The Philippines: 4th Core Expert Meeting on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region

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OUTLINE

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  - Purse Seine Fisheries
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- **FISHING EFFORT OF PURSE SEINE**
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- **STATUS OF PELAGIC FISH STOCK**
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- **EXISTING MANAGEMENT STRATEGIES FOR PURSE SEINE**
  - Close Season
  - Close Area
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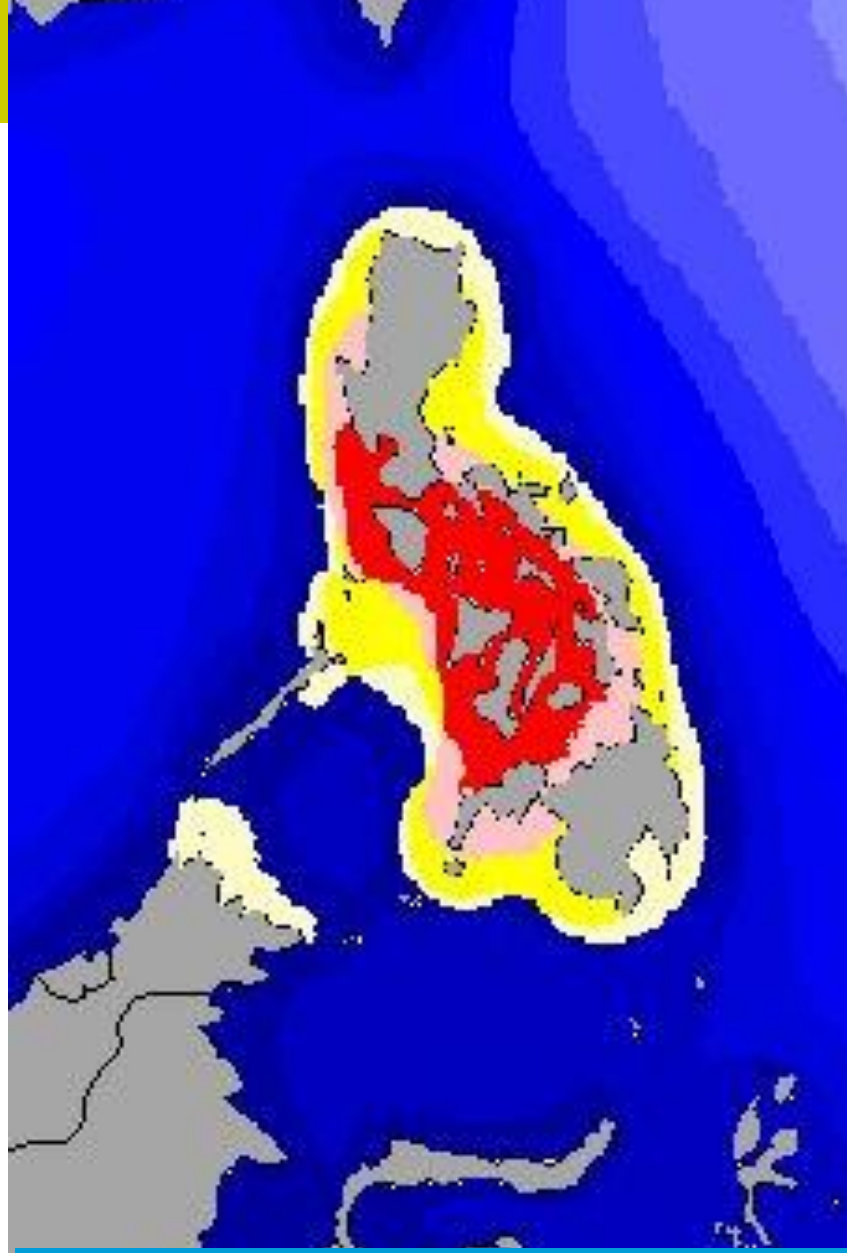
I. INTRODUCTION

- Philippines archipelago of more than 7,100 islands (archipelago/archipelagic doctrine)
- Archipelagic waters -220 million hectares, approximately 88% of Philippine territory
  - Coastal: 266,000 sq.km
  - Oceanic: 1,934,000 sq. km
- Has centers of diversity and endemism and its biological richness described as “Galapagos times ten” (Heaney and Regalado, 1998)
- 52, 177 DESCRIBED Species and still counting (many more species remain unknown to science)
- One of 17 megadiversity countries, which together contain 70-80% of global biodiversity (Mittermeier et al, 1997)



- CENTER OF THE CENTER OF MARINE BIODIVERSITY

- More than 1,130 recorded terrestrial species, half of which are found nowhere else in the world
- Awesome floral diversity: 10-14 thousand vascular and non-vascular plants (including fungi), more than half endemic to Philippines
- Marine biodiversity:
  1. Coastline 22,450 kilometers
  2. Estimated 27,000 sq. km coral reefs
  3. Nearly 500 of the more than 800 known species of corals worldwide
  4. More than 2,000 species of fish
  5. More than 40 species of mangrove plants (54 worldwide belonging to 16 families)
  6. 1,062 reported species of seaweeds
  7. 16 identified species of seagrass (Australia most diverse; SE Asia with combined coastline of more than 120,000, in second place)

PHILIPPINE CAPTURE FISHERIES: AN OVERVIEW

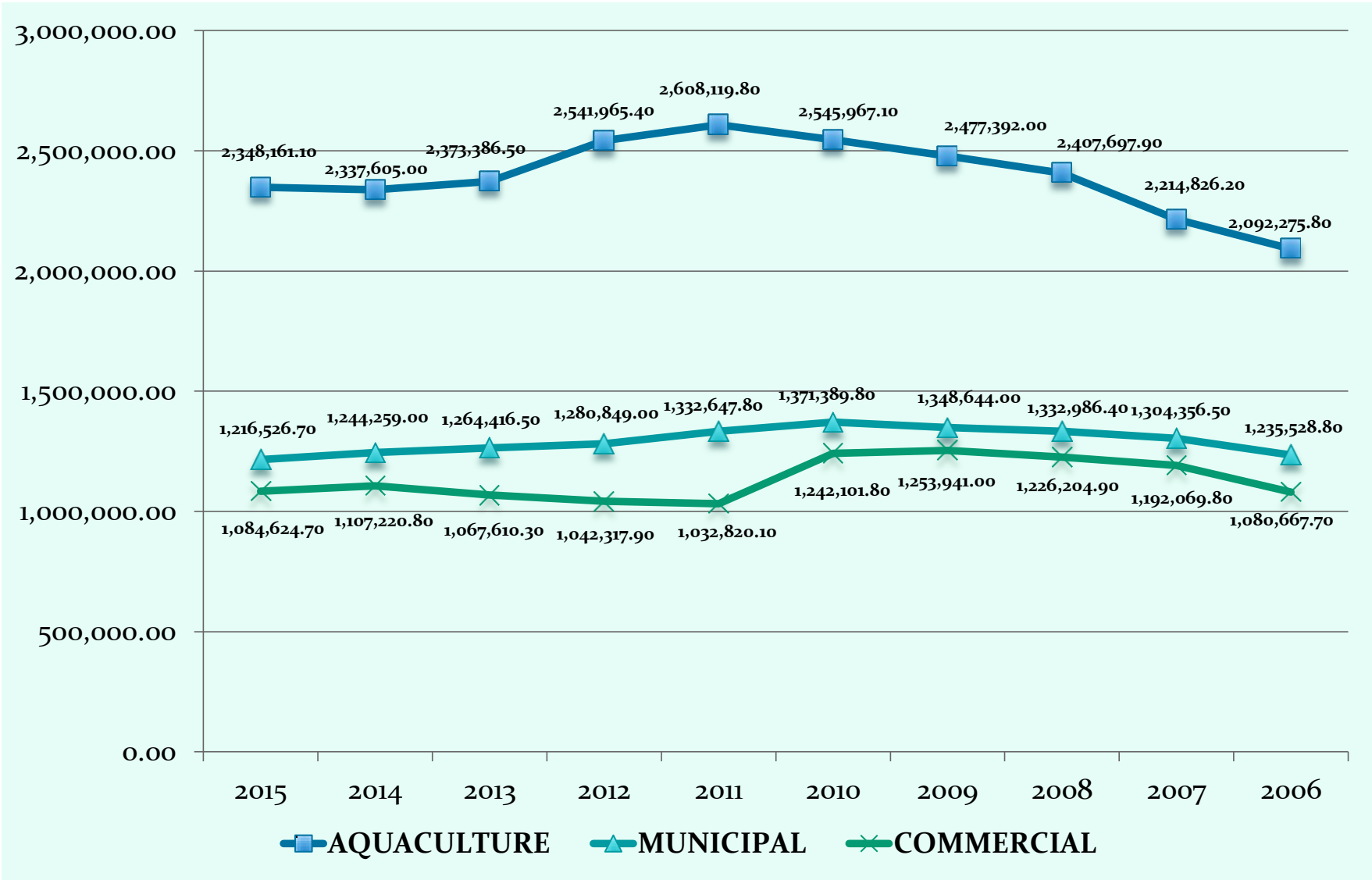
Municipal Fishing = refers to fishing within municipal waters using fishing vessels of three (3) gross tons or less, or fishing not requiring the use of fishing vessels.

PHILIPPINES CAPTURE FISHERIES: AN OVERVIEW

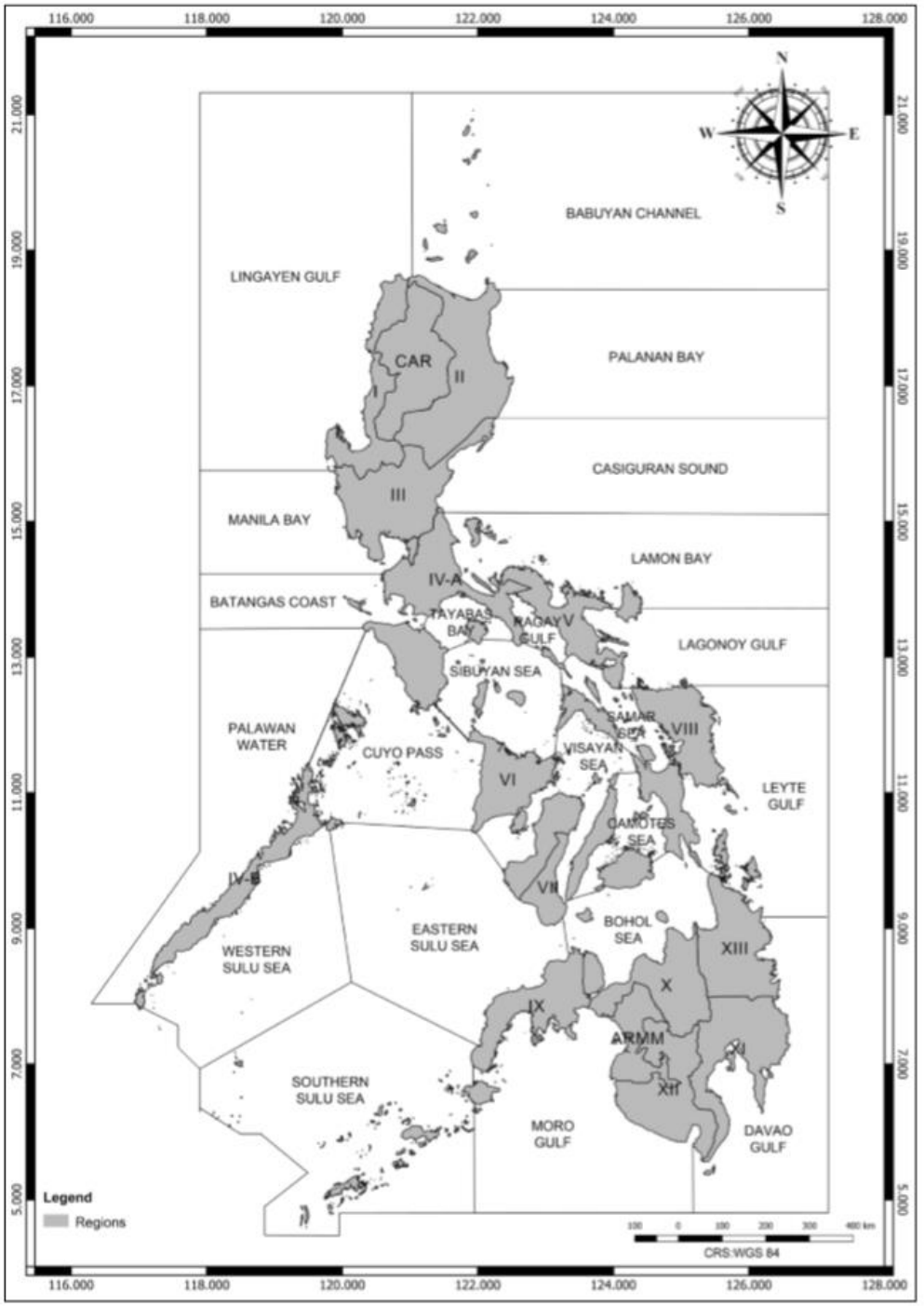
Commercial Fishing = the taking of fishery species by passive or active gear for trade, business or profit beyond subsistence or sports fishing:

- **Small Scale Commercial Fishing** = fishing with passive or active gear utilizing fishing vessels of 3.1 gross tons (GT) up to 20 GT;
- **Medium Scale Commercial Fishing** = fishing utilizing active gears and vessels of 20.1 GT up 150 GT; and
- **Large Scale Commercial Fishing** = fishing utilizing active gears and vessels of more than 150 GT.

FISHERIES PRODUCTION (CY 2006-2015)

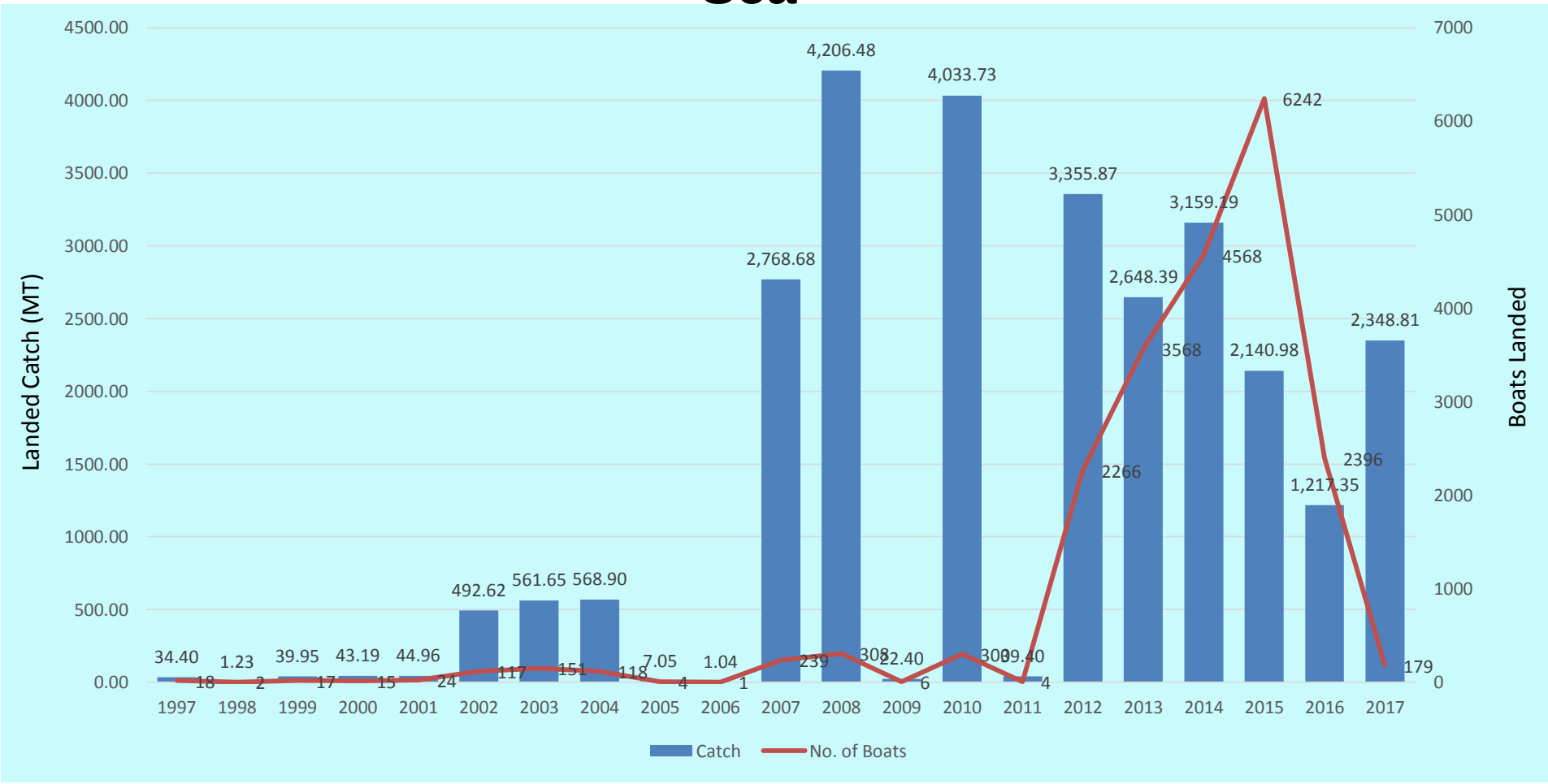


Philippines statistical fishing grounds



Major Purse Seine Fishing Grounds

TREND OF PURSE SEINE LANDINGS in the South China Sea



Source: NSAP

*2017 data only from Zambales Coast

a. Catch and Landed Purse Seine Boats in the South China Sea, Philippines

Philippine Flagged Purse Seiner Commercial Fishing Vessels		
Commercial Fishing Vessel and Gear License (CFVGL)	**Tuna Purse Seine**	**Sardines/ Mackerel/ Scad Purse Seine**
Small-Scale(3-20 GT)	**1**	**13**
Medium-Scale (20.1-150 GT)	**68**	**244**
Large-Scale (above 150)	**95**	**60**
Total	**164**	**317**

Source: Fishing Regulations and Licensing Division- BFAR

b. Total Number of Purse Seine Vessels by Type, Philippines

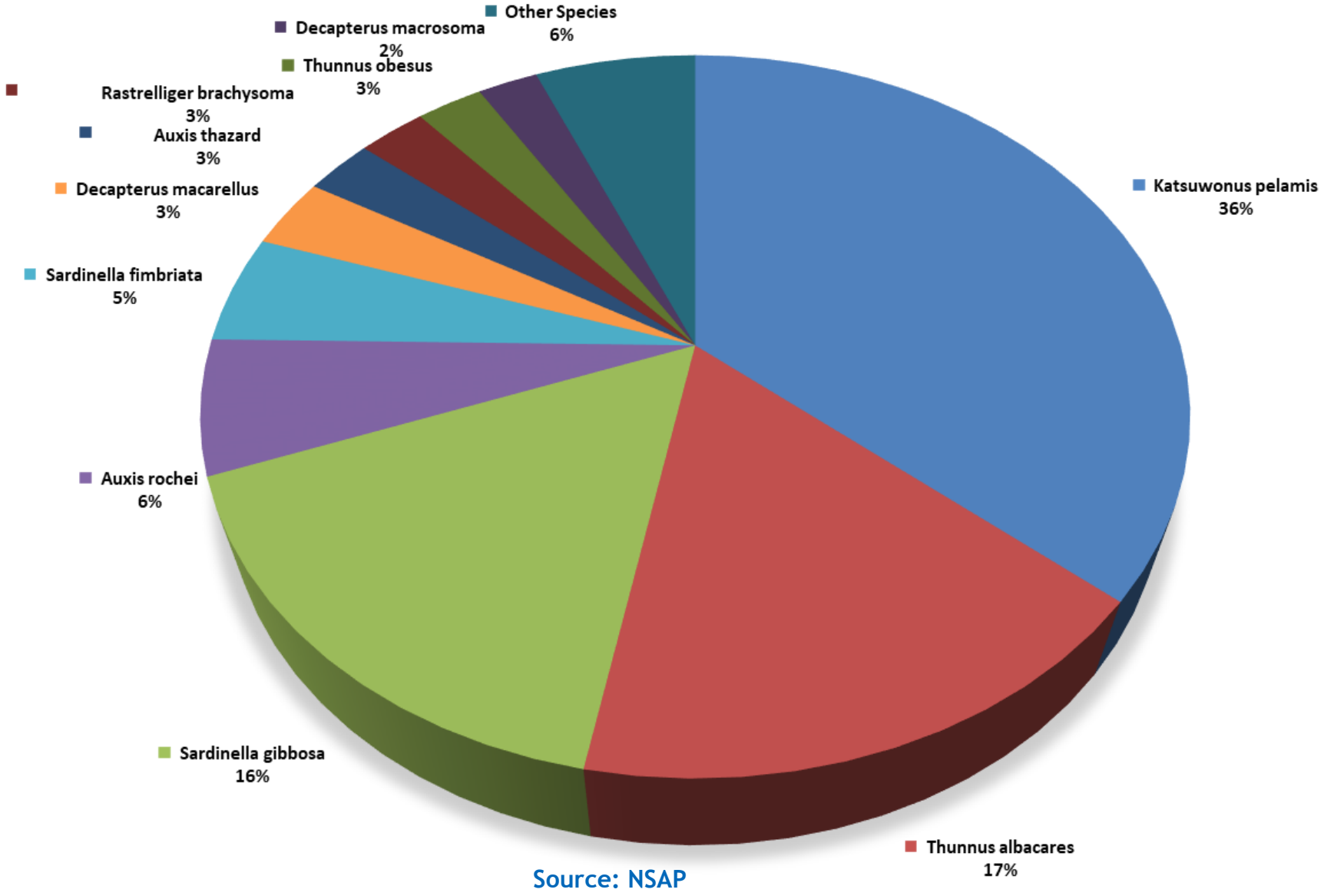
FISHING EFFORT OF PURSE SEINE

Source: NSAP

*2017 data only from Zambales Coast

CPUE of Purse Seine in the South China Sea, Philippines

III. Biological information



Source: NSAP

Information on Species Composition in the South China Sea, Philippines

Biological Information of Major Species in SCS Fishing Grounds

Fishing Ground and Species	2015 E Value	2016 E Value	L50 (CY 2015)	L50 (CY 2016)	Lm
BACUIT BAY					
Atule mate		0.73		17.36	18
Nemipterus hexodon	0.42	0.69		19.47	15.3
Rastrelliger brachysoma		0.65		18.4	
Rastrelliger kanagurta	0.74	0.65	19.81	20.84	
BALABAC STRAIT		0.6		23.21	18
Atule mate		0.6		23.21	18
BANGUI BAY	0.6	0.68	16.25	14.2	17
Selar crumenophthalmus	0.6	0.68	16.25	14.2	17

Length at First Maturity and Exploitation

Source: NSAP

Biological Information of Major Species in SCS Fishing Grounds

Fishing Ground and Species	2015 E Value	2016 E Value	L50 (CY 2015)	L50 (CY 2016)	Lm
CALATAGAN/BALAYAN BAY					
Decapterus macrosoma	0	0.76	0	14.91	0
Nemipterus hexodon	0.6		14.09	0	0
Sardinella lemuru	0.87	0.76	16.84	15.53	0
Selar boops	0.64		16.31	0	0
Selar crumenophthalmus	0.87		14.84	0	0
Upeneus vittatus	0.65		14.65	0	0

Length at First Maturity and Exploitation

Source: NSAP

Biological Information of Major Species in SCS Fishing Grounds

Fishing Ground and Species	2015 E Value	2016 E Value	L50 (CY 2015)	L50 (CY 2016)	Lm
ILOCOS COAST/NWPS					
Decapterus macrosoma	0.52		16.88		16.5
Nemipterus bathybius	0.68	0.6	18.03	27.22	22.5
Selar crumenophthalmus	0.75	0.76	21.14	19.41	20.1
IMURUAN BAY					
Atule mate		0.54		17.63	18
Decapterus russelli	0.78		12.89		
Rastrelliger kanagurta	0.63		19.7		
Selar crumenophthalmus	0.59	0.75		17.25	

Length at First Maturity and Exploitation

Source: NSAP

Biological Information of Major Species in SCS Fishing Grounds

Fishing Ground and Species	2015 E Value	2016 E Value	L50 (CY 2015)	L50 (CY 2016)	Lm
LINGAYEN GULF			13.65	14.616	19.3
Decapterus macrosoma	0.59		12.5	0	13.3
Decapterus maruadsi	0.76	0.59	13.71	13.66	13.7
Nemipterus bathybius	0.81	0.77	10.21	10.99	22.5
Rastrelliger brachysoma	0.77	0.68	20.12	22.32	16.7
Saurida tumbil	0.66	0.61	10.7	13.14	28.4
Selar crumenophthalmus	0.59	0.6	14.67	12.97	21.2

Length at First Maturity and Exploitation

Source: NSAP

Biological Information of Major Species in SCS Fishing Grounds

Fishing Ground and Species	2015 E Value	2016 E Value	L50 (CY 2015)	L50 (CY 2016)	Lm
MALANUT BAY					
Atule mate	0	0.63	0	21.58	18
Decapterus macrosoma	0.79		17.83	0	0
Decapterus russelli	0.65		12.54	0	0
Nemipterus hexodo	0	0.63	0	21.23	15.3
Rastrelliger kanagurta	0.54	0.74	0	23.06	0
Selar crumenophthalmus	0.59		18.51	0	0

Length at First Maturity and Exploitation

Source: NSAP

Biological Information of Major Species in SCS Fishing Grounds

Fishing Ground and Species	2015 E Value	2016 E Value	L50 (CY 2015)	L50 (CY 2016)	Lm
MINDORO STRIAT					
Selar crumenophthalmus	0	0.69	0	13.75	0

Length at First Maturity and Exploitation

Source: NSAP

Biological Information of Major Species in SCS Fishing Grounds

Fishing Ground and Species	2015 E Value	2016 E Value	L50 (CY 2015)	L50 (CY 2016)	Lm
PAGDANAN BAY					
Decapterus russelli	0.8		13.3	0	0
Rastrelliger kanagurta	0.84		21.85	0	0
PASALENG BAY					
Decapterus macrosoma	0.72		23.64	0	16.3
ULUGAN BAY					
Atule mate	0	0.63	0	18.8	18
Decapterus macrosoma	0.61	0	20.92	0	0
Decapterus russelli	0.67		17.76	0	0
Nemipterus furcosus	0	0.57	0	19.03	16.6
Rastrelliger kanagurta	0.59		21.76	0	0

Length at First Maturity and Exploitation

Source: NSAP

Biological Information of Major Species in SCS Fishing Grounds

Fishing Ground and Species	2015 E Value	2016 E Value	L50 (CY 2015)	L50 (CY 2016)	Lm
WEST PHILIPPINE SEA (RIZAL)					
Atule mate		0.6		26.57	18
Decapterus macrosoma	0.68		15.78		
Nemipterus hexodon		0.45		16.92	15.3
WEST PHILIPPINE, SEA PALAWAN					
Decapterus macrosoma		0.75		16.45	

Length at First Maturity and Exploitation

Source: NSAP

Comparison of Growth Parameter Estimates for *Sardinella gibbosa, S. fimbriata* and *Rastrelliger brachysoma* by Fishing Ground

Species	Year	Lmax (cm)	L∞	$K_{(yr^{-1})}$	Ø'	Fishing Ground	Reference
Sardinella gibbosa	1991	17.00	20.60	0.80	2.53	Guimaras Strait	*Fishbase.org*
	2014	16.84	18.50	0.88	2.47	Manila Bay	*This Study, 2014*
Sardinella fimbriata	1959	-	18.00	0.70	2.36	Manila Bay	*Ingles, J.et.al 1984*
	1965	-	22.00	1.15	2.75	Palawan	*Ingles, J.et.al 1984*
	1983-1986	23.75	23.70	0.99	2.75	Leyte Gulf	*Lavapie-Gonzales, et.al 1997*
	1984-1986	20.69	22.30	0.90	2.65	Guimaras Strait	*Lavapie-Gonzales, et.al 1997*
	1987	24.00	24.80	1.20	2.87	Tayabas Bay	*Lavapie-Gonzales, et.al 1997*
	1993	13.00	16.50	0.80	2.34	Manila Bay	*MADECOR, 1995*
	2014	18.04	18.50	0.95	2.51	Manila Bay	*This Study, 2014*
Rastrelliger brachysoma	1978-1979	34.50	34.00	1.10	3.10	Manila Bay	*Ingles, J.et.al 1984*
	1979-1980	-	25.00	1.60	3.00	Samar Sea	*Ingles, J.et.al 1984*
	1981	-	24.50	1.28	2.89	Ragay Gulf	*Corpuz, A., et.al 1985*
	1984-1986	29.50	28.50	1.40	3.06	Guimaras Strait	*Lavapie-Gonzales, et.al 1997*
	1993	34.50	24.50	0.85	2.71	Manila Bay	*MADECOR, 1995*
	2014	27.50	28.7	1.30	3.03	Manila Bay	*This Study, 2014*

Source: Fisheries Resources and Ecological Assessment of Manila Bay 2012-2015

Comparison of Mortality Parameter Estimates, L_{50} and E-values for *Sardinella gibbosa, S. fimbriata* and *Rastrelliger brachysoma* by Fishing Ground

Species	Year	Z (yr^{-1})	F (yr^{-1})	M (yr^{-1})	L_{50} (cm)	E	Fishing Ground	Reference
Sardinella gibbosa	2014	7.82	5.94	1.88	10.96	0.76	Manila Bay	*This Study, 2014*
Sardinella fimbriata	1959	3.38	1.75	1.63	-	0.52	Manila Bay	*Ingles, J.et.al 1984*
	1965	6.56	4.44	2.12	-	0.68	Palawan	*Ingles, J.et.al 1984*
	1983-1986	3.29	1.40	1.89	-	0.43	Leyte Gulf	*Lavapie-Gonzales, et.al 1997*
	1984-1986	2.49	0.71	1.78	-	0.29	Guimaras Strait	*Lavapie-Gonzales, et.al 1997*
	1987	5.30	3.18	2.12	-	0.6	Tayabas Bay	*Lavapie-Gonzales, et.al 1997*
	1995	3.60	1.75	1.85	-	0.49	Manila Bay	*MADECOR, 1995*
	2014	5.86	3.88	1.98	11.52	0.66	Manila Bay	*This Study, 2014*
Rastrelliger brachysoma	1978-1979	4.27	2.43	1.84	-	0.57	Manila Bay	*Ingles, J.et.al 1984*
	1979-1980	9.49	6.93	2.56	-	0.73	Samar Sea	*Ingles, J.et.al 1984*
	1981	6.09	3.93	2.16	-	0.65	Ragay Gulf	*Corpuz, A., et.al 1985*
	1984-1986	4.33	2.08	2.25	-	0.48	Guimaras Strait	*Lavapie-Gonzales, et.al 1997*
	1995	4.96	3.23	1.73	-	0.65	Manila Bay	*MADECOR, 1995*
	2014	7.47	5.32	2.15	17.39	0.71	Manila Bay	*This Study, 2014*

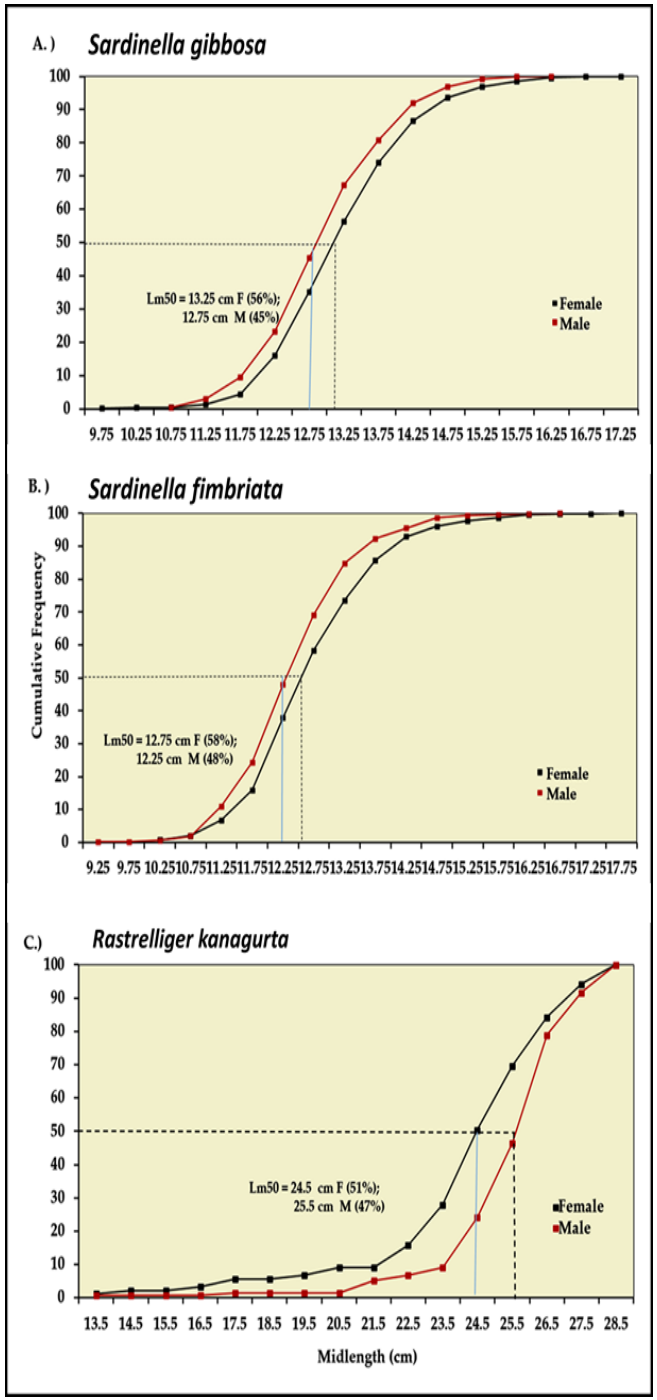
Source: Fisheries Resources and Ecological Assessment of Manila Bay 2012-2015

Biological Information

Length at First Maturity (Lm50) of Female and Male Dominant Species in Manila Bay (2014-2015).

Species	Lm(50)	
	Female	Male
Sardinella gibbosa	13.25 cm	12.75 cm
Sardinella fimbriata	12.75 cm	12.25 cm
Rastrelliger kanagurta	24.5 cm	25.5 cm

Source: Fisheries Resources and Ecological Assessment of Manila Bay 2012-2015



Spawning Season

Species	Major Spawning	Minor Spawning	Fishing Ground
Sardinella gibbosa	March - April	October - December	Manila Bay
Sardinella fimbriata	February - May	October - December	Manila Bay
Rastrelliger kanagurta	October - December	May - June	Manila Bay

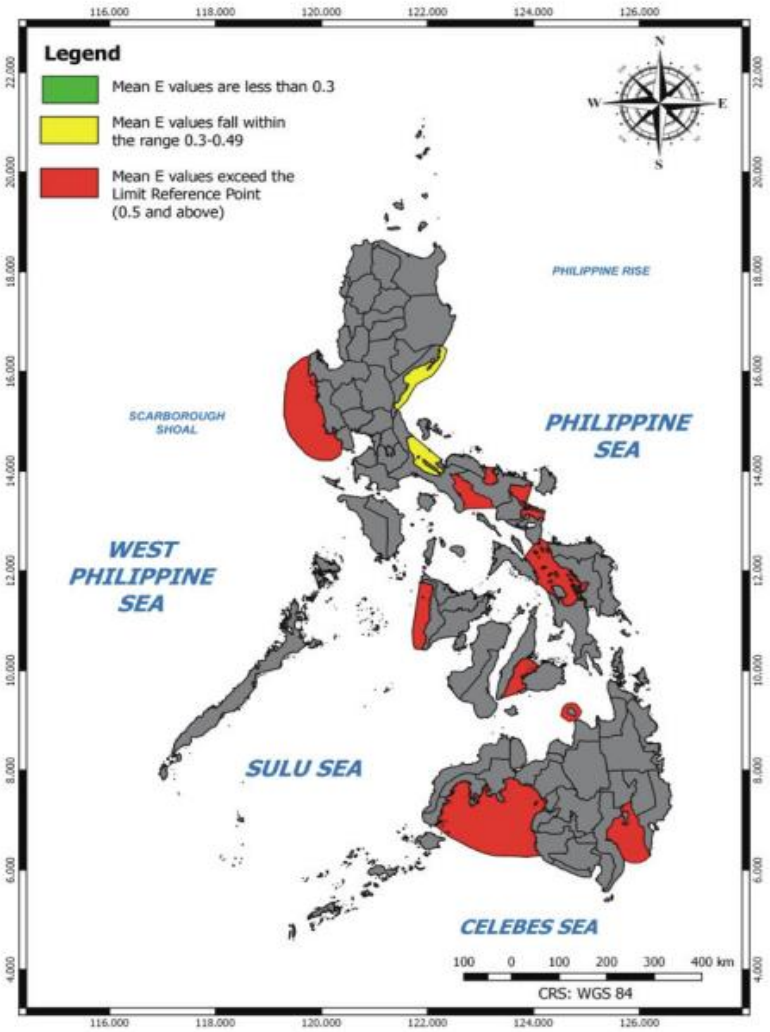
Source: Fisheries Resources and Ecological Assessment of Manila Bay 2012-2015

Biological Information

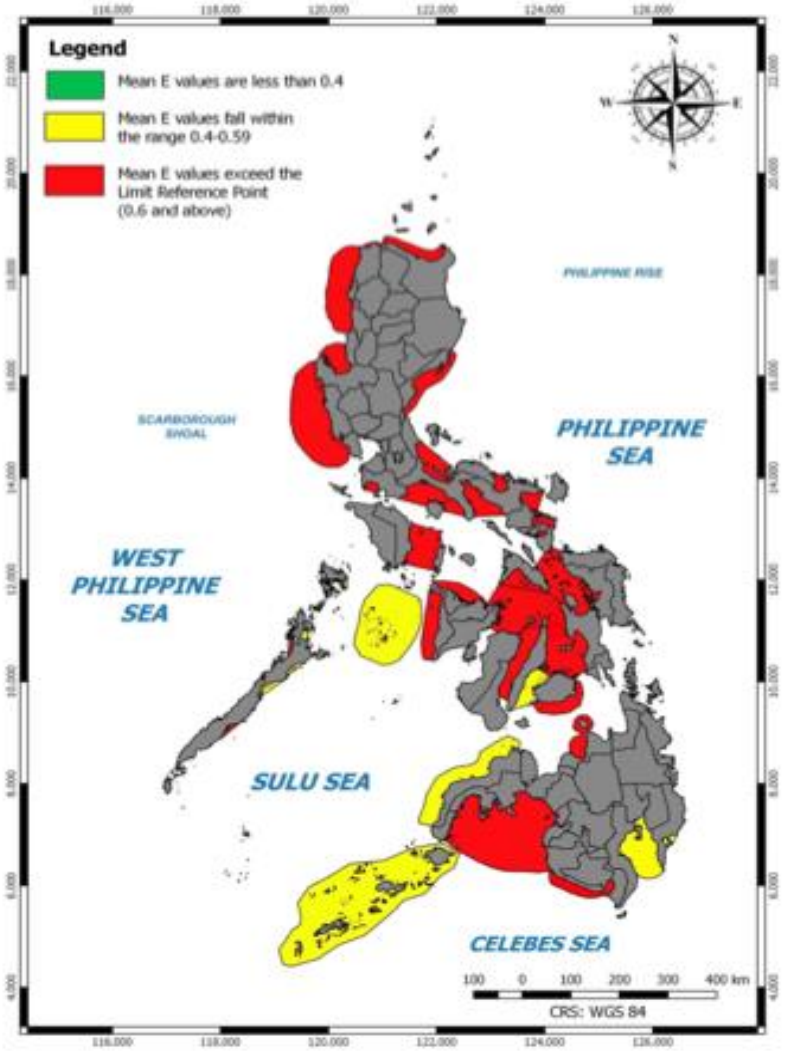
Spawning Season, Samar Sea

Species	J	F	M	A	M	J	J	A	S	O	N	D
Agumaa *(Rastralliger faughni)*				1, 2	1							
Galunggong *(Decapterus spp.)*												1, 2
Hairtail				2	2							
Hasa-hasa *(Rastrelliger brachysoma)*					2							
Alumahan, Burao *(Rastrelliger kanagurta)*				2	2	2						
Matambaka *(Selar crumenopthalus)*							2					

IV. Pelagic Stock Status (NSAP 2015)

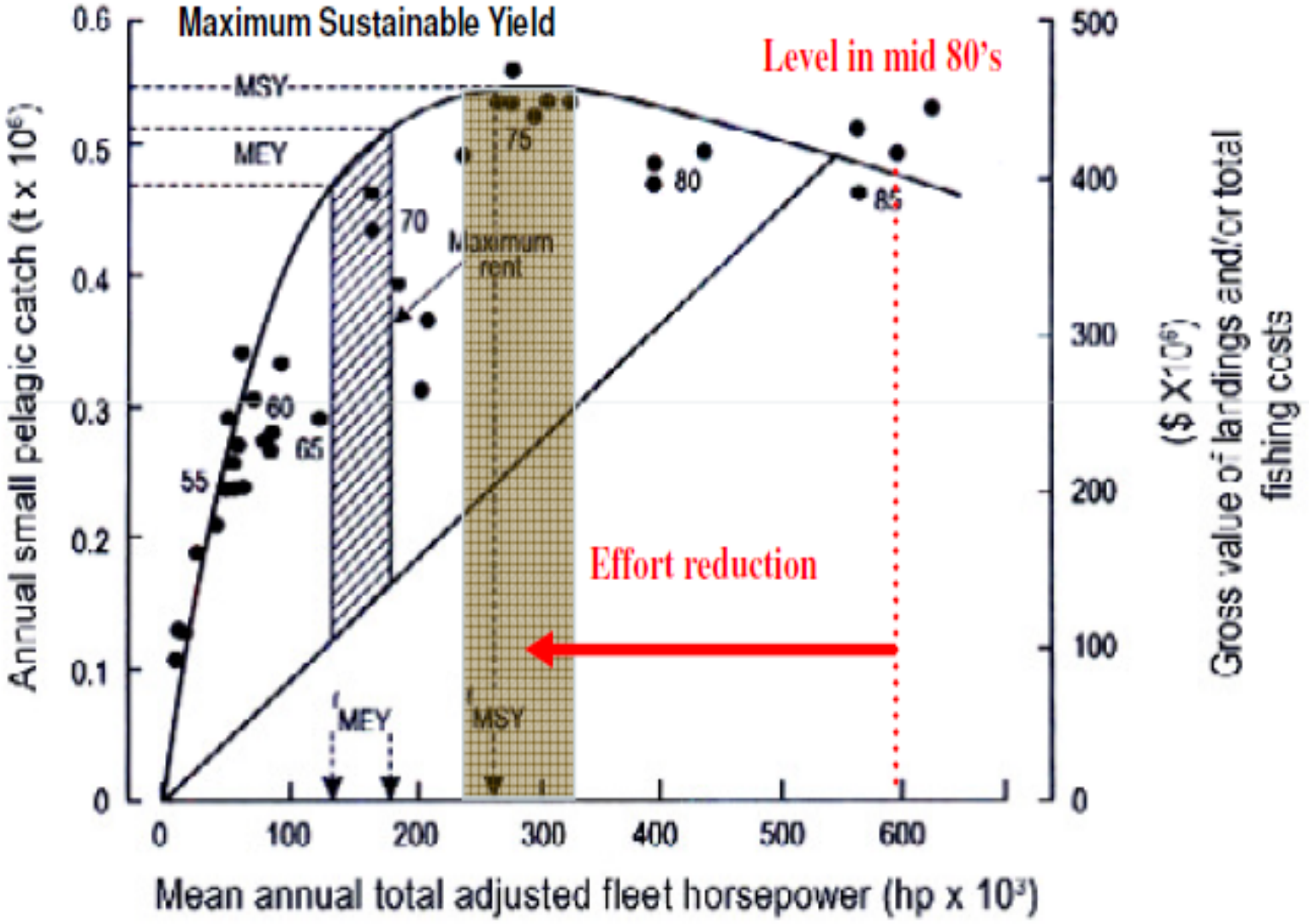


Status of Philippines **neritic tunas** by fishing ground based on Exploitation (E) values using NSAP length-frequency data, 2015.



Status of Philippines **small pelagic fishes** by fishing ground based on Exploitation (E) values using NSAP length-frequency data, 2015.

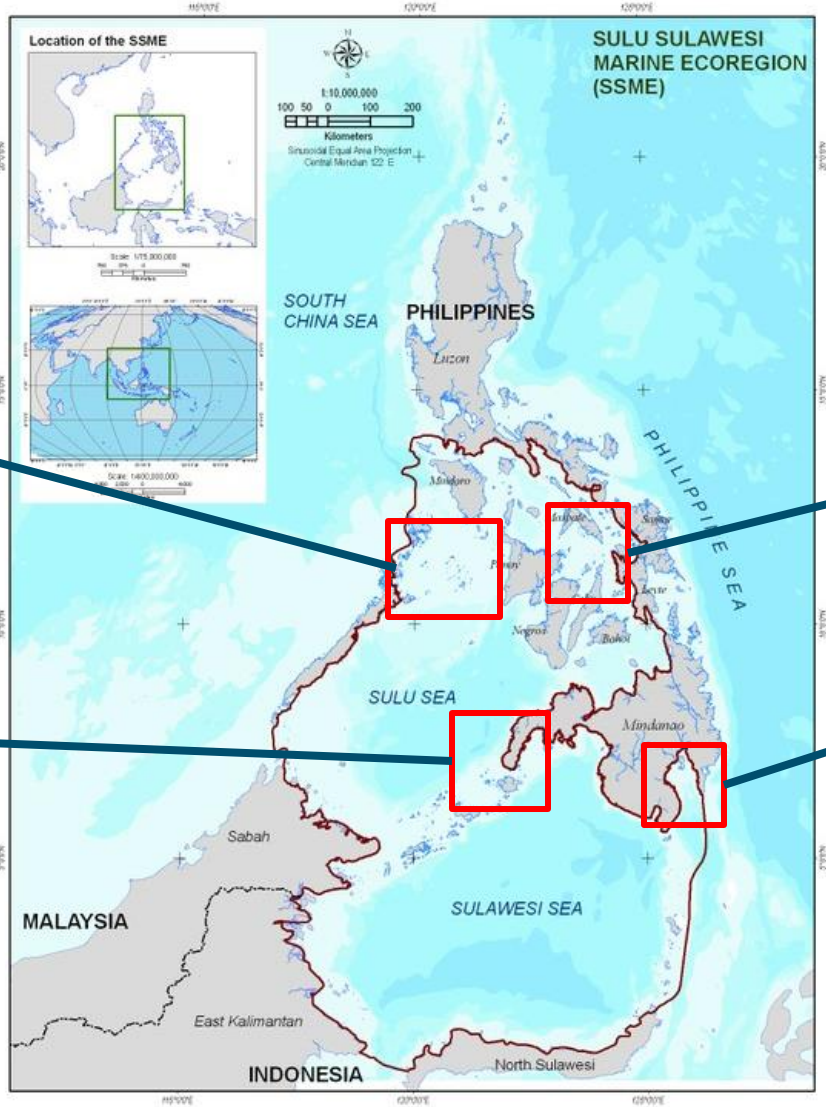
IV. MSY for Pelagic Species (Dalzell et al. 1996)



V. Existing Management Strategies for Purse Seine Close Season and Closed Area

4. Northern Palawan (2015)
(Nov 31 to Jan 31)

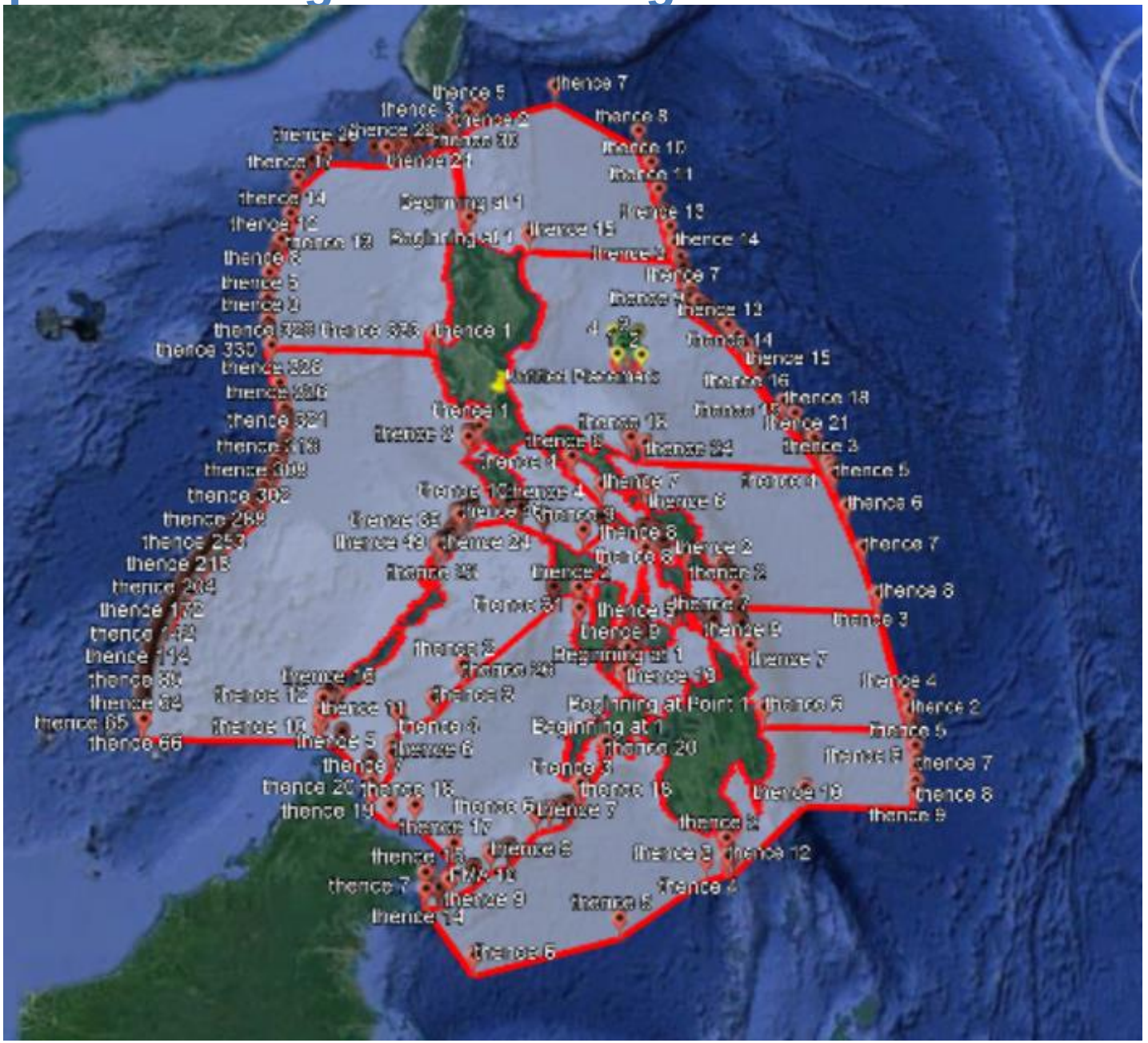
2. Zamboanga Peninsula (2011)
(Dec 1 to Mar 1)



1. Visayan Sea (1989)
(Nov 15 to Feb 15)

3. Davao Gulf (2014)
(Jun 1 to Aug 31)

V. Proposed Management Strategies in Relation to EAFM



VI. Proposed Reference Points

INDICATOR	BENCHMARK		Monitoring methods or source of data	Monitoring Frequency and who is in charge	Evaluation (notes on progress)
	Baseline	Target			
Computed length at first maturity	total length:				
			NSAP repro-bio study	Every 3 years- Project Leader	On the 4th year
Zamboanga	*S. lemuru*- 15 cm(2013-2014)	TRP = 16cm	Sampling framework		
		LRP = 13 cm			
		Trigger= 14 cm			
San Bernardino-Ticao Pass	*S. lemuru*- 15 cm	TRP = 17			
		LRP = 14			
		Trigger= 16			
Visayan Sea	*S. gibbosa*- 10 cm	TRP = 12cm			
		LRP = 10cm			
		Trigger= 11 cm			

VI. Proposed Reference Points

INDICATOR	BENCHMARK		Monitoring methods or source of data	Monitoring Frequency and who is in charge	Evaluation (notes on progress)
	Baseline	Target			
Bohol Sea	*S. lemuru*- 15 cm (2013-2014)	TRP = 16cm			
		LRP = 13 cm			
		Trigger= 14 cm			
Manila Bay	*S. lemuru*- 15 cm	TRP = 16cm			
		LRP = 13 cm			
		Trigger= 14 cm			
	S. gibbosa-13.25 cm (needs validation)	TRP = 14 cm			
		LRP = 10 cm			
		Trigger= 11 cm			

VI. Proposed Reference Points

INDICATOR	BENCHMARK		Monitoring methods or source of data	Monitoring Frequency and who is in charge	Evaluation (notes on progress)
	Baseline	Target			
e-values generated per FA[1]			NSAP sampling framework	annual	annual
Zamboanga	*S. lemuru*-0.60	TRP = 0.5			
		LRP = 0.6			
Visayan	*S. gibbosa*-0.79				
	S. lemuru-0.67				
SBS-TP	*S. lemuru*-to be established				
Bohol Sea	*S. lemuru*-0.68				
Manila Bay	*S. gibbosa*-0.74				

VI. Proposed Reference Points

INDICATOR	BENCHMARK		Monitoring methods or source of data	Monitoring Frequency and who is in charge	Evaluation (notes on progress)
	Baseline	Target			
Bohol Sea	*S. lemuru*- 15 cm (2013-2014)	TRP = 16cm			
		LRP = 13 cm			
		Trigger= 14 cm			
Manila Bay	*S. lemuru*- 15 cm	TRP = 16cm			
		LRP = 13 cm			
		Trigger= 14 cm			
	S. gibbosa-13.25 cm (needs validation)	TRP = 14 cm			
		LRP = 10 cm			
		Trigger= 11 cm			

VI. Proposed Reference Points

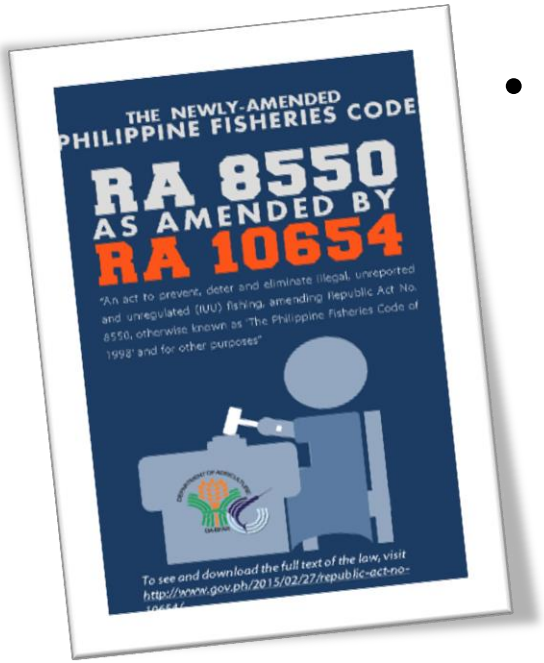
INDICATOR	BENCHMARK		Monitoring methods or source of data	Monitoring Frequency and who is in charge	Evaluation (notes on progress)
	Baseline	Target			
e-values generated per FA[1]			NSAP sampling framework	annual	annual
Zamboanga	*S. lemuru*-0.60	TRP = 0.5			
		LRP = 0.6			
Visayan	*S. gibbosa*-0.79				
	S. lemuru-0.67				
SBS-TP	*S. lemuru*-to be established				
	S. lemuru-0.68				
Bohol Sea	*S. gibbosa*-0.74				
Manila Bay					

VI. Proposed Reference Points

Spawning potential ratio [2]	13%-18% (*S. gibosa*)	20% (Prince, et al; for tropical countries)	NSAP repro-bio	Every 3 years	On the 4th year
Zamboanga	*S. lemuru*-	TRP = 30%			
		LRP = 20%			
Visayan	*S. gibbosa* 15%				
SBS-TP	*S. lemuru*-to be supplied				
Bohol Sea	*S. lemuru*-to be supplied				
Manila Bay	*S. gibbosa*- to be supplied				

*TRP: Target Reference Point
*LRP: Limit Reference Point

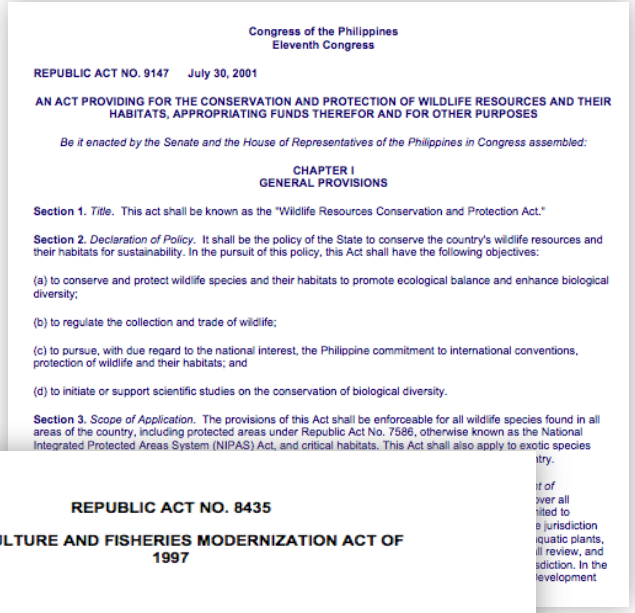
National Fisheries Management Legislation



- **Republic Act (RA) 8550 "The Philippines Fisheries Code of 1998) as amended by RA 10654 "***An Act to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing"*

LEGISLATIONS RELATED TO FISHERIES MANAGEMENT

- The Wildlife Conservation and Protection Act of 2001 (RA 9147)
- Agriculture and Fisheries Modernization Act (AFMA) (RA8435)
- Local Government Code (LGC) (RA 7160)
- ARMM Organic Act (RA6734).



Congress of the Philippines
Eleventh Congress

REPUBLIC ACT NO. 9147 July 30, 2001

AN ACT PROVIDING FOR THE CONSERVATION AND PROTECTION OF WILDLIFE RESOURCES AND THEIR HABITATS, APPROPRIATING FUNDS THEREFOR AND FOR OTHER PURPOSES

Be it enacted by the Senate and the House of Representatives of the Philippines in Congress assembled:

CHAPTER I
GENERAL PROVISIONS

Section 1. *Title.* This act shall be known as the "Wildlife Resources Conservation and Protection Act."

Section 2. *Declaration of Policy.* It shall be the policy of the State to conserve the country's wildlife resources and their habitats for sustainability. In the pursuit of this policy, this Act shall have the following objectives:

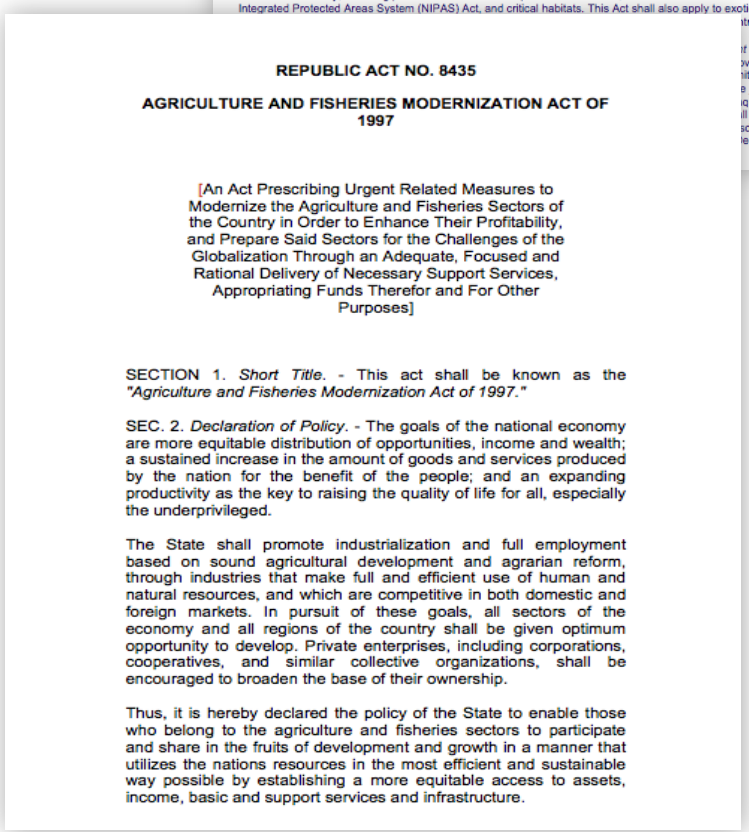
(a) to conserve and protect wildlife species and their habitats to promote ecological balance and enhance biological diversity;

(b) to regulate the collection and trade of wildlife;

(c) to pursue, with due regard to the national interest, the Philippine commitment to international conventions, protection of wildlife and their habitats; and

(d) to initiate or support scientific studies on the conservation of biological diversity.

Section 3. *Scope of Application.* The provisions of this Act shall be enforceable for all wildlife species found in all areas of the country, including protected areas under Republic Act No. 7586, otherwise known as the National Integrated Protected Areas System (NIPAS) Act, and critical habitats. This Act shall also apply to exotic species



REPUBLIC ACT NO. 8435

AGRICULTURE AND FISHERIES MODERNIZATION ACT OF 1997

[An Act Prescribing Urgent Related Measures to Modernize the Agriculture and Fisheries Sectors of the Country in Order to Enhance Their Profitability, and Prepare Said Sectors for the Challenges of the Globalization Through an Adequate, Focused and Rational Delivery of Necessary Support Services, Appropriating Funds Therefor and For Other Purposes]

SECTION 1. *Short Title.* - This act shall be known as the *"Agriculture and Fisheries Modernization Act of 1997."*

SEC. 2. *Declaration of Policy.* - The goals of the national economy are more equitable distribution of opportunities, income and wealth; a sustained increase in the amount of goods and services produced by the nation for the benefit of the people; and an expanding productivity as the key to raising the quality of life for all, especially the underprivileged.

The State shall promote industrialization and full employment based on sound agricultural development and agrarian reform, through industries that make full and efficient use of human and natural resources, and which are competitive in both domestic and foreign markets. In pursuit of these goals, all sectors of the economy and all regions of the country shall be given optimum opportunity to develop. Private enterprises, including corporations, cooperatives, and similar collective organizations, shall be encouraged to broaden the base of their ownership.

Thus, it is hereby declared the policy of the State to enable those who belong to the agriculture and fisheries sectors to participate and share in the fruits of development and growth in a manner that utilizes the nations resources in the most efficient and sustainable way possible by establishing a more equitable access to assets, income, basic and support services and infrastructure.

Management Measures in Relation to Purse Seine Fisheries

- National Tuna Management Plan
- National Plan of Action to Deter Illegal, Unreported and Unregulated Fishing (NPOA-IUUF)
- National Tuna Fish Aggregating Device (FAD) Management Policy
- Demarcation of Fishery Management Areas (FMA)
- Sardine Management Plans
- Round scad Management Plan
- Management of Long Distance Fishing
- Establishment of RPs for HCR
- Implementation of eCDTS
- BoatR and FishR

Maraming salamat po !