

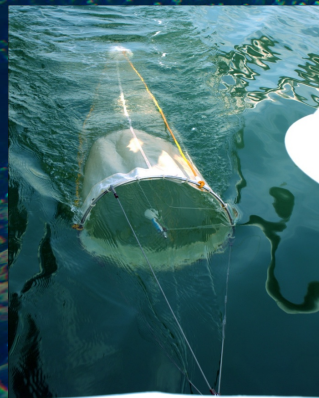
UNEP-GEF- SEAFDEC

Establishment and Operation of a Regional System of Fisheries Refugia in the South China Sea and Gulf of Thailand

(Phillipines)

Accomplishment Report 2019

Baseline Data on Fish Landing and Fish Eggs and Larvae Survey



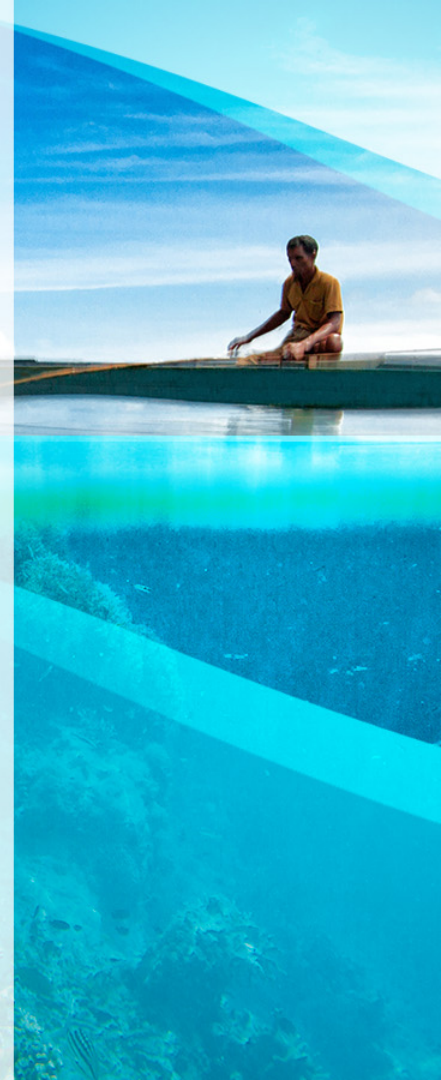
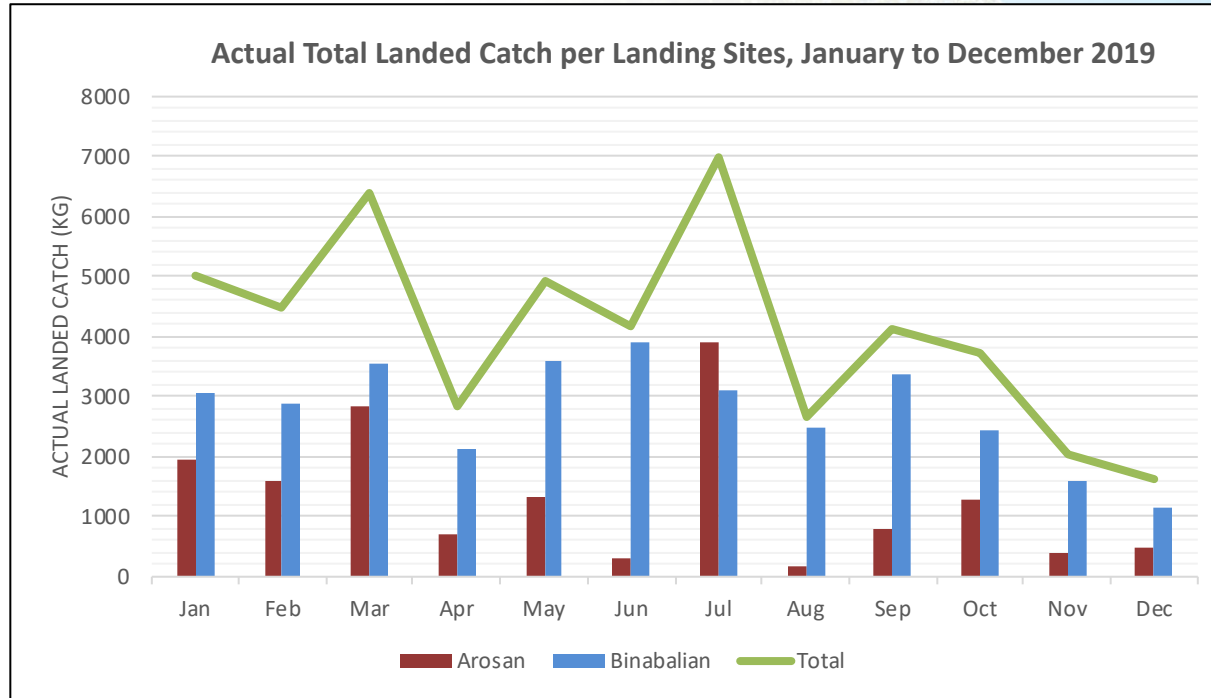
Val M. Borja

National Scientific and Technical Committee Focal Point
National Fisheries Research and Development Institute
Corporate 101 Building 101 Mother Ignacia, Quezon City Philippines

valborja1029@gmail.com

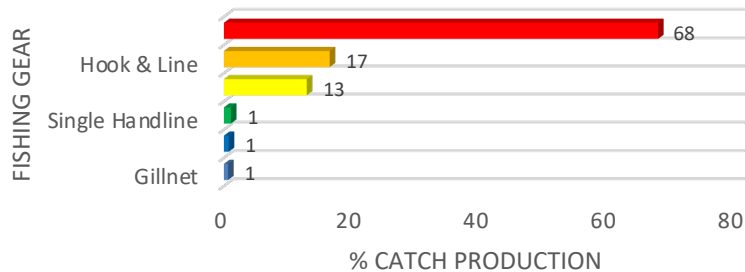


Fisheries Refugia Site 1: Bolinao, Pangasinan

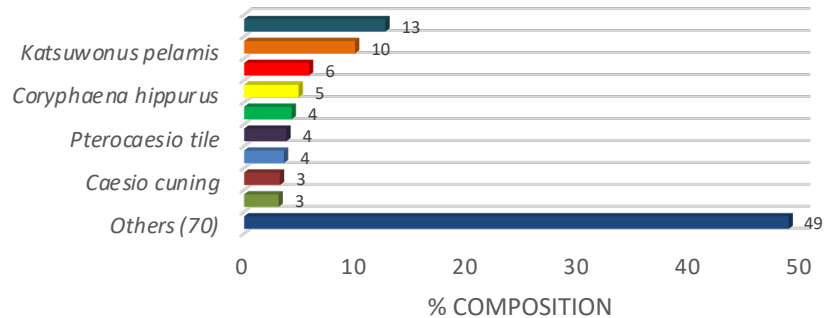


Catch Per Gear

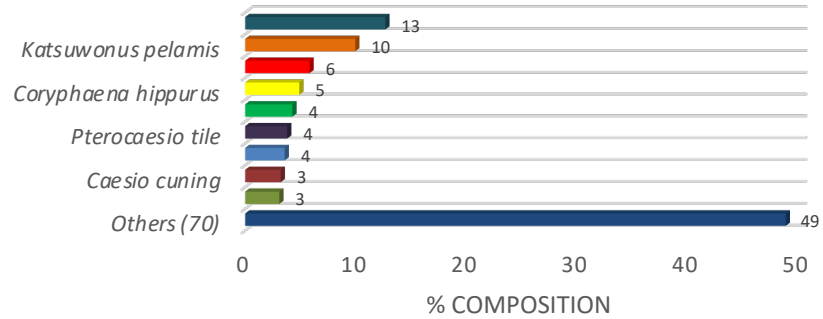
Relative Abundance of Catch by Fishing Gear in Bolinao, Pangasinan from January to December 2019



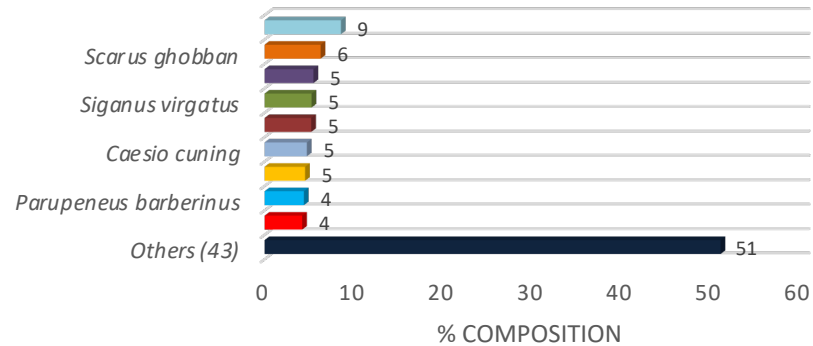
Relative Abundance of Major Species in Bolinao, Pangasinan



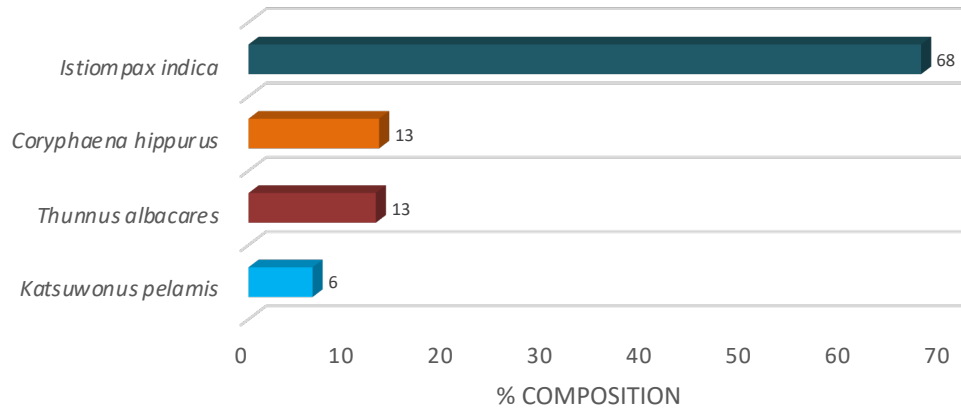
Relative Abundance of Major Species in Bolinao, Pangasinan



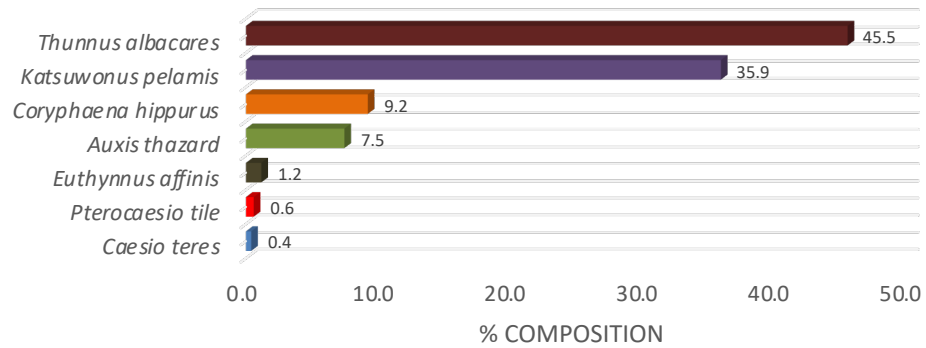
SPEAR GUN



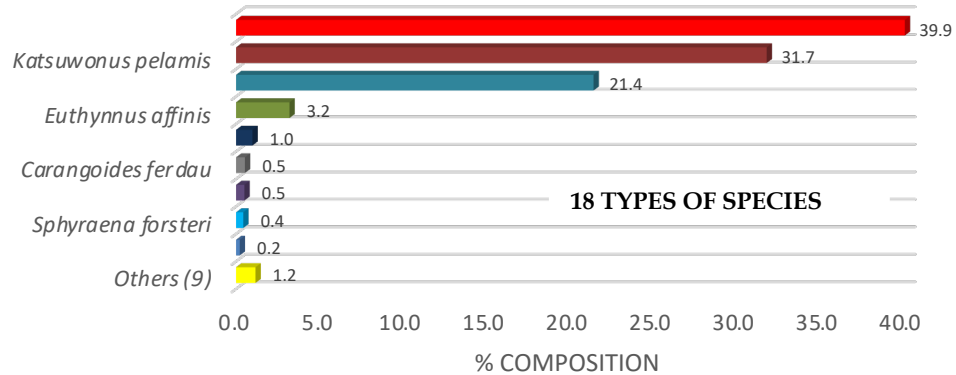
SINGLE HANDLINE



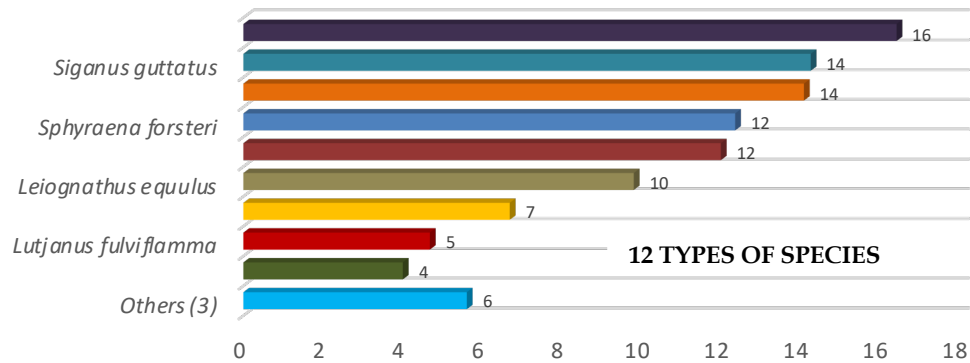
MULTIPLE HOOK AND LINE



HOOK AND LINE

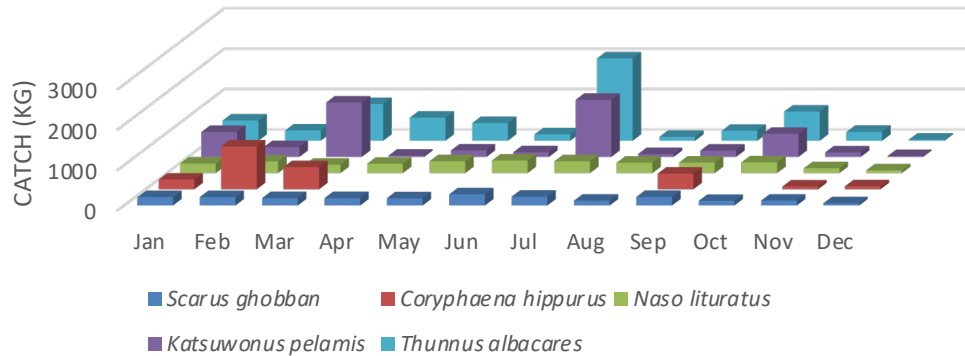


FISH CORRAL



Seasonality

CATCH DISTRIBUTION

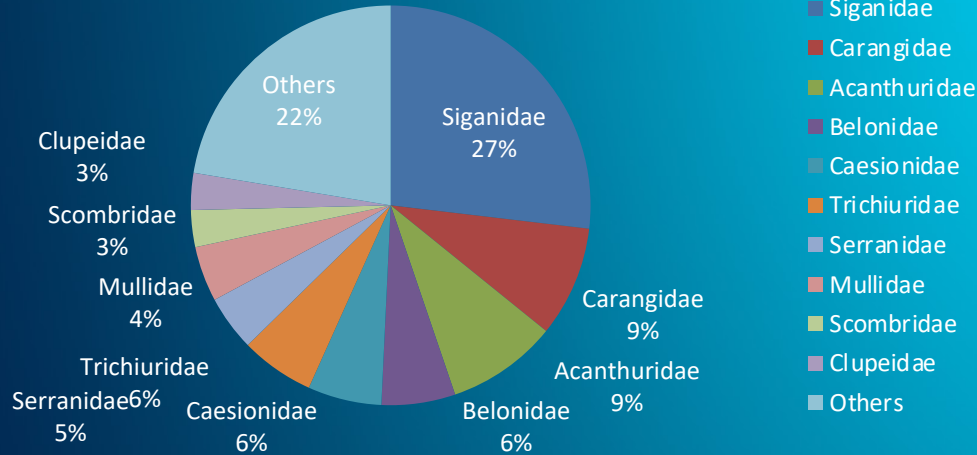


Bolinao Fish Eggs and Larvae Survey Results 2019



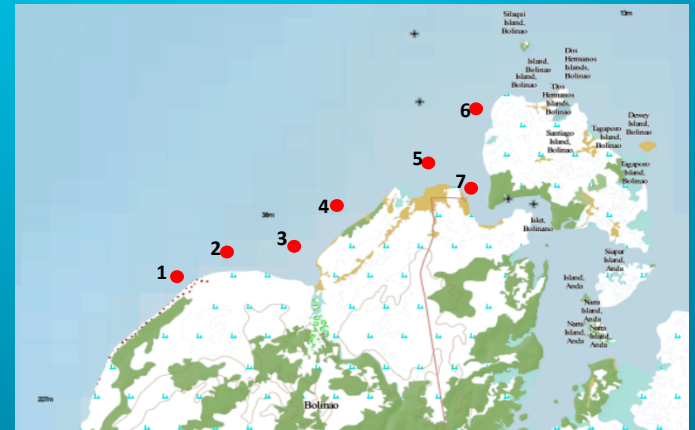
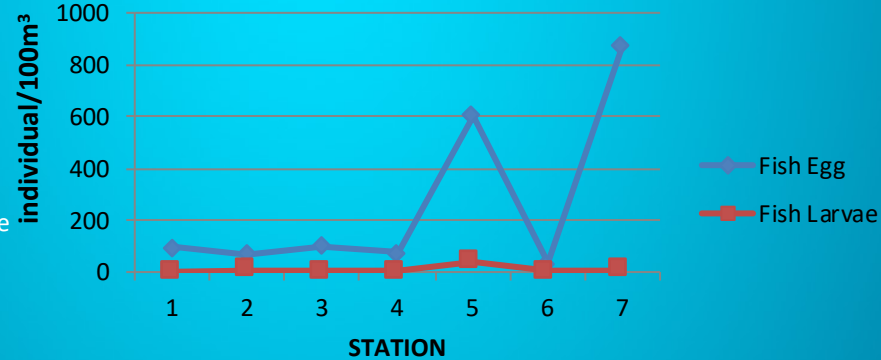
Fish Eggs and Larvae Distribution in Bolinao Bay (1st Quarter)

Fish Family Composition in Bolinao Bay (1st Quarter)



Fish Larvae = 67 Fish Eggs = 1,854

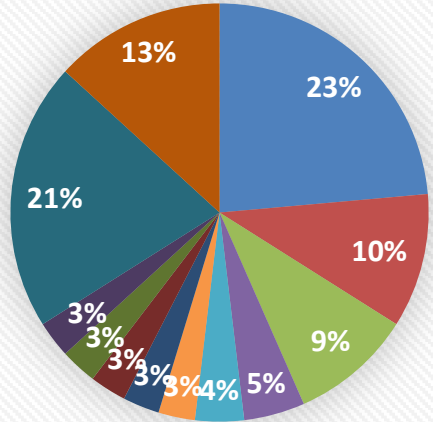
- Siganidae
- Carangidae
- Acanthuridae
- Belonidae
- Caesionidae
- Trichiuridae
- Serranidae
- Mullidae
- Scombridae
- Clupeidae
- Others



Bolinao Fish Eggs and Larvae Survey Results 2019



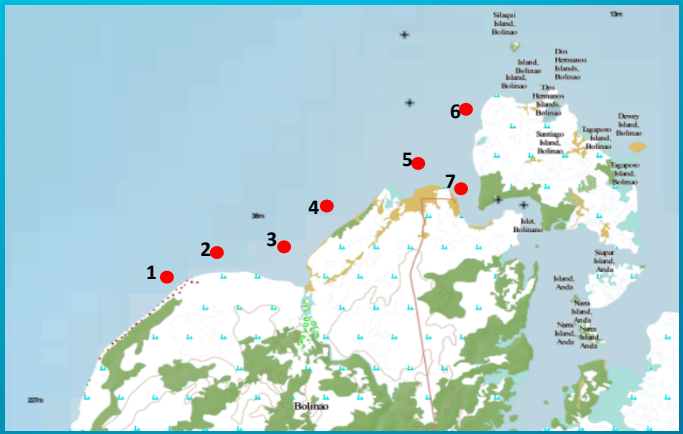
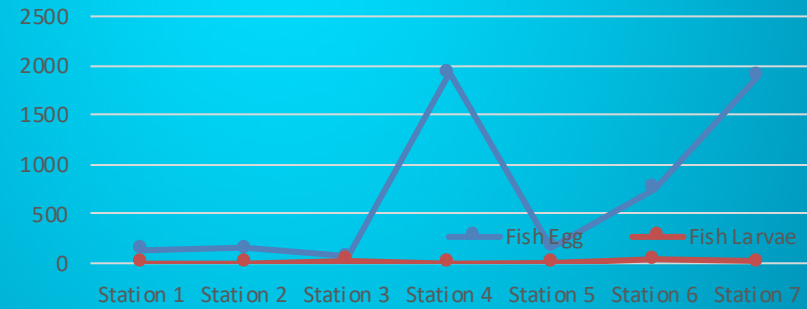
Fish Family Composition in Bolinao Bay (2nd Quarter)



- Siganiidae
- Syngnathidae
- Lethrinidae
- Labridae
- Carangidae
- Caesionidae
- Scaridae
- Others
- Acanthuridae
- Nemipteridae
- Leionathidae
- Unidentified

Fish Larvae = 84 Fish Eggs = 1,894

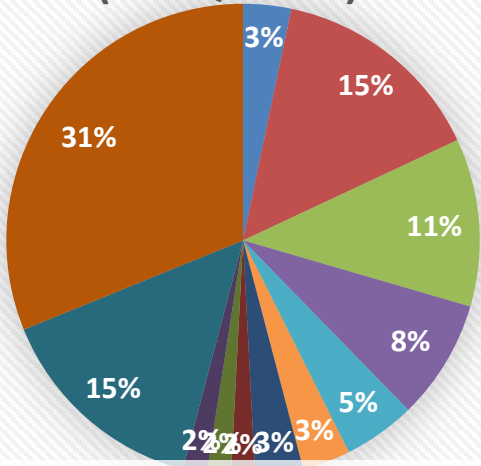
Ichthyoplankton Distribution in Bolinao Bay (2nd Quarter)



Bolinao Fish Eggs and Larvae Survey Results 2019

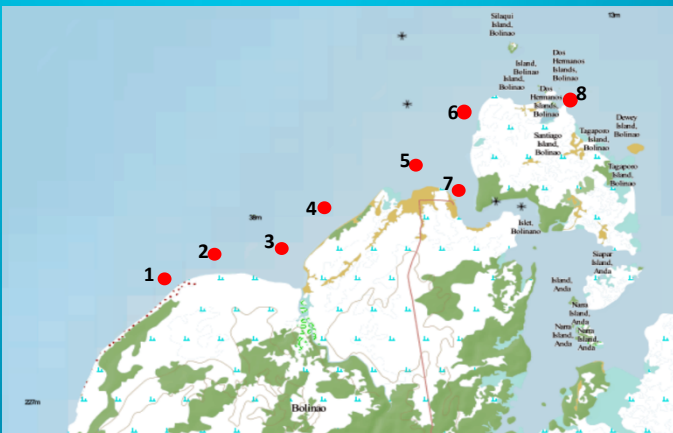
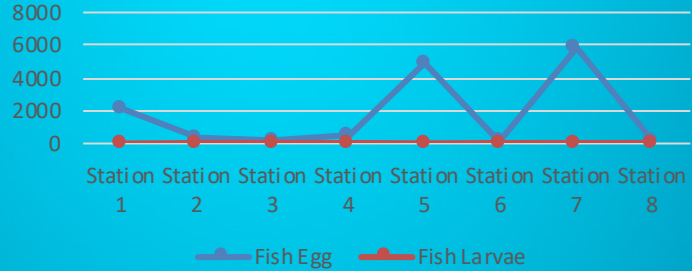


Fish Family Composition in Bolinao Bay (3rd Quarter)



- Exocoetidae
- Carangidae
- Siganiidae
- Acanthuridae
- Belonidae
- Serranidae
- Apogonidae
- Lutjanidae
- Hemiramphidae
- Engraulidae
- Other
- Unidentified

Ichthyoplankton Distribution in Bolinao Bay (3rd Quarter)

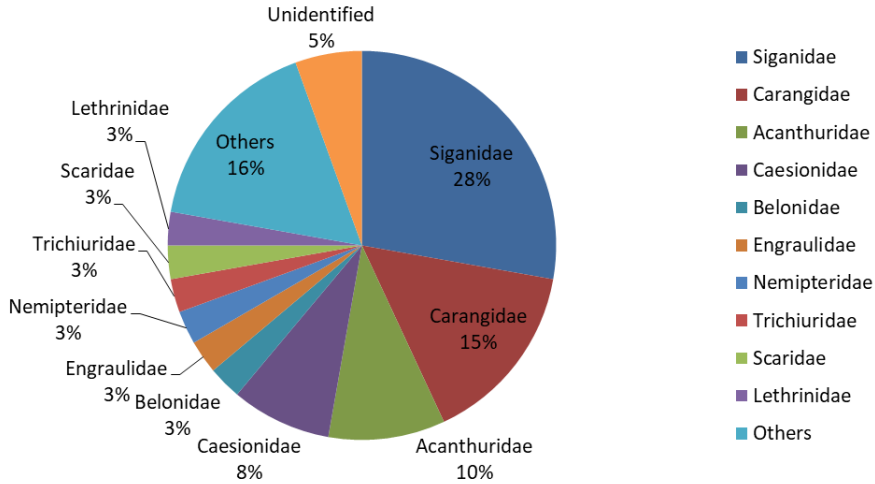


Fish Larvae= 62 Fish Eggs =5,848

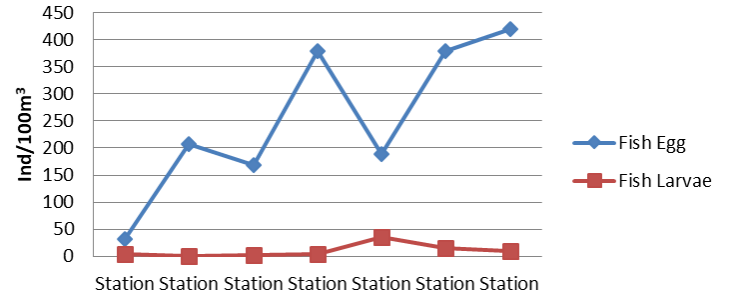
Bolinao Fish Eggs and Larvae Survey Results 2019



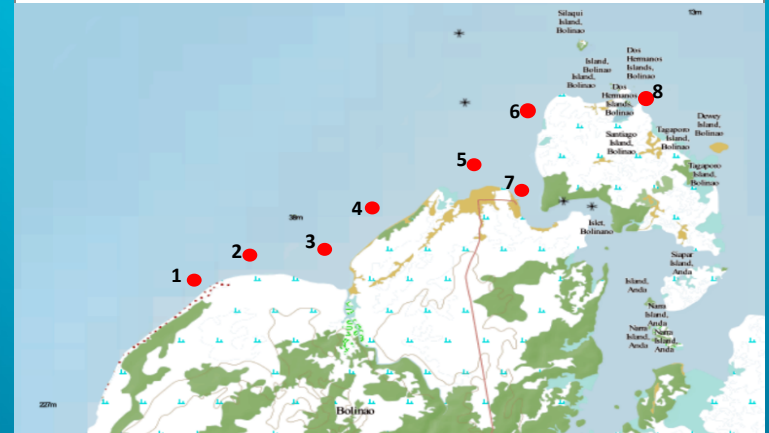
Fish Family Composition in Bolinao Bay (4th Quarter)



Ichthyoplankton Distribution in Bolinao Bay (4th Quarter)



Fish eggs 1776 Fish larve 74





Total Ban in Catching “padas” juvenile siganids in Bolinao Pangasinan



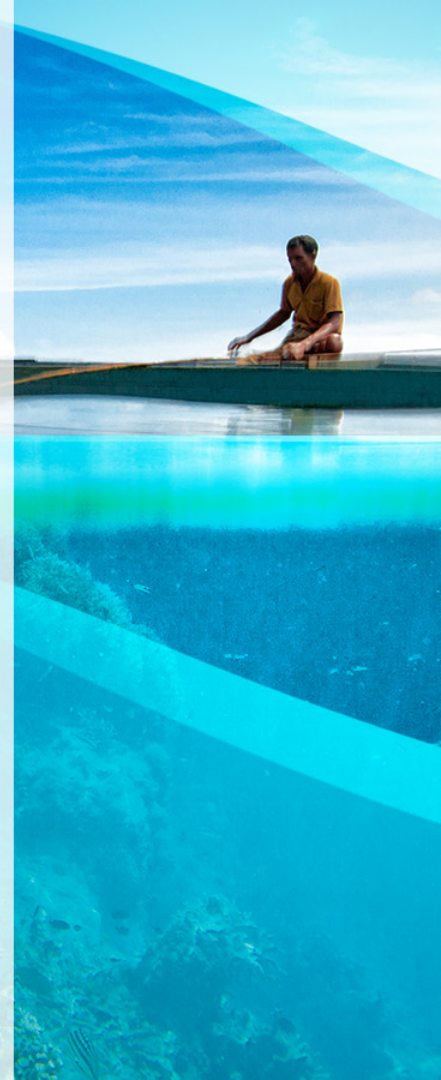
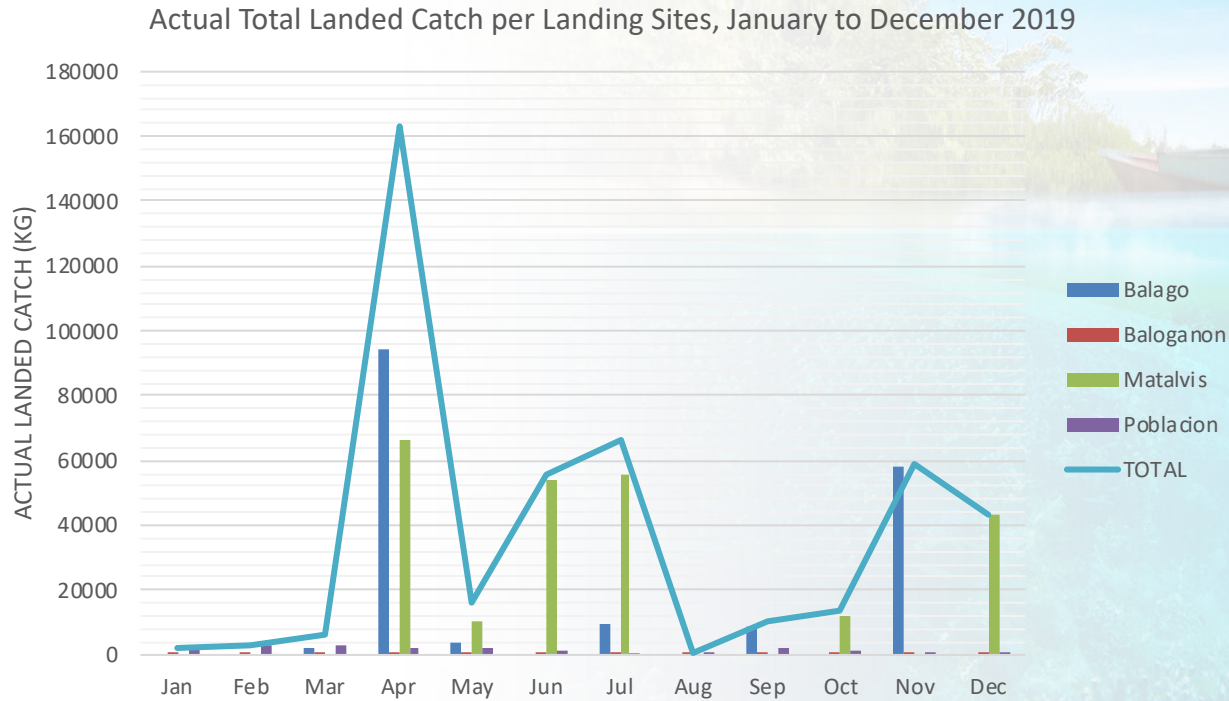
ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security Towards 202 “Fish for the People: Adaptation to a Changing Environment”

Closed Season for rabbit fish, *Siganus canaliculatus*

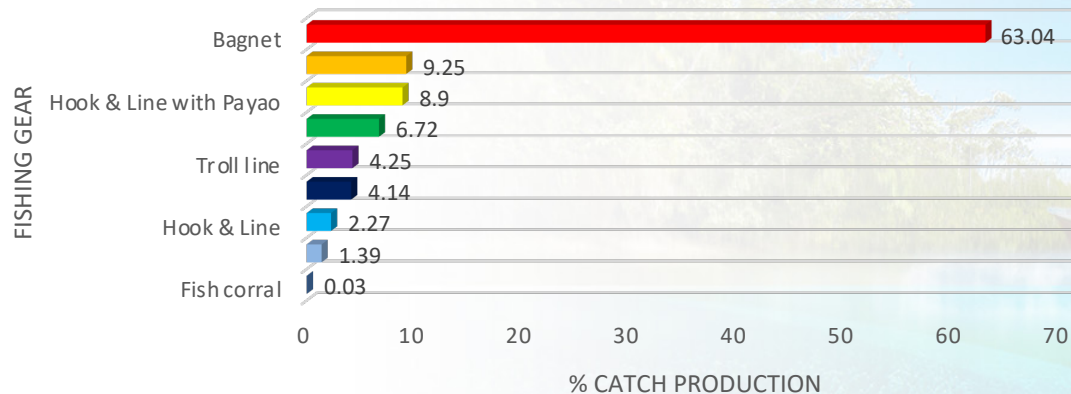
- Close season during spawning season
4th 5th and 6th day after the new moon
monthly for the entire year or for a few months only
- Banning of fine meshed gears catching rabbit fishes

Bohol, Philippines

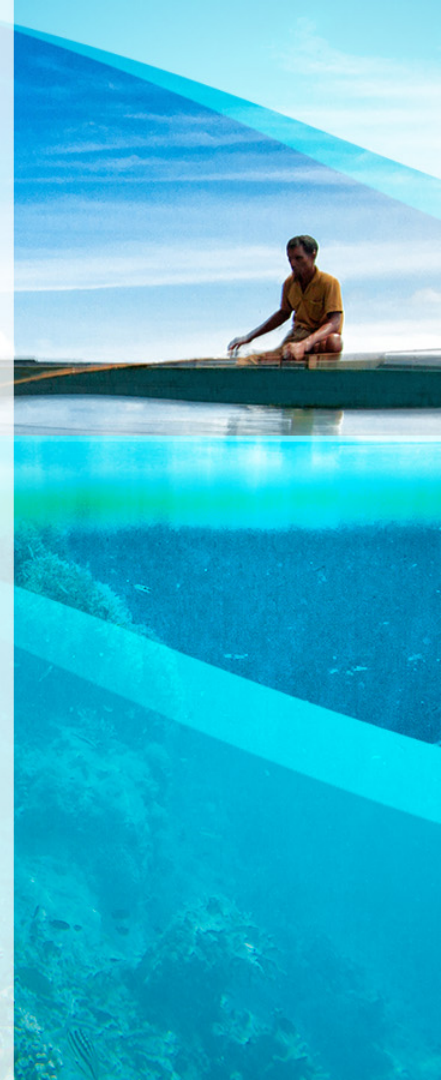
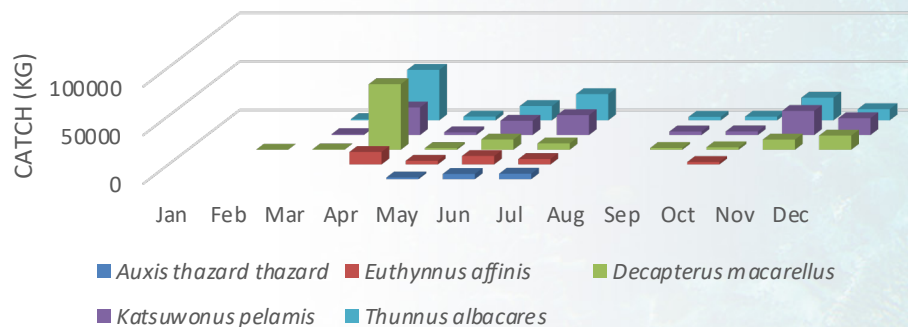
Fisheries Refugia Site 2: Masinloc, Zambales



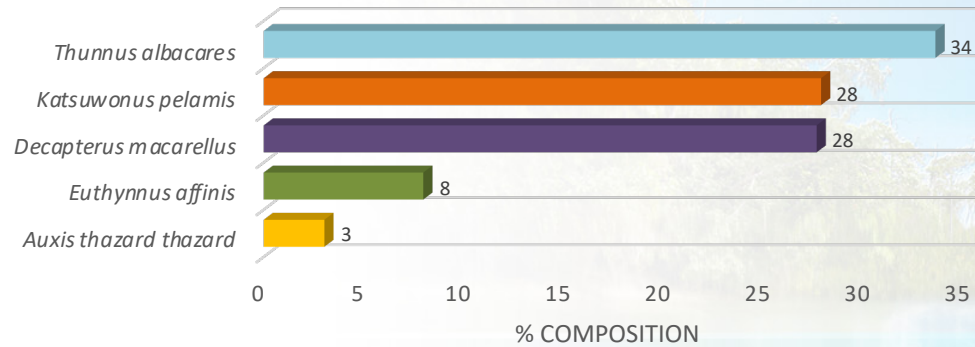
Relative Abundance of Catch by Fishing Gear from January to December 2019



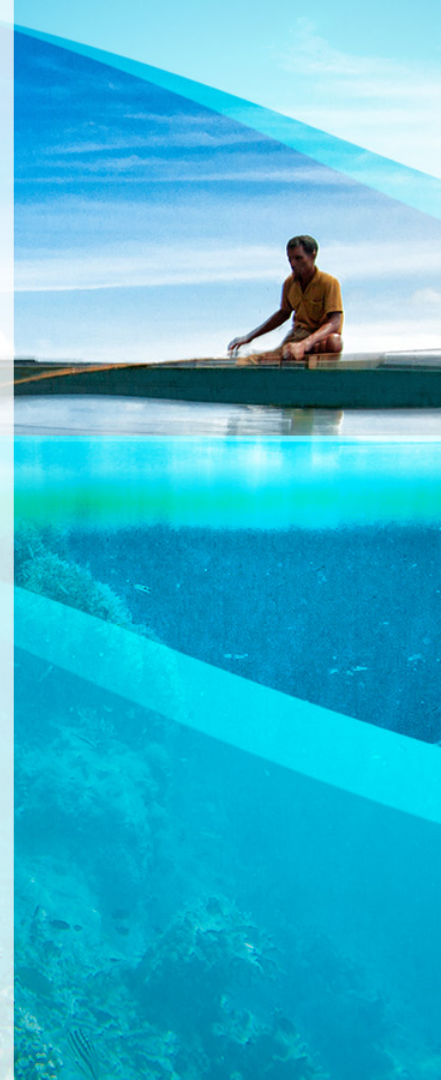
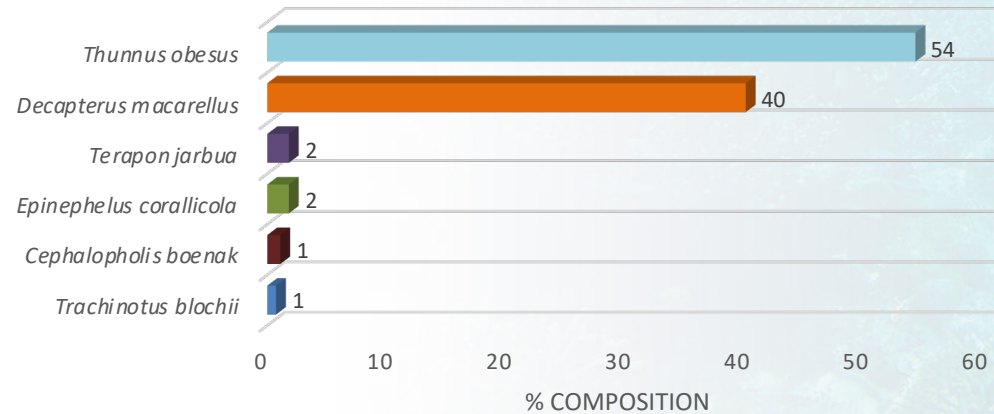
CATCH DISTRIBUTION



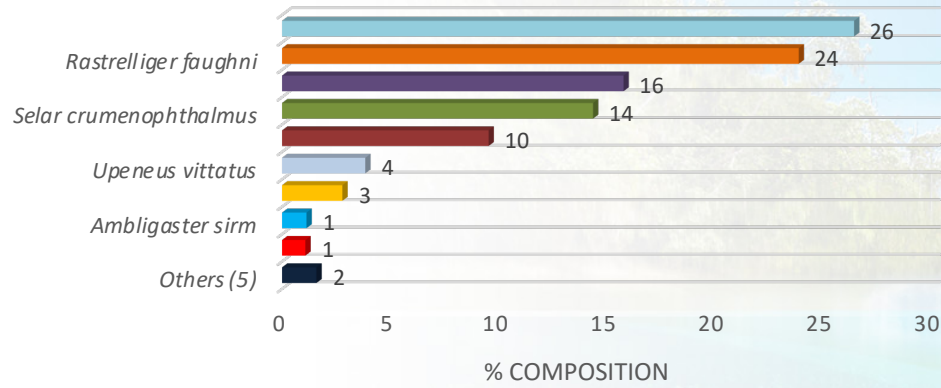
RING NET



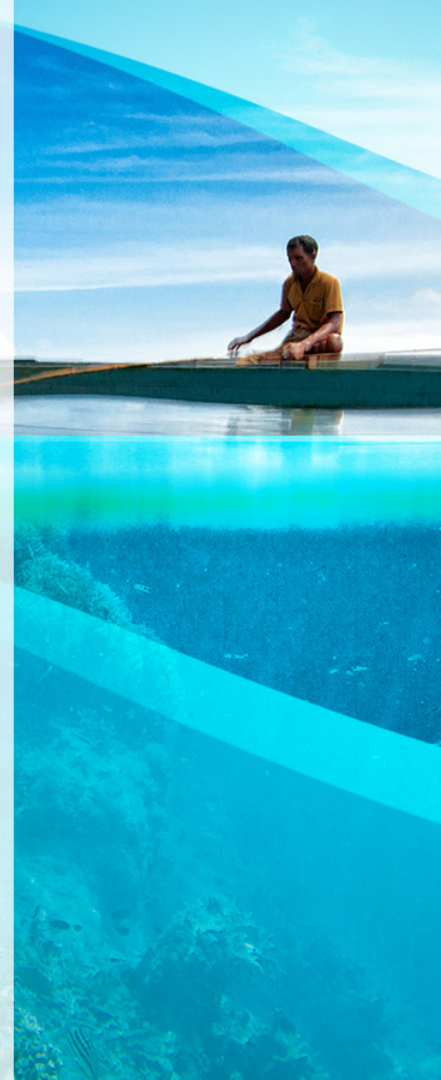
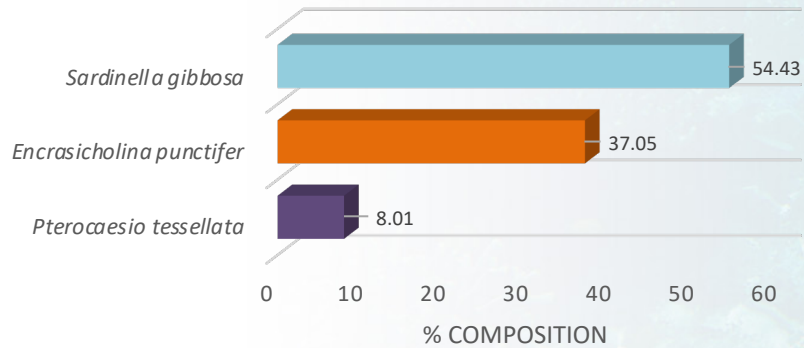
HOOK AND LINE



GILLNET



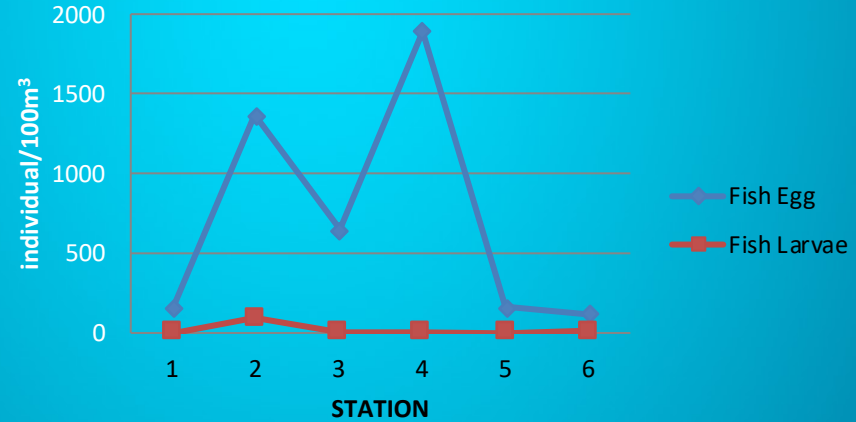
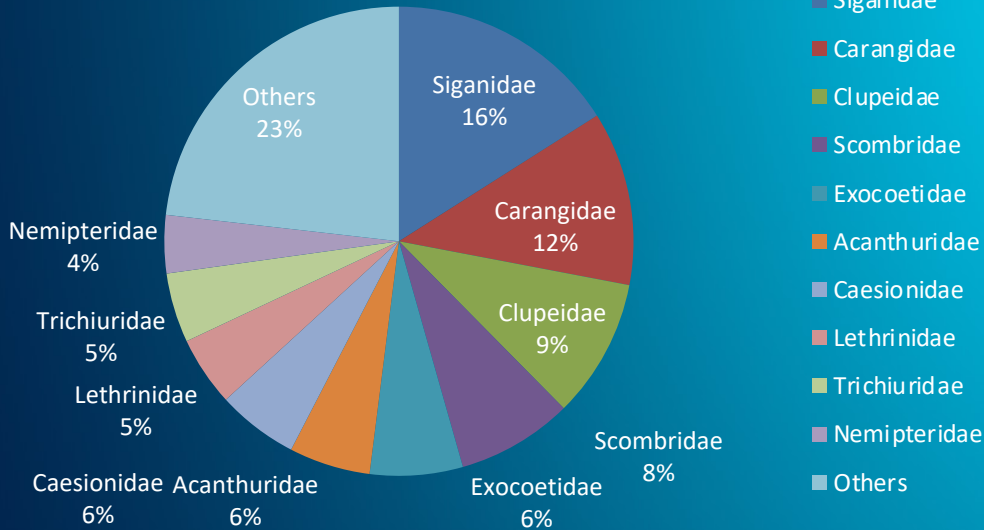
BAGNET



Masinloc Fish Eggs and Larvae Survey Results 2019



Fish Family Composition in Masinloc Bay (1st Quarter)



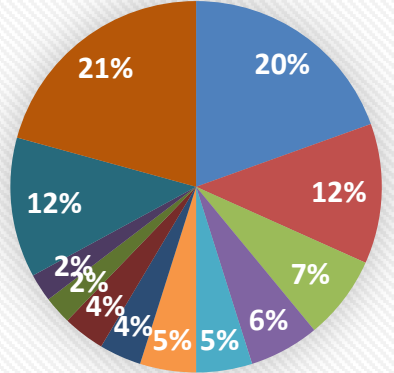
Fish Larvae = 125 Fish Eggs = 4,312



Masinloc Fish Eggs and Larvae Survey Results 2019

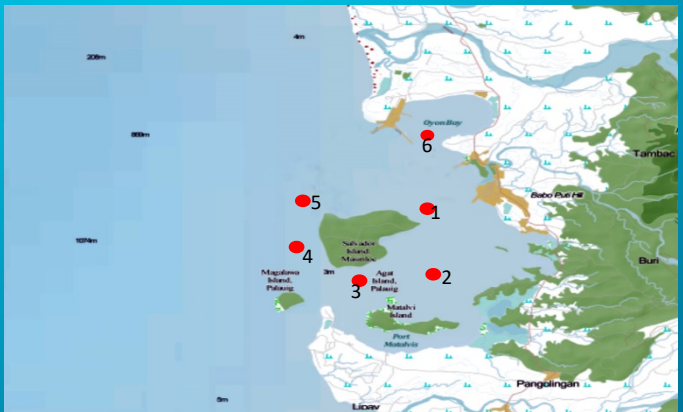
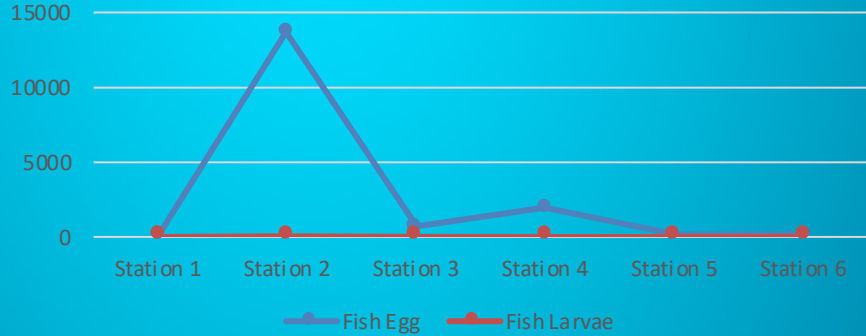


Fish Family Composition in Masinloc Bay (2nd Quarter)



- Siganidae
- Scombridae
- Carangidae
- Acanthuridae
- Exocoetidae
- Trichiuridae
- Clupeidae
- Sphyraenidae
- Lethrinidae
- Nemipteridae
- Onters
- Unidentified

Ichthyoplankton Distribution in Masinloc Bay (2nd Quarter)

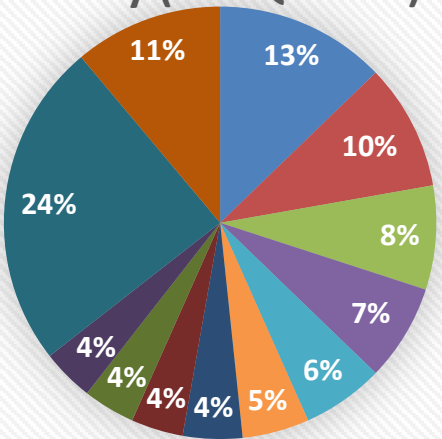


Fish Larvae = 79 Fish Eggs = 1,4,242

Masinloc Fish Eggs and Larvae Survey Results 2019



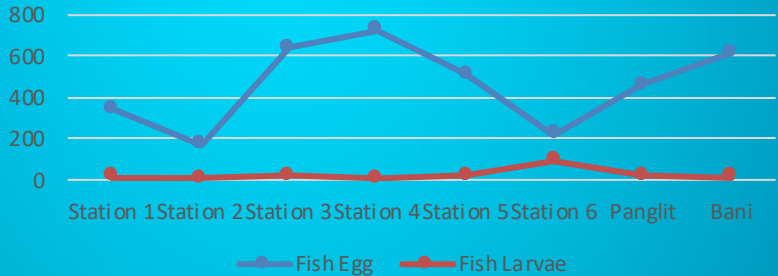
Fish Family Composition in Masinloc Bay (3rd Quarter)



- Carangidae
- Exocoetidae
- Acanthuridae
- Scombridae
- Caesionidae
- Siganidae
- Sciaenidae
- Clupeidae
- Coryphaenidae
- Lutjanidae
- Others
- Unidentified

Fish Larvae=9 Fish Eggs = 3,889

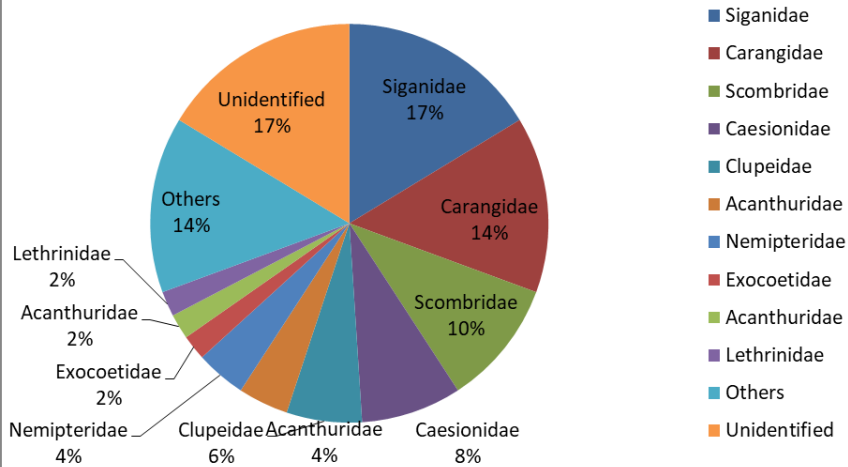
Ichthyopankton Distribution in Masinloc Bay (3rd Quarter)



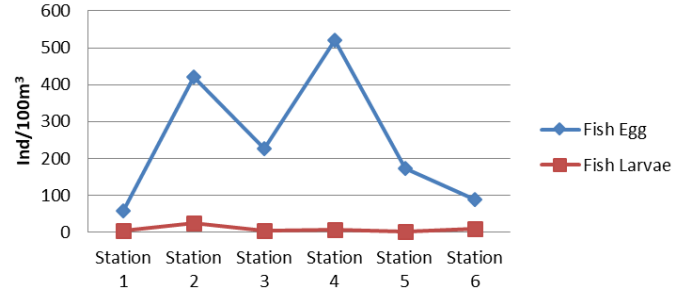
Masinloc Fish Eggs and Larvae Survey Results 2019



Fish Family Composition in Masinloc Bay (4th Quarter)



Ichthyoplankton Distribution in Masinloc Bay (4th Quarter)



Fish egg 1,485 Fish Larvae 49



List of species and catch (MT) landed in Poblacion , Masinloc (2012 – 2016)

Landing site	Gear	ScientificName	2012	2013	2014	2015	2016	Grand Total
Poblacion	Handline	<i>Abalistes stellaris</i>	0.13	0.49	0.93	1.94	0.87	4.37
		<i>Auxis rochei</i>			0.94	4.37	1.48	6.79
		<i>Auxis thazard</i>			3.21	2.43	1.98	7.62
		<i>Coryphaena equiselis</i>					0.10	0.10
		<i>Coryphaena hippurus</i>	2.70	3.25	3.96	3.45	3.37	16.74
		<i>Decapterus macrosoma</i>	0.03		0.06			0.09
		<i>Elagatis bipinnulata</i>	0.27	0.23	0.02			0.52
		<i>Euthynnus affinis</i>			0.52	0.09		0.62
		<i>Gempylus serpens</i>	0.06					0.06
		<i>Katsuwonus pelamis</i>	9.49	10.28	13.53	16.42	14.40	64.11
		<i>Scomberomorus commerson</i>			0.04		0.92	0.96
		<i>Selar crumenophthalmus</i>	0.04					0.04
		<i>Thunnus albacares</i>	26.16	27.60	29.91	24.39	22.70	130.77
		<i>Thunnus obesus</i>	0.80	0.42	2.63	2.24	0.50	6.60
Grand Total			39.69	42.28	55.74	55.33	46.32	239.37

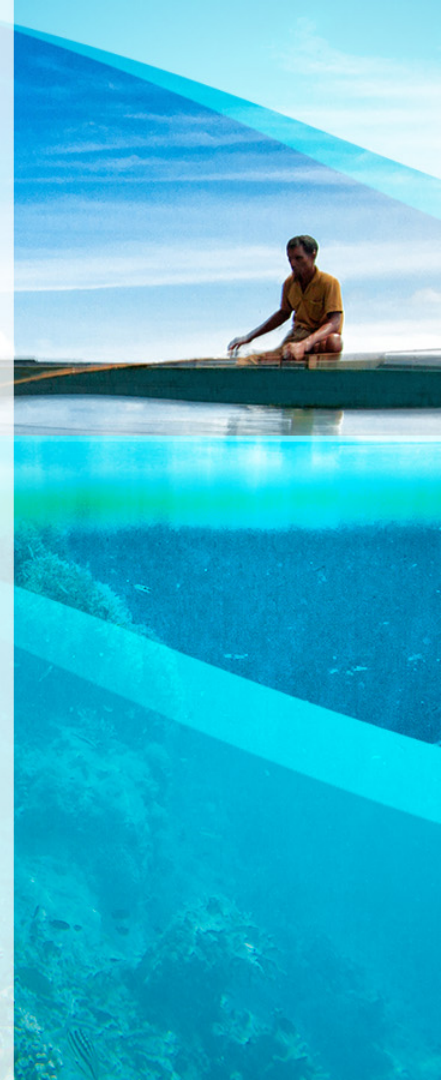
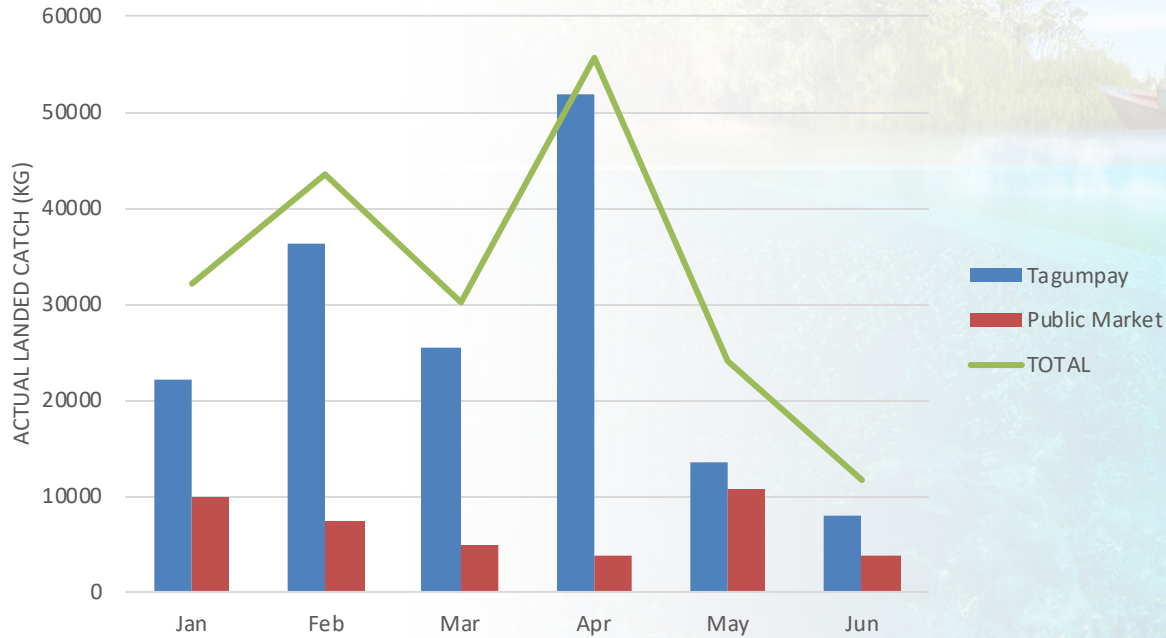


List of species and catch (MT) landed in Poblacion , Masinloc (2012 – 2016)

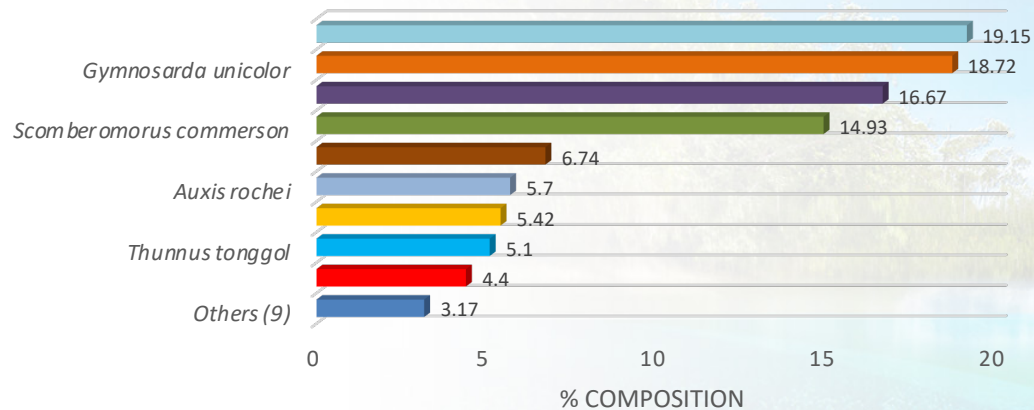
Landing site	Gear	ScientificName	2012	2013	2014	2015	2016	Grand Total
Poblacion	Handline	<i>Abalistes stellaris</i>	0.13	0.49	0.93	1.94	0.87	4.37
		<i>Auxis rochei</i>			0.94	4.37	1.48	6.79
		<i>Auxis thazard</i>			3.21	2.43	1.98	7.62
		<i>Coryphaena equiselis</i>					0.10	0.10
		<i>Coryphaena hippurus</i>	2.70	3.25	3.96	3.45	3.37	16.74
		<i>Decapterus macrosoma</i>	0.03		0.06			0.09
		<i>Elagatis bipinnulata</i>	0.27	0.23	0.02			0.52
		<i>Euthynnus affinis</i>			0.52	0.09		0.62
		<i>Gempylus serpens</i>	0.06					0.06
		<i>Katsuwonus pelamis</i>	9.49	10.28	13.53	16.42	14.40	64.11
		<i>Scomberomorus commerson</i>			0.04		0.92	0.96
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		<i>Thunnus albacares</i>	26.16	27.60	29.91	24.39	22.70	130.77
		<i>Thunnus obesus</i>	0.80	0.42	2.63	2.24	0.50	6.60
Grand Total			39.69	42.28	55.74	55.33	46.32	239.37

Fisheries Refugia Site 3: Coron, Palawan

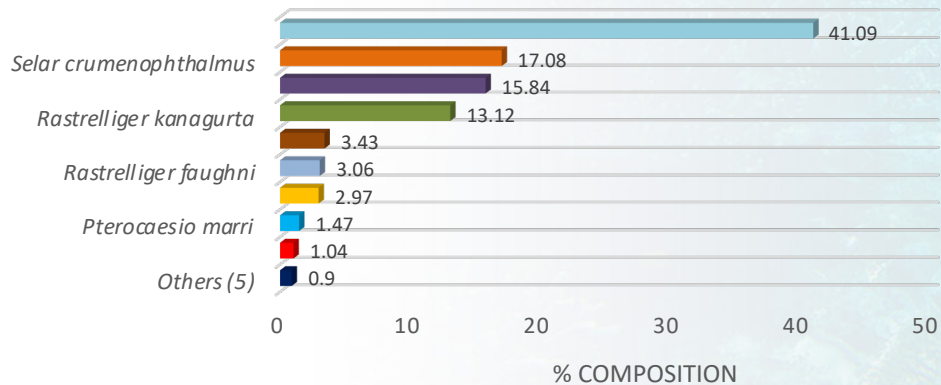
Actual Total Landed Catch per Landing Sites, January to June 2019



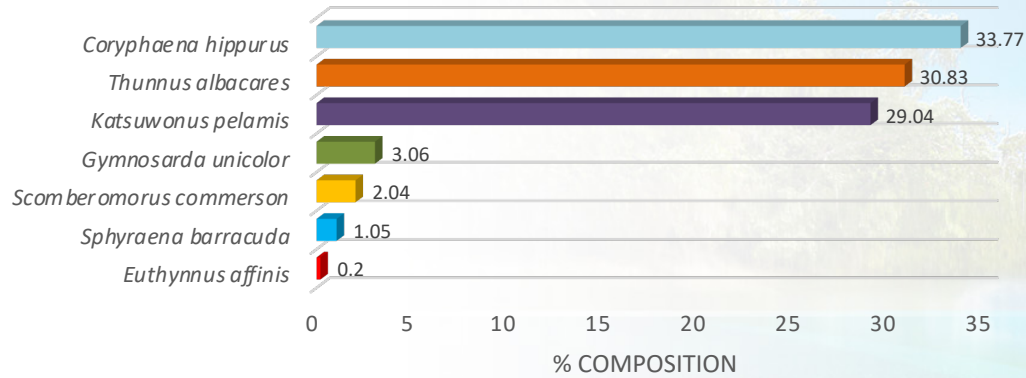
TROLL LINE



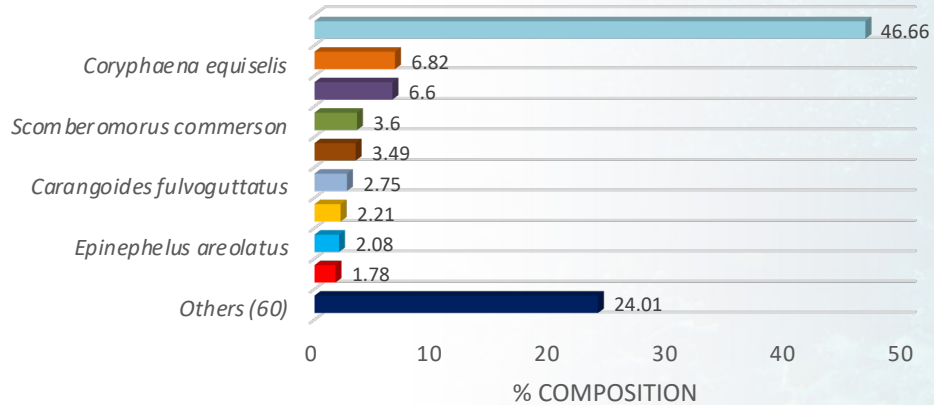
MULTIPLE HOOK AND LINE



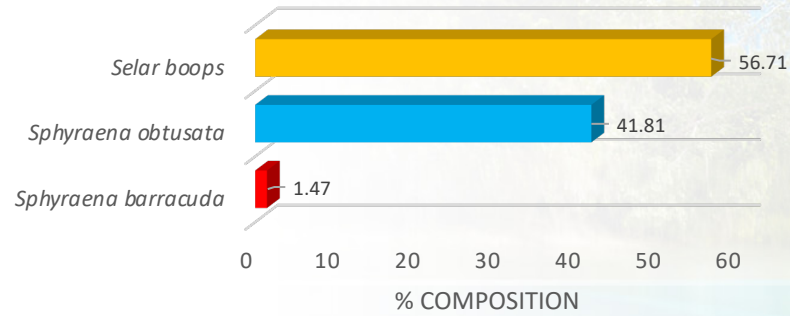
HOOK AND LINE with PAYAO



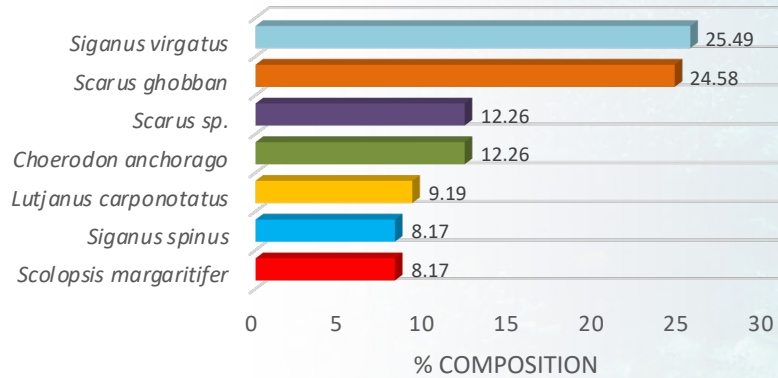
HOOK AND LINE



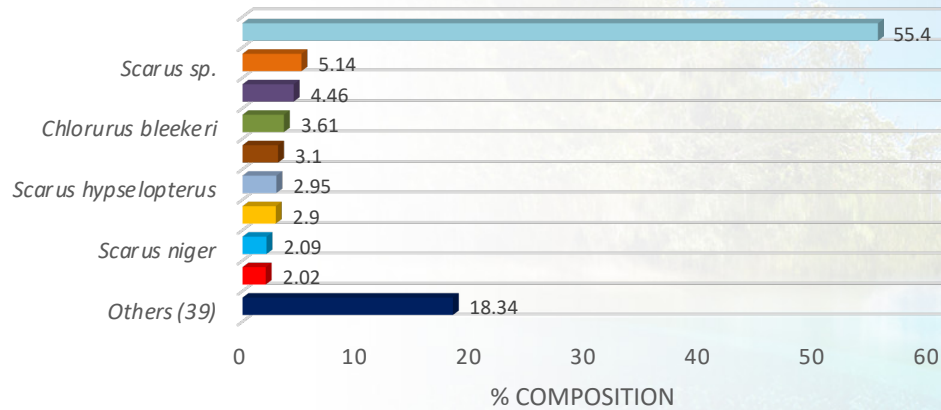
GILLNET



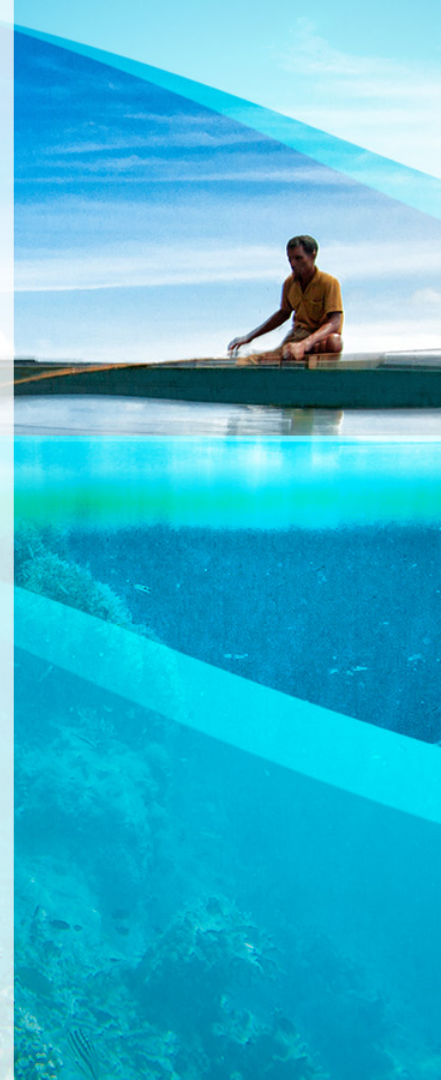
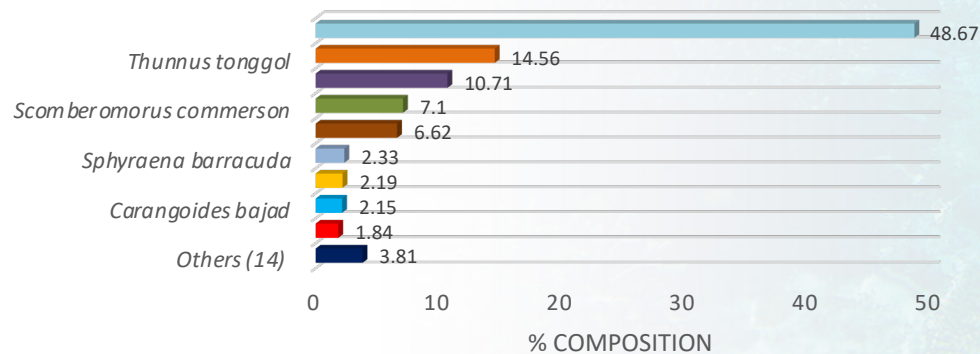
FISH CORRAL



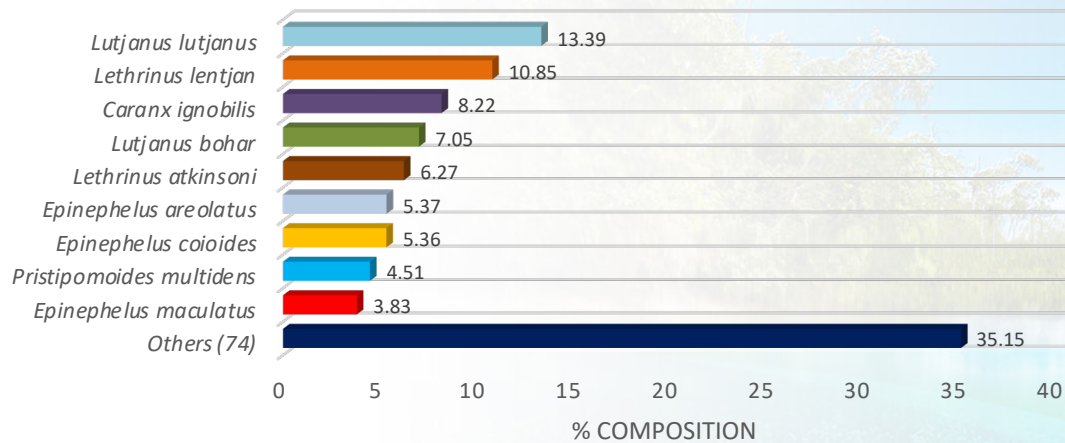
DRIVE-IN GILLNET



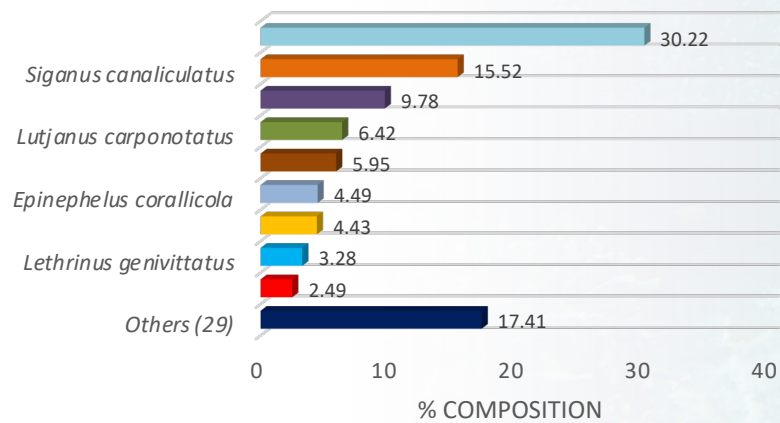
DRIFT GILLNET



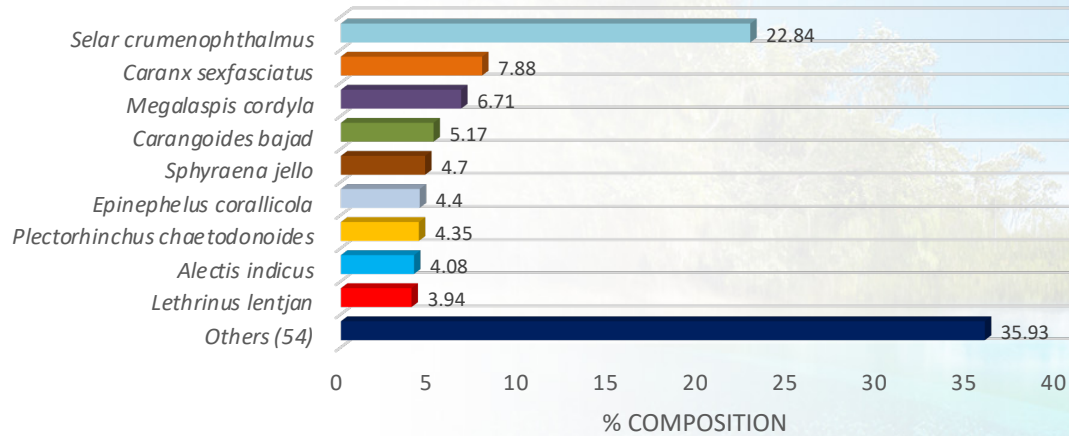
BOTTOM SET LONG LINE



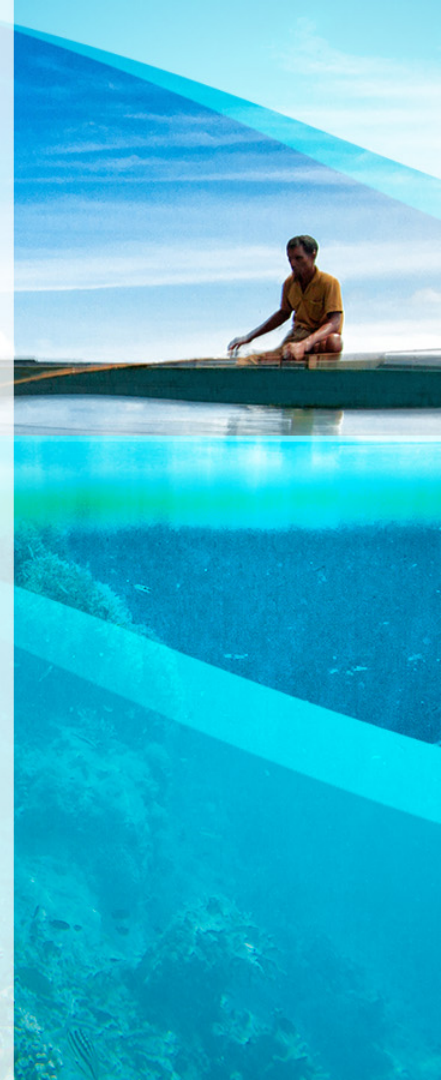
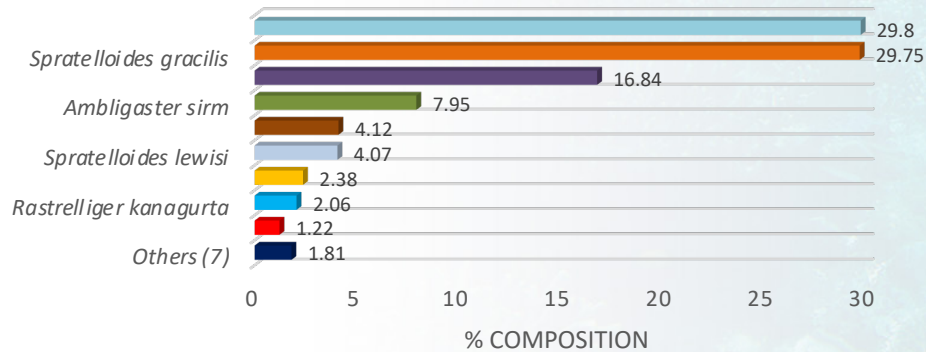
BOTTOM SET GILLNET



BOTTOM GILLNET



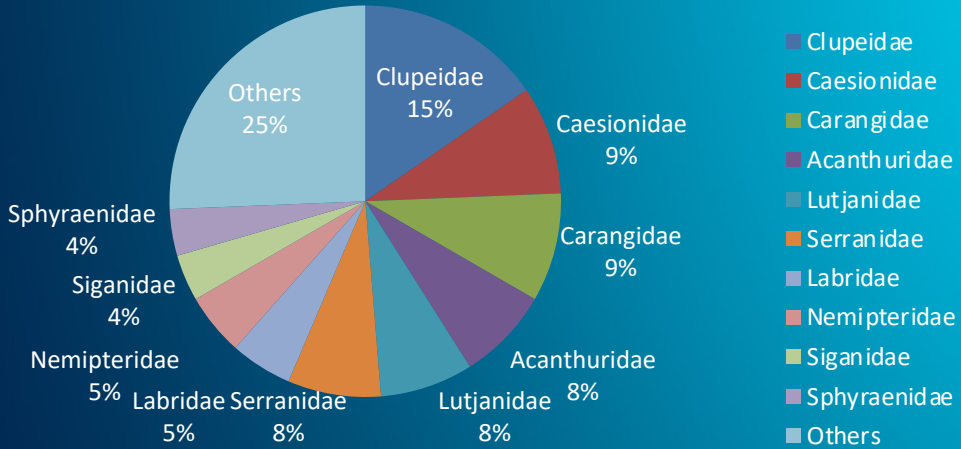
BAGNET



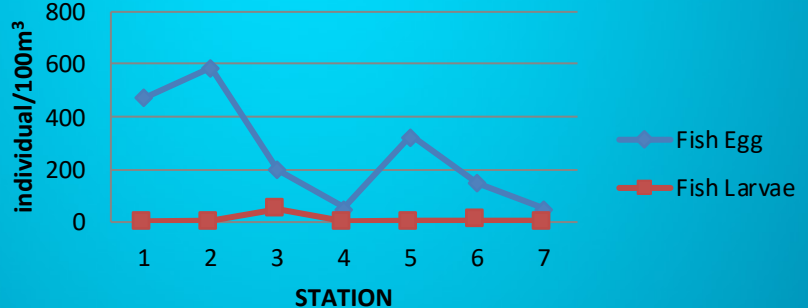
Coron Fish Eggs and Larvae Survey Results 2019



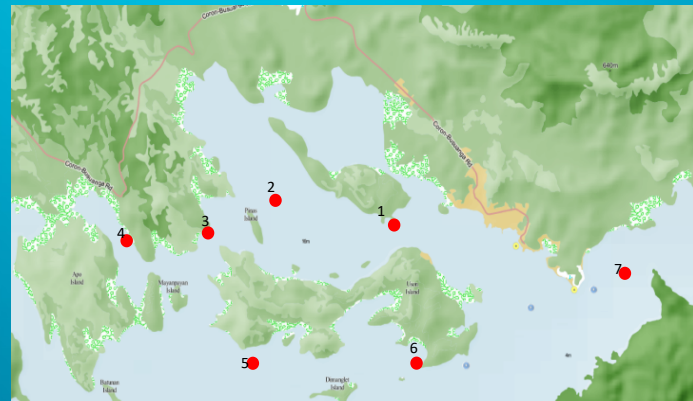
Fish Family Composition in Coron Bay (1st Quarter)



Fish Eggs and Larvae Distribution in Coron Bay (1st Quarter)



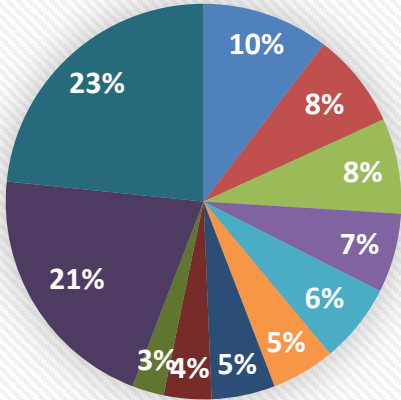
Fish Larvae= 72 Fish Eggs = 1,870



Coron Fish Eggs and Larvae Survey Results 2019

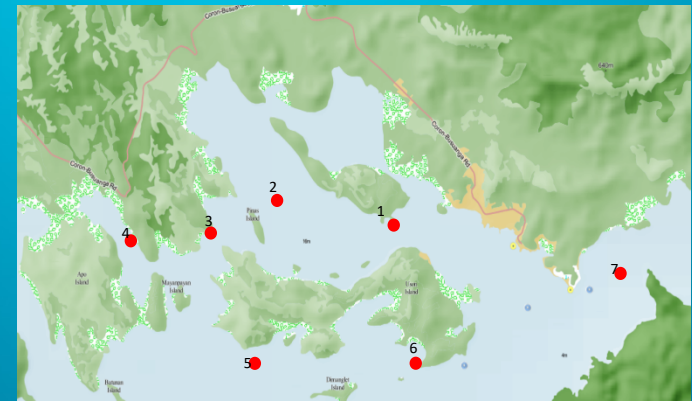
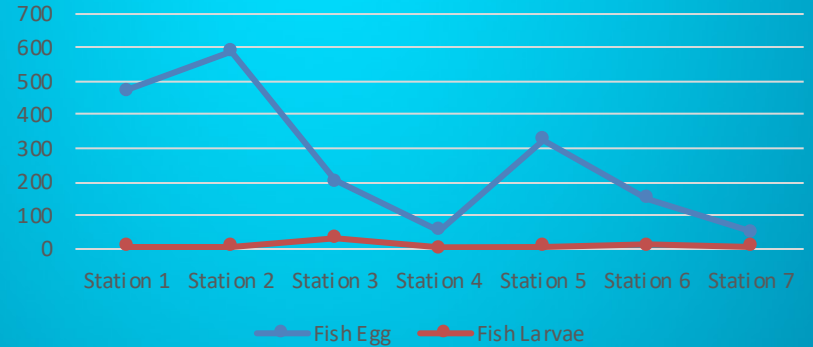


Fish Family Composition in Cron Bay (2nd Quarter)



- Caesionidae ■ Lutjanidae ■ Carangidae
- Serranidae ■ Clupeidae ■ Acanthuridae
- Lethrinidae ■ Sphyraenidae ■ Sillaginidae
- Unidentified ■ Others

Ichthyoplankton Distribution in Coron Bay (2nd Quarter)

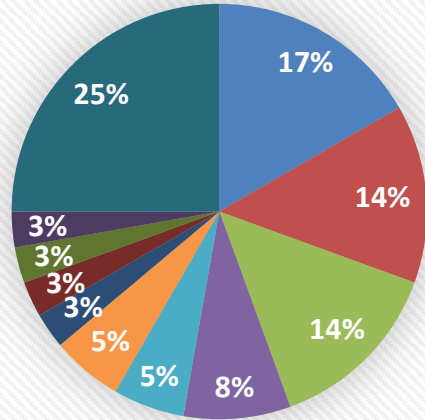


Fish Larvae= 79 Fish Eggs = 1,850

Coron Fish Eggs and Larvae Survey Results 2019

Coron Bay

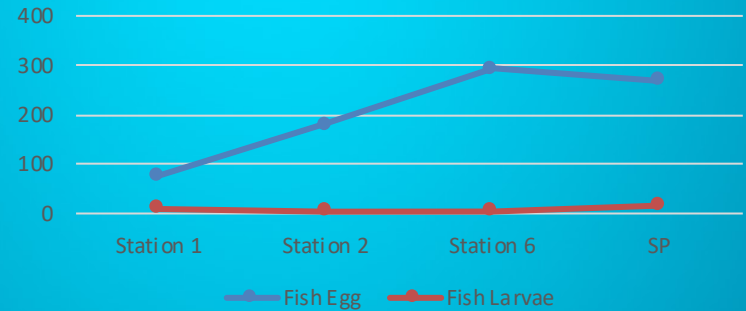
Fish Family Composition in Coron Bay (3rd Quarter)



- | | | |
|----------------|----------------|----------------|
| ■ Caesionidae | ■ Acanthuridae | ■ Lutjanidae |
| ■ Serranidae | ■ Carangidae | ■ Sillaginidae |
| ■ Syngnathidae | ■ Ephippidae | ■ Engraulidae |
| ■ Sillaginidae | ■ Others | |

Fish Larvae = 36 Fish Eggs = 820

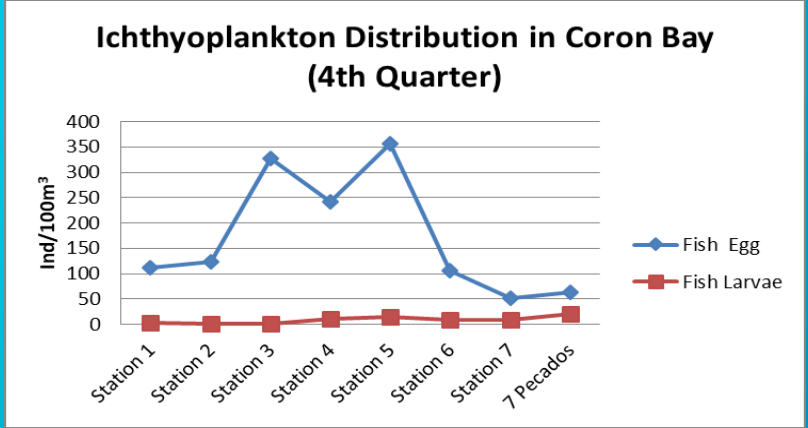
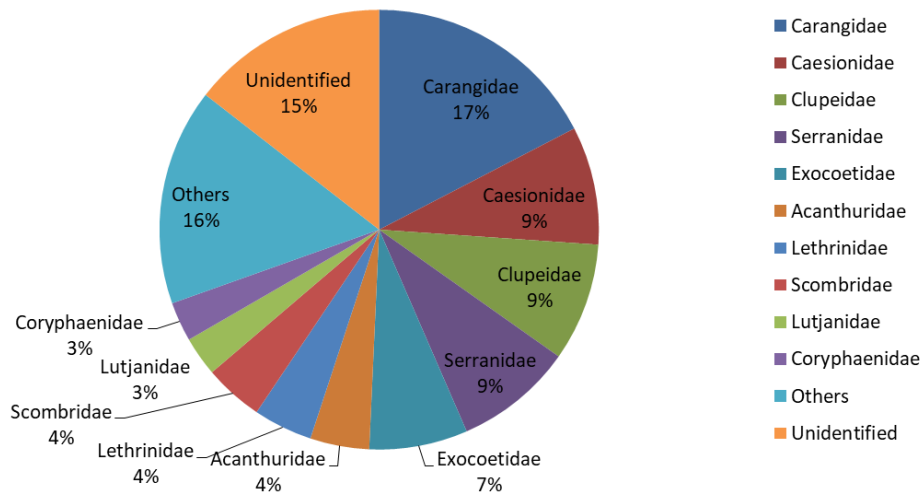
Ichthyoplankton Distribution in Coron Bay (3rd Quarter)



Coron Fish Eggs and Larvae Survey Results 2019



Fish Family Composition in Coron Bay (4th Quarter)



Fish eggs = 1,451 Fish Larvae = 77



PRIORITY SPECIES OF THREE REFUGIA SITES

(Bolinao, Pangasinan; Coron, Palawan;

Masinloc Zambales)



Fisheries *Refugia* Site : Bolinao, Pangasinan
English Name : Golden-spotted Rabbitfish
Family : Siganidae
Common Name : “Samaral”
Scientific Name : *Siganus punctatus*



Fisheries *Refugia* Site : Coron, Palawan
English Name : Mangrove Jack
Family : Lutjanidae
Common Name : “Mangagat”
Scientific Name : *Lutjanus argentimaculatus*



Fisheries *Refugia* Site : Masinloc, Zambales
English Name : Frigate Tuna
Family : Scombridae
Common Name : “Tulingan”
Scientific Name : *Auxis thazard*





Project Site	BOAT Registration (BoatR)	Fisherfolk Registration (FishR)
Bolinao, Pangasinan	1424	4941
Masinloc, Zambales	301	3927
Coron, Palawan	599	3897

