

# EVALUATION STUDY OF UNSUSTAINABLE BIRD HUNTING: THE CENTRAL MARSHES AS A MODEL



Photo: Laith Ali Al-Obeidi

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## EXECUTIVE SUMMARY

The Marshlands of Lower Mesopotamia are one of the most important wetlands systems in the Middle East, and are of environmental, social and cultural importance as they support a large natural diversity. The area represents a social ecosystem that has spanned thousands of years with the marshes inhabitants dependent on the resources of these wetlands available through bird hunting, fishing, cutting reeds and buffalo rearing.

The marshes are one of the largest wintering areas for ducks of the West Eurasia-Caspian-Nile Flyway, and they are an important area for coastal birds that migrate across West Asia to East Africa. They contribute significantly to migration flyways of global importance between continents and are important for the breeding populations of migratory waterfowl along Western Asia. In addition, the marshes are very important wintering areas for many raptor and passerine species.

The Iraqi government regime of the 1990s caused the drying of the Mesopotamian Marshes (including the Central Marshes) by building a network of channels to withdraw water and drain it towards the Gulf. This caused the near destruction of this ecosystem as well as the displacement of marsh communities and destruction of their traditional lives. After 2003, the Central Marshes were partially re-flooded, the natural wetland ecosystem was partially restored and marsh residents returned to the area and took up their traditional lives again.

The Central Marshes are considered a resting area for large numbers of waterfowl coming from northern regions during the winter season, and also providing suitable habitats for breeding of many important birds species. According to the study presented in the book on the Key Biodiversity Areas (KBAs) of Iraq [13], the Central Marshes represented one of the most significant regions for birds in the country, and classify the area as an Important Bird Area (IBA) in Iraq.

Increasing population growth and increased demand for water accompanied by climate changes, decreasing rainfall rates at the regional level, and the construction of dams at the headwaters of the Tigris and Euphrates rivers, all have slowed the natural restoration of the marshes and have increased the threats of water shortages and possibly droughts during certain periods. These factors played a role in droughts in the Central Marshes in 2008-2009, the summer 2015 and in 2017-2018, which greatly affected the wildlife and the inhabitants living there.

Because of the global importance of the site, which meets natural reserve criteria, the Iraqi Council of Ministers announced the Central Marshes as Iraq's first National Park

(NP) in 2013, and submitted these as wetlands of international importance under the Ramsar Convention on Wetlands in October 2015.

In addition, the Central Marshes were recently included in the list of World Heritage Sites (UNESCO), as part of the file inclusion for the Mesopotamian Marshlands of Iraq in July 2016, which was considered one of the great national achievements that highlight the importance of these marshes globally.

For conservation of its biological diversity, Iraq ratified the agreement on the regulation of International Trade of Wildlife "Fauna and Flora" (CITES) in 2014, the agreement links wildlife and international trade with binding provisions, intending to conserve species and encourage sustainable use.

Iraq is also a signatory to the Convention on the Conservation of Migratory Species of Wild Animals (CMS) and Law No. 29 of 2016 was issued in this regard.

Despite all of these actions, the Central Marshes still suffer from neglect. The absence of a defined role for authorities over hunting, especially hunting that affects wild bird species is considered one of the main reasons that has led to increasing pressure on these natural resources and their over-exploitation. There is extensive evidence regarding the prevalence of excessive hunting practices and their negative impacts in the marshes of southern Iraq in general and in the Central Marshes in particular, as it has caused a large reduction in the numbers of resident and migrant birds annually, and this has been documented in several studies and reports. This study was developed by the Tigris River Protectors Association (Humat Dijlah) to assess the status of bird hunting in the Central Marshes, to identify illegal practices in hunting, research their causes, and develop possible suggestions to address these issues.

We evaluated hunting in the Central Marshes National Park as a model for the state of hunting in the Iraqi marshes overall. We utilized a interview survey to gather information on these practices from a number of bird hunters identified in the area of the Central Marshes and also consulted references and available information from civil society organizations, as well as field observations.

We estimated that more than 50,000 birds are hunted annually, targeting 22 species of water birds (both resident and migrating), including globally threatened bird species, and confirmed that the Central Marshes within the designated National Park (NP) are subjected to illegal and unsustainable hunting on an annual basis.

Bird hunting occurs due to several reasons, including both economic and social. Hunted bird species are taken for the purpose of making money from their sale or using as the main source for food of the hunters' families. Hunting is also conducted as a sporting

practice. Our study documented illegal hunting activities and the tools that are used in hunting in the Central Marshes.

Finding alternative economic opportunities for hunters will mitigate and limit unsustainable hunting activities. Information from this study can contribute to identifying areas that should be protected from bird hunting and other unsustainable practices with the goal of bird conservation and wildlife protection. This will be instrumental to the success of the National Park management plan and it is what is needed to preserve the integrity of the marshlands ecosystem and biodiversity values that are necessary to maintain their status as a World Heritage Site.

## INTRODUCTION

Birds hunting, especially hunting of ducks, has been part of the livelihood of marsh residents for a long time [7]. Marsh Arabs have a subsistence culture [8], and hunting is a core activity [9], and the waterfowl and fish that breed in the marshes are part of the local food system and cultural traditions [10]. Bird hunting has always taken place in the marshes. However, available water storage in the marshlands has declined considerably since the 1970s, shrinking the size of these wetlands and making many bird species, particularly migratory birds that are reliant on the marshlands, more sensitive to the pressure of hunting [11].

Hunting caused the elimination of many wild species, including many globally threatened species that were historically present in the region and led to the extinction or continuous decline in a number of bird species [4]. It is estimated there are up to million birds affected or killed by hunters' guns every season [7]. The illegal killing and taking of birds are defined as any form of deliberate act that leads to death or removal of birds from the wild (regardless of whether or not was the target of this action) is prohibited under national legislation [1] and the illegal killing, taking and trade in birds is a global problem particularly for migratory birds that cross national borders. Killing birds constitutes a global threat to biological diversity according to the Convention on the Conservation of Migratory Species of Wild Animals (CMS) [2].

The assessment of Brochet *et al.* [3] estimates that the number of birds killed or taken illegally each year on the Arabian Peninsula, Iran and Iraq is at least 1.7- 4.6 million (best estimate: 3.2 million) birds from 413 species and many of these are migratory species. There is a possibility that this number is less than the reality. In Brochet *et al.*, Iraq is listed in the third rank with an estimate of 329,000 birds annually killed or taken illegally among the nine countries that were evaluated. While Saudi Arabia topped the list, on average with 1.7 million birds killed or taken for the northern regions only, and Iran ranked second [3].

The reasons for illegal hunting of birds: to obtain food specifically for "subsistence" living because birds are a source of affordable protein [1,4]; for commercial sale [1], which provides a major source of income for most people in rural areas [4], and they are also killed for sport and are eaten later [3,1]. In addition, eggs are collected for the same reasons [1]. The wildlife trade is another critical issue throughout Iraq, practiced openly in southern and central Iraq and in secret in the northern region of the country [5]. The Iraqi animal market is unregulated so many endangered species can be bought and sold in markets with little to no oversight [6].

The overexploitation of natural resources through hunting is a key threat to the Iraqi marshland habitats [12]. The extent of hunting in the Central Marshes National Park contributes to the decline in numbers of bird species in the marshes [13,14], and collectively, a decrease in the overall population [10]. The intensive bird hunting that occurs in varying locations represents one of the largest threats to game birds, which represents a more dangerous challenge to protecting biodiversity during the migration seasons [15]. It has caused bird diversity to decrease in the National Park (the area near Al-Fhood town) [16], and is considered one of the most pressing conservation concerns for the park.

Hunting represents a real danger to species survival, sites and individual habitats [6,13], and its consequences are reflected in the status of bird species in the area [11]. It also represents a significant concern in Iraq because there is no education about the classification system for identifying threatened species or raising awareness among members of society about their status [6].

Illegal hunting practices developed hand-in-hand with the ongoing conflict in Iraq, where factors such as severe social and economic unrests combined with a lack of employment opportunities and weak law enforcement. This created a conducive environment for illegal wildlife hunting for those seeking additional income for their livelihood [5]. Killing outside the legal open season [1,17], using illegal methods like poisoning, targeting sensitive bird species [1,4,5,17], trapping and shooting [1,4,5] have reduce bird numbers throughout Iraq.

In the marshland, where despite the positive step in 2013 of announcing that the Central Marshes would officially become Iraq's first National Park, marshland communities continue to suffer from a lack of education and services [15] and the area has not yet seen any real conservation actions on the ground [18]. The marsh residents need to receive a long-term commitment of an adequate water supply to maintain the restored marshes and achieve basic facilities for life [19]. Adequate water commitments will also provide for basic services and improved public awareness programs [8].

In general, the future of the Central Marshes, and the marshlands of Mesopotamia in general depend on the success of Iraq in achieving a balance in its national resources development. That includes issues such as the development of infrastructure for the oil industry in the marshes, the preservation of the environment and ensuring sustainable livelihoods for the inhabitants of the marshes [10].



## STUDY AREA

The study area is the Central Marshes (within the National Park) in southern Iraq (Thi-Qar - 30.958880°N, 46.988837°E), which is a complex of interconnected wetlands with an area of 131,780 hectares located to the west of the Tigris River and is bordered by the Euphrates River on the south, and is fed by water from both rivers.

It is part of Tigris-Euphrates alluvial salt marsh (PA0906) ecoregion and is located within administrative boundaries of three governorates: Thi-Qar, Maysan and Basra, as shown in Figure 1.

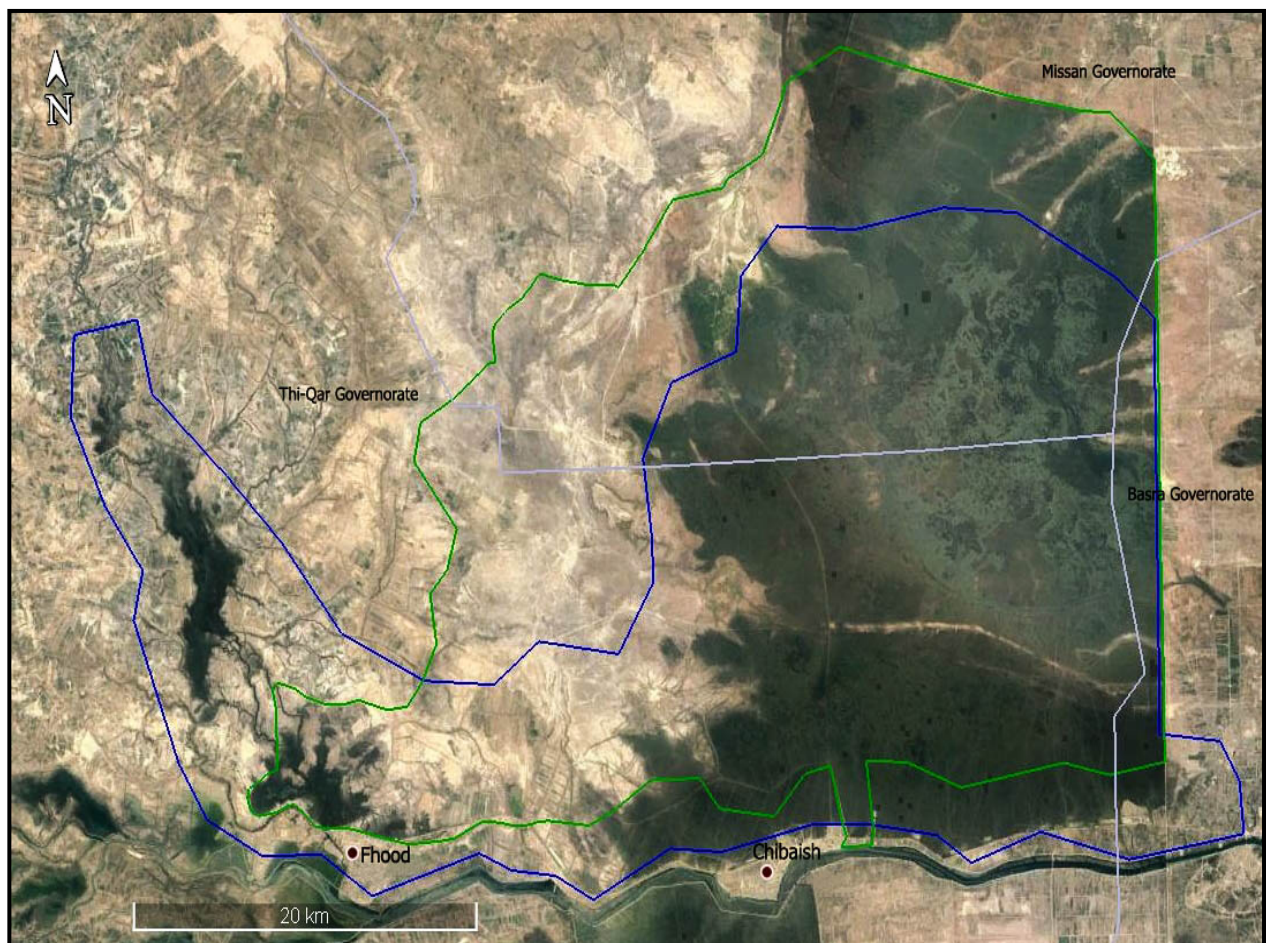


Figure (1): Satellite Image Showing Study Area (blue border represents the Central Marshes and the green border represents the National Park area)

## THE AIM OF STUDY

This aim of this study was to assess hunting of birds in the Central Marshes to identify and characterize illegal bird hunting that targets resident and migratory species, determine if globally threatened or not threatened species are targeted, researching the causes of illegal hunting, and conduct analysis of findings to provide recommendations for the protection of bird species, biodiversity and marshland conservation.

## METHODOLOGY

The data were collected using a survey questionnaire that was completed through direct interviews with bird hunters. One hundred surveys were completed from a sample of hunters identified within the study area.

The field survey took place over seven days during December 2019 and January 2020 and data was collected by Laith Ali Al-Obeidi, Bird and field studies expert with one assistant (Plate No.1), using the survey questionnaire form for data collection, high quality camera, vehicle and boats as a means of transportation within the study area.



Plate No.1: Interview with a hunter during the survey

The "Significance" of species and numbers of birds that are illegal killing and taken has been evaluated based on Brochet *et al.* Preliminary assessment of the scope and scale of illegal killing and taking of birds in the Arabian Peninsula, Iran and Iraq [3], which defines hunting as "Insignificant" when the maximum estimated number of birds illegally killed is  $\leq 50$  / year for a non-passerine species that is listed as 'Least Concern' (LC) on the global IUCN Red List [27],

For "Critically Endangered" (CR), "Endangered" (EN), or "Vulnerable" (VU) or "Near Threatened" (NT) species on the IUCN Red List, any number of illegally killed birds is regarded as "Significant".

The questionnaire consisted of three main parts. The first part includes the basic information on the interviewee: name (this was optional for the purpose of ensuring that the interviewee provided accurate information and was not worried about the legal ramifications of their answers), survey date, governorate, age, academic achievement, work or job, marital status, general monthly income, monthly income from hunting birds & number of family members.

The second part includes questions regarding hunting: When did you start hunting; How do you prefer to go hunting; The number of hunters typically participating in the hunting trip; type of hunting tools used; the preferred method of hunting; the most used and effective methods; the value obtained from the hunted birds per year; the amount spent on hunting and tools annually; how hunting tools were obtained; bird species hunted; approximate number of birds hunted in the one trip; the purpose of hunting; arrangement of hunting seasons according to priority; the approximate number of hunting trips in summer and winter; the best months for hunting; knowledge of bird species hunted (migratory, resident as well as threatened and rare species); egg and chicks collection; knowledge of illegal hunting activities practiced in the Central Marshes; practice of hunting in areas far from the residence area, and the extent of approval for entry by hunters travelling from distant areas to hunt in the Central Marshes.

The third part included questions that were posed about the extent and interest the hunter had in helping efforts to protect nature and encourage sustainable hunting; participation in awareness seminars of important bird species and prohibited hunting methods; the possibility of the hunter to leave the hunting profession and practice alternative work. Any additional ideas or commentary by the hunter was also documented.

## THE QUESTIONNAIRE RESULTS

### DATA COLLECTION AND RESULT ANALYSIS

A total of 100 interviews were successfully completed during the study period.

#### **Part One: Basic Information**

- The governorate name to which hunters belongs: most of the birds hunters interviewed were from Thi-Qar governorate; fewer were from areas adjacent to the Central Marshes in Basra governorate, and a small number were from the border areas Maysan Governorate.
- Hunters' age ranged between 22 years to 63 years.
- When asked about the level of education, options provided were: illiterate, reads and writes, primary, intermediate (middle school), secondary (high school), graduate of an institute or college, & other. The results of the analysis showed that 55% of hunters have a primary certificate, 28% read and write, 12% have an intermediate certificate, 3% have a secondary certificate (High school) and 2% is illiterate. This is shown in the figure (2).

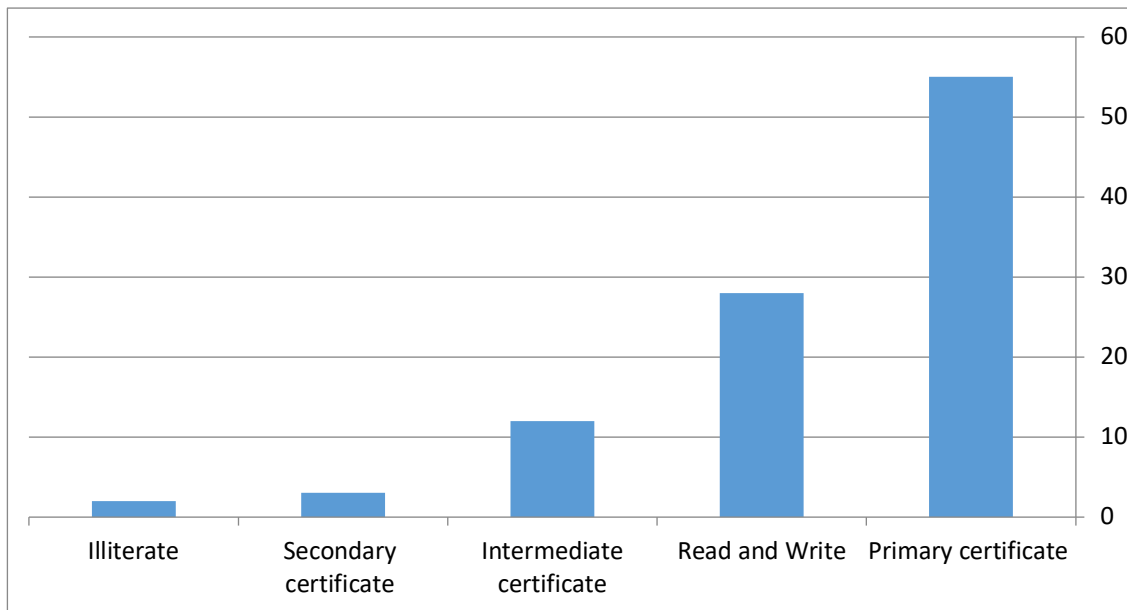


Figure (2): shows the level of education of the hunters surveyed

- Work or Job: The answer options were: employee, free worker (day laborer), retired, student, & other. The results of analysis showed that 85% of hunters are free workers who are dependent on bird hunting resources to secure their family's daily income, 13% are employees, 1% are retirees and 1% were students. This is shown in figure (3).

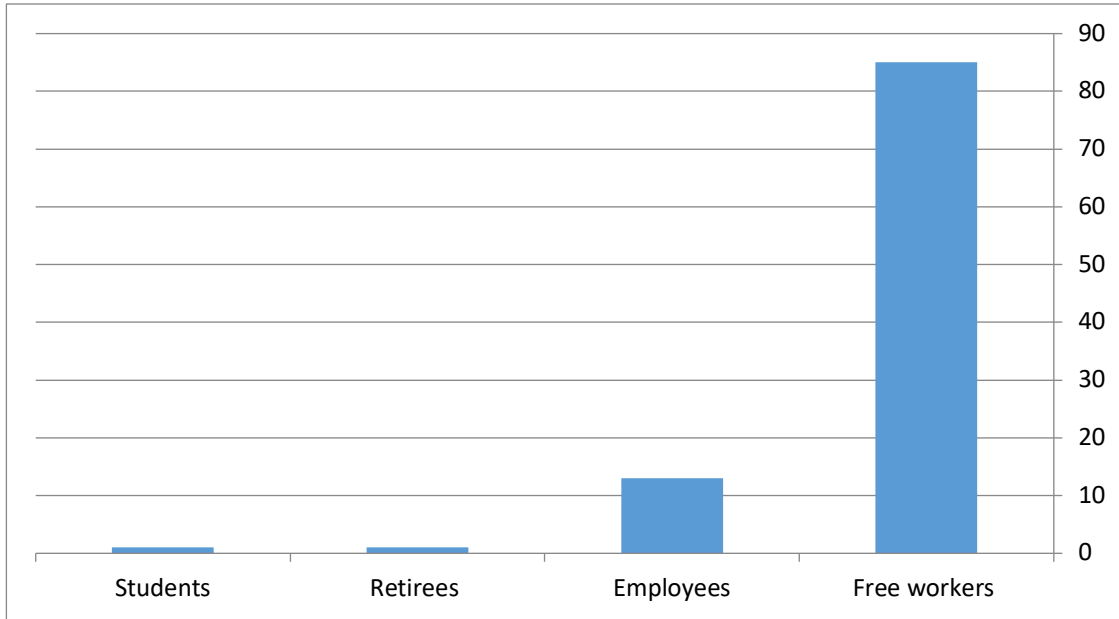


Figure (3): shows the type and percentages of work / job held by bird hunters

- Marital status of the hunters surveyed indicated that 92% are married, 3% divorced, 3% widowed, & 2% are single, as shown in figure (4).

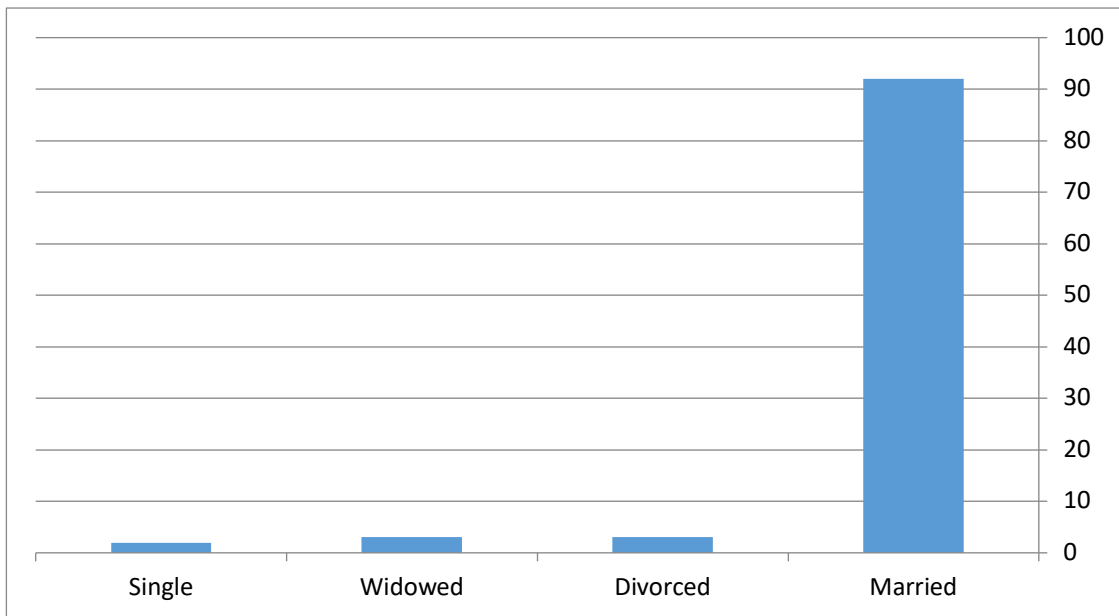


Figure (4) : shows the percentages of marital status of bird hunters

- The size of the surveyed hunters' families ranged from 3 individuals as a minimum to 9 individuals as a maximum, with an average of 6 members for the hunter's family, and one breadwinner for most of hunter's families. The number of free worker hunters who were the breadwinners in their family was one for absolute majority.



- When asking about whether hunters have a monthly income (salary) or not, the analysis showed that only 17% of bird hunters have a monthly incomes represented by a job salary or from governmental social aid, and the remaining 83% do not have any monthly income.

The amount of monthly income (salary) for those hunters who received an income (17% of the total surveyed) ranged between 200,000 Iraqi dinars (Equivalent 166 USD) as a minimum to 1,000,000 Iraqi dinars (Equivalent 833 USD) as a maximum. As for the monthly income earned from hunting birds in the best months of hunting, it was 200,000 Iraqi Dinars (Equivalent 166 USD) as a minimum, and 1,500,000 Iraqi Dinars (Equivalent 1250 USD) as a maximum.

**Part Two: Hunting Questions**

- Regarding how long the interviewee had been hunting: the answers ranged between 7 years to 37 years, which represented the longest period for hunting practice from selected samples. This gives a clear indication of the continuity and of hunting practices across generations from parents to sons within the local community as a key marshland activity.
- When asking, how do you prefer to go hunting (individually, with family members, with friend, accompanied by an experienced person, or with a group), the results were as follows: 61% they went with a friend, 29% with family members, 5% with a group, 3% individually and 2% went hunting with an experienced person, as shown in figure (5).

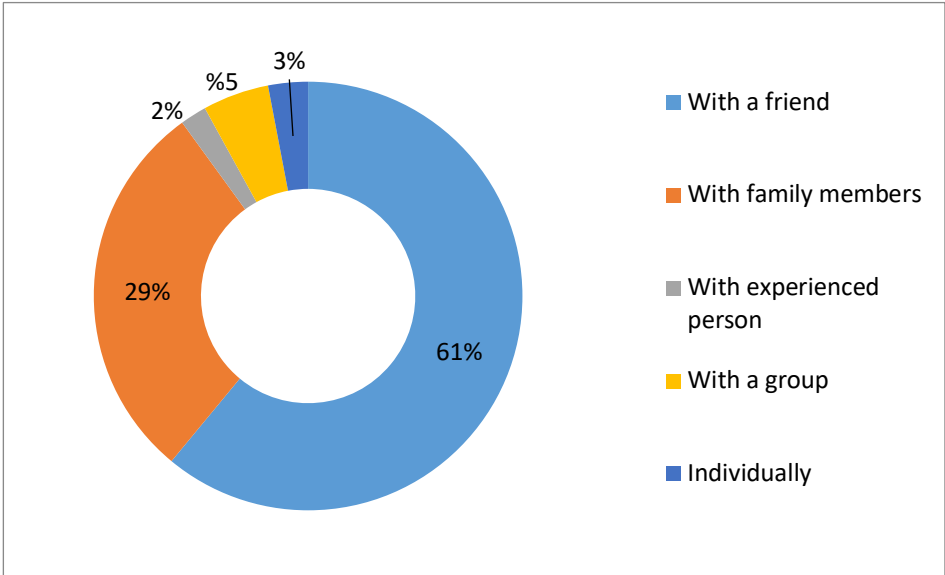


Figure (5): shows how hunters prefer to go hunting

- Regarding the number of hunters joining in a hunting trip, if hunting occurs as a group, then the number of hunters ranged from 3 hunters as a minimum to 5 hunters as a maximum.
- On the question about different types of hunting tools used in birds hunting provided several options: Guns, Nets, Al-Duosh (this is a type of large trap using a baited net and it is common in the Iraqi marshes), Poisons or Chemicals, and other, the results were 89% used hunting guns, 8% used Al-Duosh, and 3% used poisons. See the figure (6):

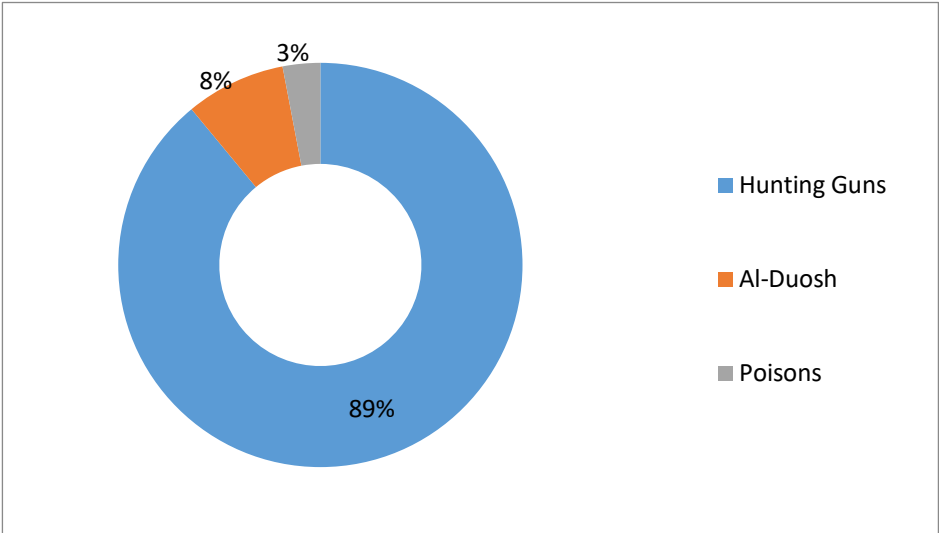


Figure (6): shows the methods used in bird hunting in the Central Marshes

- When asking about the hunters' preferred method for hunting; results indicated that 96% prefer shooting, 2% prefer to use Al-Duosh and 2% use poisons. See figure (7).

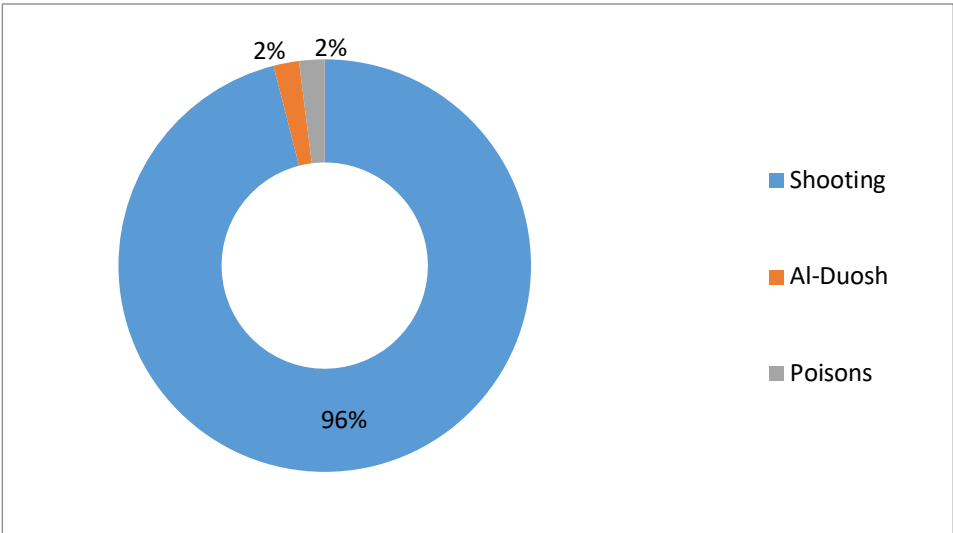


Figure (7): shows the preferred bird hunting methods in the Central Marshes

- While hunting with guns is the most common means used for birds hunting, hunters stated that the most effective means for hunting large numbers of birds are poisons / chemicals, followed by Al-Duosh. This may indicate that there is some knowledge about the impacts of using poisons and Al-Duosh, since despite their effectiveness; guns are still most commonly used.
- The results from the question about the amount of money spent on hunting and its tools annually (approximate) showed that the minimum annual spend is 250,000 Iraqi Dinars (Equivalent 208 USD), whereas the upper limit was 3,000,000 Iraqi Dinars (Equivalent 2500 USD) (included within this is the cost of a hunting boat).
- The survey showed that the value of bird hunting annually ranged between 1,000,000 Iraqi Dinars (equivalent 833 USD) as a minimum to 8,000,000 Iraqi Dinars (6666 USD) as a maximum, thus the value of game that is hunted annually is more than the amount spent on hunting tools. This was the answer from all survey results when asked about the value of the yearly hunt (where response options were: equal to what you spend on hunting tools, less than hunting tool, or more than hunting tools)
- Everyone also answered the question of how to getting hunting tools: by buying them from shops (where response options were obtaining them: from the government, from shops, from traders, from other sources).
- The questionnaire indicated that thousands of birds are killed annually and continuously in the Central Marshes, and 22 bird species are targeted, see table (1).

Table (1): Bird species that are the target in illegal hunting with a large numbers in the Central Marshes (Includes Arabic names, common names, scientific names and IUCN status).

Arabic Name	Common Name	Scientific Name	IUCN Conservation Status
الغرة	Eurasian Coot	<i>Fulica atra</i>	LC*
دجاجة الماء	Common Moorhen	<i>Gallinula chloropus</i>	LC
التحام الكبير	Greater Flamingo	<i>Phoenicopterus roseus</i>	LC
ابو منجل الاسود	Glossy Ibis	<i>Plegadis falcinellus</i>	LC
البرهان او فرفر ارجواني	Purple Swamphen	<i>Porphyrio porphyrio</i>	LC
غراب البحر	Great Cormorant	<i>Phalacrocorax carbo</i>	LC
غراب الماء القزمي	Pygmy Cormorant	<i>Phalacrocorax pygmeus</i>	LC
اوز اربد	Greylag Goose	<i>Anser anser</i>	LC
الخصيري	Mallard	<i>Anas platyrhynchos</i>	LC
الكيش (ابو مجرفة)	Northern Shoveler	<i>Anas clypeata</i>	LC



الحذف المعرق او البط الرخامي او شرشر مخطط	Marbled Teal	<i>Marmaronetta angustirostris</i>	VU**
حمر اوي	Common Pochard	<i>Aythya farina</i>	VU
حمر اوي ابيض العين	Ferruginous Duck	<i>Aythya nyroca</i>	NT***
الونس (الكوشرة)	Red-crested Pochard	<i>Netta rufina</i>	LC
ابو زلة ( البلبول)	Northern Pintail	<i>Anas acuta</i>	LC
الصواي	Eurasian Wigeon	<i>Anas Penelope</i>	LC
حذف صيفي	Garganey	<i>Anas querquedula</i>	LC
بط سماري (الجوشمة)	Gadwall	<i>Anas strepera</i>	LC
حذف شتوي	Eurasian Teal	<i>Anas crecca</i>	LC
بلشون ابيض كبير	Western Great Egret	<i>Ardea alba</i>	LC
مالك الحزين الرمادي	Grey Heron	<i>Ardea cinerea</i>	LC
مالك الحزين الارجواني	Purple Heron	<i>Ardea purpurea</i>	LC

LC\*= Least Concern , VU\*\*= Vulnerable, NT\*\*\*= Near Threatened

- The questionnaire results also showed that the numbers of birds killed with hunting guns as a minimum for each hunter is only one bird for one trip, whereas killing of 20 birds was recorded as a maximum for one trip.  
As for hunting cases that were recorded by using Al-Duosh, this ranged between 100-300 birds for each hunting trip, and number of birds that were killed as a result of using poisons ranged between 100-400 birds, targeting different species of Ducks sp. as well as Eurasian coot (another bird species which is not a targeted species but is also killed after eating the poisoned bait).
- The numbers of birds killed differed from season to season according to the abundance of favorite birds and availability of waterfowl for hunting. The winter season is ranked first followed by the Autumn and Spring, and Summer came in last due to high temperatures experienced at this time and the small number of favored target birds available for hunting.
- The highest number of bird hunting trips recorded was 50 trips for months per hunter in November, December, January, February and March, while the lowest number was 20 hunting trips per hunter. For the remaining months, the highest number of hunting trips was 15 and the least was only 4.

- The main purpose of the bird hunting was for selling to obtain money (sold for food) (96%), but was also used as food for the hunters' families, and the remaining 4% were hunted solely for the used as the hunters' family food (without selling it), as shown in figure (8).

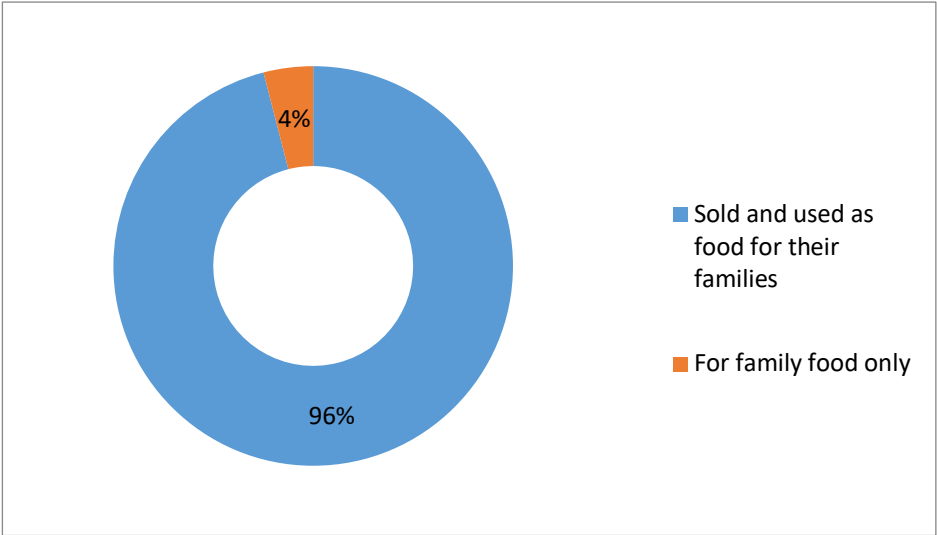


Figure (8): The main purpose of bird hunting

- Hunters were also asked if they knew the bird species that they were hunted. 88% said, "Yes", that they know bird species that they hunted; 9% answered that they had "Some knowledge" of the species and 3% answered "No", that they did not know the species. See figure (9).

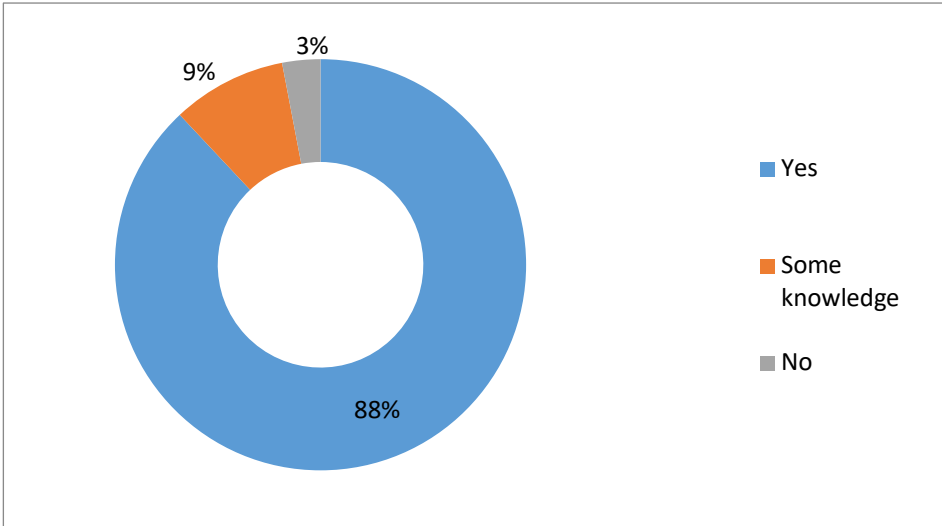


Figure (9): shows the hunters' knowledge of bird species hunted

- The survey showed that 1% of the hunters can recognizing well resident and migratory birds species from the birds hunted, while 4% of them answered that, "No" they can't recognize these species, and 95% answered that they can "Somewhat" recognize these bird species. See figure (10).

Also the questionnaire indicated that 1% of the hunters know the threatened and rare species from the birds hunted, while 60% answered "No" that they can't recognize these species, and 39% answered Somewhat that they know some of them. See figure (11).

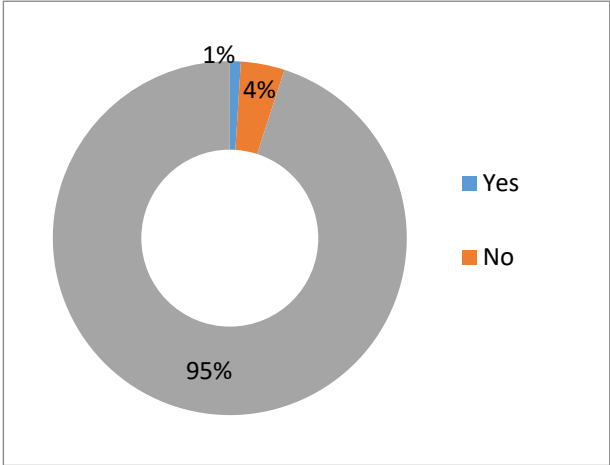


Figure (10): shows hunters' ability to recognize resident and migratory species in hunted birds

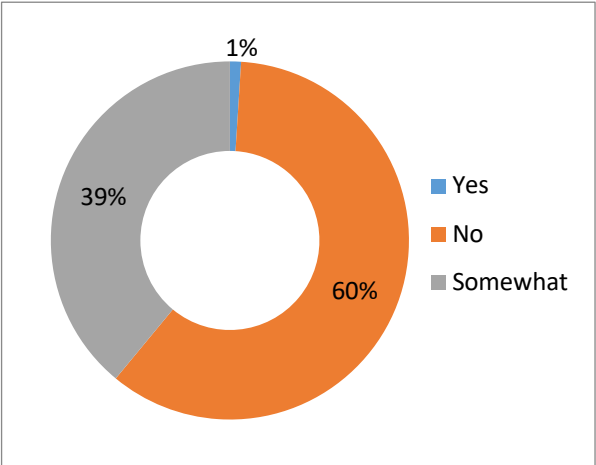


Figure (11) shows hunters' ability to recognize threatened and rare species in hunted birds

- Ten percentage of hunters surveyed admitted to the practice of egg and chicks collection from birds during the breeding season if they find them.
- One of the important questions that was asked of the hunters was which of the sub-sites within the Central Marshes are they using so that we could determine which sites are under the highest hunting pressure.

The results of the survey showed that there are 15 sub-sites that are mostly exposed to bird hunting pressure within the Central Marshes, and the percentages of hunters using these sub-sites varied as follows: 15% are hunting in Zichri, 13% in Fatma, 12% in Hallab, 11% in Hmaara, 11% in Baghdadiya Lake, 10% in Um Aludhaam, 8% in Almanthar, 7% in 712 Embankment, 3% in Abo Shuther, 2% in Al-Esagle, 4% in Um Albinni, and 1% each for, Abu Zirig, Aldabaat Lake, Al-Fhood Lake, and Abo Nislah. See figure (12).

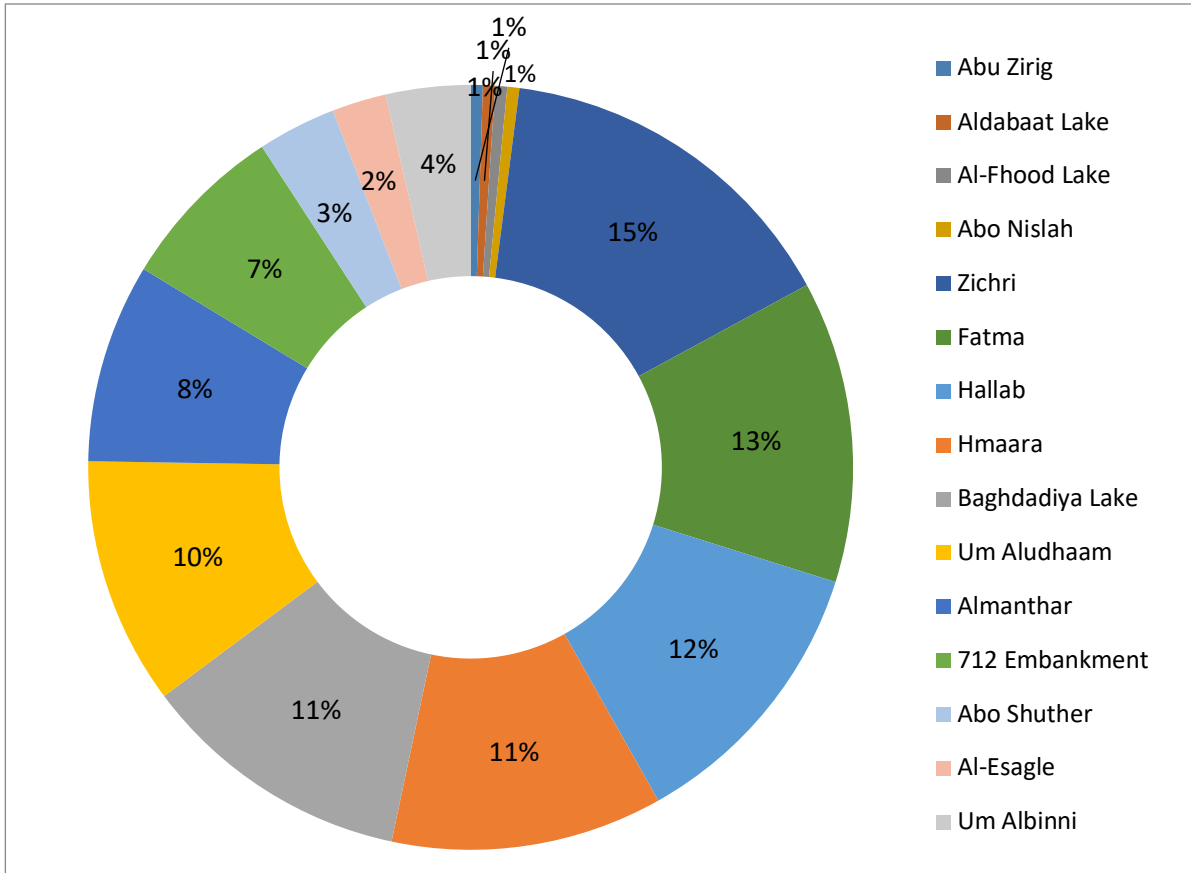


Figure (12): shows hunters preference for sub-sites within the Central Marshes

- When asking hunters for their opinion on illegal hunting activities that are practiced in the Central Marshes, their answers were entirely about hunting through the use of poisons only among the several options that were provided (i.e. live catch for trade, live catch for breeding, use of poisons, killing of threaten and important species, hunting out of season, hunting in protected sites, use illegal means such as nets and Al-Duosh, use of sound recorders, traps, reflective lights or night lighting, and other methods).
- Another question that was asked of hunters was about how far from their residence did they traveled to go hunting. The largest percentage of the answers were that they did not go to remote areas 95%, while the rest 5% sometimes went on hunting trips to other marshlands far away from their homes, such as Dalamj Marsh, which is located in Al-Diwaniyah and Wasit governorates, Sawa Lake in Muthanna governorate, Al- Hawizeh Marshes, which belongs to Basra and Maysan governorate, or some other distant sites.  
In addition to the previous question, a question was asked about their approval of hunters entering the Central Marshes to hunt from other governorates. All respondents answered that they would refuse hunters entry from other governorates as well as from areas distant from the marshes.

**Part Three: Understanding the hunters' views on and willingness to protect natural resources and bird conservation as a national wealth.**

- Responding to the question of their willingness to help in the protection of nature resources in the marshes, 75% of hunters was "Yes" and the rest 25% answered "No".
- Responding to the question of whether they were willing to participate in training courses in sustainable hunting and the impacts of illegal hunting methods, the percentages were as follows: 44% answered "Yes", 39% answered "Perhaps", while 17% answered "No", as shown in figure (13):

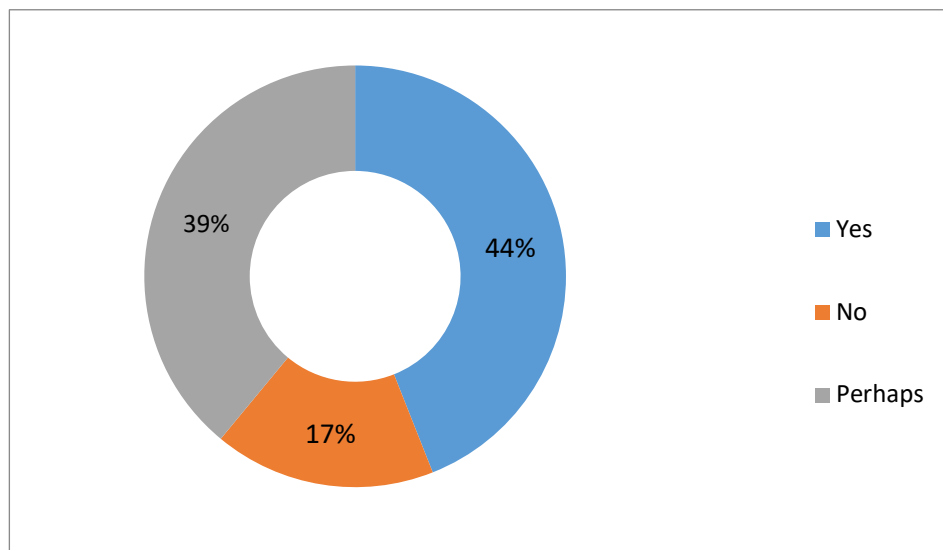


Figure (13): Shows the extent of hunters approval for participating in training courses in awareness of sustainable hunting

- The response by hunters to their acceptance of replacing hunting activity with employment in ecotourism as alternative work provided that they have a technical and financial support for this transition was: 81% answered "Yes" they would support this, 5% answered that they would not support this and 14% answered that they would "Perhaps" support this. See figure (14).

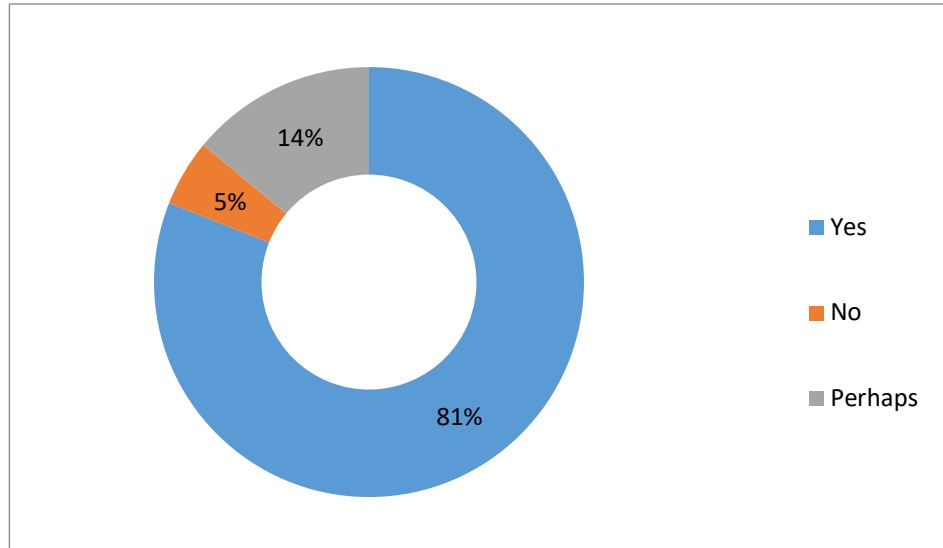


Figure (14): shows the response to replacing hunting activities with employment in ecotourism

- Related to the question listed above was a separate question that inquired into the hunters' ability to replace their current profession or hobby of bird hunting with other available professions/hobbies that better contributed to the protection of the marshes. 91% of hunters surveyed responded that "Yes", they had the abilities to do so if there was a good opportunity and support, 9% answered "Perhaps", and no one rejected this statement (0%).
- Finally, proposals from the surveyed hunters themselves on hunting and nature protection were recorded, and their comments were brief. These included: preventing the use of poisons and Al-Duosh; conserving the water of the marshes; providing job opportunities for hunters; preventing hunting in the breeding season, and some requested that awareness seminars on sustainable hunting with the goal to preserve natural resources be provided.

## DISCUSSION

### THE ECONOMIC, SOCIAL AND CULTURAL EFFECTS THAT LEADS TO BIRDS HUNTING IN THE CENTRAL MARSHES

The study indicates that bird hunters in the Central Marshes are resident of the areas near and adjacent to the borders of the marshes, which represent the districts and cities of the governorates of Thi-Qar, Basra and Maysan, while the main numbers of hunters are from Thi-Qar governorate first, and from Basra second.

Bird hunting, especially for waterbirds, is considered an economic activity for residents of the Central Marshes [4,21,20], and they depend in a large extent for their self-sufficiency from birds hunting [22], as well as from fishing, buffalo breeding, and reeds cutting, wherever the marshes provide a suitable environment for local communities and an essential resources for their livelihood [10].

One of the most important reasons that drive local residents to hunting is the level of unemployment in these communities, where most of bird hunters are a free workers (day laborers), and as this study showed, 85% of those hunters surveyed do not have a job or any other work except 2% of these hunters do get a small amount from social aid programs provided by the Ministry of Labor and Social Affairs.

Therefore, 83% of the hunters are dependent on hunting birds because they don't have any other financial resource, and the birds hunting constitutes a major source for securing their families' daily needs [4]. This is due to the level of deprivation and poverty in the marsh community [15]. Most of men in these communities are unable to secure a job because of the limited work opportunities and resources [9]. 13% of the hunters interviewed were employed and use hunting to supplement their monthly income. The remaining 2% represented retirees or students.

The increased demand for hunting is attributed to the need to meet daily family expenses, especially the number of family members, which typically averaged six persons per family, where usually there was only one breadwinner for most of these families according to our study, and the percentage who used hunted birds as food for their families exclusively was only 4%.

Our study also found that 96% of the those hunters surveyed practiced hunting to earned money after selling the birds (for food) (see plate 2), and they also use some as food for their families, hence it is clear that the main reason for bird hunting is for "food" in the majority of cases in the Central Marshes but also as a means of obtaining money after the sale of hunted birds.

The financial value of hunted birds ranged between 1,000,000 - 8,000,000 ID annually (which is equivalent 833 -6,666 USD), while the amount spent on the hunting tools ranged between 250,000 - 3000,000 ID per year, (equivalent 208-2500 USD), and the higher amount spent includes the cost of a hunting boat.

Consequently, it is clear that the value of birds hunted annually is much more than the cost of hunting tools, and this encourages them to continue.



Plate 2: Selling of water bird species in the Central Marshes near Al-Fhood City (Photo by: Laith Al Obeidi)

There is a link between the food of marsh locals and the hunting of wild birds such as Ducks, Geese, E.Coot, *etc.*, which are served in favored traditional recipes. Most of the hunters interviewed are those who had been hunting with members of their family from many years and among them are hunters who began hunting over 35 years ago. This indicates the continuous nature of this practice that is transmitted across generations from parents to children within the local community as part of their culture. The food that is obtained is of traditional and cultural importance [1] and the unique habits of the marshes residents [23] have an effect on hunting in general Cultural and heritage traditions have an important role in nature conservation and can indirectly affect ecosystems [24].

All hunters that were interviewed that hunt with guns considered shooting as a sport and a skill that must be learned and they preferred it to others hunting methods. But hunting for sport is still not the main motivation for hunting [3].



The study recorded a few cases (10%) of egg and chicks collecting during the breeding seasons in the Central Marshes. Egg collection is a practice that occurs but is of relatively minor importance on the Arabian Peninsula, in Iran and in Iraq [3].

Finally, hunters in this survey tend to go hunting in groups ranging from two to five people generally, which gives an idea of the large numbers of hunters who practice birds hunting annually in the Central Marshes.

## THE ILLEGAL HUNTING OF BIRDS IN CENTRAL MARSHES

According to an assessment on illegal bird killing in the Mediterranean [1] the illegal killing and taking of birds is defined as any form of deliberate action that results in the death or removal from the wild of a bird (regardless of whether or not it was the target of this action) that is prohibited under national legislation.

The types of illegal killing activities affecting bird species [1] are:

- Killing of protected species
- Killing within protected area, such as killing in national parks where such activities are prohibited
- Killings outside the legal open season
- Illegal method; with options such as 'poisoning' (targeted directly at birds), 'trapping' (traps, nets, etc.) and 'shooting' (illegal means include the use of silencers and automatic or semi-automatic guns)

Our study indicated that illegal killing activities practiced in the Central Marshes National Park were represented by:

- **Killing threatened species:** Our study documented the killing of bird species listed in the IUCN Red List as Marbled Teal *Marmaronetta angustirostris* and Common Pochard *Aythya farina* which are both listed as Vulnerable (VU), and Ferruginous Duck *Aythya nyroca*, listed as Near threatened (NT).

But while hunting regulations [26] explained that hunting of threatened species is illegal and prevented their hunting completely throughout the year in order to restore their natural numbers, hunters are allowed to hunt the VU Common Pochard *Aythya farina* ("three" birds only per hunter). Our results indicated that the numbers of birds hunted of this species exceeded the number of allowed for hunting for one trip and one hunter, which has caused large numbers to be killed annually.

The study also proved that both of VU Marbled Teal *Marmaronetta angustirostris* and Purple Swamphen *Porphyrio porphyrio* are hunted in large numbers over the year, and this is violation to the Wild Animal Protection Law [28], which covers the protection of 34 species of Iraqi birds, including both species VU Marbled Teal and Purple Swamphen. These species should not be hunted except for scientific experiments after obtaining government approvals.

- **Significant unsustainable hunting of other bird species:** Our study also indicated that hunting each of Greater Flamingo *Phenicopterus roseus*, Purple Swamphen *Porphyrio porphyrio* and Pygmy Cormorant *Phalacrocorax pygmeus*, (all listed as least concern (LC) in the IUCN Red List [27]) in large numbers among the 22 species that have been documented, and according to hunting regulations [26] these species are forbidden from being hunting throughout the year because they are of local and aesthetic importance.

Our results also found hunted both of Red-crested Pochard *Netta rufina* and Common moorhen *Gallinula chloropus*, in numbers exceeded the allowed number of "three" birds per hunter for the months of November, December and January, which caused the killing of a large numbers annually, which is a violation of law. Our results documented hunting practiced during the breeding season for the period of February to November, where hunting is forbidden, and hunting of these two species should forbidden in breeding season [26], and allowed only during November, December and January with a "three" birds per hunter limit.

The hunting regulations [26] also allow for the hunt of other species at a three birds per hunter limit and we found that numbers of birds hunted far were exceeded "three" birds per hunter limits for each species of: Mallard *Anas platyrhynchos*, Northern Pintail *Anas acuta*, Gadwall *Anas strepera*, Eurasian Teal *Anas Crecca*, Eurasian Wigeon *Anas Penelope*, Northern Shoveler *Anas clypeata* and VU Common Pochard *Aythya farina*.

- **Illegal killing within the National Park:** The study documented that the entire hunting efforts occurred in 15 sub-locations in the Central Marshes that are within the National Park zone. Hunting efforts occurred to varying degrees in Zichri (15%) Fatma (13%) and Hallab (12%), Hmaara and Baghdadiya lake (11% for both), Um Aludhaam (10%), Almanthar (8%), 712 Embankment (7%), Abo Shuther (3%), Al-Esagle (2%), Um Albinni (4%), while the percentage was 1% each for Abu Zirig, Aldabaat Lake, Al-Fhood Lake, & Abo Nislah.

These 15 sub-sites of the Central Marshes constitute much of the area and are interconnected and open to each other, therefore the movement of hunters using boats to move from place to place increases the extent of the areas that see hunting activities and their impact. There is essentially no site within the Central Marshes that is untouched from hunting activities during the year.

- **Hunting outside the legal open season:** bird hunting is currently practiced in all seasons of the year, even during the breeding season where hunting is legally forbidden. Iraq's National Environmental Strategy and Action Plan [17] states that degradation to Iraq's biological diversity is caused by overhunting during the breeding seasons.
- **Varying numbers of birds were hunted from season to season according to the abundance of favored target species:** Winter is ranked first because of the abundance of waterfowl, followed by autumn and then spring, with summer ranked last due to the high temperatures during this season and the smaller number of favored bird species that are present.

Fazaa, Dunn & Whittingham [25] have mentioned that the highest population of bird species found in the Central Marshes occurs in winter, especially in December, January and February. In our study, the highest number of bird hunting trips per hunter was 50 for the months of November, December, January, February and March, whereas the lowest number per hunter was 20 trips, and for the remaining months 15 hunting trips per hunter as highest number whereas the lowest number was 4 trips only. This refers to the illegal hunting practicing over the year and represents a violation to the period when bird hunting is prohibited according to Iraq's hunting regulations [26].

- **Illegal methods are used:** While hunting with guns kills the most number of birds in the Arabian Peninsula, in Iran, and Iraq [3], and this was proven to be the same for the Central Marshes in our study, there are also a number of hunting methods practiced that are legally forbidden. The study showed that the illegal methods used in the Central Marshes are shooting by using automatic guns that are forbidden by law ; trapping by using Al-Duosh, and poisoning by using poisons or chemicals. Other studies [4,5] have shown that hunting and capture techniques practiced in Iraq include the use of guns, poisons, nets, and other hunting equipment.

The percentage of birds hunted using automatic guns was the largest 89% compared to hunting by Al-Duosh from the results of our survey.

The percentage using Al-Duosh was 8%, followed by 3% using poisons / chemicals for hunting. While the last two methods may seem to be used by fewer hunters, they still have a significant impact due to the large number of species and individual birds that they kill using these methods.

According to the findings of Brochet *et al* [3], these methods target large numbers of birds and killed half of all bird families 53% that were assessed on the Arabian Peninsula, in Iran and Iraq.

All of these tools used are available and can be obtained easily from special commercial shops offering hunter equipment and without any prohibition, any conditions, or any instructions regarding what is legally permitted to use.

Due to disposable incomes, easy access to guns, cheap ammunition and the availability of transportation the number of migratory birds killed overall may be increasing [3].

Also we confirm that hunting of many least concern species occurs with the used of Al-Duosh, poisons and automatic guns (the latter varied between guns that fire five shots, eight and ten shots in rapid succession). Nets, traps, Al-Duosh, poison, explosives and automatic guns (guns that fire more than five cartridges in rapid succession) are forbidden to use in hunting of all birds species in the marshes [26].

From all of these findings it is clear that Central Marshes, including the National Park, are subject to illegal and unsustainable hunting over the year, that it occurring using activities and tools that are forbidden according to existing laws, and that mainly 22 bird species (including globally threatened species) are the focus of this severe hunting pressure.

## EVALUATION OF THE SIGNIFICANCE OF ILLEGALLY KILLED BIRDS

The significance of species and numbers of birds that are illegally killed in the Central Marshes was evaluated based on the preliminary assessment of the scope and scale of illegal killing and taking of wild birds in the Arabian Peninsula, Iran and Iraq [3]. It is considered 'Insignificant' when the maximum estimated number of birds illegally killed is  $\leq 50$ /year for a non-passerine species that is listed as "Least Concern" (LC) on the global IUCN Red List [27].

Based on this assessment [3], our study found that the hunting of all of the following species listed as Least Concern (LC) by the IUCN Red List [27] exceeded 50 birds/year for each species in the Central Marshes and that the harvest level was therefore considered "Significant".

These species include: Eurasian Coot *Fulica atra*, Common Moorhen *Gallinula chloropus*, Greater Flamingo *Phenicopterus roseus*, Glossy Ibis *Plegadis falcinellus*, Purple Swamphen *Porphyrio porphyrio*, Great Cormorant *Phalacrocorax carbo*, Pygmy Cormorant *Phalacrocorax pygmeus*, Greylag Goose *Anser anser*, Mallard *Anas platyrhynchos*, Northern Shoveler *Anas clypeata*, Red-crested Pochard *Netta rufina*, Northern Pintail *Anas acuta*, Eurasian Wigeon *Anas Penelope*, Garganey *Anas querquedula*, Gadwall *Anas strepera*, Eurasian Teal *Anas crecca*, Western Great Egret *Ardea alba*, Gray Heron *Ardea cinerea* and Purple Heron *Ardea purpurea*.

As for the species listed as "Critically Endangered" (CR), "Endangered" (EN), 'Vulnerable' (VU) or "Near Threatened" (NT) according to the IUCN Red List [27], any number of illegally killed birds was regarded as "significant". In our study, we documented hunting both of VU Marbled Teal *Marmaronetta angustirostris*, VU Common Pochard *Aythya farina* and NT Ferruginous Duck *Aythya nyroca*, which is listed as Endangered and Near Threatened on the IUCN Red List [27] and that this hunting practice occurs throughout the year in the Central Marshes and is considered "Significant".

Our results showed that the number of birds killed using guns reaches approximately 20 birds per hunter per trip. The number of birds killed by using AI-Duosh ranges between 100 to 300 birds per one hunting event (Plate 3). Typically using poisons kills 100-400 birds (except other species from non-target birds that kill)

According to our data analysis, interviews and observations, the numbers of birds killed annually is estimated at more than 50,000 birds and targets 22 bird species (mentioned in Table 1) out of a total of 125 species recorded recently in the Central Marshes [25]. An evaluation of the ecosystem services of the Central Marsh in Southern Iraq [20] recorded hunting of 12 bird species, which were sold in the main market of Chibayish city from the Central Marshes. Of their list, we included 10 of those species that were documented in our study, such as VU Marbled Teal *Marmaronetta angustirostris*.



Plate 3: Common Pochard, Eurasian Wigeon, Eurasian Coot; hunted using Al-Duosh and sold near the Central Marshes (Photo by Laith Ali Al-Obaid)

The Brochet *et al.* assessment [3] referred to illegal killing and taking of native wild birds species occurs regularly in Iraq (i.e. excluding vagrants) with estimates that ranged between 135,000-524,000 birds killed annually, and this ranked Iraq as third after Saudi Arabia and Iran in the assessment of the scope and scale of illegal killing and taking of wild birds in the Arabian Peninsula, in Iran and Iraq.

The annual estimates of the killing of some threatened species in Iraq represents the highest numbers killed per year relative to their global population size. Specifically for two species: VU Marbled Teal *Marmaronetta angustirostris*, it is estimated at 17% of the global population of this species and NT Ferruginous Duck *Aythya nyroca* it is estimated at 1% according to Brochet *et al.* [3]. These percentages refer to the killing of large numbers of both species in Iraq - particularly in the marshes, which have the most suitable habitat for these two species.



## ROLE OF GOVERNMENTAL AND NON-GOVERNMENTAL INSTITUTIONS AND CIVIL SOCIETY ORGANIZATIONS

The illegal killing and unsustainable exploitation of natural resources such as birds in the Central Marshes is related to the level of education and environmental awareness of the marsh residents. Study results showed that levels of education are varied. Twenty-eight percent (28%) of residents are able to read and write (without obtaining a primary certificate), 55% have a primary certificate, while 12% have an intermediate certificate and 3% have a secondary certificate (High school), and illiteracy was 2% from total surveyed. It is clear that all marsh residents need access to more education especially beyond the primary stage, because they leave schools at an early stage after learning only to read and write.

As the study showed, there is a lack of environmental awareness, which plays a critical role in effective environment conservation and biological diversity in the region. As has been mentioned in other studies and reports [13, 24 and others], one of the key challenges is the lack of awareness in the general public especially about biodiversity and environmental services that form the basis of all human activities.

The study showed that a large percentage of the hunters surveyed were unable to identify and distinguish the threatened and rare birds species, while 95% of them were not fully knowledgeable about the resident and migratory birds species among the species that they hunted [29], but generally they are aware of the impact of using poisons and Al-Duosh on birds.

Overall, hunters generally lack environmental awareness and knowledge of the impact of hunting on birds, as well as little knowledge of the rules and regulations governing birds hunting, the types and numbers permitted to be hunts, etc., which would contribute to the preservation of the environment and biological diversity of the Central Marshes.

The raising awareness of environmental sustainability in the marshlands depends mainly on the joint cooperation between the residents of the marshes one the hand and concerted efforts by government institutions and their related departments represented by the Ministry of Health and Environment, the Ministry of Interior (who include the Environmental Police), the Ministry of Water Resources, the Ministry of Agriculture, the Ministry of Labor and Social Affairs. Non-governmental institutions and civil society organizations are also key partners on the other hand.

In addition to the above, weak enforcement of environmental laws and inadequate support by the Iraqi judiciary in upholding environmental regulations, especially hunting regulations [26] has a major impact on environmental protection and biodiversity in the marshes [17].

Better enforcement of these rules and regulations by the environmental police and the judiciary, would help organize hunting practices of birds and other species and support the protection of birds and the environment if applied at least in the marshes.

In the end the study results also indicated that many hunters are interested in helping to protect of natural resources in the marshlands by reducing hunting pressure on birds or replacing the hunting activities and practicing another types of work including environmental tourism or any other environment projects as alternative employment. If the Iraqi government and civil society can provide technical, logistical and financial support to help them transition to employment that is less reliant on hunting as an economic means of support, this it will greatly enhance the environmental sustainability of the marshes and improve the natural and cultural ecosystem services that the Marshlands provide.



## REVIEW MOST IMPORTANT IRAQI ENVIRONMENTAL LAWS AND LEGISLATIONS OF BIRDS PROTECTION

The Environmental Protection and Improvement Law No. 27 of 2009 [30] refers, in articles on biodiversity protection, to the prevention of damages to biological groups in their habitats, and preventing hunting of threatened and semi-threatened terrestrial and waterbirds species or their trade. It also covers the prevention of hunting, killing, catching, possession, or transferring of the terrestrial and waterbirds species, which have been identified by Iraqi authorities, including migratory birds taken from their resting or breeding grounds in Iraq.

As for the Law on the Protection of Wild Animals No. 17 of 2010 [28], it emphasized the protection of wild animals, including wild birds, as part of Iraq's national wealth and regulates their hunting areas, and the identification of permitted species and hunting seasons. Article (4) clearly forbidden use unsustainable methods in hunting of wild animals including the use of nets, traps, poisons, automatic rifles, machine guns and hunting guns with a shoot length of less than 400 millimeters, in addition to egg collection or the destruction of the nests of wild birds.

Also prohibited is the chasing of wild birds with planes, cars, and other means of transportation. The law mentioned in list of 34 protected species that it is prohibited to hunt (except for scientific purposes after obtaining official approval). This includes important species and other globally threatened species as listed in the IUCN Red List [27].

Punishment for breaking this law is imprisonment for a period not exceeding (3) three years and a financial penalty not exceeding 3.000.000 Iraqi dinars (equivalent 2,500 USD) or one of these two punishments and confiscation of hunting species, tools, equipment, and transport used.

In 2017, the Ministry of Health and Environment released regulations No. 2 for regulating of hunting in the marshes [26], according to the provisions of the first, second and third items of Article 18 of the Law of Protecting and Improving the Environment No. 27 of 2009 [30] clarifying with more details the birds species and numbers that it is forbidden to hunt and other species for which hunting is allowed in the marshes (specifying the specific numbers that can be taken and the months where hunting is allowed). It also prohibits the use of nets, traps, poison, explosives and automatic guns (firing more than five cartridges continuously) for birds hunting, and prevents the hunting of native and threatened species of local and aesthetic importance completely in order to restore their numbers. This species consist of a list of 31 species of birds.

Examples of listed species that can not be hunted during their breeding season (February to October) include: Red-crested Pochard *Netta rufina*, Common Moorhen *Gallinula chloropus*, Pin-tailed Sandgrouse *Pterocles alchata* and Spotted Sandgrouse *Pterocles senegallus*. It is allowed to hunt these species during November, December and January. Bag limits are set to (3) three birds only for each hunter and it is forbidden to use nets, traps, Al-Duosh and automatic guns in their hunting.

As for species that are allowed to hunting with a bag limit of (3) three birds only for each hunter are: Mallard *Anas platyrhynchos*, Northern Pintail *Anas acuta*, Gadwall *Anas strepera*, Eurasian Teal *Anas crecca*, Eurasian Wigeon *Anas Penelope*, Common Shelduck *Tadorna tadorna*, Northern Shoveler *Anas clypeata*, and Ruddy Shelduck *Tadorna ferruginea*. It is also allowed to hunting the vulnerable (VU) species Common Pochard *Aythya farina*. But again, it is forbidden to use nets, traps, Al-Duosh and automatic guns in their hunting.

## RECOMMENDATIONS

Based on the findings of this report, we provide here a number of recommendations that should be implemented to adequately protect the unique, rare and threatened species of the Central Marshes National Park area. To ensure that these natural resources are not lost but can be enjoyed by future generations of Iraqis, immediate actions are needed. The list of recommendations provided below is not new and has been stated in other documents before, such as the Central Marshes National Park Management Plan.

The following recommendations center around the issues of improved education and awareness-raising in the marshland communities and of hunters and hunting associations; better enforcement of the regulations that already exist, continued research, and improved economic opportunities for marshland communities.

The recommendations outlined in this report will take dedicated financial, logistical and human resources to accomplish, but are well within the abilities and determination of the Iraqi people to achieve for the protection and sustainable use of the Central Marshes and Iraq's overall natural wealth.

- Increase the awareness of decision-makers and local communities of the National Park management through trainings and local educational initiatives.
- Establish "protection initiatives" to prevent birds hunting by use of poisons and Al-Duosh at the local community level, similar to examples of some fish protection initiatives that aim to prevent the use of poisons in Central Marshes.
- Increase awareness of local residents regarding sustainable use of the ecosystem services, particular in regards to awareness about the impacts of illegal hunting methods and hunting out of open seasons.
- Raising environmental awareness among the hunters in order to preserve rare and threatened species and education them on the species and bag limits that are permitted in hunting.
- Increase of the capacity of non-governmental organizations, local associations and media institutions to educate the public on the importance of ecosystem services, biodiversity conservation and environmental sustainability.
- Prevent over-hunting of non-threatened species of birds and implement hunting laws and regulations by creating checkpoints at the river entrances to the Central Marshes, especially near the cities, and conducting regular patrols to monitor illegal hunting violations that occur.
- Prohibit the hunting of any threatened birds species or the trade of these species, through the involvement and activation of the Ministry of Interior and utilizing the main checkpoints that surround the National Park to confiscate prohibited hunted species and punish violators with fines.

- Increase economic opportunities in marsh communities through establishment and support for sustainable environmental projects (i.e. eco/nature tourism, training of guides..etc) that create alternative job opportunities to reduce hunting pressure on resident and migratory birds species as well as fish and other species.
- Improve the enforcement of laws governing wildlife, hunting and protection natural species by training, fully funding and empowering the environmental police.
- Implement the financial fines mentioned in the law with regard to damage of biological diversity.
- It is necessity to work and create a spirit of joint and effective cooperation between the responsible ministries of the National Park site, such as the Ministry of Health and Environment, Ministry of Water Resources, Ministry of Agriculture, Ministry of Interior and Ministry of Labor and Social Affairs with the aim of coordinating efforts to preserve the natural systems resources in the site.
- Provide funding and support for additional studies and pilot projects to evaluate the exploitation of various natural resources within the Central Marshes as this area is surround by many villages and residential areas, and residents practice a number of activities within the Central Marshes.
- Since there are a high threats to over 20 birds species in the marshlands, which may have a negative impact on their distributions in Iraq and the region, it is necessary to conduct monitoring and evaluation program of bird hunting every year, to find out which species are most impacted and determine best management practices for individual species protection.
- The full implementation of National Park Management Plan is needed, which will contribute to achieving environmental sustainability and enhancing the relationship between the local communities and the marshes environment.
- Establishment of "local hunting regulation groups" that ensure the proper development of regulatory mechanisms for local hunting associations and individual hunters; help them understand the hunting regulations on target species; allowable hunting methods; seasons, and bag limits, as well as provide input on local species management plans.

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