Western Barn Owl (*Tyto alba*) and the Parys Wetland Complex

Habitat relationships, population signals, threats, mitigation, and rehabilitation considerations

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Abstract

The Western Barn Owl is a nocturnal predator of open terrestrial habitats that can obtain important hunting resources from wetland and floodplain margins. This report evaluates that relationship, compares the species' requirements with the Parys Wetland Complex, verifies locally recorded potential prey, analyses Southern African Bird Atlas Project 2 (SABAP2) signals for the Parys intake-area pentads, Fezile Dabi, the Free State, and South Africa, and reviews threats, mitigation, and rehabilitation evidence. The Parys Wetland Project verifies a local four-striped grass rat, other small mammals, large insects, and small passerines within documented prey categories, but occurrence records do not prove local predation or abundance. Local atlas detections remain sparse: reporting changed from 0 of 87 cards (0.0%) in 2007–2011 to 2 of 122 (1.6%) in 2022–25 August 2026, with detections in 1 of 11 pentads. This is not an individual-bird count or proof of increase. Fezile Dabi and Free State reporting recovered after an early SABAP2 dip, while the best older national comparison found decreased reporting in almost two-thirds of comparable cells. The Parys wetland–grassland mosaic can support hunting, but degraded hydrology, pollution, roads, electricity infrastructure, unsafe cavities, and rodenticides can reduce habitat quality or create mortality hazards. South African rehabilitation datasets show frequent admissions but do not provide a species-specific release or post-release survival rate.

Keywords: Western Barn Owl; Tyto alba; Parys; Fezile Dabi; Free State; wetland-associated; wetland margins; local prey; iNaturalist; SABAP2; rodenticide; rehabilitation

Purpose of the research

This research was undertaken to determine how the Western Barn Owl relates to wetland habitats; summarise its habitat, diet, movement, and breeding ecology; compare those requirements with the Parys Wetland Complex; verify potential prey recorded locally; compare SABAP2 population signals in the Parys intake-area pentads with Fezile Dabi, the Free State, and South Africa; identify known risks and mitigation; and evaluate evidence on captivity, treatment, and release after injury. It is written as a self-contained report so readers do not need the original research questions.

Key findings

- Under Parys WADER's operational framework, the Western Barn Owl is classified as wetland-associated (category 3). It is not strictly wetland-dependent, but rough wetland margins, seasonally moist grassland, floodplain edges, and adjacent pasture can provide small-mammal prey, while open water and dense reedbeds are not core habitat requirements.
- The Parys Wetland Complex contains channelled valley-bottom, unchannelled valley-bottom, and seep wetlands between urban Parys and the Vaal River. Their margins, remnant grass, nearby cropland, roadsides, farm buildings, and urban structures could provide a useful foraging–roosting mosaic. The wetland report did not survey owls, rodents, nest sites, or toxicants, so this is an ecological comparison rather than proof of local habitat use.

- The Parys Wetland Project verifies local occurrence of a four-striped grass rat, Highveld Mole-rat, large insects, and small passerines within documented prey categories. The grass rat is the strongest local mammalian candidate; none of these records proves local predation or prey abundance.
- Across the 11 Parys intake-area pentads, local SABAP2 detections were extremely sparse: 0 / 87 cards in 2007–2011 and 2 / 122 in 2022–25 August 2026, with detections in 1 pentads in the current period. This is not evidence of an individual-level population increase.
- Fezile Dabi reporting fell from 9.7% in 2007–2011 to 6.5% in 2012–2016, then rose to 15.0% in 2017–2021 and 15.1% in the current period. The Free State followed a similar pattern: 7.5%, 6.5%, 9.8%, and 10.3%. These are positive recent occurrence signals, not counts of individuals.
- National raw positive-card totals increased across SABAP2, but cannot be converted into a trend because a comparable period-specific national survey denominator was unavailable. The most informative older national comparison found decreases in 64.2% and increases in 35.9% of 953 comparable grid cells between SABAP1 and early SABAP2. This was a reporting and distribution comparison, not a 64.2% loss of owls.
- No current South African population estimate was found. BirdLife International assesses the global species as Least Concern, but lists its global population trend as unknown. Widespread occurrence and a low extinction-risk category do not demonstrate numerical stability.
- The principal risks are loss or simplification of prey-rich open habitat; second-generation anticoagulant rodenticides and other pesticides; road and building collision; loss or unsafe alteration of roosts and nests; hazardous electricity infrastructure, fences, and loose wire; pollution and sewage; disturbance, persecution, and climatic or prey fluctuations.
- Western Barn Owls are among the more frequent raptor admissions to South African rehabilitation centres. Published datasets do not provide species-specific release probability or post-release survival, so it is not defensible to say that they cope predictably well or poorly in captivity. Temporary care must minimise stress and habituation while restoring complete vision, hearing, foot function, plumage, flight control, endurance, and live-prey capture.

1. Introduction

The Western Barn Owl is one of southern Africa's most recognisable nocturnal raptors. It is widely distributed and readily uses human-modified landscapes where open hunting habitat occurs near buildings, tree cavities, cliffs, or other sheltered roosts. This adaptability has sometimes encouraged an assumption that the species is secure. The available evidence is more nuanced: local populations can fluctuate sharply with rainfall and rodents; suitable buildings and grassland can disappear or become hazardous; and nocturnal birds are detected inconsistently by general bird-atlas surveys.

Wetlands require similar nuance. The owl is neither aquatic nor a reedbed specialist, yet wetland margins can concentrate exactly the resources it needs: small mammals, rough herbaceous cover, edge structure, and open flight space. A wetland may therefore contribute strongly to a Barn Owl's hunting landscape without being the place where it roosts or nests. Conversely, a wetland surrounded by poisons, roads, contaminated runoff, unsafe electricity structures, or frequently disturbed buildings may attract an owl while increasing mortality.

2. Methods and interpretation

2.1 Literature review

The review prioritised full-text South African university research and southern African peer-reviewed studies, then used international full-text work where South African evidence was absent. It also consulted the first Southern African Bird Atlas account, BirdLife International's current factsheet, the South African National Biodiversity Institute species account, and published rehabilitation records. Findings from inaccessible papers were not used as evidence and are identified separately near the end of the report.

2.2 Parys Wetland Complex

Local habitat information came from the wetland delineation report supplied by Parys WADER. Field validation was undertaken on 16 May 2025. Seven wetlands were delineated: channelled valley-bottom, unchannelled valley-bottom, and unchannelled seep systems. Their adjusted present ecological categories comprised two C, three D, one E, and one F. The report therefore describes mostly modified to seriously or critically modified systems, although they continue to provide water purification, stream-flow regulation, erosion control, and recreational value. Documented pressures include artificial drains, roads, berms, an electricity substation and related infrastructure, sewage spills, oils, pesticides, nutrients, industrial and business runoff, invasive vegetation, and heavily transformed catchments (Collins, 2025).

2.3 Population analysis

SABAP2 full-protocol records for species code 359 were analysed in four windows: 2007–2011, 2012–2016, 2017–2021, and 2022–25 August 2026. The last period is incomplete. Reporting rate is the proportion of full-protocol cards on which at least one Western Barn Owl was recorded. An occupied pentad is a 5 × 5 minute atlas cell with at least one detection during the relevant period. Neither measure counts individual owls (Brooks *et al.*, 2022).

The local analysis used the Parys intake-area pentads selected by Parys WADER as representative of Parys and the surrounding intake-source landscape. The supplied list contained 2655_2730 twice; exact duplicates were removed, leaving 11 unique pentads. The pentads were: 2645_2720, 2645_2725, 2645_2735, 2650_2720, 2650_2725, 2650_2730, 2650_2735, 2655_2720, 2655_2725, 2655_2730, 2655_2735. Fezile Dabi was represented by 270 pentads whose centres fell within the official DC20 district polygon. Free State summaries used the BirdMap province endpoint. National values are raw positive full-protocol cards because the period-specific national denominator was unavailable. (BirdMap, 2026; Municipal Demarcation Board, 2018)

2.4 Parys WADER wetland terminology

Parys WADER uses a three-category intake and communication framework: (1) birds that live on water; (2) birds that live at the edges of water; and (3) birds that use or depend on wetlands for important ecological functions such as hunting or nesting. Under this operational framework, a species that is not strictly wetland-dependent but may use wetland habitat for hunting is described as wetland-associated. These categories are used for Parys WADER intake, research, and communication; they are not formal taxonomic or Red List categories. The Western Barn Owl is treated as a wetland-associated category 3 species in this report.

2.5 Local potential-prey verification

Local occurrence was checked through the Parys Wetland Project on iNaturalist (project 224400), using research-grade observations marked as wild and available on 25 August 2026. The filtered project contained 10,874 observations, including 17 mammal, 128 insect, and 58 bird species. Records were matched to prey categories established by the dietary literature. Observation counts are shown only to make the verification reproducible: they are observer-dependent occurrence records, may include repeated individuals, and are not prey-abundance estimates or evidence of predation.

3. Species ecology and its relationship with wetlands

3.1 Habitat

Western Barn Owls occupy open grassland, savanna, semi-arid shrubland, pasture, cropland, road verges, farmsteads, towns, woodland edges, and other mosaics where prey is accessible and a secure cavity or structure is available for daytime shelter. Large trees, cliffs, caves, buildings, silos, barns, towers, roof spaces, and nest boxes can provide roosts or nests. The first atlas account noted that buildings and other structures were especially important in landscapes lacking large cavity-bearing trees (Mendelsohn, 1997).

The owl's essential habitat is therefore better represented as a combination of functions than as one vegetation type: prey-producing open ground; cover in which rodents can persist; low and unobstructed flight paths; safe sheltered roosts; and nest sites. Modern tracking in European farmland reinforces this division. Breeding Barn Owls used buildings almost exclusively as daytime roosts, selected pastures, meadows, forest edges, and agri-environment structures for nocturnal perching or hunting, and commuted through open habitat (Séchaud *et al.*, 2021). These precise habitat selections cannot simply be transferred to Parys, but the functional separation between roosting structures and open hunting habitat is applicable.

3.2 Diet and hunting

Small mammals dominate the diet, especially murid rodents, shrews, and other locally abundant terrestrial mammals. An Eastern Cape study found strong prey specificity consistent with hunting in open country, while southern African accounts describe diet switching as rodent communities and abundance change (Perrin, 1982; Mendelsohn, 1997). Small birds, bats, insects, reptiles, amphibians, and occasionally other prey supplement the diet. A recent African pellet study in Kenya found small mammals made up 78.0% of prey in an urban population and 85.8% in a protected-area population, illustrating both rodent dependence and flexibility across landscapes (Onduso *et al.*, 2026).

Barn Owls hunt primarily at night in low, buoyant flight, with frequent quartering, gliding, and short perching bouts. Their facial disc and asymmetric ear openings support precise acoustic prey location, including in poor light. This makes grass height and density important: habitat must sustain rodents but still allow the owl to hear, approach, and strike. Uniformly bare or intensively mown ground can reduce prey refuge, while dense woody invasion or impenetrable reeds can obstruct hunting.

3.2.1 Locally verified potential prey

The iNaturalist project verifies local occurrence of taxa that fit documented Western Barn Owl prey categories. A four-striped grass rat identified as Rhabdomys chakae is the strongest local mammalian candidate. South African literature documents Barn Owl use of Rhabdomys grass rats, although older sources use different species delimitations within this taxonomically revised genus. The project record confirms occurrence, not capture by a Parys owl. The Highveld Mole-rat Cryptomys pretoriae is also recorded locally, but its fossorial ecology makes accessibility uncertain and the reviewed sources did not verify it as Barn Owl prey. Small passerines and large insects are plausible supplementary prey, not substitutes for the small-mammal prey base.

Locally recorded taxon	Project records	Dietary relevance and evidential status
Four-striped grass rat (Rhabdomys chakae)	1	Strongest local candidate: a small grassland rodent in a genus documented in South African Barn Owl diet literature; no Parys predation record.
Highveld Mole-rat (Cryptomys pretoriae)	13	Locally verified fossorial mammal; accessibility and taxon-specific Barn Owl predation remain unconfirmed.
Small passerines	Southern Masked Weaver 10; Southern Red Bishop 5; African Stonechat 4; several finches, prinias, sparrows and larks 1–2 each	Locally verified potential supplementary prey; birds are a minor dietary component and no local kill or pellet record was found.
Large insects	Elegant grasshopper 16; green milkweed locust 13; garden locust 3; mantises, molecricket and beetle 1–3 each	Locally verified potential supplementary prey; occurrence does not establish capture, palatability, or importance.
Amphibians and reptiles	No research-grade project records under the applied filters	No local occurrence evidence from this project; absence of records does not establish ecological absence.

3.3 Movement

The species is not a regular long-distance migrant in southern Africa, but it is mobile and may be nomadic in response to rainfall and rodent abundance. The first atlas account recorded movements of up to approximately 600 km and described pronounced local fluctuations associated with rodent cycles (Mendelsohn, 1997). This mobility matters when interpreting a small area: a local rise or fall may reflect redistribution, prey conditions, recruitment, or mortality.

Home range varies with breeding stage, prey, landscape composition, and urbanisation. In a Canadian study of ten Barn Owls, estimated 95% home ranges ranged from 1.0 to 28.5 km² and increased with urban land cover. Roadside grass verges were highly selected, but their use increased exposure to traffic and poisoned prey (Hindmarch *et al.*, 2017). These figures are not Parys home-range estimates; they show how suitable foraging patches and hazards can be spatially linked.

3.4 Breeding

Breeding can occur in any month when prey is abundant. In the more mesic northern and eastern parts of southern Africa, breeding is often concentrated in the dry season, broadly April to September, with a Transvaal peak reported from March to May. The normal clutch is commonly two to four eggs, but can exceed twelve during rodent outbreaks; pairs may produce second broods. Incubation is approximately 29–34 days and fledging about 45–55 days. The female performs most incubation and early brooding, while the male supplies prey; both may support older young. Nest sites can be reused for many years (Mendelsohn, 1997; SANBI, 2018).

3.5 Wetland association under the Parys WADER framework

Under the Parys WADER framework, the Western Barn Owl is classified as wetland-associated (category 3), rather than as a bird that lives on water or at its immediate edge. It is not strictly wetland-dependent, but it can use wetlands for hunting. The most useful features are rough grass and sedge margins, seasonally inundated floodplain or valley-bottom edges, transition zones to pasture or cropland, and nearby safe roosts. These habitats can support wetland-associated rodents and maintain green cover during otherwise dry periods. Dense reedbed interiors, deep open water, and permanently saturated ground are less useful unless bordered by accessible hunting strips.

The relationship can change seasonally. When high water reduces accessible ground, owls may concentrate on drier edges. When wetlands contract, rodent activity can become concentrated along receding margins. Fire, mowing, and grazing can briefly increase prey visibility but, if extensive or frequent, can remove the vegetation that supports prey. A University of Pretoria study in an eastern Gauteng agricultural matrix also identified water availability, habitat structure, and nesting opportunities as relevant to the combined owl community. Because its estimates combined species, they should not be treated as Western Barn Owl-specific effect sizes (Hannweg, 2019). The appropriate conservation target is therefore a heterogeneous wetland–grassland edge rather than uniformly short or uniformly dense vegetation.

4. Habitat comparison with the Parys Wetland Complex

Western Barn Owl requirement	Habitat offered in and around the complex	Assessment
Open, low-flight hunting space	Valley-bottom and seep margins, grassed edges, drains, roadsides, nearby pasture, cropland, and urban open space	Potentially suitable; no local tracking or owl survey confirms use
Small-mammal prey	Moist herbaceous margins and a wetland–grassland–cropland–urban mosaic; the Parys Wetland Project verifies a local four-striped grass rat and Highveld Mole-rat	Occurrence evidence now exists; the grass rat is the stronger dietary candidate, but prey abundance and local owl use remain unmeasured
Vegetation mosaic	Wetland vegetation, disturbed margins, remnant natural cover, and adjacent transformed land	Useful where rough prey refuges remain beside accessible hunting patches; invasive or uniformly altered cover can reduce value
Daytime roosts	Trees, farm and urban buildings, bridges, roof spaces, and other structures in the broader Parys landscape	Likely available, but none was audited for safety, occupancy, or disturbance
Nest cavities	Mature trees and sheltered structures may provide sites; suitable nest boxes could supplement genuinely scarce cavities	Availability is unknown; boxes do not compensate for poor foraging habitat or unsafe placement
Movement connectivity	Wetlands lie between urban Parys and the Vaal River and connect with surrounding grassland and agricultural land	Potential stepping-stone or foraging corridor; local owl movements are untracked
Water and ecosystem function	The complex retains purification, flow-regulation, erosion-control, and recreational functions	Restoring these functions should support habitat resilience and prey communities
Low contaminant and mortality risk	Sewage, oils, pesticides, nutrients, industrial runoff, roads, drains, fences, and electricity infrastructure are documented	This is the largest mismatch: suitable-looking habitat may carry toxicological and physical hazards

The Parys Wetland Complex is best understood as one component of a larger Barn Owl landscape. It is unlikely to support an owl solely through its wetland interiors, but its margins may contribute foraging habitat when combined with adjacent grassland, cropland, road verges, farm buildings, and urban structures. The two wetlands in category C may retain more ecological function than those in D–F, yet condition category alone does not predict owl use. A degraded edge can still hold rodents, while also increasing collision, poison, and disturbance risk.

The most important local uncertainty is direct use. Collins (2025) delineated wetlands and assessed condition; the study did not survey Western Barn Owls, rodents, roosts, nests, rodenticide residues, carcasses, or rehabilitation admissions. The comparison above should therefore guide targeted monitoring, not be represented as a confirmed Parys habitat-selection study.

5. Population evidence

5.1 What the available data measure

There is no repeated census of individual Western Barn Owls for Parys, Fezile Dabi, the Free State, or South Africa. SABAP2 detects whether at least one owl was recorded on a checklist. A rise in reporting rate can reflect more owls, better nocturnal effort, changed routes, use of call playback, observer skill, redistribution, or several of these factors. A decrease can likewise combine abundance, movement, and detectability. The species' nocturnal habits make this limitation stronger than for conspicuous diurnal raptors.

Scale	2007–2011	2012–2016	2017–2021	2022–25 Aug 2026
Parys 11-pentad intake-area block	0 / 87 (0.0%); 0 occupied	0 / 140 (0.0%); 0 occupied	1 / 148 (0.7%); 1 occupied	2 / 122 (1.6%); 1 occupied
Fezile Dabi District	107 / 1,100 (9.7%); 16 occupied	94 / 1,444 (6.5%); 11 occupied	170 / 1,132 (15.0%); 21 occupied	198 / 1,311 (15.1%); 22 occupied
Free State	464 / 6,225 (7.5%)	364 / 5,636 (6.5%)	612 / 6,250 (9.8%)	725 / 7,050 (10.3%)
South Africa	2,798 positive cards	3,274 positive cards	5,885 positive cards	5,727 positive cards

Values are positive cards / full-protocol cards (reporting rate), followed by occupied pentads where calculated. National values are raw positive cards only and have no comparable denominator. The final period is incomplete.

5.2 Parys intake-area pentads

All 11 unique pentads were surveyed in every period, but Western Barn Owl detections were extremely sparse. The species was reported on 0 of 87 full-protocol cards in 2007–2011, 0 of 140 in 2012–2016, 1 of 148 in 2017–2021, and 2 of 122 in 2022–25 August 2026. The recorded footprint was 0, 0, 1, and 1 occupied pentads, respectively.

The most defensible interpretation is that current reporting is higher than in the earliest period, but the evidence is too sparse to infer an increase in individual owls. The 2 positive cards may include repeat encounters with the same owl or pair, while earlier absences may partly reflect limited night coverage. The result is useful as a baseline because it identifies how little structured local information exists.

5.3 Fezile Dabi District

District reporting decreased from 9.7% to 6.5%, then more than doubled to 15.0% and remained at 15.1% in the current period. Relative to 2007–2011, the current reporting rate is approximately 55% higher. Occupied pentads changed from 16 to 11, 21, and 22.

This is evidence against a continuing district-wide decline in atlas reporting since 2007. It is not a population count, and the surveyed footprint changed substantially: 266 district pentads had at least one full-protocol card in the earliest period, compared with 148 in the current period. Positive records may be concentrated in the better-surveyed towns, farms, and roads. The stable current rate compared with 2017–2021 is more defensible than a claim of continuing growth.

5.4 Free State

Provincial reporting fell from 7.5% to 6.5%, then rose to 9.8% and 10.3%. The current rate is approximately 38% above the earliest SABAP2 period and 5% above 2017–2021. This suggests an improved province-wide occurrence signal after 2012–2016. The same cautions about nocturnal detection, observer distribution, and movement apply.

5.5 South Africa and the longer historical context

The first atlas, based mainly on fieldwork from 1987 to 1991, recorded the Barn Owl in 1,765 quarter-degree grid cells from 12,573 records across its southern African range, with a mean reporting rate of 11.1%. These figures cover more than present-day South Africa and are not individual birds (Mendelsohn, 1997).

The clearest published comparison between SABAP1 and early SABAP2 analysed 953 comparable grid cells. Western Barn Owl reporting decreased in 64.2% and increased in 35.9% of them. Decreases were classified as very large in 21.2%, large in 18.3%, and small in 24.7% of cells. This supports a widespread older reduction in reporting or distribution and argues against simply assuming long-term national stability. It does not mean that 64.2% of individual owls were lost (Underhill and Brooks, 2014).

Recent national positive-card totals rose from 2,798 to 3,274 and 5,885, then reached 5,727 in the incomplete current period. Without the total number and spatial distribution of national full-protocol cards for each period, those raw totals cannot distinguish better coverage from population change. No defensible current South African abundance estimate was found. BirdLife International assesses the global species as Least Concern, but lists the global trend as unknown (BirdLife International, 2026).

The national and regional results are not necessarily contradictory. An older broad decline signal can coexist with recent reporting increases in Fezile Dabi and the Free State. The scales, periods, coverage, and measures differ, and a mobile rodent predator can redistribute rapidly.

6. Known risks and mitigation

Risk	Relevance to Western Barn Owls and Parys	Practical mitigation
Habitat loss and simplification	Conversion, hard surfaces, intensive cultivation, uniform mowing, frequent burning, overgrazing, or dense invasion can remove either rodent refuges or accessible hunting space	Protect wetland buffers and remnant grassland; retain a mosaic of rough herbaceous strips and shorter hunting patches; restore hydrology and native vegetation; stagger mowing, fire, and grazing
Rodenticides and pesticides	Rodent dependence creates a direct secondary-poisoning pathway. Slow-acting anticoagulants can leave impaired rodents easier to catch and may accumulate after repeated prey consumption	Use integrated rodent management: sanitation, food exclusion, building proofing, habitat management, and targeted trapping; avoid routine second-generation anticoagulants; document products and locations; collect and test suspect carcasses
Road and building collision	Low nocturnal flight across roads, roadside hunting, transparent or reflective structures, and entry into buildings expose owls to trauma	Map collision hotspots; avoid creating prey-rich verges or perches immediately beside fast roads; use targeted speed reduction and warning measures; secure hazardous openings without trapping resident birds; make glazing visible where strikes occur
Loss or unsafe alteration of roosts and nests	Renovation, roof sealing, tree removal, or exclusion during breeding can kill or displace adults and young	Inspect before work; protect active sites; stage exclusions outside breeding; retain safe access where appropriate; install properly designed boxes only where foraging habitat and long-term maintenance are secure
Electricity infrastructure, fences, loose wire, and netting	Poles and structures offer perches but can cause electrocution, collision, or entanglement; fences and loose material injure flight feathers and limbs	Audit incident sites; insulate dangerous pole-top components; provide safe offset perches; remove loose wire, twine, and netting; replace or mark demonstrated fence hazards; report incidents to infrastructure owners
Sewage, industrial runoff, pesticides, oils, and nutrients	These pressures are documented in the Parys wetland report and may affect water, prey, habitat function, or the owl directly	Repair sewage systems; enforce spill response and runoff controls; maintain vegetated buffers; monitor water, sediment, prey, and carcasses where contamination is suspected
Disturbance, persecution, and misinformation	Repeated disturbance can cause nest failure; owls may be harmed through superstition, conflict, or indiscriminate predator control	Protect nest buffers; restrict unnecessary access; provide community education on rodent control and legal protection; investigate deliberate poisoning or shooting
Climate and prey fluctuations	Drought, flooding, and changed rainfall alter rodents, breeding, and nomadic movement; a temporary local absence can be misread as a permanent decline	Maintain connected, heterogeneous habitat; monitor rodents, rainfall, vegetation, breeding, and owls together; evaluate multi-year trends rather than isolated seasons

6.1 Rodenticide evidence

Anticoagulant rodenticides are the clearest toxicological concern because residues persist in prey tissues and repeated exposure can impair clotting or cause fatal internal bleeding. A Canadian Barn Owl study estimated that individual owls could encounter poisoned prey across a meaningful proportion of their home range, especially in urbanised landscapes with fragmented grass habitat (Hindmarch *et al.*, 2017). A South African predator survey in Greater Cape Town confirmed widespread anticoagulant exposure pathways in an urbanising African landscape, but included only one Cape Eagle-Owl and no Western Barn Owl sample large enough for species-specific inference (Serieys *et al.*, 2019). No systematic residue study of South African Western Barn Owls was found.

Mitigation should therefore be precautionary and monitored. Poison-led rodent control should be replaced where possible by removing food and shelter, excluding rodents from buildings, improving waste storage, maintaining clean feed stores, and using targeted mechanical control under an integrated plan. Where a toxicant is unavoidable, the least persistent effective option, smallest necessary quantity, secured placement, frequent carcass retrieval, and a documented end date are preferable to continuous second-generation anticoagulant baiting. Product choices must follow current label and legal requirements and should be reviewed with a qualified pest-management professional.

7. Rehabilitation and captivity after injury

7.1 What South African admissions show

Western Barn Owls appear frequently in South African raptor rehabilitation datasets. A KwaZulu-Natal centre admitted 83 Western Barn Owls among 547 raptors during 2004–2011. Across all species, motor-vehicle and building collisions were the most frequent known causes, only 38% were released, rescuers waited an average of 3.8 days before admission, and approximately half of the birds were fed during the delay. The outcome figures are for the entire raptor caseload, not the 83 Barn Owls (Thompson *et al.*, 2013).

A subsequent KwaZulu-Natal study recorded 23 Western Barn Owls among 242 raptors during 2015–2016. Collision trauma accounted for 52.1% of all admissions, 48% of all raptors were released, and collision cases had a poorer prognosis than grounded birds or orphaned chicks. Again, the published analysis did not calculate a Barn Owl-specific release rate (Maphalala *et al.*, 2021).

At the Mohololoholo Wildlife Rehabilitation Centre in Limpopo, the Western Barn Owl was the most frequently admitted raptor, with 130 individuals among 629 admissions from 1996 to February 2018. Most birds in the full dataset originated in Limpopo and Mpumalanga. Cause was undocumented in 48% of all cases. Among the 252 admissions with known causes across all raptor species, poisoning accounted for 23%, vehicle collision 17%, falls from nests 10%, and fences 8%; the overall release rate among cases with known outcomes was 37%. These proportions must not be assigned specifically to Barn Owls (Mashele, Thompson and Downs, 2022).

These studies demonstrate frequent need for rescue, not an inherent ability to tolerate captivity. They do not report length of stay, stress, hunting competence, or post-release survival for Western Barn Owls. The most accurate conclusion is that species-specific rehabilitation success remains unknown.

7.2 Likely response to temporary captivity

Barn Owls can be stabilised, treated, conditioned, and released, but prolonged or poorly designed captivity can compromise the very functions required for survival. They depend on silent flight, intact primary and tail feathers, precise binocular and auditory localisation, strong feet, rapid turning and braking, stamina, and normal avoidance of people. A bird may fly from perch to perch in a small cage yet be unable to hunt or evade hazards after release.

Quiet, dimly sheltered housing and minimal handling reduce sensory overload and habituation. Perches should vary appropriately in diameter and texture without damaging feet or feathers. Nutrition should be based on complete whole prey or an appropriately formulated veterinary alternative; muscle meat alone is inadequate for prolonged care. Visual barriers and hiding options can reduce stress, while carefully designed feeding enrichment can preserve normal searching and capture behaviours. Captive-owl enrichment literature supports natural structural elements, refuges, and varied feeding opportunities, but is not a substitute for rehabilitation outcome evidence (Potts, 2016).

Juveniles require particular caution. A grounded, fully feathered youngster may still be dependent on nearby parents and should not automatically be removed. If genuinely orphaned, it must be reared without imprinting or food association with people and should develop species-appropriate hunting behaviour. Co-housing decisions require clinical and behavioural judgement because companionship can be useful for juveniles while territorial or infectious risks can be harmful.

7.3 Risks along the rehabilitation journey

Stage	Principal risks	Risk reduction
Rescue and transport	Delay, dehydration, hypothermia or heat stress, forced food or fluids, aspiration, feather and wing damage, and handling stress	Contact a permitted rehabilitator promptly; use a dark, secure, ventilated box; avoid forced feeding; record exact location and circumstances
Triage and diagnosis	Missed fractures, luxation, eye or ear injury, neurological trauma, internal bleeding, electrocution burns, poisoning, starvation, or infection	Full veterinary examination; imaging and ophthalmic or neurological assessment where indicated; clotting tests and toxicology when exposure is plausible; welfare-based prognosis
Stabilisation and treatment	Pain, treatment stress, pressure injury, pododermatitis, joint stiffness, tendon adhesion, muscle loss, and wing contracture	Appropriate analgesia and stabilisation; suitable substrate and perches; regular body-mass, foot, wound, and feather checks; early controlled movement when medically safe
Nutrition and hydration	Refeeding complications, dehydration, obesity, poor feather quality, nutritional bone disease, and dependence on hand feeding	Document intake and mass; use complete nutrition and whole prey; restore independent feeding; use veterinary supplementation only when indicated
Behaviour and husbandry	Fear, chronic stress, habituation, imprinting, abnormal aggression, disease transmission, or loss of predator avoidance	Quiet visual shielding; minimal human contact; biosecurity; appropriate separation or conspecific management; no public display during rehabilitation
Flight and hunting conditioning	Re-injury, broken feathers, asymmetrical flight, poor endurance, inaccurate landing, or inability to locate and capture live prey	Progressive conditioning in a sufficiently large flight aviary; assess silent level flight, turning, ascent, braking, landing, stamina, foot use, and prey capture
Release decision	Premature release, continuing medication, incomplete vision or hearing, weak grip, poor body condition, damaged plumage, or human dependence	Use objective multi-domain criteria covering health, treatment, feeding, flight, and behaviour; do not release solely because the owl can fly
Release and post-release	Return to the original hazard, unsuitable weather, territorial conflict, disorientation, starvation, collision, poisoning, or unobserved mortality	Reassess the rescue site and hazards; select suitable habitat and weather; use supported or soft release when indicated; mark and monitor where feasible; investigate deaths

A 2025 expert-derived protocol identified 55 candidate indicators across health, flight, treatment, feeding, and behaviour for deciding whether a rehabilitated raptor is suitable for release. Its central principle is relevant to Barn Owls: absence of visible disease is insufficient without complete functional recovery and normal behaviour. The protocol has not yet been validated specifically for Western Barn Owls (Artigas and Ugaz Ruiz, 2025).

Post-release evidence also warrants caution. A British comparison of captive-bred Barn Owl releases found markedly shorter median recovery duration for released adults than for released young or wild-ringed young, with many adult recoveries occurring in the first month and starvation represented among causes. This study concerns captive-bred reintroduction rather than injured South African rehabilitation, but it shows why release itself should not be treated as a successful outcome without monitoring (Green and Ramsden, 2001).

8. Recommended programme for Parys WADER

1. Establish repeatable nocturnal survey routes through the 11-pentad Parys intake-area block. Standardise season, start time, duration, route, weather limits, listening stops, and use of call playback. Record individuals, calls, age where possible, behaviour, and coordinates.
2. Continue SABAP2 full-protocol coverage, but report the number of positive cards, total card effort, reporting rate, surveyed pentads, and occupied pentads together. Do not label sightings or positive cards as population size.
3. Map roosts, nests, regular hunting areas, road casualties, fence or wire incidents, electrocutions, suspected poisonings, and rehabilitation admissions. Protect exact nest and roost locations in public outputs.
4. Add a small-mammal and habitat component: vegetation height and cover, mowing, grazing, fire, rainfall, water extent, wetland condition, rodent activity, and nearby poison use. This is necessary to distinguish owl change from prey and detectability change.
5. Audit buildings, bridges, mature trees, nest boxes, fences, electricity structures, fast-road crossings, waste facilities, grain or feed stores, and rodent-control sites near the wetland complex. Prioritise demonstrated incident hotspots.
6. Standardise rehabilitation records by species, age, sex where known, rescue coordinates, delay to admission, diagnosis, toxicology, treatment, length of stay, outcome, release location, and follow-up. Release rate should be accompanied by welfare exclusions and post-release survival where possible.
7. Review results annually but assess trend over at least five years. A nocturnal, mobile predator tied to rodent cycles can fluctuate strongly in a single season without representing a sustained population change.

9. Limitations

- The 11-pentad Parys intake-area block is an analytical neighbourhood selected from intake locations, not the exact wetland boundary, a home range, or an administrative unit.
- SABAP2 reporting is presence-on-checklist data. It is affected by survey timing, route choice, observer skill, night coverage, playback, access, and changing spatial effort.
- The 2022–2026 period ends on 25 August 2026 and is incomplete.
- Fezile Dabi's surveyed-pentad coverage changed substantially among periods. Occupied-pentad counts should not be compared without the surveyed footprint.
- National raw detection totals lack a comparable period-specific card denominator and cannot estimate a national trend.
- The older SABAP1–SABAP2 comparison measured reporting and distribution change at a broad grid scale, not individual abundance.
- Collins (2025) assessed wetlands, not Barn Owls, contaminants, nests, mortality, or prey abundance. The iNaturalist project adds opportunistic occurrence evidence for potential prey but not a prey survey or diet analysis. The habitat assessment remains a functional inference.
- No South African species-specific rehabilitation outcome or post-release survival study was found. General raptor and international Barn Owl evidence was used transparently to fill gaps.

10. Conclusion

Under Parys WADER's terminology, the Western Barn Owl is wetland-associated because wetland and floodplain margins can provide small mammals, accessible open hunting space, and nearby shelter. This association is ecologically meaningful even though the owl does not require open water or wetland interiors and is not strictly wetland-dependent. The Parys Wetland Project now verifies local occurrence of potential prey in relevant diet categories, most notably a four-striped grass rat, but no local pellet or feeding study establishes prey use or abundance.

The population comparison cannot be expressed as numbers of individual owls because no repeated census exists. The current Parys atlas signal is 2 positive cards among 122 full-protocol cards (1.6%), with detections in 1 of 11 pentads. This is higher than the earliest local signal but too sparse to establish increase. Fezile Dabi and Free State reporting recovered after an early SABAP2 dip. At national scale, recent raw detections cannot establish trend, while the best older comparison found decreased reporting across almost two-thirds of comparable cells.

Conservation should focus on the whole landscape rather than the wetland alone: restore wetland function; retain structurally diverse grass and safe cavities; reduce poisons, sewage, collisions, entanglement, and electrocution; and build a local monitoring programme that combines standardised abundance surveys, atlas coverage, prey and habitat measures, and rehabilitation surveillance. Rehabilitation can save individuals, but release should be treated as one stage in a risk-managed journey, not as proof of recovery.

Research assistance

Prepared by Marisa Louw with literature-search, data-analysis, synthesis, and drafting assistance from ChatGPT by OpenAI, using a customised Deep Academic Research workflow.

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