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2 - Green and resilient shared environment
SO 2.2 - Protection of nature and biodiversity

BlueDiversity

ITHR0200404

Shared BLUE knowledge and skills to sustain BIODIVERSITY in mariculture

Activity 2.2 Definition and Piloting of Best Fishing Techniques for Blue Crab

BLUE CRAB TRAP REPORT

SUBMARINE LED

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INTRODUCTION

TEST OF THE MOST EFFECTIVE TRAPS

This document was developed by Blu Marine Service (PP6) after conducting a market analysis of the best traps available for the blue crab (*Callinectes Sapidus,* Rathbun, 1896). All the equipment listed below have been tested in different environments and judged based on: capture capacity, ease of use and storage, resistance, versatility of use in different environments. The tests have been conducted from June to December 2024 in the pilot area PP6.

TEST OF DIFFERENT ENTRANCE OF THE TRAP

In order to also evaluate the type of entrance of the different traps, tests were carried out in a confined environment to study the movements of the animal at the moment of entry into the trap. The tests had the objective of evaluating the best shape of the entrance of the traps that allows an easy entry of the animal while preventing its exit.

TEST OF THE BEHAVIOUR OF THE ANIMAL INSIDE THE TRAP

In order to evaluate the animal's behavior inside the traps using different types of bait, videos were acquired useful for defining the monitoring protocol and verify the interaction inside the trap with the other marine resources. Tests were also carried out to verify the resistance of the materials (bait holders and net) during crab feeding.

Video and pictures of the testing acitvities availbale on BlueDiversity drive:

https://drive.google.com/drive/folders/1wMYt29X_MZT0fN0Gf35HPeAggEDvjZnn

CODE 01
ITEM NAME: UMBRELLA TRAP

DESCRIPTION/FIGURE: octagonal trap with 16 entrances foldable like an umbrella

STRUCTURE DIMENSION:
Open: width 90 cm
Height 40 cm
Closed: height 60 cm

CONSTRUCTION MATERIAL: plastic braided netting; frame made of galvanized iron

NUMBER OF ENTRANCES: 16 ENTRANCE DIMENSION : 15 cm width oval shape

MESH SIZE: 5mm NET MATERIALS : nylon

MODE: foldable WEIGHT: 270 gr

TYPE OF BOTTOM: sand, mud. BOTTOM DEPTH: 1-5 m

MESH SIZE: 3 mm mesh NET MATERIALS: plastic

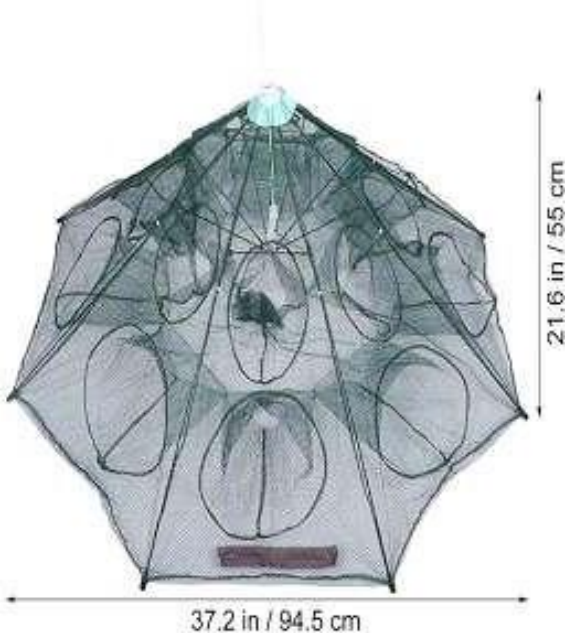
USE: trap ideal for sandy bottoms in calm waters, can be used individually

SETTING: tied on a single rope or main line at about 10–15 m from each other

PERFORMANCE/TESTING

Very light, easy to transport with little bulk, suitable for river and lagoon environments with limited accessibility; captures crabs measuring > 0.5 cm wide; usable with a guard, if big crabs are present they can pierce the net if left inside for a long time. Not recommended for at sea in the presence of wave motion or strong currents, lead seal required for depths greater than 5 metres.

CODE 1 PICTURES



CODE 02
ITEM NAME: RECTANGULAR TRAP SMALL

DESCRIPTION FIGURE: trap rectangular in shape and folds up with to 2 entrances (plastic clip closure)

STRUCTURE DIMENSION:
60x23x43 cm (open)
60x43x 5 cm (closed)

CONSTRUCTION MATERIAL: Nylon net (0,40) and metal frame reinforced with plastic

NUMBER OF ENTRANCES: 2 ENTRANCE DIMENSION: 42x22 cm
(two rectangular opposite entrance)

TYPE OF BOTTOM: sand, mud, rocks

MESH SIZE: 10 mm square mesh NET MATERIALS: nylon

MODE: foldable

USE: the trap can be used in open sea, river and lagoon. For the use in waters with currents and wave motion it is necessary to seal the structure to make it more stable. Can be used in environments with difficult access, very light weight; can remain in fishing for 48-72 hours. SETTING: usually left for 24 hours before retrieval, tied on a single rope or main line at about 10–15 m from each other

PERFORMANCE/TESTING
Very light, easy to transport with little bulk. Tests carried out in open sea, harbour and river, excellent performance and resistance. Very selective, the entrance permit to the small fishes to escape easily.

CODE 2 PICTURES

CODE 03
ITEM NAME: HOOP NET - BASKET

DESCRIPTION/FIGURE: a hoop net is a net attached to a metal hoop. The maximum hoop diameter is 36 cm. The maximum depth of the bag is 40 cm. Only one entrance.

STRUCTURE DIMENSION:
diameter 36 cm
net depth 40 cm

TYPE OF BOTTOM: sand, rocks. BOTTOM DEPTH: 0–5 m

CONSTRUCTION MATERIAL : stainless steel ring structure with nylon mesh

NUMBER OF ENTRANCES: 1 ENTRANCE DIMENSION: diameter 36 cm

MESH SIZE: 8 mm square mesh NET MATERIALS: nylon

MODE: fixed WEIGHT: 700 gr

Setting: the trap must be installed individually from the rocks harbours dock, riverside; but it requires continuous controls every 15-30 minutes. Can be used on natural and artificial reefs, piers, docks, river banks.

USE: ideal for catching crabs on cliffs/piers artificial and natural reefs, where it is not possible to use traps. Controls necessary every 15-30 minutes

PERFORMANCE/TESTING
Used successfully in environments not accessible by sea e.g. (natural and artificial reefs) where the rocks are very jagged and where there are ravines and holes that make the use of larger traps impossible.

CODE 3 PICTURES

CODE 04

ITEM NAME: HEXAGONAL TRAP

DESCRIPTION/FIGURE: hexagonal shaped trap with 6 entrances (zip closure)

STRUCTURE DIMENSION:
open: 58X22 cm
closed: 24 x 22 x 3 cm

TYPE OF BOTTOM: sand, mud BOTTOM DEPTH: 1– 10 m

CONSTRUCTION MATERIAL: plasticized iron structure with nylon mesh

NUMBER OF ENTRANCES: 6. ENTRANCE DIMENSION: diameter 17 cm (oval shape)

MESH SIZE: 8 mm exagonal mesh NET MATERIALS: plastic

MODE : foldable WEIGHT: 400 Gr

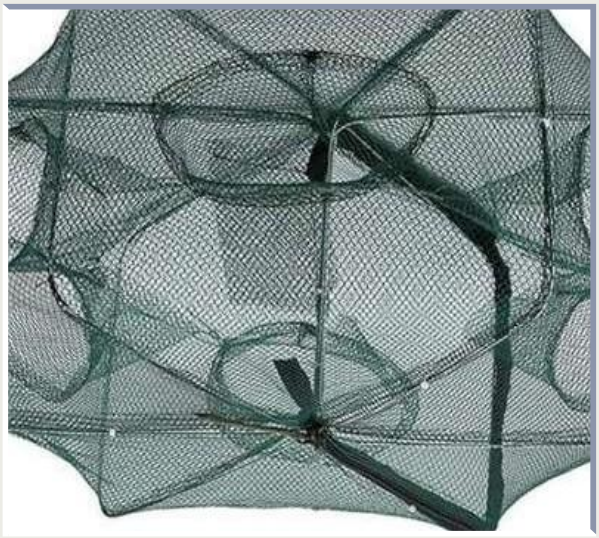
SETTING: tied on a single rope or main line at about 10–15 m from each other

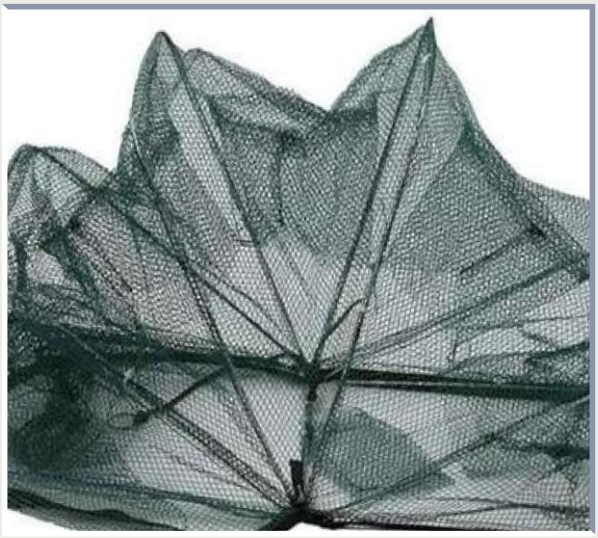
USE: ideal for catching small and medium sized crabs in calm waters with little current

PERFORMANCE/TESTING

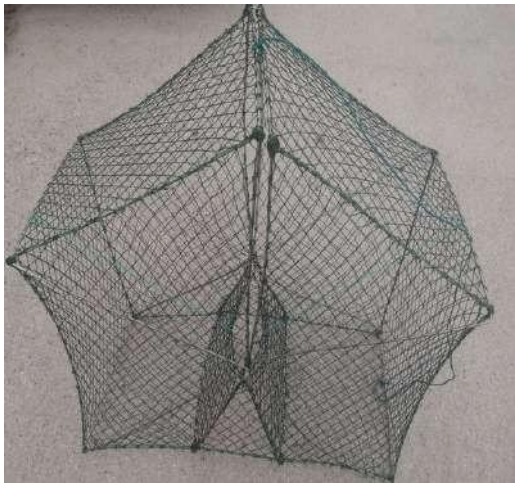
Very light, easy to transport with little bulk. Usable with a guard, if large crabs are present they can pierce the net if left inside the trap for a long time (overnight). Very light-weight, not recommended for use in open sea or in environments with strong currents.

CODE 4 PICTURES





CODE 05
ITEM NAME: PENTAGONAL TRAP



DESCRIPTION/FIGURE: nylon braided netting, stainless steel frame, one entrance (steel clip closure)

STRUCTURE DIMENSION:
open: 86x86x46 cm
closed: 40 x 56 x 10 cm

TYPE OF BOTTOM : Rocks BOTTOM DEPTH: 3–30 m

CONSTRUCTION MATERIAL: stainless steel frame and nylon mesh

NUMBER OF ENTRANCES: 1

ENTRANCE DIMENSION: 37x26 cm (one oval entrance made of flexible steel bars)

MESH SIZE: 48 mm square-mesh MATERIALS : Nylon

MODE : foldable WEIGHT: 2.5 kg

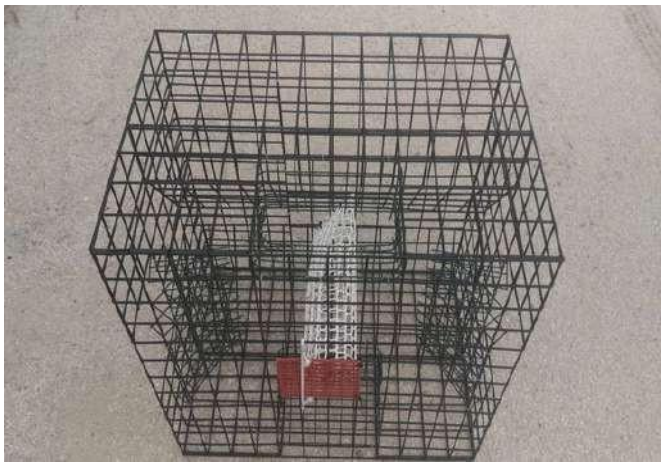
SETTING: tied on a single rope or main line at about 10–15 m from each other

USE: trap usable both at sea and in the lagoon, adapt for big crabs

PERFORMANCE/TESTING
Mainly used at sea on sandy or rocky bottoms, moderate catch capacity, bulky on board small boats.

CODE 5 PICTURES

CODE 06
ITEM NAME: GORO 1



DESCRIPTION/FIGURE: rectangular shaped trap with double-chamber, electro- welded plasticized iron net

STRUCTURE DIMENSION: 60x60x41 cm

CONSTRUCTION MATERIAL: plasticized iron structure with plastic bait holder

NUMBER OF ENTRANCES: 4 entrances with double room

ENTRANCE DIMENSION: 20x15 cm 4 rectangular opposite entrance

MESH SIZE: 40 mm square-mesh NET MATERIALS : plasticized iron

MODE: Fixed WEIGHT: 4.5 kg

TYPE OF BOTTOM: sand, mud, rocks BOTTOM DEPTH: 1–30 m

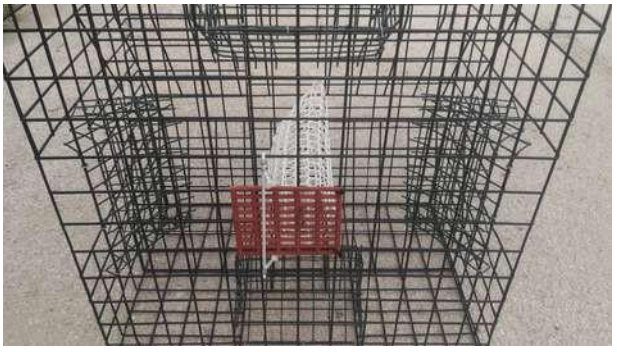
SETTING: tied on a single rope or main line at about 10–15 m from each other

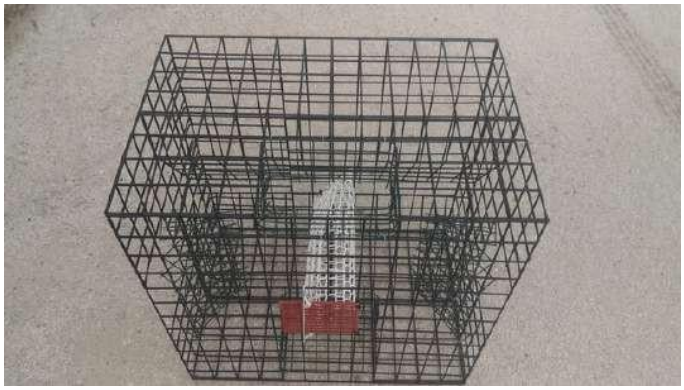
USE: trap usable both at sea and in the lagoon, adapt for big crabs

PERFORMANCE/TESTING

Trap designed for catching big crabs in large quantities, extremely resistant, usable in all environments, very effective. Heavy to carry and takes up a lot of storage space.

CODE 6 PICTURES





CODE 07
ITEM NAME: GORO 2

DESCRIPTION/FIGURE:
Rectangular shaped trap made entirely of plastic

STRUCTURE DIMENSION:
50x64x64 cm

CONSTRUCTION MATERIAL: entirely plastic structure

NUMBER OF ENTRANCES: 4 entrances with double room

ENTRANCE DIMENSION: 24x15 cm 4 rectangular opposite entrance

MESH SIZE: 30 mm square-mesh NET MATERIALS: plastic

MODE: fixed WEIGHT: 2.5 kg

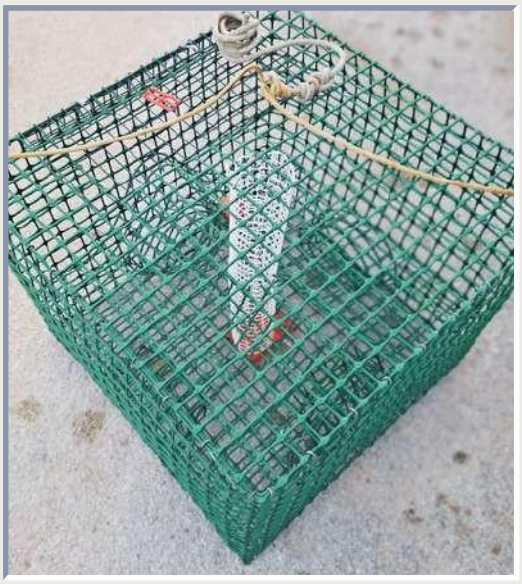
TYPE OF BOTTOM: sand, mud, rocks BOTTOM DEPTH: 1–30 m

SETTING: tied on a single rope or main line at about 10–15 m from each other

USE: trap designed for catching large crabs in large quantities, extremely resistant, usable in all environments.

PERFORMANCE/TESTING
Light to carry but takes up a lot of space in storage. Do not leave under the sun for long periods to avoid deterioration of the plastic.

CODE 7 PICTURES



CODE 08
ITEM NAME: IRON RECTANGULAR TRAP

DESCRIPTION/FIGURE:
Rectangular shaped trap with 0.8 cm galvanized iron structure, covered with galvanized iron mesh

STRUCTURE DIMENSION:
72x22x37 cm

CONSTRUCTION MATERIAL: rectangular galvanized iron structure with plastic bait holder

ENTRANCE DIMENSION: 25x 8 cm (two rectangular opposite entrance)

NUMBER OF ENTRANCES: 2

MESH SIZE: available from 10 - 30 mm square-mesh

NET MATERIALS: galvanized iron or iron reinforced with plastic

MODE: fixed WEIGHT: 4 kg

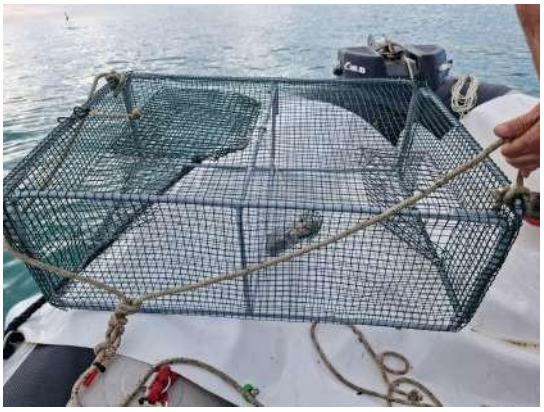
TYPE OF BOTTOM: sand, mud, rocks BOTTOM DEPTH: 2–30 m

SETTING: tied on a single rope or main line at about 10–15 m from each other

USE: usable in all environments, extremely resistant.

PERFORMANCE/TESTING
Durable and resistant. Heavy to carry and takes up a lot of storage space.

CODE 8 PICTURES



CODE 09
ITEM NAME: RECTANGULAR TRAP LARGE

DESCRIPTION/FIGURE: trap, Rectangular in shape and folds up with to 2 entrances (metal clip closure)

STRUCTURE DIMENSION: 27x58x88 cm (open) 88x27x 3 cm (closed)

CONSTRUCTION MATERIAL: Nylon net and metal frame galvanized

NUMBER OF ENTRANCES: 2 Oval shape

ENTRANCE DIMENSION: 27x3 cm (two oval shape opposite entrance)

TYPE OF BOTTOM: sand, mud, rocks

BOTTOM DEPTH: 1–30 m

MESH SIZE: 40 mm square mesh

NET MATERIALS: nylon

MODE: Foldable

WEIGHT: 2.2 Kg

SETTING: tied on a single rope or main line at about 10–15 m from each other. Usually left for 24 hours before retrieval.

USE: the trap can be used in open sea, river, lagoon. For the use in waters with currents and wave motion it is necessary to seal the structure to make it more stable. Can be used in environments with difficult access, very light weight; can remain in fishing for 48-72 hours.

PERFORMANCE/TESTING

Tests carried out in open sea, harbour and river, excellent performance and resistance

CODE 9 PICTURES

SUBMARINE LED

INTRODUCTION

The use of LED lights in crustacean traps is an innovative technique that exploits the natural behavior of some marine species to increase the effectiveness of fishing. Several studies have shown that crustaceans are attracted to specific light stimuli, making it possible to optimize catches thanks to the targeted choice of the type and color of light.

Crustaceans, like many other marine creatures, respond to light for a variety of reasons, including:

- Orientation and foraging: light can mimic the bioluminescence of some natural prey such as small planktonic organisms.
- Natural curiosity: crustaceans often display exploratory behaviors toward light sources, perceiving light as a change in their surroundings.
- Attraction to certain spectrums: certain wavelengths penetrate the water better and are more visible to crustaceans, influencing their movements.

MOST EFFECTIVE COLORS

The test conducted indicate that:

- Blue light (wavelengths around 450-490 nm) is particularly effective for many species, as blue penetrates marine waters better and mimics natural light at depth.
- Green light (wavelengths around 510-540 nm) is particularly effective, specially in shallower waters, where it is easily visible.
- White light (wavelengths around 400-700 nm) is moderately effective,

- Red light (wavelengths above 620 nm) less effective, as red light is quickly absorbed by water and is less visible at depth.

The choice of color depends on the habitat of the target crustacean and the depth of the water in which the traps are placed. The experimentation performed by PP6 confirm that the most effective colors are blue, followed by green and withe.

FUNCTIONING

1. Increased visibility of traps: LED lights increase the likelihood that crustaceans will locate the trap even in low-light conditions.

2. Reduced waiting time: Illuminated traps can attract crustaceans more quickly than traditional traps.

3. Selectivity in fishing: By changing the color and intensity of the light, it is possible to attract specific species, reducing the bycatch of unwanted organisms.

PRACTICAL APPLICATION

- Easy Installation: LEDs can be easily integrated into traditional traps, using waterproof battery power s upplies .
- Intelligent Programming: Some LED systems allow you to adjust the intensity and duration of the light, increasing energy efficiency and extending battery life.
- Field Testing: it is advisable to conduct local trials to determine which color and intensity are best suited to the target crustacean species and specific water conditions.

- # SUBMARINE LED PICTURES