

Database Design Document

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Abbreviations

CE or C/ECatch/EffortCPUECatch Per Unit EffortCVCoeeficient of variation in %DBDatabaseDGCData Group CodeEADEnvironment Agency Abu DhabiEUEuropean UnionEUEuropean UnionFAOFood and Agriculture Organization of the United NationsFISFisheries Information SystemFSFrame SurveyITInformation TechnologyNFISNational Fisheries Information SystemPBAProbability Boat ActiveSFStandardization factorSUISampling Uniformity Index	A Artfish CE or C/E CPUE CV DB DGC EAD EU EU FAO FIS FS IT NFIS PBA SF SUI	Accuracy in % Approaches,Rules and Techniques for Fisheries Monitoring Catch/Effort Catch Per Unit Effort Coeeficient of variation in % Database Data Group Code Environment Agency Abu Dhabi European Union European Union Food and Agriculture Organization of the United Nations Fisheries Information System Frame Survey Information Technology National Fisheries Information System Probability Boat Active Standardization factor Sampling Uniformity Index
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1 Introduction

1.1 Purpose

Fisheries provide a source of income, employment and recreation to inhabitants while contributing to the cultural heritage of the Emirate of Abu Dhabi. Fishing is primarily conducted from open fibreglass dories and wooden dhows, dome shaped traps are the most commonly used gear type although a variety of other methods exist. Catches are typically diverse and characteristic of multispecies tropical fisheries, target species primarily being composed of representatives of the families: Carangidae, Lethrinidae, Haemulidae, Epinephelidae and Scombridae.

Catch and effort data form the foundation of fisheries management. The outputs of effective fisheries information systems enable resource status to be monitored and evaluation of fisheries performance to be made, crucial aspects for informed management planning and decision making. In this context, the Terrestrial and Marine Biodiversity Sector of the Environment Agency – Abu Dhabi (EAD) is implementing the 'Fish Landings and Population Dynamics Project' the principal objectives of which include the collection of catch, effort and economic data and the production of fisheries statistics for the Emirate of Abu Dhabi. The project responds directly to the EAD's goal of developing a management regime for the fisheries of Abu Dhabi.

Since the inception of the Fish Landings and Population Dynamics Project in 2001, a stratified catch and effort data recording system for the Emirate of Abu Dhabi was set in place. Starting in 2005 a fishery data collection system was launched for the recording of species landed and of gear types used. A tailor-made fisheries database application was developed capable of storing the primary data, performing catch/effort estimates and producing fisheries statistical reports.

Experience gained during the aforementioned system implementation period had revealed that although it was was well conceived there were nevertheless several application areas that needed improvement, notably:

- Estimation of fishing effort by boat-gear category: Until now effort has been extrapolated on the basis of boat movements registered by the coast guard. This method cannot provide effort estimates by boat-gear since the latter is not reflected in the recordings.
- Estimation of fishing effort is not synchronized with the monthly collection of landings since it involves laborious screening of coast guard records in order to calculate total boat days for active boats. Such being the case the current system cannot provide instantaneous catch/effort estimates that are essential for regular and effective fisheries statistical monitoring.
- The data collection procedures are well conceived and the enumerators have no difficulty in implementing the data collection protocols in use. The latter however are not based on strict statistical criteria with the result that the reliability of the resulting estimates is generally not known and not indicated in the reports (a prerequisite set-up by international and regional fisheries bodies).



- At present the utility of the statistical outputs is limited to the production of annual reports. The database can indeed be interrogated at any moment but in the absence of ready-made statistical procedures users have to formulate themselves database queries; such a practice requires a certain extent of database query knowledge that is generally not mastered by the average user.
- Certain standard analytical procedures ought to be integrated into the current database such as standardization of fishing effort and CPUE, multi-variate analysis of catch/effort variables, etc.

In view of the above methodological and operational needs the Environment Agency of Abu Dhabi is upgrading its current system in order to respond better to current and future needs. Such an upgrade is carried out by means of the following twofold action:

(a) Revision of the data collection procedures (specifically those concerning fishing effort) and introduction of statistically sound data collection protocols for sampling landings and fishing effort.

(b) Adaptation and customization of the internet system ArtFishWeb Beta version (introduced by FAO in 2017) in a manner permitting its eventual expansion to the entire UAE.

1.2 Scope

The general objective of the database is to provide the means for effectively implementing a statistically consistent and comprehensive National Fisheries Information Systems (UAE-NFIS). Specifically:

(a) The UAE-NFIS database will constitute a sustaining statistical work frame for field and office operations for the effective statistical monitoring of fisheries in the Emirate of Abu Dhabi (UAE);

(b) It will be used for the fulfillment of statistical commitments to national user groups as well as to regional and international fisheries bodies.



2 Data model design

2.1 Overview

Data modeling is a method used to define and analyze data requirements needed to support the business processes of an organization. Data modeling defines not just data elements, but also their structures and relationships between them. Data modeling techniques and methodologies are used to model data in a standard, consistent, predictable manner in order to manage it as a resource.

The author has established a set of best practices for various National Fisheries Information Systems (NFIS) application domains. These are intended to help NFIS users rapidly become productive with the database and share what really works among users and researchers.

An NFIS data model uses commonly adopted statistical and IT standards. From the statistical viewpoint (not discussed here), the UAE-NFIS database uses the FAO standards relating to data collection schemes for catch and fishing effort and estimating total production by means of a generic approach.

With regards to IT standards the database has been conceived along the FAO and EU guidelines which favor open-source applications. The operational platform of UAE-NFIS is PhP-MySQL.

2.2 Data layer convention

UAE-FIS operates by means of two physically different sets of tatbles. The first set consitutes an administrative database that controls the contents of the system and its accessibility. The second set consists of "periods" each of which contains autonomous data and information for each reference month. With this architecture the system has online access only to periods requested; in this manner its performance is not affected by progressive data volume increases. Figure 1 illustrates this set-up.



Figure 1. Architecture of UAE-NFIS.

2.2 Data standards

Statistical standards

The system uses international (FAO) standards in all aspects of data collection concerning: species classification, stratification, sampling scenarios for landings and boat activities, generic formulae for estimation of catch and effort, user-controled accuracy of estimates and basic statistical analyses. Figure 2 illustrates the generic estimation process that is based on: (i) sampled landings and boat activity, (ii) spatial extrapolation factors (i.e. number of boats-gears) and, (iii) temporal extrapolation factors.



Figure 2. Generic approach for estimating catch and fishing effort



IT standards

Figure 1 illustrated the operational aspects of the UAE-NFIS; typically a client-server approach using the PhP-MySQL platform. Figure 3 below describes the generic functions and services of the system which conform to the FAO standards with regards to Fisheries Information Systems.



Figure 3. FAO standards with regards to functions and services of Fisheries Information Systems



3 Data catalogue

3.1 Overview

At EAD the UAE-NFIS is a MySQL database using WAMP 5.6. Documenting the database is done by means of tables illustrating all data elements involved as well as their interrelationships and logical links.

The use of validation rules in the PhP interfaces ensures database integrity and reduces database quality control operations. Moreover in addition to standard and regular IT data security procedures, data integrity and data security automatic functions operating autonomously protect the data from external threats such as unexpected server crushes.

3.2 Tables

Administration database uaenfis_artadmin

++ Tables_in_uaenfis_artadmin
agents messages periods
users
++ 4 rows in set (0.05 sec)

Figure 4. The four tables of the administration database uaenfis_artadmin

Period database uaenfis_artweb

Tables_in_uaenfis_artweb	+
boats gears	Ì
by_species	İ.
effort	Í.
estimates	ĺ.
frame	Ì
grounds	
landings	
major_strata	
minor_strata	
randeff	
randland	
sites	
species	
	+
3 rows in set (0.14 sec)	

Figure 5. The thirteen tables of the "period"database uaenfis_artweb



Period database uaenfis_artweb_prices





A brief description of the UAE-NFIS databases and their tables is given in Table 1 below.

Database: uaenfis_artadmin		
This database con and data integrity a	trols the entire UAE-NFIS system in terms of a and security.	accessibility, contents
Table	Description	Linked tables
agents	Data collectors operating in the field.	Landings and effort samples.
messages	All UAE-NFIS messages come from external an source. No built-in messages appear anywhere in the system.	
periods	It controls the contents of the dynamic "period" databases.	
users	It controls access to the system by means of login credentials.	Landings, effort and frame survey data for normal users.
		for the administrator.
Database: uaenfi	s_artweb_YYYY_MM	
This database con	tains on a year-month basis the statistical stru	ucture, samples and

Table 1. The three UAE-NFIS databases and their respective tables

This database contains on a year-month basis the statistical structure, samples and estimates of catch/effort, prices and average fish weight.

boats_gears	Classification of boat-gear types.	Fleet, landings, effort, estimates, prices.
by_species	Landing details by species.	Species, landings, estimates, prices.
effort	Samples of boat activities.	Sites, boats-gears, agents.



estimates	Estimated totals by year-month-minor	Minor strata, boats-
	stratum-boat-gear. Estimates refer to: total	gears, species.
	catch, effort, CPUE, prices, values, catch	
	by species.	
frame	Statistical sampling frame for extrapolating	Sites, boats-gears,
	sample fishing effort.	agents.
grounds	Table of fishing grounds.	Landings.
landings	Summary of operations of the trip sampled.	Sites, boats-gears,
		fishing grounds,
		species, agents.
major_strata	Administrative strata.	Minor strata.
minor_strata	Minor (statistical strata). A minor stratum is	Major strata, sites,
	part of an estimation context: year-month,	estimations, prices.
	minor stratum, boat-gear.	
randeff	A work table not transparent to users. It	effort
	determines the primary access keys for	
	effort samples.	
randland	A work table not transparent to users. It	landings
	determines the primary access keys for	
	landing samples.	
sites	A table of sites and ports	Minor strata, landings,
		effort, frame.
species	Species classification	Catch by species,
		estimates, prices.
Database: uaenfis_artweb_prices_YYYY		
This database contains on a year basis the estimated prices by species. A special 3-		
stage procedure yields hypothetical species prices in the case of missing input		
information.		
prices	Estimated species prices	Minor strata, boats-
		gears, species.

3.3 Data dictionary (inclusive of relationships)

Table 2. UAE-NFIS databases, tables, variables and links

Database: uaenfis_artadmin		
This database controls the entire UAE-NFIS system in terms of accessibility, contents and data integrity and security.		
Columns in table: agents	Description	Links
agent_code	Code of data collector	eff_agent in Table: effort Ind_agent in Table: landings



	Data collectoria nome	
agent_name	Data collector s name	
agent_title	Functional title	
Columns in table:	Description	Links
messages		
message	A numbered piece of text used in system displays	
Columns in table:	Description	Links
periods	2 coonpaint	
	Depend key Veen menth	
ŶŶŶŶĬVIIVI	Record Key – Year-month.	
	it refers to a period database of the format.	
	uaenfis artweb YYYY MM	
state	? = empty, R=Released, B=blocked, F=Finalized,	
allrecs	Total number of database records.	
allerrs	Errors found.	
mirecs	Number of major strata.	
mjerrs	Errors in major strata.	
mnrecs	Number of minor strata.	
mnerrs	Errors in minor strata.	
sirecs	Number of sites.	
sierrs	Errors in sites.	
bgrecs	Number of boats-gears.	
bgerrs	Errors in boats-gears.	
frrecs	Number of frame records.	
frerrs	Errors in frame records.	
landrecs	Number of landings.	
landerrs	Errors in landings.	
sperecs	Number of by-species records.	
speerrs	Errors in by_species records.	
fgrrecs	Number of fishing grounds.	
fgrerrs	Errors in fishing grounds.	
effrecs	Number of effort records.	
efferrs	Errors in effort records.	
estrecs	Number of estimates.	
esterrs	Errors in estimates.	
unkg	Weight unit (i.e. Kg)	
unval	Currency (i.e. AED)	
Columns in table:	Description	Links
users		
user_code	Numeric access code	Ind_uname in Table: landings eff_uname in Table: effort
user_name	User name max 30 chrs	
user_office	Office max 30 chrs	
user_phones	Phone(s) max 30 chrs	
user_email	Email max 30 chrs	
user_id	Login id max 12 chrs	
user_pwd	Login password max 12 chrs	
user_auth	User authorization: AD=Administrator, DO=Data	
	Operator, DS=Data Supervisor, PR=Privileged	
user data group	A two-character field linking users with sites of	si dacode in Table: sites
	functional responsibility	

Database: uaenfis_artweb_YYYY_MM

This database contains on a year-month basis the statistical structure, samples and estimates of catch/effort, prices and average fish weight.



Columns in table:	Description	Links
boats_gears		
bg_primary	Boat-gear access key	eff_bg in Table: effort Ind_bg in Table: landings est_bg in Table: estimates pr_bgc in Table: prices
bg_code	Boat-gear code	
bg_year	Reference year	
bg_month	Reference month	
bg_descr1	First description max 45 chrs	
bg_descr2	Second description max 45 chts	
bg_seq	Sequence or sorting order	
bg_uname	It contains the user code	user_code in Table: users
bg_auth	Authorization code	
bg_lupdte	Date record created or last updated	
bg_error	Error message if errors exist	
Columns in table by_species	Description	Links
SPE_PRIMARY	CHAR(16) Composite code: landings code + species code	Ind_code in Table : LANDINGS
SPE CODE	INT NOT NULL	sp code in Table: SPECIES
SPE LINK	INT NOT NULL,	
SPE_YEAR	CHAR(4) NOT NULL,	
SPE_MONTH	CHAR(2) NOT NULL,	
SPE_SITE	INT NOT NULL	
SPE_MNST	INT DEFAULT NULL	
SPE BG INT	INT NOT NULL	
SPE_SMPC	FLOAT Species catch in kg	
SPE_TOTC	FLOAT Total catch from landings	
SPE CATCH	CHAR(12) Input species catch	
SPE_CATCHN	FLOAT Converted to numeric	
SPE_PRICE	CHAR(12) Input species price	
SPE PRICEN	FLOAT Converted to numeric	
SPE VALUE	CHAR(12) Input species value	
SPE VALUEN	FLOAT Converted to numeric	
SPE AVW	CHAR(12) Input species average weight	
SPE_AVWN	FLOAT Converted to numeric	
SPE_NOF	CHAR(12) Input number of fish in catch	
SPE_NOFN	FLOAT Converted to numeric	
SPE_FKG	CHAR(12) Input no of fish in 1 kg	
SPE_FKGN	FLOAT Converted to numeric	
SPE_HTOT	CHAR(12) Input horizontal control total	
SPE_HTOTN	FLOAT Converted to numeric	
SPE_ERROR	VARCHAR(30) Error message	
Columns in table effort	Description	Links
EFF_CODE INT NOT NULL AUTO_INCREMENT	Sample sequence	
	Composite key (Sequenceryeartinoniti)	



NULL		
EFF_YEAR CHAR(4) NOT NULL.	Year	
EFF_MONTH CHAR(2) NOT NULL	Month	
EFF_SITE	Site code	si_code in Table: SITES
EFF_MNST	Minor stratum	
EFF_BG	Boat-gear code	bg_code in Table:
EFF_DAY	Day of sampling	
EFF_APPROACH CHAR(2) NOT NULL	Approach (boat, monthly, weekly, etc.).	
EFF_SMP	Boats active	
EFF_EXAM INT NOT NULL	Boats examined	
EFF_BSMP VARCHAR(12)	Boats active (input string)	
EFF_BEXAM VARCHAR(12)	Boats examined (input string)	
EFF_DM CHAR(4)	Monthly effort	
EFF_D10 CHAR(4)	10-day effort	
EFF_D7 CHAR(4)	Weekly effort	
EFF_AGE NT	Field agent code	
INT NOT NULL		
EFF_UNAME VARCHAR(30)	User code	user_code in Table: USERS
EFF_AÙTH VARCHAR(30)	User authorization	
EFF_DGĆ VARCHAR(2)	User group code	
EFF_LUPDTE VARCHAR(10)	Date created or of last update	
EFF_ERROR VARCHAR(45)	Error message	
Columns in table	Description	Links
ESTIMATES		
EST_KEY CHAR(16)	Composite key: Year-month=minor stratum-boat/gear.	
EST_CODE INT NOT	Sequence	
EST_YEAR int NOT	Reference year	
EST_MONTH int NOT	Reference month	
EST_MNC int not null,	Minor stratum code	mn_code in Table:MINOR_STRATA
EST_BGC int not null,	Boat-gear code	bg_code in Table:BOATS GEARS
EST_SPC int not null,	Species code	sp_code in Table:SPECIES



	Clabel Assurant	
EST_ACCOR float,	Global Accuracy	
EST_EFF_NBOATS int	Estimated number oof boats	
not null.		
EST EEE NACT float	Number of active boats	
	Comple heats active	
ESI_EFF_ACIBOAIS	Sample boars active	
int,		
EST_EFF_EXBOATS	Sample boats examined	
int.		
EST EEE ACTDAVS	Active days (in a month week etc.)	
	Active days (in a month, week, etc.)	
noat,		
EST_EFF_EXDAYS int,	Days examined (30, 7, etc.)	
EST_EFF_PBA float,	Estimated PBA (Probability Boat Active)	
EST_EFF_NSMP int.	Number of samples for effort	
EST EEE NDAVS int	Number of different sampling days	
EST_EFF_CV float,	Coefficient of variation for PBA	
EST_EFF_SUI float,	Sampling Uniformity Index (effort)	
EST_EFF_APPROACH	Small or Large Population Theory	
EST EFE DODTVDE	Effort population type (concave, convex)	
cnar(4),		
EST_EFF_SPAACCUR	Effort accuracy using Small Population Theory	
float,		
EST EFF TMPACCUR	Effort temporal Accuracy	
float		
	Type of compling opproach (monthly weakly stal)	
ESI_EFF_SCENARIO	i ype of sampling approach (monthly, weekly, etc.)	
char(15),		
EST_EFF_EFFORT	Estimated fishing effort	
float.	C C	
EST I ND NSMP int	Number of sample landings	
EST_LND_NDAYS int,	Number of different sampling days	
EST_LND_SMPCATCH	Sample catch (total)	
float,		
EST IND SMPDUR	Sample duration (total)	
float		
	Ormala Ortak Dan Hait Effant (ODHE)	
EST_LND_CPUE float,	Sample Catch-Per-Unit-Effort (CPUE)	
EST_LND_CV float,	CPUE coefficient of variation	
EST LND SUI float,	CPUE Sampling Uniformity Index	
EST IND POPTYPE	CPLIE Population Type	
char(4)		
EST_LND_SPAACCUR	CPUE Spatial Accuracy	
float,		
EST LND TMPACCUR	CPUE Temporal Accuracy	
float		
	Sample species catch	
	Cample species calon	
ESI_LND_PRICE float,	Estimated average price per kg	
EST_LND_VALUE	Estimated value	
float.		
EST I ND AV/W float	Estimated average weight of an individual	
	Estimated number of individuals in total actal	
float,		
EST_NOSPE int,	NA	
EST ERROR	Error message	
VARCHAR(30)		
EST AV/I EN floot	ΝΛ	
ESI_AVG1 float,	NA	
EST_TOTGT float,	NA	
EST AVKW float.	NA	
EST TOTKW float	NA	
ESI_IOTCREW float,	NA	
EST_AVGU float,	NA	
EST TOTGU float	NA	
or oo nout,	· · · ·	1



EST_AVDUR float,	NA	
EST_AVHRS float,	NA	
EST_TOTHRS float,	NA	
Columns in table FRAME	Description	Links
	Composite code (Xear, month, site code, hoat-gear, code)	
CHAR(12) NOT NULL,		
FR_CODE VARCHAR(10) NOT NULL,	Site code + Boat-gear code	
FR_YEAR CHAR(4) NOT NULL,	Reference year	
FR_MONTH CHAR(2) NOT NULL,	Reference month	
FR_SITE INT NOT NULL,	Site code	si_code in Table:SITES
FR_BG INT NOT NULL,	Boat-gear code	bg_code in Table:BOATS_GEARS
FR_NB VARCHAR(12),	Input string number of boats	
FR_NBN FLOAT,	Converted to numeric	
FR_AD VARCHAR(12),	Input string number of active days	
FR_ADN FLOAT,	Converted to numeric	
FR_UNAME VARCHAR(30) NOT NULL,	User	user_code in Table:USERS
FR_AUTH VARCHAR(30) DEFAULT NULL,	User authorization	
FR_LUPDTE VARCHAR(10) NOT NULL.	Date created or of last update	
FR_ERROR VARCHAR(60),	Error message	
Columns in table GROUNDS	Description	Links
FGR_PRIMARY CHAR(9) NOT NULL.	Composit code: year-month-ground code	
FGR_CODE INT NOT NULL,	Code of fishing ground	Ind_ground in Table: LANDINGS
FGR_YEAR CHAR(4) NOT NULL,	Referene year	
FGR_MONTH CHAR(2) NOT NULL,	Reference month	
FGR_DESCR1 VARCHAR(45),	Description 1	
FGR_DESCR2 VARCHAR(45),	Description 2	
FGR_SEQ VARCHAR(6),	Code controlling sorting order	
FGR_UNAME VARCHAR(30) NOT	User	user_code in Table: USERS



NULL,		
FGR AUTH	User authorization	
DEFAULT NULL,		
FGR_LUPDTE	Date of creation or of last update	
VARCHAR(10) NOT		
NOLL,	-	
FGR_ERROR	Error message	
VARCHAR(60),		
Columns in table	Description	Links
LANDINGS		
	Landing sequence code	
	Landing sequence code	
NULL		
AUTO_INCREMENT.		
LND YEAR CHAR(4)	Reference year	
NUT NULL,		
LND_MONTH CHAR(2)	Reference month	
NOT NULL		
	Pandem number	
LND_KEY CHAR(16),	Composit key: year-rmonth-site-boat/gear codes	
LND SITE INT NOT	Site code	si code in Table:SITES
LND_MNSTINT,	Minor stratum code	
LND_BG INT NOT		bg_code in Table:BOATS-
—		GEARS
	Complian day	GEARG
LIND_DAY INT NOT	Sampling day	
NULL,		
LND NOU INT.	Number of fishing units	
	Trip duration in days	
LIND_DOK IIOal,	The duration in days	
LND_NTRIPS INT,	No. of trips on the same day	
LND EFF FLOAT,	Sample effort	
	Sample CPLIE	
LND_TOT CHAR(12),	Input string for total catch	
LND TOTN FLOAT,	Converted to numeric	
IND RE CHAR(12)	Raising factor in case of sub-sampling (input string)	
	Converted to numeric	
LND_RFN FLOAT,		
LND_AGENT INT NOT	Data collector	agent_code in Table: AGENTS
NULL.		
	llsor	user code in Table: LISERS
VARCHAR(30),		
LND_AUTH	User authorization	
VARCHAR(30).		
	Lleer data group code	
VARCHAR(2),		
LND_LUPDTE	Date of creation or of last update	
VARCHAR(10).	·	
	Enormessage	
VARCHAR(45),		
LND REMARK	Remarks on the sample landings	
VARCHAR(45)		
	Deat as sisteration, as such as	+
LND_BREG	Boat registration number	
VARCHAR(12),		
LND BNAME	Boat name	
VARCHAR(30),		
LND_OWNER	Name of owner	
VARCHAR(30).		
	License no	



VARCHAR(12),		
LND_CREW INT,	No. of crew onboard	
LND_GROUND	Code of fishing ground(s)	tgr_code in Table: GROUNDS
CHAR(40),		
Columns in table MAJOR_STRATA	Description	Links
(MJ_PRIMARY CHAR(9) NOT NULL,	Composite code: year-month-major stratum code	
MJ_CÓDE INT NOT NULL,	Code of major stratum	mn_asso in Table: MINOR STRATA
MJ_YEAR CHAR(4) NOT NULL,	Reference year	
MJ_MONTH CHAR(2) NOT NULL,	Reference month	
MJ_DESCR1 VARCHAR(45),	Description 1	
MJ_DESCR2 VARCHAR(45),	Description 2	
MJ_SEQ VARCHAR(6),	Sequence code controlling sorting order	
MJ_UNAME VARCHAR(30) NOT NULL,	User	user_code in Table: USERS
MJ_AUTH VARCHAR(30) DEFAULT NULL,	Authorization code	
MJ_LUPDTE VARCHAR(10) NOT NULL,	Date of creation or of last update	
MJ_ERROR VARCHAR(60),	Error message	
Columns in table MINOR_STRATA	Description	Links
MN_PRIMARY CHAR(9) NOT NULL,	Composite code: year-month-minor stratum code	
MN_CODE INT NOT NULL,	Code of minor stratum	est_mnc in Table: ESTIMATES
MN_YEAR CHAR(4) NOT NULL,	Reference year	
MN_MONTH CHAR(2) NOT NULL,	Reference month	
MN_DESCR1 VARCHAR(45),	Description 1	
MN_DESCR2 VARCHAR(45),	Description 2	
MN_ASSO INT NOT NULL,	Associated to (code of major stratum)	mj_code in Table: MAJOR_STRATA
MN_SEQ VARCHAR(6),	Sequence code controlling sorting order	
MN_UNAME VARCHAR(30) NOT NULL,	User	user_code in Table: USERS



MN_AUTH VARCHAR(30) DEFAULT NULL,	Authorization code	
MN_LUPDTE VARCHAR(10) NOT NULL,	Date of creation or of last update	
MN_ERROR VARCHAR(60),	Error message	
Columns in table RANDEFF	Description	Links
RND_EFF_CODE	New sample no for effort.	
Columns in table RANDLAND	Description	Links
RND_LND_CODE	New sample no for landings.	
RND_LND_RAND	Unique random number	
Columns in table SITES	Description	Links
SI_PRIMARY CHAR(9) NOT NULL,	Composite code: year-month-minor site code	
SI_CODE INT NOT NULL,	Code of site	Ind_site in Table : LANDINGS
SI_YEAR CHAR(4) NOT NULL,	Reference year	
SI_MONTH CHAR(2) NOT NULL,	Reference month	
SI_DESCR1 VARCHAR(45),	Description 1	
SI_DESCR2 VARCHAR(45),	Description 2	
SI_ASSO INT NOT NULL,	Associated to (minor stratum code)	mn_code in Table: MINOR STRATA
SI_DGCODE VARCHAR(2).	Data group code	<mark>user_data_group</mark> in Table: USERS
SI_SEQ VARCHAR(6),	Sequence code controlling sorting order	
SI_UNAME VARCHAR(30) NOT NULL,	User	user_code in Table: USERS
SI_AUTH VARCHAR(30) DEFAULT NULL,	Authorization code	
SI_LUPDTE VARCHAR(10) NOT NULL,	Date of creation or of last update	
SI_ERROR VARCHAR(60),	Error message	



Columns in table SITES	Description	Links
SP_PRIMARY CHAR(9) NOT NULL,	Composite code: year-month-minor species code	
SP_CODE INT NOT NULL,	Code of species	spe_code in Table: BY_SPECIES est_code in Table: ESTIMATES
SP_YEAR CHAR(4) NOT NULL,	Reference year	
SP_MONTH CHAR(2) NOT NULL,	Reference month	
SP_DESCR1 VARCHAR(45),	Description 1	
SP_DESCR2 VARCHAR(45),	Description 2	
SP_SEQ VARCHAR(6),	Sequence code controlling sorting order	
SP_UNAME VARCHAR(30) NOT NULL,	User	user_code in Table: USERS
SP_AUTH VARCHAR(30) DEFAULT NULL,	Authorization code	
SP_LUPDTE VARCHAR(10) NOT NULL,	Date of creation or of last update	
SP_ERROR VARCHAR(60),	Error message	



4 Procedures

INITIAL SET-UP

System installation, initial database set-up

Setting-up all administration tables (users, agents, etc.)

Setting-up a first model period. Strata, ports, boat-gear types, species, fishing grounds, sampling frame.

Regular (monthly) procedures





5 Views and rules (Administrator)

UAE-NFIS operations are broadly divided into four groups: Administration, Data Operations, Privileged Users and Public Users. The first group of operations is performed with the purpose of setting-up, maintaining and diffusing system standards, primary data and catch/effort estimates using basic internet services. Actual work on catch/effort samples collected in the field is done by Data Operators on a decentralized basis. Data Operators use the functions of UAE-NFIS to input samples and formulate monthly catch/effort estimates of local scope. Such data is instantly reflected on the database using internet connections and services.



Figure 7. UAE-NFIS home page

5.1 Administration functions

This section explains briefly the ways of setting-up system tables needed for the monthly tasks of inputting and estimation. It further describes the manner in which catch/effort estimates are produced, along with a brief description of the reporting functions. It should be noted that:

• The UAE-NFIS Administration Group should avoid changing the system standards during an operational cycle of one year; such changes would render the monthly estimates incomparable.

• System standards ought to be set-up collectively and reviewed on an annual basis.





Figure 8. The one table of the "period" database uaenfis_artweb_prices

GENERAL ADMINISTRATION FUNCTIONS

The administrative functions listed in the left column are of general type and involve:

- Table of users;
- Table of field agents;
- Workload Statistics;
- Work Progress Monitoring;
- List of databases;
- Storage plan of databases;
- System Backup;
- System Restore;
- Communications.

SYSTEM STANDARDS AND DATABASE ADMINISTRATION

The administrative functions listed in the right column are database-specific and involve:

- 1. Creation of a new database;
- 2. Populate a new database with tables from another database;



- 3. Set-up new tables for a new database;
- 4. Delete a database;
- 5. Release a database for inputting;
- 6. Block a database;
- 7. Finalize a database;
- 8. Backup a single database;
- 9. Restore a single database.

UAE-NFIS databases are organized in time periods determined by year and month. The way their names are displayed follows the convention YYYY MM X, where:

- YYYY is the year.
- MM is the month.
- X is the state of the database. The following types apply:

• State (?): A database with no or incomplete tables. It can only be accessed by the administrator.

- State (R): Database released to Data Operators. Its tables are complete.
- State (B): Database was blocked by the administrator with exclusive access.
- State (F): Database was finalized by the administrator. The database is accessible on read-only, even by the administrator.

• State (H): A historical database. To be accessed it must first be restored as (F) by the administrator.

At the bottom of the central column the administrator can access the functions for privileged users and data operators respectively. A description of these functions is given in the respective computer operations guides.

5.2 Table of UAE-NFIS users

The table of users determines the persons that have access to UAE-NFIS functions as well as the type of access. There are at present five accessing levels of which the first four require login verification. These are:

1. Administrator: Full read-write access to all system contents.



2. Data Supervisor: Write access to only fleet, landings and effort data and only on a limited geographical basis determined by The Data Group Code (DGC). She/he can access records created by other Data Operators with the same DGC. She/he is only allowed read access to tables and estimations.

3. Data Operator: Same access rights as above but write permission is given only for records created by her/him alone.

4. Privileged User: Read-only access to fleet, landings, effort, estimations and all statistical reports.

5. Public User: No login required. Read-only access to statistical summaries. This type does not appear in the USERS' Table as no login is required.

The following considerations apply:

- User names are automatically produced by an automatic randomization process.
- Passwords are determined by the administrator.

• For Data Supervisors and Operators a single Data Group Code (DGC) is needed. This code will determine the geographical scope of each operator. A code of 99 allows global access without geographic limitations (super-supervisor).

• User records cannot be physically removed. If a person has ceased to be a user, the relating entries can be changed to reflect this status.

Home	Admir	istrator	Quit UAE-NFIS			
Add a blank recor	- The Data Group Code is Al acces and PB for public. - Submit Data button to be fo	D for Admin, PR for privileged bund at the bottom of the table Delet	e padded blank records			
User id.	User name	Office/Institution	Phone(s)			
Password	Email	Authorization	Data Group Code			
	CS	Administrator V				
DERH002	Stanley Hartmann	UAE-NFIS Administrator	971505913454			
!stanley0103	shartmann@ead.ae	Administrator	AD V			
BENLN003	Khalfan Al Suwaidi	Enumerator	971506888799			
!khalfan1298	khalfan.suwaidi@ead.ae	Data Supervisor V	99 V			
NVRIP004	Khalfan Al Suwaidi	Enumerator	971506888799			
!khalfan1298	khalfan.suwaidi@ead.ae	Data Operator	05 V			
EGUIC005	Irshad Vaza	EAD IT Expert	971557087869			
!irshad1147	irshad.vaza@ead.ae	Administrator	AD ✓			
TXPWM006	Faisal Ali Al Hammadi	Enumerator	971506199500			
!faisal1345	Faisal.Hammadi@ead.ae	Data Operator	02 V			
ZUOMW007	Thani Al Hammadi	Enumerator	971506415342			
!thani1147	Ishaq.Alhammadi@ead.ae	Data Operator	02 V			
WNIKD008	Khalid Al Hammadi	Enumerator	971507530383			
!hammadi1402	khalid.alhammadi@ead.ae	Data Operator	01 V			
HDTMU009	Khalid Al Hosani	Enumerator	971506607616			

Figure 9. Table of UAE-NFIS users



5.3 Table of UAE-NFIS field agents

This table contains the names and functional titles of the data collectors. In UAE-NFIS the field agents must all have entries in this special table.

As in the case of Users, it is advisable that data collectors' records are not removed physically in order to keep a history of all persons collecting catch/effort samples.

Home			Administrator		Quit UAE-NFIS		
Agent id	Name			Functional title			
1	ظرٍ ط§ظµظپطٹطTaisal Al Hammadiظ			Data Operator - Sila		1	
2	,ط«ط§ظ†ظٹ ط§ظ Thani Al Hammadi			Data Operator - Sila			
3	thalfan Al Suwaidiظ®ظ,ظبط			Data Supervisor - Abu Dhat	pi		
4	ط®ط§ظ ٍط ۖ ط§ظKhalid Al Hammadi			Data Operator - Delma Islar	ıd		
5	ط®ط§ظ ٍط ط§ظ Khalid Al Hosani ط®			Data Operator - Abu Dhabi			
6	ظظططط ط£طظ Mohamed Ahmed			Data Operator - Al Marfa			
7	"ط³ط¹ظٹط ط§ظ Saeed Al Hosani			Data Operator - Delma Islar	ıd		
8	"ط³ظ ֱط ط§ظ† ط§ظ Sultan Al Ali			Data Supervisor - Abu Dhat	di 🛛		
9	ظِيْطِ ظَرْطَ طَ Yaqoob Al Hammadi ظَيْطُ الْحَارِ طَ			Data Operator - Al Marfa			
10	ظئظ ُطْاظ طوط الإطلاع Yousif Al Hammadi			Data Operator - Al Sadar			
11							
12							
13							
14							
<	lir			li -		>	1
		Submit da	ta and update				

Figure 10. Table of UAE-NFIS field agents

5.4 UAE-NFIS system messages

All UAE-NFIS messages, prompts and diagnostics are available in three languages in an excel document (MESSAGES_UAE_NFIS.XLSM) that resides on sub-folder EXCEL of the Wamp 5.6 server. There are about 900 messages at present.

The Excel document is not itself accessible by the system. Upon completing editing the administrator must press CTL+W in order to transfer the Excel content onto the text file MESSAGES.TXT that resides on the same EXCEL sub-folder and will be read by the system at login time.



5	MESSAGES_UAE_NFIS.stsm - Microsoft Exc	
Paste	Yout Anial Narrow 18 A* a* = ≫ > M* Wasp Text Text Convolution Mail Age of Convolution B I 1 • > A* a* = = > Mail Margo A Center • Text - Convolution Mail Age of Convolution B I • > A* a* = = If I Mail Margo A Center • If A* a* a* Continuant formatting	I Format Cel I romat Cel I ratable Spiler Celar · Sort & Find & Celar · Shift · Select ·
CI	Clipboard 14 Font 14 Alignment 14 Number 14	Styles Cells Editing
a 1	1 2	4
1 0	0 English	العربية
2 1	1 LTR RTL	
3 2	2 Project for the Sustainable Management of Fisheries - National Fisheries Information AE-NFIS"	مشروع الإدارة المستدامة للمصايد - النظام الوطني للمعلومات السمكية لدولة الإمار
: 3	3 Public access (no login required)	الدخول لعامة المستخدمين (لا يتطلب تسجيل الدخول)
s 4	4 Login	المُستخدم المُميز - تسجيل الدخول مطلوب
5	5 Welcome to UAE-NFIS, a web-supported system for the statistical monitoring (اقبة الإحصاء)	مرحباً بكم في النظام الوطني للمعلومات السمكية المتوافق مع الشبكة المعلوماتية لمر
7 6	6 User id.	اسم المستخدم
s 7	7 Password	كلمة السر
8	8 Please first select the language desired using the three underlined options.	الرجاء تحديد اللغة باختيار أحد الخيارات الثلاثة المعروضة على يمين الشاشة
o 9	9 You may then gain restricted access to the public services which involve data summa	قد تتمكن من الحصول على الخدمات العامة التي تتضمن ملخصات البيانات و
1 10	10 general information on the system methodology and its operations.	معلومات عامة عن منهجية النظام وعملياته
2 11	11 Functions for privileged access will need a valid user id and a password.	للإطلاع على المزيد من المعلومات ينبغي الحصول على اسم المستخدم وكلمة المرو
3 12	12 For further information and queries please contact:	لمزيد من المعلومات والاستفسارات يرجى الاتصال:
4 13	13 Mr Stanley Hartmann	السيد ستاتلي هارتمان
s 14	14 Unit Head, Fisheries Investigation & Monitoring	رنيس وحدة، مراقبة مصايد الأسماك
6 15	15 Environment Agency, Abu Dhabi	هينة البينة - أبوطبي
7 16	16 P.O.Box 45553 Abu Dhabi	ص.ب.: 45553 أيوظبي
s 17	17 shartmann@ead.ae	shartmann@ead.ae
» 18	18 Administrator	مدير النظام
. 10 ∢ ∢ →	10 Data Onerator	1 4

Figure 11. UAE-NFIS system messages

5.5 Workload statistics

Workload Statistics : 2017 10 F - 2018 01 B

Data collector	Landing samples	% to total	Effort samples	% to total	All samples	% to total
ظر ط§ظµظيظڻط Faisal Al Hammadi	25	17.36	23	19.17	48	18.18
"ط«ط§ظ†ظتْ ط§ظ Thani Al Hammadi	4	2.78	1	0.83	5	1.89
لاهظ ظيط Khalfan Al Suwaidi أط المناهظ إطلاع الم	9	6.25	11	9.17	20	7.58
ط®طؤظ طلائظ Khalid Al Hammadi	19	13.19	9	7.50	28	10.61
ط®ط§ظ ٍط [−] ط§ظ Khalid Al Hosani	11	7.64	12	10.00	23	8.71
Mohamed Ahmed ططط معطط مع	14	9.72	11	9.17	25	9.47
_طِدْطِانْظَتْطَ طَؤْظَ Saeed Al Hosani ہے۔	15	10.42	16	13.33	31	11.74
يطقطيط طؤظ† طؤظ Sultan Al Ali						
ظِتْطَاظ ظَرْطَ" ط Yaqoob Al Hammadi	13	9.03	10	8.33	23	8.71
ظِنْطْ طْقْطْ عَلَى عَلَيْظَ Yousif Al Hammadi خَلْتُطْ مَا	34	34 23.61 27 22		22.50	61	23.11
	144	100	120	100	264	100

Return

Figure 12. UAE-NFIS workload statistics

The purpose of this function is to provide the administrator with information on the type and amount of data collection carried out by the data collectors.

Workload statistics on catch and effort data collection can be produced for any time interval selected by the administrator.

5.6 Work progress monitoring



Work Progress Monitoring : 2017 12 F Return

Minimum accuracy for effort : 90 % Minimum accuracy for CPUE : 90 %

	Delma Island المربع المربع المربع المربع - Lansh - Gargour معلم المربع المربع المربع المربع المربع الم											
	Active	Days	Boat	s/Gears	Sar	npling days	M	inimum required	Sa	mples	Minimum required	Remarks
Landings	3	1		39		1		7		9	19	
Effort (weekly)										7	11	
يۈ-ئۈنۈك⊂ دانداھ Delma Island المان مراھار - Ş - Tarad - Ghazal پر المان ماندان م												
	Active	Days	Boat	s/Gears	Sar	npling days	M	inimum required	Sa	mples	Minimum required	Remarks
Landings	3'	1		81		1		7		4	22	
Effort (weekly)										3	14	
			Delma	ط Island	ه ه	ط-ط ² ظٹط <u>+</u> ط© ط	§ - Ta	ط ⁻ ط§ط rad - Hadaq	<u>-</u> ط	b <mark>§b±</mark> b-b,		
	Active	Active Days Boats/Gears		Sar	Sampling days Minimum required		Sa	mples	Minimum required	Remarks		
Landings	3	1		68	1			7		2	21	
Effort (weekly)										3	13	
			Delma I	sland 뇨	بر ه"م	3 ط-ط ² ط ار م	- Tar	ad - Nesaab 뇨†ಏ - ¯	ط§ط	ئۇطµط-ط±	î -	
		Active	Days	Boats/G	ears	Sampling d	ays	Minimum require	d	Sample	Minimum required	Remarks
UNSTARTE	D	31	I	2				7			9	
Effort (week	y)										3	
Effort (10-day	rs)										3	
Effort (month	ly)										1	
Effort (boat-appr	oach)							7			14	
		Deli	ma Isla	يرهط nd	ل© ط آ	thits2h¬b§ - T	arad	- Al Hadhra طط ٍط±ط	يۇھ,	i - Thight	@ط-ط	
	Active	Days	Boat	s/Gears	Sar	npling days	Μ	inimum required	Sa	mples	Minimum required	Remarks
Landings	31	1		1		1		7		3	7	

Figure 13. UAE-NFIS work progress monitoring

This report shows for a given month the current situation with regards to data collection. It is organized by statistical stratum (or major port) and boat-gear type. The three elements that are being monitored involve:

• Days of sampling for landings. These must be more than 8 to ensure a minimum temporal accuracy of 90%. While they are less than 8 they are marked red.

• Landings samples. They must aim at the limit given in the 5th column. While below this limit they are marked red.

• Weekly effort samples. They must aim at the limit given in the 7th column. While below this limit they are marked red.

5.7 List of databases



Home	Administrat			tor	Quit UAE-NFIS
Existing databas	ses (year-month	periods)		Note for: CS , A	dministrator
If the box is empty n	o databases have bee	n created.		The databases of	on the left are marked as follows:
Data type	Records	Errors		> ? = Newly created to a second se	ated and empty to operators for inputting
2018 01 B			~	> F = Finalized > B = Blocked for	r ADMIN work
Major Strata	1			> H = Moved to I	history
Minor Strata	4]	To view general	and detailed data contents please access
Sites and ports	7]	WORK PROGRE	ESS MONITORING in the Admin page.
Boats and gears	8]		
Species	139				
Fishing Grounds	256				
Fleet data	38				
Weight and Value Units	Kg , AED				
Landing summaries	13				
Species catch	17]		
Effort	11]		
Estimates	8]		
2017 12 F			\sim		
<		>			
	Abu	Dhabi, United Ara	ıb Em	irates. UAE-NFIS	

Figure 14. Example of a database list

Usually the first thing the administrator wishes to view is the contents of UAE-NFIS, that is which are the databases of the system, which are the periods they cover and what is their current state.

For this purpose the LIST DATABASES is used which will produce a list similar to that shown in figure 14.

Databases appear in an order showing the most recent first. The database period is accompanied by the state which is: (?) for incomplete tables, (R) released to data operators, (B) blocked by the administrator, (F) finalized and, (H) historical.

There follows a table showing a summary of its contents, including eventual errors in the inputted data.

5.8 Storage plan of all databases

Period	Status	Description	Errors	Total backup	C SV file	Single backup	C SV file
AdminDB	-	Admin DB		18/04/2018	Download .CSV	-	-
2018 01	В	Blocked		18/04/2018	Download .CSV	-	-
2017 12	F	Finalized		18/04/2018	Download .CSV	19/04/2018	Download .CSV
2017 10	F	Finalized	5	18/04/2018	Download .CSV	-	-
2017 01	?	Newly created		18/04/2018	Download .CSV	-	-

Return

Figure 15. Example of a storage plan



This report shows all databases residing on the server, along with their status and any eventual .CSV downloadable backup file.

It is good practice to regularly download the .CSV files (i.e. monthly?) and park them on local storage media for additional security.

5.9 System backup

Pressing SYSTEM BACKUP will create .CSV files for all databases (periods) contained in UAE-NFIS. These should in turn be copied into a local storage for extra security. It is advisable that database backups be conducted on a monthly basis at the latest. The .CSV files occupy very little space (about 200KB per period).

5.10 System recovery

This is the inverse operation of a total backup, only it is far more delicate because it will replace the current contents of the databases by those of the last backup operation. For this reason there are two levels of affirmative confirmation, including information as to when the current backup CSV files had been produced. Special permissions (additional user id and password) also apply.

5.11 Communications

This operation sends out messages composed by the administrator. It is a one-way approach, from the administrator to all users, to a group of users or to an individual user.

The administrator is able to see which messages have been read and which have not. He can also clear old messages to shorten the message lists.



		CO. Communications		_
Home		Administrator	Delete all messages	
New message from the administrat Title cannot be blank.	or. Use T	AB to change line. ENTER	is disabled.	
Title				
Text				
				^
				~
Recipient(s) 991-ALL 992-All operators 993-All privileged users 003-Khalfan Al Suwaidi	< >	Send message:		
				,
<				>
	Sul	bmit selection :		

Figure 16. The communications screen

5.12 Create a new database (period)

To create a new database the administrator selects the desired year-month period and clicks the "Submit selected period" button. The new database will be completely empty and marked (?).

On the left hand side of the screen users can scroll the complete list of all databases contained in UAE-NFIS.

Home	Administra			or	Quit UAE-NFIS
Existing databases	s (year-mont	h periods) en created.			Selection of a period
Data type	Records	Errors			
2018 01 B]		~		
Major Strata] 1				
Minor Strata	4				
Sites and ports	7				
Boats and gears	8				
Species	139				
Fishing Grounds	256				
Fleet data	38				
Weight and Value Units	Kg , AED			s	ubmit selected period
Landing summaries	13				
Species catch	17				
Effort	11				
Estimates	8				
2017 12 F]		\sim		
<		>			
The databases on the left are marked	as follows: :> '	? = Newly created a	nd er	npty,> R = Rel	eased to operators for inputting

The databases on the left are marked as follows: : ---> 7 = Newly created and empty , ---> F ---> F = Finalized , ---> B = Blocked for ADMIN work , ---> H = Moved to history

Figure 17. Create a new database



5.13 Copy existing tables to a new database

Here the administrator uses an existing database to copy its tables to a newly created database. This is useful when tables have to be carried over during periods in which there are no significant changes to the system tables.

The following considerations apply:

- The source database must be (F-finalized), (R-released), or (B-blocked).
- The object database can only be (? with no tables).

5.14 Set-up system tables

This function allows for setting-up or editing of the system tables for a specific year-month period to be specified by the administrator. This is a one-off operation when the system enters its first implementation phase. During the subsequent periods tables are carried forward using the procedure shown previously (Section 5.13).

There are seven table types:

- 1. Major Strata (Administrative, Geographical, etc.)
- 2. Minor Strata (Statistical zones at estimation level, "logical" strata).
- 3. Sites and ports.
- 4. Boats and gears.
- 5. Species.
- 6. Fishing grounds.
- 7. Fleet table.

NOTE: Only newly created (?) or blocked (B) databases can be accessed by the administrator.

5.15 Delete a database

Only empty databases marked (?) can be deleted.

If a differently marked database has to be deleted, the administrator must first convert it to (?) by blocking it and then by deleting all of its tables.



5.17 Release for inputting

Only newly created (?) or blocked (B) databases can be released for input operations by the data operators.

If differently marked databases (i.e. H or F) have to be released, the administrator must first convert them to (B) by blocking them and then by releasing.

5.18 Block a database

By blocking a database the administrator precludes all types of access by other users. This function is useful when corrections have to be made by the administrator himself and a database should thus become "frozen" while the corrections are being made.

Databases should not remain blocked for long periods since their being inaccessible may slow down production work.

5.19 Finalize a database

Finalization of a database and marking it as (F) involves:

- Selecting an eligible database (R) or (B) that contains tables and input data and for which the catch/effort estimations have been verified.
- Re-running the estimates and this time recording them into the database.

An (F) database is available for read-only access (even by the administrator) and also remains online – i.e. readily available.

After a certain period of time all (F) databases would better be marked as (H- historical) so as to reduce the number of current databases.

5.20 Backup a single database

Figure 18 illustrates an example of a single database backup.

The resulting .CSV file will appear in the storage plan discussed earlier under 5.8.



Home	Administrat			tor Quit UAE-NFIS
Existing databases	(year-month atabases have been	periods)		Selection of a period
Data type	Records	Errors		2018 01 B
2018 01 B			~	2017 12 F 2017 10 F
Major Strata	1			2017 01 ?
Minor Strata	4			
Sites and ports	7			
Boats and gears	8			
Species	139			
Fishing Grounds	256			
Fleet data	38			
Weight and Value Units	Kg , AED			
Landing summaries	13			
Species catch	17			
Effort	11			Submit selection
Estimates	8			Submit selection
2017 12 F]		~	
<		>		
	Abu D	habi, United Arab	Emir	irates. UAE-NFIS
The databases on the left are marked > F = Finalized ,> B = Blocked for	as follows: :> ? = r ADMIN work ,>	Newly created an H = Moved to his	nd err tory	mpty , \longrightarrow R = Released to operators for inputting

Figure 18. Backup a single database

5.21 Restore a single database

This is the reverse operation of the single backup function described earlier. The backup contents will replace current contents including the database status.



6 Views and rules (Data Operators)

Data type Records Errors 2018 01 B	Existing databases (year-month periods) If the box is empty no databases have been created.			Selection of a period	
2018 01 B Effort Landings Sites and ports T Boats and gears B Show species without prices	Data type	Records	Errors		Data Processing
Major Strata 1	2018 01 B			~	○Effort
Minor Strata 4 Sites and ports 7 Boats and gears 8 Species 139 Fishing Grounds 256 Field ata 38 Weight and Value Units Kg . AED Landing summaries 13 Species catch 17 Effort 11 Estimates 8 2017 12 F Submit selection : Privileged Users' Functions (Please use the above link for privileged access to reports and data)	Major Strata	1			○ Landings
Sites and ports 7 Boats and gears 8 Species 139 Fishing Grounds 266 Fied data 38 Weight and Value Units Kg . AED Landing summaries 13 Species catch 17 Estimates 0 Include nul estimates Species catch 17 Estimates 8 2017 12 F Submit selection : Privileged Users' Functions (Please use the above link for privileged access to reports and data)	Minor Strata	4			
Boats and gears 8 Species Show species without prices Species 139 Estimation process Fishing Grounds 256 Include nul estimates Species catch 17 Include nul estimates Species catch 17 Submit selection : 2017 12 F Submit selection : Privileged Users' Functions (Please use the above link for privileged access to reports and data) Privileged users and data)	Sites and ports	7			
Species 139 Fishing Grounds 256 Fielet data 38 Weight and Value Units Kg, AED Landing summaries 13 Species catch 17 Effort 11 Estimates 8 2017 12 F Submit selection : Privileged Users' Functions (Please use the above link for privileged access to reports and data)	Boats and gears	8			O Show species without prices
Fishing Grounds 256 Fleet data 38 Weight and Value Units Kg , AED Landing summaries 13 Species catch 17 Effort 11 Estimates 8 2017 12 F Submit selection : Privileged Users' Functions (Please use the above link for privileged access to reports and data)	Species	139			
Fleet data 38 Estimation process Weight and Value Units Kg , AED Include nul estimates Landing summaries 13 Only non-zero estimates Species catch 17 Only non-zero estimates Effort 11 Submit selection : Privileged Users' Functions (Please use the above link for privileged access to reports and data) Privileged data	Fishing Grounds	256			
Weight and Value Units Kg , AED Include null estimates Landing summaries 13 Only non-zero estimates Species catch 17 Submit selection : Effort 11 Submit selection : 2017 12 F Privileged Users' Functions (Please use the above link for privileged access to reports and data)	Fleet data	38			Estimation process
Landing summaries 13 Implies of the counted of the	Weight and Value Units	Kg , AED			Oloclude nul estimates
Species catch 17 Effort 11 Estimates 8 2017 12 F Submit selection : Privileged Users' Functions (Please use the above link for privileged access to reports and data)	Landing summaries	13			Only non-zero estimates
Effort 11 Estimates 8 2017 12 F Submit selection : Privileged Users' Functions (Please use the above link for privileged access to reports and data)	Species catch	17			0 0,
Estimates B Submit selection : 2017 12 F Privileged Users' Functions (Please use the above link for privileged access to reports and data)	Effort	11			
2017 12 F Submit selection : Privileged Users' Functions (Please use the above link for privileged access to reports and data)	Estimates	8			
Privileged Users' Functions (Please use the above link for privileged access to reports and data)	2017 12 F			\sim	Submit selection :
<u>Privileged Users' Functions</u> (Please use the above link for privileged access to reports and data)	<		>	1	
(Please use the above link for privileged access to reports and data)					Privileged Users' Functions
access to reports and data)					(Please use the above link for privileged
					access to reports and data)

he databases on the left are marked as follows: : ---> ? = Newly created and empty , ---> R = Released to operators for inputting --> F = Finalized ---> B = Blocked for ADMIN work ---> H = Moved to history

Figure 19. The data operators' screen

Data Operators and Supervisors (DOPS) are in charge of inputting into the UAE-NFIS database data relating to catch and fishing effort. Computer operations are carried out on a daily basis at each outpost.

After logging-in DOPS may select a database from a list of available (released) periods. Only periods that are marked (R) can be accessed for inputting.

Selection of a period is followed by the type of inputting desired, i.e. Effort or Landings.

Below these inputting functions there are read-only functions including:

- Estimation reports.
- Working Reports.

6.1 Effort data

Effort data will automatically be selected by the system to show only sites pertaining to the Data Group Code (DGC) of the Data Operators.



These can be further filtered in order for inputting to "lock in" into a specific set of sir-boat/gear combination, so as to avoid the recording of information under wrong site-boat/gear classifications. This option is recommended for regular inputting sessions.

Home			Data Operat	ors' Function
Selection	n of sites and boat / gear type	S		
Pleases	select a site. A blank will select all sites.			
ل"ظط Delma Island	≷ط−ط²ظٹط±ط© ط⁻ّ	~		
Diagona aglast	- h t / t A hlands will t - II t -			
Please select a lansh - Gargour	a boat / gear type. A biank will select all ty +ظ ظ+ط - خط+ظظ	pes.		
	1 - 1 - 1 - 1			
	Submit selection			

Figure 20. Filtering ports and boats-gears for effort inputting

Users may filter the site only and leave all boats/gears to be included, or focus on only one boat/gear type and include all sites. By not specifying any site or a boat/gear, the system will make available all records pertaining to the operator's Data Group Code (DGC). The last two options are not recommended for regular inputting sessions.

Figure 21 illustrates an example of selected effort records. The top entry is a blank record intended to be completed and inserted into the database; it is thus shown in dark blue background to make it evident that it concerns a new insertion.

Existing records can be edited and/or deleted on a multiple basis.

The following considerations apply:

- Due attention to the day of sampling. If unchanged it will affect the temporal accuracy.
- Likewise the data collector should be specified correctly, as this entry affects workload statistics.
- Days worked in past week are indicated from a drop-down list.

Pressing the Submit button will generate a summary of insertions, deletions and replacements.



Hom	e	Р	rivileged User		Da	Data Operators' Functions		
ease note that the data ecords saved under oth	shown here are related o er identifiers will not sho	only to : Dein w here.	تھرھط na Island	−ط² ظثْط± ط© ط	Þ§ Lansh - G	لا`ط argour	±ظ,,ڟ†ط` - ظ,ط±ظ,	
Delma Is	sland لظيظط ظيظ	¥ 🗸	Boats Active	Day Ap	proach - Days	s at sea		
Day: 1 🗸 Lansh -	ط´ ۔ ظ _ِ ط <u>+</u> ظ,ظ^ط Gargour	1 🗸	Boats Examined	In month	In 10 days V	In week		
aisal Al Hammadi الأط	ظ dyظu	~						
0011 Delma Is	sland لظيظط على sland يُطيني على الم	¥ 🗸	Boats Active	Day Ap	proach - Days	s at sea	Mark record for deletion	
)ay : 1 🗸 Lansh - (ط' ۔ ظ,ط <u>+</u> ظ,ظ'ط Gargour	1 ~	Boats Examined	In month	In 10 days	In week	2018/04/17 CS	
aisal Al Hammadi الأط	ظ _" ط§ظµظپ	~						
0010 Delma Is	ٹط±ط©ط طیظ…ط land	¥ 🗸	Boats Active	Day Ap	proach - Days	s at sea	Mark record for deletion	
Day: 1 V Lansh -	ط' ۔ ظ _ن ط <u>+</u> ظ,ظ [*] ط Gargour	1	Boats Examined	In month	In 10 days	In week 6 V	2018/04/17 CS	
للثط Faisal Al Hammadi	ظ ط&ظµظپذ	~						
0009 Delma Is	and للليظ يظيط band للط	¥ 🗸	Boats Active	Day Ap	proach - Days	s at sea	Mark record for deletion	
Dav 1 V Lanch	Garmour hihihith hi ih	.t v	Boats Examined	In month	In 10 days	In week	2018/04/17 CS	
		Submit dat	a and update					

Figure 21. Input screen for fishing effort

6.2 Landings data

Landings will automatically be selected by the system to show only sites pertaining to the Data Group Code (DGC) of the Data Operators.

These can be further filtered in order for inputting to "lock in" into a specific set of sir-boat/gear combination and thus avoid the recording of information under wrong site-boat/gear classifications. The filtering approach is identical to that used for effort data and is shown in Figure 20. This function is recommended for repeating inputting sessions.

Users may filter the site only and leave all boats/gears to be included, or focus on only one boat/gear type and include all sites. Likewise by not specifying any site or a boat/gear, the system will make available all records pertaining to the operator's DGC. The last two options are not recommended for regular inputting sessions.

Figure 22 illustrates an example of selected landings records.



	Home	Data O	perators' Functions	Insert a new landing
Sample no.	Site	Total (all species)	Operations	Error
Day	Boat-Gear type	Raising Factor	Gear units Duration (days) Hours of	of fishing Updated
000022	طەط ^ى غاڭىلىيەنى ط ^ا خلىغا Delma Island §ط	100	Select to edit O Select to delete O Unmark select	tion O
31	±ظيظ†ط` - ظبط±ظبظ`ط Lansh - Gargour		0 1	0 2018/04/18 CS
000021	طحط ^ی ظتّط±ط©ط طیظ §ط	14	Select to edit O Select to delete O Unmark selec	tion O
31	Tarad - Hadaq لمنطح مط ملك المع		0 1	0 2018/04/18 CS
000020	±طۇظىظ غائىغا†طۇط، طۇغلىطط Free Port	10	Select to edit O Select to delete O Unmark select	tion O
31	إطاط - طائط Tarad - Ghazal إطاط - طائط		0 1	0 2018/04/18 CS
000019	ط-ط ² نلٹط±ط©ط ط ظرنل Delma Island کط	12	Select to edit O Select to delete O Unmark selec	tion O
31	ما طخط، مع مع مع مع المع Tarad - Hadaq المناطع المع		0 1	0 2018/04/10 Khalid Al Hammadi
000018	±طۇظىظ خاڭغا†طۇط، حاۋىظى طط	100	Select to edit O Select to delete O Unmark select	tion O
31	±ظرِظ†ط` - ظرِط±ظرِظ`ط Lansh - Gargour		0 1	0 2018/04/18 CS
000010	Al Sadar ليط طلاطيط	820	Select to edit O Select to delete O Unmark select	tion O
24	إط:ط±ط& - ط؛ط²ظ Tarad - Ghazal		0 1	6 2018/01/30 Yousof Al Hammadi
000009	±ط⁻طµط§ظ ط Al Sadar	460	Select to edit O Select to delete O Unmark selec	tion O
		Submit sel	ection :	

Figure 22. List of summary landings

To insert a new landing users click on the top right link "Insert a new landing".

To edit an existing record the "select to edit" mark is used followed by pressing the "Submit" button.

There is also available a delete option that applies on one record at a time.

Whether the choice has been an insertion or editing, the screen of Figure 23 is made available for landings data.

The following considerations apply:

LANDING SUMMARY

- Due attention to the day of sampling. If unchanged it will affect the temporal accuracy.
- Likewise the data collector should be specified correctly, as this entry affects workload statistics.
- Duration should be correct. If left 1 it will affect (overestimate) the CPUE.
- The sample catch (on light grey background) must tally with the sum of species catch, else an error occurs.
- Records marked in red as containing errors will not make part of the database.



Qui	it and return to Data Operator's	functions		Quit ar	nd return t	o Landings		
Sample no.	Site	Total (all species)	Gear units	ration Hours o lays) fishing	of I	Remark		
Day	Boat-Gear type	Raising Factor	E	rror		Data Collecto	r	
000022	ل_± ◄© ط [−] ظ _م ظط Delma Island	100	0 🗸 1	~ 0 ~				
31 🗸	Lansh - Gargour - ظ,ط±ظ,ظ^ط				Faisal Al H	" مۇئلرىلېتك łammadi	<u> </u>	
CLEAR ALL A-23 A-24 A-24 C-22, D-21, D-25)								
	Species name		Weight (kg)	Price (AED/Kg)	Value (AED)	Aver.weight (kg)	N.fish in catch	
		لآط ط Badah	50	4				
	009	یط"ط ^و ط§ط Bassar	:					
	ڭ 011 Beyah Arabi	ا ظِئْطُوط طُ ¹ ط±ط ّ	•					
	012	abban 'ظهط''طهظ	t					
		طרط 013 Jedd						
	018	ŧ						
Species name			Weight (kg)	Price (AED/Kg)	Value (AED)	Aver.weight (kg)	N.fish in catch	
وطاحط طعَظ ططَيط مع العام ا								
< l							>	

Figure 23. The landings electronic input form

SPECIES COMPOSITION

• Species catch must tally with the total sample catch.

• Species size may be expressed in three alternative ways: average weight of individuals, number of individuals in the catch and number of individuals in one kilogram. However there can be no more than one single data item indicating size.

• Species catch and total sample catch provide a checking mechanism for vertical totals.

• There is also an option to use horizontal totals so as to ensure that all arithmetic fields of the database are entered exactly as shown on the data collection form.

6.3 Estimations

Estimations can be requested at any moment and irrespective of the degree of completion of inputting.

There are two options:

1. Using the first option (include zero estimates), all estimation entities of the type month, minor stratum, boat/gear, will appear including those that for a number of reasons have resulted in zero estimates.



2. The second option limits the report to non-zero estimates only and is thus much shorter.

Figure 24 illustrates an example of such a report.

ط.ط±ط§ط" - ط؛ط ^و ظ + Tarad - Ghazal ±ط ⁻ طµط§ظ _ا ط	" Accuracy = 0.78
Effort (WEEKLY)	
Est.Effort :	403
Records :	8
Boats/Gears :	26
Active Days :	31.0
PBA :	0.500
Spatial Accur. :	0.87
Method for Accur. :	SPST
N.days :	0
Temp. Accur. :	1.00
Method for Accur. :	-
SUI :	1.00
CV (%) :	7.3 %
Landings	

Est.catch :	171,678
Records :	8
Sample catch :	3,408.0
Sample effort :	8.0
CPUE :	426.00
Aver price -	0.00

TOTALS

Accuracy :	0.70
Boats/Gears :	65
Est.Effort :	1,036
Aver.price :	1.617
Est.value :	379,971
CPUE :	226.78
Est.catch :	235,007

By species	Aver.weight (kg)	Est.Effort	Aver.price	Est.value	CPUE	Est.catch
Eshnenuh ملؤط خطخطتظ Cephalopholis hemistiktos (Yellow fin hind)		1,036	8.000	253,314	30.56	31,664
Badah للتط ط Gerres longirostris (Longtail siver biddy)		1,036	4.000	126,657	30.56	31,664
Jarjoor בלים±darcharhinidae (Shark species)		403	-	-	1.00	403
Garfah لط¬ط±ظيظ; Rastrelliger kanagurta (Indian mackerel)	-	403	-	-	410.00	165,230
Khan ᆂ֎卢† Netuma thalassina (Giant catfish)	-	403	-	-	1.25	504
Kanaad خاطط Scomberomorus commerson (Kingfish)	-	403	-	-	13.75	5,541

Figure 24. Example of an estimation procedure launched by a Data Operator



7 Statistical methodology

7.1 Formulae used in estimating catch and effort

To be noted that all computations are repeated for each statistical context, i.e a combination of: Year-month-minor stratum-boat-gear type.

In the formulae below the parameter n represents sample size while N refers to population size.

Estimated total Catch = (Sample CPUE) x (Sample PBA) x (no. boats-gears) x (no. fishing days)

 $Sample \ CPUE = \sum_{i=1}^{n} \frac{c_i}{d_i} \text{ , where } c_i \text{ is catch of sample i and } d_i \text{ is duration of trip in sample i.}$

 $Sample \ PBA = \sum_{i=1}^n \frac{a_i}{7} \ \text{, where} \ a_i \ \text{is numbers of days worked past week}.$

CPUE variance:
$$s^2 = \frac{1}{n-1} \sum_{i=1}^{n} \left(\frac{c_i}{d_i} - CPUE\right)^2$$

CPUE standard error:
$$s_{cpue} = \frac{+\sqrt{s^2}}{\sqrt{n}} \sqrt{1 - \frac{n}{N}}$$

CPUE coefficient of variation (in %): $CV_{cpue} = 100 \frac{s_{cpue}}{CPUE}$

PBA variance:
$$s^{2} = \frac{1}{n-1} \sum_{i=1}^{n} (\frac{a_{i}}{7} - PBA)^{2}$$

PBA standard error:
$$s_{pba} = \frac{+\sqrt{s^2}}{\sqrt{n}} \sqrt{1 - \frac{n}{N}}$$

PBA coefficient of variation (in %): $CV_{pba} = 100 \frac{s_{pba}}{PBA}$



7.2 Accuracy of estimates

All estimates are accompanied by an accuracy indicator that is based on sample size. Throughout the system the term "accuracy" means in fact "pessimistic accuracy"; we never know the actual accuracy level but we do know that if a certain sample size has applied then the resulting accuracy will always be higher than the pessimistic (and known) one (Figure 25).



Figure 25. Fluctuation of sampling accuracy (blue line) when sample size varies between 1 and population size. The red line shows the pessimistic accuracy that is known in advance and depends only on the population size.

UAE-NFIS uses two parallel approaches in calculating spatial accuracy: Large Population (or stochastic) and Small Population (algebraic). For the temporal accuracy only the Small Populations approach applies.

Large populations

Accuracy A is given by:

$$A \geq 1 - 1.96 \frac{\sigma_{\scriptscriptstyle R}}{\sqrt{n}} \sqrt{1 - \frac{n}{N}} \qquad \qquad \text{where } \sigma_{\scriptscriptstyle X} = \sqrt{\frac{1}{12}}$$

Small populations

Accuracy A is given by:

$$\mathbf{A} = \mathbf{a}_1 + \mathbf{a}_2 \mathbf{N}^{-\mathbf{k}\mathbf{x}}$$

The parameters a₁, a₂, and k are based on the following set of intermediate parameters:



$$W = 0,75(1 - \frac{1}{N})$$

$$a = \frac{2WN^{2}}{(N-1)^{2}} - \frac{N+1}{N-1}$$

$$g = a + \frac{1-a}{N}$$

$$S = (1-a)(\frac{1}{\ln N} - \frac{1}{N\ln N} - \frac{1}{N})$$

$$k = \frac{-2}{\ln N} \ln(\frac{S}{1-S-g})$$

$$a_{2} = \frac{(1-S-g)^{2}}{2S+g-1}$$

 $a_1 = g - a_2$