**Data collection and monitoring manual**

Monitoring scheme for fisheries following Ecosystem Based and Integrated Coastal Zone Management on the Jordanian coast of the Gulf of Aqaba.

|  |  |  |
| --- | --- | --- |
| Sector/ TOPIC: Fisheries  **Components:**  [Fisheries (Id=146)] -> [Fishing activities (Id=58)]  -> [OccupationalFishing (Id=59)] | | |
| TITLE: Monitoring scheme for fisheries following Ecosystem Based and Integrated Coastal Zone Management on the Jordanian coast of the Gulf of Aqaba. | | |
| tARGET AREA  All the gulf of Aqaba interested by the fishing activity | | |
| frequency  Daily | | |
| **MONITORING RATIONALE (System Component)** | | FIRST PHASE: training  SECOND PHASE: application of the protocol |
| **MONITORING GOAL** | | 1. Quantify fishing activities in terms of numbers of boats and numbers of crews and their particulars, fishing sites visited and trip lengths, petrol consumed, and fishing gear used on the Jordanian sector of the Gulf of Aqaba. 2. Provide daily information on the environmental conditions and fish abundance including fish that can be used as bait at fishing sites through fishermen’s observations and note taking. 3. Provide detailed descriptions on environmental incidental anthropogenic impacts seen at fishing sites and incidents encountered by fishing boats. 4. Identify fish catch total landings, species caught and their relative abundance in the Jordanian sector of the Gulf of Aqaba. 5. Map the distribution of different fish catch species and their density correspondent to respective fishing sites. 6. Estimate the size and age structure, gonads content and its maturity of caught fish populations. 7. Provide historical records on the above if available. 8. Estimating money value for the caught fish is important to understand the fisheries economic return. There is a work done in 2006, where some prices were reported (Al-Zibdah 2006). |
| **LABORATORY ANALYSIS NEEDS** | | In case of histological examination of gonads (such as:  <https://www.protocols.io/view/histological-staining-of-fish-gonadal-tissue-j8nlk5m76l5r/v1>) |
| **Data Analysis and interpretation protocols** | | All the data will be collected and entered by the ISP responsible (JREDS). |
| DSS System Diagram & INDICATORS | | |
| **DIAGRAM ELEMENT:** [Fishing activities (Id=58)]   |  |  |  |  | | --- | --- | --- | --- | | **Indicator** | **Update Frequency** | **Description** | **Data Source** | | N° of Boats |  | 156 fishing boats  (Fishermen protocol) | ASEZA  Navy  Maritime Authority | | N° of Fishermen |  | (Fishermen protocol) | ASEZA  Navy  Maritime Authority | | N° of Fishing Licenses |  | **-** | ASEZA  Navy  Maritime Authority | | Fishing Gears |  | Type of different fishing equipment  (Fishermen protocol) | ASEZA  Navy  Maritime Authority | | Landings by Species | Daily | - | JREDS | | Trip lengths |  |  |  | | Petrol consumed |  |  |  |   **DIAGRAM ELEMENT:** [Fishing Sites (Id=66)]   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Indicators attached to component: Fishing Sites (Id=66)** | | | | | | **Name** | **Description** | **DataSource** | **UpdateFrequency** | **Notes** | | Fishing sites visited | (Fishermen protocol) |  |  |  |   **DIAGRAM ELEMENT:** [OccupationalFishing (Id=59)]   |  |  |  |  | | --- | --- | --- | --- | | **Indicator** | **Update Frequency** | **Description** | **Data Source** | | Fisheries Catch Data (by Species) | Daily | **-** | JREDS | | Fish size |  |  |  | | Fish age |  |  |  | | Fish maturity |  |  |  | | Gonads content |  |  |  | | Fisheries Total Catch Data by Day | Daily | **-** | JREDS | | Monthly Catch Efforts | Monthly | **-** | JREDS | | Fisheries Catch KG/Gear | Monthly | - |  | |  |  |  |  |   **DIAGRAM ELEMENT:** [Sea water (Id=1)]   |  |  |  |  | | --- | --- | --- | --- | | **Name** | **Description** | **UpdateFrequency** | **DataSource** | | Sea Water Phisical Parameters | Data are in °C coming from 6 different monitoring programs in the Gulf of Aqaba in different locations. Temperature, Salinity, Density, Transparency | Weekly | ASEZA Monitoring Programs | | Bio Geo Chemical Parameters | Nitrate  Nitrite  Ammonium  Phosphate  Silicate  Chl A  pH  Alkalinity  DO | Monthly | ASEZA Monitoring Programs | | Total Hydrocarbon | Anthropogenic source | Monthly | ASEZA Monitoring Programs | | Suspended matter | Includes living and non-living components |  |  | | Environmental incidental impacts | From fishermen and glass boat protocols (to be modified in the IPS) |  |  | | Incidents encountered | From fishermen protocol (to be modified in the IPS) |  |  | | Environnemental conditions at visitation sites | From glass boat protocol  (to be modified in the IPS) |  |  | | | |
| Data Collection Procedure | | |
| Staff | Trainers to prepare the fishermen (first phase)  Fishermen (willing to participate to the monitoring protocol??) | |
| Equipment | Protocol  iPad  GPS  Camera | |
| Protocol | **First phase:**  Training aimed: to classify correctly species; improve the knowledge about the biology of species, and their vulnerability classifications; use of the equipment; estimation of size, age structure; training how to estimate / sample the gonads; to correctly fill the protocols.  **Monitoring goal a):**  **Monitoring goal b):**  **Monitoring goal c):**  **Monitoring goal d):**  **Monitoring goal e):** Map the distribution of different fish catch species.  **Monitoring goal f):** On collection of samples, the following details should be noted: Date, vessel, species, length, weight, sex, weight of gonads, gonad sub-sample weight, location of capture (latitude and longitude), sample from that fish, and including the region of the gonad sampled, and others. An example about Atlantic tuna is here reported (“On collection of samples, the following details should be noted: Date, vessel, species, length, weight, sex, weight of gonads, gonad sub-sample weight, location of capture (latitude and longitude), tuna school type and school association, and a unique sample number referring to the fish, sample from that fish, and including the region of the gonad sampled. To estimate proportions of sexually mature individuals, precise criteria for the classification of maturity must be defined.” ICCAT 2007).  DATA COLLECTION SHEET:    **General comments:** | |
| Quotations | GPS | |
| **References:**  Al-Zibdah M., Khalaf M., and Odat Nidal 2006. *The Fishery Status in Jordan’s Gulf of Aqaba, Red Sea.* Dirasat*, Pure Sciences, Volume 33, No. 1.*  ICCAT (INTERNATIONAL COMMISSION for the CONSERVATION of ATLANTIC TUNAS) 2007. *https://www.iccat.int/Documents/SCRS/Manual/CH4/CH4\_8-ENG.pdf* | | |