

The Goldfinch (*Carduelis Carduelis* Linnaeus, 1758) in Palestine: An Appreciated Bird and A Threatened Species

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ABSTRACT

The Goldfinch (*Carduelis carduelis* Linnaeus, 1758), is one of the most prized bird species in Middle East countries due to its brilliant colors and amazing sounds. Goldfinch hunting is a major factor in the decline of its population in Palestine. The current study focuses on the Goldfinch as an appreciated bird and a threatened species in the West Bank and Gaza Strip - Palestine. This five-year study (2018-2022) was based on visits in the field and to animal markets, pet stores and zoos as well as discussions with stakeholders and follow-up on social networking sites and news. The results showed that the Goldfinch (locally known as Turkmen brides) is appreciated by all Palestinians and bred in cages because of its beautiful voices and wonderful colors, and it is possible to crossbred it with a Canary to produce the so-called hybrid mule (known locally as Bandoek), a source of income where ordinary wild individuals can reach a price of \$45 - \$100, and to produce trained individuals known as "language Goldfinches", the price of which can reach \$3,000 or more. The methods applied for hunting Goldfinches are nets, mist nets and glue-coated sticks. Many passerine and non-passerine bird species are usually trapped, along with the Goldfinch. Hunting birds in the border areas is fraught with danger due to repeated Israeli attacks on bird hunters, causing them to be killed, injured or arrested. Large numbers of Goldfinches are usually smuggled from Jordan or Egypt to Palestine. Internal smuggling operations were also recorded between the Gaza Strip and the West Bank. Threats to the Goldfinch in Palestine include urbanization and habitat destruction, poaching, trade in male goldfinches, and weak application of the Palestinian environmental laws and regulations. In conclusion, the strict application of environmental laws, the organization of environmental awareness campaigns directed at wildlife hunters, and the artificial breeding of Goldfinches are all means of preserving biodiversity in Palestine in a sustainable fashion.

Keywords: Goldfinch; *Carduelis Carduelis*; Appreciation; Goldfinch Hunting; Hybridization; Language Goldfinches; Goldfinch Smuggling; Threats; Palestine

Introduction

The Goldfinch or the European Goldfinch (*Carduelis carduelis* Linnaeus, 1758), is a small passerine bird belonging to the finch family (Fringillidae). It is native to Europe, North Africa, and western and central Asia. It has been introduced to many countries around the world. The breeding male (Figure 1) has a red face with black markings around the eyes and a black and white head. The back and sides are orange or chestnut brown. The black wings have a wide yellow stripe. The tail is black and the rump is white. Males and females are very similar, but females have a slightly smaller red area on the face [1-4]. Goldfinch can be encountered anywhere there are shrubs, trees, herbs, herbaceous plants and spiny plants known as thistles. This is why the Goldfinch is sometimes called

Thistle Finch [5]. However, Goldfinches can be seen in orchards, parks, gardens, nature reserves and ecologically important areas [6-9]. Goldfinches are one of the most appreciated bird species in the Middle East countries because of their wonderful colors as well as their amazing voices. As a result, people tend to keep these species indoors as cage birds. A survey in an Algerian city indicated that almost 60% of households had a cage bird, with the Goldfinch being the most popular species [10]. Goldfinches are commonly kept and bred in captivity around the world because of their distinctive appearance and pleasant song. Shop owners used to hang cages of these birds at the doors of their stores. Some Goldfinch breeders cross them with other species of songbirds, such as the Canary (*Serinus canaria*) [4,10].



Figure 1: The Goldfinch (*Carduelis carduelis*) is one of the most colorful and beautiful passerines in Palestine and has long been a victim of its beauty and the sweetness of its voice and tones.

Goldfinches have become a source of financial income for their hunters [11]. Overhunting of these birds is a major factor in the decline of their populations in Middle East countries, including Palestine. Sometimes, large numbers of these birds are smuggled between countries such as between Jordan and Palestine, and between Egypt and the Gaza Strip (Personal Communications). Pet keeping can generate threats to populations of wild species, especially when the pets are sourced from the wild. Consumer demand for pets taken from the wild can promote unsustainable supply chains in wildlife in countries and regions that are poorly regulated. Studies concerning Goldfinches in the Middle East counties are escalating day by day. In Algeria, A lot of recent

work was done where Goldfinches are considered as major pets illegally trapped and later sold at pet stores [10,12-18], where in most households possessing cage birds, Goldfinches were found to be the most popular species [10]. In Morocco, Ben Yahia [19] pointed out that the country has adopted legislations to protect the Goldfinch and launches regular operations to combat the trafficking of protected species. In Jordan, El-Moghrabi [4] noted that Goldfinch is in decline due to its intensive trapping and its high commercial value. Eid, et al. [20] pointed out that Goldfinches and other passerines are trapped at a large scale and illegally traded in Jordan to the extent that they will face a drastic decline in their populations. Evans, et al. [21] showed that the Goldfinch breeds in

the Proposed Rum Wildlife Reserve in southern Jordan because there is a large expanse of suitable breeding habitat such as olive trees, irrigated cultivation, gardens, lawns and water-sprinklers.

Although Ramadan Jaradi, et al. [22] confirmed the decline in the Goldfinch population in Lebanon due to its trafficking; Abi-Said, et al. [23] indicated that Goldfinches are one of the most popular and traded species in Lebanon. They also indicated that the Goldfinch is hunted extensively during the migration season in Lebanon. The Goldfinch was one of the Saudi Arabia's high conservation priority bird species [24]. In Israel, Safriel [25] pointed out that the Goldfinch is a winter visitor that is seen in flocks in early November to mid-March, with a few have started to breed in the area. Among the 108 bird species recorded in Yarkon Park, Tel Aviv, the incidence of Goldfinches, as urban adapters, was 70% as revealed by Shwartz, et al. [26].

Most likely, there are no specialized studies on the Goldfinch in the Palestinian territories except for Abu Taleb [27], who, among other bird species, studied in his Ph.D. thesis some characteristics of the reproductive biology of the Goldfinch in the Gaza Strip. On the other hand, Goldfinches occur in many ecosystems in Palestine, although its numbers are constantly decreasing due to changing ecological habitats, persecution and poaching of birds, and this was shown by several studies in the West Bank and the Gaza Strip [6-9,11,27-34]. Qumsiyeh, et al. [35] revealed a significant decrease in vertebrate biodiversity; of which the Goldfinch was a part, in the Bethlehem area, which was becoming increasingly urban, with a rise in temperature and a decrease in annual precipitation over the past four decades. Khalilieh [36] surveyed the avifauna of Wadi Al-Quff protected area and its vicinity, Hebron. Although his study included many finch and sparrow species, the Goldfinch has not been documented in the reserve. In her very recent study, Al-Sweirki [11] focused on the animal trade in Gaza City and indicated that the Goldfinch is the backbone of bird trade in the Gaza Strip despite its scarcity in nature due to intensive poaching and trapping. The Goldfinch, which is about 12 centimeters long and weighs about 14 grams, is a prime target for the Palestinians to capture. With the early hours of dawn, bird hunters, from both the West Bank and the Gaza Strip, head away from their places of residence to areas of orchards, prairies, sand dunes and other environments to prepare and set up their nets in anticipation of the arrival of the migratory birds of bright colors and enchanting sound, especially the Goldfinch. This bird, in particular, is a target for every bird hunter in Palestine. Well-stocked nets are usually surrounded by 'cages' containing Goldfinches, also called 'horeek', to attract targeted migratory birds with their charming tweets. In fact, Many Palestinian and even Israeli reports and websites have

discussed the Goldfinch, its hunting, and the dangers it faces, in the hope of galvanizing the Palestinians to protect this beautiful-looking and sweet-tempered bird [37-43]. Based on the foregoing and the importance and value of the Goldfinch for the Palestinian society, the current study comes to focus on the Goldfinch (*Carduelis carduelis* Linnaeus, 1758) as an appreciated bird and a threatened species in the West Bank and the Gaza Strip – Palestine. The importance of this study, despite its modesty, lies in the fact that it is the first in the Palestinian Territories (West Bank and Gaza Strip) that deals with the Goldfinch in terms of poaching, trapping and the love that the Palestinians show for it because of its bright colors and beautiful sounds.

Materials and Methods

The Study Area (West Bank and Gaza Strip)

Palestine (27,000 km²) is a geographic region in Western Asia usually considered to include three political masses: The West Bank, the Gaza Strip and the rest of the Palestinian lands occupied by Israel since 1948 (Figure 2). The West Bank (5,655 km²), which represents about 21% of the total area of Palestine, is bordered by Jordan and the Dead Sea to the east and by the Palestinian lands occupied by Israel since 1948 to the south, west and north. It is composed of 11 governorates: Nablus, Qalqilya, Tubas, Salbit, Tulkarm, Jenin, Jericho and the Jordan Valley, Ramallah and Al-Bireh, Bethlehem, Hebron, and Al-Quds (Jerusalem). The population of the West Bank is estimated to be more than 3.2 million people. The West Bank is nowadays studded with Israeli settlements into which Israeli law is pipelined. The Gaza Strip (365 km²), which represents about 1.5% of the total area of Palestine, is an arid to semi-arid coastal area located in the southern part of the Palestinian coast along the eastern shore of the Mediterranean Sea (Figure 2). It is composed of five governorates: North Gaza, Gaza, Middle, Khan Yunis, and Rafah. Sand dunes are the main feature of the western part of the Gaza Strip, while silt and clay lands predominate in the eastern part. The population of the Gaza Strip is estimated to be more than 2.2 million people, and the population density reaches more than 6,000 people per square kilometer, making the Gaza Strip one of the most densely populated areas in the world. Unlike the West Bank, which is littered with Israeli settlements, today the Gaza Strip is free of Israeli settlements, after their irreversible uprooting in late 2005. The climate of Palestine is similar to that of the Mediterranean region, which is characterized by four months of hot, dry summers and short winters with rainfall from November to March. The main water resources in Palestine include groundwater, rivers, lakes, ponds, springs, and harvested rainwater. The Jordan River, one of the main rivers in Palestine, has a length of about 260 km and drains a total area of 18,300 km² [44].



Figure 2: Palestine includes three political masses: The West Bank, the Gaza Strip and the rest of the Palestinian lands occupied by Israel since 1948.

Procedure

The current five-year study (2018-2022) was based on several procedures. Multiple field visits were conducted in the morning hours before noon to the installation sites of hunting equipment for birds in general and Goldfinches in particular, which are located within the Gaza Strip and along its western and eastern belts. When needed, binoculars and digital cameras were used for monitoring and documentation. Animal markets, pet stores, and zoos were visited to study their content of Goldfinches and other bird species. It should be noted that all field procedures and actions were limited to the Gaza Strip due to the complete geographical separation between the Gaza Strip and the West Bank due to the lands occupied by Israel since 1948 (Figure 2). Like most Gazans, the author does not find a way to reach the West Bank and Al-Quds Al-Sharif (Jerusalem) due to the complex Israeli occupation procedures and the difficulty of obtaining permits to enter the West Bank and the rest of the Palestinian Territories occupied by

Israel since 1948. On the contrary, many discussions were held with various stakeholders in both the West Bank and Gaza Strip via mobile phones or social media such as Facebook, WhatsApp, etc. Stakeholders usually included bird hunters, breeders, some smugglers as well as pet store keepers to get more information about the Goldfinch's ecology, trapping and trade. The author also relied actively on following up the news and social networking sites that are always full of local news related to the Goldfinch in Palestine.

Results

Why do Palestinians Appreciate Goldfinches?

Goldfinches, which are known among the Palestinians as the «brides of Turkmen», are among the most beautiful and attractive songbirds that Palestinians in the West Bank and Gaza Strip can acquire, appreciate and raise in cages in their homes and shops. This is due to a number of reasons that the Palestinians consider:

The Pleasant and Charming Voice

Goldfinches have wonderful sounds that make their acquisition desirable in light of the bustle of Palestinian life, which suffers from many problems due to the Israeli occupation of Palestine and the constant abuse of the Palestinians by Israeli soldiers between killing, injuries, interrogations, arrests, and standing at checkpoints, especially those widely spread in the West Bank. The singing and melody of the Goldfinch is not found in other birds, as its singing has charm and beauty. The human ear can receive these tones of Goldfinch continuously and for a long time without being disturbed or tired of this singing. Whenever the Goldfinch sings in front of his owner, he wants more from the bird and does not want him to stop because of the beauty of the singing, words and language of this

talented creature.

The Harmonious and Beautiful Colors

The Goldfinch, especially the males, has various and wonderful colors (Figure 3) that are rarely owned by another bird in the Palestine environment. The colors of the feathers in Goldfinches attract the attention of homeowners and their guests, which bring happiness and joy in the souls. Some Palestinians who have been contacted consider the Goldfinch to be a member of the family, and therefore it must be taken care of, cared for, and all services provided to it. Those who are fond of raising Goldfinches and some stakeholders stated that at least 70% of Palestinians who have ornamental bird cages in their homes own Goldfinches.



Figure 3: The Goldfinch (*Carduelis carduelis*) in Marj Ibn Amer, northern West Bank, Palestine.

Hybridization

The Goldfinch (*Carduelis carduelis*) can mate with the Canary (*Serinus canaria*) to produce the so-called hybrid mule (locally known as the Bandoek) (Figure 4), which is one of the very

distinguished birds in singing. The infertile Bandoek gains strength and length of breath during its tweets from the Canary, while it gains the aesthetic and throwing ability of tweets from the Goldfinch. In other words, crossing a Canary with a Goldfinch produces a bird with a more melodic tone and the longer.



Figure 4: The infertile mule (known locally as Bandook) results from hybridization between a male Goldfinch (*Carduelis carduelis*) and a female Canary (*Serinus canaria*).

Source of Financial Income

The Goldfinch, despite its small size, is considered one of the most expensive birds that can be trapped in the Palestinian Territories. The price of ordinary wild individuals has reached \$100. Therefore, trapping Goldfinch is the aspiration of bird hunters in Palestine because it brings them significant financial incomes.

Goldfinch Language

Some Palestinians are experts and skilled in the so-called Goldfinch language, and they may annually produce many trained chicks, the price may reach \$3,000 or more per each. Any mistake made in the language sequence causes a sharp drop in the price of a Goldfinch, which sells for only about \$100. The rule in Goldfinch science says that the price of a trained Goldfinch depends on how well it masters these tones that it receives from experts.

Goldfinches Trapping in Palestine

Despite the many ways in which wild birds are trapped in the Palestinian Territories, the most common methods of catching Goldfinches are netting or sticks coated with glue as follows:

Netting

As soon as autumn of each year comes, professional and amateur bird hunters begin to set up their nets in agricultural lands

and open areas in the West Bank and the Gaza Strip. In the Gaza Strip, netting is commonly applied proximate to Mediterranean shores or near the northern and eastern borders, in search of the Goldfinch that migrates to Palestine at this time of year, to be a source of livelihood for them (Figure 5). Hunters used to attract Goldfinches to trap them in the nets by placing and tying two or more Goldfinches; known locally as «horeek», near the nets, where their feet are fixed with a rope that the hunter holds at the end. Mostly, hunters place the Goldfinches (bait) on tree branches or other objects. The hunter here moves the rope from time to time to force the tied Goldfinches to move, which contributes to attracting wild Goldfinches and sometimes other bird species. As soon as a Goldfinch falls into the net, the hunter directly pulls another rope connected to the net to close the net on the bird and ensure that it is caught. The hunter puts Goldfinches and other caught passerines in small cages and keeps repeating this action to catch more birds. Some bird hunters were able to bring audio recordings of the Goldfinch's song as a way to lure other Goldfinches into the nets designated for trapping them. It is worth mentioning that the Israeli occupation authorities forbid hunting or trapping all wild bird species including the rare Goldfinch and punish anyone convicted of hunting with imprisonment and a heavy fine, but the Palestinian Authority is less severe in dealing with this phenomenon, despite its prohibition.

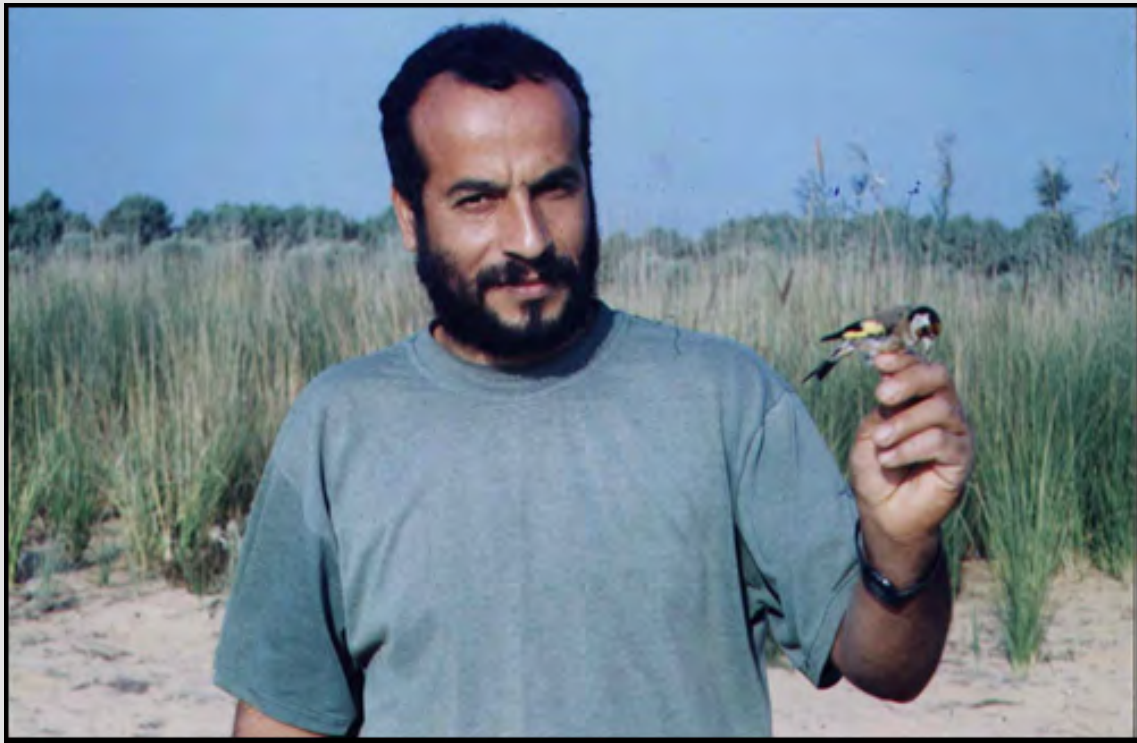


Figure 5: Trapping of Goldfinches represents a source of livelihood for bird hunters.

Mist or Aerial Nets

Mist nets, which are virtually invisible and known locally as «magic nets», have been erected in some places as well. Mist nets are not specific for the birds hunted. Goldfinches are rarely trapped by this kind of nets.

Glue-Coated Sticks

This effective method requires less effort than netting and is summarized by applying the glue as an adhesive to sticks attached to tree trunks (e.g., Date Palm trees) or other objects where Goldfinches are found in farmland and orchards. This method is similar to the netting method of using other Goldfinches as bait to attract the birds of the same species to fall on. Once the birds fall on the sticks, they will not be able to escape, and it will be easy for the bird hunter to collect the caught birds in special cages nearby.

Risks of Trapping Goldfinches Near the Borders

The political and military boundaries separating the West Bank and the Gaza Strip on the one hand and the Palestinian areas occupied by Israel in 1948 on the other hand is called the Green Line or the Armistice Line. Due to the scarcity of housing and population density in the border areas due to the military and

security conditions imposed by Israel, they enjoy an abundance of wildlife, especially wild birds that are usually targeted by hunters. The profession of bird hunting in these areas is fraught with dangers due to the repeated Israeli attacks on farmers, citizens and bird hunters because of the security arguments they claim. Many Palestinian farmers, shepherds, and bird hunters were killed in those areas, and many were injured and arrested. The researcher has remotely examined the Israeli violations in those border areas in the north and east of the Gaza Strip, and perhaps the Palestinian media focus almost daily on such Israeli violations and attacks. Israeli tanks and bulldozers sometimes penetrate into those areas to wreak havoc and kill people, trees and stones, and this matter has become clear to the eye and is not hidden from anyone.

Birds Trapped Along with Goldfinches

During the numerous field visits to the places of Goldfinch trapping in the Gaza Strip, the researcher recorded other species of passerines (order Passeriformes) and non-passerines (other orders of birds) that fall into nets or sticks coated with glue (Figure 6). Bird hunters from both the West Bank and the Gaza Strip also added other birds that fall into their hunting means. Table 1 illustrates a list of the birds trapped along with Goldfinches.



Figure 6: Many passerines, especially finches, are commonly trapped along with Goldfinch.

Table 1: Birds trapped along with Goldfinches in Palestine.

Family	Scientific Name	Common Name
Passerines		
Fringillidae	<i>Carduelis carduelis</i>	Goldfinch
	<i>Chloris chloris</i>	Greenfinch
	<i>Linaria cannabina</i>	Common Linnet
	<i>Serinus serinus</i>	European Serin
	<i>Spinus spinus</i>	Eurasian Siskin
	<i>Rhodospiza obsoleta</i>	Desert Finch
	<i>Fringilla coelebs</i>	Common Chaffinch
Passeridae	<i>Passer domesticus</i>	House Sparrow
Oriolidae	<i>Oriolus oriolus</i>	Common Golden Oriole
Alaudidae	<i>Galerida Cristata</i>	Crested Lark
Motacillidae	<i>Motacilla alba</i>	White Wagtail
	<i>Motacilla flava</i>	Yellow Wagtail
Sturnidae	<i>Acridotheres tristis</i>	Indian Myna
Non-passerines		
Psittaculidae	<i>Psittacula krameri</i>	Rose-ringed Parakeet
Picidae	<i>Jynx torquilla</i>	Eurasian Wryneck
Upupidae	<i>Upupa epops</i>	Eurasian Hoopoe
Phasianidae	<i>Coturnix coturnix</i>	Common Quail
Columbidae	<i>Spilopelia senegalensis</i>	Laughing Dove
	<i>Streptopelia turtur</i>	Turtle Dove

Fate of Trapped Goldfinches and Other Birds

Goldfinch is usually hunted in very small numbers, and sometimes the harvest of its catch may be zero in the local environment due to its small presence, unlike the rest of the bird species that can fall into the trap in greater numbers. The Goldfinch is considered the most expensive among the birds trapped in the Palestinian territories. Its price may reach in the normal situation \$45 - \$100, depending on various factors including age, singing, and so on. The fate of the Goldfinch and its relatives from the finch family is to be sold to pet shops or to the many local markets scattered throughout the Gaza Strip and the West Bank. One of the most famous local markets in the Gaza Strip is the Yarmouk Market, which is located in the center of Gaza City. It is filled with different species of wildlife that are hunted in the local environment, including some mammals and reptiles, especially snakes. In one of his visits to the Yarmouk market, the researcher recorded the display of the Palestine Viper (*Daboia palaestinae*), which is the most venomous snake in Palestine and neighboring countries, and more than 90% of poisonous snake bites in those countries are attributed to it. The fate of the rest of the birds that may fall into the

nets or the traps is to become food for the hunters or for those who buy them, or to be raised at homes, or to be sold to pet shops and sometimes to some private zoos. Some of the hunters interviewed claimed that they release some non-target birds into nature after they have been caught.

Goldfinch Smuggling in Palestine

The political and military conditions that Palestinians live have created an atmosphere of poverty, unemployment and lack of job opportunities, which made hunting and trade in wildlife a common thing. It seems that the smuggling of Goldfinches to Palestine from the surrounding countries is widely spread, especially to the West Bank from Jordan and the Gaza Strip from Egypt. Internal Goldfinch smuggling operations occur from the Gaza Strip to the West Bank and Jerusalem as well. The most common way to smuggle Goldfinches is by disguising them with clothing, empty water bottles, or chips bags. However, there are still many unknown ways. In all cases, the birds are sedated to ensure that they do not move while the smugglers cross the border. In addition, smugglers can tie a bird's beak, legs and wings before wrapping it in a piece of cloth or laying it in a mesh of fabric on the leg (Figure 7).



Figure 7: Palestinian caught attempting to smuggle 40 Goldfinches in his pants from Jordan into Palestine.

Smuggling from Jordan to Palestine

Smuggling of birds, especially Goldfinch, from Jordan to the West Bank, has become a very dangerous matter and a blatant threat to this rare species in Palestine. During the past years, the

Israeli port authorities, especially at the King Hussein Crossing, arrested several Palestinians who were trying to smuggle dozens or even hundreds of wild Goldfinch from Jordan to the West Bank in their pants. The Palestinians were detained by Israeli police for

further questioning. The smugglers used to hide the sleeping birds after they were drugged inside two specially prepared pieces of cloth, which the smuggler wore on his feet. The two pieces of cloth looked like socks and had holes for ventilation so that the Goldfinch would not suffocate. Despite the arrest of the Israeli port authorities at the King Hussein Crossing for several smuggling operations, tens or even hundreds of smuggled Goldfinches have reached their destination inside the West Bank. It is worth mentioning that Goldfinches that are caught in the wild are sold at \$45 - \$100 per bird, while the price of a hybrid Goldfinch/Canary can be \$140 - \$400. In one of the famous smuggling cases, Israeli customs officials arrested a Palestinian from Nablus who tried to smuggle more than 40 Goldfinches from Jordan to Palestine via the King Hussein Bridge in February 2017. The birds were hidden inside plastic bags tied to his legs and tucked under his pants (Figure 7). It happened when the man raised the suspicions of customs officials who asked him to step down and undergo a body search. Moreover, in 2017, the Israeli occupation authorities published a video clip of a young man from Hebron coming from Jordan who tried to smuggle Goldfinches in juice boxes before he was discovered.

Smuggling from Egypt to the Gaza Strip

It is worth noting that smuggling operations were taking place for some birds, including Goldfinch, through underground tunnels with Egypt about a decade ago, but the Egyptian security restrictions have made the matter complicated in recent years. In fact, since the earth tunnels were dug and the smuggling became common, thousands of Goldfinches were brought from Egypt, where they are hunted on farms located on both sides of the Nile Basin.

Smuggling from the Gaza Strip to the West Bank

During the past years, Israeli inspectors at the Erez Crossing, located in the far north of the Gaza Strip, have foiled several attempts to smuggle Goldfinches from the Gaza Strip to the West Bank and Al-Quds (Jerusalem), where they can sell them for thousands of shekels (the local Israeli currency used in the Palestinian territories). In one of the incidents occurred in 2017, and through a routine Israeli security examination of a Gazan agricultural trader at the Erez Crossing, it was found that 30 Goldfinches were tied and hidden in the side of his bag. The birds were released outdoors afterwards.

The Language of Goldfinches

Some Palestinians in the West Bank and Gaza Strip are experts in the language of Goldfinches, as they annually produce many trained chicks, the price of each of which may reach \$3,000 or more. However, one mistake in the language sequence is paralleled by a sharp drop in the price of Goldfinch, reaching only about \$100. In general, the price of the Goldfinch depends on how well it masters these tones that it learns from experts. To make the process clearer,

the Palestinian Goldfinch trainers begin isolating the young chicks 27 days after hatching, then placing them in individual cages in places isolated from sound and high light, so that they do not see the light or hear the noise, which disturbs their memorization of tones. The chicks are then subjected to carefully arranged and recorded tones for 6 hours a day, and the process of indoctrination continues for a whole year. A Goldfinch breeder in the Gaza Strip says that he relies on teaching languages and tones on the Goldfinch chicks that he produces inside cages and large rooms, because there is great difficulty in teaching languages and tones to chicks that are caught from nature, because it takes a long time to tame them and accustom them to cages. It also seems difficult to teach nature's chicks an imbued language because they are saturated with the language of nature.

Threats Facing Goldfinches in Palestine

The Goldfinch is of European origin and is found in Palestine most days of the year. This lovely bird species faces many challenges in the Palestinian Territories:

Urbanization

The Goldfinch is one of the migratory birds to Palestine, and because of the extensive urbanization and habitat alteration, modifications and destruction in the country, the number of Goldfinch began to decrease significantly.

Overhunting

The illegal trade and the black market in Palestine threaten the Goldfinch with extinction. Palestinian merchants resort to smuggling Goldfinch from Jordan to the West Bank and from Egypt to the Gaza Strip as a kind of money-generating trade for its owners. This is because of the rare presence of the bird in Palestine due to overhunting and the restrictions imposed by the Israeli occupation authorities on its import. Large scale poaching of Goldfinches in Palestine started since decades. Poaching Goldfinch became so frequent and widespread that the kids took it up as a hobby and adults as a part-time or even full job.

Trade in Goldfinch Males

Many university students in the West Bank and the Gaza Strip were found to trade with Goldfinches and sometimes with other passerines in order to cover their university expenses. Such a trade can disrupt the ecological balance of biodiversity in the Palestinian territories if the requested Goldfinch males are trapped and females are released, as is the case.

Weakness of Palestinian Laws and Legislation

The Palestinian Authority does not have clear laws or executive regulations to limit the hunting of endangered birds or wild birds in general, compared to the Israeli occupation, which imposes

deterrent penalties on hunters of wild birds, and the researcher witnessed this clearly when he was working in Israel more than 30 years ago.

How to Protect Goldfinches?

Many measures can be taken in the Palestinian territories to protect and preserve Goldfinches and other wild birds:

1. It is necessary for the Palestinian authorities to intervene immediately to stop the extensive and intensive poaching and the illegal trade of Goldfinches and others, as failure to do so will lead to the continued exploitation of Goldfinches and other resident and migratory songbirds to the extent that they may reach extinction.
2. The necessity of educating the local population about the ecological consequences of species extinction and its potential impacts on the local economy and human health.
3. The need to encourage artificial breeding of Goldfinches as this provides a self-sustaining solution. It is important to combat the smuggling of Goldfinch across the border in order to preserve this rare bird with a regional and global thinking.

Discussion

The Goldfinch, with its brilliant colors and excellent melodic singing, is by far the favorite pet of people living in Palestine and other countries where it has formed part of the local culture of those countries. This bird symbolizes joy, hope and positivity. For this reason, it has been bred in captivity for a very long time in many countries of the world and has even been crossed with other finches including the Canary in order to improve their singing abilities. The spread of the Goldfinch on a large scale in Palestine (West Bank and Gaza Strip) more than two decades ago may be attributed to the abundance of ecosystems and habitats that embrace it, the spread of countryside and orchards, and the weakness of urbanization, which at the present time led to urban growth at the expense of nature and ecological habitats. Streets and concrete blocks proliferated at the expense of the beautiful Palestinian wilderness. There were more job opportunities for Palestinians in the past, and the rates of poverty and unemployment were not high compared to the difficult socioeconomic conditions that are sweeping Palestine at the present time. The mountains, plains, sand dunes, and deserts contain various and attractive forms of vegetation, represented in herbs, grasses, trees, shrubs and orchards, which in turn offer feeding, hiding, camouflaging, nesting and breeding values to Goldfinches and other birds. Regarding random and unregulated urbanization that usually negatively affects wildlife, Qumsiyeh, et al. [35] showed a significant decrease in the biodiversity of terrestrial vertebrates; especially for birds, in the Bethlehem Governorate of the West Bank due to the increased rate of urbanization accompanied by an

increase in temperatures and a decrease in annual rainfall rates over the past decades.

All over the world, songbirds or perching birds (order Passeriformes) are over-hunted and over-collected for the purpose of trade, and this illegal trade, which occurs outside the scope of regulations and laws, often causes a significant decline in wild populations. Most of the discussion here will depend on the Maghreb region, especially Morocco and Algeria, where the intensity of hunting is very high, and the signs of the Goldfinch disappearing are sounding the alarm bell. During the survey of literary references prior to the start of the current study, it was found that the citizens of the Maghreb countries were more fond of the love and hunting of Goldfinches, and that is why studies were intensive in those countries compared to other Arab and Middle Eastern countries. Being guided by these studies is of great importance to the researcher. In North Africa, wild populations of Goldfinch, European Serin and Common Linnet are experiencing a sharp decline in their populations due to the songbird trade as well. These three mentioned species of finches were the most common birds encountered in markets and pet stores [15]. Of course, this situation for these finches is quite similar to what was seen during trapping operations or in shops selling pet birds throughout the Gaza Strip [11] and the West Bank [33]. Away from the Maghreb region, the conditions of poaching and trafficking in wildlife forms, including Goldfinch, are not better, and may be worse at times.

In Lebanon, a study showed that bird species from the family Fringillidae were the most traded specimens in animal markets, and the Canary (*Serinus canaria*) was the most traded species, followed by the Goldfinch and the Budgerigar [23]. In Jordan, Goldfinch and other songbirds are widely hunted and this in turn poses a threat to their local status as revealed by Eid, et al. [20]. The problem seems to be exacerbated dramatically in other Middle East countries as could be deduced from several studies [45-51]. Even in Europe, the trapping of Goldfinches and other bird species is escalating, though these countries have clear laws and legislations [52-56]. What causes smuggling of the Goldfinch is the reduction of its populations or numbers at the present time compared to decades ago, when the spread of Goldfinches was clearly visible, whether in the West Bank or Gaza Strip. Good numbers of Goldfinches are smuggled from Jordan to the West Bank and from the Sinai Peninsula in Egypt to the Gaza Strip, and sometimes internal smuggling occurs from the Gaza Strip to the West Bank, as the results showed. Abi-Said, et al. [23] indicated that Goldfinches are also smuggled in large numbers from Syria to Lebanon. Similarly, Algerian vendors or sellers reported that the majority of Goldfinches were sourced in Morocco and smuggled across the border. According to Algerian vendors, it has become difficult to obtain Goldfinches from the wild and this is accompanied by an increase in demand for the bird, and

for this reason the pressure has shifted from the Algerians to the Moroccans to smuggle huge numbers of Goldfinches across the border due to the difficulty of securing sufficient numbers of these birds in Algeria [15].

It seems not surprising in Algeria, because nearly 60% of households own caged birds, with the European Goldfinch being the most common species [10]. According to Ben Yahia [19], roughly 80% of Goldfinches sold in Tunisia come from Algeria or Morocco. In general, the illegal trade of songbirds in Algeria threatens wild populations of Goldfinch across North Africa and may threaten the populations of other songbird species [19]. Mouslim [17] reinforces the events in the Maghreb countries by saying that illegal trade is actively and dynamically carried out between North African countries (mainly the Morocco-Algeria-Tunisia route), and this in turn shows the state of threat faced by the Goldfinch in the region. Many studies reported that Spanish or Moroccan Goldfinches were observed in center and east of Algeria [17]. Perhaps the conclusion lies in what Scheffers, et al. [57] stated that the wildlife trade represents a major and flagrant threat to global biodiversity conservation, and many species of a wide range of taxa are traded internationally. There is a close similarity between the trapping methods of the Arab countries and the Middle East. Bird hunters in the Gaza Strip usually use netting and glue-coated sticks to catch Goldfinch and other songbirds. For those who use nets to trap Goldfinch, water points such as valleys or wadis (such as Wadi Gaza and Wadi Al-Quff) are ideal hunting grounds as birds usually approach them to drink. For those who use the glue method, wooded areas where thistle plants reside are an ideal hunting environment [58].

In Algeria, it is not much different; bird hunters used to place a female Goldfinch inside a cage to seduce the males who easily fall into the trap. Goldfinches are captured also by sticks coated with glue as pointed out by Mouslim [17]. The current results showed that the price of the Goldfinch is the most expensive among the birds hunted in the Palestinian territories, as it may reach \$45-\$100 in normal conditions. The price is determined by various factors including age, singing, etc. Similarly, the price of Goldfinches in Algeria was found to vary according to the song and age of the bird as it ranges between \$18 and \$209 per single bird [15]. If the Goldfinch is trained, the price may vary in Morocco from €45 to €150 (€ means euros), depending on how well the training was done. For some exceptional birds, bird prices have reached more than €5,500 [19]. Thousands of species, including the Goldfinch, are endangered around the world due to urbanization, natural habitats destruction, overexploitation, invasive species, climate change and pollution. All these threats are linked to human activities. In North Africa, the main reason for species erosion seems to be the illegal trading [17]. The study of Razkallah, et al. [16] revealed that habitat

loss as a result of repeated forest fires in the Mediterranean region and the illegal capture caused severe damage to wild populations of Goldfinches in Algeria. Despite the importance of poaching as an actual threat to the Goldfinch and its relatives of songbirds in the West Bank as the current study reveals, Qumsiyeh, et al. [35] indicated that urbanization is another threatening factor for birds and other wildlife forms as previously mentioned.

According to Ben Yahia [19], Morocco represents a major hotspot for poaching and trafficking of Goldfinch, as this species is valued for its glorious voice and bright colors as it has been domesticated and trained for singing competitions. In fact, the Goldfinch has almost disappeared from Tunisia and Algeria, and its numbers in Morocco are declining. For this reason, Moroccan wildlife and law enforcement authorities are now struggling to detect and prosecute poachers and smugglers and prevent the eradication of this ornithological treasure [19]. Despite the fact that the Goldfinch is the most targeted by bird hunters and generates financial profits for them, other wild birds, including passerines and non-passerines, may fall into the traps as shown in Table 1 [11]. The researcher's field tours showed heavy hunting of birds along with Goldfinch throughout the Gaza Strip [59-62]. Nets of various types and sticks coated with glue are not specialized in the species that are trapped and therefore there are no red lines in the species of birds that are hunted. These birds often find their way to animal markets or pet stores to be sold there and then offered for trade [11]. Bird hunters who hunt near the Green Line (the de facto border that separates the West Bank and Gaza Strip from the rest of the territories occupied by Israel in 1948) are subjected to a great deal of harm by the Israeli soldiers stationed on the border, who usually fire their weapons, sonic, smoke and tear gas grenades at the hunters. This dilemma may be more evident in the Gaza Strip due to its narrowness and small area (365 km²) [63].

These Israeli aggressive practices cause some hunters to be killed and others to be wounded, in addition to the possibility of some hunters being arrested and taken to Israeli interrogation centers. This situation in the Palestinian territories is unparalleled in the world because of Israel's occupation of Palestine, which deposits daily stars of martyrs, bandages the wounds of the injured, and calls for the detainees to be patient and relieved.

In conclusion, despite the painful reality of the Palestinians under the weight of the Israeli occupation, this study emphasizes the need for strict application of environmental laws that prevent over-hunting of wildlife in general and Goldfinch in particular. The study also recommends the need to intensify ecological awareness campaigns directed at wildlife hunters in order to reduce wildlife hunting and preserve the biodiversity of Palestine in a sustainable fashion. Artificial breeding of Goldfinches should also

be encouraged. This provides a self-sustaining solution because Goldfinches have large clutch sizes, high brood production as well as a long lifespan.

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