TITLE PAGE

ECOLOGICAL DEGRADATION AND POPULATION DYNAMICS OF MIGRATORY BIRDS AT SURHA TAAL BIRD SANCTUARY

A Report of Minor Research Project Submitted in Partial Fulfillment of the Requirement for the Degree of BACHELOR OF SCIENCE

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DECLARATION & CERTIFICATE

CERTIFICATE FROM THE SUPERVISOR

This is to certify that the project entitled "Ecological Degradation and Population Dynamics of Migratory Birds at Surha Taal Bird Sanctuary" is a bonafide work carried out by Janhawi Pandey. The work is true and correct to the best of my knowledge and belief.

(Signature of Supervisor) Name: Dr. ASHOK SINGH YADAV Department: ZOOLOGY College: SATISH CHANDRA COLLEGE, BALLIA

DECLARATION OF CANDIDATE

I, Janhawi Pandey, certify that the work embodied in this project is my own bonafide work carried out under the supervision of Dr. ASHOK SINGH YADAV. I declare that I have faithfully acknowledged, credited, and referred to the research works duly cited in this project. The matter embodied in this project has not been submitted for the award of Bachelor of Science.

(Signature of Student) Place: Ballia

ACKNOWLEDGEMENT

I would like to express my heartfelt gratitude to all those who have contributed to the successful completion of this project report. First and foremost, I extend my deepest appreciation to my project supervisor, Dr. ASHOK SINGH YADAV, for his unwavering support, guidance, and valuable insights throughout the entire project.

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CHAPTER I: INTRODUCTION

1.1 Background of the Study Area

Surha Taal, officially designated as the Jai Prakash Narayan Bird Sanctuary, is a prominent natural perennial oxbow lake situated in the Ballia district of Uttar Pradesh. Covering a massive area of approximately 34.32 km^2, it was formed by the historical shifting course of the River Ganges. Due to its immense ecological value, it is recognized as a Ramsar-priority wetland, serving as a critical wintering ground for avian species traveling along the Central Asian Flyway. For generations, it has been the pride of Ballia, representing both a natural treasure and a site of historical and political significance.

1.2 The Crisis of Contemporary Reality

In recent years, a stark disparity has emerged between the official records of the sanctuary and the ground reality witnessed by local observers. While the government signage and historical boards at the entrance still boast a vibrant presence of species such as the Bar-headed Goose and Northern Pintail, the current ecological state is one of visible decline. The lake is no longer the pristine haven it once was; instead, it has become a victim of neglect, pollution, and invasive biological growth. This project seeks to document this decline and highlight how the current "ratio" of migratory arrivals has dropped to an alarming level compared to previous decades.

1.3 Habitat Fragmentation and Palustrine Pockets

The ecosystem of Surha Taal is no longer a uniform body of water. It has become physically fragmented into high-activity boating zones and marginal Palustrine Pockets (seasonal micro-depressions). These marginal areas, which often harbor natural lotus populations, have become the final refuges for avian life. As the main water body remains choked by invasive weeds, these small pockets are the only places where any significant biological activity can still be observed.

CHAPTER II: REVIEW OF LITERATURE

2.1 Wetland Health and Bio-indicators

In the study of Zoology, birds are utilized as primary bio-indicators because their presence directly reflects the health of an ecosystem. Scientific research suggests that when a habitat's "Carrying Capacity" is reduced by physical barriers or chemical pollution, birds exhibit what is known as "Site Avoidance." This is a significant concern for Surha Taal, as the permanent loss of these migratory guests would indicate a total collapse of the wetland's biological function.

2.2 The Threat of Invasive Macrophytes

Eichhornia crassipes, commonly known as Water Hyacinth, has become the dominant invasive threat at Surha Taal. Extensive literature confirms that these plants do not just occupy space; they create a dense "Green Carpet" that fundamentally alters the lake's chemistry. By blocking sunlight and disrupting oxygen levels, they destroy the food chain from the bottom up, making the water surface physically inaccessible to swimming waterfowl. Unlike the "True Fungi" discussed in fungal systematics, which help recycle nutrients, unchecked hyacinth growth leads to stagnation and the death of the aquatic environment.

CHAPTER III: MATERIAL AND METHODS

3.1 Field Observation Strategy

The methodology for this research involved a series of direct field visits to specific zones within the sanctuary. I compared the Main Boating Hub, which receives the most human traffic, with the Marginal Seasonal Micro-Depressions, which are often overlooked by the general public. This allowed for a clear comparison of how human presence and vegetation density impact bird distribution.

3.2 Measuring Avian Sensitivity

To quantify the level of disturbance, I utilized the Flight Initiation Distance (FID). By observing how close a human could get to a bird before it took flight, I was able to map out "Disturbance Zones." My observations near the university walking paths showed a high FID, proving that the constant movement of students and tourists is a major factor in pushing birds away from the shoreline and into the choked, inaccessible center of the lake.

CHAPTER IV: RESULTS AND DISCUSSION

4.1 The "Green Carpet" and Habitat Exclusion

My primary result shows that the main body of Surha Taal is now essentially a "dead zone" for swimming birds. The Water Hyacinth has formed such a thick, piled-up layer that it is impossible for ducks or teals to land. Even boats struggle to cross the lake. This physical exclusion is the main reason why the species listed on the official boards are no longer seen in their historical numbers.

4.2 The "Board vs. Reality" Disparity

Upon examining the official taxonomic boards at the sanctuary, I noted names like the Siberian Crane and Northern Pintail. However, my field data recorded a near-zero count for these species in the main water area. The only birds remaining are the long-legged waders, such as Egrets and Storks, who have moved into the lotus-filled micro-depressions. These birds are survivors because their long legs allow them to navigate the shallow mud where the hyacinth is less dense.

4.3 Management Mismanagement and the "January 1st" Phenomenon

A critical observation of this study is the "Management Lag." The government and local authorities prioritize cleaning the lake only for the January 1st tourist rush. However, the migratory birds arrive in November. When the birds arrive, they find a choked, dirty lake and immediately move on to other areas. By the time the lake is cleaned for the New Year, the birds are already gone. Furthermore, the tourists themselves contribute to the problem by littering the site with plastics and wrappers, further degrading the water quality.

CHAPTER V: OBSERVATION LOG (FIELD DATA)

Date	Location	Official Species (on Board)	Actual Species Observed	Condition of Habitat	Scientific Note
Nov 10, 2025	Main Boating Area	Northern Pintail	None observed	90% surface area covered by Water Hyacinth "Green Carpet."	Dense vegetation prevents landing of swimming waterfowl, leading to

					site avoidance.
Nov 25, 2025	**Marginal Micro-Depression**	**Sarus Crane**	**Intermediate Egrets and Painted Storks**	**Water is clearer; surface is 30% covered by natural Lotus.**	**These pockets serve as the last refuge for waders navigating shallow waters.**
Dec 15, 2025	**Main Boating Hub**	**Bar-headed Goose**	**None observed**	**Water appears dark and stagnant with organic decay.**	**Stagnation during arrival window forces birds to seek alternative wetlands.**
Jan 01, 2026	**Main Boating Hub**	**Migratory Anatidae**	**None observed**	**Partially cleared for tourists; high presence of plastic waste.**	**Management cleaning lag and tourist pollution maintain a high disturbance zone.**
Jan 15, 2026	**Marginal Micro-Depression**	**Shorebirds and Plovers**	**Common Crane and Long-legged Waders**	**Water level receding; vegetation stable.**	**The ratio of migratory arrivals remains significantly lower than historical data.**

CHAPTER VI: SUMMARY AND CONCLUSION

In summary, the ecological status of Surha Taal is currently failing to meet the Ramsar standards of a healthy wetland. While the signage and historical records suggest a thriving sanctuary, the ground reality is one of neglect, pollution, and biological stagnation. The study concludes that the Seasonal Micro-Depressions are currently the only functional havens left for the remaining bird population. To save what remains of Ballia's natural treasure, management must shift to a "Bird-First" policy. It is my strong recommendation that de-weeding and cleaning be moved to October so the lake is clear for the November arrivals, rather than waiting for the New Year's crowd.

CHAPTER VII: REFERENCES

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