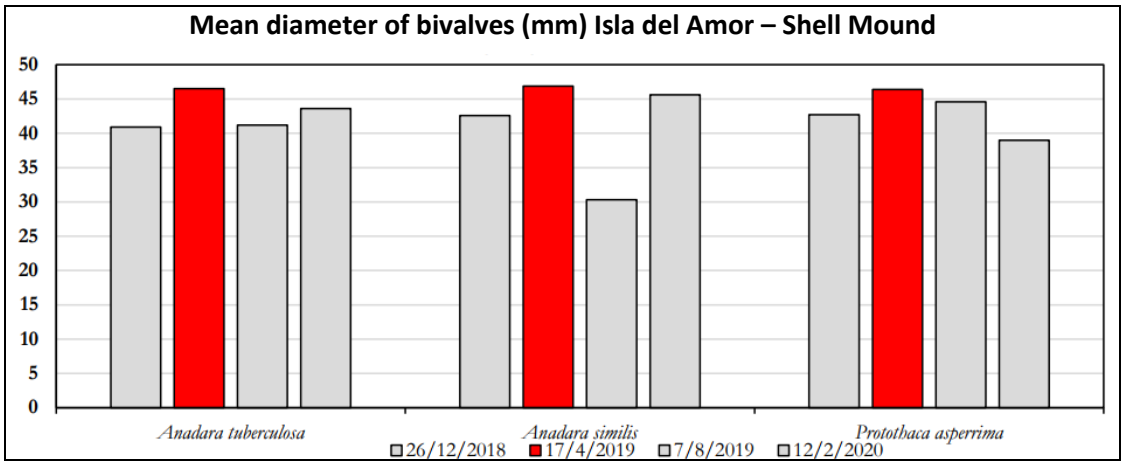


Figure 50: Evolution of the mean diameter of the bivalves collected in the Isla del Amor shell mound

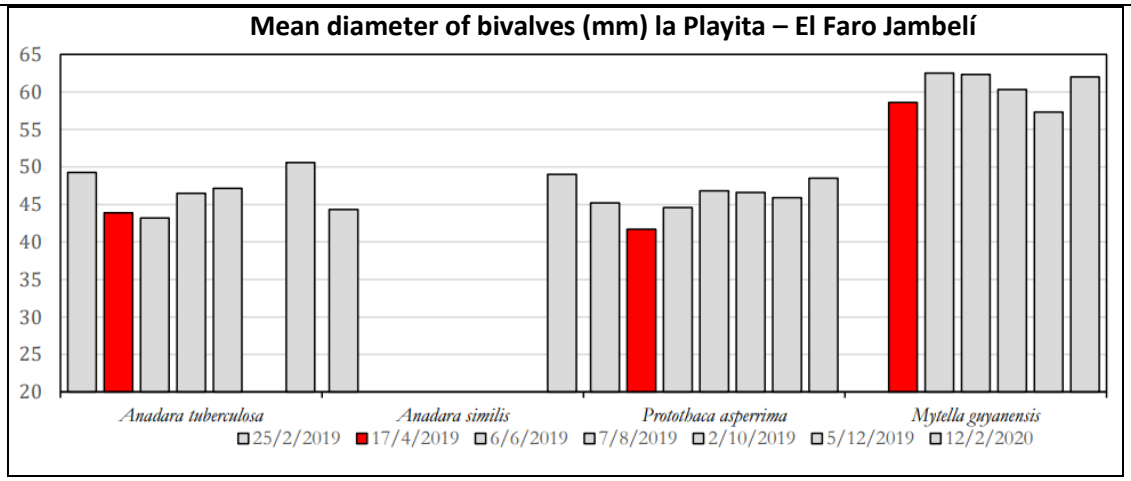


Figure 51: Mean valve diameter of the bivalves collected in the la Playita AUSCM

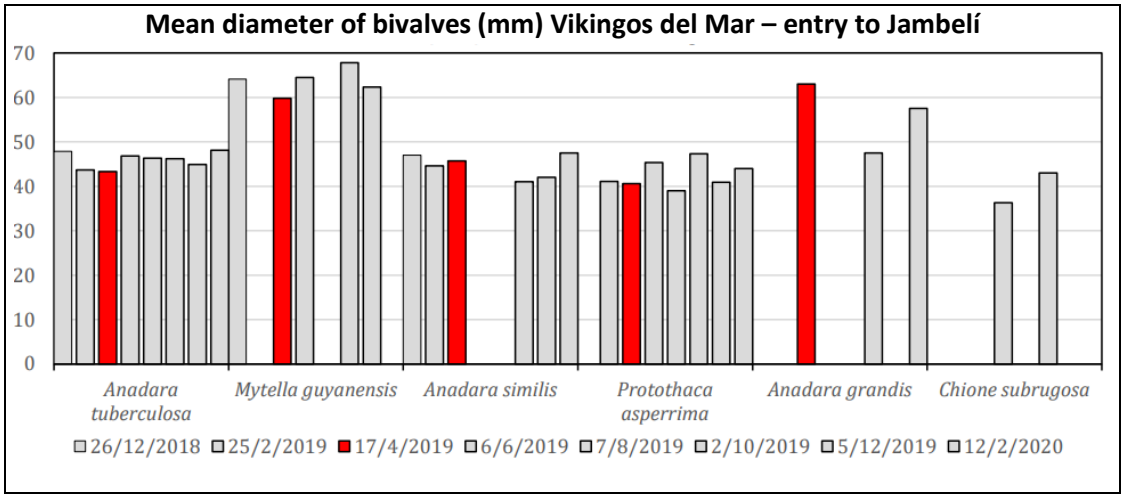


Figure 52: Mean valve diameter of the bivalves collected in the Vikingos del Mar AUSCM

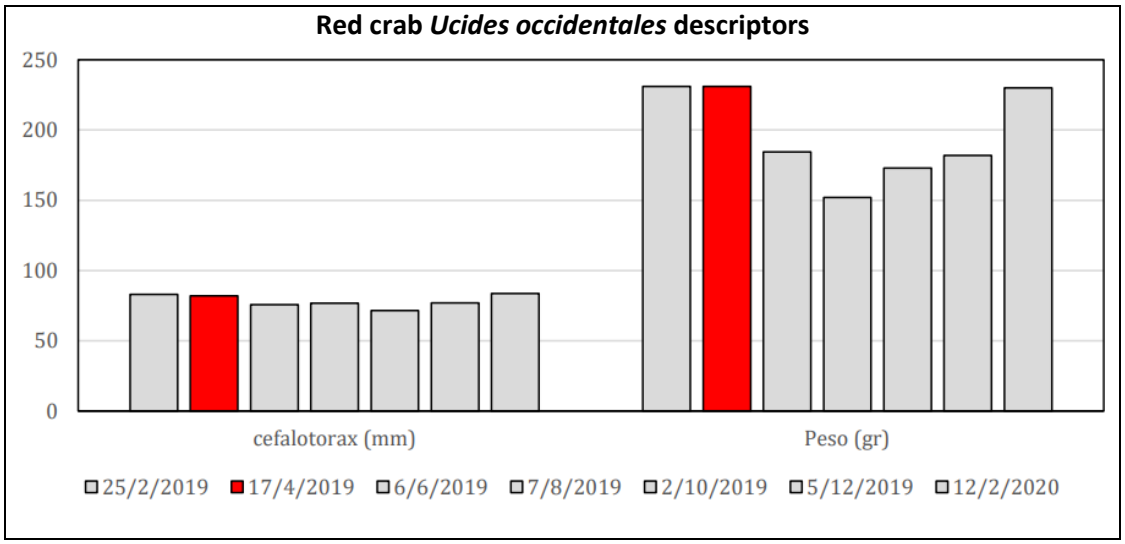


Figure 53: Descriptors of crabs collected in the Vikingos del Mar AUSCM

Annex 3. *Format established to report information related to specimens or species of the implemented monitoring campaigns* is attached to this report.

The consultants will be jointly and severally responsible for the veracity and precision of the content of the requests and study reports. They will respond according to current legal and administrative frameworks.

[There is an illegible signature]

_____

CONSULTANT'S SIGNATURE

Eduardo Rodolfo Rebolledo Monsalve

Identification No._ 1721571709

Machala. 03/04/2020

I, Miguel Angel Pantoja Shimanskii, certify that the present document consisting of 38 pages in english was translated from its original version in spanish, it's accurate to the best of my capacities as a Sworn Court Certified Translator of the Judicial Council of Ecuador.

Yo, Miguel Angel Pantoja Shimanskii certifico que el presente documento que consta de 38 páginas en ingles fueron traducidas de su versión original en español, son precisas en mis capacidades como traductor calificado y jurado del Consejo de la Judicatura.

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CC/National ID #:1717206534

Fecha/Date: 2 de Junio 2021 / June 2, 2021
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Columna1	Columna2	Columna3	Columna4	Columna5	Columna6
phylumName	className	orderName	familyName	scientificName	redListCategory
TRACHEOPHYTA	MAGNOLIOPSIDA	MALPIGHIALES	RHIZOPHORACEAE	Rhizophora samoensis	NT OR LR/NT
TRACHEOPHYTA	MAGNOLIOPSIDA	MALPIGHIALES	RHIZOPHORACEAE	Rhizophora racemosa	LC OR LR/LC
TRACHEOPHYTA	MAGNOLIOPSIDA	MALPIGHIALES	CALOPHYLLACEAE	Marila tomentosa	LC OR LR/LC
TRACHEOPHYTA	MAGNOLIOPSIDA	MALPIGHIALES	CLUSIACEAE	Tovomita secunda	LC OR LR/LC
TRACHEOPHYTA	MAGNOLIOPSIDA	MALPIGHIALES	CLUSIACEAE	Garcinia madruno	LC OR LR/LC
TRACHEOPHYTA	MAGNOLIOPSIDA	MALPIGHIALES	ELATINACEAE	Elatine ecuadoriensis	LC OR LR/LC
TRACHEOPHYTA	MAGNOLIOPSIDA	MALPIGHIALES	EUPHORBIACEAE	Dalechampia scandens	LC OR LR/LC
TRACHEOPHYTA	MAGNOLIOPSIDA	MALPIGHIALES	EUPHORBIACEAE	Alchornea triplinervia	LC OR LR/LC
TRACHEOPHYTA	MAGNOLIOPSIDA	MALPIGHIALES	EUPHORBIACEAE	Sapium laurifolium	LC OR LR/LC
TRACHEOPHYTA	MAGNOLIOPSIDA	MALPIGHIALES	EUPHORBIACEAE	Alchornea glandulosa	LC OR LR/LC
TRACHEOPHYTA	MAGNOLIOPSIDA	MALPIGHIALES	LACISTEMATACEAE	Lozania mutisiana	LC OR LR/LC
TRACHEOPHYTA	MAGNOLIOPSIDA	MALPIGHIALES	LACISTEMATACEAE	Lacistema aggregatum	LC OR LR/LC
TRACHEOPHYTA	MAGNOLIOPSIDA	MALPIGHIALES	MALPIGHIACEAE	Malpighia glabra	LC OR LR/LC
TRACHEOPHYTA	MAGNOLIOPSIDA	MALPIGHIALES	SALICACEAE	Xylosma tessmannii	LC OR LR/LC
TRACHEOPHYTA	MAGNOLIOPSIDA	MALPIGHIALES	SALICACEAE	Banara guianensis	LC OR LR/LC
TRACHEOPHYTA	MAGNOLIOPSIDA	MALPIGHIALES	SALICACEAE	Casearia mariquitensis	LC OR LR/LC

Columna1	Columna2	Columna3	Columna4
orderName	familyName	scientificName	redListCategory
CARCHARHINIFORMES	SPHYRNIDAE	Sphyrna lewini	CR
CARCHARHINIFORMES	SPHYRNIDAE	Sphyrna mokarran	CR
CARCHARHINIFORMES	SPHYRNIDAE	Sphyrna corona	CR
CARCHARHINIFORMES	SPHYRNIDAE	Sphyrna media	CR
CARCHARHINIFORMES	CARCHARHINIDAE	Carcharhinus cerdale	CR
RHINOPRISTIFORMES	PRISTIDAE	Pristis pristis	CR
SQUATINIFORMES	SQUATINIDAE	Squatina armata	CR
CARCHARHINIFORMES	PENTANCHIDAE	Apristurus brunneus	DD
CARCHARHINIFORMES	SPHYRNIDAE	Sphyrna tiburo	EN
CARCHARHINIFORMES	CARCHARHINIDAE	Nasolamia velox	EN
LAMNIFORMES	CETORHINIDAE	Cetorhinus maximus	EN
LAMNIFORMES	ALOPIIDAE	Alopias pelagicus	EN
MYLIOBATIFORMES	MOBULIDAE	Mobula thurstoni	EN
MYLIOBATIFORMES	MOBULIDAE	Mobula birostris	EN
MYLIOBATIFORMES	MOBULIDAE	Mobula mobular	EN
ORECTOLOBIFORMES	RHINCODONTIDAE	Rhincodon typus	EN
ORECTOLOBIFORMES	GINGLYMOSTOMATIDAE	Ginglymostoma unami	EN
CARCHARHINIFORMES	CARCHARHINIDAE	Carcharhinus falciformis	VU
CARCHARHINIFORMES	CARCHARHINIDAE	Negaprion brevirostris	VU
CARCHARHINIFORMES	SPHYRNIDAE	Sphyrna zygaena	VU
CARCHARHINIFORMES	TRIAKIDAE	Mustelus dorsalis	VU
CARCHARHINIFORMES	CARCHARHINIDAE	Rhizoprionodon longurio	VU
HEXANCHIFORMES	HEXANCHIDAE	Notorynchus cepedianus	VU
LAMNIFORMES	ALOPIIDAE	Alopias superciliosus	VU
MYLIOBATIFORMES	MYLIOBATIDAE	Myliobatis longirostris	VU
MYLIOBATIFORMES	DASYATIDAE	Hypanus dipterurus	VU
MYLIOBATIFORMES	DASYATIDAE	Hypanus longus	VU
MYLIOBATIFORMES	MOBULIDAE	Mobula munkiana	VU
MYLIOBATIFORMES	UROTRYGONIDAE	Urobatis tumbesensis	VU
MYLIOBATIFORMES	AETOBATIDAE	Aetobatus laticeps	VU
RAJIFORMES	RAJIDAE	Rostroraja velezi	VU
RAJIFORMES	RAJIDAE	Rostroraja equatorialis	VU
RHINOPRISTIFORMES	RHINOBATIDAE	Pseudobatos planiceps	VU
RHINOPRISTIFORMES	RHINOBATIDAE	Pseudobatos leucorhynchus	VU
RHINOPRISTIFORMES	TRYGONORRHINIDAE	Zapteryx xyster	VU
RHINOPRISTIFORMES	RHINOBATIDAE	Pseudobatos prahli	VU
RHINOPRISTIFORMES	RHINOBATIDAE	Pseudobatos glaucostigmus	VU
TORPEDINIFORMES	NARCINIDAE	Narcine entemedor	VU
CARCHARHINIFORMES	PENTANCHIDAE	Apristurus nasutus	LC OR LR/LC
CARCHARHINIFORMES	TRIAKIDAE	Mustelus henlei	LC OR LR/LC
CHIMAERIFORMES	RHINOCHIMAERIDAE	Rhinochimaera pacifica	LC OR LR/LC
CHIMAERIFORMES	CHIMAERIDAE	Hydrolagus macrophthalmus	LC OR LR/LC
CHIMAERIFORMES	CHIMAERIDAE	Hydrolagus melanophasma	LC OR LR/LC
HETERODONTIFORMES	HETERODONTIDAE	Heterodontus quoyi	LC OR LR/LC
HETERODONTIFORMES	HETERODONTIDAE	Heterodontus mexicanus	LC OR LR/LC
LAMNIFORMES	ODONTASPIDIDAE	Odontaspis noronhai	LC OR LR/LC

LAMNIFORMES	PSEUDOCARCHARIIDAE	Pseudocarcharias kamoharai	LC OR LR/LC
LAMNIFORMES	MEGACHASMIDAE	Megachasma pelagios	LC OR LR/LC
SQUALIFORMES	ETMOPTERIDAE	Centroscyllium nigrum	LC OR LR/LC
SQUALIFORMES	DALATIIDAE	Euprotomicrus bispinatus	LC OR LR/LC
TORPEDINIFORMES	TORPEDINIDAE	Tetronarce tremens	LC OR LR/LC
CARCHARHINIFORMES	CARCHARHINIDAE	Carcharhinus limbatus	NT OR LR/NT
CARCHARHINIFORMES	CARCHARHINIDAE	Carcharhinus leucas	NT OR LR/NT
CARCHARHINIFORMES	CARCHARHINIDAE	Galeocerdo cuvier	NT OR LR/NT
CARCHARHINIFORMES	CARCHARHINIDAE	Prionace glauca	NT OR LR/NT
CARCHARHINIFORMES	CARCHARHINIDAE	Carcharhinus altimus	NT OR LR/NT
HEXANCHIFORMES	HEXANCHIDAE	Hexanchus griseus	NT OR LR/NT
MYLIOBATIFORMES	UROTRYGONIDAE	Urotrygon chilensis	NT OR LR/NT
MYLIOBATIFORMES	RHINOPTERIDAE	Rhinoptera steindachneri	NT OR LR/NT
MYLIOBATIFORMES	UROTRYGONIDAE	Urotrygon rogersi	NT OR LR/NT
MYLIOBATIFORMES	UROTRYGONIDAE	Urotrygon aspidura	NT OR LR/NT
MYLIOBATIFORMES	UROTRYGONIDAE	Urotrygon munda	NT OR LR/NT
MYLIOBATIFORMES	GYMNURIDAE	Gymnura crebripunctata	NT OR LR/NT
RAJIFORMES	ARHYNCHOBATIDAE	Sympterygia brevicaudata	NT OR LR/NT

Columna1	Columna2	Columna3	Columna4	Columna5	Columna6
phylumName	className	orderName	familyName	scientificName	redListCategory
ARTHROPODA	MALACOSTRACA	DECAPODA	TRICHODACTYLIDAE	Dilocarcinus septemdentatus	LC OR LR/LC
ARTHROPODA	MALACOSTRACA	DECAPODA	PSEUDOTHELPHUSIDAE	Hypolobocera aequatorialis	LC OR LR/LC
ARTHROPODA	MALACOSTRACA	DECAPODA	TRICHODACTYLIDAE	Valdivia cururuensis	LC OR LR/LC
ARTHROPODA	MALACOSTRACA	DECAPODA	TRICHODACTYLIDAE	Moreirocarcinus laevifrons	LC OR LR/LC
ARTHROPODA	MALACOSTRACA	DECAPODA	TRICHODACTYLIDAE	Valdivia serrata	LC OR LR/LC
ARTHROPODA	MALACOSTRACA	DECAPODA	CAMBARIDAE	Procambarus clarkii	LC OR LR/LC
ARTHROPODA	MALACOSTRACA	DECAPODA	SCYLLARIDAE	Evibacus princeps	LC OR LR/LC
ARTHROPODA	MALACOSTRACA	DECAPODA	POLYCHELIDAE	Stereomastis nana	LC OR LR/LC
ARTHROPODA	MALACOSTRACA	DECAPODA	POLYCHELIDAE	Stereomastis pacifica	LC OR LR/LC
ARTHROPODA	MALACOSTRACA	DECAPODA	PALAEMONIDAE	Macrobrachium gallus	LC OR LR/LC
ARTHROPODA	MALACOSTRACA	DECAPODA	PALAEMONIDAE	Macrobrachium depressimanum	LC OR LR/LC
ARTHROPODA	MALACOSTRACA	DECAPODA	PALAEMONIDAE	Macrobrachium tenellum	LC OR LR/LC
ARTHROPODA	MALACOSTRACA	DECAPODA	PALAEMONIDAE	Macrobrachium carcinus	LC OR LR/LC
ARTHROPODA	MALACOSTRACA	DECAPODA	PALAEMONIDAE	Macrobrachium americanum	LC OR LR/LC
ARTHROPODA	MALACOSTRACA	DECAPODA	PALAEMONIDAE	Macrobrachium digueti	LC OR LR/LC
ARTHROPODA	MALACOSTRACA	DECAPODA	PALAEMONIDAE	Macrobrachium panamense	LC OR LR/LC
ARTHROPODA	MALACOSTRACA	DECAPODA	PALAEMONIDAE	Macrobrachium rathbunae	LC OR LR/LC
ARTHROPODA	MALACOSTRACA	DECAPODA	PSEUDOTHELPHUSIDAE	Hypolobocera guayaquilensis	DD
ARTHROPODA	MALACOSTRACA	DECAPODA	PALINURIDAE	Panulirus gracilis	DD
ARTHROPODA	MALACOSTRACA	DECAPODA	POLYCHELIDAE	Willemoesia inornata	DD
ECHINODERMATA	HOLOTHUROIDEA	ASPIDOCHIROT	STICHOPODIDAE	Isostichopus fuscus	EN
ECHINODERMATA	HOLOTHUROIDEA	ASPIDOCHIROT	HOLOTHURIIDAE	Holothuria hilla	LC OR LR/LC
ECHINODERMATA	HOLOTHUROIDEA	ASPIDOCHIROT	HOLOTHURIIDAE	Holothuria difficilis	LC OR LR/LC
ECHINODERMATA	HOLOTHUROIDEA	ASPIDOCHIROT	HOLOTHURIIDAE	Holothuria pardalis	LC OR LR/LC
ECHINODERMATA	HOLOTHUROIDEA	ASPIDOCHIROT	HOLOTHURIIDAE	Holothuria zacae	LC OR LR/LC
ECHINODERMATA	HOLOTHUROIDEA	ASPIDOCHIROT	HOLOTHURIIDAE	Holothuria fuscocinerea	LC OR LR/LC
ECHINODERMATA	HOLOTHUROIDEA	ASPIDOCHIROT	HOLOTHURIIDAE	Holothuria kefersteinii	DD
ECHINODERMATA	HOLOTHUROIDEA	ASPIDOCHIROT	HOLOTHURIIDAE	Holothuria theeli	DD
ECHINODERMATA	HOLOTHUROIDEA	ASPIDOCHIROT	HOLOTHURIIDAE	Holothuria portovallartensis	DD
ECHINODERMATA	HOLOTHUROIDEA	ASPIDOCHIROT	HOLOTHURIIDAE	Holothuria arenicola	DD
ECHINODERMATA	HOLOTHUROIDEA	ASPIDOCHIROT	HOLOTHURIIDAE	Holothuria stocki	DD
ECHINODERMATA	HOLOTHUROIDEA	ASPIDOCHIROT	HOLOTHURIIDAE	Holothuria impatiens	DD
MOLLUSCA	BIVALVIA	UNIONOIDA	HYRIIDAE	Castalia ambigua	LC OR LR/LC
MOLLUSCA	BIVALVIA	VENERIDA	SPHAERIIDAE	Eupera cubensis	LC OR LR/LC
MOLLUSCA	BIVALVIA	UNIONOIDA	MYCETOPODIDAE	Lamproscapha ensiformis	LC OR LR/LC
MOLLUSCA	BIVALVIA	UNIONOIDA	HYRIIDAE	Castalia schombergiana	DD
MOLLUSCA	BIVALVIA	UNIONOIDA	MYCETOPODIDAE	Anodontites trigonus	DD
MOLLUSCA	GASTROPODA	ARCHITAENIOG	AMPULLARIIDAE	Pila globosa	LC OR LR/LC
MOLLUSCA	GASTROPODA	ARCHITAENIOG	AMPULLARIIDAE	Pomacea paludosa	LC OR LR/LC
MOLLUSCA	GASTROPODA	ARCHITAENIOG	AMPULLARIIDAE	Asolene petiti	LC OR LR/LC
MOLLUSCA	GASTROPODA	NEOGASTROPO	CONIDAE	Conus arcuatus	LC OR LR/LC
MOLLUSCA	GASTROPODA	NEOGASTROPO	CONIDAE	Conus gladiator	LC OR LR/LC
MOLLUSCA	GASTROPODA	NEOGASTROPO	CONIDAE	Conus diadema	LC OR LR/LC
MOLLUSCA	GASTROPODA	NEOGASTROPO	CONIDAE	Conus patricius	LC OR LR/LC
MOLLUSCA	GASTROPODA	NEOGASTROPO	CONIDAE	Conus regularis	LC OR LR/LC
MOLLUSCA	GASTROPODA	NEOGASTROPO	CONIDAE	Conus mahogani	LC OR LR/LC
MOLLUSCA	GASTROPODA	NEOGASTROPO	CONIDAE	Conus princeps	LC OR LR/LC
MOLLUSCA	GASTROPODA	NEOGASTROPO	CONIDAE	Conus fergusoni	LC OR LR/LC
MOLLUSCA	GASTROPODA	NEOGASTROPO	CONIDAE	Conus lucidus	LC OR LR/LC
MOLLUSCA	GASTROPODA	NEOGASTROPO	CONIDAE	Conus vittatus	LC OR LR/LC
MOLLUSCA	GASTROPODA	NEOGASTROPO	CONIDAE	Conus perplexus	LC OR LR/LC
MOLLUSCA	GASTROPODA	NEOGASTROPO	CONIDAE	Conus virgatus	LC OR LR/LC
MOLLUSCA	GASTROPODA	NEOGASTROPO	CONIDAE	Conus purpurascens	LC OR LR/LC
MOLLUSCA	GASTROPODA	NEOGASTROPO	CONIDAE	Conus emarginatus	LC OR LR/LC
MOLLUSCA	GASTROPODA	NEOGASTROPO	CONIDAE	Conus tornatus	LC OR LR/LC
MOLLUSCA	GASTROPODA	NEOGASTROPO	CONIDAE	Conus poormani	LC OR LR/LC
MOLLUSCA	GASTROPODA	NEOGASTROPO	CONIDAE	Conus ximenes	LC OR LR/LC
MOLLUSCA	GASTROPODA	NEOGASTROPO	CONIDAE	Conus archon	LC OR LR/LC
MOLLUSCA	GASTROPODA	NEOGASTROPO	CONIDAE	Conus tiaratus	LC OR LR/LC
MOLLUSCA	GASTROPODA	NEOGASTROPO	CONIDAE	Conus nux	LC OR LR/LC

MOLLUSCA	GASTROPODA	ARCHITAENIOC	AMPULLARIIDAE	Pomacea reyrei	DD
MOLLUSCA	GASTROPODA	HYGROPHILA	PHYSIDAE	Mexinauta peruvianus	DD
MOLLUSCA	GASTROPODA	ARCHITAENIOC	AMPULLARIIDAE	Pomacea chemnitzii	DD
MOLLUSCA	GASTROPODA	ARCHITAENIOC	AMPULLARIIDAE	Pomacea cousini	DD
MOLLUSCA	GASTROPODA	SORBEOCONCI	HEMISINIDAE	Aylacostoma osculati	DD
MOLLUSCA	GASTROPODA	ARCHITAENIOC	AMPULLARIIDAE	Pomacea martinezi	DD

Columna1	Columna2	Columna3	Columna4	Columna5	Columna6
className	orderName	familyName	scientificName	commonName	redListCategory
REPTILIA	TESTUDINES	CHELONIIDAE	Chelonia mydas	Green Turtle	EN
REPTILIA	TESTUDINES	CHELONIIDAE	Caretta caretta	Loggerhead Turtle	VU
REPTILIA	CROCODYLIA	CROCODYLIDAE	Crocodylus acutus	American Crocodile	VU
REPTILIA	TESTUDINES	DERMOCHELYIDAE	Dermochelys coriacea	Leatherback	VU
REPTILIA	TESTUDINES	CHELONIIDAE	Lepidochelys olivacea	Olive Ridley	VU
REPTILIA	CROCODYLIA	ALLIGATORIDAE	Caiman crocodilus	Spectacled Caiman	LC OR LR/LC
MAMMALIA	CETARTIODACTYLA	DELPHINIDAE	Lagenodelphis hosei	Fraser's Dolphin	LC OR LR/LC
MAMMALIA	CETARTIODACTYLA	ZIPHIIDAE	Mesoplodon peruvianus	Pygmy Beaked Whale	LC OR LR/LC
MAMMALIA	CETARTIODACTYLA	DELPHINIDAE	Peponocephala electra	Melon-headed Whale	LC OR LR/LC
MAMMALIA	CETARTIODACTYLA	DELPHINIDAE	Stenella attenuata	Pantropical Spotted Dolphin	LC OR LR/LC
MAMMALIA	CETARTIODACTYLA	DELPHINIDAE	Stenella longirostris	Spinner Dolphin	LC OR LR/LC
MAMMALIA	CARNIVORA	PROCYONIDAE	Potos flavus	Kinkajou	LC OR LR/LC
MAMMALIA	CARNIVORA	PROCYONIDAE	Nasua narica	White-nosed Coati	LC OR LR/LC
MAMMALIA	CARNIVORA	PROCYONIDAE	Bassaricyon medius	Western Lowland Olingo	LC OR LR/LC
MAMMALIA	CETARTIODACTYLA	DELPHINIDAE	Delphinus delphis	Common Dolphin	LC OR LR/LC

gbifID	kingdom	phylum	class	order	family	genus	species	taxon Rank
3068028254	Animalia	Arthropoda	Malacostraca	Decapoda	Ocypodidae	Ocypode	Ocypode gaudichaudii	SPECIES
2988276154	Animalia	Chordata	Aves	Suliformes	Phalacrocoracidae	Phalacrocorax	Phalacrocorax brasilianus	SPECIES
2859951508	Animalia	Arthropoda	Malacostraca	Decapoda	Grapsidae	Goniopsis	Goniopsis pulchra	SPECIES
2859940495	Animalia	Arthropoda	Malacostraca	Decapoda	Grapsidae	Goniopsis	Goniopsis pulchra	SPECIES
2859910503	Animalia	Arthropoda		Araneae	Araneidae	Trichonephila	Trichonephila clavipes	SPECIES
2851051127	Animalia	Chordata	Amphibia	Anura	Bufonidae	Rhinella	Rhinella horribilis	SPECIES
2850730112	Animalia	Arthropoda	Malacostraca	Decapoda	Ocypodidae	Ocypode	Ocypode gaudichaudii	SPECIES
2850705089	Animalia	Arthropoda	Malacostraca	Decapoda	Ocypodidae	Uca	Uca princeps	SPECIES
2850652118	Animalia	Arthropoda	Malacostraca	Decapoda	Ocypodidae	Uca	Uca princeps	SPECIES
2596339256	Animalia	Chordata	Reptilia	Squamata	Tropiduridae	Microlophus	Microlophus occipitalis	SPECIES
2529392287	Animalia	Chordata	Aves	Pelecaniformes	Ardeidae	Nyctanassa	Nyctanassa violacea	SPECIES
2529379291	Animalia	Chordata	Aves	Coraciiformes	Alcedinidae	Chloroceryle	Chloroceryle americana	SPECIES
2529369236	Animalia	Chordata	Aves	Passeriformes	Hirundinidae	Progne	Progne chalybea	SPECIES
2529348286	Animalia	Chordata	Aves	Passeriformes	Icteridae	Quiscalus	Quiscalus mexicanus	SPECIES
2529343311	Animalia	Chordata	Aves	Passeriformes	Thraupidae	Sicalis	Sicalis flaveola	SPECIES
2529288312	Animalia	Arthropoda		Araneae	Sparassidae	Heteropoda	Heteropoda venatoria	SPECIES
2447996983	Animalia	Chordata	Aves	Columbiformes	Columbidae	Zenaida	Zenaida meloda	SPECIES
2445111526	Animalia	Mollusca	Gastropoda	Neogastropoda	Melongenidae	Melongena	Melongena patula	SPECIES
2429404343	Animalia	Cnidaria	Hydrozoa	Anthoathecata	Porpitidae	Porpita	Porpita porpita	SPECIES
2429404044	Animalia	Mollusca	Bivalvia	Arcida	Arcidae	Larkinia	Larkinia grandis	SPECIES
2006080393	Animalia	Chordata	Aves	Pelecaniformes	Threskiornithidae	Platalea	Platalea ajaja	SPECIES
2006075797	Animalia	Chordata	Aves	Pelecaniformes	Ardeidae	Egretta	Egretta caerulea	SPECIES

country Code	state Province	occurrence Status	decimal Latitude	decimal Longitude	coordinateUncertaintyInMeters	event Date	institution Code	collection Code	catalog Number
EC	El Oro	PRESENT	-3.338.026	-80.274.785	61.0	2019-09-24T08:42:00	iNaturalist	Observations	71845727
EC	El Oro	PRESENT	-3.238.491	-80.038.297	3.0	2020-11-15T15:02:39	iNaturalist	Observations	64962347
EC	El Oro	PRESENT	-335.182	-80.263.135	61.0	2016-07-23T16:39:00	iNaturalist	Observations	55998395
EC	El Oro	PRESENT	-3.348.884	-80.258.934	15.0	2016-07-23T15:47:00	iNaturalist	Observations	55998394
EC	El Oro	PRESENT	-3.345.903	-802.588	8.0	2018-10-21T17:15:00	iNaturalist	Observations	55998377
EC	El Oro	PRESENT	-3.346.575	-80.257.028	61.0	2015-07-05T00:27:00	iNaturalist	Observations	55994894
EC	El Oro	PRESENT	-332.257	-80.267.644	31.0	2011-02-26T04:42:00	iNaturalist	Observations	55998381
EC	El Oro	PRESENT	-3.347.554	-80.258.107	31.0	2016-07-25T15:59:00	iNaturalist	Observations	55998393
EC	El Oro	PRESENT	-3.349.746	-80.259.151	15.0	2016-07-23T16:14:00	iNaturalist	Observations	55998397
EC	El Oro	PRESENT	-3.340.144	-80.273.292	31.0	2020-02-16T08:01:00	iNaturalist	Observations	40790287
EC	El Oro	PRESENT	-3.351.418	-80.260.226	17.0	2019-02-23T12:01:00	iNaturalist	Observations	36614325
EC	El Oro	PRESENT	-335.108	-80.260.187	19.0	2019-02-23T12:01:00	iNaturalist	Observations	36614324
EC	El Oro	PRESENT	-3.350.753	-80.259.544	18.0	2019-02-23T12:01:00	iNaturalist	Observations	36614322
EC	El Oro	PRESENT	-3.349.922	-8.025.905	15.0	2019-02-14T12:01:00	iNaturalist	Observations	36614319
EC	El Oro	PRESENT	-3.350.533	-80.259.383	69.0	2019-02-23T12:01:00	iNaturalist	Observations	36614318
EC	El Oro	PRESENT	-3.345.549	-80.258.499	61.0	2019-02-22T09:01:00	iNaturalist	Observations	36613797
EC	El Oro	PRESENT	-334.601	-80.257.492	4.0	2019-09-24T09:01:00	iNaturalist	Observations	35112215
EC	El Oro	PRESENT	-3.346.327	-80.259.835	4.0	2019-09-23T16:45:00	iNaturalist	Observations	33962484
EC	El Oro	PRESENT	-3.345.639	-8.025.924	4.0	2019-09-23T15:45:00	iNaturalist	Observations	33960018
EC	El Oro	PRESENT	-3.345.427	-80.259.018	4.0	2019-09-23T16:25:00	iNaturalist	Observations	33960014
EC	El Oro	PRESENT	-335.173	-80.260.583	4.0	2019-02-12T00:00:00	iNaturalist	Observations	20780450
EC	El Oro	PRESENT	-3.352.415	-80.261.059	15.0	2019-02-12T00:00:00	iNaturalist	Observations	20767606

identified By	date Identified	license	rights Holder	recorded By
msr	2021-03-23T13:05:21	CC_BY_NC_4_0	prengel	prengel
Christiana Fattorelli	2020-11-18T23:49:59	CC_BY_NC_4_0	Nicole Pastuisaca	Nicole Pastuisaca
cstobie	2020-09-05T12:20:13	CC_BY_NC_4_0	Angel Mario Hualpa Erazo	Angel Mario Hualpa Erazo
cstobie	2020-09-05T12:21:57	CC_BY_NC_4_0	Angel Mario Hualpa Erazo	Angel Mario Hualpa Erazo
cstobie	2020-09-05T13:08:13	CC_BY_NC_4_0	Angel Mario Hualpa Erazo	Angel Mario Hualpa Erazo
Pedro D. Vernet P.	2020-08-10T07:01:32	CC_BY_NC_4_0	Angel Mario Hualpa Erazo	Angel Mario Hualpa Erazo
Angel Mario Hualpa Erazo	2020-08-10T04:24:00	CC_BY_NC_4_0	Angel Mario Hualpa Erazo	Angel Mario Hualpa Erazo
msr	2020-08-10T18:53:01	CC_BY_NC_4_0	Angel Mario Hualpa Erazo	Angel Mario Hualpa Erazo
msr	2020-08-10T18:51:09	CC_BY_NC_4_0	Angel Mario Hualpa Erazo	Angel Mario Hualpa Erazo
Green Jewel	2020-03-27T00:22:09	CC_BY_NC_4_0	Green Jewel	Green Jewel
Green Jewel	2019-12-13T12:08:36	CC_BY_NC_4_0	Green Jewel	Green Jewel
Green Jewel	2019-12-13T12:08:36	CC_BY_NC_4_0	Green Jewel	Green Jewel
Green Jewel	2019-12-13T12:08:34	CC_BY_NC_4_0	Green Jewel	Green Jewel
Green Jewel	2019-12-13T12:08:34	CC_BY_NC_4_0	Green Jewel	Green Jewel
Green Jewel	2019-12-13T12:08:33	CC_BY_NC_4_0	Green Jewel	Green Jewel
Martin MandÃ¡k	2019-12-13T11:25:22	CC_BY_NC_4_0	Green Jewel	Green Jewel
Green Jewel	2019-10-31T03:27:56	CC_BY_NC_4_0	Green Jewel	Green Jewel
Pablo Andrade	2019-10-17T17:37:22	CC_BY_NC_4_0	Green Jewel	Green Jewel
Thomas Mesaglio	2019-10-07T00:03:52	CC_BY_NC_4_0	Green Jewel	Green Jewel
Green Jewel	2020-02-14T18:52:40	CC_BY_NC_4_0	Green Jewel	Green Jewel
Green Jewel	2019-02-26T15:03:02	CC_BY_NC_4_0	Green Jewel	Green Jewel
Green Jewel	2019-02-26T00:47:39	CC_BY_NC_4_0	Green Jewel	Green Jewel