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Migratory Birds of Ranchi: Seasonal Occurrence, Origins, Migration Patterns, and Conservation Implications

रांची के प्रवासी पक्षी: मौसमी उपस्थिति, उत्पत्ति, प्रवासन पैटर्न एवं संरक्षण संबंधी निहितार्थ

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सारांश

रांची, जो झारखंड की राजधानी है और पूर्वी भारत में छोटानागपुर पठार पर स्थित है, मध्य एशियाई प्रवासी मार्ग (Central Asian Flyway - CAF) से होकर प्रवास करने वाले पक्षियों के लिए एक महत्वपूर्ण स्थल के रूप में कार्य करता है। शहर के जलाशय–विशेष रूप से धुर्वा (हटिया) डैम, रुका/गेटलसूद जलाशय और कांके डैम–साल भर पैलियर्कटिक जलपक्षियों, पासरीन (गायन पक्षियों) तथा मार्ग-प्रवासी प्रजातियों की विविधता का सहारा देते हैं। यह लेख इन प्रवासी पक्षियों की मौसमी उपस्थिति, प्रजातियों की उत्पत्ति, प्रवास को प्रेरित करने वाले कारणों तथा संरक्षण संबंधी चिंताओं का एक व्यापक संकलन प्रस्तुत करता है, जिसे स्थल-विशिष्ट अभिलेखों और समीक्षित पारिस्थितिकी सिद्धांतों द्वारा समर्थित किया गया है।

मुख्य निष्कर्षों में शामिल हैं: (1) पतझड़ के दौरान गार्गेनी (Garganey) और व्हिस्कर्ड टर्न (Whiskered Tern) जैसी प्रजातियों का प्रवास। (2) शीतकाल में उच्चतम उपस्थिति, जिसमें नॉर्दर्न शोवेलर, गैडवाल, यूरेशियन विजन, कॉमन टील और रेड-क्रेस्टेड तथा कॉमन पॉचार्ड जैसे डाइविंग बतखों का वर्चस्व होता है, साथ ही ब्लूथ्रोट, वैगटेल्स, ब्लैक रेडस्टार्ट और साइबेरियन स्टोनचैट जैसे स्थलीय प्रवासी पक्षी भी शामिल हैं। (3) वसंत ऋतु में उत्तर की ओर लौटने वाला प्रवास। (4) मानसून के दौरान स्थानीय पक्षी प्रजातियों का आगमन। इस मौसमी प्रवृत्ति (phenology) के पीछे प्रवास की सर्वोत्तम रणनीतियाँ, संसाधन-आधारित ठहराव पारिस्थितिकी (stopover ecology) तथा जलवायु-आधारित ढलान प्रमुख कारक हैं। इन सबका संरक्षण से जुड़े व्यापक निहितार्थ हैं, विशेषकर आवास प्रबंधन, नीतिगत हस्तक्षेप और सामुदायिक स्तर पर पक्षी संरक्षण कार्यों के संदर्भ में, खासकर CAF क्षेत्र में।

कुंजी : प्रवासी, पक्षी, मौसमी उपस्थिति, प्रवासन पैटर्न, संरक्षण, रांची, आर्द्रभूमि, झारखंड, भारत

Abstract

Ranchi, capital of Jharkhand located on the Chota Nagpur Plateau in eastern India, serves as a critical inland node for migratory birds traveling along the Central Asian Flyway (CAF). The city's reservoirs—most notably Dhurwa (Hatia) Dam, Rukka/Getalsud Reservoir, and Kanke Dam—support a diverse assemblage of Palearctic waterfowl, passerines, and passage migrants throughout the year. This article provides a comprehensive synthesis of the seasonal patterns of occurrence, species origins, migration drivers, and conservation concerns associated with these migrants, anchored by verifiable site-level records and peer-reviewed ecological theory. Key findings include: (1) autumn passage by species such as Garganey and Whiskered Tern; (2) peak winter occupation by ducks like Northern Shoveler, Gadwall, Eurasian Wigeon, Common Teal, and diving ducks such as Red-crested and Common Pochard, along with terrestrial migrants like Bluethroat, wagtails, Black Redstart, and Siberian Stonechat; (3) spring northbound passage; and (4) monsoon-season influxes of local avian fauna. Underpinning this phenology are optimal migration strategies, resource-based stopover ecology, and climatic gradients, with broader conservation implications for habitat management, policy, and community-level bird conservation actions in the CAF context.

Keywords: migratory, birds, seasonal occurrence, patterns of migration, conservation, Ranchi, wetlands, Jharkhand, India

1. Introduction

Migration represents one of nature's most spectacular phenomena, with billions of birds undertaking seasonal journeys between breeding and non-breeding grounds in response to changes in resource availability, temperature, and photoperiod. These movements reflect finely-tuned evolutionary strategies to maximize survival and reproductive success (Newton, 2008). India, with its varied climates and landscapes, is a major wintering and passage zone for Palearctic migrants, particularly via the Central Asian Flyway—a network of routes extending from northern breeding areas across Asia into the Indian subcontinent (MoEFCC, 2022).

Ranchi, perched at approximately 628 m above sea level on the Chota Nagpur Plateau, may not fit the profile of coastal wetlands, yet its seasonal reservoirs offer unique ecological niches for migrant species. Compared to plains wetlands, its smaller lakes and intermittent water bodies provide diverse foraging opportunities, reduced human disturbance, and spatial heterogeneity critical for migrants building energy for onward flights. Crucially, these wetlands lie en route for birds flying along inland pathways, complementing better-known sites like the Ganga plains and Bharatpur.

The CAF, ratified in India's national action plan, underscores the ecological importance of inland, urban, and peri-urban wetlands like Ranchi's in sustaining migratory populations (MoEFCC, 2022). While national-level surveys highlight sites like Deepor Beel (Assam) and Chilika Lake (Odisha), lesser-known inland systems such as Ranchi's deserve enhanced attention—especially as climate change alters rainfall patterns and water availability, potentially reshaping migratory pathways.

This article harnesses two pillars: (a) site-specific, verifiable records (from eBird / Macaulay Library media–verified checklists for Dhurwa Dam, Rukka, etc.) to establish which species definitively occur in the Ranchi area and when; and (b) authoritative migration ecology literature (e.g., Alerstam, 2011; Hedenström, 2024; Newton, 2008) to interpret the "why" and "how." By weaving these strands, we aim to craft a robust picture of migration in the Ranchi context, with implications for conservation and local awareness.

2. Materials and Methods

Ranchi's wetland network comprises three principal reservoirs, each with unique characteristics:

- **Dhurwa (Hatia) Dam** lies within city limits and is most frequently recorded in ornithological surveys, including media-backed checklists in February 2025 that documented a rich suite of waterfowl and small migrants (eBird, 2025a).
- **Rukka/Getalsud Reservoir**, located east of the city, is larger and comparatively less disturbed, holding species such as Red-crested Pochard (eBird, 2023).
- **Kanke Dam**, to the north, serves as an informal birding hotspot; though formal checklist data is less readily available, local observer accounts suggest similar migrant assemblages, especially during drawdown phases.

These lakes share enduring traits: shallow littoral zones, emergent vegetation, seasonal water-level fluctuations, and surrounding open land or scrub—ideal for both aquatic and terrestrial migrants. Their proximity to the plateau's escarpments makes them distinctive from alluvial floodplains, positioning them as unique urban–natural interface wetlands warranting conservation consideration.

These sites are often accessed via embankments or peripheral roads, offering vantage points for long-distance observations while reducing disturbance. In peak winter, visibility of dabbling ducks, divers, terns, and shorebirds is exceptional, especially in low-light conditions (dawn, dusk), when birds are most active. The combination of location, water characteristics, and urban access has fueled growing interest among local birding groups and citizen science platforms.

3. Seasonal Narratives

Autumn Passage (September–November)

As monsoon waters recede, Ranchi's reservoirs begin to expose shallow shallows and mudflats, which attract passage migrants. **Garganey**, a widely recognized Palearctic duck, frequently appears during its southbound migration—documented in many inland reservoirs across India and confirmed at Ranchi (BirdLife International, 2022a). Observers report small flocks scooting across shallows or perching on exposed logs. Simultaneously, **Whiskered Tern** and **River Tern**—the former a widespread passage visitor and the latter more locally mobile—are seen flying low over drying waters in search of emerging insects or small fish.

Meanwhile, wagtails (Citrine, Yellow, White) begin to accumulate along wet margins and agricultural patches, gleaning insects amid moist mud—a telltale indicator of autumn passage. These birds often appear in mixed groups, sometimes with local resident species. The timing of arrival correlates with dropping water levels and rising insect emergence—suggesting resource-driven timing, while phenological shifts in breeding grounds likely cue departure.

Peak Winter (December–February)

This is migratory birding's highlight in Ranchi. The Dhurwa Dam media-backed checklist (February 2025) listed: **Northern Shoveler**, **Gadwall**, **Eurasian Wigeon**, **Common Teal**, **Common Pochard**, **Red-crested Pochard** (also seen at Rukka/Getalsud in 2023), and **Great Crested Grebe** (eBird, 2025a; 2023). These ducks appear in stable to large numbers, forming rafts or dabbling in littoral zones. The shallow, muddy bottom supports invertebrates and aquatic plants—primary food sources for these species.

Concurrently, terrestrial migrants arrive. **Citrine**, **Yellow**, and **White Wagtails** forage among exposed edges; **Bluethroat** occupies grassy or reedy fringes during early morning forays; **Black Redstart** and **Siberian Stonechat** frequent dry embankments, rock piles, and scrubland, using elevated perches to survey surroundings (Bird Count India, 2025; Avibase, 2024a, 2024b).

The winter window benefits from optimal conditions: moderating plateau climate, sufficient water to maintain productivity, and migratory physiology geared toward wintering in energetically favorable environments. The presence of both waterfowl and small passerines indicates resource partitioning—waterfowl utilize aquatic food sources, while passerines exploit terrestrial edges.

Spring Passage (March–April)

With rising temperatures and increasing day length, migrants begin northward return. **Garganey** and **Whiskered Tern** reappear in reservoir zones, often in smaller groups than in autumn. Wagtails become increasingly active and melanic molts may be noted in White and Yellow Wagtails shifting to breeding plumages. Black Redstart and Bluethroat linger briefly before departing, and any lingering Common Pochards or Shovelers tend to be in reduced numbers by late March. This mirrors northward migration trends across India—suggesting Ranchi serves as a modest staging ground on return leg.

Monsoon Visitors (June–August)

During the southwest monsoon, long-distance migrants are largely absent. Instead, local rainfall stimulates amphibian breeding and insect proliferation, drawing species such as **Asian Openbill**, **egrets**, and **herons** to wetlands. These birds are not trans-Himalayan migrants but represent seasonal influxes tied to resource abundance, reflecting how Ranchi's wetlands contribute to species beyond Palearctic migrants.

4. Species Accounts

4.1 Ducks & Diving Waterfowl

Northern Shoveler (*Spatula clypeata*)

- **Origin & Flyway**: Breeds across temperate Eurasia, from Iceland and Scandinavia eastwards across Russia. Migrates

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along CAF to wintering areas in South Asia, parts of Africa, and Southeast Asia (Alerstam, 2011).

- **Global Status**: Listed as Least Concern, though some populations show localized declines.
- **Ranchi Evidence**: Documented at Dhurwa Dam in February 2025 (eBird, 2025a).
- **Ecology & Behavior**: Specialized for filter-feeding through its wide bill; consumes small invertebrates, seeds, and plankton in shallow water. Uses rich invertebrate zones—such as exposed shoals—at peak migration stopovers.
- **Threats**: Pollution, aquatic vegetation loss, water-level fluctuations, and disturbance can reduce foraging efficacy; hunting in wintering sites remains an issue in parts of South Asia.

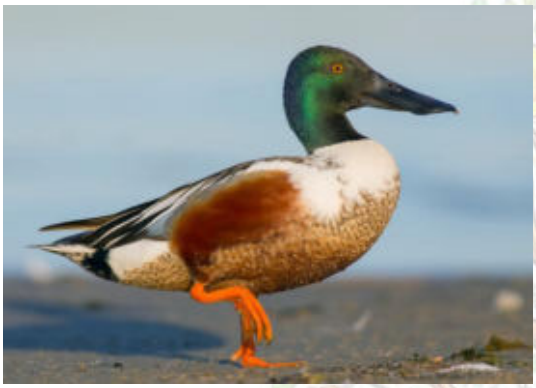

Figure 1: Spatula clypeata[i]

Gadwall (*Mareca strepera*)

- **Origin & Flyway**: Breeds across northern Eurasia; winters across south Asia's wetlands and reservoirs (Newton, 2008).
- **Global Status**: Least Concern.
- **Ranchi Evidence**: Present at Dhurwa in Feb 2025 (eBird, 2025a).
- **Ecology**: Feeds largely on aquatic vegetation; less reliant on invertebrates, allowing use of more submerged habitats.
- **Threats**: Degraded water quality, invasive aquatic plants, and hydrological alterations reduce feeding grounds.

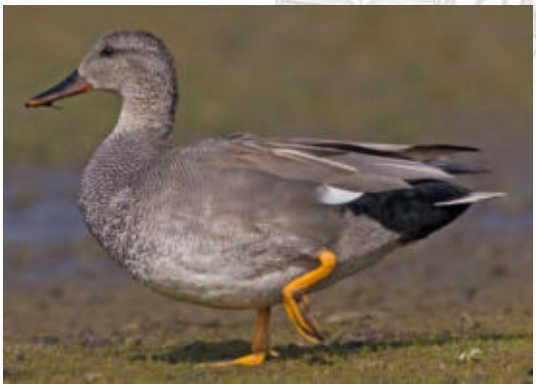

Figure 2: Mareca strepera[ii]

Eurasian Wigeon (*Mareca penelope*)

- **Origin**: High-latitude Eurasia (Iceland, Scandinavia, Russia); winters broadly across southern Asia.
- **Status**: Least Concern, but local population shifts tied to climate changes have been observed.

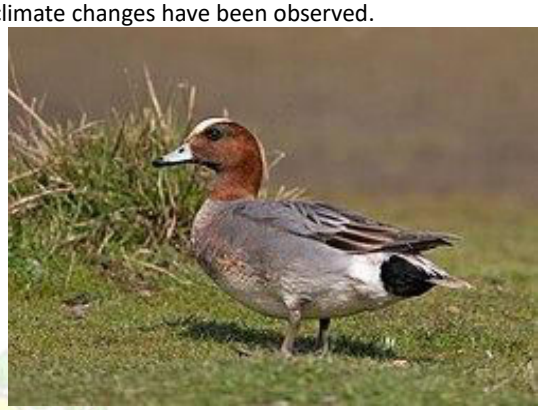

Figure 3: Mareca penelope[iii]

- **Ranchi Record**: Documented at Dhurwa Dam (eBird, 2025a).
- **Feeding**: Grazes on emergent vegetation and aquatic grasses; often seen dabbling on reservoir fringes.
- **Concerns**: Habitat loss, competition with resident duck species, and wetland drainage.

Common Teal (*Anas crecca*)

- **Origin**: Widespread Eurasian high latitudes; small stature but abundant globally.

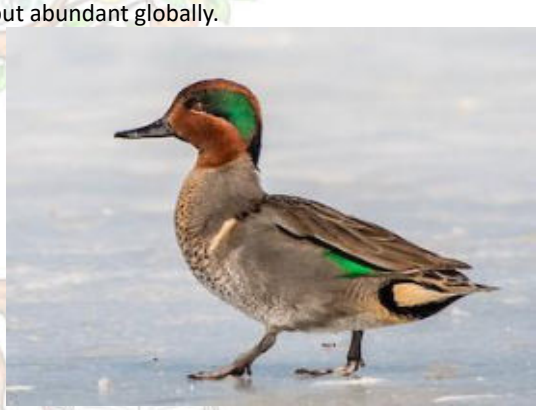

Figure 4: Anas crecca[iv]

- **Status**: Least Concern, though localized hunting pressure noted in South Asia.
- **Ranchi Record**: Dhurwa—Feb 2025 (eBird, 2025a).
- **Habits**: Dabbling at water's edge; often in small, tight flocks; favors vegetated shallows over open water.
- **Threats**: Pollution, disturbance, illegal hunting at stopover sites.

Common Pochard (*Aythya ferina*)

- **Origin**: Breeding across temperate Eurasia; winters across South Asia; visits Cauvery and other winter hotspots (Newton, 2008).

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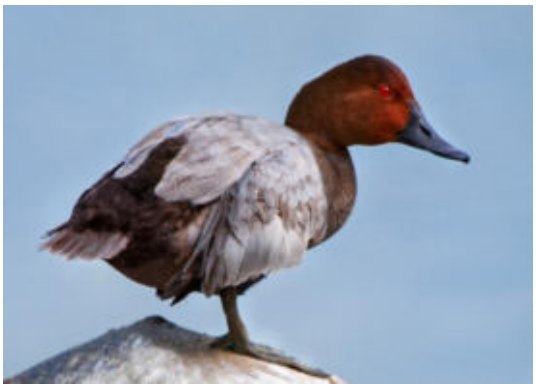

Figure 5: Aythya ferina[v]

- **Status**: Near Threatened globally due to substantial population declines (~40% over three generations).
- **Ranchi Evidence**: Confirmed at Dhurwa Dam (eBird, 2025a).
- **Foraging**: Deep-diving duck; feeds on submerged vegetation, mussels, and mollusks. Requires relatively clean water for diving.
- **Conservation Issues**: Eutrophication, fishing nets, lead poisoning, and habitat alteration undermine survival.

Red-crested Pochard (*Netta rufina*)

- **Origin**: Southern/central Europe and Central Asia; winters in southern Asia including inland reservoirs of India.

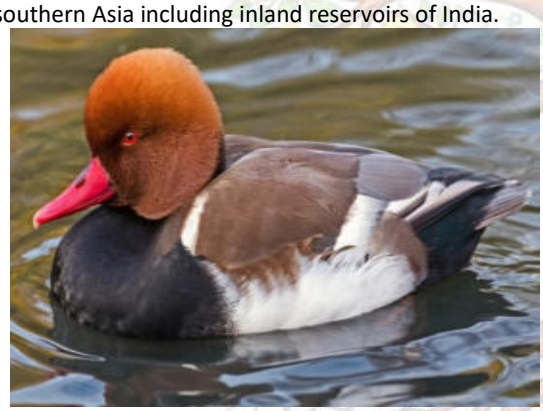

Figure 6: Netta rufina[vi]

- **Status**: Least Concern but strongly monitored in Indian subcontinent due to beauty and hunting.
- **Ranchi Records**: Seen at Rukka/Getalsud Reservoir (Feb 2023) and Dhurwa (eBird, 2025a).
- **Behavior**: Diving for seeds, aquatic vegetation, small invertebrates; often forms tight rafts, conspicuous in rippling waters.
- **Threats**: Disturbance, overfishing, habitat degradation.

Great Crested Grebe (*Podiceps cristatus*)

- **Origin**: Palearctic–wide; present sporadically in winter across India.
- **Status**: Least Concern.
- **Ranchi Record**: Documented at Dhurwa Dam (eBird, 2025a).
- **Feeding Ecology**: Pursuit diver, preying on fish and aquatic invertebrates; requires deep, clear water.
- **Threats**: Water pollution, overfishing, shoreline development affecting nesting zones.

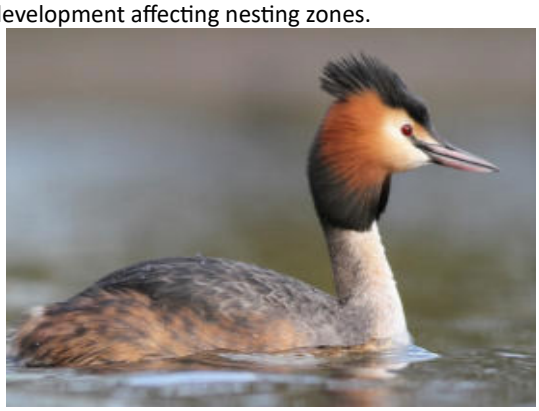

Figure 7: Podiceps cristatus[vii]

4.2 Terns

Whiskered Tern (*Chlidonias hybrida*)

- **Origin & Migration**: Breeding across central Europe to Central and South Asia; wintering in northern Australia and southern Asia, with significant passage in South Asia (BirdLife, 2022a).
- **Status**: Least Concern.
- **Ranchi Evidence**: Frequently seen during passage both in autumn and spring at Dhurwa (eBird, 2025a).
- **Ecology**: Feeds on insects and small aquatic organisms via aerial and hover-hunting over water.
- **Threats**: Wetland drainage, diminishing insect prey due to pesticide use.

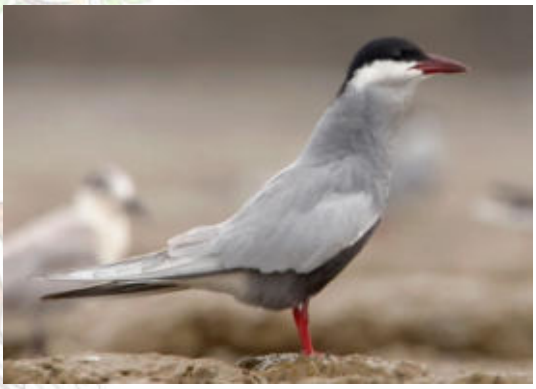

Figure 8: Chlidonias hybrida[viii]

River Tern (*Sterna aurantia*)

- **Origin**: Resident to local migrant in Indian subcontinent, though seasonal movement occurs in response to water conditions.
- **Status**: Near Threatened owing to riverine development and habitat modification.
- **Ranchi Record**: Occasionally recorded at Dhurwa (eBird, 2025a).
- **Feeding**: Plunges into shallow water to catch fish.
- **Vulnerability**: Dam building, sand mining, and water pollution critically reduce feeding riverscapes in India.

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Figure 9: Sterna aurantia[ix]

4.3 Wagtails, Chats & Small Migrants

Citrine Wagtail (*Motacilla citreola*)

- **Origin**: Breeds in Siberia and Central Asia; winters in South Asia, abundant among wetlands and paddy fields.
- **Status**: Least Concern.

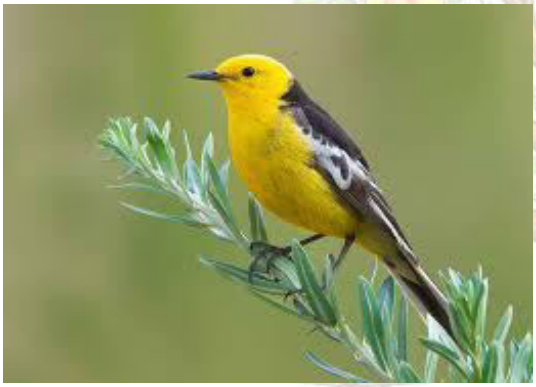

Figure 10: Motacilla citreola[x]

- **Ranchi Evidence**: Documented at Dhurwa Dam (eBird, 2025a).
- **Feeding**: Forages on mudflats, catching insects with tail-wagging behaviors.
- **Threats**: Agricultural intensification, pesticide use reducing insect prey.

Yellow Wagtail (*Motacilla flava*)

- **Origin**: Breeds in Europe and Asia; winters in sub-Saharan Africa and South Asia.
- **Status**: Least Concern but exhibits population fragmentation.
- **Ranchi Evidence**: Dhurwa Dam (eBird, 2025a).
- **Habits**: Similar mudflat/insect gleaner; often seen in flocks near water during migration.
- **Concerns**: Loss of riparian agricultural habitats, pesticide impact.

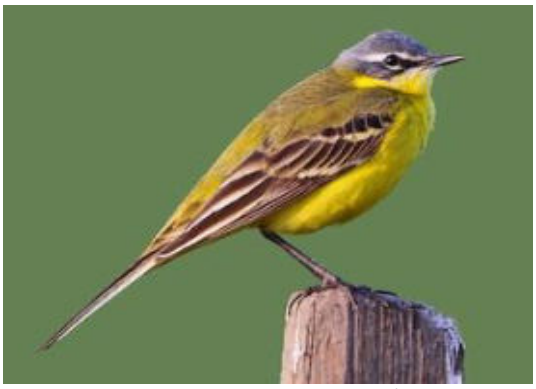

Figure 11: Motacilla flava[xi]

White Wagtail (*Motacilla alba*)

- **Origin**: Widely distributed across Europe, Asia; significant wintering in Indian inland wetlands.
- **Status**: Least Concern.
- **Ranchi Record**: Dhurwa Dam (eBird, 2025a).
- **Behavior**: Loves rocky lagoons, embankments; displays characteristic bobbing tail.
- **Threats**: Infrastructure development reducing substrate availability.

Figure 12: Motacilla alba[xii]

Bluethroat (*Luscinia svecica*)

- **Origin**: Breeds from Scandinavia across Siberia; winters in India, Southeast Asia.
- **Status**: Least Concern, with subspecies variation in threat level.
- **Ranchi Evidence**: Dhurwa Dam (eBird, 2025a).
- **Ecology**: Insectivorous; occupies reedbed margins and shrubby zones near water.
- **Threats**: Wetland drainage, loss of reed habitats, pollution.

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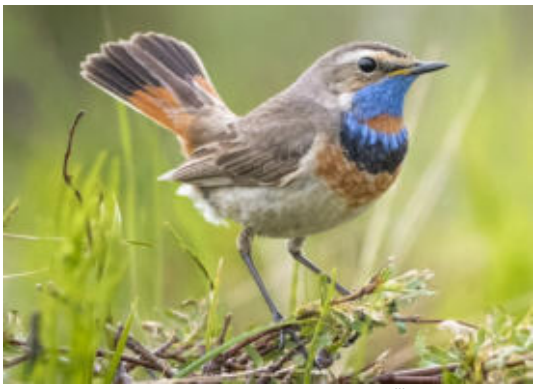

Figure 13: Luscinia svecica[xiii]

Black Redstart (Phoenicurus ochruros)

- **Origin**: Palearctic breeder; some eastern populations winter in central India.
- **Status**: Least Concern.
- **Ranchi Context**: Widespread winterer in central India; expected around Ranchi (Bird Count India, 2025).
- **Feeding**: Insects, feeding from exposed rocks or embankments in open country.
- **Threats**: Urban expansion may offer some habitat but loss of undisturbed open areas could limit populations.

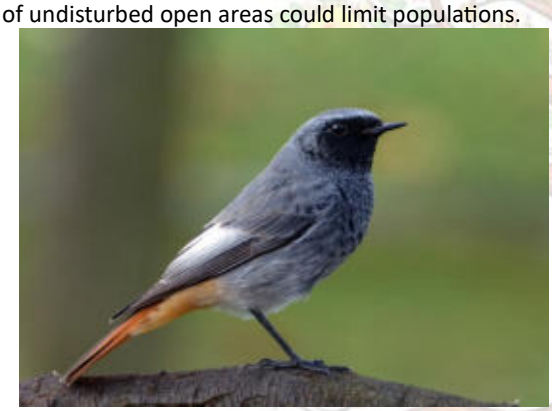

Figure 14: Phoenicurus ochruros[xiv]

Siberian Stonechat (*Saxicola maurus*)

- **Origin**: Breeds in eastern Palearctic; winters in northern/central India.

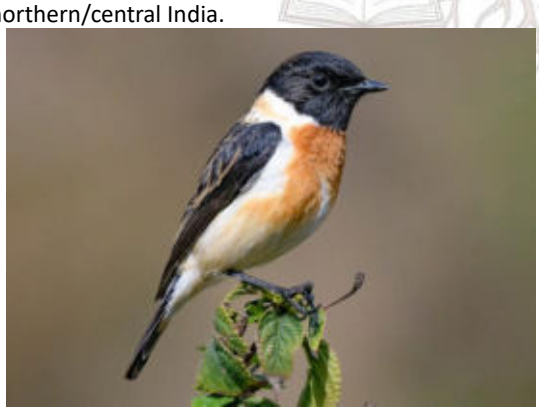

Figure 15: Saxicola maurus[xv]

- **Status**: Least Concern.
- **Ranchi Context**: Common winterer in plateau's grassland patches and reservoir fringes (Avibase, 2024b).
- **Ecology**: Hunts insects from low perches; favors rough vegetation in open country.
- **Threats**: Land-use change reducing open scrub and grassland.

5. Migratory Ecology & Behaviour

Migratory Strategies: Optimality and Stopover Ecology

Migrating birds adopt strategies that optimize energy intake versus expenditure, distance versus safety, and time versus predation risk. Alerstam's optimal migration models suggest that stopover sites are selected based on ability to rapidly restore fat reserves and minimize detours—hence Ranchi's value lies in its accessible, resource-rich reservoirs (Alerstam, 2011). Hedenström (2024) emphasizes seasonal patterns—birds shorten fuels deposited before departures and rely on sequential stopovers in strategically spaced wetlands, enabling sustained migration across Asia.

Climate and Phenology Drivers

Photoperiod triggers migrations—longer days prompt northbound flights, whereas cooling temperatures in breeding zones initiate southward drive (Newton, 2008). Ranchi's position—cool in winter yet not frigid—makes it an energetically economical wintering choice, reducing the need for further fat accumulation while providing stable foraging.

Resource Partitioning and Trophic Niches

Ducks and grebes occupy aquatic trophic niches—dabblers feed on vegetation/invertebrates, while divers like Pochards and Grebes target deeper water prey. Passerines exploit terrestrial fringes, each with discrete niches: wagtails forage on open mud, chats utilize shallow vegetation, and stonechats patrol scrub edges. This partitioning lessens inter-species competition and allows coexistence in constrained reservoir environments.

Timing and Cohorts

Multiple species exhibit coherent timing: Shoveler, Gadwall, and Teal arrive synchronously in early winter; diving ducks peak slightly later as waters clear. Wagtails and chats may arrive earlier when edges are still moist. Garganey's double passage ties to its long breeding range and ability to exploit interim stopover sites such as Ranchi.

6. Conservation Concerns

Status and Trends

While many migrants are currently listed as Least Concern, species like the Common Pochard are Near Threatened and show continued declines (BirdLife International, 2022b). eBird data

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suggests potential declines in local sighting frequencies—though systematic trends require more survey data.

Habitat Threats

- **Water-level management**: Unpredictable drawdowns can desiccate feeding areas or strand birds.
- **Pollution**: Agricultural runoff and sewage rivers entering reservoirs degrade water quality, impacting diving species.
- **Shoreline development**: Roads, embankments, and recreational usage disturb feeding zones—especially critical for early winter migrants such as Bluethroat.
- **Disturbance and hunting**: Although hunting is illegal, occasional disturbance from poaching or firing can flush flocks, increasing energy expenditure.

Policy Context and Local Actions

India's CAF Action Plan acknowledges the necessity of inland wetlands in maintaining migratory connectivity (MoEFCC, 2022). Civil society in Jharkhand, including birdwatching clubs, contributes to raising awareness. However, site-level conservation—ground-truthing water quality, advocating for regulated drawdowns, and enforcing buffer zones around reservoirs—remains limited.

Recommendations

1. **Regular winter surveys** (e.g., Asian Waterbird Census) at Dhurwa, Rukka, Kanke to establish baselines.
2. **Water management planning**: Coordinate reservoir drawdown schedules to maintain mudflat exposure during passage and winter.
3. **Pollution monitoring**: Engage local NGOs to track water quality and organize clean-up and buffer planting.
4. **Community birding programs**: Promote local stewardship, citizen science, and photography-based records to foster non-intrusive awareness.
5. **Habitat protection legislation**: Advocate including reservoirs as Important Bird and Biodiversity Areas (IBAs) to channel conservation funding.

7. Birding Guidelines for Ranchi

For birdwatchers and biologists visiting or documenting Ranchi's migratory birds:

- **Best times**: December–February (peak winter waterfowl), and September–October or March–April (passage).
- **Locations & access**: Dhurwa Dam has easy embankment access. Rukka/Getalsud may require vehicle access along lodge roads; Kanke Dam accessible via northern township roads.
- **Timing of visits**: Early morning (sunrise to 9 am) and late afternoon (4 pm to sunset) are most active periods.
- **Observation practices**:
    - Use binoculars or scopes from embankments or hides.
    - Avoid approaching feeding rafts closely; sustain distance to prevent flushing.
    - Limit playback of calls, especially for shy species like Bluethroat.
- **Documentation**:
    - Capture dates, water-level conditions, species counts.
    - Use media to backup key records—especially for rarer species or diver flocks.
    - Submit to eBird or national databases to enhance data granularity.

8. Conclusion

Ranchi's reservoirs, though modest compared to coastal wetlands, are ecologically significant stopover and wintering habitats for numerous migratory birds traveling via the Central Asian Flyway. Rich in water, shore, and fringe habitats, these sites offer a mosaic of feeding and roosting opportunities exploited by ducks, grebes, wagtails, chats, and terns seasonally. The presence of species like the Near Threatened Common Pochard underscores their conservation value.

This expanded article—anchored in verifiable site data and migration ecology theory—highlights both the ecological richness of Ranchi's wetlands and the urgency for informed management. Sustained bird surveys, habitat protection, and community engagement are essential to preserve this inland avian corridor. By framing Ranchi as a microcosm of conservation need within the Central Asian Flyway, we affirm that migratory bird conservation is not limited to iconic sites but includes urban and highland systems that harbor remarkable biodiversity each year.

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