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Perspective

Addressing knowledge–action gaps created by recent taxonomic and classification changes in lampreys

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ABSTRACT

Knowledge–action gaps (KAGs) are gaps between knowledge and the application of that knowledge, which can result in management actions that are not based on the best available science. Awareness of KAGs and ways to address them are increasing—for example, forming collaborative relationships between scientists and managers to coproduce and apply scientific knowledge and brokering this knowledge with interested parties. Here, we present a new conceptual model that integrates knowledge coproduction with knowledge brokering. We also present a new example of addressing KAGs that involves changes to the taxonomic classification for some lamprey species. Taxonomic name changes among fishes are common and can initially cause confusion; therefore, it is essential to broker this information. In our example, new information led to a reclassification of lampreys from the genus *Lampetra* to *Occidentis* and synonymized Western Brook Lamprey (formally *L. richardsoni*) with Western River Lamprey *O. ayresii* (formally *L. ayresii*). This information was coproduced by an international team of state, federal, and academic biologists. This collaborative approach and subsequent knowledge brokering are important because the new taxonomic classifications of lampreys are not reflected in preexisting policies and outreach materials in the state of Oregon. We highlight mechanisms for knowledge brokering and the roles that all knowledge coproducers must play in reducing KAGs.

INTRODUCTION

Although new scientific information is being generated faster than ever before, it is not always readily incorporated into management. This so-called knowledge–action gap (KAG; Tables 1 and 2) is increasingly acknowledged as a challenge in technical professions, including fisheries science (Cooke et al., 2021; Cvitanovic et al., 2014; Daim et al., 2007; Greenway et al., 2019; Hulme, 2014; Weiss, 2007). For example, rough estimates of the time lag in addressing human health issues, from research that generates new knowledge to clinical implementation of that knowledge, is nearly two decades (Morris et al., 2011). In environmental sciences, the timeline from the end of data collection to publication for peer-reviewed science journals can take 40 months or more (Cvitanovic et al., 2014). Peer-reviewed publications can lend credibility to the knowledge being used to fill an action gap. However, there may be other, more efficient and effective pathways for filling KAGs.

Knowledge–action gaps can be narrowed through science transfer (Hinderer et al., 2021) and improvements in the methods of that transfer (Cooke et al., 2024). But how can we ensure science transfer is effective? A traditional approach conceptualizes knowledge generators as separate from knowledge users and that information dumps (which may include peer-reviewed publications) from the former are all that is needed to satisfy the latter (Crandall et al., 2020; Smith et al., 2013; Toomey et al., 2016). However, this unidirectional approach of communicating is ineffective (Crandall et al., 2020; Toomey et al., 2016). A more effective approach involves coproduction of scientific knowledge, where knowledge generators and knowledge users work collaboratively throughout the research process including developing research priorities and questions; interpreting results; and coauthoring analyses, reports, and peer-reviewed journal articles (Cooke et al., 2021; Cvitanovic et al., 2015; Toomey et al., 2016). This approach requires dedication to forming meaningful relationships between scientists and managers early in the scientific process and participating in respectful and inclusive dialogue through all phases of the process (Cooke et al., 2021, 2024; Hinderer et al., 2021). Such scientific coproduction can shift the focus from scientific *outputs* toward management and conservation *outcomes* (Arlettaz et al., 2010; Smith et al., 2013; Weiss, 2007), thereby aligning knowledge production with knowledge needs. Changing incentives for researchers from output-based to outcome-based activities may help promote this shift (Beier et al., 2017). However, even co-produced knowledge takes time to reach all audiences because it is

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Table 1. Definition of the term "knowledge–action gap" (first row), along with examples of synonyms for the "knowledge–action gap." Except for the first row, the terms are presented in alphabetical order. The definitions of some terms are taken verbatim from other authors, as indicated by quotation marks.

Term or synonym	Definition	Source
Knowledge–action gap	"The barriers experienced by both scientists and knowledge users in mobilizing conservation action, practice, or policy based on scientific evidence."	Nyboer et al. (2021); see also Nguyen et al. (2017)
	"Gap between the data, evidence, and knowledge generated by researchers and those actually used or actioned by resource managers."	Hinderer et al. (2021); see also Cooke et al. (2021)
Efficacy–effectiveness gap	The disparity between evidence-based effectiveness for a (medical) treatment and application of that evidence into (medical) practice and care.	Weiss (2007)
Knowledge–action boundary	The gap between scientific evidence and incorporating that evidence into conservation policy and practice.	Cook et al. (2013)
Knowing–doing gap	The mismatch between the "ecological knowledge generated by researchers and that applied by practitioners."	Hulme (2014); see also Greener (2018)
Research–implementation gap	The disparity between knowledge produced from scientific literature and translation and implementation of science into conservation action.	Knight et al. (2008); see also Arlettaz et al. (2010); Cvitanovic et al. (2014), and Toomey et al. (2016)
Science–action gap	Lack of integrating scientific evidence and up-to-date knowledge into decision-making practices.	Nguyen et al. (2019)
Science–management knowledge gap	The limited application of science to environmental management.	Stern et al. (2021)
Science–management divide	Failure of alignment, compatibility, and flow of knowledge between researchers and policy makers and resources managers.	Roux et al. (2006)
Science–policy gap	"The difference in levels of confidence for a given scientific finding expressed by the scientific community and by society."	Bradshaw and Borchers (2000)
Theory–practice gap	"The gap between the theoretical knowledge and the practical application of nursing, most often expressed as a negative entity, with adverse consequences."	Greenway et al. (2019)

often impossible to include all possible knowledge users in the scientific process. Additionally, new knowledge requires time to be included in organizational policies, outreach, and education.

Knowledge brokering can be one solution to address KAGs (Cvitanovic et al., 2017; Meyer, 2010; Michaels, 2009). Previous work has described knowledge brokers as individuals, organizations, or intermediaries that are separate from knowledge generators and users (Cvitanovic et al., 2015; Meyer 2010; Michaels, 2009; Figure 1). These dedicated knowledge brokers may exist within the organizations that coproduced the information or in boundary organizations that collaborate with knowledge generators and users. Examples of how knowledge brokering has previously filled KAGs in fisheries and wildlife management are presented in Table 3. Diversifying the way that knowledge is brokered can facilitate knowledge uptake (Arseneault-Deraps et al., 2025). These examples underscore the importance of integrating knowledge coproduction with knowledge brokering but overlook the roles that knowledge users and generators can play in this process. KAGs may be further reduced when knowledge generators and users also participate in knowledge brokering (Figure 1B).

Below, we present a new example of this integration (Figure 1B) involving scientific name changes for lampreys in western North America. The authors of this article have diverse experiences in generating, using, and brokering knowledge to inform fisheries management. Each of us has struggled with KAGs in various capacities. To maximize the effectiveness of our jobs in serving fisheries management, we find ourselves increasingly involved in the coproduction of knowledge and brokering the obtained knowledge to various audiences. Most of these experiences have not involved clearly documented examples. However, the exception is the present article, where we describe how new knowledge on taxonomic diversity and classification resulted in KAGs related to policy, education, and outreach within at least one natural resource agency. We offer suggestions for how to address the KAGs in this example via knowledge coproduction and brokering and provide considerations to reduce KAGs that are broadly associated with taxonomic name changes in the future. Finally, we conclude with some suggestions for how to address KAGs in general.

EXAMPLE OF ADDRESSING A KNOWLEDGE–ACTION GAP

With over 40 species worldwide and diverse life histories, lampreys (Petromyzontiformes) are diverse and widespread in temperate areas of both the Northern and Southern Hemispheres (e.g., Docker & Potter, 2019; Hughes et al., 2025; Potter et al., 2015). Native lampreys play important roles in ecosystems, with some species being central to diet, culture, and folklore in western Europe and for Indigenous peoples of western North America (Almeida et al., 2021; Close et al., 2002; Docker et al., 2015; Hanel et al., 2021). In addition, lampreys are sources of prey for other animals (e.g., Cochran, 2009). Anadromous lampreys supply marine-derived nutrients to freshwater ecosystems, and larval lampreys recycle nutrients (Clemens & Wang, 2021; Close et al., 2002; Docker et al., 2015). However,

Table 2. Definitions of the main terms used in this article (presented in alphabetical order), which have been adapted to fit its context. The bolded terms are identified elsewhere in the table. Some of these terms may be used and defined differently in other contexts. However, the definitions that are provided here pertain to our use of these terms in this article. Terms are shown in bold upon first use.

Term	Definition	Sources
Boundary organization	Organizations that are intermediaries between **knowledge generators** and **knowledge users** and that connect research with decision making	Guston (2001); Cvitanovic et al. (2014); Cooke et al. (2024)
Coproduction	The collaboration between researchers and practitioners to create scientific knowledge to narrow the **knowledge–action gap**. Collaborators engage throughout the full cycle of research, including identification of research needs to study design, data collection, interpretation, and even application.	Cooke et al. (2021)
Information dumps	A form of unidirectional information sharing that occurs when **knowledge generators** provide too much information without sufficient context, making it difficult or impossible for **knowledge users** to absorb and use that information.	This article; see also Smith et al. (2013)
Knowledge brokering	The translation and transfer of knowledge, connecting research to application and decision making. This process may take many forms, involves knowledge generators building relationships with knowledge users, and requires tailoring information for relevance and accessibility to different users and contexts.	Lomas (2007); Ward et al. (2009); Meyer (2010); Hering (2016)
Knowledge broker	Individuals or organizations who participate in **knowledge brokering**. “Dedicated” knowledge brokers are individuals or organizations whose primary focus is to transfer knowledge. This article highlights the importance of **knowledge generators** and **knowledge users** to also serve as knowledge brokers.	This article; Lomas (2007); Ward et al. (2009); Meyer (2010); Hering (2016)
Knowledge generator (i.e., knowledge producer)	Individuals or organizations that create new information via research and/or knowledge syntheses that can be applied to management and related conservation challenges.	Nguyen et al. (2017); Nyboer et al. (2021); Cooke et al. (2021)
Knowledge user	Decision makers, managers, and other individuals who apply information from **knowledge generators** to guide and implement management and conservation actions.	Nguyen et al. (2017); Nyboer et al. (2021)
Outcomes	Contributions that fill the knowledge–action gap and lead to meaningful change in management and conservation.	Ewart and Ames (2020); Volk and Schäfer (2024)
Outputs	Endpoint products of scientific inquiry (e.g., peer-reviewed publications) that may inform the knowledge gap but not necessarily lead to meaningful changes in management.	Ewart and Ames (2020); Volk and Schäfer (2024)
Science transfer	The process of moving scientific knowledge and tools directly to **knowledge users**.	Hinderer et al. (2021)

as a nongame species, lampreys have not received much positive attention in the public eye (e.g., Clemens, Arakawa, et al., 2021; Clemens & Wang, 2021).

Like many fishes across western North America, lampreys have generally exhibited declines in abundance and distribution from a combination of factors including human activities that degrade and fragment stream habitat (e.g., Clemens et al., 2017; Clemens, Weeber, et al., 2021; Maitland et al., 2015). However, lampreys are understudied and conservation efforts have lagged behind those for game fishes (e.g., Clemens, Weeber, et al., 2021). In response to declines, lampreys native to western North America were petitioned for listing under the Endangered Species Act in 2003. However, the petition was denied based on lack of available information to understand their biology and population structure, which could inform the development of recovery plans (U.S. Fish and Wildlife Service, 2004). Some of the biggest knowledge gaps include species diversity and current distributions.

To improve the conservation and management of lampreys in western North America, a growing amount of conservation, research, and outreach efforts have occurred, led in part by the Pacific Lamprey Conservation Initiative (https://www.pacificlamprey.org/; Wang & Schaller, 2015), the Tribal Pacific Lamprey Restoration Plan (Columbia River Inter- Tribal Fish Commission, 2011), and the Conservation Plan for Lampreys (Oregon Department of Fish and Wildlife [ODFW], 2020) as well as other actions (e.g., Clemens et al., 2017). Activities include habitat restoration (e.g., Lamprey Technical Workgroup, 2020a, 2023); providing adequate passage and screening (e.g., Lamprey Technical Workgroup, 2020b, 2022a, 2022b); translocation (e.g., Close et al., 2009; Hess et al., 2022; Ward et al., 2012); and research, outreach, and training. In addition, significant efforts have been devoted to public outreach to dispel negative sentiments about lampreys that are related to press on invasive Sea Lamprey *Petromyzon marinus* in the Great Lakes region (e.g., Clemens & Wang, 2021; ODFW, 2024; USFWS, 2023).

One expanding area of research for lampreys explores the taxonomic relationships and species diversity of Brook and River lampreys in western North America. This work informs policy and management related to endemic species and lineages of lamprey. Through a compilation of previous studies, Carim, Auringer, et al. (2024) demonstrated the genetic distinctiveness of western North American brook and river lampreys from lampreys in the genus *Lampetra*, native to eastern North America and Eurasia. To recognize this, they named a new genus, *Occidentis*, for brook and river lampreys of western North America formerly classified as *Lampetra* (Carim, Auringer, et al., 2024). In addition, Carim, Larson, Helstab, Young, et al. (2023) and Carim, Auringer, et al. (2024) estimated the number of lamprey species within *Occidentis*. These analyses demonstrated that Western Brook Lamprey (formally

Table 3. Five examples from the peer-reviewed literature of how knowledge brokering was used to fill knowledge–action gaps in conservation and natural resources science.

Approach	Findings	Source
Conducted a survey of conservation managers (knowledge users) to explore the efficacy of knowledge brokering on informing management actions to reduce bird predation.	Managers were open to changing 46% of their management actions to reduce bird predation after being presented with a summary of scientific literature on the effectiveness of relevant management actions.	Walsh et al. (2014)
Through a case study, conducted a social network analysis and survey to understand the efficacy of a dedicated knowledge broker in facilitating climate adaptation knowledge exchange among stakeholders (knowledge users) in their professional network.	A single knowledge broker created a large stakeholder network, with increasing connections among members of the network over time. Members of the network reported that this connectivity led to better diffusion of knowledge among stakeholders and improved science outcomes in climate adaptation.	Cvitanovic et al. (2017)
Conducted a survey of fish telemetry researchers (knowledge generators) to understand whether knowledge brokering increased integration of their research into policy as well as stakeholder (knowledge user) trust and acceptance.	Researchers that focused on knowledge coproduction and brokering (dissemination, stakeholder engagement, and public outreach) had greater integration of their research into policy and greater social acceptance of their work.	Nguyen et al. (2019)
Reviewed policy and management documents (knowledge outputs) and conducted interview with stakeholders (including both knowledge generators and users) to identify pathways for successful uptake of scientific knowledge into policy on sustainable forest management of Brazil nut trees in Peru.	Public consultation (knowledge brokering and exchange) with stakeholders was critical in forming appropriate research questions. Knowledge brokering of research findings among researchers, policymakers, and stakeholders increased integration of research into policy documents and led to practices that reduced conflict among stakeholders.	Ramirez and Belcher (2019)
Systematically reviewed academic literature to evaluate approaches to knowledge exchange (including both knowledge coproduction and brokering) that best integrate research findings into marine conservation policy.	Knowledge brokering positively influenced marine conservation policy. It was most successful when inclusive of diverse types of knowledge (e.g., Indigenous knowledge) and included regular direct contact among knowledge generators and users. The best approach to knowledge exchange is context dependent, and success may depend more on process-based factors such as interpersonal communication skills and maturity of relationships among knowledge generators and users.	Karcher et al. (2024)

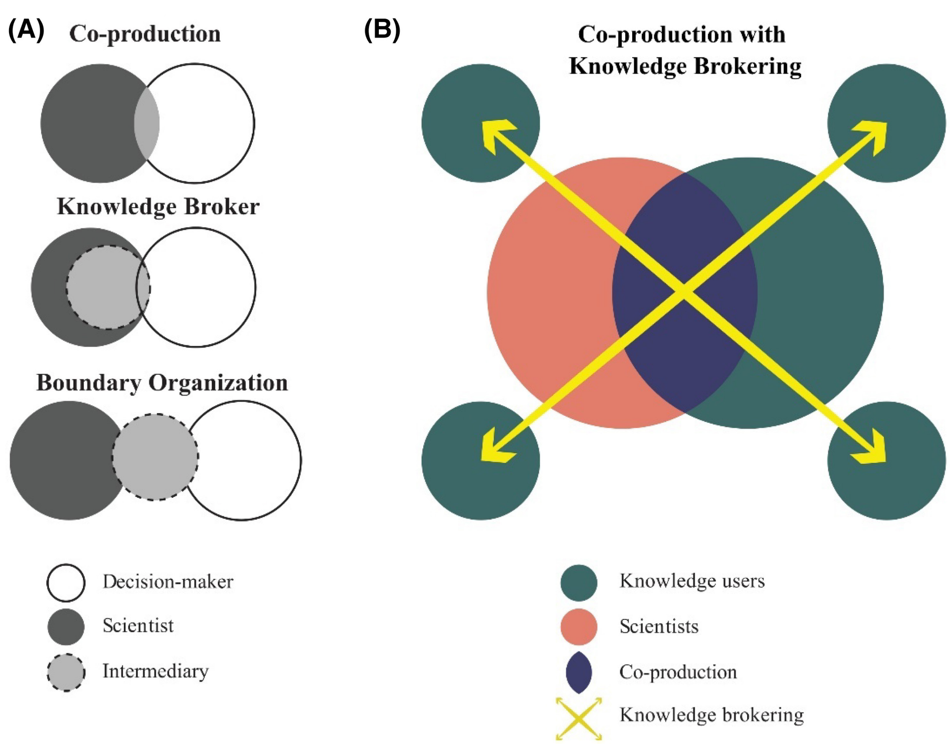

Figure 1. The figure displays (A) conceptual models for knowledge exchange between biologists and decision makers, adapted from Cvitanovic et al. (2015). (B) We propose an update to the concept of coproduction, where those involved in the coproduction of knowledge also particiapte in knowledge brokering. In our model, users may represent decision makers (e.g., managers and policymakers), intermediaries such as dedicated knowledge brokers and boundary organizations, and the general public.

L. richardsoni) and Western River Lamprey *O. ayresii* (formally *L. ayresii*) are more accurately represented as life history variants of a single species, *O. ayresii* (Carim, Auringer, et al., 2024; Figure 2). Similar to procedures for taxonomic reclassification for animals, a new common name is likely suitable to improve accuracy in nomenclature (American Ornithological Society, 2020). We recommend retaining the names Western River Lamprey and Western Brook Lamprey to distinguish between the migratory and resident forms, respectively (see Carim, Larson, Helstab, Young, et al., 2023; Carim, Larson, Helstab, Docker, et al., 2023). Research suggests these life history forms are driven by underlying genetic markers (Silver et al., 2025). This genetic basis means that we can refer to the anadromous Western River Lamprey and resident Western Brook Lamprey as different "ecotypes" of *O. ayresii* (see Clemens & Schreck, 2021, for a definition of ecotypes). This is similar to how steelhead and Rainbow Trout refer to anadromous and freshwater forms of the species *Oncorhynchus mykiss*, respectively.

These changes to lamprey classification were borne out of science coproduction among researchers and managers at federal, state, and academic institutions in the United States and Canada, including three U.S. state agencies: the California Department of Fish and Wildlife, the Washington Department of Fish and Wildlife, and the Oregon Department of Fish and Wildlife (ODFW). Including fisheries managers as coauthors (e.g., knowledge generators) narrowed the KAG by providing them with new information "in real time." This allowed managers at Washington Department of Fish and Wildlife to rapidly update educational workshops that are directed at increasing awareness of lampreys (M. Blanchard, personal communication, December 2024). It also may have prevented KAGs for managers in Washington and California, where state fish and wildlife agencies have not yet developed management plans and policy documents for brook and river lampreys.

However, this new knowledge on lamprey classification resulted in outdated information resources for the ODFW (Table 4). This change in information could be perceived as mixed messaging (Intemann, 2023) that could inadvertently degrade public trust in the ODFW. Taxonomic name changes among fishes are common and can initially cause confusion among biologists and managers; however, accurate taxonomy is important to informing these disciplines. Therefore, it is essential to broker information on taxonomic name changes (Box 1). These KAGs associated with taxonomic reclassifications of lamprey also have implications beyond knowledge users in the state of Oregon—for example, extending to documents and decisions at the federal level, such as petitions to list lampreys under the Endangered Species Act (e.g., USFWS, 2004). Similarly, these KAGs extend to the American Fisheries Society until it next updates the list of common and scientific names of North American fishes, approximately every 10 years (Page et al., 2023).

Years will elapse before this new knowledge on lamprey classification and diversity can be incorporated into documents managed by the ODFW, the American Fisheries Society, and others. In the interim, knowledge brokering is a stop-gap approach to minimizing KAGs that are associated with conservation and education documents. For instance, coauthors of Carim, Larson, Helstab, Young, et al. (2023) and Carim,

Table 4. Conservation documents, policies, and education materials originating in whole or part from the Oregon Department of Fish and Wildlife (ODFW) in which Western River Lamprey is depicted and/or described as being a separate species from Western Brook Lamprey rather than as different life history variants of the same species (Figure 2) and that use the old genus name, *Lampetra*, for these and other related lamprey (i.e., Pacific Brook Lamprey *L. pacifica*) rather than the new name, *Occidentis* (Carim, Auringer, et al., 2024; Carim, Larson, et al., 2024). The abbreviation is as follows: "Doc." = Document.

Doc. description	Doc. type	Dates	Source
Conservation Plan for Lampreys	Conservation plan	2020[a]	OAR[b] 635-500-6780; ODFW (2020)
Oregon lampreys	White paper	2002[c]	Kostow (2002)
Lampreys of Oregon	Educational brochure	2021[c]	https://www.dfw.state.or.us/fish/species/lampreys.asp
Native lampreys of Oregon	Story map	2024[c]	https://www.dfw.state.or.us/fish/species/lampreys.asp
Protected wildlife: prohibits unauthorized take, capture, hold, release or possession	Policy	2017[d]	OAR[b] 635-044-430: https://secure.sos.state.or.us/oard/viewSingleRule.action?ruleVrsnRsn=168868
Sensitive species list used to assist prioritization of conservation actions	Policy	2008, 2016, 2019[e]	OAR[b] 635-100-0040: https://secure.sos.state.or.us/oard/viewSingleRule.action?ruleVrsnRsn=173209 and https://www.dfw.state.or.us/wildlife/diversity/species/docs/Sensitive_Species_List.pdf
Oregon conservation strategy	Conservation Strategy[f]	2006, 2016, 2026[g]	https://www.oregonconservationstrategy.org/ocs-strategy-species/fish/
Definition of native migratory fish relevant for passage	Policy	2022	OAR[b] 635-412-0005: https://secure.sos.state.or.us/oard/displayDivisionRules.action?selectedDivision=2988
Specifies passage criteria in fishways	Policy	2022	OAR[b] 635-412-0035: https://secure.sos.state.or.us/oard/displayDivisionRules.action?selectedDivision=2988

[a]Date codified and published.
[b]"OAR" = Oregon Administrative Rule. Rule changes by additions or updates depend upon how recently the current rule was codified and the importance and urgency of policy needs.
[c]Date published.
[d]Date *Lampetra* (now *Occidentis*; Carim, Auringer, et al., 2024; Carim, Larson, et al., 2024) species added.
[e]Western Brook Lamprey were added in 2008, Western River Lamprey in 2016, and Pacific Brook Lamprey in 2019.
[f]This name will be changed to the "State Wildlife Action Plan" in 2026.
[g]Western Brook Lamprey were added in 2006 and Western River Lamprey were added in 2016. This document is up for review and updates every 10 years. The update, which includes Pacific Brook Lamprey, was submitted in 2025 for approval and publishing in 2026.

Box 1. General considerations for taxonomic name changes.

> Although scientific names are given to organisms in order to give them a stable world-wide name, sometimes we find that an error has been made in the naming of a species, and so the name has to be changed. . . .Although for a short time this name change will cause some confusion, in the long-term it will produce added stability and clarity (Billard, 1989)

Fish taxonomy is subject to name changes as new species are discovered, and taxonomic relationships are revised with new methods and evidence (Adams et al., 2023; Eschmeyer et al., 2010; Swartz et al., 2008). Such taxonomic changes can inadvertently confuse research (e.g., Saitoh, 2019), biogeographic assessments (e.g., Vavalidis et al., 2019), and the application of knowledge by users who are not taxonomists (e.g., Mace, 2004; Pickett et al., 2020; Pinder et al., 2019). Accurate taxonomy is essential for species identification and effective fisheries management and conservation (Kottelat, 1998; Morrisson et al., 2009; Stauffer & Kocovsky, 2007). As a result, calls have been made for increased research and knowledge brokering of taxonomic classification (House of Lords, 2008) and increased recognition of the interdependency of taxonomy and conservation (Conix, 2019) to reduce knowledge–action gaps in fisheries research, education, and conservation (Mace, 2004; Reid et al., 2013). This article as a whole presents an example of one way in which the gap is bridged via the coproduction of science and subsequent knowledge brokering.

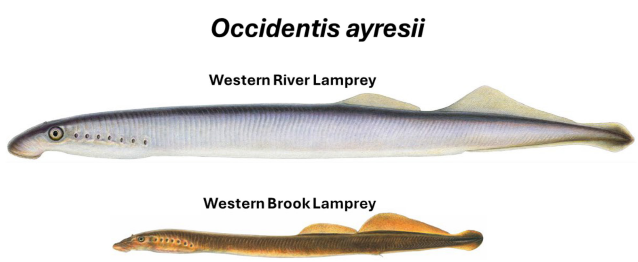

Figure 2. Illustrations of adult *Occidentis ayresii*, presented as one species, updated to reflect classification from knowledge generated by Carim, Larson, Helstab, Young, et al. (2023), Carim, Larson, Helstab, Docker, et al. (2023), Carim, Auringer, et al. (2024), and Carim, Larson, et al. (2024). The two life history variants, Western River Lamprey (migratory) and Western Brook Lamprey (freshwater resident) are shown according to their relative scale of maximum adult body sizes. Western Brook Lamprey was formerly classified as a separate species, *Lampetra richardsoni*. The illustrations were copyrighted by Joseph Tomelleri and purchased for use from Joseph Tomelleri by the Oregon Department of Fish and Wildlife.

Auringer, et al. (2024) have communicated the new information on lamprey taxonomy and species diversity to audiences within their respective organizations and beyond. In addition, coauthor K.J.C. worked with science communication specialists (dedicated knowledge brokers) at the U.S. Forest Service to summarize the Carim, Larson, Helstab, Young, et al. (2023) publication in lay terms that made the information more accessible to fisheries biologists and public lands managers who were stewarding streams where these lamprey occur (see Carim & Larson, 2023). The coauthors of Carim, Larson, Helstab, Young, et al. (2023) and Carim, Auringer, et al. (2024) have presented the results of this work to different audiences at conferences and seminars geared toward U.S. Forest Service biologists (Carim, Larson, et al., 2024); state, federal, tribal, and nongovernmental organization partners that are focused on fisheries conservation (Carim, 2024; Carim, Larson, Helstab, Docker, et al., 2023), and fisheries professionals of North America (Docker et al., 2024). In addition, *this* perspective article and Carim and Larson (2023) can be used to communicate the new knowledge on lamprey classifications and diversity throughout organizations, including ODFW staff and commissioners, and to initiate updates to pertinent conservation and education documents (e.g., Table 4).

CONCLUSIONS

We presented an example of science coproduction and knowledge brokering (Figure 1) to address KAGs in fisheries management associated with lampreys. The concept of knowledge brokering that we describe differs from previous concepts by expanding who may be considered knowledge brokers. Knowledge brokers have been characterized as individuals who are separate from knowledge generators and knowledge users (e.g., Cvitanovic et al., 2015; Meyer, 2010; Figure 1A). Efforts to reduce KAGs can be more effective when both knowledge generators and users serve in knowledge brokering roles (Figure 1B). Effective knowledge brokering requires interpersonal skills, experiential knowledge, and professional competencies (Karcher et al., 2025; Lomas, 2007; Tuohy et al., 2024). Thus, dedicated knowledge brokers will continue to be valuable assets, assisting researchers and managers in communicating their work with various audiences (Karcher et al., 2025).

Fisheries biologists and managers cannot anticipate all knowledge needs. As a result, policy and management decisions are often based on incomplete knowledge, which can result in KAGs. In addition, as science updates knowledge, there may still be KAGs until policies, management, and educational materials can be updated. Researchers can reduce KAGs by brokering knowledge beyond common science outputs (e.g., reports and publications). Similarly, managers who participate in science coproduction are uniquely poised to broker knowledge to other decision makers within their organizations. Opportunities for active discourse among knowledge generators and users via conferences and outreach to audiences can facilitate the transfer of scientific knowledge. When new information is brokered, adaptive management can allow for updated decision making and improve the integration of the best available science into fisheries management and conservation.

DATA AVAILABILITY

No new data was generated to create this article.

ETHICS STATEMENT

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CONFLICTS OF INTEREST

None declared.

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