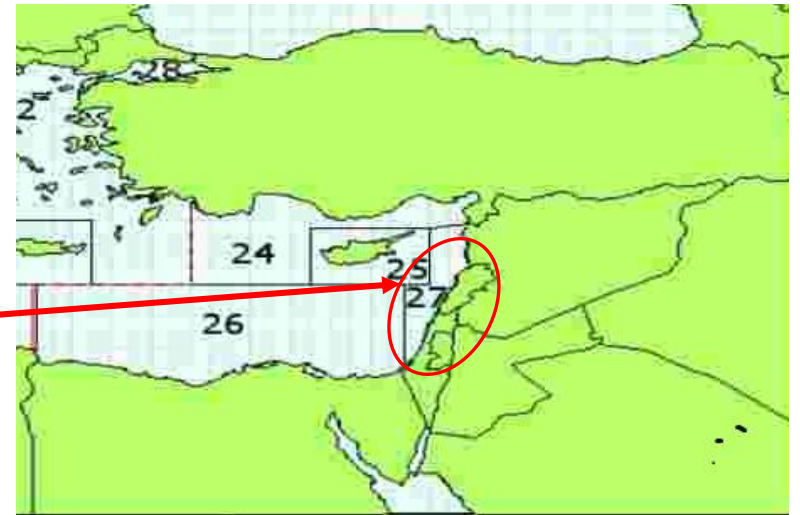


National Monitoring Programme for Fisheries in Lebanon (EO3)

MYRIAM LTEIF

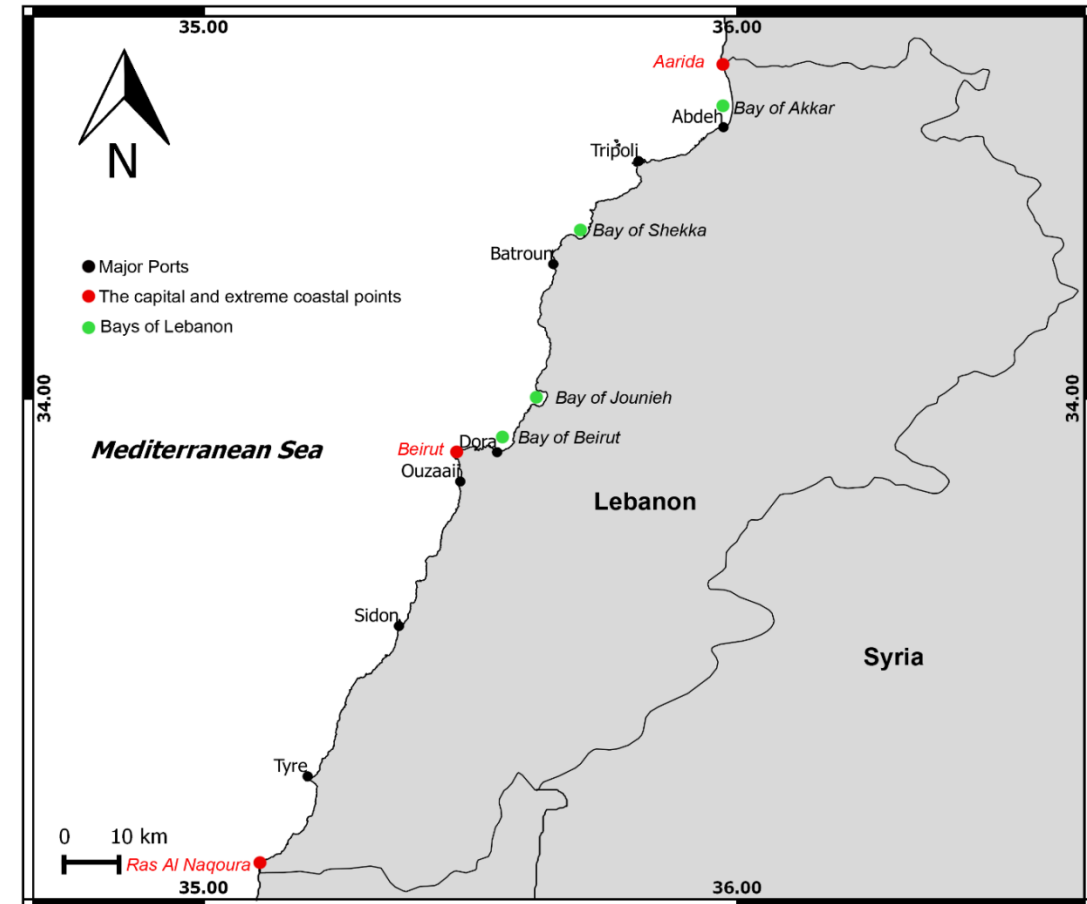
General context

- Lebanese coastal area extends 220 km
- Surface temperature ranges from 17°C to 32°C



General context

- 44 ports
- 7 main ports
- Fishing is artisanal
- 1460 fishing vessels (98% less than 12m – small scale)
- Total catch: ranges from 3000 to 4000 t/year



General context

- The effort of the fleet is concentrated within the 6 nautical miles with higher percentage within the 3 nautical miles
- Fishing occurs beyond 500 meters from the coast
- Few are the studies dealing with the sustainable development and management of fisheries in Lebanon



Legal context

National fishing legislation (Lebanese Ministry of Agriculture)

Decision 346/1 – 15/7/2010: Organizing and defining fishing gears and materials.

Decision 8/1 – 4/1/2012: Organizing and defining some fishing gears and materials.

Decision 1160/1 – 25/11/2014: General conditions of shark fishing.

Decision 952/1 – 26/10/2011: Sanitary conditions for the transportation vehicles of fresh, frozen, and cooled fish.

Decision 1234/1 – 31/12/2015: Related to the sanitary conditions for the transportation vehicles of fresh, frozen, and cooled fish.

Decision 202/1 – 14/4/1997: Organizing underwater spearfishing.

Decision 676/1 – 27/7/2011: Forbid the fishing, transportation, selling and consumption of some types of fish.

National Monitoring programme of fisheries in Lebanon

Objectives

General objective:

Ensure the sustainability of commercially exploited fish stock by artisanal fisheries along the Lebanese coast

Ecological objective “commercially exploited fish” of the Good Ecological State:

- Determine that the level of pressure by known commercial fisheries is kept within biologically safe limits (criterion 3.1)
- Ensure that the reproductive capacity of stocks is maintained (criterion 3.2)

Criteria and Indicators of EO3

3.1 Pressure by commercial fisheries to be kept within biologically safe limits

- Total catch (landings) by operational unit
- Total effort by operational unit
- Catch per unit effort (CPUE) estimated by above from fisheries
- Estimating fishing mortality

3.2 Reproductive capacity of stocks maintained

- Age determination
- Spawning Stock Biomass (SSB)

Organization

This programme consists of 3 sub-programmes:

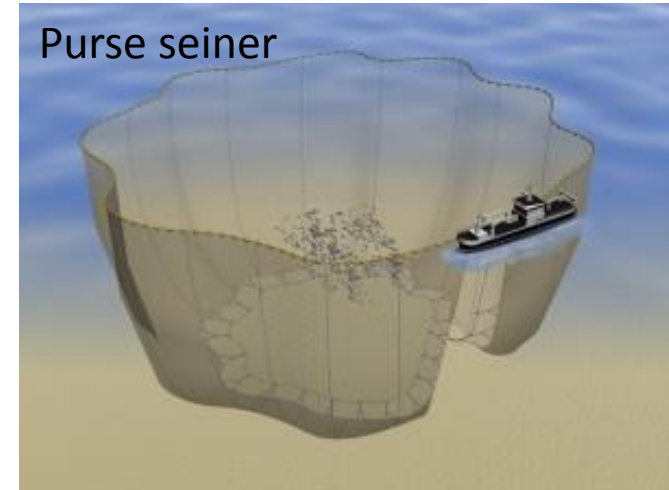
- Subprogramme 1 – Small pelagic fish
- Subprogramme 2 – Demersal fish
- Subprogramme 3 – Elasmobranchs

Subprogramme Objectives

- Better identify the fishing pressures on small pelagics, demersal species, and elasmobranchs caught directly or as bycatch along the Lebanese coast
- Keep these stocks a safe threshold
- Create a database of basic biological data to ensure the proper management of these stocks

Subprogramme 1 – Small pelagic fish

- Characterized by living in the “pelagic zone”.
- Represent 22% of the total worldwide marine capture
- In the Mediterranean: 50% of total annual catch
- In Lebanon: targeted by purse seines and constitute the largest percentage of the catches
- The scarcity of data for this fish stock necessitates initiating a monitoring program to ensure its sustainable management



Subprogramme 1 – Small pelagic fish

Parameters

From fishery data:

Total catch + effort of purse seiner operations → CPUE and use it as an abundance index

From biological data for stock assessment:

Total weight and length of the concerned fish stock → weight-length parameters 'a' and 'b' and length-frequency distribution

Sex and sexual maturity → the sex ratio and L50

Age from otolith reading → Von Bertalanffy growth parameters (L_{inf} , k , and t_0) for reliable age-length keys for the species concerned.

Elements of protocol

Parameters	Protocol	Duration	Potential cost
Total catch	Obtained from 20 representative purse seiners (10 in Dora and 10 in Tripoli) using logbooks given to main fishermen on the vessel	Yearly between April and December (On a daily basis)	\$10000/year For giving money to the fishermen to give information
Total effort	Represents the number of fishing operations performed by each vessel (obtained from logbook)	Yearly between April and December (On a daily basis)	
CPUE	Estimated from catch and effort data (catch/effort)	Yearly between April and December	
Bycatch	Obtained by recording bycatch species from fishermen logbook records	Yearly between April and December (On a daily basis)	
Biological data (Weight, length, sex, maturity, and otoliths)	Taken by measuring and identifying fish from one box of one purse seine catch per region	Yearly between April and December (Twice every month)	\$3000/year For buying the boxes of the purse seine catches
Mortality and SSB	Estimated by using biological data	Yearly between April and December	-

Existing mechanisms for monitoring

- Fisheries data collection system in Lebanon in line with the new GFCM Data Collection Reference Framework (DCRF) – FAO - EastMed in collaboration with CNRS and MoA since 2015

Aim: Assess the diversity of small pelagics in purse seine catches by sampling purse seiner catches once every month from April to December.

- Purse seiner total catch data is also being noted every month by the MoA.

Subprogramme 2– Demersal fish

- Live and feed on or near the continental shelf in coastal waters.
- A very important component of total world catches.
- In Lebanon: Mainly targeted by gillnets, trammel nets and bottom longlines.
- More than 67 % of the vessels target demersal species.
- Prone to exploitation by Lebanese artisanal fisheries by direct fishing and/or bycatch

Subprogramme 2 – Demersal fish

Parameters

From fishery data:

Total catch + effort of fishing vessels using GN, TN and L → CPUE and use it as an abundance index

From biological data for stock assessment:

Total weight and length of the concerned fish stock → weight-length parameters 'a' and 'b' and length-frequency distribution

Sex and sexual maturity → the sex ratio and L50

Age from otolith reading → Von Bertalanffy growth parameters (L_{inf} , k , and t_0) for reliable age-length keys for the species concerned.

Elements of protocol

Parameters	Protocol	Duration	Potential cost
Total catch	Obtained from: <i>3 bottom longline vessels</i> <i>3 gillnet vessels</i> <i>3 trammel net vessels</i> from each of the 3 ports (Tripoli, Dora, Sidon/Tyr)	Yearly (on a daily basis)*	\$20000/year For giving money to the fishermen to give information
Total effort	Represents the mesh and length of the nets or the number of hooks and length of the longline (obtained from logbook)	Yearly *	
CPUE	Estimated from catch and effort data (catch/effort)	Yearly	
Bycatch	Obtained by recording bycatch species from fishermen logbook records	Yearly *	
Biological data (Weight, length, sex, maturity, and otoliths)	Obtained by taking measurements from one sample of the potential demersal fish stock concerned monthly bought from: <i>1 bottom longline vessel</i> <i>1 gillnet vessel</i> <i>1 trammel net vessel</i> in each of the 3 above mentioned ports	Yearly (1 per month)	\$10000/year For buying the fish samples
Mortality and SSB	Estimated by using biological data	Yearly	-

Elements of protocol

Parameters	Protocol	Duration	Potential cost
Total catch	Obtained from 50 fishing operations: <i>10 bottom longline operations</i> <i>20 gillnet operations</i> <i>20 trammel net operations</i> throughout predefined hauls along the Lebanese coast	Yearly	\$30000/year Cost of hiring fishermen vessels and producing/mending the gear
Total effort	For the operations mentioned: <i>500 m bottom longline with 200 hooks</i> <i>1 km gillnets of 26, 30 and 40 mm</i> <i>1 km trammel nets of 22, 24, 26, 28 mm</i>	Yearly	
CPUE	Estimated from catch and effort data (catch/effort)	Yearly	
Bycatch	Obtained from recording bycatch species in each haul	Yearly	
Biological data (Weight, length, sex, maturity, and otoliths)	Obtained by taking measurements from all fish obtained from the survey operations	Yearly	-
Mortality and SSB	Estimated by using biological data	Yearly	-

Existing mechanisms for monitoring

Past and current scientific fishing surveys:

- CIHEAM PESCA Libano project (2012-2013) → CNRS and MoA
- Tripoli survey (2015-2016) → CNRS project - 15 hauls/season
- CANA and CANA+ project survey → CNRS - Batroun, Beirut, Sidon...



Pagellus erythrinus

Current data collection

Fisheries data collection system in Lebanon in line with the new GFCM Data Collection Reference Framework (DCRF) – FAO - EastMed in collaboration with CNRS and MoA since 2015

Pagellus erythrinus and *Lithognathus mormyrus*



Lithognathus mormyrus

Subprogramme 3 – Elasmobranchs

- Sharks and batoids (rays and skates)
- Characterized by their conservative life-history traits.
- Vulnerable to elevated fishing exploitation.
- 1.1 % of total landing in the Mediterranean.
- In Lebanon: direct and incidental catches → prone to exploitation



Incidental catch of *Hexanchus griseus* in Selaata



Rhinochimaera sp. direct catch in a Lebanese fish market (Tripoli)

Subprogramme 3 – Elasmobranchs

Parameters

From fishery data:

Total catch + effort of fishing vessels using GN, TN and L → CPUE and use it as an abundance index

From biological data for stock assessment:

Total weight and length of the concerned fish stock → weight-length parameters 'a' and 'b' and length-frequency distribution

Sex and sexual maturity → the sex ratio and L50

Age from vertebrae or spine reading → Von Bertalanffy growth parameters (L_{inf} , k , and t_0) for reliable age-length keys for the species concerned.

Elements of protocol

Parameters	Protocol	Duration	Potential cost
Total catch	Obtained from: <i>10 elasmobranch targeting vessels (direct fishing)</i> from each of the 3 ports (Tripoli, Dora, Sidon/Tyr)	Yearly (daily basis)*	\$20000/year For giving money to the fishermen to give information
Total effort	Represents the mesh and length of the nets or the number of hooks and length of the longline (obtained from logbook)	Yearly *	
CPUE	Estimated from catch and effort data (catch/effort)	Yearly	
Bycatch	Obtained from: <i>4 bottom longline vessels</i> <i>3 gillnet vessels</i> <i>3 trammel net vessels</i> targeting bony demersal species from each of the 3 ports (Tripoli, Dora, Sidon/Tyr) Elasmobranch bycatches will be obtained from fishermen logbook records.	Yearly*	\$20000/year For giving money to the fishermen to give information
Biological data (Weight, length, sex, maturity, and spines or vertebrae)	Obtained by taking measurements from one sample of the potential elasmobranch stock concerned monthly bought from: <i>3 bottom longline vessel</i> Directly targeting the concerned elasmobranch stock in each of the 3 above mentioned ports	Yearly	\$8000/year For buying the elasmobranch samples
Mortality and SSB	Estimated by using biological data	Yearly	-

Existing mechanisms for monitoring

Elasmobranch bycatch from scientific surveys:

- CIHEAM PESCA Libano project (2012-2013) → CNRS and MoA
- Tripoli survey (2015-2016) → CNRS project - 15 hauls/season
- CANA + project survey → CNRS - Batroun, Beirut, Sidon...

Current elasmobranch catch and bycatch collection

- Biology, distribution and diversity of cartilaginous fish species along the Lebanese coast, Eastern Mediterranean (Lteif, 2015)
- No monitoring plan for elasmobranch catch and bycatch
- Age determination using vertebrae for *Rhinobatos rhinobatos* (Ongoing in the Lebanese University)

Recommendations

- Awareness for fishermen regarding the use of logbooks
- Awareness for the proper identification of bycatch (especially for purse seiners and elasmobranchs)
- Capacity building for long-term formation of researchers in the field to help in the taxonomic identification of catches and bycatches
- Ensure the sustainability of fisheries (Application of GFCM recommendations)
- Develop a library for calcified structures that will aid in age reading and stock identification

**Thank you for your
attention**