

## Habitat mapping project of the proposed Iraqi Marshlands National Park area

### الخرائط البيئية لمشروع انشاء متنزه وطني في منطقة الاهوار العراقية

- لتنفيذ هذا المشروع تتبع الخطوات الثلاثة التالية
- 1- وضع الخطط ومناقشتها
  - 2- مسح الغطاء الارضي وتعين المحطات الرئيسية
  - 3- وصف وتعريف البيئات الموجودة

**For Step III** in June 2008, sites were identified as habitats of specific species and described according to water quality, sediments, birds, fish, benthic macroinvertebrates, zooplankton and phytoplankton, plants and habitat characteristics and their status. The "Iraqi Marshlands Habitat Classification System" is gradually being refined, but currently remains provisional. Additional surveys supporting Step III will cover the environmental parameters that can give Nature Iraq an indication of the environmental or economic values of each habitat subclass. This information will help decision-makers to prepare plans for ongoing marsh restoration and conservation of those sites that are important from an environmental point view, such as the National Park in the Central Marshes and Ramsar sites in Iraq.

### طرق العمل

- 1- استخدام انواع الخرائط المتوفرة وخصوصا الصور الفضائية الملتقطة بواسطة الاقمار الصناعية او من خلال الشبكة العنكبوتية او Google ثم ومن خلال تقنية Remote sensing الاستشعار عن بعد وتعرف هذه التقنية بانها المساعدة لوضع الخرائط البيئية الكبيرة ولها القدرة على تصنيف انواع الغطاء النباتي وتصنيف بيئات الاهوار.
- 2- وضع جدول باسماء المناطق البيئية المختلفة وشفرة لها والاحداثيات بجهاز GPS و تأشيرها على الخرائط المعدة لمنطقة المحمية **الجدول رقم 1**
- 3- المسح البيئي الميداني لمنطقة المحمية بواسطة المقاربة البيئية الهكتارية Habitat Hectare Approach من اجل توصيف وتقسيم النباتات الى مراتب رئيسية وفرعية كميا ونوعيا من اجل المحافظة عليها وكذلك وضع قائمة جرد تفصيلية بالانواع Species Inventory list وطبقا لذلك توضع خرائط توزيع للانواع او باشكال تشبيكية لها وفي كل موضع وتثبيت علامات ارضية لها Bench marks وتحدد بالمساحة لاعطاء القيمة البيئية Habitat Score **الشكل 1**

### توفر المقاربة البيئية الهكتارية (HHA) Habitat Hectare Approach

- 1- حالة الموقع البيئية
- 2- محتويات المشهد الطبيعي من النباتات landscape content
- 3- قائمة بنوعية النباتات وكمياتها

يتم التعرف على انواع واجناس النباتات باستخدام المفاتيح التصنيفية مثلا Al-Saadi & Al-Mayah, 1983 نتائج المسح للنباتات **الجدول 2**

انواع البيئات حسب نظام تصنيف بيئة الاراضي الرطبة العراقي

### **Iraqi Marshlands Habitat Classification System (IMHCS)** (امكس )

**Habitat inventory** **الموضوع اساسا على انواع النباتات ويفضى الى قائمة جرد بيئية** **list**

### **الجدول 3**

- 1-بيئة المياه الجارية Rivers
  - 2- بيئة قنوات الاروائية (بزل) irrigation canals
  - 3- بيئة مياه راكدة standing water
  - 4- بيئة نباتات الاهوار Marsh veg
  - 5- بيئة الصحراوية مع وجود غطاء نباتي
  - 6- بيئة تجمعات اشجار و شجيرات Woodland & Herbaceous veg
- وبالامكان تقسيمها الى وحدات اصغر وخصوصا السائدة منها
- 1-النباتات الجذرية الغاطسة
  - 2-نباتات المناقع المتكيفة للاهوار كالتصب والبردي
  - 3-النباتات الطافية الحرة
  - 4-النباتات البرية
  - 5- قنوات او جداول البزل المحفور بلا نباتات
  - 6-صحراء جرداء بلا نباتات

the proposed

Central Marshes National Park area and were distributed between the Al Chibaish Marsh area and Abu Zirig Marsh area. Table 1 includes the **names, codes** and **GPS coordinates of each habitat survey site.**

the starting point of the project. By using satellite images from 2006an initial land cover survey and water quality study was conducted for nine candidate survey sites in these marshes.

### **Satellite image processing**

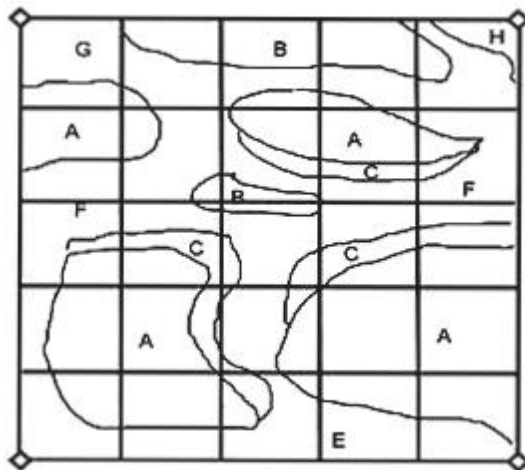
Remote sensing has long been identified as a technology capable of supporting the development of habitat maps over large areas. Satellite images contain a information regarding land and water characteristics and the application of digital image process-

Table 1.

**The Habitat Hectare Approach (HHA) for assessing habitat**

In order to characterize vegetation classes and subclasses of high conservation priority and to gather quantitative data on species richness, plot studies were used (as suggested by Sayre et al. 2000). The number of plots at the site was determined by the range of distinct habitats defined in preliminary classifications of the sites (usually between one and four habitat types). The HHA involves assigning a habitat score to a habitat zone that indicates

the quality of the vegetation relative to established benchmarks. This habitat score can then be multiplied by the area of the habitat zone (in hectares) to determine the quality and quantity of vegetation (thus calculating “habitat hectares”). The components are divided into two groups reflecting an assessment of both “site condition” and “landscape context”. This is useful for habitat assessment and ground-truthing (DSE 2004). The HHA method was applied in the ground-truthing exercises as a methodology to check the classification of the land-cover classes resulting from remote sensing application. Due to the broader complexity of the HHA method, only the determination of vegetation cover from this method was applied within each hectare and without the scoring (Fig. 2).



**Figure 2.** Application of the Habitat Hectare Approach (HHA) method; field data sheet for describing habitats (codes A-F indicate habitat classes).

**Vegetation****Habitat Types**

The proposed “Iraqi Marshlands Habitats Classification System” presented in Table 3 is based on vegetation due to the ecological importance of vegetation communities and because vegetation is a result of the ecological conditions. Table 4 describes the specific habitats seen within the study areas along with a basic site description of example study sites.

**Table 3. Provisional “Iraqi Marshlands Habitat Classification System”.**

**WATER****1. Inland running water, river or canal**

1.1 Unvegetated rivers and canals

1.2 Submerged river and canal vegetation

### 1.3 Riparian vegetation

## 2. Inland standing water

2.1 **Pond** or openness– Unvegetated standing water

2.2 **Unvegetated mudflat** – Unvegetated mud, temporarily submerged and subject to water level fluctuations

2.3 **Flooded communities** – Periodically or occasionally flooded land with phanerogamic communities adapted to aquatic environments that are subjected to water level fluctuations and temporary desiccation (*Cyperus difformis*, *C. michelianus*, *C. laevigatus*)

2.4 **Aquatic communities** – With aquatic vegetation communities formed by free floating vegetation, rooted submerged vegetation or rooted floating vegetation

2.4.1 **Free-floating vegetation** — With floating vegetation communities (*Lemna* sp. pl., *Salvinia natans*, *Spirodela polyrhiza*) and *Ceratophyllum demersum* and *Hydrocharis morsusraeae* communities.

2.4.2 **Rooted, submerged vegetation** – Rooted submerged communities (*Potamogeton* sp. pl., *Vallisneria spiralis*, *Myriophyllum* sp., *Najas* sp. pl., *Hydrilla verticillata*)

2.4.3 **Rooted, floating vegetation** – Rooted formations with floating leaves (*Nymphaea* sp. pl., *Nuphar luteum*, *Nymphoides indica*)

2.5 **Salt water** – Saline ponds and lakes with phanerogamic communities

## MARSH

### 3. Marsh Vegetation

#### 3.1 **Permanent Marsh**

3.1.1 Helophytic vegetation

3.1.1.1 Reed bed (*Phragmites australis* beds)

3.1.1.2 Reed mace bed (*Typha domingensis* beds)

3.1.1.3 *Schoenoplectus litoralis* bed

3.1.1.4 *Cladium mariscus* vegetation – *Cladium mariscus* bed

3.1.2 **Woody vegetation** – Tree size formations with willow (*Salix* sp.) and poplars (*Populus* sp.) within the marsh, excluding riparian treed formations having a linear structure

3.1.2.1 Riparian willow – Dominated by willow formations (*Salix* sp.)

3.1.2.2 Riparian poplar – Dominated by poplar formations (*Populus* sp.)

3.2 Brackish or saltwater marsh vegetation – Brackish or saline marshes with halophytic vegetation

3.2.1 Salt pioneer swards – Pioneer communities growing on salt or brackish mudflat (*Salicornia* sp. pl. community)

## TERRESTRIAL HABITATS

## 4. Desert

### 4.1 Desert shrub

### 4.2 Unvegetated desert

### 4.3 Unvegetated saline lands

## 5. Woodlands

### 5.1 Woodland, forest and other wooded area

### 5.2 Shrub

## 6. Herbaceous vegetation

### 6.1 Grassland

### 6.2 Steppe

### 6.3 Sparsely vegetated land

**Table 4.** The habitat classes identified at each site with site description.  
**Central March CM Site code Types of habitat General description of the site**

#### HABCM-

2

#### 2.4.2 Rooted submerged vegetation

##### 3.1.1.1 Helophytic vegetation (reed bed)

##### 3.1.1.2 Helophytic vegetation (reed mace bed)

#### 2.4.1 Free-fl oating vegetation

This is an open water area that is adjacent to the road on the east and surrounded by reed beds in the other directions; there also are groups of reeds that are distributed randomly inside the area. There are small groups of *Typha* sp. (reed mace beds) and *Schoenoplectus litoralis* close to the road (in the east side of area). The water is shallow. The open area is covered by submerged plants and most of them are decayed at the surface.

#### HABCM-

5

#### 1.1 Unvegetated river and canal

#### 2.4.2 Rooted submerged vegetation

##### 3.1.1.1 Helophytic vegetation (reed beds)

##### 3.1.1.2 Helophytic vegetation (reed mace beds)

#### 2.4.1 Free-fl oating vegetation

Similar to Site CM-2 (thus an open water area with randomly distributed reed groups). There is a road adjacent to the site from the east and there are small *Typha* groups (on the east side of the area). There are small areas beside the road where submerged vegetation is absent and the water is deeper than the rest of area. The submerged plants are more dense than Site CM-2 but similarly decayed.

#### HABCM-

10

#### 2.4.2 Rooted submerged vegetation

##### 3.1.1.1 Helophytic vegetation (reed beds)

This Lake is also known as a "Bargah". It is a large open water area with submerged vegetation and surrounded from all directions by reeds (reed beds). There are small groups of reed (known as "Tahala") in the middle of the Bargah. Fishing occurs in the area by nets and electroshock.

#### HABCM-

11

#### 2.4.2 Rooted submerged vegetation

##### 3.1.1.1 Helophytic vegetation (reed beds)

##### 2.4.1 Free-fl oating vegetation

This is considered as an extension to Abu Sobatt canal, which is an inlet to Al Baghdadia Lake (Bargah). This canal divides the area into two sides (east and west) but the habitats are the same on both sides of the canal. They have small open water areas with a high density of submerged plants and are surrounded by reeds and *Typha* from all directions. All submerged plants are decayed on the surface of water. The canal is bordered by a line of *Typha* followed by a line of reeds on both sides. This is a water buff also grazing area. There is extensive fishing with nets in the moving water of the canal.

HABCM-12

#### 2.4.2 Rooted submerged vegetation

##### 3.1.1.1 Helophytic vegetation (reed beds)

##### 2.4.1 Free-fl oating vegetation

This is open water area (known locally as "Bargah") has submerged vegetation in different densities. It is surrounded on all sides by reeds beds and there are groups of reeds inside the area of the Bargah. Most of the submerged plants are decayed on the water surface. This area had been burned before and the ground was brownish and included spots with a low density of submerged plants.

HABCM-13

#### 2.3 Amphibious communities

##### 2.4.1 Free-fl oating vegetation

##### 3.1.1.1 Helophytic vegetation (reed beds)

##### 4.2 Unvegetated desert

##### 6.3 Sparse vegetation

A paved road divides this area into two sides: The west side is an aquatic habitat with reed beds and a water passage close to the road. There is also an area of high ground to the southwest with terrestrial plants (*Tamarix* sp.) and aquatic plants (dry *Phragmites australis*). The soil is wet indicating that this is a seasonal marsh. The east side includes three types of habitat, (a) in the northern portion are reed beds and reed mace beds; (b) in the middle area is dry land without plants that is used by the local people; and (c) in the southern portion is terrestrial vegetation. This area includes high usage by water buffalo, including breeding activity.

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#### Central

#### March

#### CM

#### Site

#### code Types of habitat General description of the site

HABCM-25

##### 3.1.1 Helophytic vegetation (reed beds)

##### 4.1 Desert shrubs

##### 2.4.1 Free-fl oating vegetation

This is a dry area with a mix of terrestrial plants (to the southwest) and aquatic plants (to the northwest and northeast). There is a small area that still contains some shallow water (5–20 cm depth). The area is considered a seasonal marsh. There is a paved road adjacent to the area on the west. There are many people who live along the road and breed water buffalo. Note: The siting of this area was determined by two coordinates to the west and the description places it about 1 km toward the east.

HABCM-

26

## 5.1 Unvegetated desert

## 3.1.1 Helophytic vegetation

(reed beds)

## 4.1 desert shrubs

This is a dry area (a seasonal marsh) with *Phragmites* that was dry. It also has terrestrial plants (*Tamarix* sp. and *Suaeda* sp.).

There is a paved road to the east of area and as one moves northward, the plant cover decreases and the area becomes more desert-like.

HABCM-

27

## 3.1.1 Helophytic vegetation

(reed beds)

## 4.1 desert shrubs

This is a dry site (seasonally wet) that is located to the west of a soil embankment that extends beside the area from north

to south. The entire area is covered by dry reeds with low density intermixed with terrestrial vegetation (*Tamarix* sp. and *Suaeda* sp.).

HABCM-

28

## 2.4.2 Rooted submerged vegetation

## 3.1.1.2 Helophytic

vegetation (reed mace beds)

## 4.1 desert shrubs

## 2.4.1 Free-floating

vegetation

The main part of this area is open water with rooted submerged vegetation and surrounded by reed mace beds (*Typha domingensis*) from the east and west. From the north there are reed beds. From the south, there is a small canal and road. There are small soil embankments to the southeast of the area. The area is used for water buffalo grazing.

Abu Zirig

(AZ)

HABAZ-

1

## 1.1 Unvegetated river and canal

## 2.4.2 Rooted submerged vegetation

## 3.1.1.1 Helophytic

vegetation (reed beds)

## 2.4.1 Free-floating

vegetation

The major habitat here is reed beds and there are small open water areas inside the reed beds. This area is adjacent to the road on the south and to a soil embankment of the river that is adjacent to the area and has openings that feed the marsh with water from the river on the west side of the marsh. There are date palm trees on the soil embankment. This area is considered a water buffalo grazing area; local people cut and collect the reeds for water buffalo feeding and manufacturing of goods. The area is close to Al Fuhood City.

HABAZ-

2

## 1.1 Unvegetated river and canal

## 2.4.2 Rooted submerged vegetation

## 3.1.1.1 Helophytic

vegetation (reed beds)

## 2.4.1 Free-floating

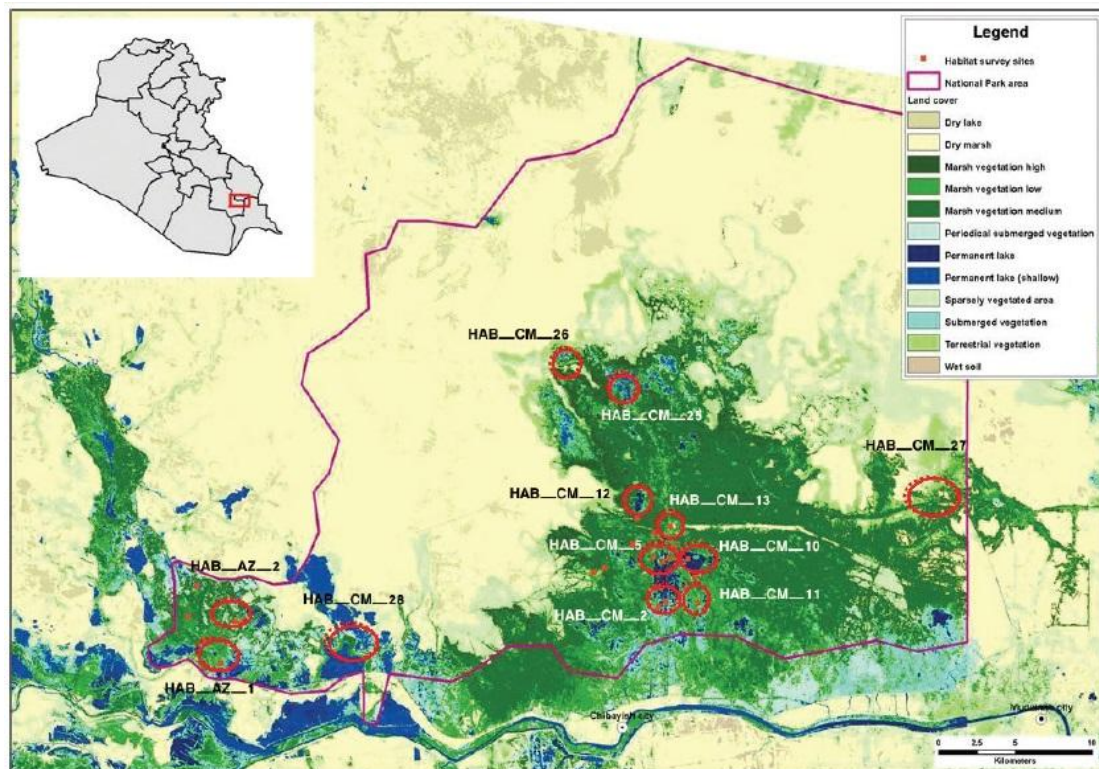
vegetation

This is a water passage (canal) with a depth of about 2 meters and width of about 25–30 meters, bordered on both sides by reeds that achieve heights of about 2–3 meters above the water surface. The canal extends from north to south. There are areas close to the reeds with dense and decayed submerged plants, and there is a narrow area in the middle of an open, moving water area devoid of plants and deeper than the rest of canal. This area is used for breeding by some birds on the submerged plants (the tops of these plants have emerged

above the water surface due to the decreasing water level

**Table I.** Site names and nodes, and GPS coordinates at Al Chibaish (CM) and Abu Zirig (AZ) for the 14 to 18 June 2008 habitat survey.

Area (Central Marsh)	Name of site	Site code No.	GPS coordinates					
			N latitude			E longitude		
			°	'	"	°	'	"
Al Chibaish	Al Baghdadia	HAB-CM-2	47	0	48.3	31	1	26.4
	Al Baghdadia	HAB-CM-5	47	0	52.5	31	2	50.6
	Al Baghdadia	HAB-CM-10	47	2	13.0	31	2	21.0
	Um Lilo	HAB-CM-11	47	2	16.9	31	1	28.7
	Eishan Al-Gubba	HAB-CM-13	47	1	3.6	31	4	10.8
	Core area	HAB-CM-12	46	59	58.8	31	4	32.2
	Core area	HAB-CM-25	46	59	53.9	31	7	49.2
	Core area	HAB-CM-26	46	58	13.7	31	9	44.4
	Zichri	HAB-CM-27	47	13	18.5	31	2	50.3
	Central Marshes (Al Hamar)	HAB-CM-28	46	49	37.3	30	59	21.0
Abu Zirig	Close to Al-Fuhood Town	HAB-AZ-1	46	46	30.1	30	59	4.8
	Close to Al-Fuhood Town	HAB-AZ-3	46	41	18.4	31	0	53.5



**Figure I.** Satellite-based land-cover classification of the Central Marsh (Al Chibaish and Abu Zirig) showing the selected survey sites (circled areas).



**Table 2.** Vegetation cover (%) of each of 12 survey sites.

Plant species	HAB-CM-2	HAB-CM-5	HAB-CM-10	HAB-CM-11	HAB-CM-12	HAB-CM-13	HAB-CM-25	HAB-CM-26	HAB-CM-27	HAB-CM-28	HAB-AZ-1	HAB-AZ-2
<i>Aeluropus lagopoides</i>						*				*		
<i>Alhagi graecorum</i>									*		*	
<i>Ceratophyllum demersum</i>	15	5		30	10		5			10	10	20
<i>Chara</i> sp.			5	*	5					5		
<i>Cressa cretica</i>									*	*	*	
<i>Cynanchum acutum</i>									*			
<i>Hydrilla verticillata</i>	5			*						25	5	20
<i>Myriophyllum</i> sp.	10	30	5	5	40							
<i>Najas marina</i>			70		5						10	
<i>Phragmites australis</i>	10	20	5	30	30	30	50	20	40		50	50
<i>Phoenix dactylifera</i>											*	
<i>Potamogeton crispus</i>												
<i>Potamogeton lucens</i>	40	*		20								10
<i>Potamogeton pectinatus</i>	10	10	5	5			5			40		
<i>Potamogeton perfoliatus</i>				*						*		
<i>Salvinia natans</i>						5				*	*	
<i>Schoenoplectus litoralis</i>	*	*	*	5	*						*	
<i>Suaeda</i> sp.						20		5	*			
<i>Tamarix</i> sp.			*			20		20	20			
<i>Typha domingensis</i>	20	30	*	10	5	10	10	5		20	5	*
<i>Vallisneria</i> sp.				*								

\*Trace occurrence-detectable.