Aquatic Conservation: Marine and Freshwater Ecosystems

WILEY

SHORT COMMUNICATION OPEN ACCESS

Unauthorized Translocations of Threatened Fauna in Freshwater Ecosystems: Insights From the Iberian Southeast

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Received: 21 October 2024 | **Revised:** 8 June 2025 | **Accepted:** 7 July 2025

Keywords: amphibians | covert rewilding | donor populations | fish | impacts | management | recipient ecosystems | reintroductions | unofficial translocations

ABSTRACT

Unauthorized translocations of native and threatened wildlife are widely conducted for conservation purposes. This illegal practice remains understudied and is poorly considered by wildlife managers despite its important socioecological implications. By focusing on the southeastern Iberian Peninsula as a case study, we combined data from freshwater biodiversity monitoring programs, published records and local expert knowledge to provide a comprehensive assessment of the magnitude of unauthorized translocations in freshwater ecosystems. A total of 14 cases of covertly translocated populations were recorded, involving 10 freshwater vertebrate species (six fish and four amphibians). All these species are classified as threatened taxa (i.e., critically endangered, endangered or vulnerable) at a global, national or regional level, seven of them being Iberian endemisms. At least nine out of these unauthorized translocations have resulted in self-sustaining populations, but their impact on local biodiversity and recipient ecosystems' functioning remains to be assessed. This case study suggests that unauthorized translocations could be an emerging conservation issue in freshwater ecosystems, highlighting the need for implementing integrative management approaches to halt this illegal practice at source. These management approaches should include a more proactive attitude by environmental authorities towards official conservation translocation programs and increased social awareness of the potential impacts of unauthorized translocations.

1 | Introduction

Biodiversity loss is a major global challenge, prompting conservation translocations to counteract increasing extinction risks in declining or regionally extirpated species (Cardinale et al. 2012; Novak et al. 2021). Conservation translocations describe the deliberate human-assisted movement of individuals from a donor population to a recipient ecosystem (Corlett 2016; Stark and Galetti 2024), where (i) the target species may still be present but facing high extinction risk, which is known as restocking or population reinforcement, (ii) the target species was previously present but has vanished, which is called reintroduction or (iii) the target species was historically absent but the recipient ecosystem provides apparently suitable habitat for such species, which is known as managed relocation or assisted migration. Besides ensuring the cessation of factors causing past declines, any translocation action must be supported by a previous risk assessment to thoroughly evaluate potential impacts on donor populations and recipient ecosystems as well as social acceptance of the target species (Linhoff et al. 2021).

Risk assessments are mostly based on health risk analyses and screening for potential impacts of the translocated population on native biota or local human activities (IUCN 2013; Linhoff et al. 2021). In this context, best-practice guidelines for conservation translocations provide specific indications about when translocation is the best management option. When properly planned and supported by a formal risk assessment, official translocation actions very rarely lead to unintended impacts (Novak et al. 2021), though potential impacts of assisted migrations must be carefully considered (Peterson and Bode 2021). Over the last century, the number of official reintroduction programs and other translocation-based initiatives targeting animal species has increased substantially worldwide (Resende et al. 2020), with growing social consideration and public participation (Klein and Arts 2022).

Environmental authorities can refuse official translocation programs when risk assessments highlight uncertainty about the actual benefits for the target species, the long-term feasibility of conservation efforts or the potential impacts on recipient ecosystems (Bode 2021; Thomas 2022). Besides the growing social consideration of translocation actions, the inaction or risk-aversive attitude from some environmental authorities towards official translocations can be encouraging illegal actors (e.g., guerrilla conservationists) to carry out unauthorized releases of threatened native species to restore extinct populations or simply expand their current distribution range (Bode 2021). These unauthorized translocations of native and—very often—legally protected species in the pursuit of conservation objectives (hereafter referred to as unauthorized translocations) are being conducted across several regions of southern and central Europe (Bode 2021; Zamora-Marín et al. 2025). As the ultimate goal of unauthorized translocations is often aligned with rewilding principles (i.e., restoring species to areas where they were previously extirpated), unauthorized translocations are also referred to as covert rewilding in reference literature (Bode 2021; Zamora-Marín et al. 2025). This illegal practice comprises an emerging conservation issue that involves several management challenges (Zamora-Marín et al. 2025).

Owing to its informal and unofficial nature, unauthorized translocations often require minimal resources because they are based on the direct translocation (i.e., hard release) of individuals without previous risk assessment (Palomar et al. 2017; Thomas 2022), thus posing potential threats on both donor and recipient ecosystems (Figure 1). On one hand, within donor populations, unauthorized translocations could involve the continued and non-sustainable retrieval of high numbers of individuals (e.g., Verbeylen 2003; Linnell et al. 2009), which could jeopardize the long-term viability of such native populations (Wootton and Pfister 2013). On the other hand, in recipient ecosystems, covertly translocated taxa may cause similar impacts to those reported for invasive alien species through a wide array of mechanisms (see Figure 1 and Simberloff et al. 2013). For instance, and owing to the absence of health risk analyses, unauthorized translocations can contribute to infectious disease transmission, as already exemplified by the spread of the Tasmanian Devil Facial Tumour Disease in Australia (Bode 2021). Moreover, translocated populations may thrive in the recipient ecosystem and—through natural dispersal mechanisms—come into contact with near-natural populations of the same or closely related species, which can lead to introgressive hybridization and even local extinctions (Dufresnes et al. 2015). Furthermore, potential mechanisms of impacts from unauthorized translocations also comprise predation and competitive interactions with local biocenosis (e.g., resource competition). Ultimately, unauthorized translocations may also raise new human-wildlife conflicts because social acceptance of the target species is not assessed (see Linhoff et al. 2021). However, it is worth noting that covertly translocated populations might occasionally lead to benefits for local biodiversity and restore some ecosystem functions (Law et al. 2016). The direction and magnitude of impacts caused by unauthorized translocations can be variable and context-dependent, so further research is needed to quantify and assess effects on local biota and recipient ecosystems' functioning. In this context, it is expected that the number of unauthorized translocations will be greater in regions characterized by a long-lasting and ongoing process of human-mediated species movements, as is the case of the Iberian Peninsula (Muñoz-Mas and García-Berthou 2020; Zamora-Marín et al. 2023).

Despite unauthorized translocations being overlooked so far in the scientific literature and only three previous studies have focused directly on this topic (Bode 2021; Thomas 2022; Zamora-Marín et al. 2025), several cases of covertly translocated populations have been documented over the last two decades (Zamora-Marín et al. 2025). For instance, the reintroduction of the Eurasian beaver (*Castor fiber*) along various European river catchments is one of the most popular cases of unauthorized translocations. Over the last two decades, unauthorized releases of beavers have been conducted in the UK (Crowley et al. 2017; Gaywood 2018), Belgium (Verbeylen 2003), Italy (Bertolino et al. 2023) and various Iberian river catchments (Calderón et al. 2022; Burón et al. 2023; Ansón and García-Prendes 2024). Other covertly translocated populations have also been reported for the European polecat (*Mustela putorius*) in Scotland (Solow et al. 2006), the Tasmanian devil (*Sarcophilus harrisii*) in the Australian Bass Strait (Bode 2021) and the Eurasian lynx (*Lynx lynx*) in several regions of central Europe (Linnell et al. 2009; Sutherland et al. 2025). Hence, except for the Eurasian beaver, most unauthorized translocations documented in the literature refer to terrestrial wildlife and correspond to flagship or iconic species. Though less popular and iconic, freshwater vertebrates (e.g., fish and amphibians) might also be subjected to unauthorized translocations because they are comparatively much easier to capture and transport towards recipient ecosystems, and both are among the most threatened taxa in the world (Luedtke et al. 2023; Sayer et al. 2025). Although instances of unauthorized translocations concerning freshwater fauna are generally rarer and more scattered in the literature, genetic and biogeographic studies have already pointed to unauthorized release as the single putative pathway to explain the origin of some amphibian populations in various regions of southern (Palomar et al. 2017) and central Europe (Dubey et al. 2019; Vliegenthart et al. 2022), but more direct evidence is needed. Under this scenario, bringing this emerging issue into the scientific debate of aquatic conservationists seems timely for a consensus-based implementation of preventive and effective management strategies.

This study aims to assess the magnitude of unauthorized translocations of threatened freshwater fauna in the southeastern Iberian Peninsula, as well as highlight potential ecological and

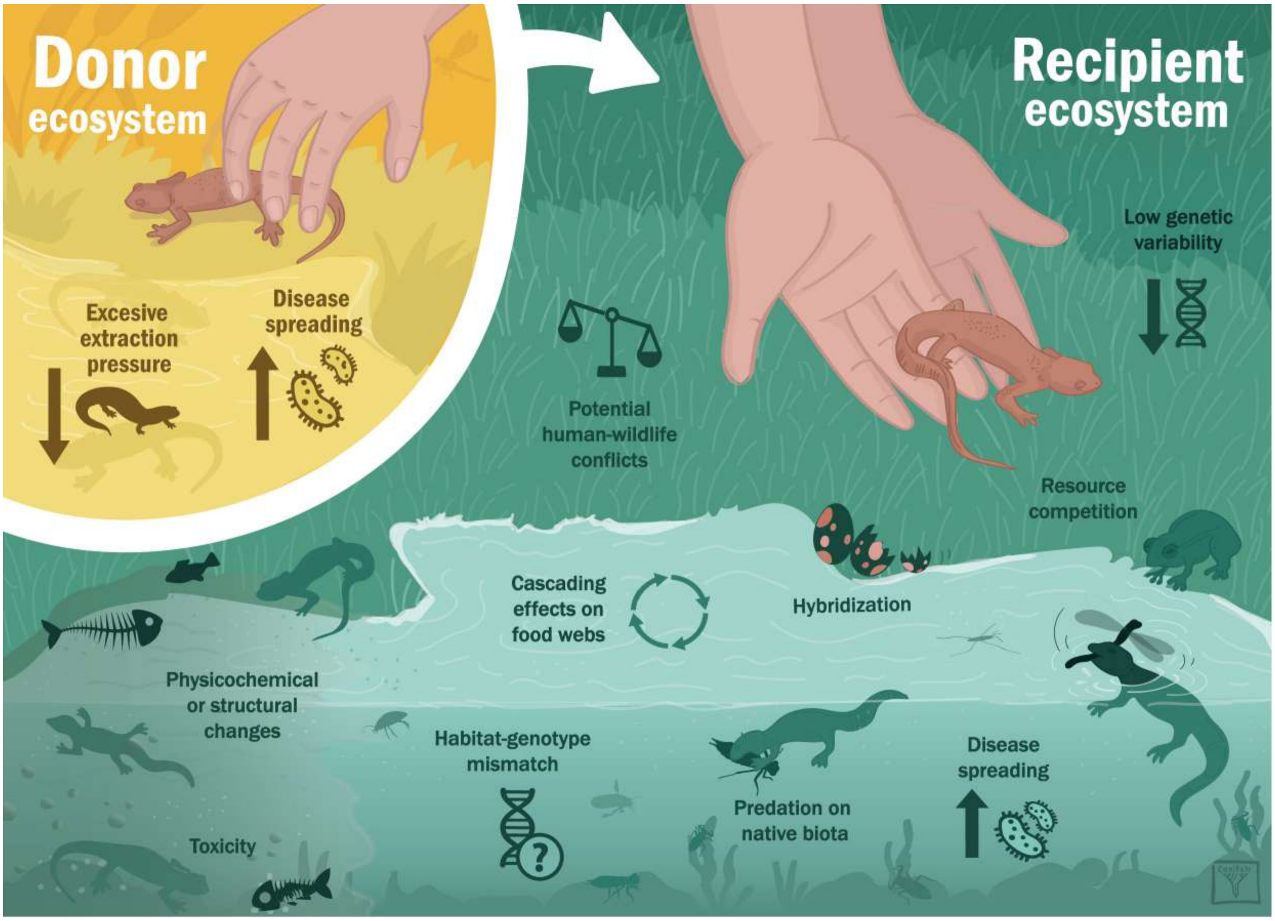

FIGURE 1 | Conceptual representation of ecological, socioeconomic and health impacts that could be caused by covertly translocated populations in freshwater ecosystems. A putative newt species is used as a model taxon to illustrate different impacts on native biota, ecosystem functioning and local human activities. Note that this figure aims to exemplify all potential impacts derived from the unauthorized translocation of any animal taxa, so a covertly translocated newt species could cause only some (not all) of these represented impacts.

management implications of unauthorized translocations in freshwater ecosystems. For that purpose, we combined information from regional databases on long-term monitoring of freshwater fauna, international and grey literature and local expert knowledge to collect all existing records of covertly translocated populations in freshwater ecosystems from the Iberian southeast. Our study comprises a first comprehensive assessment of this emerging conservation issue at a regional scale and contributes to raising concern among wildlife managers, policy-makers and conservationists on the potential impacts of covert rewilding and the need for integrative management approaches.

2 | Methods

The Iberian southeast (i.e., SE Spain) mostly comprises the provinces of Almería, Murcia and Alicante and is characterized by a Mediterranean semiarid climate, with high environmental heterogeneity ranging from the coast to inland areas (Armas et al. 2011). Freshwater ecosystems are represented by two main rivers, some small tributaries and a wide array of singular typologies of small waterbodies (e.g., temporal saline streams and traditional near-natural ponds), totalling about 18.500 ha of surface area covered by freshwater (Ballester-Sabater et al. 2003). Despite the semiarid conditions, this region harbours significant values of freshwater biodiversity and is characterized by a notable representation of singular species, including 15 water beetle species endemic to this region (Abellán et al. 2005), as well as four freshwater fish and four amphibian species endemic to the Iberian Peninsula (Fernández-Cardenete et al. 2013; Oliva-Paterna et al. 2014). However, freshwater ecosystems are highly impacted by biological invasions as a result of the intense flow regulation and strong anthropogenic pressures (Oliva-Paterna et al. 2019). For instance, nonnative fish species represent about 90% of the total richness of the freshwater fish assemblage in the Iberian southeast (Sánchez-Pérez et al. 2022), thus highlighting the magnitude of both intentional and non-intentional species introductions in the study area. Under this scenario of human-mediated species movements, it would be expected that unauthorized translocations of threatened freshwater fauna are also being conducted by illegal actors in the Iberian southeast.

To identify potential cases of unauthorized translocations in freshwater ecosystems from the Iberian southeast, we reviewed regional databases from long-term monitoring programs targeting amphibians, freshwater fish and macroinvertebrates, and conducted across lentic (e.g., artificial pools or cattle ponds) and lotic (e.g., main rivers, small tributaries or temporal streams) ecosystems over the last two decades (2004–2024). Most of these data have been generated by the research groups Biology and Conservation of Aquatic Vertebrates (Department of Zoology and Physical Anthropology, University of Murcia) and Aquatic Ecology (Department of Ecology and Hydrology, University of Murcia) in the framework of different research projects aimed to assess the ecological status of freshwater ecosystems and their associated biodiversity (e.g., Egea-Serrano et al. 2006; Abellán et al. 2007; Sánchez-Pérez et al. 2022). These biomonitoring projects are based on the application of standardized survey methods on an annual or seasonal basis, so they provide reliable information on temporal changes in communities' composition. For instance, standard electrofishing procedures (CEN 2003) were applied for freshwater fish surveys along main rivers and tributaries from the study area (Sánchez-Pérez et al. 2022), whereas active dip-netting was used to collect samples of larval and adult stages for amphibians and freshwater macroinvertebrates (Sánchez-Fernández et al. 2004; Torralva et al. 2005b). Cases of unauthorized translocations were identified considering the following criteria: (1) the taxon is native to the Iberian Peninsula and it still presents or has historically presented self-sustaining populations across Iberia; (2) records correspond to species translocated in natural habitats where no recent populations were present (i.e., regularly surveyed sites); and (3) intentional release in the pursuit of conservation is the single putative pathway of colonization because these species are not associated with recreational or aesthetic uses, and natural colonization from the nearest wild populations is unlikely due to dispersal constraints. Two records corresponding to legally translocated populations of the Iberian toothcarp (*Apricaphanius iberus*) from official reintroduction programs were excluded from this study.

Additionally, we reviewed both regional, national or international scientific literature (including bulletins, regular checklists or technical reports) published during the last two decades to retrieve records of unauthorized translocations. Alternatively, we searched for potential synonyms of unauthorized translocations, such as covert rewilding, within-region introductions, unofficial releases, illegal translocations and similar combinations. Furthermore, we also asked stakeholders (e.g., technical experts from environmental offices, naturalist associations and environmental rangers) for the occurrence of translocated populations other than those already identified by our above-described procedure. Again, cases of unauthorized translocations from grey literature and local expert knowledge were identified as such when they fulfilled all the above criteria.

For each recorded case of covert rewilding, we also retrieved the exact location of the translocated population, its population status (i.e., established, non-established or unknown), whether the species was already present or not in the recipient site (i.e., historical occurrence), the IUCN category at global, national and regional level, as well as the year of discovery of the translocated population. The translocated population was considered established when prospective surveys confirmed its successful establishment and breeding in the recipient ecosystem, otherwise being considered non-established (i.e., prospective surveys were conducted but translocated individuals were not found) or unknown (i.e., prospective surveys were not conducted). A translocated taxon was considered historically present in a recipient ecosystem when reference historical sources (e.g., Lozano-Rey 1935; Hernández-Gil 2004; Torralva et al. 2005b; Torralva et al. 2005a) supported its occurrence in that site, otherwise being considered absent. IUCN categories at global, national and regional levels were retrieved from the IUCN red list (IUCN 2025), the national red books (Doadrio 2002; Pleguezuelos et al. 2002) and the regional red list (Robledano et al. 2006), respectively. Therefore, this methodological approach resulted in a comprehensive assessment of unauthorized translocations of freshwater fauna and their key attributes in the Iberian southeast.

3 | Results

A total of 14 covertly translocated populations of freshwater species were identified in the Iberian southeast. These cases of covert rewilding correspond to six fish and four amphibian species, all of them being native to the Iberian Peninsula and seven of them being considered as Iberian endemism (Table 1). All these translocated species are classified as threatened taxa at different geographic levels, with two of them (the Valencia toothcarp *Valencia hispanica* and the Spanish Toothcarp *Apricaphanius iberus*) being listed as endangered at a national level, and the European eel *Anguilla anguilla* being listed as critically endangered at a global level. At least nine out of these unauthorized releases have resulted in self-sustaining populations. Half of the recorded populations were discovered—and presumably translocated—during the last 7 years (2018–2024), whereas the other half date from the period 2006–2015. Nine of these cases were located within protected areas (e.g., natural parks or riverine reserves). The recipient ecosystems encompassed small waterbodies ($n=6$), ephemeral streams ($n=4$) and river stretches ($n=4$).

Regarding their historical occurrence in the recipient ecosystem, only one of these recorded populations—that of Sharp-ribbed Salamander, *Pleurodeles waltl,* in the Sierra Espuña Natural Park, Province of Murcia—was reintroduced into a historically inhabited site. All other instances were introduced into novel sites where no conspecific populations were previously present (Figure 2). However, the historical occurrence of the endangered *V. hispanica* in the Chícamo river (Murcia) and the European eel (*A. anguilla*) in Hoya García (Segura River, Murcia) remains uncertain because historical records on their presence are available for close river locations but not exactly for the colonized stretches.

4 | Discussion

Unauthorized translocations in the pursuit of conservation objectives have been largely overlooked by scientific literature (but see Bode 2021; Thomas 2022). Previous studies have documented isolated cases of illegally translocated populations involving various iconic and conservation-concern species of terrestrial vertebrates (see Introduction). Documented cases likely comprise only the ‘tip of the iceberg’ of the real magnitude of unauthorized translocations (Thomas 2022), given that translocated individuals do not always thrive into the recipient ecosystem and establish self-sustaining populations. Moreover, covertly translocated populations in remote or isolated habitats can take some time from the release to the discovery (Bode 2021), so

TABLE 1 | Records of unauthorized translocations concerning threatened freshwater fauna documented in the Iberian southeast. For each record, we provide the taxonomic identity, the English name, the IUCN category at global, national or regional level, the location of the recipient ecosystem (i.e., municipality or protected area), the status of the introduced population, whether the species was (or not) historically present in the recipient area, the type of the colonized habitat and the year of discovery of the translocated population. Official IUCN categories are used as follows: VU (vulnerable), EN (endangered), CR (critically endangered) and EX (extinct in the wild). The riskiest category at global, national or regional level for each record is indicated: Spain, RM (Province of Murcia) and GVA (Valencian Community). The reference source for each record is provided in Appendix I. The symbol (†) beside the scientific name denotes Iberian endemic species.

Class	Species	English name	IUCN category	Introduced population	Province of introduction	Population status	Historical occurrence	Habitat type	Year of discovery
Amphibia	*Discoglossus galganoi*†	Iberian Painted Frog	EN (GVA)	Crevillente Municipality	Province of Alicante	Established	Unknown	Ephemeral stream	2022
Amphibia	*Hyla meridionalis*	Mediterranean Tree Frog	EX (RM)[b]	Crevillente Municipality	Province of Alicante	Established	No	Ephemeral stream	2022
Amphibia	*Pleurodeles waltl*	Sharp-ribbed Salamander	VU (RM)	Sierra Espuña Natural Park	Province of Murcia	Established	Yes	Artificial pool	2015
Amphibia	*Pleurodeles waltl*	Sharp-ribbed Salamander	VU (GVA)	Aspe Municipality	Province of Alicante	Unknown	No	Ephemeral stream	2022
Amphibia	*Triturus pygmaeus*†	Southern Marbled Newt	VU (Spain)	Crevillente Municipality	Province of Alicante	Established	No	Ephemeral stream	2011
Teleostei	*Anguilla anguilla*	European eel	CR (global)	Hoya Garcia, Segura River	Province of Murcia	Unknown	Yes	River stretch	2018
Teleostei	*Cobitis paludica*†	Southern Iberian spined-loach	VU (global)	Chícamo River	Province of Murcia	Non-established	No	River stretch	2006
Teleostei	*Achondrostoma arcasii*†	Bermejuela	VU (global)	Chícamo River	Province of Murcia	Non-established	No	River stretch	2006
Teleostei	*Squalius pyrenaicus*†,[a]	Southern Iberian chub	VU (Spain)	El Valle y Carrascoy Natural Park	Province of Murcia	Established	No	Artificial pool	2022
Teleostei	*Apricaphanius iberus*†	Iberian Toothcarp	EN (Spain)	Sierra Espuña Natural Park	Province of Murcia	Established	No	Artificial pool	2021
Teleostei	*Apricaphanius iberus*†	Iberian Toothcarp	EN (Spain)	Balsa del Sapo	Province of Almeria	Established	No	Artificial pool	Unknown
Teleostei	*Apricaphanius iberus*†	Iberian Toothcarp	EN (Spain)	La Muela Natural Park	Province of Murcia	Eradicated but again unofficially restored	No	Artificial pool	2019
Teleostei	*Apricaphanius iberus*†	Iberian Toothcarp	EN (Spain)	Yecla Municipality	Province of Murcia	Established	No	Artificial pool	2022
Teleostei	*Valencia hispanica*†	Valencia Toothcarp	EN (Spain)	Chícamo River	Province of Murcia	Established	Unknown	River stretch	2006

[a]Populations of Squalius pyrenaicus in the Iberian southeast have been recently classified as *S. tartessicus*.
[b]No historical records of *Hyla meridionalis* are available for the Valencian Community (GVA). Instead, the regional IUCN category for the nearest autonomous community (RM) with proved historical distribution is provided.

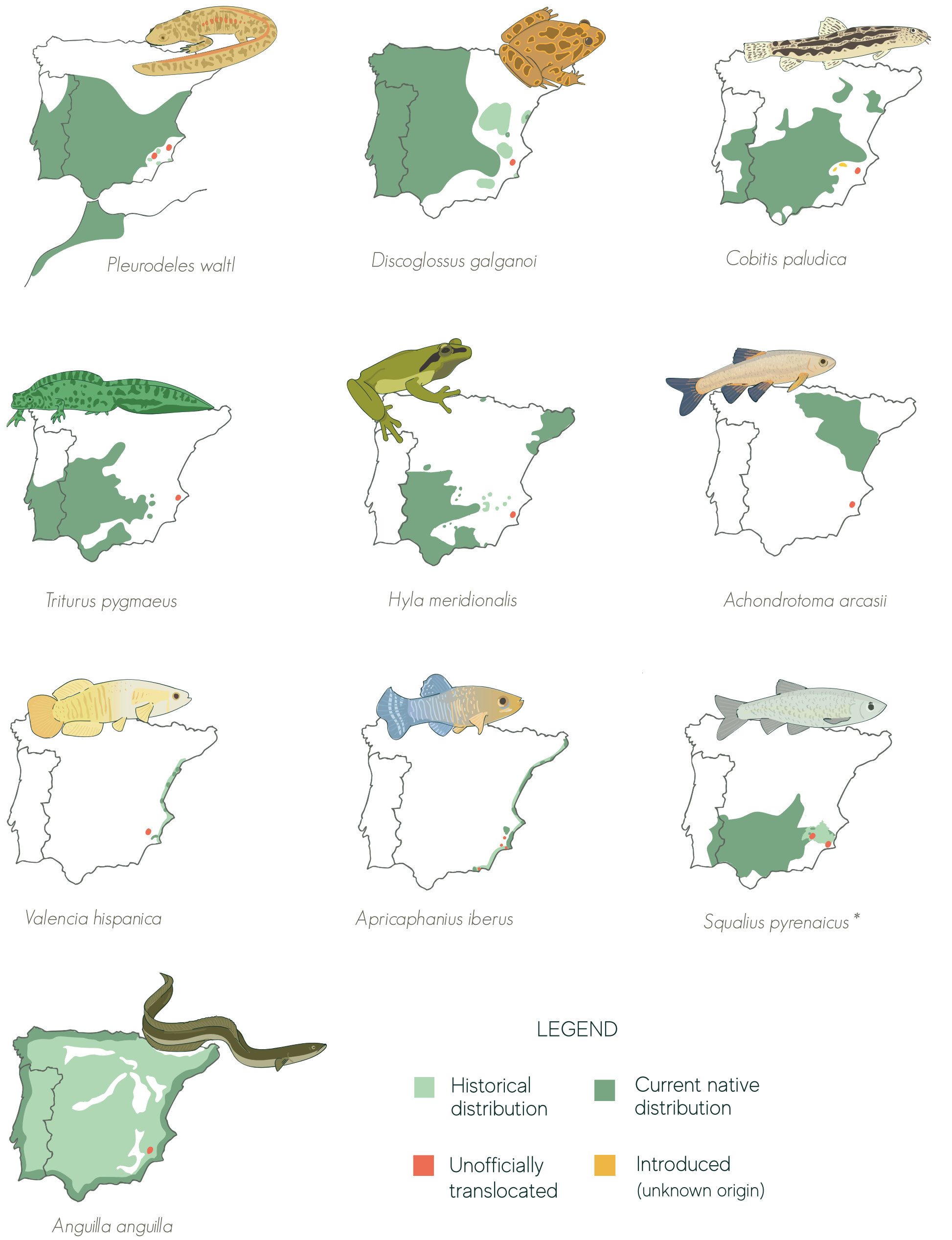

FIGURE 2 | Distribution maps of the freshwater species for which covertly translocated populations have been reported in the Iberian southeast. Maps depict the current native distribution range, the historical range and the location of translocated populations (red dots), as well as the existence of introduced populations of unknown origin (orange dots). Note that the species' historical distribution actually includes both the current (dark green) and the historical range (light green). Distribution maps have been generated according to reference literature (Appendix I). Please, note that range contractions for some species may not be reflected in these maps, as the purpose of this figure is to show the location of the translocated populations as for the natural ones. * Populations of *Squalius pyrenaicus* in the Iberian southeast has been recently classified as *S. tartessicus*.

quantitative assessments of known cases must be carefully considered because they can underestimate the real magnitude of this conservation issue (Thomas 2022). Comprehensive assessments on this illegal practice at broad geographical scales have not been yet conducted, and its ecological and socio-economic implications remain unknown, deserving further research. Our study contributes to fill this gap by providing a first thorough assessment on the magnitude of unauthorized translocations in southeastern Iberian freshwater ecosystems. We reported 14 cases of unauthorized translocations in freshwater ecosystems, which spanned a variety of attributes related to the recipient ecosystems and translocated populations (Table 1), thus allowing us to draw attention to this emerging conservation issue and to identify its potential drivers.

Though scarce and often encrypted by alternative terminology (e.g., regional translocations, illegal releases, within-country introductions), reported cases of unauthorized translocations in literature support its occurrence in freshwater ecosystems elsewhere, leading to new conservation challenges. Fourteen recent cases in a small study region such as the Iberian southeast must call the attention of conservationists and wildlife managers on this issue, as this illegal practice may be much more widespread in freshwaters than previously thought. Indeed, unauthorized translocations with conservation-concern freshwater fauna have also been reported in other European countries. For instance, in the Netherlands, mtDNA analyses have highlighted that various native species of amphibians have also been the subject of unauthorized regional translocations, as documented for the common midwife toad (*Alytes obstetricans*) (Vliegenthart et al. 2022), the great crested newt (*Triturus cristatus*) and the alpine newt (*Ichthyosaura alpestris*) (Robbemont et al. 2023), the common spadefoot toad (*Pelobates fuscus*) (Koster et al. 2022) and three species from the genus *Hyla* (Kuijt et al. 2022). Covertly translocated populations of the Mediterranean smooth newt (*Lissotriton vulgaris*) have also been genetically identified in Switzerland (Dubey et al. 2019), where several trans-alpine translocations of amphibians have been reported. Therefore, covert rewilding appears to be taking place widely across European freshwaters, and likely worldwide. This scenario of widespread covert rewilding is also occurring in the Iberian Peninsula, where unauthorized releases of the endangered Spanish toothcarp (*A. iberus*) and the Baetican toothcarp (*Apricaphanius baeticus*) have been conducted by conservation-minded aquarium hobbyists in Catalonia (Gonzalez et al. 2018) and along the Vega River in Andalusia (Gonzalez et al. 2014), respectively. Likewise, the introduction of endemic Iberian loaches (i.e., genus *Cobitis*) in Catalonia (Clavero et al. 2023) and the threatened alpine newt across the Peñalara Natural Park in Madrid (Palomar et al. 2017) is also very likely mediated by unauthorized releases. Unlike other unauthorized translocations driven by recreational, emotional or ornamental purposes, these actions are specifically intended to restore extinct or declining populations as well as to expand the distribution range of conservation-concern species (Bode 2021; Zamora-Marín et al. 2025).

Unauthorized translocations of native and threatened wildlife may pose serious risks to native biota and even disrupt recipient ecosystems' functioning (Figure 1). In our study, the impacts of translocated populations on native biota of recipient ecosystems were not measured and should be thoroughly assessed by further research. Some of these illegally translocated populations share habitat with natural populations of other threatened and legally protected species. For instance, the translocated population of the invertivorous Valencia toothcarp in the Chícamo River (Province of Murcia) shares freshwater habitats with the threatened and endemic Iberian water beetle *Octhebius montesi* (Millán et al. 2011), so impacts related to excessive predation pressure could undermine *O. montesi* populations. On the other hand, in the context of disease transmission mediated by unauthorized translocations, it is worth considering the higher vulnerability of freshwater ecosystems to this impact (Johnson and Paull 2011), where a greater number of highly pathogenic infectious diseases have been reported worldwide (e.g., chytridiomycosis, ranavirosis or aphanomycosis). In fact, the lethal amphibian-associated chytrid fungus *Batrachochytrium dendrobatidis* has already been detected in our study area and is rapidly spreading across breeding sites with high conservation value for amphibians (J. Bosch, per. com.). The covertly translocated populations reported here do not appear to have contributed to the arrival or spread of this disease so far, but further unauthorized translocations could contribute to spreading this infectious disease into still non-affected amphibian breeding sites (see Martel et al. 2020). Therefore, we believe that environmental risks associated with unauthorized releases of wildlife should raise higher concern among decision-makers and conservation practitioners.

To halt unauthorized translocations at source, environmental authorities should adopt a more permissive attitude towards official translocations (Bode 2021; Zamora-Marín et al. 2025), as enhanced surveillance and aggravated punishment might not be sufficient to dissuade guerrilla actors from proceeding with unauthorized releases (Bode 2021). Moreover, increased efforts towards social awareness of potential ecological and socio-economic impacts of covertly translocated populations would likely mitigate this conservation issue (Viviano et al. 2023). Despite the apparent widespread occurrence of unauthorized translocations, it is worth noting that the magnitude and ecological significance of this conservation issue is considerably lower as compared to the introduction of typically invasive species or other major anthropogenic pressures in freshwater ecosystems. However, in view of the more and more reported cases, unauthorized translocations deserve further attention from wildlife managers and aquatic conservationists because management strategies are rarely available to mitigate this illegal practice. Once covertly translocated populations are discovered, decision-makers and wildlife managers should conduct a preliminary assessment to evaluate their population status and potential impacts on recipient ecosystems, thus collecting basic information to assist the decision-making process (Zamora-Marín et al. 2025). Based on this assessment, three management options should be considered according to Zamora-Marín et al. (2025): (1) conducting long-term population monitoring when impacts on local biota are negligible but potential risks remain, (2) implementing conservation management if the translocated species was previously (e.g., historically) present in the recipient ecosystem and poses no significant risks, or (3) proceeding with population eradication (or population control when eradication is unfeasible) if the species is found to have detrimental ecological effects. We believe that a case-by-case approach must be applied, and the decision-making process should be guided by two main questions (Zamora-Marín et al. 2025): the historical occurrence (or absence) of the translocated species in the recipient ecosystems, and its potential impacts on local biota. As for the Iberian southeast, we recommend the eradication of those populations covertly translocated into habitats outside the current or historical species' range to avoid impacts on local biocenosis. In this context, cost–benefit analyses could be useful to prioritize the eradication of those translocated populations with greater impacts on recipient ecosystems and those that are more cost-effective from an operational point of view. We suggest long-term monitoring as the most appropriate management option for those translocated populations whose historical occurrence in the recipient ecosystem remains unclear and there is no evidence of known impacts on local biota. However, it is worth noting that long-term monitoring of covertly translocated populations should be focused on assessing potential impacts (e.g., interactions with indigenous species or local human activities, dispersal ability and effects on ecosystem functioning), thus providing sound evidence to manage such translocated populations as natural (conservation management) or invasive ones (eradication or population control). Hence, long-term monitoring should not be viewed as a stand-alone management option (Nichols and Williams 2006; Lindenmayer et al. 2013), but rather as an intermediate step in the decision-making process (see Zamora-Marín et al. 2025). As the last management option, conservation management should only be implemented when the target species has been translocated into previously inhabited sites, and impacts on the recipient ecosystems have been assessed and are negligible. However, it is worth noting that the conservation of covertly translocated populations could launder the reactionary attitude of guerrilla actors and boost further unauthorized releases (Bertolino et al. 2023). Anyway, all these management approaches should include a more proactive attitude by environmental authorities towards official reintroduction programs and increased social awareness of the potential impacts of unauthorized translocations (Zamora-Marín et al. 2025).

Author Contributions

José Manuel Zamora-Marín: conceptualization, methodology, validation, writing – original draft, writing – review and editing, visualization. **Adrián Guerrero-Gómez:** methodology, validation, writing – review and editing. **Antonio Zamora-López:** methodology, validation, writing – review and editing. **Mar Torralva:** methodology, validation, resources, writing – review and editing, supervision, funding acquisition. **Francisco J. Oliva-Paterna:** methodology, validation, resources, writing – review and editing, supervision, funding acquisition. **David Sánchez-Fernández:** conceptualization, methodology, validation, writing – original draft, writing – review and editing, visualization, supervision.

Acknowledgements

We specially thank José A. Sánchez-Zapata and Miguel Clavero for their assistance in conceptualization and discussion with helpful comments to a first draft of this manuscript. We also thank Andrés Millán, Víctor Álvarez, Julián Castaño, Rubén Tarifa, and environmental rangers from the Autonomous Community of Murcia for the provision of some records of translocated freshwater fauna. Illustrations were designed by Carmen Cañizares (@canitanatura). J.M. Zamora-Marin. is supported by a postdoctoral grant funded by the Generalitat Valenciana and the European Social Fund Plus (CIAPOS/2023/129). D. Sánchez-Fernández is funded by a postdoctoral contract from the Spanish Ministry of Science and Innovation (Ramón y Cajal program; RYC2019-027446-I).

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are openly available in the main manuscript and in the Supporting Information.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section.