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Diversityof Ducks (Leach, 1819) and Water Quality of Hamal Lake Sindh, Pakistan

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ABSTRACT

Hamal Lake is considered as the welcoming ground for migratory as well as resident birds such as ducks. However, there is no implementation of strict rules to protect this splendid lake from environmental pollutants and hunting causing duck and other wildlife species vulnerable. In the context, a comprehensive study was proposed to record the variety of duck species and their conservation status through thorough study of their morphology, and observations of their habitat. The identified duck species of hamal lake include Anas acuta (Northern pintail), Anas carolinensis (Green-winged teal), and Anas platyrhynchos (Mallard).Morphological variation in male and female of discovered species was obvious. The conservation condition was identified as very poor in the wildlife in Hamal Lake since there were no conservation measures of the ducks and other wildlife being implemented. Poaching and hunting were also witnessed; freshwater habitat was also damaged as a result of the huge pollution made by locals. It was noted that the Hamal Lake had a lot of ducks to be caught to engage in illegal trade that takes place openly across different markets in Qambar Shahdadkot. It is that threatening condition of ducks which must be immediately conducted. exertions to protect ducks that play important role in ecosystem. The water quality of lake was analyzed as followed:pH:8.1±0.6, EC µS/cm: 2945.1±1617.4, TDS mg-1:1843.5±691.1, T-Hard mg-1:530.1±170.4, T-Alk mg-1:530.1±170.4, Cl mg-1:430.2±88.1, SO4mg-1:460.0±122.3, PO4 mg-1:443.6±101.3, NO2mg-1:4.2±1.4, NO3mg-1:7.8±3.1, CO2 mg-1:18.9±3.2.

Introduction

Hamal Lake is the place of the inhabitants and Siberian migratory birds. It is also an excellent breeding area of freshwater fish. Water mismanagement has however polluted the lake and the poor quality of the lake water is thus threatening the ecosystem of the lake. The release of toxic and salty water of Hardin drain has a detrimental impact on the environment and the wildlife of this lake. Wetland stability is also affected by numerous factors, which are affected by land use and land covers. [1-6]. Pollution is rising in areas where the wildlife is living and it has even become part of wildlife. The pollution has a great impact on waterfowl, including ducks, geese and birds that reside by the lake.

The hunting activities commence immediately there is the approach of winter; the hunting is carried out without any control whatsoever. Some powerful individuals accompanied by their family and friends go out to hunt the migratory birds without the required relevant permits. They are hunting these birds and selling them in the market illegally. Over exploitation is a fight against an important element of our environment. Migratory birds are significant in seed dispersal, pollination and other service provision as they promote biological processes. The destruction of habitat and human activities have been leading to the decrease in the diversity of birds. (Bird Life International, 2012). Overexploitation, hunting, and developments works are some of the main threats to the declining trend of birds.

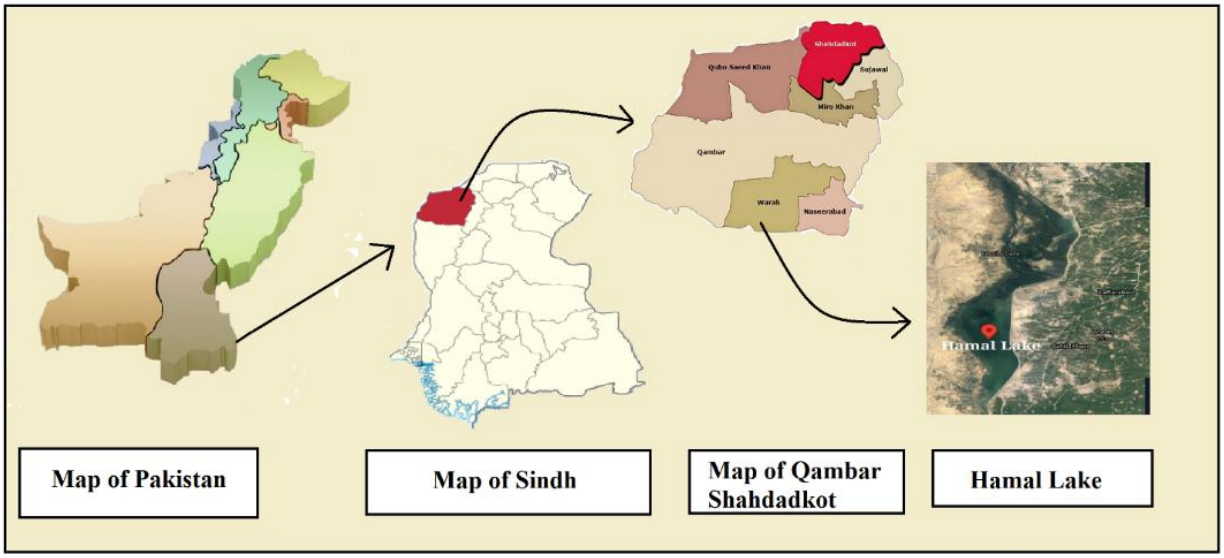
Food Deficiency Availability of food is a strong variable that has a great impact on the migration and occurrence of migratory birds (Hockey et al., 1992). The reduction of the avifauna diversity occurs mainly due to un-availability of habitats during the tropical wintering regions (Marra et al., 1993) and lack of food stuff (Johnson and Sherry, 2001). Gaston et al. (2000) notices that food resources throughout the wintering areas are available throughout the year, which has a significant influence in the abundance of migratory birds.

The status of Hamal Lake is hidden for its duck diversity and water quality, hence present study was carried out through thorough surveys for recording duck species and laboratory analysis for the water quality parameters: pH, EC (Electric Conductivity), TDS (Total Dissolved Solids), T-Hard (Total Hardness), T-Alk (Total Alkalinity), Cl (Chloride), SO_4 (Sulphate), PO_4 (Phosphate), NO_2 (Nitrite), NO_3 (Nitrate) and CO_2(Carbon dioxide).

Materials and Methods

Hamal Lake is located in Sindh in Qambar Shahdadkot District, Pakistan, 58 km south of the city of Lorkana and 40 km south of Qambar town. This lake is 25 km long and 10 km wide covering 2,965 acres (1,200 ha) on its surface. It is a fresh water lake and streams of Kirthar Mountains are the primary source of water. The records of duck species were done through monthly surveys (July 2024 -April 2025) using the following methods:Body weight, Body length, Beak, Neck, Wingspan, Primary feathers, Secondary feathers, Shank, Foot, Tail and laboratory analysis of all the water quality parameters; pH, EC (electric conductivity), TDS (Total Dissolved Solides), T-Hard (Total Hardness), T-Alk (Total Alkalinity), Cl (Chloride), SO4 (Sulphate), PO4 (Eighty five Duck species were analyzed and determined using identification keys through taxonomic literature and metric ruler and electrical weight machine. Each survey had an ecological observation and a status of conservation. The quality of water was examined by means of pH meter of Model Orion, 420 was studied to examine the concentration of hydrogen ion whilst Conductivity meter (Model: Orion. 115) was used in recording the value of both electric conductivity (EC) and total dissolved solids (TDS). The centrifuge values of Total hardness (T-Hard), total alkalinity (T-Alk) chloride (Cl) and carbon dioxide (CO2) were determined through titration procedures using the analytical methodology [C.H. Danial, 1948;Sunita, 2002].

Figure 1: Map of Hamal Lake, Situated in District Qambar Shahdadkot, Sindh, Pakistan



Results and Discussion

Altogether 85 duck specimens were studied and identified as *Anas acuta* (Northern pintail), *Anas* carolinensis (Green-winged teal), and Anas platyrhynchos (Mallard).

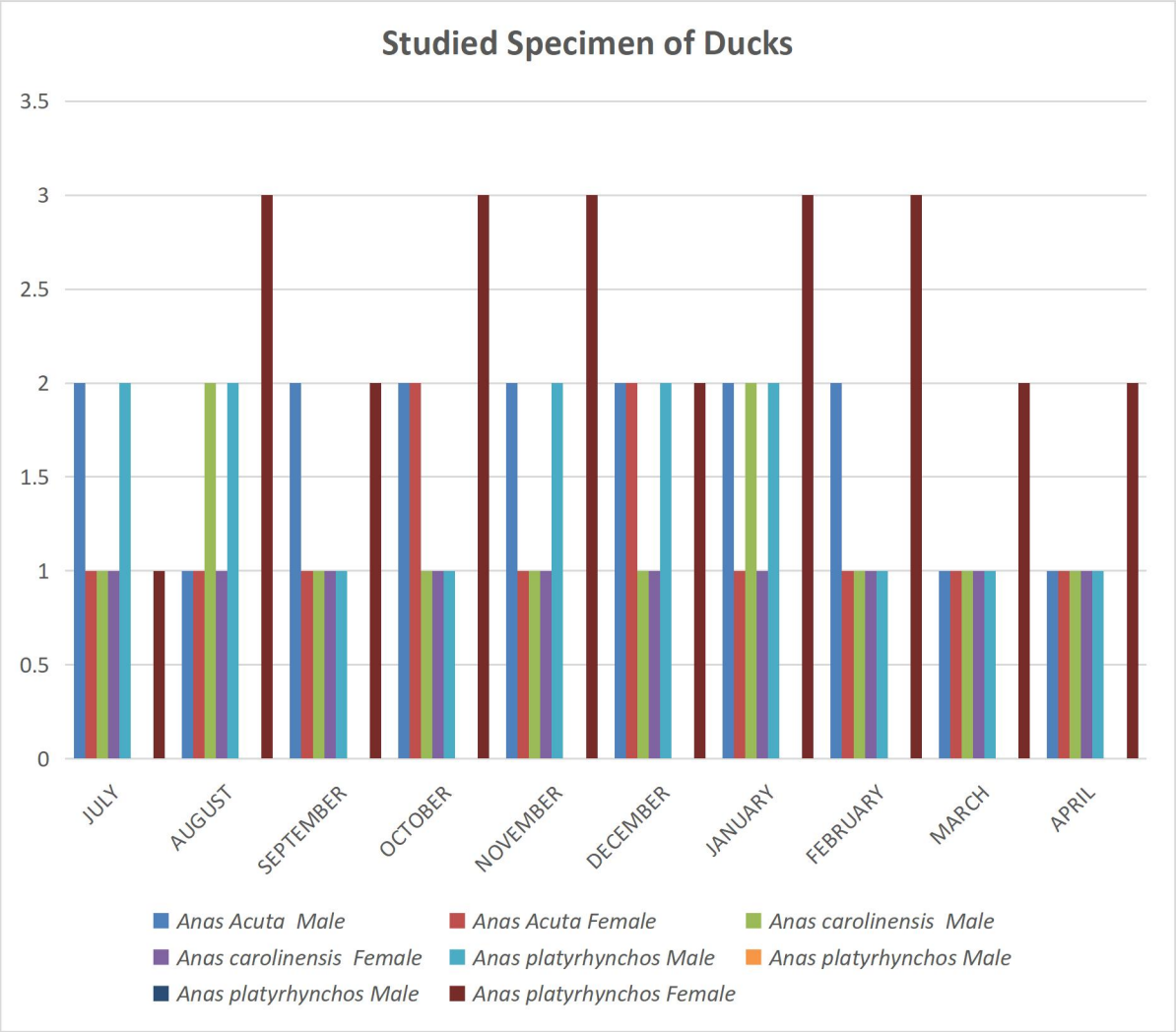


Figure 2. Duck diversity recorded from Hamal Lake

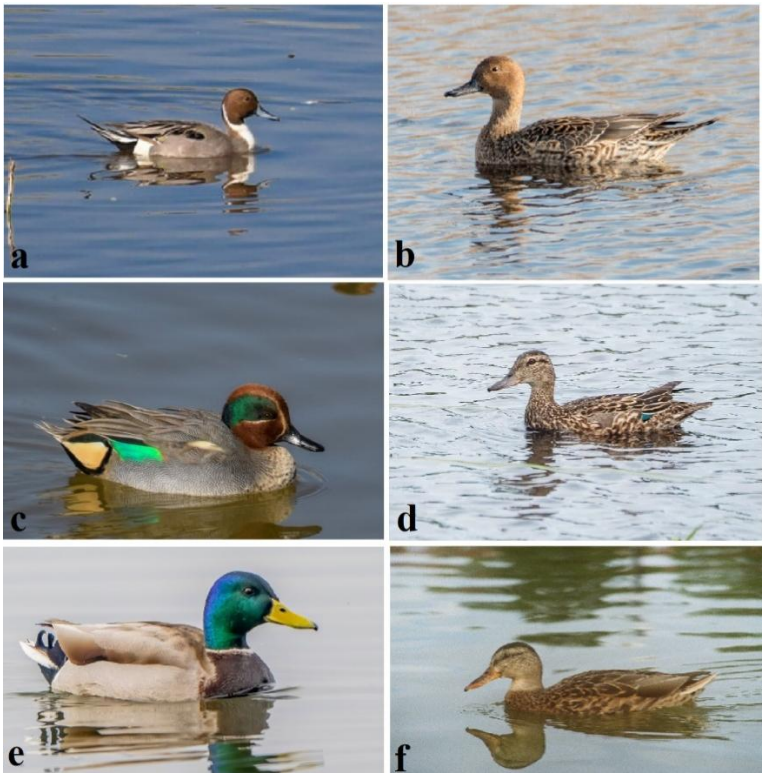


Figure 3. (a) Anas acuta (Northern pintail): Male (b) Anas acuta (Northern pintail):Female(c)Anas carolinensis (Green-winged teal):Male (d) Anas carolinensis (Green-winged teal): Female (e) Anas platyrhynchos(Mallard): Male (f) Anas platyrhynchos(Mallard): Female.

***Anas acuta* (Linnaeus, 1758)**

Northern pintail is very long-necked, grayish black-billed, small-headed, and tail feathers long and pointed. The male is brown-headed, the neck, chest and belly of a white color. Its sides are gray in color and its wings have a greenish patch that is surrounded by a white border. The sides and legs of the male are gray and its central tail feathers are long black in color and distinct. The female is brown on the head and neck, and is mottled on the back and body with brown and black, and a white line on his edge of wings.

Table 1: ***Morphometryof Anas acuta (Northern pintail)***

S.no	Body weight (g)	Body length (In)	Beak (In)	Neck (In)	Wingspan (In)	Shank (In)	Foot (In)	Tail (In)
Male	771.4±129.4	21.6±1.1	1.82±0.4	2.4±0.4	19.6±1.5	1.59±0.4	2.31±0.6	2.4±0.5
Female	861.3±104.5	19.4±3.1	1.68±1	2.3±0.7	19.8 ± 1.5	1.8 ± 0.5	2.55±0.5	2.8± 0.8

***Anas carolinensis* (Gmelin, 1789)**

Green-winged tealMales have a brownish body with a white vertical stripe running from the shoreline to the neck. Their darker heads are cinnamon in bright light, with a huge green curl from the eye to the rear of the neck. Females have a yellowish streak running down the back of their tails. The secondaries (speculum) of both sexes contain green wing patches, however these

can be covered when not in flight.

Table 2: ***Morphometry of Anas carolinensis (Green-winged teal)***

S . No	Body weight (g)	Body length (In)	Beak (In)	Neck (In)	Wingspan (In)	Shank (In)	Foot (In)	Tail (In)
Male	869.2±82.5	20.7±1.6	1.59±0.4	2.26±0.5	19.6±1.8	1.9±0.3	2.5±0.4	2.53±0.6
Female	844.3±97.2	21.9±1.4	1.9±0.3	2.2±0.6	19.37±1.9	1.9±0.3	2.56 ±0.5	2.6±0.7

***Anas platyrhynchos* (Linnaeus, 1758)**

The male Mallards are dark green headed and bill is yellow. Their breasts were brown and black back. Women are spotted brown and orange-bills. It has a blue spot on the back of its wings that was encircled by a white line. The female mallard is brown and tan with a white tail and an orange bill which is mottled.

Table 3: ***Morphometry of A. platyrhynchos(Mallard)***

S.No	Body weight (g)	Body length (In)	Beak (In)	Neck (In)	Wingspan (In)	Shank (In)	Foot (In)	Tail (In)
Male	963.06±86.9	20.4±1.6	2.08±0.2	1.56±0.5	20.3±1.2	1.86±0.4	2.08±0.3	2.8±0.52
Female	999.5±163.9	19.96±1.9	2.05±0.2	1.44±0.5	20.3±1.2	2.08±0.2	2.11±0.3	2.5±0.6

Water quality of Hamal Lake was analyzed from six sites during the surveys from July 2024 to April 2025 as detailed in Table 4-13.

Table 4: ***Physico-chemical analysis of Hamal Lake during July 2024***

Parameters	S1	S2	S3	S4	S5	S6	Mean±Std
pH	7.8	7.5	8.2	8.0	8.5	9.2	8.2±0.6
EC µS/cm	2300.9	1468.5	2450.2	2380.4	2727.2	6430.0	2959.5±1752.1
TDS mg^{-1}	1600.2	1170.8	1700.8	1638.9	1800.8	3420.9	1888.7±781.2
T-Hard mg^{-1}	465.2	430.5	509.8	480.9	535.8	900.2	553.7±173.6
T-Alk mg^{-1}	280.0	240.8	300.9	300.0	325.8	413.5	310.2±58.0
Cl mg^{-1}	400.0	350.2	450.8	435.8	480.2	568.2	447.5±74.2
$SO_4 mg^{-1}$	438.8	375.9	560.2	500.0	475.5	722.4	512.1±120.0
PO_4 mg^{-1}	380.9	300.0	420.0	408.5	450.3	750.8	451.8±155.2
$NO_2 mg^{-1}$	3.3	3.0	4.5	3.2	5.7	6.0	4.3±1.3
$NO_3 mg^{-1}$	7.0	6.5	8.0	7.5	8.5	15.2	8.8±3.2
CO_2 mg^{-1}	18.0	20.0	16.0	16.8	18.0	16.5	17.6±1.4

Table 5: ***Physico-chemical analysis of Hamal Lake during August 2024***

Parameters	S1	S2	S3	S4	S5	S6	Mean±Std
pH		8.0	8.0	8.5	8.2	8.7	9.2
EC µS/cm	2357.3	1477.8	2482.7	2408.2	2780.7	6510.0	3002.8±1772.9
TDS mg-1	1638.8	1165.8	1720.6	1680.2	1869.2	3456.0	1921.8±788.3
T-Hard mg-1	472.5	438.8	528.8	492.8	550.8	950.2	572.3±189.4
T-Alk mg-1	288.8	250.0	320.2	300.5	357.2	420.1	322.8±59.4
Cl mg-1	428.5	362.8	470.8	448.2	500.8	572.9	464.0±70.7

SO4mg-1	450.9	380.9	565.82	500.0	486.7	751.2	522.6±127.4
PO4 mg-1	428.5	362.2	450.5	440.8	485.2	581.0	458.0±72.5
NO2mg-1	3.87	3.0	5.0	4.0	6.0	6.2	4.7±1.3
NO3mg-1	7.5	6.8	8.5	7.8	9.0	15.8	9.2±3.3
CO2 mg-1	15.0	18.0	15.0	15.2	14.9	13.8	15.3±1.4

Table 6: ***Physico-chemical analysis of Hamal Lake during September 2024***

Parameters	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**	**Mean±Std**
pH		8.0	8.0	8.5	8.5	8.8	9.4
EC µS/cm	2380.9	1485.2	2527.2	2457.2	2900.5	6570.2	3053.5±1785.2
TDS mg-1	1650.2	1180.5	1750.7	1744.8	1960.4	3485.5	1962.0±790.0
T-Hard mg-1	480.7	450.0	550.0	525.8	675.2	980.7	610.4±197.3
T-Alk mg-1	300.0	250.0	335.8	320.1	360.8	455.6	337.0±69.1
Cl mg-1	430.5	370.5	480.4	450.8	537.9	708.5	496.4±117.7
SO4mg-1	480.0	388.5	577.3	530.2	580.6	780.7	556.2±131.2
PO4 mg-1	435.8	370.0	462.8	450.0	500.2	745.1	494.0±130.2
NO2mg-1	4.0	3.5	5.5	4.2	6.2	7.0	5.1±1.4
NO3mg-1	7.8	7.0	8.9	8.0	9.2	16.0	9.5±3.3
CO2 mg-1	13.8	14.7	15.0	15.0	15.0	14.9	14.7±0.5

Table 7: ***Physico-chemical analysis of Hamal Lake during October 2024***

Parameters	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**	**Mean±Std**
pH		8.0	7.8	8.0	8.0	8.0	9.2
EC µS/cm	2350.9	1478.2	2380.6	2368.2	2450.8	6505.8	2922.4±1793.1
TDS mg-1	1597.2	1155.7	1692.8	1667.7	1760.8	3305.2	1863.2±738.7
T-Hard mg-1	410.7	450.7	474.2	450.2	535.7	929.5	541.8±194.3
T-Alk mg-1	275.8	235.8	300.0	290.5	300.9	388.2	298.5±50.1
Cl mg-1	385.5	340.2	450.0	408.5	465.5	550.8	433.4±73.1
SO4mg-1	400.0	350.0	457.8	440.8	472.5	657.2	463.1±104.9
PO4 mg-1	390.8	322.8	435.8	420.8	468.8	558.5	432.9±78.9
NO2mg-1	3.0	2.5	4.0	3.0	5.2	5.5	3.9±1.25
NO3mg-1	6.8	5.9	7.7	7.0	8.2	13.8	8.2±2.8
CO2 mg-1	19.5	19.8	18.2	18.5	17.2	16.0	18.2±1.4

Table 8: ***Physico-chemical analysis of Hamal Lake during November 2024***

Parameters	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**	**Mean±Std**
pH	7.5	7.2	8.0	7.8	8.0	8.9	7.9±0.6
EC µS/cm	2250.5	1430.5	2350.2	2288.7	2550.2	6244.4	2852.4±1705.9
TDS mg^{-1}	1500.7	1145.2	1557.8	1520.2	1600.0	3209.2	1755.5±730.6
T-Hard mg^{-1}	400.0	380.3	450.8	445.5	470.2	800.5	491.2±155.2
T-Alk mg^{-1}	200.8	180.6	250.5	228.9	265.5	350.76	246.2±60.0
Cl mg^{-1}	350.9	305.8	386.8	375.1	400.8	600.3	403.3±102.1
$SO_4 mg^{-1}$	350.2	338.7	400.7	380.5	410.2	700.0	430.1±135.1
PO_4 mg^{-1}	380.6	358.6	400.8	400.1	430.8	559.7	421.8±71.7
$NO_2 mg^{-1}$	2.5	2.0	3.5	3.0	4.5	4.0	3.2±0.9
$NO_3 mg^{-1}$	5.0	5.2	5.9	5.6	7.0	13.1	7.0±3.1
CO_2 mg^{-1}	22.7	24.0	20.0	22.0	20.0	17.2	21.0±2.4

Table 9:	*Physico-chemical analysis of Hamal Lake during December 2024*						
Parameters	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**	**Mean±Std**
pH	8.0	7.5	7.7	7.5	7.5	8.2	7.7±0.3
EC µS/cm	2280.0	1400.5	2309.8	2320.9	2357.2	6179.5	2808.0±1692.1
TDS mg^{-1}	1482.5	1100.0	1500.5	1500.6	1579.2	3000.5	1693.9±662.2
T-Hard mg^{-1}	380.9	350.0	437.2	400.8	450.0	700.9	453.3±126.7
T-Alk mg^{-1}	180.4	150.2	238.9	200.9	258.2	300.0	221.4±54.8
Cl mg^{-1}	380.9	270.2	358.2	438.5	380.5	541.5	395.0±90.2
$SO_4 mg^{-1}$	345.00	300.9	387.5	360.8	400.0	650.2	407.4±123.9
PO_4 mg^{-1}	358.5	345.0	380.2	370.8	385.9	600.7	406.9±96.1
$NO_2 mg^{-1}$	2.0	2.0	3.0	3.0	4.0	3.8	3.0±0.9
$NO_3 mg^{-1}$	5.0	4.4	5.0	5.0	7.0	10.1	6.1±2.2
CO_2 mg^{-1}	24.0	24.8	22.8	22.8	20.6	17.7	22.1±2.6

Table 10:	*Physico-chemical analysis of Hamal Lake during January 2025*						
Parameters	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**	**Mean±Std**
pH	7.5	7.2	8.0	7.5	8.5	8.5	7.9±0.6
EC µS/cm	2300.8	1457.2	2350.3	2367.2	2462.5	6250.2	2864.7±2
TDS mg^{-1}	1500.6	1098.7	1680.9	1550.8	1740.5	3180.2	1792.0±716.4
T-Hard mg^{-1}	380.9	350.2	450.2	400.8	500.0	875.2	492.9±194.6
T-Alk mg^{-1}	195.2	175.4	238.5	220.2	250.0	350.8	238.4±61.5
Cl mg^{-1}	350.8	328.5	390.2	370.4	400.8	550.2	398.5±78.8
$SO_4 mg^{-1}$	350.8	335.5	400.0	375.9	400.8	650.7	419.0±116.5
PO_4 mg^{-1}	370.5	358.2	400.0	388.2	400.3	538.2	409.2±65.3
$NO_2 mg^{-1}$	3.0	2.5	3.7	3.5	4.0	4.4	3.5±0.7
$NO_3 mg^{-1}$	5.5	5.0	6.0	5.8	7.0	10.5	6.6±2.0
CO_2 mg^{-1}	24.0	24.0	20.5	22.8	20.0	16.8	21.4±2.8

Table 11:	*Physico-chemical analysis of Hamal Lake during Fabruary 2025*						
Parameters	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**	**Mean±Std**
pH	7.4	7.2	8.0	7.5	8.5	9.0	7.9±0.7
EC µS/cm	2348.5	1560.5	2530.5	2450.3	2500.8	6438.5	2971.5±1737.1
TDS mg^{-1}	1559.2	1240.7	1650.8	1578.5	1700.8	3329.5	1843.2±745.7
T-Hard mg^{-1}	400.8	385.5	465.8	430.7	500.3	900.8	514.0±194.1
T-Alk mg^{-1}	200.0	178.5	250.0	208.5	270.0	400.8	251.3±80.6
Cl mg^{-1}	400.8	310.7	380.2	450.2	435.8	585.5	427.2±91.8
$SO_4 mg^{-1}$	358.9	340.2	400.8	380.5	465.8	680.5	437.8±126.6
PO_4 mg^{-1}	390.2	360.2	410.5	405.0	430.8	560.8	426.2±70.0
$NO_2 mg^{-1}$	3.0	2.5	3.5	3.2	5.0	6.2	3.9±1.4
$NO_3 mg^{-1}$	5.0	4.4	7.0	6.0	7.5	15.2	7.5±3.9
CO_2 mg^{-1}	24.0	22.0	21.5	22.0	18.9	15.5	20.6±3.0

Table 12:	*Physico-chemical analysis of Hamal Lake during March 2025*						
Parameters	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**	**Mean±Std**
pH	7.7	7.5	8.0	7.7	8.5	8.8	8.0±0.5
EC µS/cm	2400.8	1530.2	2385.2	2315.2	2467.3	6532.1	2938.5±1794.6
TDS mg^{-1}	1600.8	1122.5	1700.2	1600.7	1770.2	3280.1	1845.8±738.6

T-Hard mg^{-1}	400.0	380.8	465.2	425.5	519.5	900.0	515.2±194.9
T-Alk mg^{-1}	208.5	185.5	252.8	225.8	275.8	420.5	261.5±84.2
Cl mg^{-1}	358.9	350.9	405.8	385.5	435.0	560.5	416.1±77.2
$SO_4 mg^{-1}$	375.5	350.9	405.8	380.5	450.0	700.2	443.8±130.0
PO_4 mg^{-1}	377.2	360.8	402.8	380.8	460.2	638.2	436.7±104.6
$NO_2 mg^{-1}$	3.3	2.5	4.0	3.5	5.0	6.3	4.095±1.4
$NO_3 mg^{-1}$	5.8	5.5	6.5	6.2	7.5	15.0	7.8±3.6
CO_2 mg^{-1}	22.0	22.5	20.0	20.5	19.2	16.0	20.0±2.3

Table 13: ***Physico-chemical analysis of Hamal Lake during April 2025***

Parameters	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**	**Mean±Std**
pH	8.0	7.7	8.0	8.0	8.2	9.0	8.2±0.4
EC µS/cm	2450.2	1665.8	2639.2	2490.2	2680.2	6550.8	3079.4±1740.4
TDS mg^{-1}	1642.7	1200.8	1753.5	1680.7	1870.2	3450.5	1933.1±777.6
T-Hard mg^{-1}	425.8	400.8	480.1	458.2	550.0	930.5	540.9±197.6
T-Alk mg^{-1}	250.0	228.9	275.0	250.0	285.2	400.8	281.6±61.7
Cl mg^{-1}	450.6	375.8	400.5	475.5	462.7	625.8	465.2±87.5
$SO_4 mg^{-1}$	400.0	375.2	435.0	405.8	455.1	735.7	467.8±134.2
PO_4 mg^{-1}	400.2	377.2	450.2	400.5	485.5	700.4	469.0±120.0
$NO_2 mg^{-1}$	3.8	3.5	4.8	4.0	5.9	7.0	4.8±1.4
$NO_3 mg^{-1}$	5.5	5.0	7.7	6.5	8.0	16.7	8.2±4.3
CO_2 mg^{-1}	20.0	20.0	18.0	19.5	15.5	13.7	17.8±2.6

Discussion

District Qambar Shahdadkot in Sindh dumping garbage and sewerage in the water due to this Hamal Lake is becoming heavily polluted. The environment has had an adverse influence on the wildlife of Hamal Lake, and the population of native birds has practically vanished. The poor quality of water caused by pollution has a negative impact on the health of the wild animals that live at Hamal Lake in Sindh, Pakistan. In the winter, Siberian birds migrate to Hamal Lake, where they have a hard time feeding because the lake's poisonous water has killed many fish, and there aren't enough resources for native and migratory birds. The effluents from the Kot Magsi and Usta Muhammad areas are discharged into Hamal Lake in two ways.

The stagnant water is most affected with contaminants. Several researchers have searched the limestone outcrops, natural biological factors such as decomposition of humic substances and photosynthesis or the influence of anthropogenic forces such as atmospheric deposition or ditching and acidic precipitation are the reasons behind making water contaminated.

Water Quality Parameters

Water quality of Hamal Lake was analyzed as followed: pH was slightly higher than normal level i.e. 6.0-9.0for aquatic life ((Freda, et al. 1990), but extremely high EC was recorded all the time above the normal level i.e. 150.0- 500.0along with TDS (normal range:50.0-250.0)(Boyer, et al. 1995).TDS value was measured relatively same during entire study period as suggested by (Chapman, et al. 2000), whereas Hardness in aquatic habitat of ducks analyzed from whole area consisted of 350.0 mg/L - 980.7 mg/L during entire study, that is much higher than normal range i.e. 75.0-200.0 mg/L (Wurts and Masser, 2004). Total Alkalinity from six sites of Hamal lake was recorded out of recommended level of EPA., 2013; which may not play supportive role for survival of animal.Meanwhile, Alkalinity value did not vary significantly during the study entire study period, however Cl in this area extended between 270.2 to 708.5 mg/L considered as high level

that may not be endured when out of 50.0-150.0. (Lori Siegel, 2007). Entire range of SO4 was extremely higher which never came within normal level (50.0-100.0). Hamal lake contained PO_4 in entirely out of auspicious range (0.03-0.05) (Yanamadala, 2005) along with NO_2that was recorded out of normal level which is proved by Kerry and Griffis, 2007 to affect aquatic life a when increased high than 2.0 mg/L. Concentration of NO_3 was 7.8±3.1 ranging from favorable to unfavorable level (1.0-2.5) by increasing from 4.4 to 17.0 mg/L. The lake consisted of normal level of CO_2 that permanently stayed within 12.0 to 25.8 during entire period of present research (Table 4-13).

Biological Parameters

Kandi (Prosopis cineraria), Elephant grass (Typhaelephantiana), Common Reed (Phragmiteskarka) are three common vegetation species found in Hamal Lake.The conservation status was observed as very poor in the wildlife in Hamal Lake as there was no implementation of conservation actions for saving wildlife. Hunting and poaching were observed common, meanwhile, freshwater habitat was also recorded to be degraded through massive pollution created by local people of Qambar Shahdadkot. It was observed that many ducks were captured from the Hamal Lake for illegal trade that occurs openly in various markets of Qambar Shahdadkot.

Conclusion

Three different species of ducks were observed during the survey of the Hamal Lake including: *Anas acuta* (Northern pintail), Anas carolinensis (Green-winged teal) and *Anas platyrhynchos* (Mallard). The ducks had an ecological state which was consistent when it came to food availability including pondweed and aquatic plants and insects, fish eggs, fish and frogs. It was in the hunting and human intrusion and disturbance of the habitat, which was present at every survey of the Hamal Lake. The lake in the meantime had not a good prognosis on water quality in regards to aquatic life and it was contaminated by Garbage and anthropogenic wastes, meanwhile water quality parameters were also higher than normal level. In order to save the duck species conservation status should be provided, and thus, the species in question might not be reduced in the next future.

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