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ORIGINAL ARTICLE

The study of Dove's success in Brooding in two regions of Karkhe and Elhaie Sahar in Khuzestan Province

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ABSTRACT
*This bird, the dove, in the protected area of Karkhe and the free region of Elhaiein Khuzestan Province is economically very important (for hunting). This research has been done in Iran and in Khuzestan Province and Shoosh City. Recognizing this bird by means of survey and regular visits from the region in different seasons specially winter and spring during 9 month from the date, January 2011 till September 2012 with desert operations and direct observations by means of tools like Russian Berkot Binoculars 15*50milimeter and photography with Canon12 Megapixel Camera with an ability to recognize 35Xzoon. The bird's laying started from 2012/04/15 and hatching also started from 2012/04/29 and this continued until 2012/08/18 when the first bird started to fly. During this time, in this area and among 200 eggs, 400 of them were studied and their parameter like weight, length, and width and roundness measuring and recording and when they hatched till they fled,their weight were measured every other day and in different sheets, the data were noted. And this collecting data were by means of statistic trial software SPSS and excel. The results found in research included the success of 66% of chicks flying, number of fatality in each nest being low, number of fatality naturally occurred comparing to human's in the so-called area being low, and the success of 44% chicks to fly, the rate of fatality compare to fatality in measuring period being low, and the high amount of human fatality compare to natural fatalities in the protected area.*
Key words: *Dove, Egg, None-protected area, Fatality.*

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INTRODUCTION

The values of birds were noticed highly in faraway times. The importance of birds in different societies has been different according to their culture, social and economic conditions. [1] Birds are an enormous group of vertebrates, which till now 9648 species of birds have been recognized. Among this number, 521 species of birds were recognized. Iran having the 105 areas important for local birds which is suitable for winter living, spring and summer hatching is the number one in Middle East. [2] Bird in Iran by overcoming the environment could win the earth, water and air and by adjusting themselves to every situation start to nest and brood.

The importance of bird is not hidden from anybody's eyes. Some of the birds like silver gulls help the environment to be pure from pollutions by feeding from animals, fishes, and excreta which are alongside the rivers. [3, 4] Addition to the scientific values, birds are considered as a factor to balance the nature. [5] Streptopelia torture is a bird which is economically very important. Therefore, in spring season and late winter many hunters hunt great number of this bird and by this they make a living. [6, 7]. A kind of hog in this protected area existed which damage the agriculture highly specially watermelon, melon, cucumber, etc. The farmers have to hunt them at night to protect their own crops against this natural enemy. To this matter, they use shotguns which make the environment very dangerous for those of other species like doves. This case would cause a decrease in the number of this bird in this province without a correct management. The regeneration homes as particular regions are selected to control the progress of species population and reflection of pleasant conditions of the home. [9, 10] In the regeneration period and brooding of this bird, hunting their parents doubles the damage's and threatens' rate. One fact is that

their parents are hunted, and the other fact is that living chances continue to live for the chicks will be zero. [12], so in this time and in this protected area, there must be some serious solution to protect this species in order that this bird can continue to live without any further stress. Therefore from the aspect of management, estimate of this bird's population in this area and counting the bird's successes in brooding and its ability to turn the eggs into birds and finally the face that whether this chick could make an adult bird which can fly or not [4]. Since the birds are very important, there were many studies done in foreign countries and in Iran it has started.

The purpose of this research is to study brooding success of the bird, dove in two districts, the protected one, Karkhe and the non-protected; Elhaie is to pay more attentions to this precious bird's regeneration and solutions to apply appropriate management approaches.

MATERIALS AND APPROACHES

Introduction to under studied regions:

The protected region, Karkhe:

This region has a northern width of 32/57 and east length of 48/32 and 48/10, which in South is stretched sided to Naderi Bridge in Andimeshk from Sorkhe village, Sheikh Azizi and after crossing the west of Shoosh City, it continues to Abdollah Khan, and it ends in the location of Juhi Village (Ayatollah Meshkini). This region is provided by good living and homage conditions because of having green rainforests and it is a home for a variety of wild life. The special qualities of this region are having rain forests of Gaz, Pade, and Sarim which are similar to eachother in intensity.

The non-protected area of Elhaie

The region of Elhaie is 700 Hectare consisting of woodland and the most important one is in GhaleSahar. The location of this region compare to Ahvaz City is in the 35 km far from Ahvaz-Andimesh. The most important district of this region is located in the woodlands of GhaleSahar Rural. This region have many beautiful seasonally ponds which their water is supplied and is a very suitable place for aquatic birds and those which are waders. Also its woodlands which are 80% Gaz trees and the rests are Pade, Sarim, have made the region a special beautiful region and each year a great number of dove build their nests in this area. The vegetation of Karkhe Protected area and Elhaie non-protected area is a combination of forests and woodlands.

The researches' limits:

To identify the area under study of the regeneration of the regular dove in the protected area, first by observations and being in the region, the whole region has been recognized and its size has been measured which is a protected area in 4 limited parts in the following order.

A) From northern: to the fenced district.

B) From southern: to the farms around the woodlands, it is limited, which is still fenced in this side.

C) From east: it is ended to the Halave Outpost.

D) From west: to the Karkhe river, it follows.

This limited area is a vast region, according to the accessible facilities and tools such as GPS, a district in size of 27 Hectares had been selected in which the research has been done.

2.2.1. Identifying the limited area in the non-protected Elhaie Rural district

This region has been divided into 4 categories. From 4 directions, it will be ended to this location.

A) From northern: Ashare Village

B) From southern: GhaleSahar Refinery

C) From east: GhaleSahar Farms

D) From west: Karkhe River

Sampling approach, Sample's size, and statistic society

The regions under study are almost 800 Hectare in size, which according to nest building conditions and familiarity with the region, about 36 Hectare from it were chosen as the locations to be studied and compared. After identifying the regions, with a help of the local map coordinated to 1/750000 and GPS, the region was divided into 4 parts in order to perform the research easier. Then, to master the whole matter, there were some acts likes library researches and live observations (binoculars and photography cameras were used to identify and also to find the approaches of plants and animals distributions and the rate of net making of the regular dove..

During the brooding period, three times a week for measuring the weight and the height of the egg, the diameter and roundness of the egg, the region must be visited and the data required to measuring the eggs with an exactness of 0mm to 02 by Kulis (a device with a great precision to measure the length and width of the egg, the height of the nest outside and also inside of it, and the length of the shortest materials to build a nest) must be used and then the data must be recorded in a working notebook.

Also a compass is required to measure the diameter of the egg from width and length and a ruler to measure the accounted diameters.

In the hatching time, visited have been done three days a week and the chicks were measured. In every region 100 nest and 200 egg, which totally makes it, in two regions 200 nests and 400 eggs were being studied which their parameters had been recorded. By means of GPS, the nest was identified. Three times a week, the brooding continued again from the date 2001/1/27 until the flying of chicks 2001/5/28 in the studied areas. In the region under study, the samples were chosen randomly and they were from all parts of the region under study. [17]

The study of development started in two regions and every three days in a week in the protected area from the time of first hatching and the size of weight gathering per gram by means of a digital balance with a precision of 0.01 was measured. Due to the great number of nests, the chicks will be brought down from trees by using a basket and the Caroline done. Weighing the chicks recorded every other day from the hatching time to the time when they first flied and foe every nest as well. By doing this, the rate of daily progresses of every regular dove chick would have been determined.

Brooding which started from the date 2001/1/27 and the first egg was observed in the region and two times a week after 14 days when the first nest was hatched, the region has been visited every other day and the selected variables were noted by means of highly precise devices. The eggs were in light white and to some extent. Every nest which was used in this nest had 2 eggs. According to this the eggs fatality were precisely recorded, and in the tables bellow all the data were recorded. During brooding and hatching the eggs were randomly observed and the ones which hatched were weighted by a digitalscale precisely and the steps which are 8 in number were recorded orderly.

Methods and analytic tools

To study the success of dove's regeneration and to compare the measures of fatalityand death of the eggs in two regions the means of SPSS software and Excel were used. By using charts the information were interpreted in order to analyze the results very precisely.

RESULTS AND DISCUSSION

According to the researches and studying the results, it is clear that in the protected area of Karkhe, the 66% success has been observed for all the bird's fly, i.e. from the 200 eggs, 28 were damaged when they were eggs. In the different processes of brooding, 40 chicks died and in general 68 eggs and chick couldn't make it in the protected area to fly.

Also in the non-protected area out of 100 nest which had 200 eggs, 44% were successful in hatching, which in this size during the period of eggs, 30 eggs were dead and the varied steps of weighing the chicks, we had a fatality of 82 chicks which shows the success of chicks being able to fly in the protected area of Karkhe compare to non-protected area of Elhaie rural district, GhaleSahar village. (Tables 1, 2)

In the research by (Parsons and Maror R.A) in 2002, the success of regeneration and its changes in different regions of dove's population were studied. In this research it was in determined that most of the fatalityoccurred in the brooding period. In another study by Browned and Morchant [13] in the years 2003 till 2004 on the success of regeneration in the colonies in Netherland were observed which the highest rate of fatality occurred in the period of regeneration, which are relevant to the current study's results. There were no major differences observed in two regions in average of the eggs and in the two regions, there were only some small differences. The average of length and width of the eggs (cm) were not so much different (Tables 3, 4). The results showed that the average of egg's shaoes (counted by percentage) in two regions had small difference of 1%, which shows the equality of eggs in two regions.

Table 1. The varied processes of egg's and chick's fatality distinguished the processes in numbers and percentages of eggs and regular dove's chick (*Streptopelia turtur*) in the protected area of Karkhe.

The sum of successes	The sum of failures	Step 8	Step 7	Step 6	Step 5	Step 4	Step 3	Step 2	Step 1	*Streptopelia turtur*
132	68	..	..	3	9	15	11	2	28	Sum in number
66	34	..	..	1.5	4.5	7.5	5.5	1	14	Average in percentage

Table 2. The varied processes of egg's and chick's fatality distinguished the processes in numbers and percentages of eggs and regular dove's chick (*Streptopelia turtur*) in the non-protected area of Elhaie Rural District-GhaleSahar Village.

The sum of successes	The sum of failures	Step 8	Step 7	Step 6	Step 5	Step 4	Step 3	Step 2	Step 1	*Streptopelia turtur*
88	112	..	16	6	22	31	7	..	30	Sum in number
44	56	..	8	3	11	15.5	3.5	..	15	Average in percentage

Table 3. The average of regular dove's eggs measured in the protected area of Karkhe.

The roundness shape of egg no.2	The roundness shape of egg no.1	Egg no.2's width (cm)	Egg no.1's width (cm)	Egg's length $(cm)^2$	Egg's length $(cm)^2$	Egg's weight $(gr)^2$	Egg's weight $(gr)^2$	*Streptopelia turtur*
7598	7647	212.3	213.3	281.8	280.8	764.5	762.7	Sum
75/98	76/47	2.123	2.133	2.818	2.808	7.645	7.63	Average

Table 4. The average of regular dove's eggs (*Streptopelia turtur*) measured in the non-protected area of Elhaie Rural District- GhaleSahar.

Egg no.2's shape being oval	Egg no.1's shape being oval	Egg no.2's width (cm)	Egg no.1's width (cm)	Egg no.2's length (cm)	Egg no.1's length (cm)	Egg no.2's weight (gr)	Egg no.1's weight (gr)	Regular dove
7743	7772	210/2	213/1	279/9	279	752/9	760/4	Sum
77/43	77/72	2/102	2/131	2/8	2/79	7/53	7/6	Average

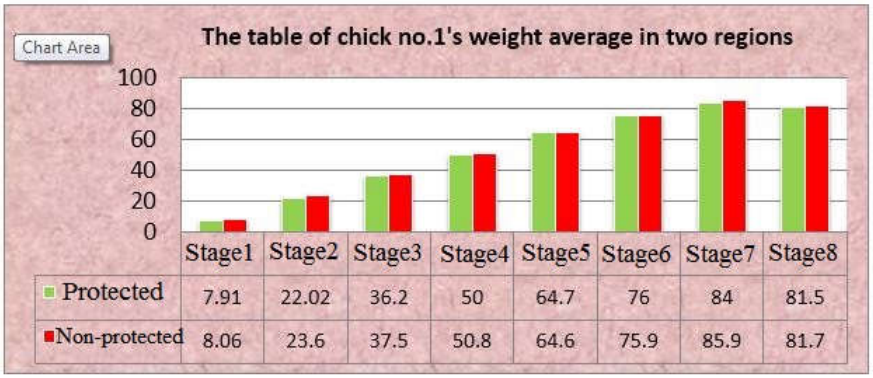
By study the average of first and second dove chick's weights (*Streptopelia turtur*) in this two regions of study, it was determined that, every day the amount of increases in weights of this bird's chicks from the steps 1 to 6, from 6 to 8 gr is increasing, which this amount in the 7thstepbecause of approaching the flying steps of this bird, decreased to 3 or 5 gr every day and in the last step i.e. flying step, instead of increasing in weight, there were decreases in the chick's weight. [Fig 1, 2].

Probably this is because the parents stop feeding their babies. Because chicks are ready to fly, so they have to leave the nest all by themselves and look for food. Also this was observed that the chicks in the first days of flying and after flying and return to the same nest for resting.

The table, shows the fatality and damages of the eggs and the chicks step by step. The first step indicates the damage of the eggs and the steps number 2 to 8, the percentage of chick's fatality in the two under study regions. The results show that in the two regions the amount of fatality in the non-protected area of Elhaie Rural District- GhaleSahar is more than the amount of fatality in the protected area. One of the most important successes of this study is the success of the chicks to fly. In the protected area, the success of flying were estimated to be 66% and the failure were like 34% [Fig 4]. The factors and reasons which were important in failure and success of flying, in Britain and in Netherland by some researchers who had studied about the regular dove (*Streptopelia turtur*) were studied and compared with the acquired results. The universal discoveries about this birds being successful or failure were almost equal to this research's results. In a research by Pagkert and Groski (1995)which was done on the ecology and the regeneration of the dove and studied it. They reported that the time of the bird's arrival to the regeneration area is in the second half of April; however, in some years it would happen sooner. This bird's brooding time would have been from May, and it would continue to the last days of June. In this research, the amount of this bird's regeneration was identified in this way.

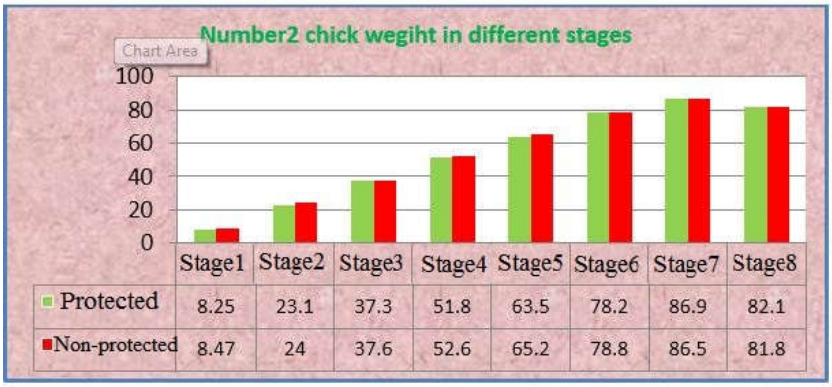
Only 27.6 percent of the early eggs would turn to flying birds and the successes were little, which this failure has been indicated due to the reasons bellow.

1. The damage of birds by attacks of other kind of birds was a major reason.
2. The damage of nests by hunters and killing the chicks and hunting their parents in the brooding time. [16]



	Stage1	Stage2	Stage3	Stage4	Stage5	Stage6	Stage7	Stage8
Protected	7.91	22.02	36.2	50	64.7	76	84	81.5
Non-protected	8.06	23.6	37.5	50.8	64.6	75.9	85.9	81.7

Fig.1, the average of first regular dove chick's (*Streptopelia turtur*) in the two regions under study per gram.



	Stage1	Stage2	Stage3	Stage4	Stage5	Stage6	Stage7	Stage8
Protected	8.25	23.1	37.3	51.8	63.5	78.2	86.9	82.1
Non-protected	8.47	24	37.6	52.6	65.2	78.8	86.5	81.8

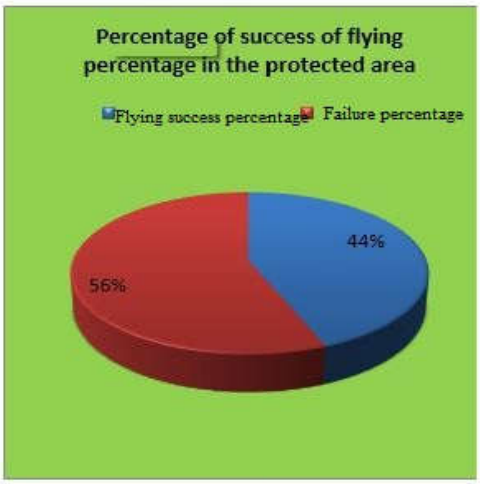
Fig.2, the average of second regular dove chick's (*Streptopelia turtur*) in the two regions under study per gram.

During the years 1930 till 2002, there were studies in different Netherland's colonies about the success of this bird in regeneration. And the rate of fatalities in chicks and their success of flying in each nest, were studied by the research team indifferent years, in which flying successes per each nest were reported in different years, and in the year 1993 the number of 0.23 flying has been reported as successful, which this rate by good management after the studies of failures in 1993, and after years of managing were reported to be a success of 0.76 per each nest, which shows how managing the environment is effective on bird's flying successes. Also in the current studies in the protected area, the success of flying was high because of correct managements. And this success is the result of the following reasons:

1. Fenced protected area.
2. Two environmental monitoring outpost being in the region especially Halaveh department of environment. Nesting in heights.
4. Controlling the people coming in and out of the district.
5. Prohibition of using guns in the protected was not necessary, due to the outpost being in the place and also the other reasons mentioned above.

By study of the region, the effectiveness is of kind and the amount of distribution in planting related to the region. According to the reasons it's a question to be asked, which is numbered bellow:

A) The regular dove would choose their nest according to the region's plant distribution.
B) They would use trees and plants to provide themselves with the material necessary for the nesting.
C) They used plant seeds to feed themselves and their chicks as well.
D) The mass of plant distribution were used for shadowing in the warm months of the year, etc.



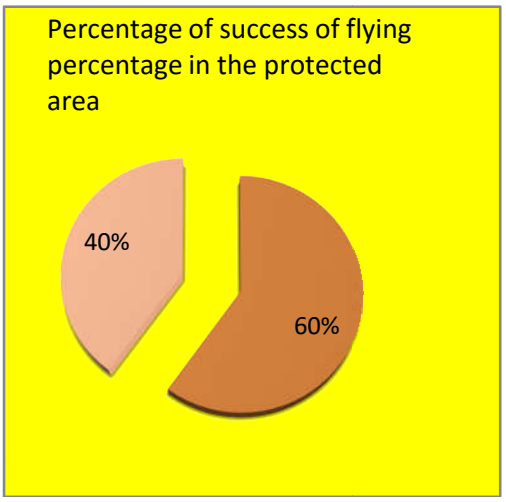


Fig 3. Average of success of flying percentage in the protected area
Fig 4. Average of success of flying percentage in the non-protected area

The threatening factors which are divided in two groups:
A) The threatening medical factors such: Snakes, Wind, Birds, The natural ignitions, and
B) The threatening humanistic factors such as: Damage of the nests, breaking the branches and trees, unlimited pasture, Farm poisons, Breaks of the eggs, Carrying the chicks, hunting the parents by shotguns, land use changes.
These are major factors to harm human being and nature. Which factors have influences on the success of regeneration till flying steps? The natural indicators which indicated the chicks' hatching success until it was time for them to fly, were equal since the air conditioning was often the same. As an example in the protected area, massive tree distribution for nesting, and enough materials for nesting, choosing a home environmentally friendly to those of other bird like nightingale, sparrow, pigeon, ringdove, and Eurasian collared dove, enough water supplies such as, Dez River, ShavoroKarkhe, enough food sources, etc. were some factors effective on regeneration and fly successes which were almost equal for the two regions.

CONCLUSION

The success of flying in the protected area with a difference of 22% is better in number. However, it shouldn't be neglected that this region although having many natural and artificial obstacles and threatens could have got a percentage of 44 in successes of living steps and babyhood and facing so any dangers like land use changes, coming hunters, using warm and cold guns, unlimited wood gathering and pastures, carrying eggs and chicks without controls and concerns of outpost of environmental monitoring in the fenced region shows that in the Elhaie Rural District, GhaleSahar the environment conditions would be better for the regular dove which this bird although facing all this obstacles, yet comes to the region every year and starts to nest and regenerate.
Of course this research in the region helped the regular dove and on the other hand it had some disadvantages for the bird. The help was because we were all in the region every other day and till afternoon we would study in the region. The locals would think we were environment fans and they wouldn't touch the nest. And this would make them not to enter the area. Also for measuring the parameters of the study, we had to climb trees and touch the nest, which would get the birds nervous and stressed out, and their parents in order to keep us away from their babies, would try to throw themselves here and there which shows that how faithful they are to their chicks.

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