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PRACTITIONER'S PERSPECTIVE

Twenty Years of Evidence-Based Conservation: Progress, Promise, and Future Directions

A call for evidence-based conservation: Securing the future of waterbirds along the East Asian-Australasian flyway

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Abstract

1. Migratory species worldwide face escalating anthropogenic pressures, yet effective conservation requires transboundary strategies across their ranges. This is particularly evident in the East Asian-Australasian Flyway (EAAF), a region vital for migratory waterbirds and home to a third of the global human population. Despite its ecological importance and the numerous threats impacting waterbird populations, a systematic, evidence-based assessment of conservation actions is lacking.
2. We investigated the conservation actions implemented by reserve managers in the EAAF, focusing on their perceived threats and associated management strategies. We then compared these practitioner-driven priorities with the scientific evidence available in the conservation evidence (CE), using a modified pressure–state–response (PSR) framework to structure the linkage between implemented actions and evidence. This comparison allowed us to identify potential gaps between conservation practice and scientific knowledge, highlighting key research areas for improved, evidence-based species conservation along the flyway.
3. Our results revealed discrepancies between perceived threats and the evidence in the CE to support management actions. Habitat loss and human disturbance were prioritized by the reserve managers, but evidence for the effectiveness of some management practices was limited. Biological invasions were a lower priority for managers, despite there is a comparable evidence base for justifying the action. This indicates a mismatch between research focus and on-the-ground needs. Furthermore, the existing CE database has limited evidence specific to the EAAF.
4. *Synthesis and application*: The modified PSR framework proved valuable for assessing conservation effectiveness and identifying research gaps for waterbirds in the EAAF. Recognizing similar threats to other migratory species globally, we urge action to: (1) prioritize regionally relevant research validating frontline conservation actions, (2) enhance communication between researchers and practitioners and (3) expand evidence databases with relevant spatial and taxonomic representation. Implementing these steps will strengthen the evidence base,

better align research with on-the-ground needs and improve the long-term prospects for migratory species in Asia.

KEYWORDS
conservation evidence, EAAF, migratory animal, practitioner, urbanization, waterbird, wetland reserve

1 | INTRODUCTION

In the Anthropocene, human activities exert unprecedented pressures on biodiversity, particularly on species requiring large landmasses with different resources to complete their lifecycles (Doherty et al., 2021). Consequently, protecting a single area is often insufficient to ensure population viability, necessitating coordinated conservation actions across multiple locations (Lovejoy et al., 1987; Murray & Fuller, 2012). Major threats include climate change, habitat loss and fragmentation. Altered habitats and increasing human activities also provide new gateways for biological invasions that introduce novel competitors, predators and diseases. Additionally, human disturbances, such as poaching, pollution and recreational activities, further influence wildlife survival (Newbold et al., 2015). Effective wildlife conservation ultimately depends on integrated conservation strategies across species' distribution ranges (Lovejoy et al., 1987; Martin et al., 2007).

Migratory species, especially for the long distant migrants' survival, hinges on securing sites in multiple locations across countries and continents in which the conservation actions and policies can be differed. This highlights the necessity for a transboundary cooperation (Lovejoy et al., 1987; Wilcove & Wikelski, 2008). For instance, the East Asian-Australasian Flyway (EAAF), one of the nine major flyways globally, spans over 22 countries and is home to approximately one-third of the global human population. A concerning number of migratory species, both landbirds and waterbirds, are experiencing population declines, driven by threats such as habitat loss, hunting and pollution that occur across multiple countries along the flyway (Murray & Fuller, 2012; Yong et al., 2018; Yong et al., 2021; Liang et al., 2025), highlighting that conservation actions taken along the flyway, both within and beyond the reserves, are paramount to waterbird survival (Lee et al., 2025). Addressing migratory species declines thus requires a range-wide evaluation along their migratory routes to identify research needs and translate findings into effective evidence-based conservation actions (Pullin et al., 2004).

A successful transboundary conservation, especially for migratory species, requires an evidence-based approach which allows evaluation of effectiveness of the current implemented actions. The pressure–state–response (PSR) framework—which illustrates the relationship between the impact of human activities (pressure) on the environment and natural resources (state) to inform policy decisions (response) (OECD, 1998)—has a simple construct and is easily interpreted by users and the public because the relationship between different factors can be connected and easily visualized. It is also widely used by many organizations around the world to demonstrate causal relationships (e.g. Hazbavi et al., 2020). We, therefore, adopted this effective structure from the PSR framework but modified its components, following Häkkinen et al. (2022), to identify potential gaps between conservation practice and scientific knowledge. In our modified framework, threats (pressure) impact conservation actions (state), prompting evidence (response), which highlights the cause–effect relationship between conservation actions taken and their benefits to targeted species under various threats. This modified framework allows for transparent, evidence-based evaluation, ensuring that conservation strategies are supported by scientific data, maximizing their adequacy and effectiveness. We then apply it to study different management actions on waterbirds along the EAAF, which has received limited conservation evaluation, despite their immense importance to migratory waterbirds and the increasing human activities in the region (Yong et al., 2018).

To address this gap, we combine information on management actions from frontline practitioners and assessments on conservation impacts from the scientific literature to: (a) evaluate the conservation efforts made across the EAAF and their effectiveness based on the conservation evidence (CE) database assessment (Conservation Evidence, 2025); (b) identify the potential knowledge gap between researchers and frontline practitioners, facilitating the translation of scientific findings into practical conservation actions; and (c) highlight current challenges and research areas needed to strengthen conservation along the flyway. By synthesizing this information, we aim to advocate for evidence-based conservation practices and identify research needs from a practitioner perspective to support waterbird conservation along the EAAF.

2 | LINKING PRACTITIONER PERSPECTIVES WITH CONSERVATION EVIDENCE

Employing the modified PSR framework, we collected practitioners' views on perceived threats to waterbirds and on current conservation actions adopted in their reserves (threat and conservation action information) and the assessed research-based conservation actions (evidence information) using Conservation Evidence (Conservation Evidence, 2025). Conservation Evidence is a database that assesses the effectiveness of various conservation actions. These assessments, including those related to waterbird conservation, are systematically reviewed by a representative group of experts. Based

BRITISH ECOLOGICAL SOCIETY Journal of Applied Ecology

on available evidence, these experts anonymously score and provide their views on specific actions. The assessments consider both conservation journals and grey literature (Sutherland et al., 2019), resulting in a relatively comprehensive, expert-reviewed database. This database is valuable for validating the effects and evidence availability of conservation actions implemented in different wetland reserves.

An online questionnaire in four languages (i.e. English, Korean, Japanese and Chinese) was prepared using Google Forms and the Tencent Questionnaire platform, to understand the threats faced by reserve managers and the conservation measures undertaken across geographical locations along the EAAF. Ethical approval was granted by Lingnan University (Ref: EC186-2425). All participants provided informed consent via the questionnaire's landing page, which outlined the research purpose and confidentiality before they proceeded to the survey. The questionnaire was circulated for 2 months, starting 19 June 2025, through the East Asian-Australasian Flyway Partnership's (EAAFP, n.d.) email list and social media channels, direct email to reserves and online conservation forums. Five major threats to migratory waterbirds—water pollution, hunting, human disturbance, habitat loss and biological invasion—were categorized and selected for this study based on the categories listed on CE refine filter. Threats with only a small number of assessed action or actions solely related to songbirds, raptors and strictly pelagic seabirds were excluded from this study. We particularly highlight hunting, as it is a major yet often overlooked threat distinct from other forms of human disturbance (Liang et al., 2025). We also collected habitat information about the reserve that the respondent manages. Further details regarding the questionnaire design and the complete questionnaire in each language can be found in the Supplementary information (Questionnaire).

To evaluate the effectiveness of conservation actions, we referred to the data provided on CE. As in September 2025, there were, in total, 3891 actions documented on the website based on 8870 studies. Of the 454 bird conservation actions listed on CE website, a list of 255 bird conservation actions was filtered out primarily based on the actions' focal species and habitat. As our study focused on waterbirds (including all waterfowls, shorebirds and seabirds), we selected the action if there is at least one evidence that evaluated the effect to waterbirds. We selected all actions under categories 'wetland and coastal' as well as actions with summarized evidence that related to waterbirds. Under this circumstance, a total of 50 waterbird-related conservation actions was selected. By identifying the similarities between these CE actions, we further grouped them into 18 broad action types that address the five major threats. We then summarized the conservation actions reported in the questionnaires and fit them into same 18 broad action types, and we also included actions that fell outside of these types separately, expressed as percentages of respondents (Table S1). We then connected these actions with evidence levels described in CE: 'Beneficial', 'Likely to be beneficial', 'Trade-offs between benefits & harms', 'Unlikely to be beneficial', 'Likely to be ineffective or harmful' and 'Unknown effectiveness' (Table S2).

3 | THREATS AND CONSERVATION OF WATERBIRDS: PRACTITIONER PERSPECTIVES AND CONSERVATION EVIDENCE

We collected 25 valid and completed questionnaires from different reserves along EAAF. These responses distributed across 15 geographic locations: Australia (1), Cambodia (2), China (4), Hong Kong SAR (1), Indonesia (1), Japan (3), Malaysia (2), Myanmar (1), New Zealand (2), Philippines (1), Taiwan (3), Thailand (2), USA (1) and Vietnam (1) (Figure 1). These locations cover critical sites along the EAAF, including breeding grounds, stopover sites and wintering grounds. Based on the respondents' replies, among their reserves, coastal wetlands (52%) and freshwater marsh/swamp (40%) were most common, followed by artificial wetlands and farmland (20%). Other habitats included lake/lagoon (16%), reef/atoll (4%), riverine (4%) and tundra (4%).

Reserve managers identified habitat loss as the most significant threat, with 72% expressing 'very concerned', followed by human disturbance (48%), hunting (40%), water pollution (40%) and biological invasion (28%). This pattern remained consistent for the 'somewhat concerned' responses, with the exception of hunting, which elicited a lower level of overall concern (Figure 2). We identified 24 different conservation actions adopted by respondents, including those mentioned in open-ended questions. These actions were then aligned and compared with those regrouped actions that we retrieved from CE (Figure 3).

To address habitat loss, managers most often employed 'Restoring habitat' (64%), 'Vegetation management' (64%) and 'Enhance habitat for food provision' (60%) (Figure 3a). While CE assessments confirmed the benefits of restoring wetland habitats, vegetation management's impact on waterbirds was mixed. Notably, despite its popularity, there is a lack of CE evidence supporting the effectiveness of providing diverse habitats for food provision. Conversely, 'Island building' (16%) and 'Artificial nest' provision (8%), though less common, are supported by CE data as beneficial. Furthermore, frequently used actions like 'Managing nearby agricultural land' (48%) and 'Controlling water level' (40%) have both positive and negative impacts. The practice of 'Provide nesting materials' (8%) lacked CE validation.

Regarding human disturbances, reserve managers' actions can be broadly separated into behavioural and physical approaches. For the behavioural approach, which aims to influence visitor behaviour, reserves incorporate actions related to 'Education' (96%) and 'Cooperate with local communities' (28%); these actions were beneficial according to CE. For the physical approach, which aims to mitigate human disturbance through constructions such as 'Trail design' (52%), 'Establish restricted area' (36%) and 'Put up signs for restricted area' (12%), the actions were beneficial and supported

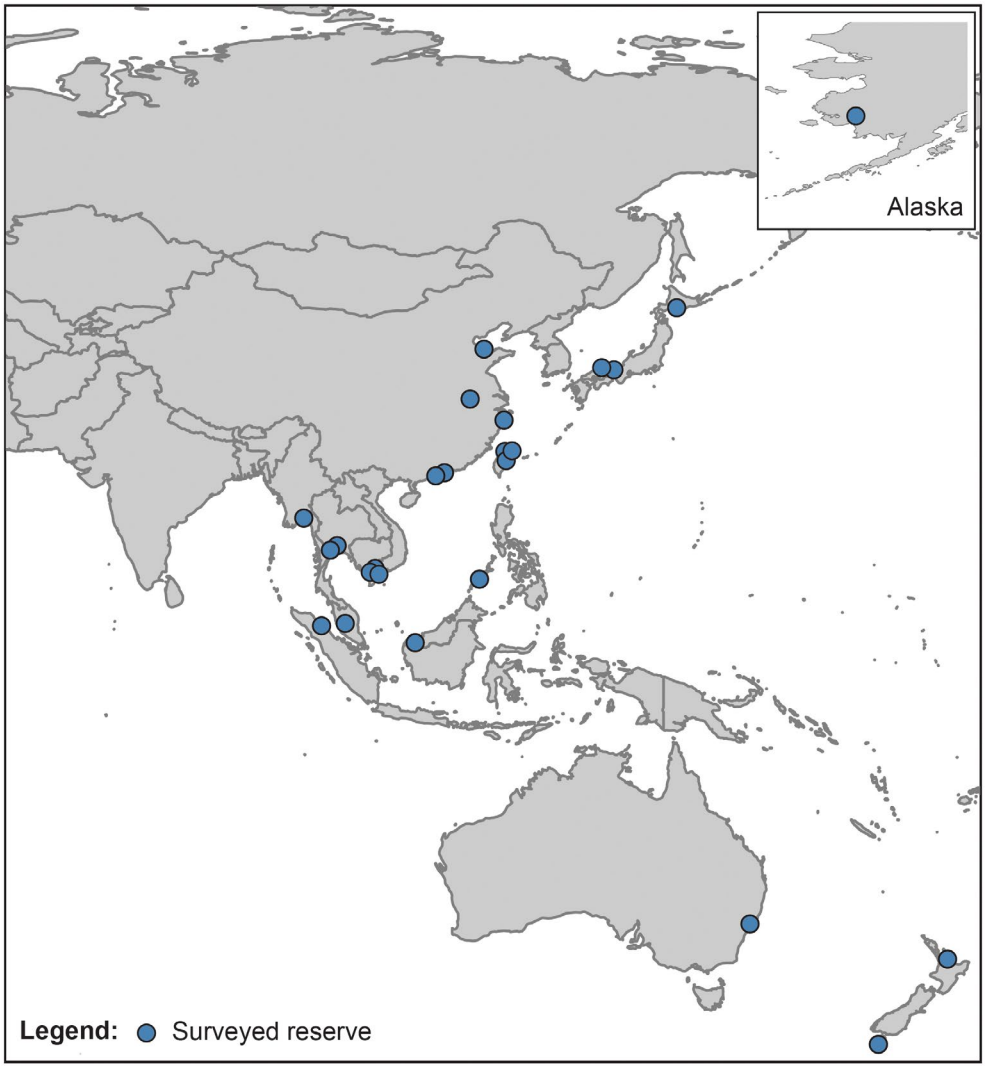

FIGURE 1 Map showing the approximate locations of surveyed wetland reserves.

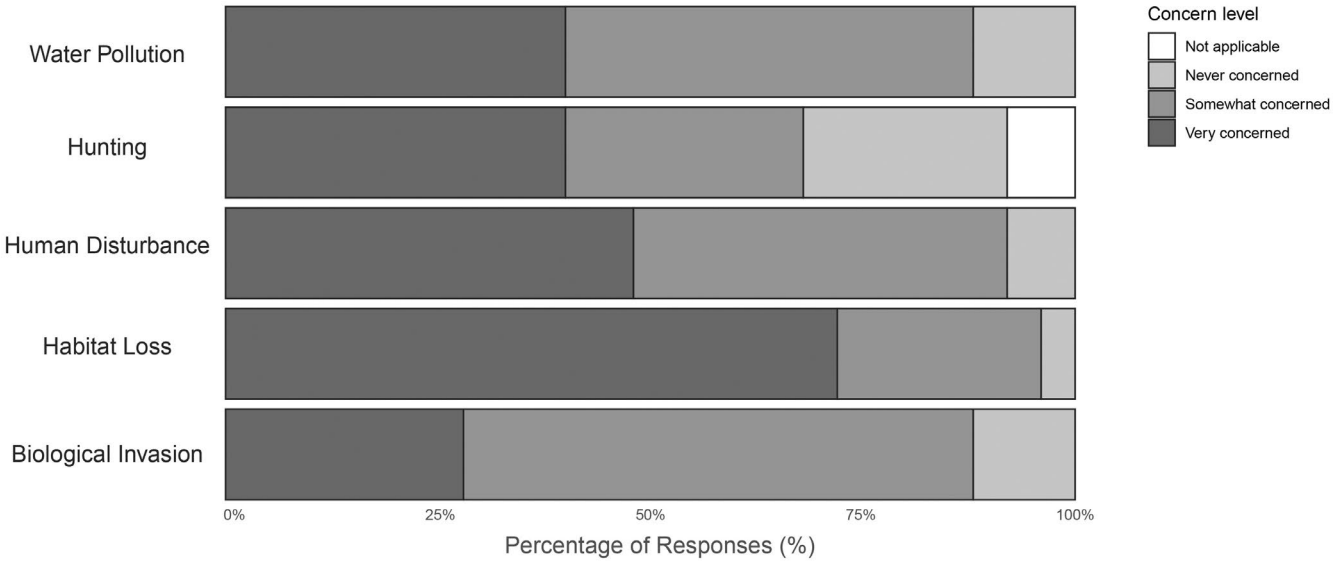

FIGURE 2 Distribution of concern levels (very concerned, somewhat concerned, near concerned and not applicable) assigned by respondents to different threats (habitat loss, human disturbance, hunting, biological invasion, water pollution).

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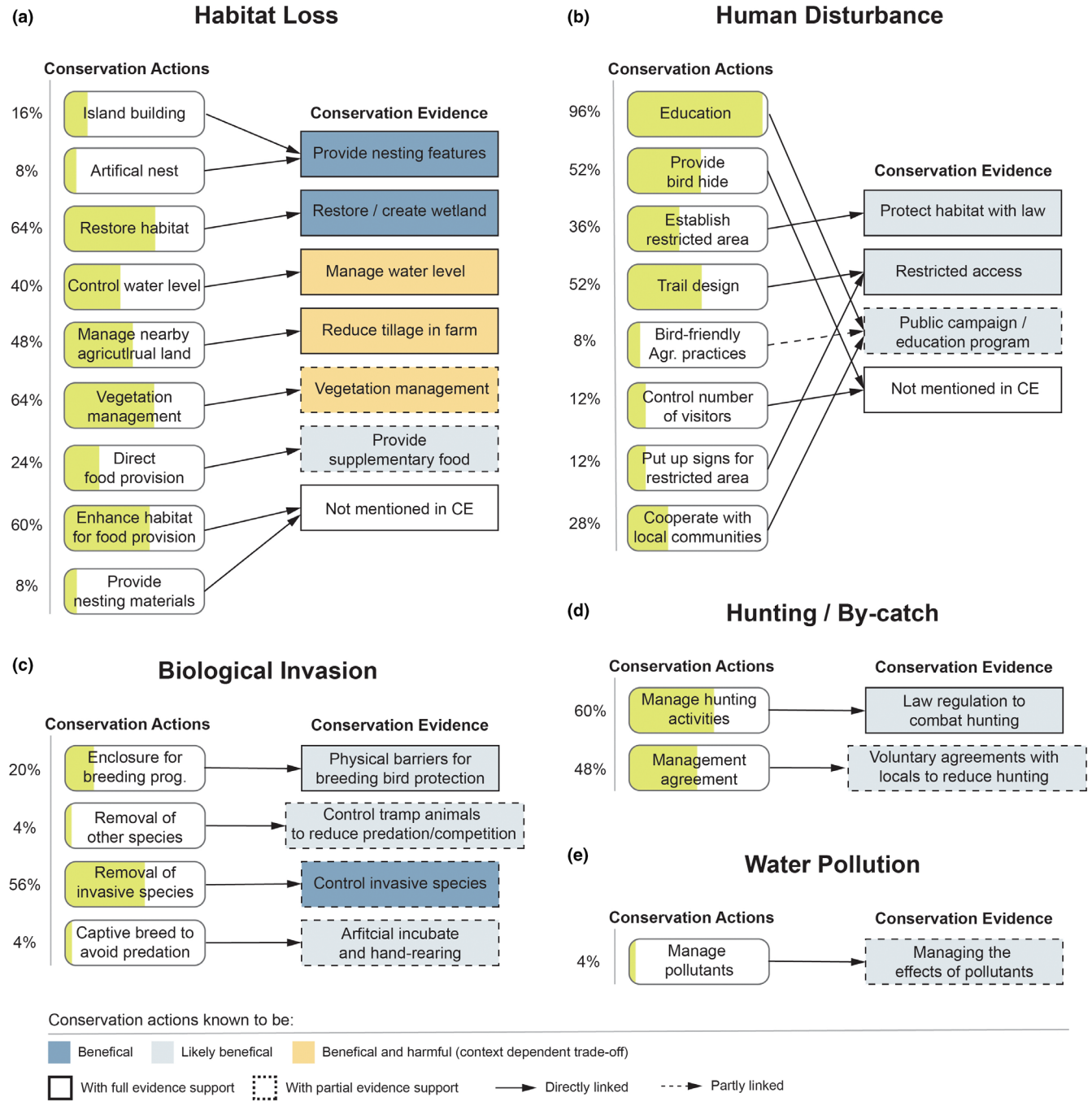

FIGURE 3 Modified pressure–state–response (PSR) frameworks illustrating conservation actions and their evidence support within the conservation evidence (CE) database for habitat loss (a), human disturbance (b), biological invasion (c), hunting/bycatch (d) and water pollution (e). The adoption rate (percentage) is indicated by the yellow bar. Evidence within the CE is further classified as beneficial, likely beneficial or having trade-offs. Fully and partially supported evidence are connected by solid and dotted lines, respectively. The relative linkage of conservation actions that directly and partly directly address evidence is indicated by solid and dotted arrows, respectively.

by CE. However, some common practices, such as 'Building bird hides for birders' (52%), had not been included and assessed in the CE database. 'Bird-friendly agricultural practices' were also mentioned (8%), with only partial evidence as indicated in CE to support agricultural practices. Hunting and by-catch, considered a type of human disturbance, were addressed by 'manage hunting activities' (60%) and 'management agreement' (48%) with local communities (Figure 3d). Both actions have evidence in CE and are likely to be beneficial.

For biological invasion, 'Removal of invasive species' is the most common practice employed by respondents (56%) as part of habitat management to conserve waterbirds. While these practices have shown beneficial effects on waterbirds, they are supported by only partial evidence (Figure 3c). 'Enclosure for breeding programmes'

(20%) was also used by reserves and is likely to be beneficial. Captive breeding and removal of tramp species were also mentioned, but these actions have only partial evidence supporting them and are likely to be beneficial.

Regarding water pollution, nearly half of the respondents (44%) expressed 'very concerned' about water pollution, often linked to coastal development. However, only 4% mentioned managing pollutant effects (Figure 3e).

4 | BRIDGING THE GAP: EVIDENCE-BASED CONSERVATION FOR WATERBIRDS IN THE EAAF

Conservation practitioners drive species protection through their threat prioritization and conservation actions, but the scientific basis for their actions in the EAAF is often unclear. Using a modified PSR framework, we revealed mismatches: between reserve managers' concerns and scientific research support and between conservation actions and evidence. We discuss these concerns and propose solutions to bridge the research–practice gap for evidence-based conservation in the EAAF.

4.1 | Closing the conservation research gap in the EAAF

Our survey revealed a disconnect between the priorities of frontline practitioners in the EAAF and the focus of applied scientific research. For instance, managers perceive biological invasion as the least pressing threat to migratory waterbirds, yet the CE database contains a similar number of studies supporting actions addressing this threat as for the most concerning threat—habitat loss (100 vs. 102; Table S2). Although the number of supporting studies does not necessarily reflect the confidence level of the evidence, the CE database employs a systematic search system to curate its evidence. This curated database can serve as a useful proxy for how the research community prioritizes research among different threats. This discrepancy may arise because the perceived threat of biological invasion is higher among researchers compared with reserve managers. Additionally, difficulty, such as funding availability, in conducting relevant studies on other threats or actions might lead to this specific pattern. Therefore, it is important to enhance communication between researchers, reserve managers and funding authorities to better understand priorities on the ground. In parallel, researchers should also promote targeted funding initiatives that specifically address the key threats identified by reserve managers in the EAAF to build a stronger evidence base for these high-priority threats. Addressing these gaps is often challenging, as the decision-making process varies with different cultures, management authorities and other practical limitations. Nevertheless, it would be beneficial to establish a two-way knowledge exchange and cross-institutional framework to facilitate communication between research institutes and frontline conservation parties, aligning practical needs and scientific support (Bertuol-Garcia et al., 2018; Walsh et al., 2019).

4.2 | Improving conservation action effectiveness and adoption in EAAF

Conservation actions across EAAF reserves varied in adoption and the evidence supporting their effectiveness. Here, we review actions taken under different threats in order of their perceived importance.

Conservation actions adopted by practitioners to address habitat loss, identified as the most concerning threat, were mostly classified as 'Trade-offs' in the CE database, including actions such as vegetation management and water-level control, across different waterbird species (e.g. Martz, 1967; Rajpar & Zakaria, 2011). Understanding which species benefit from these measures is important; however, evidence in the CE on these two commonly practiced actions was derived from other flyways, limiting its applicability to waterbird communities in the EAAF (see further discussion in Section 4.3). Additionally, actions aimed at 'enhancing habitat for food provision', potentially a response from managers to address the loss of foraging habitat along the coast of EAAF, were widely adopted but not assessed in CE.

Human disturbance was another major concern for reserve managers. Although conservation actions taken by different reserves did not have any negative effects, they were only classified as 'likely to be beneficial' (not 'beneficial') in CE. Interestingly, most evidence supports passive actions that reduce contact between humans and waterbirds, such as trail design and establishing restricted areas. However, evidence related to directly controlling the number of visitors was lacking in the CE database. With increased human density and conflict with waterbirds along the EAAF, relying solely on passive measures may not be sufficient, especially given that their benefits are only considered likely or non-existent. Indeed, installation of bird hides is practiced by more than half of the reserves, but a recent study has shown that different users' behaviour in bird hides can cause varying levels of disturbance to waterbirds (Ma et al., 2025). The very act of installing more bird hides to accommodate visitors can, paradoxically, attract even larger crowds. As visitor numbers increase, the effectiveness of passive measures designed to minimize disturbance may be compromised.

For hunting and bycatch, the evidence in CE was based on studies from other flyways, from countries with very different cultures and living standards than those in the EAAF region. The incentives for hunting and events that cause bycatch might be different, which warrants further investigation, as approximately 47,870 shorebirds were killed per year in just 19 stopover sites in China, not considering other waterbirds and countries (Liang et al., 2025). Importantly, hunting and by-catch occurred across all stages of migratory cycle from breeding ground (eggs & chicks) to non-breeding area (adults & juveniles) birds. Despite the established conservation law, illegal hunting of migratory waterbirds are still exceptionally high not only in China but also in Thailand and Myanmar (Gallo-Cajiao et al., 2020). Therefore, local wetland managing teams are critical

for more direct control of human disturbance and for educating local communities about protecting bird species. However, the resources and legal authority of these teams are often limited. Coordinated efforts between research institutes, reserves, local communities and enforcement agencies are therefore required to combat this threat in the increasingly populated EAAF, and the EAAFP's hunting task force (EAAFP, n.d.) could serve as a model for such collaboration.

Water pollution, particularly from heavy metals and organic matter, was identified as a significant threat, which nearly one-third of respondents rating it as 'very concerned' (Figure 2). Similar concerns have been reported and raised along the flyway (Varagiya et al., 2022). However, only 4% of respondents indicated that they had relevant actions to mitigate this threat. The reason for this discrepancy is unclear, as we did not directly ask for the reasons for not implementing actions under each threat. However, based on the responses regarding factors limiting their conservation actions (Q20 of the questionnaire), we observed that obtaining funding was considered challenging for these reserves. Given that water pollution is a landscape level, or even regional, issue, requiring collaborative efforts and significant costs. Local practitioners might reduce its priority compared to tackling other threats (e.g. Independent Evaluation Group, 2022). Research evidence also indicates that CE actions related to pollution were primarily focused on artificial lighting and oil spills (Williams et al., 2013). Allocating resources and research to mitigate water pollutants and identify high-risk pollutants in reserves along the EAAF is crucial, especially as industrial and residential development along the flyway is expected to intensify (Ma et al., 2024).

Although biological invasion is not always a primary concern for managers, direct removal of invasive species is common in surveyed reserves. The uncertain outcomes of these control actions are concerning, as they can demand substantial resources. For example, 10,000–15,000 invasive *Sonneratia* trees are removed annually from the mangroves and mudflats of the Inner Deep Bay Ramsar site in Hong Kong SAR, China, to maintain foraging habitat for waterbirds (Hong Kong SAR Government [HKG], 2020). We speculate that this mismatch between perceived threat and action may arise from managers prioritizing straightforward causal relationships. When addressing multiple threats a reserve faced, managers may favour actions with obvious and direct results, potentially overlooking their effectiveness and relative priority. It is also possible that these actions are driven by factors beyond the perceived threat level, such as reliance on experience-based or traditional practices for invasive species control (Pullin et al., 2004). Regardless of the underlying reasons, the lack of evidence supporting these actions suggests that they may not deliver the expected benefits for waterbird conservation, despite potentially consuming a significant portion of limited conservation resources (Figure S1). Therefore, understanding the other factors, apart from threats, that influence managers to prioritize conservation actions remains crucial. Our results show that more than a quarter of practitioners believe that past knowledge and experience are always useful in waterbird conservation (Figure S2). This pattern is consistent with the observation that conservation is often based on anecdotes and conventional wisdom rather than available evidence-based materials (Sutherland et al., 2004). In contrast, approximately half of the respondents considered primary literature and online resources to be at least often useful for waterbird conservation. Although most respondents do not believe that a lack of information limits their conservation success, we maintain that refining current web-based databases with local scientific research could promote a shift towards more evidence-based conservation practices in the future.

Apart from the direct anthropogenic drivers mentioned above, climate change is also a major threat, accelerating habitat loss for migratory waterbirds. Some studies predict that sea-level rise will reduce a significant amount of habitat by the end of the century (De la Cruz & Numa, 2024). Coastal wetland loss along the EAAF has been severe, with some countries experiencing up to 75% loss in the past 50 years (An et al., 2007; Cho & Olsen, 2003; Zhang & Ouyang, 2019). Therefore, ensuring the quantity and quality of remaining foraging grounds and managing alternative habitats such as fishponds, saltpans and artificial ponds to support migratory waterbirds is of paramount importance. This underscores the urgent need to address the evidence gaps to inform effective conservation action, particularly within the EAAF.

4.3 | Limitations of current conservation evidence for the EAAF

While the CE assessment provides substantial coverage of bird conservation actions, the reviewed studies and expert judgements may introduce bias into the overall effectiveness ratings. A large proportion of the reviewed studies focus on flyways in the Americas, Africa and Europe, drawing from experts in these regions. Consequently, only 18 of 50 selected actions cover the EAAF (Table S2), resulting in a lack of spatial coverage along the flyway. This is concerning because management needs may differ between locations, as waterbirds may require different resources across stopover, wintering and breeding grounds. Moreover, some assessed actions in CE may not precisely align with the current needs of reserve managers. For instance, 'manage nearby agricultural land' is broader than the CE action 'reduce tillage in farms', which may create ambiguity for the team when evaluating the effectiveness of specific conservation efforts. Lastly, some evidence was reviewed over a decade ago (Williams et al., 2013), which might now not fit the current practitioners' needs and priorities. Ongoing coastal development is concentrated in developing countries in Southeast Asia, where evidence supporting conservation efforts is lacking (Yong et al., 2018). These limitations highlight the urgent need for a more comprehensive and regionally relevant evidence database for conservation action in the EAAF.

Apart from the CE assessments, this study is also limited by the small sample size ($n = 25$) and the responses were not well distributed across the flyway (e.g. only one response from Australia), which limits the generalizability of the findings to all parties and management

contexts along the EAAF. Therefore, the results and conclusions should be interpreted with caution. Furthermore, while conserving migratory birds requires addressing climate change effects—such as habitat loss from sea-level rise and the spread of invasive species (De la Cruz & Numa, 2024; Haig et al., 2019; Lázaro-Lobo & Ervin, 2021)—we did not categorize climate change as a stand-alone threat. In practice, conservation actions targeting habitat loss, biological invasion and pollution often simultaneously mitigate climate change impacts. Because these interventions are intertwined, it is difficult to disentangle specific climate-oriented actions from general management practices at the site level.

Despite these limitations, opportunities exist to address these gaps. Although evidence from EAAF was mostly missing from CE assessments, ongoing research has resulted in some beneficial actions, such as 'using enclosures for breeding programmes', which are supported by research conducted within this flyway. For instance, the breeding success of Black-faced Spoonbills (*Platalea minor*) can be promoted by installing artificial fences in their breeding colonies, which significantly reduces nest predation by ground-dwelling predators (Yang et al., 2024). In fact, research on management within the EAAF exists, but it is scattered throughout the literature, making it less accessible to conservation managers than the CE website. This reduces the likelihood of such research being noticed and implemented by managers. Moreover, grey literature and many traditional local practices may include information on beneficial actions but require further assessment (Cadotte et al., 2025). Systematic reviews and/or meta-analyses in the future would further reduce this bias on the effectiveness levels, leading to a more objective outcome and guideline for practitioners' reference (Stewart & Ward, 2019). There is an urgent need to incorporate and compile these findings into the CE to support more evidence-based conservation actions along the EAAF.

5 | COORDINATED RESEARCH FOR MIGRATORY SPECIES CONSERVATION

We used a modified PSR framework to provide an overview of mismatches in resources and research gaps related to conservation actions implemented in reserves along the EAAF. By gathering information from wetland reserves across multiple countries along the flyway and analysing threats independently, we were able to identify and prioritize shortfalls in research evidence for specific conservation actions for waterbirds. This exercise will assist in research planning and in bridging the gap between scientists and frontline practitioners. The modified PSR framework can also be applied to migratory land birds along the flyway, which face increasing anthropogenic pressures (Yong et al., 2021) but require different conservation actions in terrestrial systems. Beyond birds, other migratory species, such as Monarch butterflies, bony fishes and marine mammals, are also declining (Lascelles et al., 2014; Tenger-Trolander et al., 2019; Wilcove & Wikelski, 2008), highlighting the urgent need for coordinated research efforts to enrich the conservation toolkit available to frontline practitioners. We believe that this initial study provides valuable insights into identifying research needs to inform waterbird conservation efforts. We also believe that an updated CE database with evidence from the EAAF is urgently needed. Ultimately, bridging the divide between conservation research and on-the-ground implementation is essential for the long-term success of migratory species conservation across the globe.

AUTHOR CONTRIBUTIONS

Sze-On Ng, Yik-Hei Sung, Yat-tung Yu, Toby P.N. Tsang and Roger H. Lee conceptualized the idea and outline of this study. Sze-On Ng, Toby P.N. Tsang and Roger H. Lee developed the methodology. Toby P.N. Tsang and Sze-On Ng designed the questionnaire. Sze-On Ng collected the data and disseminated the survey through online platform. Sze-On Ng, Roger H. Lee and Toby P.N. Tsang analysed the data and created figures. Sze-On Ng wrote the first draft of the manuscript. All authors made substantial contributions on reviewing and commenting the manuscript and approved the final version before publication.

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

Data are available from the figshare repository https://doi.org/10.6084/m9.figshare.31978047 (Ng & Lee, 2026).

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

Data S1. Questionnaire used in this study, available in multiple languages.

Figure S1. Distribution of perceived limitations to conservation success based on different factors affecting habitat management implementation. Factors assessed include personnel, funding, information availability, agency priorities and information access. Response options were: does not limit success, rarely limits success, sometimes limits success, often limits success and always limits success.

Figure S2. Perceived usefulness of different information sources for informing habitat management decisions. Sources assessed include primary literature, past knowledge/existing practices, meetings/symposia, online resources, management documents, listservs and other sources. Response options were: always useful, often useful, sometimes useful, rarely useful and not applicable.

Table S1. Respondents' conservation actions corresponding to the actions documented on conservation evidence.

Table S2. Effectiveness of 50 waterbird conservation actions and their mapping to 18 broader categories, including flyway abbreviations.

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