

# THE PHILIPPINE BLUE SWIMMING CRAB MANAGEMENT PLAN

DEPARTMENT OF AGRICULTURE  
BUREAU OF FISHERIES AND AQUATIC RESOURCES

## 1.0 INTRODUCTION

### 1.1 Blue Swimming Crab Management Plan (BSCMP)

The Blue Swimming Crab (BSC) Management Plan will be the framework of regulatory measures for the proper management of the BSC fisheries in the Philippines. The BSC, scientifically named *Portunus pelagicus*, locally known as “kasag”, “lambay”, “masag”, “alimasag” is the focus of this management plan.

The goal of the BSCMP is to ensure the sustainability of the BSC resources. In keeping with the Philippine Fisheries Code, this plan specifically protects the interest of the municipal capture fisheries and sets forth management measures based on the best available scientific evidence on the status of blue swimming crab resources.

### 1.2 Importance of Management Plan

It aims to achieve “sustainability” in utilizing our natural resources, the effect of the environment on the resource and the effect of resource exploitation on the environment. BSCMP is a highly integrated approach that encompasses all the complexities of ecosystem dynamics, the social and economic needs of human communities, and the maintenance of diverse, functioning and healthy ecosystem. It requires careful account on the condition of ecosystem that may affect crab stocks and their productivity. It also requires careful account of the ways fishing activities may affect marine ecosystems. Management decisions are best made using multiple lines of evidence and precautionary approach: “when in doubt, err on the side of conservation”.

### 1.3 Objectives

The objectives of the BSCMP are:

#### **Long Term:**

- a. Ensure the sustainability of the BSC resources and rational management of the fisheries;
- b. Develop and improve breeding, hatchery and grow-out technology for BSC;
- c. Maintain the catch and effort of BSC to a sustainable level (with LGU, fisherfolks, other stakeholders with direct dependence on the resource).

#### **Short Term:**

- a. Monitor and evaluate the current state of the BSC industry;
- b. Regulate the fishing capacity and effort in catching BSC;

- c. Recommend the use of environmental and social-friendly fishing gears (i.e. crab pot/trap);
- d. Provide regular updates on the scientific data for catch, effort and biological parameters;
- e. Provide management measures for gravid crabs and juveniles (regardless of species);
- f. Increase public awareness on the conservation and protection of BSC;
- g. Create strong linkage with the LGU and other stakeholders for a collaborative efforts in the management;
- h. Create Technical Working Group (TWG) to institutionalize the implementation of the plan;
- i. Develop a Geographic Information System (GIS)-based map of the BSC fisheries of the country;
- j. Empower stakeholders to develop technical competence in managing the blue swimming crab resource;
- k. Enforce the implementation of fishery laws and regulations.

#### **1.4 Application**

The management measures contained in this Plan shall apply to all forms of activities leading to the utilization of BSCs. For purposes of this Plan, the defined area covers all fishing grounds of BSCs such as but not limited to Guimaras Strait, Visayan Sea, Samar Sea, Ticao Pass, Burias pass, and others.

The management measures to be implemented by the Bureau of Fisheries and Aquatic Resources (BFAR) applies to National waters but in municipal waters the measures provides assistance (technical/financial) to the Local Government Units (LGUs).

## **2.0 MANAGEMENT FRAMEWORK**

### **2.1 Description of Blue Swimming Crab (*Portunus pelagicus*)**

The blue swimming crabs, *Portunus pelagicus* (Linnaeus 1758) Phylum Arthropoda, Class Crustacea, Order Decapoda and Family Portunidae is locally named “kasag” (Hiligaynon), “alimasag” (Tagalog), and “lambay” (Bisaya). The carapace is hard, rough and broadly flattened extending to nine protrusions on the sides with the last one quiet pronounced. It has a single pair of chelae, with three pairs of long ridged legs and a pair of modified legs as swimming paddles. Generally, the color of female and male BSC is mottled brown and mottled blue, respectively.

This species are cosmopolitan in the coastal waters of the Philippines. Juvenile individuals are found in the shallow waters (mostly in seagrass, seaweeds and algal beds while the mature ones are found in sandy substrates at deeper waters of up to 20 meters isobaths (Ingles 1996). The average size of maturity for females is 10.56-cm and 9.64-cm for males (Ingles and Braum 1998). Please refer to Annex A - Biology of Blue Swimming Crab.

## 2.2 Blue Swimming Crab (BSC) Fishery

The BSC fishery is a significant sub-sector of the crustacean fishery. The BSC catch is steadily declining in volume and crab size due to the serious depletion of the breeding stock of crabs. The fishing gear that catches crab particularly the crablets are municipal trawl, fish corral, crab entangling net, pulling net “*suwayang*”, push net, man trawl using sailboat.

BSC fishermen currently use entangling nets for crabs, a long rectangular panel of netting with diamond-shaped mesh that are held vertically in the water column and anchored so that the net touches the bottom of the ocean floor. It is made of nylon 0.30mm twine size, 4 knots and 50 meshes depth. One unit of crab entangling net is 133 meters long and using 18 units resulting to more than 2-km of entangling net per fisher per operation. This is a non-selective fishing method that does not allow for the return to sea of juvenile crabs that have not yet reached sexual maturity or gravid crabs that have not yet spawned. The retained (fishes, other crabs and rays) and discarded by-catch (other crabs, sponges, mollusks, and others) of the entangling net blue swimming crabs fisheries is also substantial and in some cases are causing pressure to other protected, endangered and threatened species like sharks, some shells, and the famous Irrawaddy Dolphins (Romero 2009, Flores 2005, Ingles 2003). The continued use of entangling nets and trawl fishing will result in the loss of the main source of income for 30% of the population (Ingles, 1996).

Other crab fishermen are using crab trap/pot also known as “*panggal*” which are enticing devices generally made of bamboo splits woven together and provided with a non-return valve for easy entrance but difficult to exit and that the crab still alive inside the pot which could be back in the water if it is a gravid one or not yet matured. This fishing gear has simple structure, which can be handled easily on board a small fishing boat.

The use of crab trap/pot as a recommended fishing method will allow fishermen to return gravid and juvenile crabs to the sea encouraging sustainable fishing, while increasing fishing incomes. Crabs caught by this fishing gear are maintained alive. Lost “*panggal*” at sea has less environmental hazard for it is biodegradable and able to decompose in a period of 3 to 5 months. Nonetheless, compared to synthetic nets which are non-biodegradable can cause ghost fishing by catching of fish, crustaceans, mammals, etc. and are difficult to retrieve. The crab pot method will also create an additional income-generating activities for the community: supply the bamboo needed to produce the pots, develop and utilize skills in weaving, and gather otherwise less valued trash fish to be used as baits.

The enacted Ordinance No. 019, series of 2003 an ordinance regulating the catching, selling, possessing or buying of Gravid Blue Swimming Crabs and Crablets in the Province of Negros Occidental was the first to acknowledge the need to protect this resource due to environmental responsibility and urgency. The Northern Iloilo Alliance for Coastal Development (NIACDEV) followed suit by passing an ordinance banning the catch and trade of berried females

and crablets of *Portunus pelagicus*. The NIACDEV is composed of the municipalities of Carles, Balasan, Estancia, Concepcion, San Dionisio, Sara, Lemery, Batad and Ajuy.

### 2.3 Other Species of Crabs

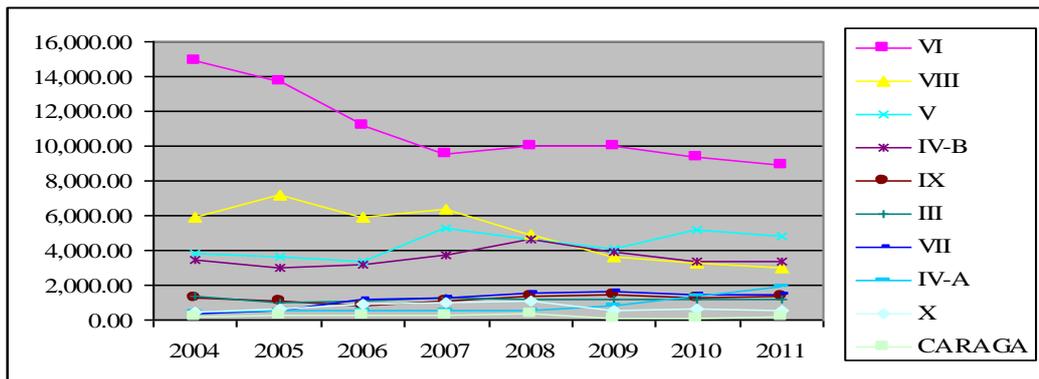
The management measures of other commercially important species of crabs such as *Charybdis feriata* (Christian crab), *Portunus sanguinolentus* (Three-spot swimming crab), *Charybdis natator* (Ridged swimming crab) shall be included in this plan as a precautionary approach subject to further studies by NFRDI.

### 2.4 Industry Situationer

#### 2.4.1 Catch Statistics

In year 2011, data showed that the Blue Swimming Crabs harvested by the municipal fishery sector accounts to 95.38% (27,920.67MT) while the commercial fishery contributes only 4.62% (1,353.53 MT). The volume BSC harvested in year 2011 contributes to 1.34% of the annual fishery production. Likewise, BSC fishing industry based on 2009 Fisheries Statistics rank 20 among the highest fishery commodity. Similarly, it is the 4<sup>th</sup> most important fishery export of the country in terms of value (39,171 USD or P1,852,785) of processed/frozen crabs meat and fat. In that same year, export volume and value processed/frozen crabmeat and fat represents 5.80% of the total fish and fishery product exports.

**Figure 1. Blue Swimming Crab Production trends by Regions, 2004-2011**



## 2.4.2 Statistics of licensed fishing boats used for catching Blue swimming crab

**Table 1. Fishing gears used mainly for catching crabs by the number of owners/operators by province in CY 2008**

Fishing Gear	Negros Occidental	Capiz	Iloilo	Guimaras Island
Crab Fishing (entangling net & Pots)	444			
Crab entangling net	298	31	13	90
Crab liftnet	2		3	
Crab pot/trap (Panggal)	218	14	541	100
Total	926	45	557	190

## 2.4.3 Size composition of the catch, stock assessment and other regional data

The Bureau of Fisheries and Aquatic Resources' National Stock Assessment Program (BFAR's NSAP) conducted an assessment of the northeastern side of Visayan Sea resources in 1999-2003, which unfortunately did not include landings from the neighboring islets. Thus, landings prior to NSAP project coverage are grossly underestimated.

**Table 2. Annual Trend of estimated Municipal Production (MT) of Blue Swimming Crabs from Top 10 Major Producers, 2004-2011**

Regions	2004	2005	2006	2007	2008	2009	2010	2011	Average
VI	14,903.06	13,743.92	11,158.29	9,545.31	10,026.32	9,993.78	9,382.55	8,928.28	10,960.19
VIII	5,904.49	7,202.40	5,889.56	6,355.58	4,904.53	3,628.59	3,314.42	2,981.91	5,022.69
V	3,861.08	3,666.97	3,359.18	5,299.65	4,671.02	4,072.56	5,210.14	4,784.24	4,365.61
IV-B	3,414.06	3,012.86	3,208.92	3,727.11	4,596.52	3,915.33	3,321.75	3,358.20	3,569.34
IX	1,296.05	1,084.73	850.71	1,092.74	1,339.70	1,488.13	1,287.31	1,396.96	1,229.54
III	1,355.75	1,010.04	1,063.33	1,286.97	1,191.89	1,205.06	1,161.41	1,178.68	1,181.64
VII	353.43	571.55	1161.37	1,303.89	1,557.19	1,599.10	1,427.57	1,420.48	1,174.32
IV-A	491.39	520.7	541.02	562.53	572.55	828.3	1,331.82	1,913.13	845.18
X	476.98	603.77	915.16	1,008.97	1,050.34	560.13	650.61	552.87	727.35
CARAGA	170.01	274.5	243.62	233.48	346.13	108.28	105.18	137.36	202.32
<b>Annual</b>	<b>32,656.22</b>	<b>32,894.68</b>	<b>29,350.89</b>	<b>31,505.16</b>	<b>31,509.14</b>	<b>28,271.55</b>	<b>28,169.95</b>	<b>27,920.67</b>	<b>30,284.78</b>

## 2.5 Economic and Social Context

### 2.5.1 Production, Employment, and Exports

The regional crab production is highest in Region VI contributing 32.23%, which include Negros Occidental exporting crabmeats to parts of the U.S. and Asia. Region VIII follows it at 21.46% and Region V at 17.89% (Fisheries Statistics 2007). Several seafood companies ventured in the Philippines such as Phillips Seafood and Byrd International, both companies were based in the Chesapeake Bay area

in Maryland, USA and they import BSCs from Guimaras Strait, Visayan Sea, and East side of Negros.

Due to increasing demand on Blue Swimming Crabs since early 1990, crab overfishing and habitat destruction became a major issue of the Blue Swimming Crab industry. According to the initial survey of the Capture Fisheries Division (CFD) in the Visayan Sea (Eleserio, F.O. and M.M. Mandreza, January 7, 2010 Field Report), the Blue Swimming Crab harvest had declined from 20 kilos per day in the early 1990's to 5 kilos per day per fishermen in years 2008 and 2009. Likewise, processing plants or crab meat picking plants decline its production from two (2) tons per day to one (1) ton per day during peak season and 500 kilograms every other day during lean season. August is the common peak month for Blue Swimming Crab fishing while March and April are the common lean months.

There are two (2) BFAR-Hazard Analysis Critical Control Point (HACCP) accredited crab meat picking plant in the Philippines namely RGE AgriDev Corp. and Phil Union Frozen Foods Incorporated. Both companies are located in Cebu. The United States is the major export destination for pasteurized crabmeat. The number of fishing boats involved in catching crabs in the Visayan Sea is at 972 (NSAP data, 2005) with an estimated of 2 fishers per boat. There are 27 crab meat picking station/plants in the Visayan Sea estimating 30 employed individual per station including the plant operators, drivers, cooks, pickers, packers and middlemen/buyers. The job generated for blue swimming crab processing in this area of Visayan Sea is more or less 3,000 individuals. The table below shows the crab export from year 1999 to 2010.

**Table 3. Volume and Value of Crab and Crab Fat Export, 1999 to 2009**

Year	Quantity (MT)	% Change	Value (\$)	% Change	Value (P)	% Change
2010	5,795	33.00	60,422	54.25%	2,704,504	45.97
2009	4,357	21.46	39,171	12.57%	1,852,785	20.39
2008	3,587	(10.10)	34,794	(14.63)	1,538,919	(18.00)
2007	3,990	(13.07)	40,755	20.02	1,876,742	8.52
2006	4,590	3.64	33,956	(9.76)	1,729,416	(11.17)
2005	4,429	11.82	37,629	18.36	1,946,838	18.36
2004	3,961	(23.91)	31,793	(2.95)	1,644,888	(2.96)
2003	5,206	(1.70)	32,761	8.99	1,695,005	8.99
2002	5,296	(6.30)	30,058	(4.89)	1,555,145	1.98
2001	5,652	23.46	31,602	65.13	1,524,925	97.73
2000	4,578	34.81	19,138	43.61	771,210	43.62
1999	3,396		13,326		536,988	
Total	44,685		305,812		14,820,076	
Average	4,469	2.07	30,581	13.76	1,482,008	16.34

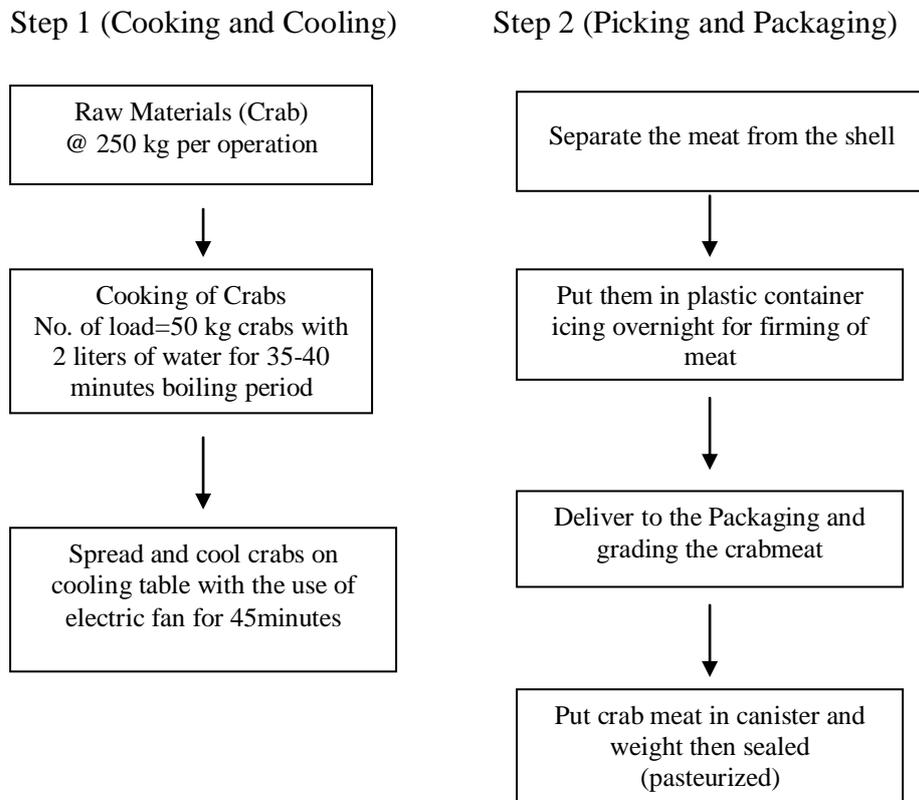
## 2.5.2 The Processing Sector

Resource reduction on raw crab supply has become more of a problem for the year 2009. Majority of fishers and picking plants dilemma was the difficulty to catch considerable amount of crab compared to year 2007 and 2008. It became more problematic when fuel price and cost of fishing provisions went up this year, including the various natural and manmade calamities encountered.

Most of the crabmeat picking plants at present is in the process of applying for the HACCP accreditation. Various seminars and plant inspection has been made by the BFAR Central Office and Regional Offices to ensure the quality of produce crab meat since processing has its critical importance on the quality of products and its marketability.

Station buyers also known as middlemen usually buy raw crabs from fishers. These middlemen steam or boil the crabs prior to transport to picking stations. In the picking station, cooked crabs are bought and are sorted according to its size. Quality crabmeat undergoes the following processing procedure:

**Figure 2. Flow Diagram in Processing Blue Swimming Crab Meat**



## 2.6 Legal and Policy Context

**2.6.1 National Policy Framework.** The policy framework for fisheries management in the Philippines as provided in national

law, notably the Fisheries Code (Republic Act 8550) and the Agriculture and Fisheries Modernization Act (AFMA) RA 8435, both enacted in 1998, and the Local Government Code (LGC) RA 7160. The Fisheries Code deals with fisheries management while the AFMA views fisheries as a component of the entire agricultural sector. The LGC, on the other hand, is not specifically a fisheries law, rather, it is a general law that spells out the guidelines for the local autonomy and decentralization, which includes fishery functions.

**2.6.2 The Fisheries Code.** The Fisheries Code adheres to the following objectives: (i) conservation, protection and sustained management of the country's fishery and aquatic resources; (ii) poverty alleviation and the provision of supplementary livelihood among municipal fisherfolk; (iii) improvement of productivity of aquaculture within ecological limits; (iv) optimal utilization of offshore and deep-sea resources; and (v) upgrading of post-harvest technology. The Fisheries Code is a codification of existing fishery laws.

BFAR's current mandate in the coastal area, which largely encompasses municipal waters, is now limited to technical assistance to LGUs in conservation, production, processing and marketing of fish products.

The responsibilities of BFAR as provided by the Fisheries Code which affect government's policy on blue swimming crab fishing include:

- Issuance of licenses for the operation of commercial fishing vessels through the Director's office (national), regional offices, or any provincial fishery office;
- Monitor and review joint fishing agreements between Filipino citizens and foreigners who conduct fishing activities in international waters, and ensure that such agreements are not contrary to Philippine commitment under international treaties and convention of fishing in the high seas;
- Formulate and implement a Comprehensive Fishery Research and Development Program to include, but not limited to, sea farming, sea ranching, tropical/ornamental fish and seaweed culture, aimed at increasing resource productivity, improving resource use efficiency, and ensuring the long-term sustainability of the country's fishery and aquatic resources;
- Establish and maintain a Comprehensive Fishery Information System;

- Establish a corps of specialist in collaboration with the Department of National Defense (DND), DILG, and Department of Foreign Affairs (DFA) for the efficient monitoring, control and surveillance of fishing activities within Philippine territorial waters and provide the necessary facilities, equipment and training therefore;
- Enforce all laws, formulate and enforce all rules and regulations governing the conservation and management of fishery resources;
- Recommend measures for the protection/enhancement of the fishery industries;
- Formulate rules and regulations for the conservation and management of straddling fish stocks and highly migratory fish stocks; and
- Perform such other related functions, which shall promote the development, conservation, management, protection and utilization of fisheries and aquatic resources.

Some Highlights of the Fisheries Code are as follows:

- Modes of limitation of access. The fishing license and permit system is mandated to be based on the limits of MSY, with preference in allocation to local communities in adjacent or nearest municipal waters. Catch ceiling limitations are intended to limit access through restrictions on the harvesting of resources.
- Temporal and spatial limitation. The establishment of closed seasons and closed areas, as well as fish refuge and sanctuaries, is another mode of limiting access. The municipal government, in consultation with the FARMC, has jurisdiction over the establishment of closed seasons and closed areas within municipal waters, while the BFAR, with the concurrence and approval of the affected LGU and FARMC, may do so in waters within municipal boundaries.
- User fees and other charges. User fees and other fishery charges are based on resource rent. This concept considers social benefits from using the fishery as a resource, over and above financial profits of users. Other procedures recognized as limiting access include the limited entry of both commercial and municipal fishing vessels in areas deemed as overfished by either the DA or relevant LGU. Another is the absolute prohibition on the use of active (e.g., trawl, purse seine, Danish seine, pushnet and bagnet) fishing

gear in municipal waters; and that of fishing beyond the TAC or fishing during closed seasons.

- Jurisdiction of local governments. The Fisheries Code strengthens the responsibilities of municipality/city government in fishery management through legislation, enforcement, the granting of fishery rights and privileges, and conservation (RA 8550, Article 1 Section 16).
- Priority to municipal fisherfolk. The preferential rights of subsistence fishers to communal fishing and marine areas, as guaranteed by the Constitution and the LGU, are reiterated by the Fisheries Code through Sec. 7, which states that priority should be given to resource users in the local communities adjacent to municipal waters, and Sec. 17, which refers to the preference for organized local fisherfolk organizations.
- Enforcement. The Fisheries Code maintains the multiplicity of government agencies and other entities tasked to enforce fishery laws. Persons and deputies who are authorized to enforce the Fisheries Code include law enforcement officers of the DA, Philippine Navy (PN), Philippine Coast Guard (PCG), Philippine National Police-Maritime Group (PNP-MG), law enforcement officers of the LGU and other government enforcement agencies, and deputy fish wardens (government officials and employees, Punong Barangays, and officers and members of fisherfolk organizations).
- Institutional strengthening. The BFAR, with a weaker mandate in the past years, has been restored to its functions, and provided with a reorganized structure that allows it to create regional, provincial, and municipal offices as necessary. An office of Undersecretary of Fisheries and Livestock has also been created within the DA.

Administrative Orders issued by BFAR relevant to blue swimming crab fishing and pursuant to the provisions enumerated above are:

- FOO 233. Creation of a National Technical Working Group (TWG) for the Blue Swimming Crab Industry. 06/02/2009
- FAO 155. Regulating the use of fine-meshed nets in fishing. 06/23/1986
- FAO 155-1. Amending Section 2 of Fisheries Administrative Order (FAO) No. 155, regulating the use of fine meshed nets in fishing. 06/23/1994
- FAO 222. Regulations on the operation of Modified Danish seine. 10/30/03

- FAO 201. Ban of fishing with active gear. 01/23/2000
  - FAO 233. Aquatic Wildlife Conservation. 04/16/2010
  - Department of Agriculture Administrative Order No. 1, 2004. Guidelines on the delineation of municipal waters.
- ✓ Republic Act No. 7160 – Local Government Code of 1991 further devolves the management of the municipal fisheries waters (within the 15 km radius from the shoreline) to the local government units covering the area.
  - ✓ Executive Order No. 305 – Devolving to Municipal and City Governments the Registration of Fishing Vessels Three (3) Gross Tonnage Below.

With reference to FAOs 155 and 155-1, on fine meshed nets, the Fisheries Code mentions the promulgation of FAO to amend FAOs 155 and 155-1.

**2.6.3 AFMA Law.** AFMA expresses the *“policy of the State to ensure that all sectors of the economy and all regions of the country shall be given optimum opportunity to develop through the rational and sustainable use of resources peculiar to each area in order to maximize agricultural productivity, promote efficiency and equity and accelerate the modernization of the agriculture and fisheries sectors of the country.”* There is a divergence in the objectives of the two laws. AFMA essentially places priority on sustained increase in production, industrialization, and full employment while the Fisheries Code prioritizes management, conservation and protection of fishery and aquatic resources, optimal utilization of existing resources, and maintenance of ecological balance and the quality of the environment.

**2.6.4 The Philippine Coast Guard (PCG)** is one of the agencies assigned to enforce fisheries law. It is also responsible for inspecting vessels for compliance with licensing, safety and manning requirements.

**2.6.5 Philippine National Police-Maritime Group (PNP-MG).** RA 6975 created the PNP Maritime Group, a maritime police unit within the Philippine National Police, and which has been vested with the authority to perform all police functions “over Philippine territorial waters and rivers, and coastal areas...”

### **3.0 IMPLEMENTATION FRAMEWORK**

#### **3.1 Research and Development (R & D)**

The Fisheries Code (Sect. 2) commits to the use of Total Allowable Catch (TAC) and Maximum Sustainable Yield (MSY) with both defined under the

Fisheries Code (definitions 55 and 72) in the management of fisheries in Philippine waters. Given the current data deficiency, MSY and TAC are still not available as shown in the table. Further, the following shall be included: stock assessment, morphometric parameters, population dynamics, supply chain mapping and socio-economic fishery monitoring as areas for research.

**Table 4. Estimated MSY and TAC**

	MSY	TAC	Current Catch MT	Comment
Blue swimming crab, all species of crustaceans (MT)			15,000	MSY and TAC to be calculated by the NFRDI-NSAP

### 3.1.1 Monitoring

LGU Fishery Technician/NSAP Enumerator shall monitor daily catch for crab in respective Municipalities, and BFAR be furnished with the monthly data. The Philippine Association of Crabs Processors, Inc. (PACPI) as BFAR partner shall provide data from picking plants and buying stations. BFAR shall continue the registration of crab processors, traders and exporters for the purpose of traceability.

### 3.1.2 Aquaculture

Improvement of hatchery, nursery and grow-out technology and enhancement of BSC (*Portunus pelagicus*) in key areas identified shall be conducted by BFAR thru the National Fisheries Research and Development Institute (NFRDI), in collaboration with the Southeast Asian Fisheries Development Center – Aquaculture Department (SEAFDEC-AQD), Academe, LGU, and PACPI.

### 3.1.3 Crab Stock Enhancement

Encourage the establishment and improvement of holding cages of berried crabs in municipal waters to enhance crab stocks. LGU shall be required to formulate a municipal ordinance requiring the BSC buyers to establish prescribed holding cages for berried crabs.

- 3.3.1. Juvenile Production
- 3.3.2. Seeding/Sea Ranching
- 3.3.3. BSC Sanctuaries

### 3.1.4 Socio-economic study

Conduct a socio-economic and supply chain study of the BSC industry.

## **3.2 Regulations**

### **3.2.1 Monitoring on the Status of the Population**

In order to achieve this, the following sets of data are to be collected and shall be stored in data base system:

1. Annual catch estimates through test fishing, landing and processors production receipts
2. Fishing effort for the above catch estimates (logs)
3. Operational data (catch per unit effort) over the years of each gear type and vessel size
4. Biological morphometrics (sex, carapace width, carapace length and weight) – analysis
5. Growth, mortality and recruitment parameters
6. Fecundity

### **3.2.2 Fishing Capacity**

Noting the current lack of definitive data to determine appropriate levels of fishing effort and catch, and the high estimated exploitation rates, a precautionary approach to fishing effort is hereby applied until adequate estimates of exploitation rate can be ascertained. The following data should be collected:

1. The number of municipal fishing boat for blue swimming crabs
2. The total gross tonnage of the blue swimming crab boats
3. The number of fishing days and the frequency of fishing
4. The total number of fishers

### **3.2.3 Fishing Gear/Ground Limitation**

1. The use of crab pots and liftnets over entangling nets.
2. Crab trap/pot must have a limited number of units while the length/depth and or units of entangling nets per fishing boat shall also be limited.
3. Regulate the use of entangling nets and disallow the use of trammel nets/multi-layered nets, trawl/otter trawl.
4. In addition, the minimum mesh size for gillnet shall be 5 cm stretch mesh and that no gillnet fishing activity in areas with depth less than 10 meters in order to minimize the catching of juvenile crabs (Germano, 2006). Likewise, crab pots deployed in shallow areas, catch generally smaller crabs than

gillnets which are deployed in deeper water (Germano, 2006).

#### **3.2.4 Addressing Crabs as By-catch**

1. Regulate mesh size of fish pots/traps and liftnets and the use of trammel nets to minimize crab by-catch.
2. Provide guidelines to ensure crab by-catch is avoided and if not, should be returned at sea alive.
3. Policy guidelines for proper disposal of used entangling nets and guidelines for the construction of entangling nets and pots to prevent/minimize ghost fishing of lost traps or entangling nets.

#### **3.2.5 Protection of Critical Life stages of BSC**

1. The minimum size of BSCs to be caught, sold, or traded shall be 10.2 cm (or 4 inches) in carapace width. The minimum size regulation should be strictly implemented for carapace width measurement procedure, see Diagram 1.
2. Investments in improving hatchery techniques for possible hatchery-reared stock enhancement.
3. Establishment of blue swimming crab sanctuaries in Municipal waters particularly in seagrass beds and mangrove forests.

#### **3.2.6 Closed Fishing Season/Area**

To prevent recruitment overfishing, a close season shall be imposed per specific locality provided that there is a scientific data of at least two years to support the measure. This shall entail regular monitoring by NSAP or other academic institutions or other credible research institutions. This will be coordinated with LGUs on actual occurrence of gravid crabs and continuing studies on peak catching season.

### **3.3 Information, Education and Communications (IEC) Campaign**

- Dissemination of information materials
- Conduct of forum/symposium, trainings and seminars

### 3.4 Timetable of Implementation

This plan intends to implement the programs/activities and target schedule as stated below (items A and B):

#### A. Program of Activities for Implementing BSC Management Plan

Activities	Period of Implementation			
	2012	2013	2014	2015
1. Approval and adoption of BSCMP	2 <sup>nd</sup> Qtr.			
2. IEC campaign on the importance of Blue Swimming Crab Management Plan				
3. Capability building of BFAR, LGU, PACPI, and other stakeholders in managing blue swimming crab resource				
4. Inventory/Assessment of Blue Swimming Crab, stocks, boats, gears, fishers, processing plants at the municipal level				
5. Review/Amendments on the formulation of Comprehensive MFO - Consultation/public hearing				
6. Registration and licensing of Blue Swimming Crab fishers, gear, boats, processing plants				
7. R and D on Blue swimming crab - Development of breeding, hatchery and grow-out facilities - Natural habitats and ecosystem structure studies				
8. Production enhancement for proper management of berried crabs thru installation of cages in prioritized/cluster areas - Reseeding Program				
9. Implementation of integrated blue swimming crab resource management measures				

#### B. Strategies of Implementation

Based on the above activities, government, private agencies/institutions, and PACPI should cooperate to implement the various activities. Through a TWG or a Committee, the different units should identify what activities they will implement and prepare project proposals with areas coverage and budgetary requirements. The TWG or Committee should monitor the implementation of activities by the units based on their methodology and itineraries. As shown in the period of implementation, the units could agree on the priorities and likewise, prepare their budgetary requirements.

### 4.0 RESPONSIBILITIES OF IMPLEMENTING UNITS

The following defines the responsibilities of the implementing units and other pertinent agencies:

- 4.1 BFAR** – The Bureau thru the TWG will play key roles in the implementation of this plan. It will spearhead and harmonize all efforts, activities and initiatives to be conducted within the plan. All necessary data/information and statistics shall be provided by the Bureau as well as technical assistance for the benefit of the plan. A research body should be tapped for the purpose of investigation of stock's condition, breeding, marketing flow and other pertinent data. Regulatory and other control functions will also be the role of the Bureau.
- 4.2 NFRDI** – The National Fisheries Research and Development Institute being the research arm of the Bureau of Fisheries and Aquatic Resource through its National Stock Assessment Program shall provide TAC and MSY inputs for the BSC Management Plan. The said institution shall conduct research and development on breeding/hatchery technologies and grow-out facilities for BSC. Likewise, it shall conduct natural habitats and ecosystem structure studies.
- 4.3 BFAR-RFOs** – The concerned BFAR Regional Field Offices in Regions V, VI, VII, VIII, and CARAGA shall conduct the following activities:
- 4.3.1 Inventory/Assessment of Blue Swimming Crab stock, boats, gears, fishers, processing plants at the municipal level;
  - 4.3.2 Formulation of a comprehensive Municipal Fisheries Ordinance thru the conduct of Consultation/public hearing;
  - 4.3.3 Installation of cages for berried crabs in prioritized/cluster areas and monitoring of its status;
  - 4.3.4 Stock enhancement of BSC;
  - 4.3.5 IEC campaign on the importance of Blue Swimming Crab Management Plan; and
  - 4.3.6 Implementation of integrated blue swimming crab resource management measures.
- 4.4 SEAFDEC-AQD** – The Southeast Asian Fisheries Development Center – Aquaculture Department in Tigbauan, Iloilo shall support BFAR-NFRDI in the improvement of hatchery, nursery and grow-out technology for BSC (*Portunus pelagicus*).
- 4.5 ACADEME** – shall support BFAR in providing relevant results of studies/researches relative to BSC.
- 4.6 LGU** – The Local Government Unit has overall jurisdiction of respective municipal waters thus they are considered as Key Implementor of the Management Plan. They will facilitate and make sure that established management schemes are being supported. The LGU will assist BFAR and PACPI in the activities related to this plan particularly on the conduct of surveys and research, education, and implementation of various projects.

- 4.7 NGO/PACPI** – PACPI is an industry association dedicated to the sustainability of the blue swimming crab fishery. PACPI will work alongside BFAR, LGUs, NGOs and fisherfolks in the implementation of actions that would help promote blue swimming crab resource sustainability. It will support the BSCMP thru creative and interactive print ads that seeks to educate the crab fishermen regarding the more beneficial ways of collecting BSC. It will be written in various local dialects and will be displayed in picking plants of crabmeat processors and in coastal communities and schools. An infomercial that would focus on promoting the long term benefits of correct fishing practices of these resources will also be launched. In addition, PACPI will implement various initiatives such as installation of gravid crab holding cages near picking or cooking stations, launching of educational programs, reseedling of protected nursery areas, identification of best methods to improve survival of hatchery grown crabs in the wild, and provision of support to BSC stock assessment.
- 4.8 FISHERFOLK** – Fishermen must ensure at their level that the management plan is being implemented accordingly. They must participate in the application of proper management measures and contribute in monitoring their seas through conduct of patrolling activities. Necessary data and information in the conduct of research activities will be provided to TWG in the formulation of appropriate policies.

## 5.0 BUDGETARY REQUIREMENTS

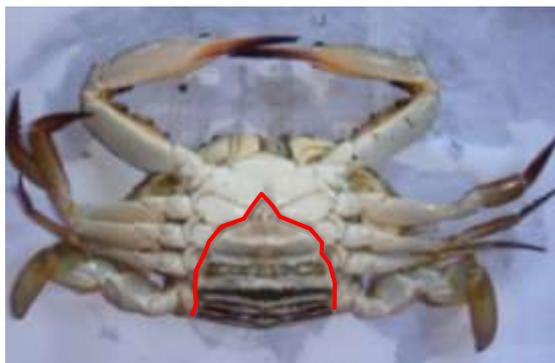
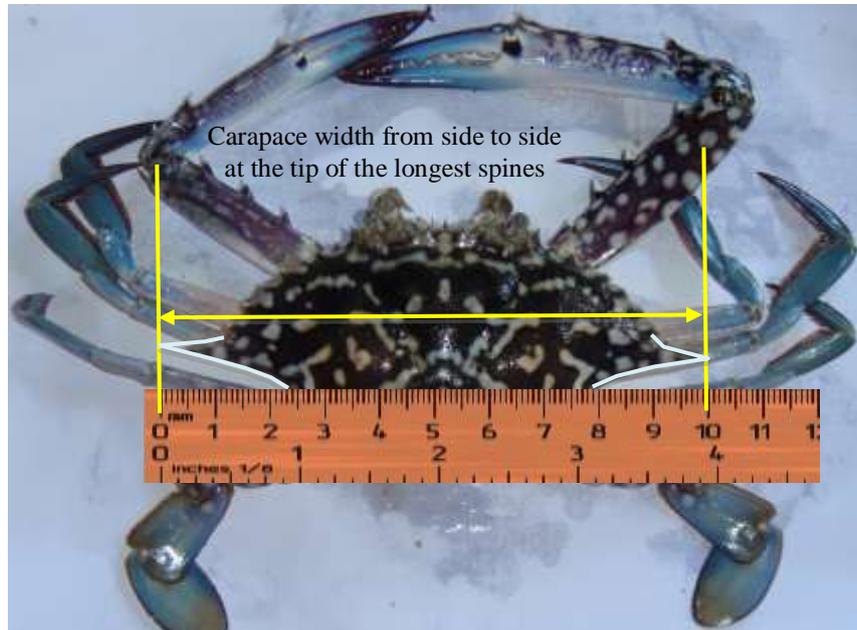
Note: See program of activities

ACTIVITY	Responsible Agency/Unit	ESTIMATED BUDGET (in '000)									
		2012		2013		2014		2015		Total	
		MOOE	CO	MOOE	CO	MOOE	CO	MOOE	CO	MOOE	CO
1. Inventory/Assessment of Blue Swimming Crab stock, boats, gears, fishers, processing plants at the municipal level in Regions V, VI, VII, VIII, and CARAGA	BFAR-RFOs, LGUs, FARMC, PACPI and Academe	10,000	-	5,000	-	5,000	-	5,000	-	25,000	-
2. Registration and licensing of Blue Swimming Crab fishers, gear, boats, processing plants	LGU	10,000	-	5,000	-	5,000	-	5,000	-	25,000	-
3. Blue swimming crab stock enhancement - Development of breeding, hatchery and grow-out facilities - Natural habitats and ecosystem structure studies - Installation of berried crab holding cages - Reseeding Program	BFAR-RFOs, LGUs, PACPI and Academe	10,000	50,000	15,000	50,000	20,000	50,000	20,000	50,000	60,000	200,000
4. Restocking program in Regions V, VI, VII, VIII, and CARAGA	BFAR-RFOs, LGUs, PACPI and Academe	5,000	-	7,500	-	7,500	-	10,000	-	30,000	-
5. Proper management of berried crabs thru installation of cages in prioritized/cluster areas	BFAR-RFOs, LGUs, PACPI	20,000	20,000	15,000	20,000	15,000	20,000	15,000	20,000	65,000	80,000
6. IEC campaign on the importance of Blue Swimming Crab Management Plan	BFAR-RFOs, LGUs, PACPI	5,000	-	5,000	-	5,000	-	5,000	-	20,000	-
7. Implementation of integrated blue swimming crab resource management measures in Regions V, VI, VII, VIII, and CARAGA	BFAR-RFOs, LGUs, PACPI	20,000	-	15,000	-	15,000	-	15,000	-	65,000	-
8. Review/Amendments on the formulation of Comprehensive MFO - Consultation/public hearing in Regions V, VI, VII, VIII, and CARAGA	BFAR-RFOs, LGUs, PACPI and Academe	2,500	-	2,500	-	2,500	-	2,500	-	10,000	-
9. Capability building of local government units in managing blue swimming crab resource - Training on the propagation and culture of BSC - Stock assessment of blue swimming crab resource - Review and amendment to the MFO - Law enforcement - Management of fish sanctuaries	BFAR-RFOs, LGUs, FARMC, PACPI and Academe	50,000	5,000	35,000	5,000	30,000	5,000	25,000	5,000	140,000	20,000

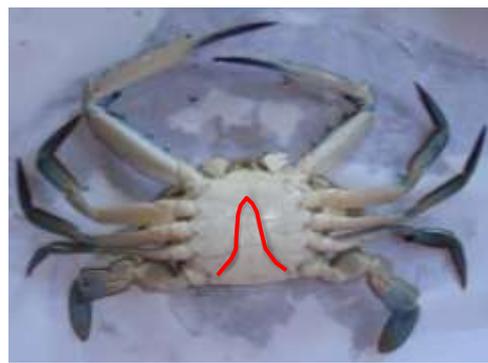
ACTIVITY	Responsible Agency/Unit	ESTIMATED BUDGET (in '000)									
		2012		2013		2014		2015		Total	
		MOOE	CO	MOOE	CO	MOOE	CO	MOOE	CO	MOOE	CO
<ul style="list-style-type: none"> <li>- Licensing and registration</li> <li>- Management measures/interventions for resource (minimum size, closed season and fishing gear limitation)</li> <li>- Identification of appropriate livelihood projects</li> <li>- Provision of technical assistance in the drafting of municipal ordinance for BSC management</li> </ul>											
<b>TOTAL</b>		<b>132,500</b>	<b>75,000</b>	<b>105,000</b>	<b>75,000</b>	<b>100,000</b>	<b>75,000</b>	<b>102,500</b>	<b>75,000</b>	<b>440,000</b>	<b>300,000</b>

**Diagram 1—Blue Swimming Crab (*Portunus pelagicus*) width measurement of carapace**

Blue Swimming Crab is undersize if the width of its carapace, as shown in diagram 1, is less than 10cm when measured from side to side at the tip of the longest spines.



Female Blue Swimming Crab



Male Blue Swimming Crab



Females are dull green in color



Males with blue markings

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**Smithsonian Environmental Research Center.**

[http://www.serc.si.edu/labs/fish\\_invert\\_ecology/bluecrab/reproduction.aspx](http://www.serc.si.edu/labs/fish_invert_ecology/bluecrab/reproduction.aspx)

**South Australian Consolidated Regulations**

[http://www.austlii.edu.au/au/legis/sa/consol\\_reg/fmr2007357/sch2.html](http://www.austlii.edu.au/au/legis/sa/consol_reg/fmr2007357/sch2.html)

## ANNEX A: Reproductive biology of a Blue Swimming Crab

### Blue Swimming Crab

Taxonomy: *Potunus pelagicus* (Linnaeus, 1758)

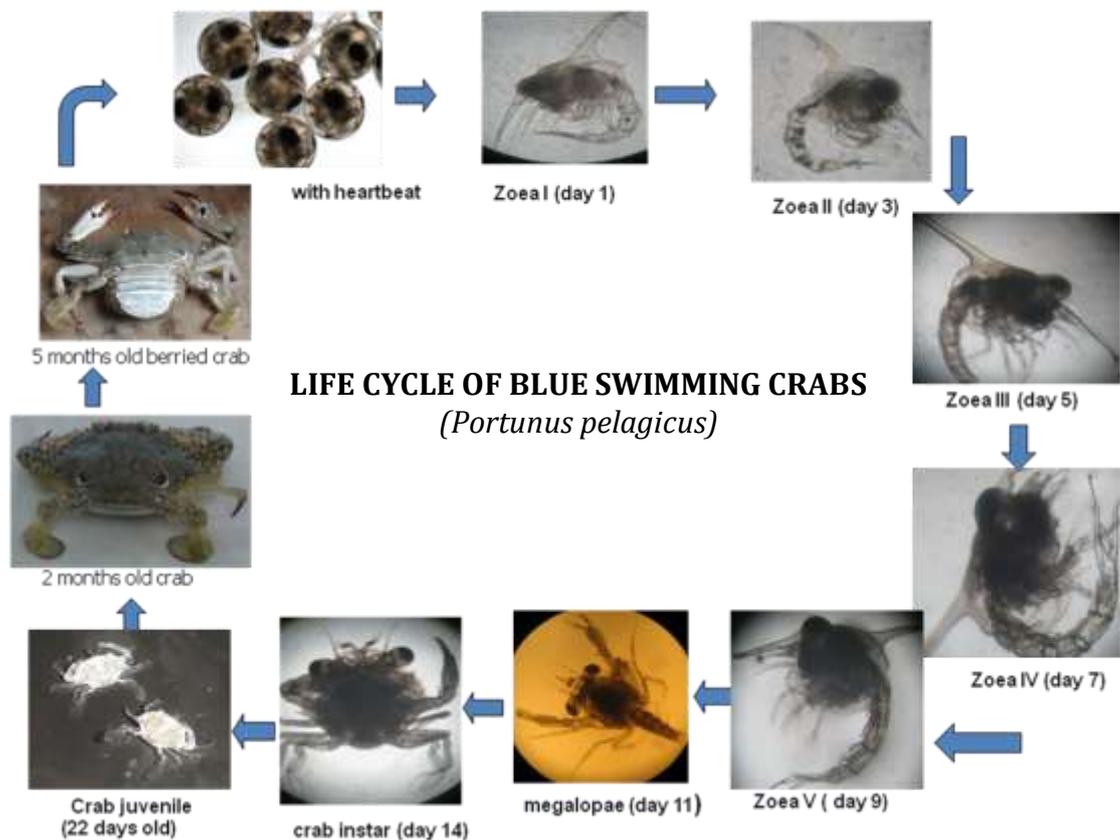
Phylum : Crustacea  
 Class : Malacostraca  
 Subclass: Eumalacostraca  
 Order : Decapoda  
 Family : Portunidae

### Frequent synonyms/misidentification:

*Portunus*(*Portunus*) *segnis* (Foskål, 1775) formerly known as *Portunus mauritianus* (Wrad, 1942), *Portunus trituberculatus* (Miers, 1876) and *Portunus sanguinolentus* (Hersbt, 1783)

The species is similar to *Portunus trituberculatus* in its general appearance. *P. trituberculatus* resembles a large stocky female of *P. pelagicus*. *P. pelagicus* is, however, easily distinguished because it have 4 frontal teeth (3 in *P. trituberculatus*) and it have 3 spines in the merus of chelipeds (4 in *P. trituberculatus*). *Portunus sanguinolentus* (Herbst, 1783) inhabit the same area but it is easily distinguished by their 3 prominent spots colored deep-purple to red in the posterior 1/3 of the carapace.

Blue swimming crabs' colorful physical appearances depend much on the habitat. The male crabs are blue while females are grayish green. Only the claws are blue, and the claws of mature females also have bright orange-red tips. There's another easy way to distinguish males from females; locals look for the "apron". Males have a "t" shaped abdomen, and females have triangular abdomens that become rounder as they grow and aged. Females are generally smaller, reaching maturity size of around 11.43cm or more. Male blue swimming crabs will go as much as 22.86cm from the pointiest part of his shell to the other point.



**Source:** Guiuan Marine Fisheries Development Center, Guiuan, Eastern Samar,

Crabs grow by shedding their shells, a process called molting. They take in water to expand and break out of the old shell. A new soft shell underneath hardens quickly. With three (3) pairs of walking legs, they generally walk sideways, clearing a path with sharp lateral spines. Large, powerful claws are used for defense, digging, sexual displays, and to gather food. Adult blue crabs feed on bivalves, crustaceans, fish, worms, plants, detritus, and nearly anything else they can find, including dead fish and plants. The blue crab's favorite food may be thin-shelled bivalves. When these are scarce, they resort to cannibalism on juvenile crabs.

### Egg Development



**Source:** BSC Broodstocks photos taken in Guiuan Marine Fisheries Development Center, Guiuan, Eastern Samar

### Reproductive Cycle

#### 1) Mating

Female blue crabs mate only during molting. When they become sexually mature immediately following their pubertal molt (immediately following this molt, the female is known as a "sook.") When approaching this pubertal molt, females release a pheromone in their urine which attracts males. Male crabs vie for females and will carry and protect them, called "cradle carrying," until molting occurs. Following this molt, when the female's shell is soft, the pair will mate. During mating, the female captures and stores the male's sperm in sac-like receptacles so that she can fertilize her eggs at a later time. Once the female's shell has hardened, the male will release her and she will migrate to higher salinity waters to spawn.

## 2) Spawning

For spawning, *Portunus pelagicus*, requires a sandy substrate and relatively clear water environment. The eggs are carried by the surface current to areas where the juveniles could settle.

The *P. pelagicus* are highly fecund and fecundity is best describe by “ $\log F = \log a + b \log CW$ ” (Ingles 1996) which indicates that the number of eggs produced increases exponentially with increasing body size (Ingles 1996). Spawning is found all year round but the peak and lean seasons is influenced by the monsoons.



**Sponge Crab (Ovigerous Female)**  
Photo courtesy of Thomas H. Shafer,  
Univ. of North Carolina at Wilmington

## 3) Growth Stages

Growth and development of the blue crab, as in other crustaceans, consist of a series of larval, juvenile, and adult stages during which a variety of morphological, behavioral, and physiological changes occur. These changes are most dramatic when the animal molts (sheds its rigid exoskeleton) permitting growth and changes in body shape. Before molting, a new shell is formed underneath the old exoskeleton, which then loosens and is cast off. The new shell is initially soft, but it expands and hardens in a few hours. The stage between molts is termed intermolt.

### a. Larvae

#### Stage 1 - Zoeae

First stage larvae, called zoeae, measure approximately 0.25 mm at hatching. They bear little morphological resemblance to adults (Hopkins 1943), are filter feeders, and live a planktonic existence in the high-salinity surface waters near the spawning grounds (Pyle and Cronin 1950; Darnell 1959). Tagatz (1968) found more zoeae near the water's surface than at the bottom.

The zoeae and all subsequent life stages can increase body size only by molting (Hay 1905; Pyle and Cronin 1950). Zoal development may require 31 to 49 days, depending on salinity and temperature, but development time has been shown to be variable even in a single salinity-temperature regime (Williams 1965). Zoeae molt four to seven times before entering the next stage of development. The final zoal stage is about 1.0 mm in width (Hopkins, Rogers 1944).



**Zoea - First Larval Stage**  
Photo courtesy of Alicia Young-Williams  
Smithsonian Environmental Research Center

#### Stage 2 – Megalops

The final molt of the zoeae is characterized by a conspicuous change to the second larval stage, called a megalops (also termed megalopa [singular] or megalopae [plural]). Development to this stage requires 31 to 49 days. The megalops larva is more crablike in appearance than the zoeae, its carapace is broader in relation to its length,

and has biting claws and pointed joints at the ends of the legs. It measures about 1.0 mm in width. The megalops swims freely, but generally stays near the bottom in nearshore or lower-estuarine, high-salinity areas (Tagatz, 1968). The megalops stage lasts 6 to 20 days, after which the megalops molts into the "first crab" stage, with proportions and appearance more like those of an adult.

There are usually seven zoeal stages and one postlarval, or megalopal, stage. On occasion, an eighth zoeal stage is observed.

### b. Juveniles

The juvenile "first crab" is typically 2.5 mm wide (from tip to tip of the lateral spines of the carapace). These juveniles gradually migrate into shallower, less-saline waters in upper estuaries and rivers where they grow and mature (Fischler and Walburg 1962).

Males generally migrate farther upstream, preferring low-salinity waters, whereas females tend to stay in lower rivers and estuaries (Dudley and Judy 1971; Music 1979). Moreover, juveniles are found in shallow seagrass/seaweed areas as previously reported by Batoy et al. (1988). This size-related distribution of BSC is also supported by the observation that crab pot or "timing", which are deployed in shallow areas, catch generally smaller crabs than gillnets "pukots", which are deployed in deeper water (Germano et al. 2006).

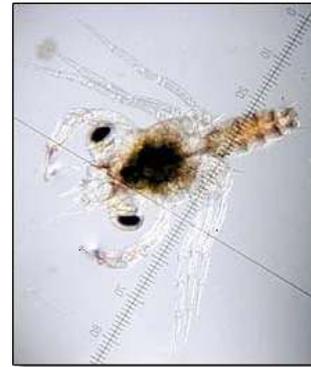
Growth and maturation occur during a series of molts and intermolt phases, each of which is termed a "crab" stage according to the number of molts that have occurred since the megalops stage.

### c. Adults

In the tropical areas, which include the Philippines, female *P. pelagicus* matures at an average carapace width (CW) of 10.56-cm and the males at an average CW of 9.64-cm (Ingles and Braum 1988, Ingles 1996). The average age of maturity of female BSC is at 8-months to one year while the male BSC matures at about 4 months-old (Ingles 1996, Ingles and Braum 1988). Adult BSC are found at a depth ranging from 2-12.8 meters (Germano et al. 2006). This is similar to the depth (>6m) reported by Batoy et al. (1988).

## Biological and Behavioral Life Cycle Pattern

Ingles (1996) briefly described the biological and behavioral life cycle patterns of the blue swimming crab *Portunus pelagicus* to be strictly limited within the marine environment. Embryonic development is about 5 days starting from oviposition (Ingles 1996). The eggs (fertilized) hatched to become zoea, which undergoes three



**Megalopa - Post Larval Stage**  
Photo courtesy of Alicia Young-Williams  
Smithsonian Environmental Research Center



**"First Crab"**  
Photo courtesy of Alicia Young-Williams  
Smithsonian Environmental Research Center

molting processes to become megalopa, the megalopa stages further molts twice into megalopa stage 1 and stage 2 (Ingles 1996). The eggs, zoea1, zoea2, zoea3, megalopa1 and megalopa 2 stages are all part of the surface and subsurface plankton (Ingles 1996).

The megalopa then metamorphose into first crab instar, and started changing its life habit from plankton into benthic within the shallow areas of the littoral zones (Ingles 1996). The crab instar undertakes about 3 to 4 molts to reach the juvenile stage (Ingles 1996). The juveniles forage in the intertidal areas and seek refuge in the seagrass beds using the tidal fluctuations to facilitate their movements within the intertidal and the subtidal areas for about 2 to 3 months (Ingles 1996). As this crab matures, it undertakes passive migration towards the deeper areas (Ingles 1996).

The main diet of blue swimming crabs is mussels (Ingles 1996). The adult *Portunus pelagicus* has also very few predators, the major predator is only the octopus (Ingles 1996). The major mortalities occur during their planktonic stages and during the periods of ecdysis (Ingles 1996). On the other hand, based on the gut content analysis made by Germano et al. (2006) food items of BSC primarily consist of algal blades/filaments, fragments or whole individual of benthic organisms (diatoms, polychaetes, nematodes, foraminiferans, radiolarians), sessile and slow-moving invertebrates (poriferans, bryozoans, gastropod and bivalve veliger, copepods, penaeids, asteroideans, echinoids, ophiuroids, holothuroids), decapods, larvaceans, fish scales and detritus.

## Food

Blue swimming crabs are classified as general scavengers, bottom carnivores (eats other animals), detritivores (eats decaying organic matter), and omnivores (eats either other animals or plants). At various stages in the life cycle, Blue Swimming Crabs serve as both prey and as consumers of plankton, benthic macroinvertebrates, fish, plants, mollusks, crustaceans (including other Blue Swimming Crabs), and organic debris. Food is located by a combination of chemoreception (chemical sense) and taction (touch). Blue Swimming Crabs may play a significant role in the control of benthic populations.



Adult Crab Feeding  
© 2006 bluecrab.info

Macroinvertebrates are organisms without backbones (e.g., insect larvae, annelids (leeches), oligochaetes (worms), crustaceans (crabs, crayfish and shrimp), mollusks (clams, oysters and mussels), and gastropods (snails)) and inhabit bottom substrates (e.g., sediments, debris, logs, macrophytes, and filamentous algae.)

### 1) Adult Food

Adult Blue Swimming Crabs prefer mollusks such as oysters and hard clams as their primary food sources. The crab uses the tips of its front-most walking legs to probe the bottom for buried bivalves and to manipulate them after they are located. Some other common food items include dead and live fish, crabs (including other Blue Swimming Crabs), shrimp, benthic macroinvertebrates, organic debris, and aquatic

plants and associated fauna such as roots, shoots and leaves of sea lettuce, eelgrass, ditch grass, and salt marsh grass. It will also prey on oyster spat, newly set oysters and clams, or young oysters and quahogs if other food is unavailable.

## 2) Juvenile Food

Juvenile Blue Swimming Crabs feed mostly on benthic macroinvertebrates, small fish, dead organisms, aquatic vegetation and associated fauna.

## 3) Larval Food

Zoeae are phytoplanktivorous and readily consume algae, phytoplankton and zooplankton. Megalope are considered general scavengers, bottom carnivores, detritivores, and omnivores. Megalope are more omnivorous than zoeae and prey upon fish larvae, small shellfish, and aquatic plants.

## 4) Abundance & Predators

Predators claim large numbers of young crabs, and crab populations may vary from year to year according to the abundance of predators. Blue Swimming Crabs are subject to predation throughout their life cycle and are particularly susceptible when they are soft during the molting process.

As larvae, they are vulnerable to fishes, jellyfish, shrimp, and other planktivores. Plankton feeders eat the larvae as they drift in the water; after they settle, eel, drum, striped bass, sea trout, catfish, spot, and other Blue Swimming Crabs are primary predators.

Various fishes and birds, as well as other Blue Swimming Crabs consume the megalopae and juvenile crabs.

The main predators of adult *P. pelagicus* are octopus, other crabs and fishes. Its relative the *Calinectes sapidus* found in Chesapeake Bay are consumed by other crabs\*, American eels, striped bass, Atlantic croakers, cobia, red drum, black drum, oyster toadfish, sandbar sharks, bull sharks, cownose rays, speckled/spotted trout, weakfish, catfish, gars, largemouth bass, loggerhead turtles, Atlantic Ridley turtles, herons and egrets, various diving ducks and raccoons.

\*The Blue Swimming Crab is well known for its cannibalistic habits. Crabs make up as much as 13% of a crab's diet. Blue Swimming Crabs in poor health, missing important appendages, heavily fouled with other organisms, and those during or immediately following molt are more likely to be cannibalized.

## Autotomy & Regeneration

Blue Swimming Crabs have the ability to sacrifice limbs (called autotomy) in order to avoid capture. Missing limbs are regrown by a process called regeneration.

Source: Smithsonian Environmental Research Center  
[http://www.serc.si.edu/labs/fish\\_invert\\_ecology/bluecrab/reproduction.aspx](http://www.serc.si.edu/labs/fish_invert_ecology/bluecrab/reproduction.aspx)  
<http://www.bluecrab.in>

Proforma/Model ordinance in the Province of Negros Occidental

Republic of the Philippines  
 PROVINCE OF NEGROS OCCIDENTAL  
 Provincial Administration Center  
 Bacolod City

OFFICE OF THE SANGGUNIANG PANLALAWIGAN

EXCERPT FROM THE MINUTES OF THE REGULAR SESSION OF  
 THE SANGGUNIANG PANLALAWIGAN OF THE PROVINCE OF  
 NEGROS OCCIDENTAL HELD AT THE CITY OF BACOLOD ON 24<sup>TH</sup>  
 DAY OF SEPTEMBER 2003.

PRESENT:

Hon. Isidro P. Zayco	Vice Governor/Presiding Officer
Hon. Rolando P. Ponsica	Member – 1 <sup>st</sup> District
Hon.	Member – 1 <sup>st</sup> District
Hon. Corazon P. Diploma	Member – 2 <sup>nd</sup> District
Hon. Reynaldo P. Depasucat	Member – 3 <sup>rd</sup> District
Hon. Ma. Remedios Mapa-Suplado	Member – 3 <sup>rd</sup> District
Hon. Ike M. Barredo	Member – 4 <sup>th</sup> District
Hon. Emilio Y. Montalvo	Member – 5 <sup>th</sup> District
Hon. Angelito L. Colmenares	Member – 5 <sup>th</sup> District
Hon. Genaro Rafael K. Alvarez	Member – 6 <sup>th</sup> District
Hon. Adolfo T. Mangao, Sr.	Member – 6 <sup>th</sup> District
Hon. Miller V. Serondo	Member - PCL
Hon. George B. Gitano	Member - ABC
Hon. Lorenzo P. Suatengco	Member - SK

ABSENT:

Hon. Edgardo Y. Acuña (OB)	Member – 2 <sup>nd</sup> District
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ORDINANCE NO. 019

Series of 2003

AN ORDINANCE REGULATING THE CATCHING,  
 SELLING, POSSESSING OR BUYING OF GRAVID BLUE CRABS  
 AND CRABLETS IN THE PROVINCE OF NEGROS  
 OCCIDENTAL

Be it enacted by the Sangguniang Panlalawigan of the Province of  
 Negros Occidental on its regular session duly assembled that:

**Section 1. TITLE** - This ordinance shall be known as the "Blue Crab Fishery Ordinance".

**SECTION 2. RATIONALE AND OBJECTIVES** - The Blue Crab is the sixth most important fishery export in the country. Region IV, particularly the Visayan Sea and Guimaras Strait, is the highest producer of Blue Crabs. It is therefore the policy of the province to conserve, protect and manage Blue Crab Fishery as part of the province's natural and economic resource. Towards this end, this ordinance is enacted with the following objectives;

- a) To address the problem of resource depletion of blue crabs in municipal and city waters in the Province; and
- b) To utilize properly blue crabs as a sustainable source of livelihood.

**Section 3. SCOPE** - This Ordinance shall be enforced in the waters of all component cities and municipalities of the Province under the supervision and control of the Office of the Governor.

**Section 4. DEFINITION OF TERMS** - As used in this Ordinance, the following terms are defined as follows:

- a) Blue Crabs - refer to the invertebrate scientifically known as *Portunus pelagicos* and locally known as alimasag or kasag.
- b) Blue Crab fishing gears - refer to gears used specifically for catching blue crabs. These are passive fishing gears like bottom-set gill nets and crab pots.
- c) Carapace - refers to the external skeleton of the blue crab, the size of which may be used to determine the age of the crab.
- d) Crablets - refer to sub-adults of the crabs below 5 cm carapace width.
- e) Gravid Crabs - refer to egg-bearing crabs.
- f) Mature Crabs - refer to reproductively-capable crabs the average size of which is 11 cm for both males and females.
- g) LGU - means a municipality or a component city composing the Province of Negros Occidental.

- h) Province- means the Province of Negros Occidental.

**Section 5. PROHIBITED ACTS** – It shall be unlawful for any person to engage in any of the following activities;

- a) Catching, selling, possessing or buying gravid blue crabs;
- b) Catching, selling, possessing or buying blue crabs which have not reached the average size of maturity or crabs with a carapace below 11 cm. for both male and female.
- c) Using gill nets to catch blue crabs with stretched mesh size of less than 12 cms.
- d) Engaging in blue crab fishery without the required license/permit from the concerned city or municipality.

**Section 6. PENALTIES** – Any person who violates this Ordinance shall be punished as follows:

- a) For violation of the Section 5 (a), and (b);

*First Offense* – Offender shall be given a warning and shall be instructed to return into the sea, whether dead or alive, all the gravid crabs, crablets and/or immature crabs;

*Second Offense* – In addition to returning the crabs into the sea, the offender shall be reprimanded and warned that a repetition of the same offense shall be a cause for criminal action;

*Third Offense* – The offender shall be fined the amount of P1,500.00. Furthermore the offender's fishing permit or license shall be accordingly suspended for not more than thirty (30) days.

- b) For violation of the Section 5 c), and (d);

The offender shall be punished with a fine of P1,500.00 or suffer an imprisonment of seven (7) days, both fine and imprisonment upon the discretion of the court, the confiscation of fishing gear and fish catch, and revocation of permit or license.

**Section 7. PERSONS AUTHORIZED TO ENFORCE THIS ORDINANCE** – The law enforcement officers of the LGU's in their respective

areas of jurisdiction and other government agencies, and deputized fish wardens (Bantay Dagat) are hereby authorized to enforce this Ordinance.

**Section 8. ROLE OF THE LGU** – The concerned LGU, thru the Municipal or City Agriculture Officer, shall keep a record of apprehensions and the issuance of the corresponding warnings or reprimand to any offender. Upon commission of the offense for the third time, the matter shall be brought by the Municipal or City Agriculture Officer for appropriate action to the Office of the Station Commander which has jurisdiction over the case for preparation of affidavits to support the complaint for filing in court.

**Section 9. REPEALING CLAUSE**- All existing ordinances and rules and regulations or parts thereof which, are inconsistent with the provisions of this Ordinance are hereby repealed or modified accordingly.

**Section 10. SEPARABILITY** – Any portion or provision of this Ordinance declared unconstitutional shall not affect any provisions not effected thereby.

**Section 11. EFFECTIVITY** – This Ordinance shall take effect after the completion of its publication in local newspaper of general circulation in the province.

**ADOPTED UNANIMOUSLY.**

CERTIFIED CORRECT:

(SGD.) HON. ISIDRO P. ZAYCO  
Vice-Governor

ATTESTED:

(SGD.) MARY JEAN BABETTE Q. DIAZ  
Legislative Staff Officer V

APPROVED:

(SGD.) HON. JOSEPH G. MARAÑON  
Governor

## ANNEX C

### SURVEY OF BLUE SWIMMING CRAB "*Portunus pelagicus*" FISHERY IN SUPPORT TO SUSTAINABLE HARVEST AND UTILIZATION

#### I. Fisherman's Profile:

Name of Fisher: \_\_\_\_\_ Association: \_\_\_\_\_  
Region and Province: \_\_\_\_\_ Municipality: \_\_\_\_\_  
Village/Sitio: \_\_\_\_\_ Contact Number: \_\_\_\_\_

#### II. Fishing Gear Specifications:

##### A. For Gillnet

Length \_\_\_\_\_ Width \_\_\_\_\_ Depth \_\_\_\_\_ No. of meshes down \_\_\_\_\_  
Materials used: \_\_\_\_\_

##### B. For Crab Pot/Trap

Dimension of pot/trap: Length \_\_\_\_\_ Width \_\_\_\_\_ Depth \_\_\_\_\_ Hole/mesh diameter \_\_\_\_\_  
Materials used: \_\_\_\_\_  
Type of fishing ground: \_\_\_\_\_ muddy \_\_\_\_\_ sandy \_\_\_\_\_ corral reef areas \_\_\_\_\_ others

##### C. For other fishing gears, please specify \_\_\_\_\_

Length \_\_\_\_\_ Width \_\_\_\_\_ Depth \_\_\_\_\_ No. of meshes down \_\_\_\_\_  
Materials used: \_\_\_\_\_

#### III. Fishing Boat Specifications:

Type of boat used: \_\_\_\_\_ Wooden \_\_\_\_\_ Fiberglass \_\_\_\_\_ others, please specify \_\_\_\_\_  
Length \_\_\_\_\_ Width \_\_\_\_\_ Depth \_\_\_\_\_  
Engine HP/brand \_\_\_\_\_

#### IV. Fishing Ground:

Location	Fishing Depth	Fishing Months

#### V. Seasonality of catching crabs:

##### Fishing Season:

Months: Peak \_\_\_\_\_ Lean \_\_\_\_\_  
Volume: Peak \_\_\_\_\_ Lean \_\_\_\_\_  
Value: Peak \_\_\_\_\_ Lean \_\_\_\_\_

##### Spawning Season:

Months: Peak \_\_\_\_\_ Lean \_\_\_\_\_  
Volume: Peak \_\_\_\_\_ Lean \_\_\_\_\_  
Value: Peak \_\_\_\_\_ Lean \_\_\_\_\_

**VI. Fishing operation profile:**

Volume catch per setting (in kg/trip) \_\_\_\_\_ No. of fishing gear units used per trip \_\_\_\_\_  
No. of hours soak in water per setting \_\_\_\_\_ Frequency of fishing operation per trip \_\_\_\_\_  
Size ranges of carapace \_\_\_\_\_ Selling price per kilo \_\_\_\_\_  
Number of fisher per boat \_\_\_\_\_

**VII. Processing Plant (if any):**

Name of processing plant: \_\_\_\_\_  
Location: \_\_\_\_\_  
Type of processing \_\_\_\_\_  
Buyers name: \_\_\_\_\_ Address: \_\_\_\_\_  
Size of crabs used: Juvenile \_\_\_\_\_ Berried \_\_\_\_\_ (support with pictures)  
Male \_\_\_\_\_ Female \_\_\_\_\_ (support with pictures)  
Note: Juvenile crab if size is below 4 inches

**VIII. Market Information from the Landing Sites:**

Crab Source/Municipality of origin: \_\_\_\_\_ Size Range: \_\_\_\_\_ Volume \_\_\_\_\_  
Buying Price: \_\_\_\_\_ (per kg) Selling Price: \_\_\_\_\_ (per kg)  
Outlets/ Destination: \_\_\_\_\_  
Market Practices: \_\_\_\_\_ Direct selling \_\_\_\_\_ Whole sale \_\_\_\_\_ Retail \_\_\_\_\_  
Price per kilo according to sizes (if applicable): Small \_\_\_\_\_ Medium \_\_\_\_\_ Large \_\_\_\_\_  
Price per kilo according to appearance (if applicable): Premium \_\_\_\_\_ Soft shelled \_\_\_\_\_  
Target Market: \_\_\_\_\_ Local \_\_\_\_\_ Domestic \_\_\_\_\_ International

**IX. Other information to be collected includes:**

- Municipal Fishery Ordinance (if any) for Blue Swimming Crab (BSC)
- Monthly production statistics for BSC
- PAO, MAO and FARMC contact information
- Investment and maintenance costs for fishing boats and fishing gears; and processing plants
- Socio-economic profiles on the fishing and processing sectors
- Up-to-date review of the supply/value chain.

## ANNEX D

### Data on the observed peak occurrence of juvenile and gravid crabs

Municipality	Gravid/berried Blue Swimming Crabs (spawning months)	Peak Catching Seasons
<b>NEGROS OCCIDENTAL</b>		
▪ E.B. Magalona	March to May August to September	June to August
▪ Silay City	November to December	June to July
▪ Talisay City	August	August to February
▪ Victorias	August	May to September
<b>ILO-ILO</b>		
▪ Carles	June to August	August to September
<b>GUIMARAS</b>		
▪ Sibunag	October to November	July and August (10 kg per day)
▪ San Lorenzo	August to September	August to October (6 to 7 kg per day)
▪ Buenavista	Every month there are few gravid crabs occur at the rate of 1 to 2 pieces per 3 kilos	August to September (6 to 10 kg per day)
<b>CAPIZ</b>		
▪ Roxas City	July	August, November and December (120 kg in 3 days)
<b>SORSOGON</b>		
▪ Sorsogon Bay	February to April (second spawning March to July)	July to August
<b>CAMARINES SUR</b>		
▪ San Miguel Bay	February to April	July to August
<b>MASBATE</b>		
▪ Asid Gulf	October to December	July to September
<b>SAMAR, LEYTE, BOHOL and CEBU</b>		
▪ Guiuan	January to March, July, August, December	-
▪ San Pedro Bay	March, November	-
▪ Camotes Sea	February, June, August	-
▪ Ormoc Bay	July, August, November, December	-
<b>BASILAN</b>		
▪ Basilan Strait	June, July, October, November	-